ONLINE ABSTRACT BOOK

SCR'26

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THE SWISS MEETING FOR MEDICAL IMAGING SPECIALISTS

DIAGNOSIS AND TREATMENT

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Dear Colleagues!

The Swiss Society of Radiology (SGR-SSR), the Swiss Society of Nuclear Medicine (SGNM-SSMN) and the Swiss Association of Radiographers (SVMTR-ASTRM) are delighted about the high quality of abstracts which were submitted for presentation at the annual Swiss Congress of Radiology.

The continuous excellent work of all authors is highly appreciated as it makes the congress a very prestigious scientific meeting.

This "Online Abstract Book of the Swiss Congress of Radiology" is the 15th issue which is solely published online. It represents a cost efficient, durable platform independent documentation of scientific abstracts. Integration of the abstract data on the Congress' web page as well as permanent accessibility all over the world is the purpose.

The "Online Abstract Book of the Swiss Congress of Radiology" will be accessible on the Congress' web page at www.myscr.ch.

It includes all the abstracts of the scientific talks and posters presented at the annual Swiss Congress of Radiology 2026 in Lausanne.

Proper citation of scientific abstracts is however important, especially in case of online-only web publications. The Swiss Society of Radiology thereof recommends the use of the following structure to cite abstracts from the "Online Abstract Book of the Swiss Congress of Radiology":

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We look forward to welcoming you to the Swiss Congress of Radiology 2027 in Basel.

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A7

Baseline MR Elastography Assessment of Tumor Stiffness Predicts Survival in Pancreatic Ductal Adenocarcinoma

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Purpose: To evaluate whether baseline tumor stiffness measured by magnetic resonance elastography (MRE) predicts survival in pancreatic ductal adenocarcinoma (PDAC), we hypothesized that patients exhibiting an MRE "ring sign" (stiff peripheral rim with a softer, necrotic core) or homogeneously elevated stiffness would have worse outcomes than those with homogeneous lower stiffness.

Methods and Materials: 55 patients with newly diagnosed PDAC (Jan-2021 to Apr-2023; ethics approval Bern, registryID NCT03469726) underwent baseline fasting (≥6h) multiparametric MRI and 3D-MRE (3T Magnetom Prisma, Siemens) for staging, stiffness mapping, and exclusion of liver metastases. MRE was performed using a pneumatic driver (Resoundant, 40Hz, 40A) and a spin-echo 3D-MRE sequence (10 slices, 3.5mm thickness, end-expiration) providing full pancreatic coverage. Survival analysis was performed using Kaplan–Meier estimates and Cox proportional hazards regression.

Results: Unresectable PDAC demonstrated the lowest survival (0% at 3 years), confirming its aggressive nature. Patients with homogeneous tumor stiffness <13.3 kPa demonstrated significantly improved survival (39% at 3 years). In contrast, high stiffness (hazard ratio [HR, 95% CI] = 2.3 [1.2–4.3]; p<.05) and the MRE ring sign (HR = 2.1 [1.1–4.0]; p<.05) were each independently associated with elevated 3-year mortality (26% and 0% survival, respectively).
Notably, resected patients displaying the ring sign had outcomes similar to those with unresectable tumors. These findings align with histopathologic evidence linking intratumoral necrosis to aggressive PDAC behavior.

Conclusion: A single baseline MRE examination can therefore provide prognostic information, with tumor stiffness emerging as a promising noninvasive imaging biomarker for survival prediction and risk stratification in PDAC. Integration of MRE-derived stiffness mapping into standard pancreatic MRI protocols may enhance personalized treatment planning and outcome assessment.

A37

Prostate Cancer: Value of volume-adjusted PSA density in recurrence assessment after HIFU

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Purpose: To evaluate the diagnostic performance of the Prostate Imaging after Focal Ablation (PI-FAB) score on multiparametric MRI in combination with volume-adjusted PSA density (vaPSA-D, derived from volumetrically assessed residual vital prostate tissue) for detecting in-field recurrence after high-intensity focused ultrasound (HIFU) ablation of localized prostate cancer.

Methods and Materials: In this retrospective single-center study, 119 men treated with HIFU were followed with mpMRI and prostate biopsies at 6, 12, and 36 months. PI-FAB scores and vaPSA-D were assessed independently. Diagnostic performance was analyzed using histopathology from biopsy as reference standard.

Results: PI-FAB demonstrated good diagnostic performance, particularly at 36 months (AUC 0.92). vaPSA-D showed increasing accuracy over time (AUC 0.68, 0.81, 0.84 at 6, 12, and 36 months; overall 0.78), outperforming PI-FAB at 12 months. Integrating vaPSA-D into PI-FAB subgroups significantly enhanced recurrence assessment: PI-FAB 1: sensitivity/specificity 75%/78% (threshold 0.14 ng/ml); PI-FAB ≥2: sensitivity/specificity 67%/85% (0.18 ng/ml); PI-FAB 3: sensitivity/specificity 69%/90% (0.18 ng/ml).

Conclusion: Both PI-FAB and vaPSA-D provide reliable recurrence assessment after HIFU, with complementary strengths: PI-FAB performs best at later follow-up stages, whereas vaPSA-D maintains high sensitivity throughout. Their combined application offers the most accurate evaluation of post-HIFU recurrence and may help reduce unnecessary biopsies.

A16

Multicenter Validation of Bosniak Classification, Version 2019 for Class III-IV Aggressive and Any Cancer Prediction

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Purpose: To determine whether Bosniak Classification, version 2019 (v2019) can predict aggressive cancer in addition to any cancer, compare the accuracy of Bosniak III and IV subclassifications, and evaluate the association of nodule size with aggressive cancer and any cancer.

Methods and Materials: This multicenter, multinational retrospective diagnostic accuracy study included 421 Bosniak III or IV cystic renal masses from 419 patients across 10 institutions in three countries. Pre-treatment renal mass protocol CT or MRI performed within 1 year of resection were reviewed independently by 2 blinded radiologists at each site (20 radiologists). Reference standard was surgical histopathology. Generalized linear mixed models determined risk of aggressive cancer, any cancer, and subclass performance. Agreement was assessed with Gwet's AC1 and intraclass correlation (ICC).

Results: Probability of any cancer was 74.8% for Bosniak III (95% CI: 69.6-79.4%) and 91.0% for Bosniak IV (95% CI: 88.2-93.2%). Probability of aggressive cancer was 10.3% for Bosniak III (95% CI: 7.3-14.3%) and 33.1% for Bosniak IV (95% CI: 29.1-37.3%). Bosniak IV subclasses had significantly higher probability of any cancer and aggressive cancer than Bosniak III subclasses ($p<0.001$ to 0.007; $p<0.001$ to 0.001, respectively). The odds did not significantly differ within Bosniak III ($p=0.56$ to $p=0.99$) or IV ($p=0.10$ to $p=0.74$) subclasses. Nodule size was strongly associated with risk of any cancer ($p=0.01$ [OR 3.8/10 mm]) and aggressive cancer ($p=0.003$ [OR 2.1/10 mm]). Inter-rater agreement was substantial for Bosniak class (Gwet's AC1: 0.70 [95% CI: 0.63-0.77] and good-to-excellent for nodule size (ICC:0.89 [95% CI: 0.85 – 0.91]).

Conclusion: Bosniak v2019 stratifies risk of aggressive cancer and any cancer. Nodule size was strongly associated with aggressive cancer risk. The expert opinion-derived Bosniak v2019 subclass criteria are robustly supported.

A27

Integrating AI-automated liver volumetry and multiparametric MRI data extraction for characterisation of patients with chronic liver disease

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Purpose: To analyse if artificial intelligence (AI)-automated volumetry of liver structures and data extraction from liver T1 mapping can differentiate stages of chronic liver disease (CLD) and detect clinically significant portal hypertension (CSPH).

Methods and Materials: In this retrospective study (09/2018 to 05/2019), 159 patients underwent liver MRI including T1 maps before (T1 long) and 20 minutes after Gd-EOB-DTPA-administration (T1 short) and pre-contrast T1 Dixon-sequence for volumetry. CLD-patients were grouped based on liver biopsy into early CLD (F0-F2; n=34), advanced CLD (F3-F4; n=27) and advanced CLD with CSPH (F3-F4 with portosystemic collaterals, splenomegaly >12 cm with thrombocytopenia <100 G/L or ascites). 45 patients without CLD served as a negative control group. Total liver volume (TLV), hepatic veins volume (HVV), liver segmental volumes I–VIII, T1 long and T1 short were automatically measured using an in-house developed liver-segmentation-algorithm. A T1 reduction rate (ΔT1) was calculated as (T1 long – T1 short)/T1 long. A functional-right-lobe-volume-ratio (FRLVR) was calculated as (volumes segments IV–VIII/TLV)*ΔT1 and a hepatic-veins-ratio (HVR) as (HVV/TLV)*1000.
Parameters were compared between groups using the Kruskal–Wallis test. Univariate logistic regression analysis assessed the discriminatory power of parameters for group differentiation.

Results: All parameters differed significantly between the groups ($p<0.05$). TLV initially increased with CLD-severity and decreased at advanced CLD-stages with CSPH. In contrast, ΔT1, FRLVR and HVR continuously decreased with increasing CLD-severity. HVR and FRLVR showed strong discriminatory power for CLD (odds ratio OR 0.71 and 0.88), advanced CLD (OR 0.72 and 0.86) and CSPH (OR 0.66 and 0.87), all $p<0.001$.

Conclusion: Our findings highlight the potential of integrating automated liver segmentation for MRI data extraction and volumetry into clinical workflows to improve management of CLD patients.

A261

Voxel-Level Liver Stiffness Mapping From Diffusion MRI: Validation Against VCTE and Evaluation of Intrahepatic Heterogeneity

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Purpose: Non-invasive fibrosis assessment is central to cirrhosis management. The current non-invasive methods such as vibration-controlled transient elastography (VCTE) measures a small liver region and is operator dependent, and MR elastography requires specialised equipment. Here we evaluated a 3T diffusion-based virtual elastography (DvE) method that converts two-point shifted ADC into voxel-wise stiffness (μ_diff) and examined its relationship with VCTE in adults undergoing HCC surveillance. Secondary aims were to assess intrahepatic heterogeneity and six-month repeatability.

Methods and Materials: This prospective study included paired MRI and VCTE. DWI used single shot-EPI with b=200 and b=1500 s/mm². μ_diff was derived from sADC using a calibrated linear model. Processing involved liver masking with vessel exclusion, outlier filtering, defining a VCTE-matched right-lobe region of interest, and a whole-liver heterogeneity index with coefficient of variation (HI). Associations between μ_diff and VCTE derived measures were tested using Spearman's ρ and repeatability of μ_diff across two consecutive scans was calculated with a two-way random-effects absolute-agreement ICC.

Results: Eighty-two MRI–VCTE pairs were analysed. Right-lobe μ_diff correlated with VCTE stiffness (ρ=0.34, p=0.034) and showed moderate repeatability in rescans (ICC=0.58). Whole-liver μ_diff showed a weaker correlation (ρ=0.18, p=0.09). HI greater than 20% identified 26.8% of livers as heterogeneous. Excluding these patients strengthened the whole-liver μ_diff correlation to VCTE (ρ=0.27, p=0.043; n=60).

Conclusion: DvE provides whole-liver stiffness maps relevant for cirrhosis screening. The findings show concordance with right-lobe VCTE and suggest that intrahepatic heterogeneity can influence method agreement. DvE may complement VCTE for a whole-liver non-invasive fibrosis evaluation.

A88

The Relationship between T1 Mapping in peripheral Liver Parenchyma, Perivascular Spaces, and Liver Fibrosis Stage in Histology

Sandro Urs von Däniken[1], Seyedeh Sharareh Mirzargar[2,1], Damiano Catucci[1], Lukas Zbinden[2], Verena Obmann[1,3], Annalisa Berzigotti[4], Simone Poli[2,5], Élise Vuille-Lessard[4], Adrian Thomas Huber[1,5]; [1] Inselspital - Universitätsspital Bern, Diagnostic, Interventional and Pediatric Radiology, Bern, Switzerland; [2] ARTORG, University of Bern, Bern, Switzerland; [3] Zuger Kantonsspital, Department of Radiology, Baar, Switzerland; [4] Inselspital - Universitätsspital Bern, Department of Visceral Surgery and Medicine, Bern, Switzerland; [5] LUKS – Luzerner Kantonsspital, Department of Radiology and Nuclear Medicine, Luzern, Switzerland

Purpose: To evaluate the relationship between T1 relaxation times in perivascular and peripheral liver parenchyma, and liver fibrosis stage in histology on non-contrast liver MRI.

Methods and Materials: 65 patients with liver biopsy underwent a parametric 3T MRI within 3 months from biopsy, including non-contrast T1 mapping between 08/2018 and 04/2023.
Patients were grouped based on histological fibrosis grade (F0, F1, F2, F3 and F4). T1 relaxation times were automatically measured in 6 voxel around the portal (T1pp), and hepatic veins (T1ph), as well as in the non-perivascular peripheral liver regions (T1per), using an in-house developed and trained liver segmentation algorithm. T1pp, T1ph, and T1per, as well as their differences, were compared between groups by using the Kruskal-Wallis test and paired t-tests.

Results: T1 relaxation times differed significantly between all groups ($p<0.05$) in all regions, where T1 increased with increasing fibrosis grade. The paired t-tests showed significant differences between T1per and T1pv within all fibrosis grades (mean delta T1 12-37ms, p range from <0.0001 to 0.039). The same was observed for comparison of T1pp and T1per (mean delta T1 12-29ms, p range from <0.0001 to 0.0427). Comparing periportal and perihepatic regions, no significant difference could be found (mean delta T1 of -14 - +21ms; p-value: 0.094-0.306). The delta T1 were not significantly different between fibrosis grades.

Conclusion: T1 relaxation times vary significantly in different regions of the liver, with a strong relationship to the liver fibrosis grades. Future studies are warranted to explore the potential diagnostic value of regional T1 differences for more accurate liver tissue characteristics.

A108

Not All PI-RADS Are Equal: Impact of Radiologist Expertise on the Detection of Clinically Significant Prostate Cancer in PI-RADS 4 and 5 Lesions

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Purpose: Multiparametric MRI has transformed the diagnosis of prostate cancer, yet variability in interpretation can significantly influence clinical decision-making. Given the central role of MRI in guiding biopsy decisions, this study aimed to assess how interpretation by expert genitourinary (GU) radiologists impacts the accurate detection of clinically significant prostate cancer (csPCa) in men presenting with PI-RADS 4/5 lesions.

Methods and Materials: We conducted an analysis of 362 cases of patients with PI-RADS 4 or 5 lesions (233 PI-RADS 4; 129 PI-RADS 5) who underwent consecutive transperineal software-fusion prostate biopsy procedures. Cases were included between November 2023 and October 2025. Patient PSA was < 50 ng/mL. MRI readers were categorised as expert GU radiologists (three certified or fellowship-trained prostate MRI readers) or non-experts (general radiologists or external referrers). Histopathological outcomes were classified as ISUP grade 0/1 (non-significant) or ISUP ≥2 (clinically significant cancer). Statistical analyses were performed to evaluate diagnostic accuracy according to reader expertise.

Results: Of the analyzed lesions, 94 were reported by experts (26%) and 268 by non-experts (74%). Univariate analysis showed that PI-RADS 4 lesions interpreted by expert readers harboured a significantly higher rate of csPCa (43%) compared to those read by non-experts (25%, p=0.013). For PI-RADS 5 lesions, detection rates were similar (64% vs. 62%, n.s.).

Conclusion: Reader expertise has a substantial impact on the diagnostic accuracy of prostate MRI, particularly for PI-RADS 4 lesions, where interpretation variability remains clinically meaningful. In our study population expert readers detected a significant higher proportion of significant prostate cancers compered with the non-expert ones, delineating the effect of specialised training in reading prostate-MRI

A17

Automated Quantification of Perivenous and Peripheral Liver T1 and T2 Relaxation Times in FALD, PSC, and LF

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Purpose: We present a deep-learning, sequence-adaptive method to quantify T1/T2 relaxation times in perivenous and peripheral liver regions across Fontan-associated liver disease (FALD), primary sclerosing cholangitis (PSC), and other patients with liver fibrosis (LF).

Methods and Materials: An nnU-Net was trained on non-contrast T1-weighted Dixon 3T MRI (n=200) to segment liver parenchyma and vessel tree. T1 and T2 maps were affine- registered to Dixon T1. In a held-out set (16 FALD, 16 PSC, 16 LF, and 16 control), T1 and T2 relaxation times were measured in (i) the perivenous region within 9.6 mm of the vessel tree and (ii) the remaining peripheral parenchyma. To reduce partial-volume and flow-bias, the 2.4 mm next to vessels were excluded. We report mean T1/T2 relaxation times (m1,m2) and differences of mean (Δ). Paired t-tests compared regional values, and intra-class correlation coefficient (ICC) assessed algorithm-radiologist agreement.

Results: In FALD patients, m1 was 1036.3 ms (peripheral) and 1011.9 ms (perivenous). m2 was 39.8 ms (peripheral), and 38.3 ms (perivenous). Peripheral values were higher than perivenous values for both T1 (Δ=24.3 ms; p=.002) and T2 (Δ=1.5 ms; p<.001). In LF patients, the m1 was 901.1 ms (peripheral) and 951.2 ms (perivenous). m2 was 36.9 ms and 36.1 ms. Peripheral values were lower than perivenous values for T1 (Δ=-50.1 ms; p=.005), but not for T2 (Δ=0.8 ms; p=.3). In PSC and CTRL, no significant regional variation was observed: Peripheral values were lower than perivenous for both groups in T1: (Δ=[-21.8, -4,5] ms; p=[0.3, 0.5]), but not T2: (Δ=[4.4, 0.2] ms; p=[0.1, 0.8]). Agreement between algorithm and radiologist was good for T1 (ICC=0.79) and excellent for T2 (ICC=0.92).

Conclusion: Automated extraction of regional liver T1/T2 maps reveals distinct perivenous and peripheral patterns in FALD versus LF, likely reflecting different hepatic remodeling mechanisms and improving non-invasive liver characterization beyond fibrosis staging.

A12

LI-RADS CT/MRI Nonradiation Treatment Response Assessment Version 2024 for Detecting Local Recurrence of Surgically Resected Hepatocellular Carcinoma

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Purpose: To compare detection of local recurrences after surgical resection of HCC between LI-RADS CT/MRI Nonradiation TRA v2024 (v2024) and the LI-RADS CT/MRI Core version 2018 (v2018) diagnostic algorithm.

Methods and Materials: This retrospective study included patients with surgically resected HCC who underwent at least one liver CT or MRI performed ≥6 months after surgery. Two radiologists independently reviewed all postoperative CT and MRI in separate sessions, assessing the surgical margin using LI-RADS CT/MRI Nonradiation TRA v2024 and LI-RADS CT/MRI Core v2018, respectively; a third radiologist resolved discrepancies. Local recurrence was defined by v2024 as LR-TR Viable (i.e., masslike enhancement at the margin, in any phase and of any size) and by v2018 as LR-5, LR-M, or LR-TIV.

Results: The retrospective study included 200 patients (142 men, 58 women) followed for a median of 30.5 months. Interreader agreement for v2024 was substantial (κ=0.71). By v2024, LR-TR Viable at the surgical margin was assigned in 56 (28.0%) patients: on first postoperative examination in 21 patients, directly after LR-Nonviable assignment without intervening LR-TR Equivocal assignment in 31 patients, and after LR-TR Equivocal assignment in remaining patients. LR-TR Viable was assigned after a median of 5.1 months and at a median size of 1.5 cm. By v2018, LR-5, LR-M, or LR-TIV was assigned at the surgical margin in 53 (26.5%) patients after a median of 12.0 months (p<.001) and at a median size of 2.1 cm (p<.001). At the time of 56 initial LR-TR Viable assignments, v2018 categories assigned were LR-3, LR-4, LR-5, LR-M, and LR-TIV in 21, 10, 18, 3, and 4 patients, respectively. Upgrade of LR-3 and LR-4 observations to LR-5, LR-M, or LR-TIV occurred after a median of 5.1 and 3.0 months, respectively.

Conclusion: v2024 enables detection of postoperative HCC local recurrence in 28% of patients, at an earlier time, and at a smaller size compared to v2018, potentially improving eligibility for salvage therapies.

A171

Liver Fat and Iron Quantification with Spectral Localizer Radiographs from Photon-Counting Detector CT

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Purpose: Quantification of liver fat on CT is often confounded by hepatic iron deposition and the use of iodinated contrast agents. This phantom study aimed to evaluate the feasibility and accuracy of quantifying liver fat content (LFC) in the presence of iron using spectral localizer radiographs acquired with photon-counting detector CT (PCD-CT).

Methods and Materials: Sixteen liver phantoms were constructed using mixtures of liver tissue, fat, and iron to simulate four levels of LFC (0%, 10%, 30%, 50%) and four levels of liver iron concentration (LIC: 0, 1.5, 3, and 6 mg/mL). Five additional reference phantoms (containing fat only, water only, or water–iron solutions) were included. All phantoms were scanned on a clinical PCD-CT system using three tube current settings (10 mA, 50 mA, 300 mA) to acquire spectral localizer radiography data. Material decomposition of high- and low-energy bin data yielded water and hydroxyapatite (HA) maps. HA-values were analyzed as a function of LFC and LIC, and water-values were correlated with corresponding HA-values.

Results: Increasing LFC resulted in a linear decrease in HA-values, consistent across all LIC levels (slopes = −0.0016 to −0.0023; mean = −0.0019; r = 0.997–1.0). Conversely, increasing LIC caused a linear increase in HA-values, independent of LFC (slopes = 0.0147 to 0.017; mean = 0.0156; r = 0.978–1.0). When combined with water-values in a two-dimensional material space, these stable linear relationships enabled accurate estimation of LFC irrespective of LIC. Findings were reproducible across all tube current settings.

Conclusion: Spectral localizer radiographs from PCD-CT allow accurate quantification of liver fat content even in the presence of iron deposition. If validated in vivo, this technique may enable low-threshold opportunistic screening for hepatic steatosis and iron overload from standard pre-contrast localizer scans.

A112

Potential Iodinated Contrast Reduction in Oncologic Body CT Using Dual-Energy and Deep Learning: A Phantom Study

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Purpose: To determine the optimal low-keV level using Deep Learning Image Reconstruction (DLIR) that maximizes lesion detectability, and to assess the potential for iodinated contrast media (ICM) reduction across varying patient body habitus.

Methods and Materials: An abdominal phantom was scanned using a standard thoraco-abdomino-pelvic Dual-Energy CT (DECT) protocol during the portal venous phase, with three rings inserts simulating different body habitus. Virtual monoenergetic images (VMI) were reconstructed from 40 to 70 keV in 10 keV increments using adaptative statistical iterative reconstruction-V (ASIR-V) 50% and DLIR-High (DLIR-H). Contrast enhancement was quantified, spatial resolution was evaluated with the Task-based Tran fer Function, and noise characteristics were analyzed using the Noise Power Spectrum. Low-contrast lesion detectability (5–10 mm) was assessed using an anthropomorphic model observer.

Results: Compared to ASIR-V, DLIR-H provided equivalent contrast, reduced image noise, and improved spatial resolution. All lesions size with DLIR-H were technically detectable under all conditions. The reconstruction at 40 keV demonstrated the highest detectability of hypovascular lesions, regardless of lesion size or phantom dimensions. The theoretical potential for iodine dose reduction using 40 keV with DLIR-H is at least 31.3%.

Conclusion: Under phantom conditions, 40 keV with DLIR-H shows superior detectability of hypovascular lesions under all conditions suggesting a theoretical potential iodine load reduction of 31.3%.

A181

Long-term outcome of recanalization of symptomatic chronic portal and splanchnic venous thrombosis without cirrhosis

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Purpose: To report a single-center experience of portal and splanchnic vein recanalization (PSVR) in patients with symptomatic chronic thrombosis and absence of liver cirrhosis.

Methods and Materials: 21 consecutive patients (mean age 52, range 26-69 yrs) who underwent PSVR were included. Mean clinical/sonographic and CT-follow-ups were 43, respectively 36.5 months. Main indications included recurrent variceal hemorrhage (n=14), refractory ascites/hydrothorax (n=4), neuro-cognitive disability (n=2) and portal biliopathy (n=2). Aetiological factors were thrombophilia (19%), myeloproliferative neoplasms (33%), local [umbilical catheter, postop stenoses] (14%) or unknown (33%). Types of splanchnic-portal thrombosis (Sarin): type 1 (19 %), type 3 (81 %), extension to splenic (9%), mesenteric veins (19%) or both (57%). The following PSVR were performed: Portal vein (PV) angioplasty (n=1), PV angioplasty plus splenic stenting (n=1), PV stenting (n=3), TIPS plus PV stenting (n=6), TIPS plus splanchnic vein stenting (n=10). All patients resumed long-term anticoagulation after recanalization.

Results: The technical success rate was 100% with a 30d complication rate of 14% (re-thrombosis in 2 and splenic access hemorrhage in 1 pat). One patient was lost to FU. One late death due to a non-related cause occurred. Reinterventions were needed in 11 patients (52%) during the FU. Both patients with portal biliopathy had late re-thromboses associated with tipsitis and re-thromboses occured after revascularization. Antibiotic treatment and exchanges of biliary drainages were successful. One patient presented with GI-hemorrhage as the PV had re-thrombosed. The secondary patency rate after PSVR was 75%. Patency of the portal and splanchnic veins warranted clinical improvement.

Conclusion: PSVR in patients without cirrhosis is safe adopting techniques depending on the intrahepatic and splanchnic extension. Durable clinical improvement can be obtained at the expense of maintenance interventions. Symptomatic biliopathy may not respond to PSVR.

A120

Results of the QUANTI CNS study: Efficacy and Safety of gadoquatrane in patients undergoing contrast-enhanced MRI of the CNS at reduced Gadolinium dose compared to macrocyclic GBCAs.

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Purpose: Gadoquatrane is a novel tetrameric macrocyclic gadolinium (Gd)-based contrast agent (GBCA) with high relaxivity allowing for a reduction in the Gd dose compared to macrocyclic GBCAs. The QUANTI CNS study was a phase 3 study investigating efficacy and safety of gadoquatrane, at a dose of 0.04 mmol gadolinium (Gd)/kg body weight (bw) compared to 0.1 mmol Gd/kg bw of macrocyclic GBCAs (gadobutrol, gadoterate meglumine and gadoteridol) in CE-MRI of the central nervous system (CNS).

Methods and Materials: The study was a multicenter, randomized, double-blind, cross-over study, conducted 15 countries. Adult patients with known or suspected CNS pathology underwent two CE-MRIs, one with gadoquatrane and the other with a comparator GBCA, administered in random order with a washout period of 3 to 14 days. MRIs were evaluated in a blinded independent central review. Safety parameters were assessed for both MRI periods.

Results: Out of 303 patients receiving at least one contrast administration, 294 completed both MRIs. The study met the primary objectives by showing gadoquatrane MRI to be non-inferior to comparator MRI and superior to pre-contrast MRI, based on the three visualizationparameters: contrast enhancement, delineation, and morphology.
The mean scores vs. combined comparator MRI for all three parameters and three readers were similar with differences close to zero and below the non-inferiority margin of 0.35.
Combined gadoquatrane MRI demonstrated significant improvements in all visualization parameters compared to pre-contrast images (p <.0001) for all three readers. Sensitivity and specificity for the detection of lesions, were shown to be non-inferior to comparator MRI.
The safety profile was similar for gadoquatrane and comparators.

Conclusion: Gadoquatrane at a dose of 0.04 mmol Gd/kg bw, which corresponds to a 60% reduced gadolinium dose compared to GBCA at 0.1 mmol Gd/kg bw, is non-inferior for CE-MRI of the CNS with a similar safety profile.

A104

AI for Longitudinal Brain Metastasis Management

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Purpose: To develop an automated pipeline for lesion-level brain metastasis (BM) detection, segmentation, longitudinal tracking, and response assessment in MRI to support clinical decision-making and retrospective studies.

Methods and Materials: This IRB-approved retrospective study includes 177 patients (63% male, 37% female) with 896 BMs treated with stereotactic radiosurgery at CHUV and monitored for >360 days with contrast-enhanced T1-weighted MRI (approximately every 2 months). The pipeline consists of sequence selection, BIDS conversion, image registration, automatic re-segmentation using prior lesion masks from therapy planning as input, lesion tracking across follow-ups, atlas-based localization, automated RANO-BM-based response assessment (CR, PR, SD, PD), trajectory clustering, and 1-year CR prediction using clinical and imaging features. Detection and segmentation were evaluated using Dice Similarity Coefficient (DSC) and F1-score. Stability and response predictability were tested using t-tests and AUC.

Results: New lesion segmentation in pre-treatment scans achieved DSC 0.79 and F1 0.80. Re-segmentation with prior significantly outperformed baseline without prior in follow-up scans (DSC 0.78, F1 0.88 vs. 0.56, 0.60; $p<0.05$), especially for enhancing tumor (DSC 0.76 vs. 0.53) and edema (0.52 vs. 0.47). For response assessment, automatic contours and volumetric criteria showed greater measurement stability ($p<0.001$ under rotation) and higher 1-year outcome predictability than manual measurements. Clustering into five groups revealed characteristic lesion trajectories with distinct final response categories.. Response prediction achieved AUC 0.90 (CI95%: 0.88–0.92) using only pre-treatment and first follow-up MRI.

Conclusion: The proposed pipeline enables accurate BM segmentation, automated response assessment, and reliable 1-year outcome prediction. It supports large-scale retrospective analysis and the development of decision-support tools for personalized BM management.

A60

Comparing Small and Large Woven EndoBridge Devices for Intracranial Aneurysm Treatment: Findings from the WorldWideWEB Multicenter Study

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Purpose: Small Woven EndoBridge (WEB) devices (≤ 4.5 mm) present technical challenges during deployment and have limited safety and efficacy data. This study compared clinical, angiographic, and safety outcomes between small, large (> 4.5 mm), and very large (> 7.5 mm) WEBs in the endovascular treatment of intracranial aneurysms.

Methods and Materials: We conducted a retrospective analysis of prospectively collected data from the WorldWideWEB consortium, including 1473 adults treated with WEB between January 2011 and December 2022 across 30 international centers. Patients were stratified into small and large WEB groups; a subanalysis compared small and very large WEBs. The primary outcome was retreatment rate; secondary outcomes included modified Rankin Scale (mRS), complete occlusion, intracranial hemorrhage (ICH), and thromboembolic complication (TEC) rates. Statistical analyses were performed using t-test/Mann–Whitney U test for continuous variables, chi-squared/Fisher's exact tests for categorical variables, and ordinal mixed-effects logistic regression, with significance at $p < 0.05$. Institutional review board approval was obtained; informed consent was waived given the retrospective design and anonymized data.

Results: Median age was 59 [51.0, 68.0] years; 29.7% were male. Small WEBs (n = 229, 15.5%) achieved lower retreatment (4.3% vs 8.8%, $p = 0.037$), comparable mRS at last follow-up (FU) (1 [1–2] vs 1 [1–2], $p = 0.88$), and superior complete occlusion periprocedurally (57.1% vs 36.6%, $p < 0.001$) and at FU (76.2% vs 58.5%, $p < 0.001$), with similar ICH (2.6% vs 0.9%, $p = 0.102$) and TEC rates (3.1% vs 3.9%, $p = 0.686$). Very large WEBs had higher retreatment (16.1%, $p < 0.001$) and lower complete occlusion (periprocedural: 32.2%, $p < 0.001$; follow-up: 50.5%, $p < 0.001$), with comparable safety outcomes.

Conclusion: Small WEBs demonstrated lower retreatment rates and comparable clinical but superior anatomic outcomes versus large devices, with similar safety profile.

A265

Absolute brain glutamate quantification at 3 T using singlet-filtered 1H-MRS: clinical feasibility in healthy volunteers and glioma patients

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Purpose: To evaluate the clinical feasibility of a singlet-filtered, glutamate-targeted proton MR spectroscopy (1H-MRS) sequence at 3 T for absolute cerebral glutamate (Glu) quantification using external water-phantom calibration in healthy volunteers and glioma patients.

Methods and Materials: A room-temperature external water phantom provided the calibration factor for voxel-wise Glu concentration. Spectra were acquired in 24 healthy volunteers (55 voxels in frontal and occipital cortex and basal ganglia) and 19 treatment-naïve glioma patients (34 tumor voxels) at 3 T using short-echo localization, water suppression and a singlet filter with optimal-control RF pulses targeting the Glu triplet at 2.35 ppm. Phantom-normalized Glu peak areas were compared with those from standard point-resolved spectroscopy (PRESS) using Welch t-tests.

Results: Singlet-filtered spectra of sufficient quality were obtained in 81/89 acquisitions (91%). The sequence consistently resolved the Glu triplet at 2.35 ppm while reducing non-Glu resonances to <15% of baseline. External-phantom calibration showed a coefficient of variation <10%. Glu concentrations were lower in glioma-related voxels than in healthy cortical voxels ($p = 0.012$), whereas a pooled analysis including unlabeled volumes of interest did not reach significance ($p = 0.210$).

Conclusion: Singlet-filtered 1H-MRS enables robust absolute Glu quantification at 3 T with high acquisition success and low calibration variability. The method is clinically feasible and may complement established molecular imaging techniques for glioma characterization and therapy monitoring.

A2

Oral Cavity Lesion Mimicker: How prevalent is the Mylohyoid Boutonnière on MRI?

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Purpose: The mylohyoid muscle (MM) is commonly considered a continuous muscular sling, but it is frequently discontinuous, forming mylohyoid boutonnières (MHB) that can contain salivary tissue, fat, blood vessels, or lymph nodes. While some studies have explored MHB in cadavers and through CT imaging, the prevalence of them on MRI remains largely unexplored. This study aims to assess the prevalence, age-dependence, anatomical distribution, and content of MHB as visualized on MRI.

Methods and Materials: A retrospective review of MRI scans of the head and neck from 294 patients between 2016 and 2020 was conducted. MR images were analyzed for the presence, location, and contents of MHB. Inter-rater agreement from the three independent readers with different levels of experience and statistical analysis were performed to assess consistency across readers.

Results: MHB were identified in 50.7% of individuals, with bilateral deficiencies occurring in 45.6% of cases. Most defects were located in the anterior (45.6%) and middle (51.0%) thirds of the MM. The herniated content consisted predominantly of salivary tissue (69.3%), followed by fat (15.9%), and blood vessels (14.2%). No significant association was found between MHB prevalence and age. There was a high level of inter-rater agreement among all three raters regarding the presence, side, location, and content of the MHB, with no statistically significant discrepancies observed across the assessed parameters.

Conclusion: A MHB is a true and common anatomical variant, with a prevalence of 50.7% in this study, and most defects are bilateral. MRI provides high soft tissue contrast, which is beneficial for evaluating oral cavity anatomy, while CT may have higher sensitivity for small bony or soft tissue defects due to its superior spatial resolution. This knowledge aids in preventing diagnostic errors when evaluating oral cavity lesions, minimizing the need for unnecessary invasive procedures.

A274

AI-Assisted Opportunistic Screening for Intracranial Aneurysms on T2-Weighted MRI: A Clinical Validation Study

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Purpose: Unruptured intracranial aneurysms (UIAs) occur in approximately 3% of individuals and carry a clinically important risk of rupture, which can lead to subarachnoid hemorrhage, lasting disability, and high societal cost. Population-wide screening is currently impractical because aneurysm diagnosis and management relies on angiographic techniques that are expensive and resource-demanding. Leveraging routinely acquired T2-weighted MRI for opportunistic screening could offer a scalable alternative, provided reliable automated detection is available. We therefore evaluated the clinical performance of a deep learning (DL) model for UIA detection on T2-weighted MRI and compared it with blinded radiologist review.

Methods and Materials: In this retrospective study, 1,759 T2-weighted MRI examinations, including 79 aneurysm-positive cases, were analyzed by a DL algorithm and three radiologists with 15, 6, and 2 years of experience. Readers were given limited time per case to approximate routine clinical conditions. Model and reader sensitivity and specificity were compared using McNemar's test.

Results: The DL model detected UIAs with 46.05% sensitivity and 98.99% specificity, whereas radiologists achieved a mean sensitivity of 3.51% and mean specificity of 99.94%.
The model's sensitivity and specificity were significantly different from radiologist performance. False-positive predictions by the DL model were most frequently located at arterial bifurcations, along curved vessel segments, and adjacent to the nasal sinuses.

Conclusion: Compared with time-constrained radiologist assessment, the DL model demonstrated substantially higher sensitivity for UIA detection on routine T2-weighted MRI while preserving high specificity. These findings support AI-enabled opportunistic aneurysm screening as a feasible, resource-efficient enhancement to standard MRI workflows, with potential to improve early case identification and reduce variability in clinical practice.

A68

Chemical Versus Chemical and Mechanical Angioplasty for Cerebral Vasospasm after Aneurysmal Hemorrhage: A Pilot Randomized Study

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Purpose: Refractory cerebral vasospasm (CV) and delayed cerebral ischemia (DCI) following aneurysmal subarachnoid hemorrhage (aSAH) are associated with high morbidity and mortality; CV may recur despite intra-arterial chemical treatment, and the role of adjunctive mechanical angioplasty remains unclear.
The objective of this pilot randomized prospective trial was to assess the effects of the adjunction of mechanical angioplasty to chemical vasodilation alone on the reduction of brain hypoperfusion.

Methods and Materials: In a prospective, monocentric, interventional trial, we randomly assigned patients with a refractory CV within the internal carotid arteries (ICAs) and an indication for endovascular management to undergo intra-arterial chemical angioplasty (control group) or chemical plus mechanical angioplasty (treatment group). The primary end point was the change of brain perfusion in the dedicated arterial territory measured by the Time to Drain (TTD) on CT perfusion

Results: A total of 12 patients with 44 refractory CV were randomly assigned, 21/44 (55 arterial segments) to the intervention group and 23/44 (86 arterial segments) to the control group. Median change in TTD beyond the treated artery was of -43% (-62- -34) in the intervention group (β, -20; 95% confidence interval [CI], -27 to -13; P<0.001) versus -10% (-49-9). Median change in vessel size was of 83% in the intervention group as compared with 27% in the control group (P<0.001).

Conclusion: In this pilot randomized study, among SAH patients with refractory vasospasm in the ICA requiring endovascular management, the adjunction of mechanical angioplasty was associated with a significantly higher improvement in brain perfusion and a lower risk of recurrence.

A291

Clinical Outcomes and Safety of Continuous Intraarterial Nimodipine for Refractory Vasospasm After Aneurysmal SAH: A Retrospective Single-Center Analysis

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Purpose: Continuous intraarterial nimodipine (CIAN) is used as a rescue therapy for severe cerebral vasospasm after aneurysmal subarachnoid hemorrhage (SAH). Evidence on its effectiveness and safety, both as monotherapy and in combination with other endovascular interventions, remains limited.

Methods and Materials: This retrospective single-center study analyzes approximately 50 patients treated for angiographically confirmed intracranial vasospasm after SAH between 2007 and 2020. Patients received either CIAN alone or CIAN in combination with additional treatment modalities such as stent retriever or intraarterial vasodilators. Clinical and radiologic responses, delayed cerebral ischemia, and functional outcomes at discharge and follow-up were evaluated. Procedure-related complications, including infection, thromboembolic events, catheter-associated issues, and hemodynamic instability, were systematically reviewed.

Results: This retrospective study adds real-world data on the efficacy and risk profile of CIAN used as monotherapy or as part of multimodal rescue strategies for severe post-SAH vasospasm. Aligned with the existing literature, CIAN frequently achieves angiographic and often clinical improvement, but is associated with measurable procedural risks that require structured surveillance and prophylactic measures.

Conclusion: CIAN is an effective and generally safe treatment for severe post-SAH vasospasm, either alone or within multimodal therapy. Associated risks are manageable with a structured algorithm, supporting optimized treatment selection and rescue strategies in high-risk patients.

A238

Flat-Panel Computed Tomography in Otosclerosis: CT Grading, ROI-Based Density Analysis, and Correlation With Intraoperative and Functional Outcomes

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Purpose: To evaluate FPCT in the preoperative assessment of otosclerosis, focusing on CT grading, ROI-based density measurements, and correlation with intraoperative findings and postoperative functional outcomes.

Methods and Materials: A monocentric retrospective study was conducted on 33 patients (52 ears) undergoing surgery for conductive or mixed hearing loss caused by otosclerosis. FPCT datasets were analyzed for fenestral and retrofenestral involvement and graded according to established CT classifications. Radiodensity values of otosclerosis foci were extracted using standardized ROIs and compared with otic capsule density. Imaging findings were correlated with intraoperative observations and with pre- and postoperative audiological data.

Results: FPCT depicted fenestral and retrofenestral foci with excellent diagnostic accuracy, correctly identifying all intraoperatively confirmed cases (sensitivity 100%). ROI-based densitometry showed no significant correlation with preoperative hearing levels or postoperative functional gains (e.g., ROI vs pre-op ABG: $\rho = -0.133$, $p = 0.384$; ROI vs AC Gain: $\rho = 0.138$, $p = 0.521$). Similarly, Symons–Fanning grade did not significantly correlate with preoperative severity or postoperative improvement (grade vs ABG: $\rho = 0.086$, $p = 0.56$).
Despite the absence of statistically significant predictors of hearing outcomes, FPCT provided detailed visualization of footplate, oval window niche, and inner ear structures supporting surgical planning.

Conclusion: FPCT provides high-resolution morphological and quantitative assessment of otosclerosis, achieving excellent diagnostic sensitivity and providing valuable intraoperative correlation. Although densitometric and grading metrics did not predict postoperative hearing outcomes in this cohort, FPCT remains a powerful tool for preoperative planning in candidates for stapes surgery.

A175

Does AI-based quantification of chest structures shift our scope on opportunistic anaemia detection? Insights from more than 14,000 native chest CTs

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Purpose: To systematically quantify the relationship between haematocrit and CT attenuation of AI-segmented thoracic cardiovascular structures on non-contrast chest CT, and to identify the structure and metric with the best diagnostic performance for opportunistic anaemia detection.

Methods and Materials: We retrospectively included 14,839 non-contrast chest CTs acquired between May 2012 and January 2024 in 7,024 patients (62% male, 38% female, median age: 63 years (interquartile range: 52–73 years)) with same-day laboratory haematocrit. TotalSegmentator was used for 3D segmentation of cardiovascular structures including myocardium, ventricles, atria, aorta and pulmonary artery. Mean attenuation was automatically extracted. We computed spearman rank correlations between haematocrit and attenuation values and ratios (e.g. left ventricle (LV) myocardium/LV blood pool). For anaemia detection, receiver operating characteristic analyses were performed.

Results: Mean attenuation values (HU) of all segmented structures were significantly lower in patients with laboratory confirmed anaemia compared with non-anaemic patients (eg.: pulmonary artery 35 HU vs 44 HU, $p < 0.001$). Attenuation values correlated significantly with haematocrit, the highest in the pulmonary artery ($r = 0.76$, $p < 0.001$). The LV myocardium/LV blood pool ratio showed a lower correlation ($r = 0.54$, $p < 0.001$). For anaemia detection, pulmonary artery attenuation achieved the best diagnostic performance (AUC = 0.89, Youden = 0.63, cutoff = 37 HU), outperforming LV myocardium/LV blood pool ratio (AUC = 0.78, Youden = 0.43, cutoff = 1.19).

Conclusion: Fully automated AI-based segmentation and attenuation quantification of thoracic cardiovascular structures on routine non-contrast chest CT enables opportunistic anaemia detection. Pulmonary artery attenuation outperformed the conventional LV myocardium/LV blood pool ratio, indicating that current qualitative or manual ROI-based approaches underuse available CT information suggesting reevaluation.

A15

Deep learning-based automated coronary plaque quantification: First demonstration with ultra-high resolution photon-counting detector CT at different temporal resolutions

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Purpose: To evaluate the feasibility and reproducibility of a novel deep learning (DL)-based coronary plaque quantification tool with automatic case preparation in ultra-high-resolution (UHR) photon-counting detector CT coronary angiography (CCTA), and to assess the influence of temporal resolution on plaque quantification.

Methods and Materials: Forty-five patients undergoing clinically indicated UHR CCTA were retrospectively included. Two datasets were reconstructed per scan: dual-source (66 ms) and simulated single-source (125 ms) temporal resolutions. A DL-based algorithm enabled fully automated coronary segmentation and intensity-based plaque quantification for the left anterior descending (LAD), left circumflex (CX), and right coronary (RCA) arteries, as well as the largest plaque lesion per vessel. Diameter stenosis was determined for the most extensive lesion. Reproducibility was assessed by repeating the analysis three times in ten randomly selected patients, with expert review of all outputs. Statistical comparisons used paired Wilcoxon signed-rank tests with Benjamini-Hochberg correction.

Results: Atherosclerotic plaques were present in 119/135 (88%) arteries. Repeated runs yielded identical results across all measurements ($P > 0.999$), and outputs were anatomically correct without manual correction. At the vessel level, total plaque volume was higher in 125 ms reconstructions in 28/45 patients (62%) and significantly higher overall (681.3 mm^3 vs. 647.8 mm^3, $P < 0.05$). At the lesion level, total plaque volume was higher in 44/45 patients (98%; 447.3 mm^3 vs. 414.9 mm^3, $P < 0.001$). Median stenosis grades were also higher at 125 ms (35.4% vs. 28.1%, $P < 0.01$).

Conclusion: The novel DL-based tool provided fully automated, reproducible, and anatomically consistent plaque quantification in UHR CCTA. Lower temporal resolution (125 ms) systematically overestimated plaque burden versus 66 ms, emphasizing the need for protocol standardization in DL-based plaque analysis.

A137

Preoperative imaging of spinal arterial circulation in patients with TAAA and aortic dissections prior to surgery.

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Purpose: This study aimed to evaluate the status of spinal arterial supply in patients with thoracoabdominal aneurysms (TAAA) and aortic dissection prior to aortic replacement using contrast-enhanced (CE) MRA and CTA, in order to help prevent postoperative spinal cord ischemia - a concerning complication following this surgery.

Methods and Materials: Preoperative CE-MRA and CTA of 38 patients with TAAA and aortic dissections were retrospectively evaluated. Based on the extent of the replaced aorta, patients were divided into three groups according to the modified Crawford classification: I. descending thoracic aorta and the suprarenal abdominal aorta (n=11), II. the entire descending thoracic and abdominal aorta (n=18), III. the descending thoracic aorta below Th6 and the entire abdominal aorta (n=8). The length of the anterior spinal artery (ASA), the location of the Adamkiewicz artery (AKA), and the status of the feeding intercostal arteries (ICAs) were documented.

Results: The most frequent location of ASA was between Th9 and Th12, with an average length of 145±49.5mm. In most cases, the AKA entered the spinal canal on the left side, typically at the Th9 level. The pin was observed in most cases around the Th9 level, too. Only in one case in group II, AKA was not visible. On average, 83% of potential feeding ICAs were contrasted, 64% of them showed no significant stenosis, and in 36% proximal stenosis (≥70%) was detected. The lowest number of patent ICAs was detected in group II vs. group I and group III: 4.7±2 vs 7±4 and 6.7±5 (p=0.04 and 0.1). In most cases, ASA and AKA were visible only on CE-MRA; however, ICAs were sometimes indistinguishable from veins, and pulsation artifacts often obscured their aortic origins, allowing differentiation only with CTA.

Conclusion: The presence and extent of TAAA and dissections can influence the spinal arterial circulation; hence, preoperative evaluation of the ASA and feeding ICAs with a combination of CE-MRA and CTA is essential.

A9

Liver T1 in Cardiac MRI: A Novel Predictor of Heart Failure and MACE

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Purpose: Liver injury frequently accompanies cardiovascular disease, influenced by factors such as heart failure-induced hepatic congestion and shared cardiometabolic risks. Cardiac magnetic resonance (CMR) T1 mapping, primarily used for myocardial tissue characterization, enables simultaneous assessment of hepatic T1 times. This study aimed to compare the predictive significance of T1 times from different hepatic regions regarding major adverse cardiac events (MACE).

Methods and Materials: In this retrospective single-center study, 232 patients undergoing 1.5T CMR with T1 mapping between 2018 and 2022 were analyzed. Regions of interest were manually delineated on T1 maps in the right, left, and caudate liver lobes. The primary endpoint was a composite of non-fatal myocardial infarction, heart failure hospitalization, stroke, encephalopathy, and all-cause mortality. Associations between hepatic T1 values and MACE were assessed using univariate and multivariate Cox regression analyses, adjusting for clinical and cardiac functional parameters.

Results: Of the cohort, 21 patients (9%) experienced MACE over a median follow-up of 179 days (IQR 54–858). Median hepatic T1 times were 617 ms (IQR 576–655) in the right lobe, 611 ms (IQR 564–661) in the left lobe, and 619 ms (IQR 576–665) in the caudate lobe. Patients with MACE had significantly higher right lobe T1 (median 656 ms vs. 610 ms; p<0.001) and caudate lobe T1 (median 653 ms vs. 615 ms; p=0.013), but not left lobe T1 (p=0.15). Multivariate Cox regression identified right lobe hepatic T1 as an independent predictor of MACE (HR 1.010 per ms increase; 95% CI 1.005–1.015; p=0.022).

Conclusion: Liver T1 mapping by CMR is a promising noninvasive biomarker for predicting adverse cardiac events, with the right liver lobe demonstrating superior prognostic value. Precise localization of hepatic T1 measurement is crucial for optimal risk stratification.

A200

Ultra-High Resolution Photon-Counting Detector Coronary CT Angiography: Diagnostic Accuracy in Patients with High Agatston Scores

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Purpose: In patients with severe coronary artery calcification, conventional coronary CT angiography (CCTA) is limited by calcium blooming, which reduces diagnostic accuracy and can lead to unnecessary invasive coronary angiography (ICA). Ultra-high-resolution (UHR) photon-counting CT (PCD-CT) reduces blooming and may improve diagnostic performance. This study aimed to assess the diagnostic accuracy of UHR CCTA with PCD-CT for detecting coronary stenoses in patients with high coronary calcium scores using ICA as the reference standard.

Methods and Materials: In this IRB-approved single-center study, 94% of patients underwent UHR PCD-CCTA as part of pre-TAVR evaluation. Coronary stenoses (<50%, 50–70%, >70%) were assessed by two blinded readers. Diagnostic accuracy, sensitivity, and specificity were calculated at vessel- and patient-level using ICA as the reference. Subgroup analyses were performed across Agatston categories (600–999, 1000–1999, 2000–2999, >3000).

Results: 62 patients (mean age, 76 ± 9 years, 16 women) with Agatston scores >600 who underwent UHR PCD-CCTA and ICA within 2 months were included. The median Agatston score was 2423 (IQR: 1085-3340). Across all Agatston categories, CCTA demonstrated high diagnostic accuracy and strong agreement with ICA (Cohen's kappa 0.71–1.00). In patients with Agatston scores >3000 (n=18), sensitivity and specificity for detecting >50% diameter stenoses remained high (92–100% and 83–100%, respectively) for both readers as well as for >70% diameter stenoses (sensitivity (88-100), specificity (89-100)). There was no correlation between Agatston score and diagnostic error ($p > 0.05$).

Conclusion: UHR CCTA with PCD-CT provides high diagnostic performance even in patients with extensive coronary calcifications, including those with Agatston scores above 3000.

A197

Coronary CT Angiography to Diagnose Healing of Spontaneous Coronary Artery Dissection: Comparison with Invasive Angiography

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Purpose: Spontaneous coronary artery dissection (SCAD) is a rare, underdiagnosed cause of myocardial infarction (MI), especially in younger women without traditional cardiovascular risk factors. Diagnosis and follow-up imaging is usually performed with invasive coronary angiography (ICA). This study aimed to evaluate the accuracy of coronary computed tomography angiography (CCTA) to diagnose healing of SCAD.

Methods and Materials: In this prospective single-center study, 20 patients with 24 coronary segments showing SCAD underwent ICA and CCTA both in the acute phase (median time after symptom onset to CCTA 3 days) and during follow-up (median time 106 days). SCAD was classified at follow-up CCTA as healed or non-healed using ICA as the reference standard.

Results: At follow-up, ICA showed healing in 19 (79%) and no healing in 5 (21%) SCAD lesions. CCTA had an overall accuracy of 79% in diagnosing SCAD healing, with a positive predictive value of 100%. Segments being evaluable with CCTA were larger (median 2 mm, IQR, 1.5-2.7 mm) than those being non-evaluable (median 1 mm, IQR, 0.8-1.2 mm, p<0.001), and vessel size with a median above 1.5 mm (IQR, 1.3-2.5 mm) showed a higher accuracy to diagnose SCAD healing with CCTA than below (median 0.7mm, IQR, 0.7-0.8mm, p<0.001).

Conclusion: Our study indicates that CCTA can serve as a non-invasive alternative to ICA for monitoring SCAD healing, especially in proximal and mid-coronary lesions.

A214

Streamlining Endometriosis MRI Reporting: Automated #ENZIAN Classification in Pelvic MRI Using Local and Online LLMs

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Purpose: The #Enzian classification standardizes endometriosis reporting but requires specialized training. This study evaluated whether large language models (LLMs) can accurately extract #Enzian scores from MRI reports to support novice radiologists and clinicians.

Methods and Materials: This retrospective study included 186 pelvic MRI reports (2022–2025). Reference #Enzian scores were established by two uroradiologists via consensus. A 50-case subset was scored by 12 residents without #Enzian experience for benchmarks.
Twelve LLMs—six online (Gemini 2.5 Pro, Claude Sonnet 4.0, GPT-5, o3, Grok 4, Claude Opus 4.1) and six local (Llama 3.1 8B, Aya Expanse 8B, MedGemma 27B, DeepSeek R1 32B, Llama 3.3 70B, GPT-OSS 120B)—were tested with one-shot prompting. Accuracy was exact #Enzian score matching vs. reference. Comparisons used logistic regression with bootstrap resampling. Cohen's κ assessed agreement.

Results: In the full 186-report cohort, online LLMs achieved accuracies of 96.0–97.0%, local models 76.5–94.3%.
In the 50-case subset, inter-expert κ=0.96; residents 87.4% accuracy (mean κ=0.54 vs. experts). Online LLMs reached 88.9–92.4% (mean κ=0.62–0.78), with four significantly outperforming trainees: Gemini 2.5 Pro (OR 1.61, p<0.001), Grok 4 (OR 1.42, p<0.001), o3 (OR 1.40, p<0.001), Claude Opus 4.1 (OR 1.17, p<0.05). Local models 61.7–87.1% (mean κ=0.30–0.70), all significantly inferior (p<0.001) except GPT-OSS 120B (OR 0.87, p=ns).Online API costs for 186 reports: $3.82 (Gemini 2.5 Pro)–$42.26 (Claude Opus 4.1).

Conclusion: Online LLMs accurately extract #Enzian scores exceeding novices, offering potential as training aids and for standardized reports in surgical planning. Out-of-the-box local models demonstrate limited performance for this application.

A87

Factors influencing background parenchymal enhancement on contrast-enhanced mammography (CEM): a systematic review and meta-analysis

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Purpose: Background parenchymal enhancement (BPE) represents the physiological contrast uptake of fibroglandular breast tissue. While BPE on contrast-enhanced breast MRI has been associated with breast density and menopausal status, evidence for factors influencing BPE on contrast-enhanced mammography (CEM) remains limited and heterogeneous. This systematic review and meta-analysis aimed to summarise available evidence on the association between BPE on CEM, breast density, and menopausal status.

Methods and Materials: A systematic review was conducted and reported according to PRISMA guidelines, searching PubMed and Scopus up to September 2025 for studies assessing BPE on CEM. Random-effects meta-analyses of odds ratios (ORs) were performed to investigate associations between BPE on CEM, breast density and menopausal status. For the analysis, BPE was dichotomised as low (minimal/mild) versus high (moderate/marked), breast density as BI-RADS categories A/B versus BI-RADS categories C/D, and menopausal status as pre-menopausal versus post-menopausal.

Results: Among 18 studies initially identified (published between 2017 and 2025), 7 studies (1985 patients) were ultimately included in the meta-analysis of the association between breast density and BPE, 6 studies (1579 patients) in the meta-analysis of the association between menopausal status and BPE. Breast density C/D (1159/1985 patients, 58.4%) had a 5.51 summary OR (95% CI 3.43–8.84, $p < 0.001$) for the presence of high BPE. Pre-menopausal status (565/1579 patients, 35.8%) had a 5.80 summary OR (95% CI 3.37–9.99, $p < 0.001$) for the presence of high BPE.

Conclusion: Dense breasts and pre-menopausal status are strongly associated with high BPE on CEM, suggesting that BPE on CEM may serve as a surrogate imaging marker of tissue composition and hormonal activity.

A130

Deep-Learning Detection of Breast Arterial Calcifications in Mammography: Influence of Image Quality and Diagnostic Performance in Population Screening

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Purpose: To evaluate the performance of AI-enabled breast arterial calcification (BAC) detection, determine its prevalence in a large screening population, and assess the influence of image-quality parameters on automated BAC identification.

Methods and Materials: This retrospective single-centre study had ethics approval, and general consent was obtained. Between 01/2011 and 12/2017, 4,692 women (mean age 61.3 ± 11.7 years; range 40–89) underwent 6,061 mammographic examinations (24,519 images). A YOLO-based deep-learning model was trained to detect BAC and differentiate them from non-vascular calcifications on standard craniocaudal and mediolateral oblique views. Quantitative image-quality metrics (radiation dose, compression force, breast density, posterior nipple line, pectoralis angle, breast elevation) were automatically extracted and correlated with AI outcomes. Multivariable logistic regression identified independent predictors ($p < 0.05$).

Results: BAC were detected in 652 of 4,692 women (13.9 %, 95 % CI 12.9–14.9) with sensitivity 0.99 (0.98–0.99), specificity 0.35 (0.30–0.41), and accuracy 0.88 (0.86–0.89). BAC-positive images showed lower radiation dose (0.81–0.89 vs. 0.88–0.93 mGy, $p < 0.001$), slightly higher compression forces ($p \leq 0.005$), and more frequent post-surgical status (26–29 % vs. 9–10 %, $p < 0.001$). Breast density was lower (ACR B 45–47 % vs. 33–35 %; ACR D 7–11 % vs. 15–16 %, $p < 0.001$). Independent predictors included higher compression (OR 1.18, $p < 0.001$), lower density (OR 0.47, $p < 0.001$), and post-surgery (OR 3.99, $p < 0.001$). In MLO views, adequate elevation (OR 1.22, $p = 0.046$) and post-surgical status (OR 3.78, $p < 0.001$) remained significant.

Conclusion: AI-enabled BAC detection performed reliably, BAC was common in this screening population, and patient and image-quality factors significantly influenced automated detection.

A202

Comparison of Automated Lung Texture Analysis in Systemic Sclerosis-Associated Interstitial Lung Disease: Photon-Counting vs. Conventional Energy-Integrating CT

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Purpose: To investigate whether the superior image quality of photon-counting detector CT (PCD-CT) facilitates the application of automated lung texture analysis (LTA) for detecting interstitial lung disease (ILD) in systemic sclerosis (SSc) compared to conventional energy- integrating detector CT (EID-CT).

Methods and Materials: The study included 186 patients from a cohort of 660 with systemic sclerosis (SSc) who underwent clinically indicated EID-CT or PCD-CT. Patients were matched for demographic and rheumatological characteristics. Visual ILD assessment by three expert radiologists served as the reference standard. Image quality was evaluated subjectively and objectively, while quantitative ILD features and disease extent were extracted using LTA with the CALIPER algorithm. Diagnostic accuracy was assessed through ROC analysis with AUC as the accuracy measure.

Results: LTA-based assessment of ILD revealed a higher AUC for PCD-CT compared to EID-CT in detecting ILD overall (PCD-CT AUC: 0.846 vs. EID-CT AUC: 0.772) and specific ILD features such as ground-glass opacities, reticulation, and honeycombing. In contrast, EID-CT demonstrated higher AUC values for detecting extensive ILD (>20% lung involvement; AUC: 0.978 vs. 0.842). Despite the reduced radiation exposure with PCD-CT, it still provided comparable signal-to-noise ratios (SNR) and showed improved image quality ratings.

Conclusion: LTA showed acceptable to excellent AUC values for ILD detection on both PCD-CT and EID-CT scans, with PCD-CT consistently yielding superior AUCs in detecting individual ILD features in systemic sclerosis. Notably, LTA models trained on EID-CT data performed robustly when applied to PCD-CT images. This underscores the potential of PCD-CT, with its improved image quality and reduced radiation dose, to facilitate longitudinal ILD monitoring using LTA. However, additional multicenter validation is required to verify these results.

A210

Tracheal Remodeling as a Structural Marker of Progression in Fibrotic Interstitial Lung Disease

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Purpose: The clinical relevance of tracheal remodeling in fibrotic interstitial lung disease (ILD) is poorly understood. The purpose of our study was to evaluate whether changes in tracheal structure correlate with functional decline and predict progressive pulmonary fibrosis (PPF).

Methods and Materials: The clinical relevance of tracheal remodeling in fibrotic interstitial lung disease (ILD) is poorly understood. The purpose of our study was to evaluate whether changes in tracheal structure correlate with functional decline and predict progressive pulmonary fibrosis (PPF).

Results: Inter-reader agreement for all tracheal measurements was excellent (ICC > 0.90 for t_0 and t_1 metrics). Baseline tracheal metrics showed no association with FVC or DLCO ($|r|<0.10$). In contrast, tracheal enlargement over time strongly correlated with functional decline (ΔArea $r=-0.45$, ΔmaxDM $r=-0.40$, ΔDM90 $r=-0.50$; all $p<0.001$). In multivariable models, ΔmaxDM and ΔDM90 independently predicted ΔFVC after adjustment for baseline PFTs.
For PPF, ΔArea_mean significantly predicted progression (OR 1.04 per mm² increase, $p=0.003$). In terms of diameter change, ΔDM90 was also significant for predicting progression, while ΔmaxDM showed a strong trend.

Conclusion: Longitudinal tracheal enlargement is closely linked to functional decline and provides independent prognostic information for progressive pulmonary fibrosis (PPF). Remodeling with progressive tracheal enlargement represents a structural marker of progressive fibrotic behavior and may serve as a simple CT-based biomarker for risk stratification.

A241

The Effect of X-ray Dose Photon-Counting Detector Computed Tomography on Nodule Properties in a Lung Cancer Screening Cohort: A Prospective Study

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Purpose: To assess whether photon-counting detector CT (PCD-CT) performed at chest x-ray–equivalent dose allows accurate pulmonary nodule detection and measurementcompared with same-study low-dose PCD-CT, using semiautomated and manual methods.

Methods and Materials: In this prospective study (Feb–Jul 2023), 101 participants underwent noncontrast low-dose and x-ray-dose PCD-CT. Patients not referred for screening or follow-up and nodules <5 mm were excluded. Semiautomated software measured nodule diameter and volume; two blinded readers measured diameter and density. Nodules were categorized with Lung-RADS v2022. Image quality was assessed subjectively and objectively.

Results: CTDIvol was 0.11 ± 0.03 mGy for x-ray-dose and 0.65 ± 0.15 mGy for low-dose scans. In 53 participants, 172 nodules ≥5 mm were identified. Semiautomated detection sensitivity at x-ray dose was 0.94, higher for solid nodules (>0.95) than subsolid (>0.86).
Missed nodules were significantly smaller. Semiautomated measurements slightly underestimated diameter for solid nodules (P = 0.01), while volume was unaffected (P = 0.775). Readers rated density lower at x-ray dose, but diameter did not differ significantly.
Semiautomated and manual diameters showed good to excellent correlation. Lung-RADS agreement between dose levels was good (κ = 0.73, 0.62, 0.76), with accuracies of 0.82, 0.78, and 0.85.

Conclusion: PCD-CT at x-ray–equivalent dose enables highly sensitive semiautomated nodule detection. Volumetry is more robust to dose-related image quality changes than diameter measurement. Both semiautomated and manual assessments are accurate at this ultra-low dose, although density tends to be underestimated.

A30

DISTINGUISHING ILA FROM ATELECTASIS ON RADIOGRAPHS: A FOUNDATION MODEL WITH MULTI-INSTITUTIONAL VALIDATION

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Purpose: To evaluate the performance of a radiology vision foundation model (RAD-DINO) combined with a lightweight multi-layer perceptron (MLP) classifier for distinguishing interstitial lung abnormalities (ILA) from atelectasis on chest radiographs, validated externally across institutional datasets.

Methods and Materials: A classification pipeline was developed using RAD-DINO as a frozen feature extractor with an appended MLP classifier. Training utilized a curated dataset comprising posteroanterior (PA) chest radiographs of confirmed ILA and atelectasis cases, verified through same-day CT imaging. The internal dataset included 542 ILA and 1,167 atelectasis cases. The external validation cohort consisted of 85 ILA and 100 atelectasis cases. Data were split into training, validation, and internal test sets using an 80:10:10 ratio.
Given the limited number of ILA cases, the RAD-DINO backbone r mained frozen to mitigate overfitting. Random sampling ensured balanced representation of atelectasis cases during training epochs. The model was trained for 10 epochs using cross-entropy loss and the Adam optimizer. Performance metrics included accuracy, precision, recall, F1 score, and ROC-AUC, assessed on internal and external test datasets.

Results: The final model demonstrated robust performance with an accuracy of 79.8% on internal validation and 81.1% externally. ROC-AUC scores were 0.865 (internal validation) and 0.890 (external test). The frozen RAD-DINO effectively provided generalizable features, while random sampling enhanced training stability and performance consistency across diverse datasets.

Conclusion: Radiological vision foundation models, combined with a lightweight MLP classifier, effectively distinguish ILA from atelectasis on chest radiographs. Freezing the RAD-DINO backbone facilitated robust transfer learning with limited labeled data, maintaining high generalizability and diagnostic accuracy across multiple institutions.

A98

Impact of Photon-Counting CT on Quantitative Emphysema Measurements Relative to Energy-integrating CT

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Purpose: To assess the agreement between energy-integrating detector CT (EIDCT) and photon-counting CT (PCCT) for quantitative emphysema evaluation using low-attenuation volume percentage (LAV%), and to examine how absolute and relative differences evolve with disease severity.

Methods and Materials: Fourteen patients who underwent paired EIDCT and PCCT were retrospectively analysed. LAV% was extracted from EIDCT and from three PCCT reconstructions (MonoE, T3D and FBP). Demographic and exposure characteristics were summarised. Paired t-tests quantified absolute differences (PCCT – EIDCT) and symmetric percentage differences for each reconstruction, with Holm correction. Subgroup analyses were performed for EIDCT LAV% >5%, >10% and >20%.

Results: The cohort had a mean age of 64.5 years, BMI 24.9 kg/m², and 36% active smokers. PCCT delivered lower radiation exposure than EIDCT (mean DLP 80 vs. 106 mGy·cm).
Across the full cohort, PCCT systematically overestimated emphysema. MonoE showed a mean difference of +3.94% and a relative difference of +38.7% (p=0.058), T3D showed +3.80% and +38.4% (p=0.059), and FBP showed the largest bias, with +4.44% and +101.5% (p=0.00038; Holm p=0.0011). Subgroups demonstrated increasing divergence with disease severity: for LAV% >10%, MonoE and T3D differences rose to +8.5% and +8.2% (relative +18–17%), while FBP remained significantly biased (+6.3%, +23.5%). For LAV% >20%, MonoE and T3D showed differences of +9.7% and +9.4% (relative +19–18%), though significance was limited by sample size.

Conclusion: PCCT consistently overestimates emphysema relative to EIDCT, with discrepancies amplifying in moderate and severe disease. These findings highlight the need for harmonisation of quantitative emphysema metrics when interpreting PCCT in longitudinal or mixed scanner settings.

A184

Deep learning reliably detects hepatic steatosis in lung cancer screening low-dose CT: preliminary data from a Swiss cohort

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Purpose: To evaluate the reliability of an automated AI-based segmentation tool for liver steatosis assessment on low-dose lung CT and to calculate the prevalence of the steatosis in a Swiss lung cancer screening population.

Methods and Materials: This is a retrospective study including 415 patients who performed low-dose lung CT for lung cancer screening. Mean liver attenuation values [Hounsfield Unit (HU)] were calculated by manually placing regions of interest (ROI) at 3 levels in 200 consecutive patients. Volumetric liver attenuation was obtained using a publicly available deep-learning tool (TotalSegmentator) on all study patients.The quality of liver segmentation was visually checked using a 5-grade scale (1=failure, 2= >50% error, 3= 25-50%, 4= 10-25%, 5= <10%) on 15 randomly selected patients, HU outliers and discordant cases (>5HU). Fat-fraction (FF) equivalent was computed using the formula: FF = (HU×−0.58)+38.2. Steatosis was graded as follows: absent (FF:<5%), mild (5–14%), moderate (15–28%), and severe (>28%). Agreement between manual and AI-based measurements was assessed using Bland-Altman analysis and the Two-One-Sided Test (TOST) for equivalence (±5HU bounds).

Results: AI-based tool correctly segmented the liver in all reviewed cases (grades 4-5). A strong concordance between the manual and automated methods was found (p<0.001, ±5 HU bounds). In 32/200 cases (18%) the absolute difference between methods was >5HU, mainly due to parenchymal heterogeneity or anatomical variants segmentation issues such as beaver tail. Steatosis was found in 197/415 (47%) participants including 37% mild, 9% moderate and 1% severe.

Conclusion: AI-based tool provides liver attenuation measurements comparable to manual ROIs. Around 10% of lung cancer screening population suffer from moderate or severe steatosis. Automatic AI-based steatosis assessment may be useful within the lung cancer screening workflow, particularly to detect patients with moderate and severe disease.

A242

Photon-Counting Detector CT Iodine Maps Versus SPECT/CT: Advancing LungPerfusion Imaging in Chronic Thromboembolic Pulmonary Hypertension

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Purpose: To compare photon-counting detector CT (PCD-CT) iodine maps of the lung parenchyma with perfusion SPECT/CT for the evaluation and extent estimation of perfusion defects.

Methods and Materials: In this retrospective study, 26 subjects who underwent PCD-CT and perfusion SPECT/CT for evaluation of suspected chronic thromboembolic pulmonary hypertension (CTEPH) were included. Two blinded radiologists assessed CT iodine maps and lung-kernel reconstructions for presence and extent of lobar perfusion defects and for CTEPH diagnosis. Two blinded nuclear medicine physicians/radiologists evaluated SPECT/CT. Clinical diagnoses were determined in an interdisciplinary setting. Quantitative perfusion metrics were obtained for both modalities and compared with right heart catheterization measurements.

Results: Among 26 subjects, 10 had CTEPH or CTEPH overlap, 12 had PH from other causes, 3 had no PH, and 1 had resolved pulmonary embolism. Radiation dose was significantly lower for PCD-CT than SPECT/CT (1.19 ± 0.33 mSv vs 6.34 ± 1.68 mSv, $P < 0.001$). PCD-CT readers showed a trend toward higher diagnostic accuracy, sensitivity, and specificity for CTEPH than the scintigraphy consensus (accuracy: 0.85, 0.88 vs 0.73), though differences were not significant. Interreader agreement for PCD-CT defect estimation was good to excellent; intermodality agreement was moderate. Quantitative correlation of relative perfusion between PCD-CT and SPECT/CT was strong to excellent. PCD-CT perfusion defect extent moderately correlated with mean pulmonary artery pressure, pulmonary vascular resistance, and cardiac index.

Conclusion: PCD-CT iodine maps provide accurate CTEPH detection comparable to SPECT/CT, with strong quantitative concordance but moderate qualitative agreement, and at substantially lower radiation dose. Visual perfusion defect extent on PCD-CT is associated with prognostic hemodynamic measures.

A29

CLINICIAN-CENTRIC EXPLAINABLE AI: A MULTI-DIMENSIONAL FRAMEWORK FORTRUSTWORTHY DIAGNOSTIC REASONING IN RADIOLOGY

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Purpose: Artificial intelligence (AI) in radiology continues to face adoption barriers due to opaque decision-making processes that limit clinical trust. Traditional explainable AI (XAI) tools rarely align with radiologists' diagnostic reasoning. We propose a Clinician-Centric Explainable AI (CC-XAI) framework to embed clinically meaningful, anatomy- and workflow-rooted explanations directly into radiological decision support.

Methods and Materials: A conceptual and applied analysis of CC-XAI was performed, contrasting its interpretability with general-purpose XAI. We developed a five-category taxonomy comprising: (1) Visual (anatomy-aware saliency maps), (2) Textual (clinical language generation), (3) Example-Based (retrieval of annotated similar cases), (4) Quantitative (comparative measurement over time), and (5) Rule-Based (integration of clinical decision logic). A modular CC-XAI system was illustrated using a representative lung nodule case, demonstrating integration of lesion localization, volumetric growth analysis, similar case retrieval, and risk-factor-based reasoning into one cohesive explanation output.

Results: The proposed CC-XAI framework translates AI predictions into structured, interpretable outputs aligned with clinical workflows and cognitive heuristics. In our example, a spiculated nodule with growth from 8 mm to 15 mm over one year (estimated doubling time of 1119 days) was explained via anatomy-aware localization, growth kinetics, retrieval of two malignant-confirmed prior cases, and rule-based consideration of smoking, cancer history, and pulmonary fibrosis. Each module contributes to a cohesive final interpretation that improves explainability and trust calibration.

Conclusion: CC-XAI addresses a fundamental barrier to AI adoption in radiology by offering domain-specific, multi-dimensional explanations that mirror radiologists' decision-making processes. Embedding these modules into radiology workflows can facilitate clinically robust, interpretable, and trustworthy AI integration.

A31

DETECTION OF INTERSTITIAL LUNG ABNORMALITIES ON CHEST CT:COMPARATIVE EVALUATION OF RADIOMICS AND DEEP LEARNING MODELS

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Purpose: To develop and compare two machine learning approaches for detecting peripheral fibrotic changes suggestive of interstitial lung abnormalities (ILA) on chest CT: a radiomics-based model and a convolutional neural network (CNN).

Methods and Materials: A total of 1,715 chest CT scans were retrospectively collected from a tertiary academic ILD-referral center, including 440 cases with ILA and 1,275 controls without ILA. The radiomics model was built by extracting handcrafted features from segmented lung regions and applying an XGBoost classifier. The CNN model, based on a SlowFast architecture, was trained using manually annotated regions of peripheral fibrosis.
Both models were evaluated on an internal test set and an independent external validation cohort from another academic ILD center. Model performance was assessed using accuracy, weighted precision, weighted recall, weighted F1-score, and area under the receiver operating characteristic curve (AUC).

Results: In internal testing, the radiomics model achieved an AUC of 0.88, with an accuracy of 87%, weighted precision of 0.87, weighted recall of 0.87, and a weighted F1-score of 0.87.
On external validation, the radiomics model retained an AUC of 0.81, with reduced accuracy (63%), weighted precision of 0.68, weighted recall of 0.63, and a weighted F1-score of 0.61.
The CNN model demonstrated an AUC of 0.86 on the internal test set, with an accuracy of 83.4%, weighted precision of 0.69, weighted recall of 0.64, and a weighted F1-score of 0.66.
On external validation, the CNN achieved an AUC of 0.79, maintaining balanced sensitivity and specificity with modest decline in overall performance.

Conclusion: Radiomics and CNN-based models both enabled accurate and generalizable detection of peripheral fibrotic changes associated with ILA. These complementary approaches have potential for integration into clinical workflows to support early, automated detection of interstitial lung abnormalities.

A244

Quantitative Lung Perfusion Imaging using Photon-counting detector CT: Differentiating Aging Effects from PAH and CTEPH

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Purpose: To characterize age-related changes in lung perfusion using photon-counting detector CT (PCD-CT) and evaluate perfusion biomarkers for chronic thromboembolic pulmonary hypertension (CTEPH) and pulmonary arterial hypertension (PAH).

Methods and Materials: This retrospective study included 43 consecutive patients without pulmonary hypertension or structural lung or vascular abnormalities who underwent clinically indicated PCD-CT using a standardized CTEPH protocol. Spectral CT data were used to calculate mean enhancement, normalized perfusion (mean enhancement/pulmonary trunk enhancement), coefficient of variation (CV), and lobar lung volumes. Associations with age were assessed with linear regression. A second cohort of 22 patients with confirmed PAH (n=11) or CTEPH (n=10) was analyzed for disease comparison against age-matched controls.

Results: In healthy individuals, mean enhancement ($r = -0.50$, $p < 0.001$) and normalized enhancement ($r = -0.62$, $p < 0.001$) decreased with age, while CV increased ($r = 0.57$, $p < 0.001$). Lung volumes showed moderate age-related increases, most prominently in the upper lobes. After adjustment for age and sex, mean enhancement correlated negatively with mean pulmonary artery pressure and pulmonary vascular resistance, and CV correlated positively with pulmonary artery wedge pressure and right atrial pressure. Compared with age-matched controls, CTEPH showed lower mean enhancement ($p = 0.037$), higher heterogeneity ($p < 0.001$), and reduced normalized enhancement; PAH also demonstrated significantly reduced normalized enhancement ($p < 0.035$). PAH exhibited diffuse perfusion reduction, whereas CTEPH displayed regional perfusion deficits consistent with vascular obstruction.

Conclusion: PCD-CT–derived perfusion parameters vary with age and show characteristic alterations in CTEPH and PAH. These metrics have potential as noninvasive imaging biomarkers for pulmonary hypertension and may support optimization of PCD-CT perfusion assessment.

A86

Performance of ChatGPT-4o, a Large Language Model, as an Educational Tool for Generating Radiology Differential Diagnoses

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Purpose: To evaluate the performance and perceived utility of ChatGPT-4o, a large language model (LLM), compared to a gold-standard radiology case textbook in generating differential diagnoses for radiology trainees.

Methods and Materials: This multicentric cross-sectional descriptive study, conducted between March and October 2025, involved 13 volunteer postgraduate radiology trainees (years 2–4). The reference standard was the textbook "Top 3 Differentials in Radiology: A Case Review" (O'Brien, Thieme, 2010). Using structured prompts based on key imaging findings from the textbook, ChatGPT-4o (OpenAI) generated differential diagnoses in English. Responses were compiled into a standardized document. Participants evaluated both sources through: 1) ranking (1-3) for perceived usefulness between Textbook, ChatGPT, and Clinical Experience, and 2) 5-point Likert scales (1-5) across four domains: clarity, trust, differential usefulness, and diagnostic usefulness.

Results: In the ranking evaluation (n=2484 responses), Textbook was most frequently ranked first (40%), followed by ChatGPT (36%) and participants' Clinical Experience (24%). In qualitative assessments, ChatGPT achieved mean scores of 4.4±0.3 for clarity, 4.3±0.3 for trust, 4.3±0.4 for differential usefulness, and 4.2±0.4 for diagnostic usefulness. Subgroup analysis revealed that ChatGPT excelled in Chest and Cardiac imaging (4.4-4.5±0.2), Head-Neck (4.2-4.4±0.2-0.3) and Genitourinary (4.2-4.5±0.2-0.4) specialties. The lowest ratings were observed in Breast imaging, for diagnostic usefulness (3.9±0.7).

Conclusion: ChatGPT-4o demonstrates significant potential as an educational tool for generating radiology differential diagnoses. However, concerns regarding trust and potential inaccuracies highlight the need for cautious integration into radiology training.

A52

Phase 3 trial investigating safety and efficacy of gadoquatrane for low-dose contrast-enhanced MRI of the body

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Purpose: To investigate efficacy and safety of gadoquatrane, a new low dose macrocyclic gadolinium-based contrast agent (mGBCA), compared to approved mGBCAs (gadobutrol, gadoterate meglumine, gadoteridol) for contrast-enhanced (CE)-MRI of the body (except CNS).

Methods and Materials: The "QUANTI OBR" study with a multicenter, randomized, prospective, double-blind, cross-over design, investigated gadoquatrane at a dose of 0.01 mmol/kg body weight (bw), which corresponds to 0.04 mmol gadolinium (Gd)/kg bw, vs. 0.1 mmol Gd/kg bw of comparator mGBCAs. Adult patients with a known or suspected pathology of the body underwent two CE-MRIs, either with gadoquatrane or comparator. MRI scans were evaluated by three central blinded readers per group. The primary endpoints were the visualization parameters contrast enhancement, delineation and morphology, which were scored on a 4- or 3-point-scale. Secondary endpoints sensitivity and specificity for the detection and exclusion of any lesion were assessed versus a clinical composite standard of truth. Safety parameters were recorded.

Results: 405 patients (mean age 56 years; 51% women) underwent at least one CE-MRI. Of those, 378 were evaluable for efficacy analysis. The study met the primary objectives by demonstrating non-inferiority of gadoquatrane vs. comparators and superiority over pre-contrast MRI. Differences between gadoquatrane and comparators consistently approached zero, with upper limits of the 95% confidence intervals remaining below the predefined non-inferiority margin of 0.35 for all comparisons. Secondary endpoints, sensitivity and specificity, were shown to be non-inferior. The safety profile was similar for gadoquatrane and comparators and consistent with the known safety profile of mGBCAs.

Conclusion: Gadoquatrane at 0.04 mmol Gd/kg bw is non-inferior to comparators at 0.1 mmol Gd/kg bw for CE-MRI of the body with a similar safety profile..

A273

Counting coins in the dark – Austrian, German and Swiss medical A governance and local HTA framework for value-based adoption of breast AI in a multi-site public hospital network.

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Purpose: To present a governance model using composite KPI scoring and the RADAR framework as a local HTA tool for value-based adoption of an AI solution for mammography/tomosynthesis in a hospital network.

Methods and Materials: After technical validation, an FDA/CE-marked AI system for mammography/DBT was deployed as an assistive tool in screening and diagnostic workflows at four hospitals. Seven breast radiologists completed a structured institutional questionnaire for 202 patients. Three domains were rated on 1–5 Likert scales: clinical completeness/concordance (KPI-REL), impact on diagnostic management (KPI-REP) and operational impact (KPI-TIME). Change in reader confidence was also collected but not included in the composite score. A composite KPI-Σ (weights 0.50/0.31/0.19 for REL/REP/TIME) was used as a synthetic value index. Quantitative and qualitative findings were summarised into a departmental decision memo with use cases and monitoring metrics, aligned with RADAR, an adaptation of the Fryback–Thornbury imaging efficacy model that introduces “local efficacy” for radiology AI.

Results: KPI-REL (4.39) and KPI-REP (4.00) indicated high diagnostic utility, with management changes in ≈3% of cases, including both avoided recalls and justified escalations. KPI-TIME (3.09) showed an overall time-neutral profile. Confidence increased (3.56±0.78) but was excluded from KPI-Σ (4.02/5) to keep the index focused on patient and organisational value. KPI-Σ supported a “validation passed” decision and a targeted deployment: second reader in screening to stabilise recall rates and selective use in diagnostic exams without priors, dense breasts and complex post-surgical follow-up, with predefined monitoring.

Conclusion: Our governance model, using composite KPIs and RADAR framework, provides practical guidance for decisions on adopting breast AI in clinical practice. This approach ensures that AI solutions add value to both patient care and hospital management.

A121

Multimodal AI implementation in Radiology: a 4.5-year multi-center experience in large Swiss Imaging Network

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Purpose: To assess how deploying AI for diagnostic imaging affects efficiency and radiologist adoption across musculoskeletal, chest, breast, and neuroimaging at one of Switzerland's largest radiology networks.

Methods and Materials: This retrospective, multi-center study analysed the experience of processing 389,000+ consecutive examinations by 10 CE-certified AI tools between March 2021 and September 2025 (20 centers; 58 radiologists, 53 responses; mean age 42.7±9.3 years, range 29–64, 34M/24F). Patient consent was not required; institutional approval was waived in accordance with local regulations for anonymized workflow studies. Objective metrics included AI latency and report turnaround time (TAT) collected from RIS and AI dashboards. Subjective data were gathered via a mixed-methods survey, employing Likert scales and Net Promoter Score (NPS), alongside thematic analysis of free-text feedback. Statistical analysis included Shapiro-Wilk testing for normality and Spearman correlation for trust/confidence.

Results: AI adoption reached 91.4%; musculoskeletal AI had 67.8% utilization. The General Innovation Index was 73/100 ("Early Adopter"). NPS varied from −55.3 (spine MRI) to +86.7 (bone age). Median AI processing was 3 minutes (95.6% results ready before validation). Report TAT dropped 16–33% with AI (e.g. trauma X-ray 6→4 min), significant at $p<0.01$. Radiologists cited safety (71.7%) and time savings (56.6%) as top benefits. Speed improvements were the most requested feature (48%). Trust and clinical confidence correlated strongly ($r=0.66$, $p<0.01$).

Conclusion: AI delivered high adoption and faster reporting, acting as both a safety net and a workflow enhancer. For long-term value, ongoing optimization, seamless integration, and genuine user-driven feedback are essential.

A102

Thoraco-abdominal complications of extracorporeal membrane oxygenation (ECMO) : diagnostic value of multidetector-CT (MDCT)

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Purpose: Extracorporeal membrane oxygenation (ECMO) is a hemodynamic support technique increasingly used in patients with severe acute cardiac and/or pulmonary failure. Although very effective, ECMO is associated with an increased risk of thoracoabdominal complications. The aim of this study is to identify the most frequently observed complications on imaging, determine their incidence, assess their risk factors, and analyse their impact on mortality.

Methods and Materials: This retrospective study includes 137 patients (100 males, median age 57.7 years) treated with ECMO at the Centre Hospitalier Universitaire Vaudois (CHUV) between January 2018 and December 2022. Patients were divided into two groups: those who developed at least one thoracoabdominal complication detected on CT and those who did not. Clinical, biological, and radiological data were extracted from medical records and analyzed to identify factors associated with the occurrence of these complications.

Results: Eighty-six patients (63%) developed at least one thoracoabdominal complication. These patients had significantly longer ECMO treatment duration and hospital stay than patients without complications (234 h vs. 157 h and 54.8 days vs. 23.9 days). The most frequent complications were haemorrhagic events (58%, n = 89), followed by thromboembolic complications (32%, n = 49) and iatrogenic complications (10%, n = 15). Mortality increased with increasing number of complications and certain comorbidities were significantly related to their occurrence.

Conclusion: Thoracoabdominal complications under ECMO are common, mainly haemorrhagic or thromboembolic, and lead to a significant increase in hospitalization duration, treatment time, and mortality. CT plays a central role in their early detection, characterization, and in guiding clinical management.

A275

Self-Supervised Denoising of Low-Dose CT for Intracorporeal Drug Packet Detection

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Purpose: Low-dose CT (LDCT) is highly sensitive for detecting intracorporeal drug packets, but its effectiveness is limited by noise that can restrict packet identification. This work aims to develop a deep learning method to denoise LDCT images containing body packets to improve image quality for accurate detection of packets.

Methods and Materials: We analysed 185 LDCT volumes acquired across multiple scanners between 2007–2023, all positive for drug packets. The dataset was split into training (n=130), validation (n=27), and testing (n=28) sets. A 3D blind-spot U-Net was trained in a self-supervised manner to denoise images. During training, 3D patches were extracted from the training volumes. Noise masking was applied using a blind-spot strategy by replacing masked voxels with neighbours during training. Intensity histogram matching was used for data harmonization across scanners before scaling. The Adam optimizer with cosine learning rate scheduling and mixed-precision training was employed. Performance was assessed using PSNR and SSIM metrics.

Results: The denoising model demonstrated robust performance across data splits. On the test set, the mean PSNR is 26.03 ± 2.49 dB, with a mean SSIM of 0.93 ± 0.02. Comparable results were observed in the training (PSNR 25.99 ± 3.20 dB, SSIM 0.94 ± 0.03) and validation (PSNR 26.42 ± 3.77 dB, SSIM 0.93 ± 0.04) splits, confirming model generalizability. Statistical tests indicated no significant difference between splits ($p > 0.05$), showing the consistency for enhancing noisy LDCT scans containing drug packets.

Conclusion: This study demonstrates that self-supervised 3D blind-spot U-Net denoising effectively improves LDCT image quality for scans containing intracorporeal drug packets. The method consistently reduces noise while preserving important details across diverse scanners and acquisition conditions.

A113

Parenchymal contrast enhancement in acute pancreatitis for assessing disease severity: Comparison between CT and MRI

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Purpose: To compare pancreatic parenchymal enhancement on CT and MR images in acute pancreatitis (AP) and assess its value in predicting disease severity.

Methods and Materials: This single-center study prospectively and consecutively included 76 patients with clinically suspected AP and 79 healthy controls. AP severity was graded using clinical and biological criteria and contrast-enhanced CT (CECT) at 48–72h after symptom onset. Within 24h of CECT contrast-enhanced MRI was performed. Three blinded radiologists placed ROIs in pancreatic head, body and tail across pre-contrast, arterial and venous phases on CT and MR images, and on ADC and T2-mapping MR sequences. The arterial-to-venous enhancement ratio (AVER) was calculated and tested statistically against laboratory findings, Ranson, Balthazar, CTSI and length of hospital stay. A linear support vector machine (SVM) model was trained to predict AP severity using age, CRP, ADC, MRI AVER, and T2-mapping values.

Results: MRI AVER distinguished healthy controls from AP patients with an AUC = 0.75, while CT AVER distinguished healthy controls from AP patients with only AUC = 0.55. AVER differed significantly across Balthazar grades (both, CT and MRI: $p<0.01$). CT AVER predicted hospital stay >5 days (AUC=0.70), outperforming MRI for length of stay prediction (AUC=0.52). The SVM model achieved an AUC=0.95 for distinguishing mild from moderate AP.

Conclusion: Pancreatic enhancement patterns on CT and MR images, assessed with AVER, correlate with disease severity and clinical outcomes in AP. When combining AVER with age, CRP, ADC and T2 mapping values, an AUC of 0.95 can be achieved for predicting AP severity.

A155

CT angiography of the cerebral arteries in whole-body CT of trauma patients – Image quality and diagnostic assessability compared to a dedicated neuroradiologic scan protocol

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Purpose: To compare image and diagnostic quality of head and neck CT angiography (CTA) between a dedicated neuroradiological single-bolus CTA and a split-bolus CTA acquired as part of a whole-body polytrauma CT.

Methods and Materials: This retrospective IRB-approved study included 260 age- and sex- matched patients examined between January 2023 and June 2025 (130 split-bolus, 130 dedicated CTA). Vessel attenuation was measured at 15 predefined arterial segments. Attenuation >300 HU was defined as diagnostic. Subjective image quality was assessed by two radiologists using Likert scales evaluating arterial contrast, venous contamination, overall image quality and diagnostic assessability. Statistical analysis included t-tests, Fisher's exact tests and Mann–Whitney U tests with Benjamini–Hochberg correction.

Results: Dedicated single-bolus CTA showed significantly higher attenuation in all arterial segments except the cervical internal carotid artery ($p = 0.084$). Mean and median attenuation exceeded 300 HU in all segments in both groups. The proportion of segments <300 HU was higher in the split-bolus group except in the cervical ICA ($p = 0.346$). Subjectively, dedicated CTA received higher arterial contrast scores and showed less venous contamination. Diagnostic assessability remained comparable between groups.

Conclusion: Dedicated neuroradiological CTA provided higher arterial enhancement and better subjective contrast. However, split-bolus CTA consistently achieved diagnostic attenuation across all arterial segments, including the clinically critical cervical ICA, supporting its use as a diagnostically sufficient technique for vascular evaluation in polytrauma patients.

A295

10 years of experience in geriatric abdominal emergency imaging

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Purpose: To provide the reader with an overview of frequent abdominal emergencies and their relative incidences in geriatric patients, based on the experience of the first ten years of radiological collaboration with a dedicated geriatric emergencies division at a cantonal hospital.

Methods and Materials: A dedicated geriatric emergency division opened in our hospital 10 years ago and most imaging studies are performed on site since then, including radiography, ultrasound, and computed tomography (CT). By retrospective analyses we calculated the overall frequency of abdominal and thoracoabdominal computed tomography (CT) scans per year. We then searched for cases with the most frequent abdominal emergencies in the geriatric age group, resumed the symptoms and radiological findings, and underlined in the discussions main differences as referred to younger adults.

Results: The number of annual CT scans performed in the geriatric hospital has doubled from 2015 to 2018, from 1,611 to 3,150, and rises steadily since, at an average of 6% per year. Approximately a quarter of all CT scans covered the abdominal region

Conclusion: The imaging platform for a dedicated geriatric emergency division is presented with descriptive statistics of imaging studies in an era of demographic transition are displayed. CT is the mainstay diagnostic modality when dealing with abdominal urgencies in older patients, mainly where infection is suspected, and also in patients with constitutional symptoms, significant weight loss, or weakness.

A146

Clinical Audits in radiation protection: Implementation status and added value

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Purpose: The aim of this study was to assess the implementation status and added value of the national clinical audit programme on radiation protection in Switzerland, based on the report of the Federal Office of Public Health (FOPH) delivered to the Federal Council.

Methods and Materials: This retrospective evaluation was carried out by the FOPH and covers all clinical audits performed between January 2018 and December 2024 in radiology (CT), nuclear medicine, radiotherapy and cardiology. Data were extracted from expert committee reports for each field, derived from institutional audit reports and based on national standards and Good Clinical Practice guidelines. Recommendations to the istitutions were grouped into five categories: justification, protocol optimisation, dose management, quality management and training. The analysis relied on descriptive statistics, interdisciplinary comparisons, and an assessment of the implementation status of recommendations and organisational structures required by the programm.

Results: Clinical audits were conducted at 192 institutions between 2018 and 2024. Audit teams issued an average of 8 recommendations per institution. The most common categories were optimisation of diagnostic or therapeutic protocols (34%), enhancement of justification (27%), improvement of quality management processes (22%), and strengthening of continuing education (17%). The review found a high level of organisational maturity regarding radiation protection, while identifying recurrent areas for improvement across all fields. Both audited institutions and auditors reported measurable benefits, including standardisation of workflows, reduction of unnecessary exposures, and stronger interprofessional collaboration.

Conclusion: Clinical audits are an effective national instrument for improving radiation protection, quality of care and safety culture in Switzerland. The findings confirm their strategic relevance and support the continued development of the programme.

A58

Population dose in Switzerland from medical exposure. Focus: CT examinations and interventional procedures evolution

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Purpose: The aim of this study was to present the radiation exposure of the Swiss population from medical diagnostic procedures performed in 2023 and examine the trends in CT and interventional procedures over the last years.

Methods and Materials: The survey of 2023 was based on billing data for radiology and nuclear medicine examinations. A bibliographic study was additionally performed to examine the evolution of CT and interventional procedures.

Results: Almost 13 million radiological examinations were performed, corresponding to 1,443 examinations per 1,000 inhabitants. The collective effective dose was 1.7 mSv per capita. CT examinations accounted for 75.7% of the total dose, while they accounted for only 14.4% of the total number of examinations. A 33% increase in the collective effective dose for CT scans was observed in comparison with the 2018 survey. IR procedures accounted for 12% of the total dose, while their frequency was low (2%). The number of the IR procedures only contributed 2% to the frequency chart, but it has increased from 13 to 24 procedures per 1000 populations since the last survey. Changes in the methodology of the population survey as well as bibliographic data will be discussed.

Conclusion: The study will present the population dose from exposure of medical diagnostic procedures based on the national survey 2023. Explanations of the trends for two high dose modalities will be provided.

A266

A Computational Optimization Framework for Multi-Source Transcranial Near-Infrared Light Stimulation in Alzheimer's Disease

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Purpose: Transcranial near-infrared (NIR) light stimulation shows potential for modulating neurovascular and metabolic dysfunctions in Alzheimer's disease (AD); however, its clinical translation remains limited by inadequate personalization and inter-subject variability, which this study addresses by developing a computational framework for patient-specific stimulation optimization.

Methods and Materials: This retrospective study included 20 patients with AD (age 70.5 ± 8.7 y, range 52-83 y; 11 females/9 males). Patient-specific heterogeneous numerical phantoms were synthesized from T1-weighted 3T MRI data of the patients. These phantoms incorporated inter-subject and sex-based variability through individualized multispectral (650-1100 nm) optical parameter mapping, cortical parcellation, and subcortical segmentation. Monte Carlo simulation was used to model the temporal point spread function of NIR light flux dynamics from 10 stimulation sites, and a UNet architecture coupled with reinforcement learning was employed to enhance brain parenchyma targeting while mitigating extracerebral scattering. Independent samples t-tests were performed for sex group comparisons.

Results: The computational framework demonstrated robust performance in enhancing targeting precision. Quantitative analysis validated its capability to concurrently optimize light wavelengths, flux distributions, and pulse modulation frequencies, achieving significant improvement in dose spatiotemporal concentration within targeted brain regions. No significant sex-based differences in total energy deposition within gray matter or white matter were identified in the patients (equal variance t-test: $p > 0.05$).

Conclusion: By patient-specific, image-guided, and model-based optimization of stimulation parameters, this framework holds promise for translating precise NIR light stimulation into clinical practice and warrants further validation in AD and related brain disorders.

A159

Automated Series-Based Dose Monitoring and Protocol Harmonization in a Regional CT Network

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Purpose: The aim of this project is to implement a centralized, automated dose monitoring system capable of instantly evaluating radiation exposure from individual CT acquisitions across 8 scanners located in 5 different hospitals of the Ente Ospedaliero Cantonale throughout the Canton of Ticino in Switzerland. The system is designed to enable timely identification of dose exceedance and support continuous optimization and harmonization of clinical practice across a geographically distributed radiology network.

Methods and Materials: The monitoring system was implemented using Radimetrics (Bayer), and configured to allow for series-level comparison with Diagnostic Reference Levels (DRLs) in real time. Email alerts are sent when the acquisition CTDIvol or DLP exceeds twice the DRL, within minutes after the exam is received by the platform. Interactive dashboards were developed to monitor dose exceedance trends over time and across centers, enabling cross-site analysis and identification of recurring deviations in protocols.

Results: From August 1 to October 31, 2025, the system monitored approximately 29,000 CT acquisitions from 13,000 exams. It enabled prompt notification of radiation protection experts for unusually high-dose series. Approximately 35 cardiac CT acquisitions performed at Ospedale Civico di Lugano and Ospedale di Locarno exceeded twice the DRL threshold, revealing dose differences between the acquisition modes used in cardiac CT exams and identifying opportunities for protocol optimization and series-level parameter analysis.

Conclusion: The implementation of this automated, multi-site dose monitoring system is providing valuable insight into the real-time behavior CT protocols across a regional radiology network.
The presentation will highlight how this level of control has supported harmonization of protocol parameters across the network and optimization of acquisition parameters at series level.

A33

Enhanced open-source platform for comprehensive patient dose management – OpenREM

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Purpose: Estimating fetal dose following a CT examination of a pregnant patient is a complex task that a medical physicist can perform using Monte Carlo simulations or dedicated computational programs. Several software, free and commercial, are available for this purpose. The objective of this study was to compare these tools in terms of accuracy and reliability.

Methods and Materials: The study included 62 pregnant patients who underwent abdominal or thoracoabdominal CT scans in three Swiss hospitals. Dose-related metrics such as CTDIvol, scan length, kV, and mAs were collected, alongside biological data including gestational age and the abdominal perimeters of the pregnant patients. The dose absorbed by the fetus was calculated using five tools: Radimetrics, VirtualDose, Fetaldose.org, ImPACT CT and NCICT. Fetal dose estimates were compared, and the influence of patient size or gestation stage was analyzed.

Results: Fetal dose estimates varied significantly across the different software programs, with the average coefficient of variation being 40 % and the maximum variation reaching 128 %. For those software tools that accounted for patient size, a strong correlation was observed between conceptus dose and maternal perimeter. Specifically, in the second trimester, the Pearson r-coefficients for Radimetrics and Fetaldose.org were found to be 0.52 and 0.67, respectively. Notably, none of the software tools reported conceptus doses exceeding twice the $CTDI_{vol}$, indicating that conceptus exposure remained consistently below this threshold. This factor ($2\times CTDI_{vol}$) can be used as a conservative estimate for worst-case scenarios and offers a practical starting point for assessing conceptus dose in clinical settings.

Conclusion: The findings highlight the importance of carefully selecting both the appropriate dose estimation method and the parameters that may influence the accuracy of fetal dose assessment.

A174

Impact of AI on Radiology report turnaround time: a multi-center analysis of trauma X-ray imaging

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Purpose: To evaluate the impact of artificial intelligence on radiology report turnaround time for trauma-related X-ray examinations in a multi-center Swiss radiology network.

Methods and Materials: This retrospective study received the waiver of informed consent. Data were extracted from the Radiology Information System covering February to August 2025. A total of 18,679 trauma-related X-ray examinations (excluding chest X-rays) from 58 radiologists across 20 centers were analyzed. Examinations included 41 specific anatomical codes covering extremities, spine, and pelvis images processed using AI-based fracture detection software. AI-assisted cases were defined as examinations with confirmed AI output before report validation. Non-AI cases included examinations without patient consent for AI use. A 30-minute turnaround time threshold was applied to exclude examinations that are not reported on the spot. Statistical analysis employed Mann-Whitney U tests with significance defined as $p<0.05$.

Results: The cohort demonstrated significantly shorter reporting times with AI assistance: mean turnaround time 5.09 minutes (95% CI: 4.93-5.26) with AI versus 6.60 minutes (95% CI: 6.06- 7.15) without AI, representing a reduction of 1.51 minutes (95% CI: 0.94-2.08; $p<0.001$), or 22.9% time savings. Among 11 examination types with adequate sample sizes, two showed statistically significant reductions for foot (2.72 minutes, $p=0.008$) and knee imaging (1.98 minutes, $p=0.020$). At individual level, 28.8% of radiologists achieved shorter median times with AI, though high within-radiologist variability prevented statistical significance.

Conclusion: AI integration in trauma X-ray interpretation significantly reduces overall report turnaround time by approximately 23%, with examination-specific benefits most pronounced for extremity imaging, demonstrating measurable workflow efficiency gains in routine clinical practice.

A218

Design and measurement of 3D-printed variable density and variable morphology breast phantoms for mammography and breast CT dose assessment

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Purpose: Accurate dose quantification across radiation-based breast imaging techniques is important for patient safety, but currently available phantoms do not easily allow the assessment of the impact of breast size and density across modalities. Here we design, produce, and validate 3D-printed, fillable phantoms in different morphologies, for the purpose of radiation dose measurement and comparison studies.

Methods and Materials: Three representative breast shapes (small, medium, large) were exported from real Breast CT (BCT) data. Corresponding compressed shapes were generated following the Virtual Imaging Clinical Trials for Regulatory Evaluation (VICTRE) pipeline, in which morphology is controlled through 10 length and deformation parameters. Volumes of VICTRE phantoms were optimized to match uncompressed BCT phantom volumes. Surface models of each shape were printed using a 3D printer (Stratasys F370-3D, alphacam GmbH). Four mixtures, representative of BI-RADS categories A-D, were prepared using varying ratios of 1.5% agarose, rapeseed oil, and soy lecithin, poured into the printed surface models, and set overnight at 4°C. Calibrated MOSFET dosimeters were placed on four sides of each phantom to measure Entrance Surface Dose (ESD) and calculate Mean Glandular Dose (MGD).

Results: Compressed phantoms in all sizes and densities were successfully measured in a mammography device (Inspiration Prime, Siemens Healthcare). Uncompressed phantoms in all sizes and in three of the four densities were successfully measured in a BCT device (nu:view, Advanced Breast-CT). The mixture with greatest oil content remained in liquid form, precluding measurement due to risk of BCT device damage. Device MGD increased with increasing breast size and with increasing breast density, confirming the known correlation between thickness, density and MGD.

Conclusion: The use of 3D-printed phantoms that can be filled with mixtures of varying densities enables direct dose comparison across different breast imaging devices.

A82

Structured Synthetical Radiology Report Generation Using Large Language Models: A Flexible Workflow for Clinical Use

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Purpose: To develop and validate a flexible, privacy-compliant workflow for generating structured synthetic radiology reports using large language models (LLMs), enabling accessible and customizable data creation for research, education, and clinical workflow prototyping.

Methods and Materials: A structured prompt generation workflow was designed, combining fixed elements with customizable sections to instruct LLMs in producing synthetic radiology reports. The system was implemented via a spreadsheet interface and a Python script within a Google Colab environment, facilitating large-scale prompt generation without any programming expertise required. The workflow was tested across multiple LLMs, including GPT-4-Turbo, DeepSeek-V3, and Gemini-V2.5. Clinical evaluation was performed by three radiologists assessing 120 synthetic reports for correctness, clarity, and realism using a 5- point ordinal scale.

Results: The workflow successfully generated structured synthetic reports with high median scores for clarity (5 [5, 5]), correctness (5 [4, 5]), and realism (4 [4, 5]). Performance varied significantly by LLM, with general-purpose models often matching or exceeding specialized medical models. Inter-rater agreement was moderate to substantial across evaluation criteria. The system demonstrated high adaptability, supporting customization for specific educational or research needs.

Conclusion: This study presents an accessible, reproducible workflow for generating high- quality synthetic radiology reports using LLMs. The approach offers a privacy-safe, customizable tool for radiology research, education, and workflow development, with potential for widespread adoption in academic and clinical settings.

A93

Evaluation of multiplanar reconstructions in CT: a analysis of spatial resolution, noise and detectability

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Purpose: Multiplanar reconstructions (MPRs) are widely used in clinical computed tomography (CT) to facilitate the interpretation of images. Although they provide valuable complementary views, their image quality is often compromised by the parameters used during the reconstruction of the primary axial images. This study quantitatively evaluated how reconstruction parameters affect the image quality of MPRs across three modern CT systems.

Methods and Materials: A phantom was designed to measure spatial resolution and noise in axial, coronal, and sagittal planes, thus enabling a volumetric characterization of scanner performance. Inserts with 120 HU and 1000 HU contrast levels were used to determine the task-based transfer function (TTF) in all planes, while the three-dimensional noise power spectrum (NPS) was assessed in a uniform water region. These measurements were combined in a non-prewhitening observer model with an eye filter (NPWE) to compute detectability indices for spherical targets ranging from 0.5 mm to 5.0 mm in diameter. The analysis included three reconstruction kernels and slice thicknesses from 0.6 mm to 3.0 mm, reconstructed with the manufacturers' algorithms.

Results: Results showed that MPRs, being resliced from axial images rather than reconstructed directly from raw data, exhibited reduced spatial resolution—most notably along the longitudinal direction—when thicker slices were used. High-resolution or edge-enhancing kernels produced MPRs with anisotropic resolution and decreased detectability, whereas smoother kernels yielded more isotropic image quality and higher detectability.
Overall, MPR image quality was consistently inferior to that of axial slices, and the degradation intensified with increasing slice thickness.

Conclusion: These findings underscore the importance of optimizing primary reconstruction parameters—kernel selection, pixel size, and slice thickness—to preserve MPR image quality and ensure accurate diagnostic interpretation in clinical CT practice.

A118

The QuantImage v2 Online Platform for Interactive Radiomics AI Education and Advanced Model Interpretation

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Purpose: With the rapid integration of Artificial Intelligence (AI) into clinical medical imaging, developing educational tools for clinicians and students to understand and interpret AI models via hands-on experience has become of highest priority. Previous studies using the QuantImage v2 for teaching (>60 students) have shown that users' understanding of radiomic concepts is closely related to their ability to analyze performance metrics, highlighting the need for improved visual and interactive tools to support explainability. This work presents novel QuantImage v2 functionalities designed to improve the understanding and interpretation of radiomics model performance and feature behavior in both educational and research settings.

Methods and Materials: This work builds on QuantImage v2, an open-source platform for developing radiomic models from various modalities (e.g. MRI, CT, PET). The feature explorer and model building modules were adapted for improved presentation of the model metrics and visualization plots for advanced feature and model interpretability. To explore the relationship between features and outcomes, the existing heatmap is complemented by a new feature that computes a two-dimensional Uniform Manifold Approximation and Projection (UMAP) embeddings. Usability of the new version was reassessed in an initial teaching session.

Results: The model interpretability plots were often mentioned as helpful for understanding model interpretability. The UMAP visualizations also complemented the heatmap in identifying patterns and discriminative feature collections. Users reported that having practical lessons, training the models and interpreting their performance helped solidify concepts as well as important pitfalls related to AI.

Conclusion: The new QuantImage v2 modules improve the interpretability of radiomics AI workflows by offering hands-on and intuitive visualizations of model performance and feature behavior, supporting transparent model development in the educational context.

A35

Evaluation of MedGemma-4B, a domain specific vision-language model, in fundamental radiological image classification tasks.

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Purpose: To evaluate the performance of MedGemma-4B, a specialized medical vision-language model (VLM), on six fundamental radiological image classification tasks, including modality, body part, orientation, contrast, image mode, and organ identification, and to assess its limitations in clinically essential perceptual tasks.

Methods and Materials: In this study, MedGemma-4B was assessed using 600 multicenter radiological images sourced from Radiopaedia.org, divided equally into six classification tasks. Standardized visual question answering (VQA) prompts were used to query the model, and outputs were categorized by expert radiologists as correct, incorrect, or imprecise. Performance was evaluated via accuracy with 95% confidence intervals and χ^2 tests for inter-group differences.

Results: MedGemma-4B demonstrated robust accuracy in modality (97%) and body part identification (80%), but performance dropped significantly in orientation (41%), contrast phase recognition (32%), and image mode classification (48%). Organ identification achieved moderate accuracy (74%). Statistical analysis confirmed significant performance disparities across tasks ($p < 0.001$), with modality and body part tasks outperforming others.

Conclusion: MedGemma-4B excels in broad categorizations like modality and anatomical region but struggles with finer-grained radiological tasks. These limitations highlight the need for targeted data inclusion and fine-tuning to improve clinically deployable AI tool

A249

Enabling Earlier Detection of Spinal Lesions in CT Imaging with Artificial Intelligence: A Case Study

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Purpose: To evaluate whether an AI-based second reader on spinal CT can enable earlier detection of malignant bone lesions and reduce reporting misses.

Methods and Materials: A nnU-Net segmentation model trained on 653 CT studies (516 with malignant lesions) was used to detect vertebral malignancies. We retrospectively included 200 patients with reported malignant spinal bone lesions and retrieved earlier CT scans in which no lesion had been documented. The AI model was applied to these prior scans to simulate a second-reader scenario. A board-certified radiologist reviewed AI-positive findings on prior scans, first without and then with AI output, assessing lesion visibility and malignancy. Primary outcome was the proportion of missed malignancies that AI would have detected earlier; secondary outcome was the diagnostic lead time.

Results: AI detected 12 malignant lesions on prior scans that had not been reported and were judged non-recognizable without AI, providing a mean lead time of 228 days and up to 671 days before baseline diagnosis. These findings represent true early detection, where the malignancy was only appreciable with AI support. Additionally, AI flagged 25 further malignant lesions that were retrospectively visible on prior scans but absent from the original reports, indicating relevant reporting gaps in approximately one fifth of patients. Overall, AI contributed 37 additional malignant spinal lesions beyond routine reporting.

Conclusion: An AI-based second reader can identify malignant spinal bone lesions several months before radiologists and reduce overlooked but visible lesions, supporting earlier intervention and potentially improving patient outcomes.

A234

Impact of calcium suppression imaging on hand and wrist fracture detection in spectral CT: A comparison with X-ray and CT

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Purpose: To evaluate the impact of Calcium Suppression (CaSupp) imaging of spectral computed tomography (SpCT) on fracture detection in clinical routine in the acute trauma setting of the hand and wrist.

Methods and Materials: Retrospective inclusion of 125 patients who underwent both X-ray and SpCT examinations of the hand and wrist in acute trauma setting. Two independent readers evaluated fracture presence on X-ray, conventional CT, and conventional CT plus CaSupp images (time interval 4 weeks, each). Bone bruise (BBr) presence was evaluated on CaSupp images. Sensitivity and specificity were calculated to the consensus reading as the reference standard.

Results: Of the 125 patients (mean age, 55 years ± 19.5 [SD]; 67 female), 120 presented with at least one fracture, for a total of 212 fractured bones. Sensitivity was increased significantly in CT+CaSupp (94.3 and 97.2%) compared to conventional CT (88.2 and 90.1%, p<.01) and X-ray (72.6 and 75.9%, p<.01). Specificity was 99.9 and 100% for CT+CaSupp, 99.8 and 99.9% for conventional CT, and 99.4 and 99.9% for X-ray. Reader 1 detected 13 additional fractures in CT+CaSupp compared to conventional CT alone, while Reader 2 detected 15 additional fractures. BBr was seen in 58% of all fractures, in 76% of multifragmentary fractures, and in 13% of avulsion fractures. Inter-reader κ was almost perfect for X-ray (κ=.85), CT and CT+CaSupp (κ=.95), and substantial for BBr (κ=.61).

Conclusion: CaSupp images in combination with conventional CT images significantly improved sensitivity for acute trauma fracture detection in the hand and wrist compared to conventional CT images alone and X-ray.

A18

Diffusion tractography of normal nerves in knee imaging at 7 Tesla: feasibility, normal values and comparison with 3 Tesla

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Purpose: To assess diffusion metrics—fractional anisotropy (FA), mean diffusivity (MD), radial diffusivity (RD), and axial diffusivity (AD)—of the tibial (Tibialis) and common fibular (Fibularis) nerves at the knee in patients without neuropathy at 7 Tesla, with subgroup analyses by sex and age.

Methods and Materials: Single-center retrospective study (n = 30; 33.9 ± 9.6 years; 21 M/9 F). Imaging was performed on a clinical 7 T MRI system (Siemens MAGNETOM Terra). FA/MD/RD/AD metrics were obtained by GQI reconstruction and deterministic tractography (DSI Studio). Normality was verified. Paired Tibialis–Fibularis comparison: Student's t-test. Sex analysis: Welch's t-test. Age groups (≤ 29, 29–39, ≥ 40): one-way ANOVA.

Results: FA, AD, and RD were significantly higher in the Tibialis compared to the Fibularis, while MD showed no significant difference. Mean ± SD: Tibialis FA = 0.533 ± 0.047; MD = 1.424 ± 0.099 ×10^{-3} mm^2/s. Fibularis FA = 0.484 ± 0.069 (p < 0.001); MD = 1.410 ± 0.117 ×10^{-3} mm^2/s (p = 0.472). By sex, FA tended to be higher in men for both nerves but did not reach significance. Across age groups, no clear difference was observed for FA; MD/AD/RD showed no differences by sex or age. Compared with published 3 T series on the same normal nerves in the knee–leg region, our values lie at the upper end of reported ranges.

Conclusion: At 7 T, diffusion imaging is feasible and reliable. Values are different comparing Tibialis and Fibularis nerves at the knee and tends to be higher than norms reported in the literature at 3 Tesla. These normative references may serve as a basis for future studies on pathological conditions affecting these nerves.

A262

Deep learning-based chemical shift-artifact correction of ZTE MRI for enhanced bone assessment of the lumbar spine

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Purpose: To evaluate the impact of deep learning-based reconstruction with chemical shift correction (DLCSC) on osseous assessment in zero echo time (ZTE) MRI of the lumbar spine, comparing it against both a standard DL and non-DL reconstruction.

Methods and Materials: This retrospective, single-center study included 38 patients who underwent 3T ZTE MRI of the lumbar spine. K-space data were reconstructed using three methods: conventional non-DL, standard DL, and the prototype DLCSC algorithm.
Quantitative image sharpness, SNR and CNR was measured and analyzed with repeated-measures ANOVA. Two radiologists independently rated pathology-related criteria (n=22) and bone depiction quality (n=38) on a 4-point scale. Ordinal data were analyzed using the Friedman test, and inter-reader agreement was assessed with weighted Cohen's kappa.

Results: DLCSC images yielded quantitatively sharper images (mean sharpness = 0.388) compared to both non-DL (0.269; p = .010) and standard DL (0.247; p = .001). SNR and CNR were significantly higher for DLCSC and DL, compared to non-DL (p < .001). In the qualitative assessment, mean scores for all criteria of pathologies and bone depiction quality improved significantly from non-DL to DL to DLCSC, respectively (p < .001 for all). There were no significant differences in the classification of pathology types (p > 0.05). Inter-reader agreement ranged from substantial to almost perfect (κ = 0.65–0.85).

Conclusion: The DLCSC technique significantly enhanced bone assessment of the lumbar spine, compared to DL and non-DL reconstructions, including the evaluation of pathologies.
This advancement extends the utility of ZTE for comprehensive spine imaging.

A115

A GENERALIZABLE AI-BASED BONE MINERAL DENSITY CLASSIFICATION FROMCONTRAST AND NON-CONTRAST SPINE CT SCANS

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Purpose: We aimed to develop and validate a generalizable, contrast-aware algorithm for the automatic classification of osteoporosis and osteopenia from sagittal spinal CT scans, to support routine clinical diagnosis with high specificity and adequate sensitivity in order to minimize unnecessary follow-up procedures.

Methods and Materials: We collected data from a diverse, multi-center cohort with CT scans from seven scanner manufacturers and 32 scanner models. We compiled two independent datasets: one for training a contrast phase correction model (n = 633 studies) and another for bone mineral density (BMD) classification (n = 779). To assign ground truth BMD categories (normal, osteopenia, or osteoporosis) we used T-scores from matched DEXA scans obtained from the same patients taken 30 days earlier up to 90 days later. For BMD analysis, we selected CT scans that covered at least three vertebrae and segmented the vertebral bodies using TotalSegmentator, a U-Net based model. We trained a separate model on the contrast phase dataset to correct for intravenous contrast, ensuring consistency in HU measurements. After segmenting the vertebrae, we isolated the spongiosa region and calculated the median Hounsfield Unit (HU) values for each vertebra. We determined sex-specific HU thresholds per vertabra to classify BMD and evaluated the model on an independent holdout set (n = 184).

Results: The contrast correction model significantly reduces the measured HU value difference between contrast-enhanced and native scans (R^2 from 0.86 to 0.96) from the same study. The BMD prediction model achieves 60.0% sensitivity and 88.0% specificity on the holdout set. Subgroup analyses revealed consistent performance across sex and age groups as well as contrast presence.

Conclusion: To the best of our knowledge, this is the first CT-based algorithm capable of classifying bone mineral density across the entire spine in both contrast-enhanced and native scans. It demonstrates strong performance under real-world conditions.

A139

MRI Quantification of the Transverse Arch: Associations with Hallux Valgus and Morton's Neuroma

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Purpose: To evaluate the relationship of a deformed forefoot with hallux valgus and Morton's neuroma, analyzing a pathological horizontal widening (splayfoot) and vertical flattening of the transverse arch separately. Additionally, to assess the diagnostic accuracy of MRI for detecting a widened forefoot (splayfoot) compared to radiography, which is considered the gold standard.

Methods and Materials: This retrospective single-center study included 200 patients who underwent weight-bearing dorsoplantar radiographs and forefoot MRI in an unloaded prone position. Patients were divided into a non-splayfoot group (≤35°, n=100) and a splayfoot group (>35°, n=100) based on the intermetatarsal-I/V-angle measured in the radiographs. The transverse arch height (TAH) was measured on axial T1-weighted images and the intermetatarsal-I/V-angle was assessed on fat-saturated PD-weighted coronal MR images. Additionally, the presence of hallux valgus and Morton's neuroma was evaluated.

Results: Splayfoot deformity was strongly associated with hallux valgus ($p<0.001$), but not with Morton's neuroma ($p=0.157$). Flattening of the transverse arch (TAH≤5 mm) was linked to more than a threefold increased likelihood of Morton's neuroma ($p=0.029$). Conversely, no significant relationship was found between TAH and hallux valgus ($p=0.181$). ROC analysis showed that the MRI-based intermetatarsal-I/V-angle had moderate diagnostic accuracy for splayfoot detection (AUC=0.803), whereas TAH could not distinguish between patients with and without splayfoot (AUC=0.514).

Conclusion: Splayfoot is a significant and strong risk factor for hallux valgus, while a flattened transverse arch is linked to a higher risk of Morton's neuroma. Both pathologies are associated with a transverse arch deformity, which can be assessed reliably by MRI.

A84

Acetabular cup version measurement in total hip arthroplasty: Comparing MRI versus CT

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Purpose: The acetabular cup version in patients with total hip arthroplasty (THA) is a key parameter influencing hip stability and functional outcomes. Although CT is the reference standard for assessing cup orientation, MRI has emerged as a preferred cross-sectional imaging modality for evaluating postoperative pain. This study compared MRI- and CT-based measurements of acetabular cup version regarding agreement, reproducibility, and reliability.

Methods and Materials: Patients who underwent THA between 2015 and 2025 with postoperative CT and MRI were retrospectively analyzed. MRI was performed using optimized metal-artifact reduction sequences. Acetabular cup version was measured on axial high-bandwidth T1-weighted turbo-spin echo sequences and on corresponding CT scans by two musculoskeletal radiologists. Inter- and intra-reader, as well as inter-modality agreement were assessed using intraclass correlation coefficients (ICC). Bland-Altman plots evaluated systematic bias.

Results: Thirty patients were included (mean age, 64.1 years; 14 women). Mean acetabular version was 31.2° (standard deviation [SD], 9.4–10.3) for CT and 30.1°–30.2° (SD, 8.9–9.3) for MRI for both readers.
Inter-reader agreement was almost perfect for CT (ICC, 0.96) and substantial for MRI (ICC, 0.76). Intra-reader agreement was almost perfect for both modalities (ICC, CT: 0.99; MRI: 0.94). Bland-Altman analysis showed no statistically significant differences between CT and MRI measurements with a slight positive bias for MRI (mean pooled difference, 1.1°; p = 0.058; limits of agreement, −4.7° to 6.8°) and almost perfect agreement for both readers (ICC, 0.86–0.90).

Conclusion: MRI measures acetabular cup version with excellent reliability and close agreement with CT, reinforcing MRI's role in postoperative THA evaluation.

A22

Prospective Assessment of Bone Mineral Density in Spectral Localizer Radiographs From Photon Counting Detector CT: A Prospective In-Vivo Study

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Purpose: To determine in a prospective patient study the accuracy of areal bone mineral density (aBMD) measurements with spectral localizer radiographs obtained with a clinical photon-counting detector (PCD)-CT scanner in comparison with dual-energy x-ray absorptiometry (DXA).

Methods and Materials: In this IRB-approved, prospective study, 41 patients (15 females, 26 males; mean age 61.3 years, age range 35 - 78 years) between 03/2024 and 10/2024 underwent PCD-CT of the abdomen with a spectral localizer radiograph (tube voltage 140 kVp, tube current 30 mA) and DXA within a median of 45 days. Areal bone mineral density (aBMD) values were derived for lumbar vertebrae L1 - L4 from both methods and were compared with linear regression, Pearson correlation, intraclass correlation coefficients (ICCs), and Bland-Altman plots. T-scores were calculated on a patient level and were compared between methods.

Results: DXA and spectral localizer radiographs showed strong correlation in aBMD measurements ($R = 0.97$, $p < 0.001$) and patient level T-scores ($R = 0.99$, $p < 0.001$). There was a strong agreement between aBMD from both methods (ICC, 0.96 (95% CI [0.94, 0.97])). Bland-Altman analysis revealed a very small mean difference in aBMD between methods (mean absolute error 0.019 g/cm2) with narrow limits of agreement (-0.083 g/cm2 to 0.121 g/cm2). Similarly, there were small differences in regard to the T-score (mean absolute error 0.156) with narrow limits of agreement (-0.422 to 0.734) between methods. ICCs indicated an excellent agreement between T-scores from DXA and spectral localizer radiographs (ICC, 0.98 (95% CI [0.95, 0.99])).

Conclusion: Our prospective patient study indicates that spectral localizer radiographs obtained with a clinical PCD-CT system enable accurate quantification of the lumbar bone areal mineral density. This opens-up the opportunity for opportunistic screening of osteoporosis in patients who undergo CT for other indications.

A289

Cartilage might not be as healthy as it looks: automatic MRI-based scoring of cartilage osteoarthritic severity reveals early structural changes in cartilages graded as healthy by radiologists

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Purpose: To determine if an automated MRI-based measure of osteoarthritic cartilage severity, the Cartilage Thickness Score (CTh-Score), can quantify early disease signs in cartilage graded as healthy by radiologists using a gold-standard semi-quantitative grading systems (MOAKS). The CTh-Score is based on cartilage thickness patterns dervied form MRI and scores the cartilage between 0 and 100 (with higher scores indicating higher severity).
Baseline CTh-Scores of knees that later developed cartilage lesions over 48 months ("cases") were compared with those that remained lesion-free ("controls").

Methods and Materials: Baseline DESS MRI scans were processed to compute the CTh-Score automatically. Cases were defined as knees with fully healthy cartilage at baseline (all grades = 0 in femorotibial joint ROIs) that exhibited any cartilage lesion at 48 months (any grade > 0 in any femorotibial ROI). Controls remained fully healthy at both baseline and 48 months. CTh-Scores were compared controlling for age, sex, BMI, and mean regional cartilage thickness.

Results: Cohort sizes were n=48 (cases) vs n=60 (controls). As expected, cases demonstrated substantially higher mean [SD] CTh-Scores at 48 months compared with controls (26.8 [19.9] vs. 6.4 [5.5], $p<0.001$). Importantly, already at baseline, CTh-Scores were significantly higher in knees that later progressed (in term of MOAKS) than in those that remained healthy (7.7 [7.2] vs. 4.6 [4.7], $p=0.006$).

Conclusion: At 48 months, the CTh-Score distinguished knees that developed degeneration from those that remained healthy. Notably, the CTh-Score also detected significant differences at baseline (despite all knees being graded as completely healthy by radiologists) indicating greater sensitivity of this automated measure to early osteoarthritic cartilage features. Because the CTh-Score leverages deep-learning–based pattern recognition, it may capture subtle structural alterations that difficult to catch by a human eye.

A279

Revising The Coxa Profunda Sign Reveals No Association With Acetabular Deformities Or 3D Lunate Surface Area

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Purpose: To evaluate whether a deep learning–based AI algorithm applied to routine CT scans can identify patients with reduced bone mineral density (BMD) prior to the occurrence of fragility fractures.

Methods and Materials: Fragility fractures contribute to morbidity and mortality in the older population. Osteoporosis, the underlying pathology, remains underdiagnosed as BMD testing is usually restricted to patients with suspected disease or after the first fracture. Routine CT scans, frequently obtained for non-skeletal indications, often include spinal segments containing valuable but unused bone health information. We retrospectively analysed CT examinations of patients (N= 354, women n=180, mean age 68.9 years SD 10.95, range 29–95) who sustained a fragility fracture within 1–2 years (mean time 16.40 months, SD 3.25) after imaging. Both contrast-enhanced (n=700 series) and non-contrast CT (n=204 studies) scans were included. Radiology reports were manually evaluated whether radiologists detected signs for decreased BMD. The AI-based pipeline first segments each vertebra in the scan and assigns a BMD score to it. These scores are then aggregated to classify the study as either healthy or reduced BMD.

Results: AI classified 57% of patients as having reduced BMD (osteopenia/osteoporosis) in the prior CT, compared with 10% noted by radiologists in their original reports. Reduced BMD prediction was particularly frequent in women (69% vs 45% in men) and in patients aged 65–80 years (63%). The algorithm performed consistently across contrast-enhanced (47% reduced BMD) and non-contrast scans (63% reduced BMD), demonstrating robustness to protocol variability.

Conclusion: AI-based opportunistic screening of routine CT scans can identify signs of osteoporosis that would otherwise remain unnoticed. By detecting reduced BMD before the first fracture, this approach could shift clinical practice from reactive fracture management to proactive prevention.

A132

Relationship Between Coraco-Glenoid Ligament Variants and SLAP Lesions: Insights from a 3-T Arthro-MRI Study

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Purpose: The insertion site of the coraco-glenoid ligament (CGL) of the shoulder seems to be involved in superior labrum anterior and posterior (SLAP) lesions. Anatomical and arthro-magnetic resonance imaging (MRA) studies have reported five CGL variants. This study aimed to evaluate inter-reader reliability in the identification of CGL presence and variants on 3-T MRA, also investigating potential associations between CGL variants and SLAP lesions.

Methods and Materials: In this retrospective cohort study, three board-certified musculoskeletal radiologists (20, 10, and 5 years of experience) evaluated 1136 consecutive MRA examinations, 577 (50.2%) of patients with SLAP lesions. Inter-reader reliability in assessing CGL presence and variants was evaluated with Fleiss' κ. After 1:1 patient matching according to age and sex, the association between the presence of SLAP lesions and CGL variants was evaluated with binary logistic regression, calculating odds ratios (ORs) and their 95% confidence intervals (CI).

Results: "Almost perfect" reliability was found for the identification of CGL variants (κ 0.832, 95% CI 0.813–0.851), the most frequent being type I (393/1136 patients, 34.6%), and type II (320/1136 patients, 28.2%). 1:1 matching resulted in two groups of 427 patients with and without SLAP lesions (256 males in each group; median age 52 years, IQR 44–59 years). Among these 854 matched patients, compared to the type I CGL variant, all other CGL variants had high ORs for the presence of SLAP lesions, ranging from OR 4.3 (95% CI 2.5–7.5) of type III to OR 39.9 (95% CI 24.5–65.0) for type II

Conclusion: 3-T MRA grants high reliability in identifying CGL presence and variants. In an age and sex matched comparison, the type II CGL variant was strongly associated with the presence of SLAP lesions.

A195

Comparison of Ultrasound Imaging and MR fat fraction for assessment of Sarcopenia

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Purpose: Sarcopenia, characterised by muscle mass and strength loss, is common in the ageing population, leading to disability and higher healthcare costs. While MRI is accurate for muscle analysis, it is costly & less accessible. Ultrasound (US) offers a cost-effective alternative. This study evaluates ultrasound attenuation imaging (ATI) and echo intensity (EI) as alternatives to Dixon MRI fat fraction (MR-FF) for assessing muscle quality in muscles, including the rectus femoris (RF), gastrocnemius (GS) and biceps brachii (BB) muscles

Methods and Materials: A prospective multicentre study was conducted with 60 volunteers (aged 21-88) who had previously undergone whole-body MRI. Ultrasound images were obtained using a routine clinical scanner equipped with attenuation imaging tools. Measurements were taken by tracing the borders of the right RF, GS and BB muscles. Corresponding T1-weighted Dixon VIBE fat and water images were used for MR fat fraction percentage. Correlation analysis was performed to compare MR-based fat infiltration with US imaging, & compared with clinical evaluation for sarcopenia

Results: Correlations between US EI and MRI were >0.65 for the BB, and > 0.7 for the RF. Ultrasound attenuation showed no correlation with EI, with values of ~0.17 RF. Inter-operator agreement was excellent, with correlations of > 0.9 for both RF and BB, and >0.85 for GS. Echo intensity demonstrated a strong correlation with MRI fat fraction, suggesting its potential as a low-cost, non-invasive screening tool for sarcopenia

Conclusion: EI offers a promising ultrasound-based imaging modality for screening patients at risk for sarcopenia, providing a cost-effective and widely accessible alternative to MRI. However, no correlation was found between ATI and MR fat fraction percentage or between ATI and EI. This study underscores the need for continued research to refine ultrasound-based methods for evaluating muscle quality in clinical settings

A260

MR imaging of the paediatric skull using a novel zero echo time bone sequence with artificial Intelligence-enhanced image reconstruction enabling 3D visualization

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Purpose: MRI is increasingly used for imaging craniofacial bones due to the lack of ionizing radiation. The purpose of this study was to assess the application of a novel zero echo time (ZTE) sequence with artificial intelligence (AI)-based image reconstruction that allows for 3D reconstructions in our paediatric radiology department with comparison to other available diagnostic imaging modalities.

Methods and Materials: We retrospectively evaluated brain MRIs with ZTE bone sequences from all patients with informed consent between December 2022 and July 2024. Imaging indications and the MRI's effectiveness in answering clinical questions were evaluated by two radiologists, comparing results with other available diagnostic modalities.

Results: A total of 109 patients (42.2% girls, mean age 4.7 ± 4.4 years) were analyzed, with additional imaging modalities in 52.3% (32 CT, 19 ultrasound, 6 conventional radiographs).
Clinical indications included craniosynostosis (23.9%), tumour (22.9%), head trauma (22.0%), malformation of the skull/genetic disorders (14.7%), and other conditions (16.5%). The clinical question regarding the bone could be answered by ZTE in 97.2% (106/109). In one patient with head trauma, a fracture was suspected, but could not definitively be confirmed by ZTE (adjacent epidural hematoma). In another patient suspected of having craniosynostosis, the sutures were not evaluable due to overlapping bones in a child with a shunt and overdrainage. A third case with fibrous dysplasia was misinterpreted as a calcified cephalhematoma in MRI with clarification by CT due to its superior visualization of the spongiosa with ground-glass matrix.

Conclusion: ZTE bone imaging with 3D reconstructions enables reliable skull imaging. This MR technique could potentially replace CT scans for evaluating skull pathologies in children, reducing ionizing radiation exposure.

A256

Radiation-Free Dynamic Assessment of the Paediatric Trachea Using Four-Dimensional Zero Echo Time MRI

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Purpose: To evaluate the feasibility of four-dimensional zero echo time MRI (4DZTE) for quantitative, radiation-free assessment of paediatric tracheal morphology and respiratory dynamics.

Methods and Materials: In this retrospective, REB approved study, 45 children who underwent clinically indicated 1.5T lung MRI including 4DZTE (GE Healthcare, Waukesha, WI, USA) between 04/2025 and 10/2025 were included (median age 7.5 years; range 0.3–17.5 years). 4DZTE is a rapid 3D sequence using a physiological bellows signal for retrospective respiratory gating during spontaneous breathing. Semi-automated transverse, anteroposterior, and cross-sectional area (CSA) measurements were obtained at the thoracic inlet and mid-trachea during inspiration and expiration. Data were analysed descriptively; differences were assessed using the Wilcoxon signed-rank test and reported as medians with interquartile range (IQR).

Results: Tracheal dimensions and CSA closely matched published CT-based age-related data. At the thoracic inlet, median CSA was 71.9 mm² (IQR 45.6–108.4 mm²) in inspiration and 71.0 mm² (IQR 44.9–106.4 mm²) in expiration (difference −2 mm²; 95% CI −3.8 to −1.0 mm²; p<0.001). At the mid-trachea, median transverse diameters were 10.3 mm (IQR 8.3–12.2 mm) and 10.4 mm (IQR 8.1–12.2 mm), respectively (difference −0.1 mm; 95% CI −0.17 to −0.03 mm; p<0.01). Median anteroposterior diameters were 8.0 mm (IQR 6.2–10.2 mm) vs 7.8 mm (IQR 6.0–9.8 mm) (difference −0.3 mm; 95% CI −0.4 to −0.2 mm; p<0.001). All expiratory values were smaller (<20% CSA reduction; <10% anteroposterior).

Conclusion: 4DZTE MRI enables quantitative and dynamic assessment of paediatric tracheal morphology without radiation, offering a promising non-ionising alternative to CT for evaluating airway structure and respiratory variation

A250

Evaluation of three different FAST brain MRI approaches in children

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Purpose: FAST brain MRI is a sedation-free, non-contrast brain MRI strategy with a short acquisition time as an alternative to CT or conventional MRI. We compared three FAST approaches: T2 SSFSE, bSSFP real-time imaging, and NeuroMix, evaluating their diagnostic accuracy against conventional MRI.

Methods and Materials: All MRI examinations containing an axial T2 SSFSE, dynamic bSSFP real-time imaging, and NeuroMix (multiparametric sequence: T2 SSFSE, T2-FLAIR SSFSE, T1-FLAIR PROPELLER, 3D-EPI T1, DWI, SWI, T2*), performed between February and May 2025 (1.5/3T GE MR scanners), were included in this retrospective analysis. We compared the approaches regarding the detection of acute pathologies using conventional sequences as the reference standard and motion artifacts.

Results: A total of 206 children were included in the study (48% female, mean age 8.4±4.6 years). Reduced image quality due to motion artifacts was detected in 6.8% of NeuroMix, 4.8% of T2 SSFSE and 0% of bSSFP real-time. All cases of hydrocephalus (n=14) and CSF overdrainage (n=7) were correctly identified in all approaches. Detection of the following pathologies was highest in NeuroMix: tumor (NeuroMix vs. T2 SSFSE vs. bSSFP: 16/16 (100%) vs. 15/16 (93.8%) vs.11/16 (68.8%)), hemorrhage (23/23 (100%) vs. 14/23 (60.9%) vs. 9/23 (39.1%)), ischemia (5/5 (100%) vs. 1/5 (20%) vs. 1/5 (20%)), subdural collections (6/7 (85.7%) vs. 5/7 (71.4%) vs. 5/7 (71.4%)), thrombosis (2/2 (100%) vs. 1/2 (50%) vs. 0/2 (0%)), and abscess/empyema (3/3 (100%) vs. 2/3 (66.7%) vs. 1/3 (33.3%)). All approaches accurately identified all 17 lesions exhibiting a midline shift. Combining the three sequences, 76 of 77 (98.7%) acute pathologies were detected.

Conclusion: FAST brain MRI (<5 minutes) offers a quick, motion-robust option for paediatric neuroimaging, while maintaining sufficient image quality to rule out acute pathologies, having the potential to reduce radiation exposure and sedation risks for children by replacing CT and MRI exams under anaesthesia

A185

Deep learning-based image reconstruction for accelerated MRI of the knee in children

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Purpose: To investigate image quality and diagnostic accuracy of accelerated paediatric knee magnetic resonance imaging (MRI) reconstructed from undersampled k-space data using a deep learning (DL)-based approach.

Methods and Materials: In 31 children (median age 12 years 5 months, age range 5 years 4 months to 17 years 9 months) MRI of the knee was performed at 1.5T with standard protocol followed by an accelerated protocol of undersampled 2D and 3D fast spin echo (FSE) sequences combined with dedicated DL-based image reconstruction (DLSpeed) at the same spatial resolution.

Signal-to-noise ratio (SNR) and contrast-to-noise ratio (CNR) of bone marrow and subcutaneous fat were compared between images from both protocols with Wilcoxon signed-rank test.

Subjective image quality and detection of pathological findings were assessed by three observers.

Results: There was no significant difference in SNR and CNR of bone marrow and subcutaneous fat between both image sets for T1-weighted ($p>0.05$) and for proton density (PD)-weighted 2D FSE sequences ($p>0.05$). SNR and CNR of bone marrow and subcutaneous fat on fat suppressed T2-weighted 2D FSE images obtained with DLSpeed were significantly higher ($p<0.001$) than that of corresponding images obtained with the standard protocol. On the short tau inversion recovery 3D FSE acquisition, there was no significant difference of SNR of bone marrow ($p=0.05$), a small difference of CNR of subcutaneous fat ($p=0.04$), while the DLSpeed images showed higher SNR of subcutaneous fat ($p=0.001$) and higher CNR of bone marrow ($p=0.006$). No significant differences were found in subjective image quality and detection rate of pathological findings between the two reconstruction algorithms. The acquisition time was reduced by approximately 28%.

Conclusion: DL-based image reconstruction of undersampled k-space data can improve SNR and CNR of certain 2D and 3D FSE acquisitions while reducing scan times, resulting in similar subjective image quality and diagnostic accuracy for paediatric knee MRI.

A19

Evaluation and optimization of pediatric VCUG protocols after a fluoroscopy system upgrade

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Purpose: In the context of the new Children's Hospital, the fluoroscopy systems were upgraded. The older Siemens units were replaced by a new Stephanix D²RS machine. A review of 6 months of use shows patient doses are significantly higher for voiding cystourethrogram (VCUG) than before, highlighting the challenge of optimization in the absence of national pediatric dose reference levels (DRLs).

Methods and Materials: Local DRLs were established for the new fluoroscopy system for four age groups (0–1, 1–3, 3–5, and >5 years) and compared with data from the previous systems and published literature. The existing factory protocols were optimized. Different acquisition parameters were tested using stacked solid water plates to simulate different patient thicknesses. Image quality was also evaluated both qualitatively and quantitatively, using the Leeds TOR 18FG and the CDRAD phantom, respectively.

Results: 232 pediatric VCUG exams were analyzed retrospectively. Before optimization, the new system delivered significantly higher doses than the older Siemens units, especially for patients under one year: mean PDS was 28 mGy·cm² for Siemens units versus 187 mGy·cm² for Stephanix. Qualitative and quantitative assessments showed that Stephanix provided better image quality regardless of the doses. After optimization, dose was reduced by 82%, particularly for newborns (0-1 year).

Conclusion: An initial check of the new system showed that the factory protocols were not optimized, resulting in unnecessarily high doses for pediatric patients. After protocol optimization with phantom testing, doses were significantly reduced while providing better image quality than the old systems. Results emphasize the need of dose-image quality assessment as part of the system's commissioning. Protocols should then be crosschecked
using patient data.

A40

The QUANTI Pediatric study: pharmacokinetics and safety of gadoquatrane in pediatric patients undergoing contrast-enhanced magnetic resonance imaging (CE-MRI) with a reduced Gadolinium dose

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Purpose: To investigate the pharmacokinetics (PK) and safety of gadoquatrane, a low-dose macrocyclic gadolinium (Gd) based contrast agent (GBCA), in pediatric patients from birth to <18 years (y) undergoing contrast-enhanced MRI (CE-MRI) in any body region, to demonstrate similarity to PK and safety in adults thus supporting efficacy extrapolation from adult to pediatric patients per ICH E11 guidance.

Methods and Materials: QUANTI Pediatric is an open-label phase 1/3 study, investigating gadoquatrane at 0.04 mmol Gd/kg body weight (bw) in pediatric patients, conducted alongside two adult phase 3 studies using the same dose. Patients were allocated to three age groups: 0-<2, 2-<12, and 12-<18y. For PK, three blood samples were taken from each patient post injection (p.i.) within predefined time windows. Safety, including adverse events and laboratory parameters, was monitored up to 7 days p.i. Investigators assessed pre- and post-gadoquatrane MRIs exploratorily using imaging endpoints.

Results: Of 105 screened patients, 93 received gadoquatrane (59.1% male, 62.4% brain MRI).
For PK, 23 patients aged 0–<2y, 45 aged 2-<12y, and 24 aged 12–<18y were evaluable. Gd plasma concentrations and PK parameters were similar across age groups and within expected ranges, overlapping with adult data. 16 (17.2%) patients had treatment emergent adverse events (TEAE), 3 serious, 5 TEAEs (5.4%) were related to gadoquatrane.
Post-contrast MRI assessments showed expected added diagnostic value vs pre-contrast.

Conclusion: Gadoquatrane exhibits similar PK and safety profiles in pediatric and adult patients, allowing efficacy extrapolation from adult to pediatric patients per ICH guidance, being supported by MRI assessments.

A285

AI-Accelerated T2-weighted Turbo Spin Echo Imaging of the Neonatal Brain with Deep Resolve Boost: A Retrospective Comparison with Conventional T2

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Purpose: To compare image quality, feasibility, and clinical applicability of AI-based Deep-Resolve-Boost TSE T2-w ($T2_{DRB}$) and conventional turbo spin echo T2-w ($T2_{CONV}$) images of brain MRI in the neonatal period, which is underrepresented in the existing literature on AI-based generated images.

Methods and Materials: Single-center retrospective study of clinically acquired consecutive brain MRIs in term equivalent age (TEA) and term neonates performed between Nov 2023 and Feb 2024 following an upgrade of our scanner and software. A standard brain protocol (including $T2_{CONV}$) with an axial $T2_{DRB}$ sequence available from the commercial clinical solution were performed. Radiologists assessed image quality using a 5-point Likert scale and a forced-choice comparison of 10 anatomical landmarks between $T2_{CONV}$ and $T2_{DRB}$.
SNR and CNR were compared with paired t-tests. Feasibility was evaluated through acquisition time, artefact burden, and repeat rates. Clinical applicability was assessed by lesion detection relative to $T2_{CONV}$ and inter-reader agreement. Demographic and clinical variables were collected as independent factors. Statistical analysis was performed with R.

Results: Fourteen patients were included (10 male), of whom half was premature at birth, with a median gestational age of 34.6 weeks (IQR 28.1-39.4). Indications for MRI were assessment of brain development at TEA in preterm new-borns (7), hypoxic ischemia (2), malformation assessment (6), and prenatal periventricular hemorrhagic stroke (1).
Preliminary results indicate a radiologist preference for $T2_{CONV}$ over $T2_{DRB}$ (mean Likert 4.1 vs 3.8, respectively). Across the 10 anatomical structures, preference for $T2_{CONV}$ was strongest for the globus pallidum, the PLIC, and the frontal subcortical zone.

Conclusion: T2-weighted TSE DRB-accelerated sequence is promising from the perspective of quality and speed but may hinder interpretation of the myelinating neonatal brain.

A192

Real-life performance of an artificial intelligence-based fracture detection software in a paediatric emergency department

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Purpose: To assess the performance of an artificial intelligence (AI)-based software for fracture detection used by emergency paediatricians (EPs) during clinical decision-making.

Methods and Materials: Between January and April 2024, bone radiographs from consecutive patients after trauma were assessed by experienced EPs in a university children's hospital. EPs could use AI (BoneView, Gleamer, Paris, France) for decision-making, but did not necessarily follow its output. EP/AI diagnoses were compared using paediatric radiology diagnoses as reference standard.

Results: In total, 1192 children (mean age: 9.3 years) with 1286 radiographic studies were included, covering the axial skeleton (clavicle (38), thoracic spine (12), lumbar spine (19), pelvis (32)), upper extremity (shoulder (23), upper arm (16), elbow (86), forearm (101), hand/wrist (180), fingers (219)), and lower extremity (upper leg (14), knee (103), lower leg (66), ankle (209), foot (138), toes (30)). In total, 669 fractures and 7 dislocations were identified by the ground truth. Discrepant results for EP and/or AI diagnoses were observed in 240 radiographs. Among 46 false-negative EP diagnoses, AI correctly identified 23 fractures. Of 40 false-positive EP diagnoses, AI correctly identified 35 as true negatives. In 99 true-negative EP diagnoses, AI generated 77 false-positive results. Among 125 true- positive EP diagnoses, AI failed to identify 50 fractures. AI missed 5 of 7 dislocations and produced 1 false-positive. EPs correctly identified all dislocations except for 1 false-positive, which AI classified correctly.

Conclusion: AI-based fracture detection software can assist EPs, particularly in reducing false-positive diagnoses. However, the considerable number of misleading AI outputs underscores the necessity of cautious interpretation. The influence of AI assistance may depend on the clinician's level of experience and degree of trust in the AI tool.

A272

Fluoroscopic defecography in children: A preliminary experience in Geneva

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Purpose: Colo-rectal motility disorders are frequent in the pediatric population with scarce radiological literature in this field. Defecography is a valuable study to assess anorectal function during evacuation and here we evaluate feasibility and added value of the technique in children, in collaboration with a new dedicated clinical program at our hospital.

Methods and Materials: Since April 2025, in parallel to a new program at our hospital dedicated to pediatric GI motility disorders, we started to perform fluoroscopic defecographies with adapted equipment . We have so far studied ten patients (more to come) in children aged 9 to 15 years, 6 boys and 4 girls. They were addressed for severe constipation, fecal incontinence or rectal prolapse. Four had previous surgery for ano-rectal malformations, one for Hirschsprung's disease and two for spinal malformations. The study consists of filling the rectum with barium contrast and obtaining dynamic images on a radio-transparent toilet.

Results: Several abnormalities were detected such as: pelvic floor dyssynergia, rectocele, rectal prolapse, ano-rectal intussusception. We were able to discuss each case with the gastroenterologist in charge to compare with clinical and manometric findings.

Conclusion: Fluoroscopic defecography is feasible in children with adapted equipment .
Findings, discussed with clinicians, are valuable in directing therapeutic management such as bio-feedback, medication or surgery.

A150

Interim Efficacy Analysis of 177-Lu-DOTA-JR11 in Meningioma: Updated 12-Month Disease Control Rate in Meningioma Patients

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Purpose: In a previous study, the somatostatin receptor 2 (SST2) antagonist [177Lu]Lu-DOTA-JR11 showed 2.2–5.7-fold higher meningioma absorbed doses compared with standard peptide receptor radionuclide therapy (PRRT) with [177Lu]Lu-DOTATOC in meningioma patients.
Primary aim: evaluation of 12-month disease control and preliminary efficacy of PRRT with the SST2 antagonist [177Lu]Lu-DOTA-JR11 in patients with recurrent or progressive, unresectable meningioma.

Methods and Materials: We retrospectively analyzed 12 consecutive patients with unresectable or recurrent, SST2-positive meningioma treated with [177Lu]Lu-DOTA-JR11 at a single academic tertiary center in Switzerland. All patients were reviewed by a neuro-oncology tumor board and had exhausted standard treatment options (compassionate-use).
Six patients originated from the initial phase 0 cohort and six additional patients were treated thereafter according to a three-cycle protocol. Contrast-enhanced MRI was performed at baseline and at 12 months. Tumor response was assessed volumetrically and categorized as stable or progressive disease, the latter defined as ≥ 40% increase of volume.
The 12-month disease control rate (DCR) was defined as the proportion of patients without progression.

Results: All 12 patients completed clinical and imaging follow-up at 12 months. Seven patients (58%) showed stable disease; no complete or partial responses were observed.
Compared with the initial cohort of 6 patients, who had a 12-month DCR of 83% (5/6 patients), inclusion of the additional 6 patients resulted in a total 12-month DCR of 58% (7/12 patients).

Conclusion: This interim analysis suggests that [177Lu]Lu-DOTA-JR11 PRRT can achieve 12-month disease stabilization in a relevant subset of patients with progressive meningiomaswithout standard treatment options. Ongoing follow-up will help clarify long-term disease control and refine patient selection.

A271

Role of Quantitative SPECT/CT in the Prediction of Iodine 131 Therapy Effectiveness

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Purpose: To evaluate whether quantitative SPECT/CT parameters obtained after the first I-131 administration can predict therapy effectiveness in differentiated thyroid cancer (DTC).

Methods and Materials: We conducted a retrospective monocentric study of consecutive patients treated between 08/2019 and 12/2024 for DTC with radioiodine. Patients receiving a first cycle of I-131 (ablative or adjuvant), followed by post-therapy quantitative SPECT/CT performed 48–72h later (Siemens Healthineers Intevo) were included. We applied same reconstruction parameters for all datasets. Quantitative metrics were extracted from the thyroid bed (SUVmax, SUVmean, SUVpeak, TLG). Ablation effectiveness was assessed using thyroglobulin (Tg) measured 6–12 months after treatment, and successful ablation was defined as Tg <1ng/L. Statistical analysis included Spearman correlation, parametric and non-parametric testing.

Results: In total, 50 patients were included (mean age: 51y, range 12-83). Quantitative SPECT/CT metrics were similar in patients with and without successful ablation, even after excluding patients with positive anti-Tg antibodies. In contrast, all quantitative metrics were significantly correlated with the decrease in Tg with radioiodine treatment (r=0.3, p=0.03 for all parameters).

Conclusion: Our study showed a significant correlation between SPECT/CT quantitative metrics and the decrease in Tg after iodine 131 treatment in patients with DTC. When combined with the patient's clinical and biological data, this information may help identify individuals who are more susceptible to not respond to radioiodine and who may require increased surveillance..

A245

Safety and Efficacy of Radiolabeled Somatostatin Receptor Antagonist [177Lu]Lu-DOTA-JR11 for Peptide Receptor Radionuclide Therapy in Patients with Somatostatin Receptor Positive Tumors - Interim analysis of a retrospective study

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Purpose: Peptide receptor radionuclide therapy (PRRT) is an established treatment approach for the treatment of somatostatin receptor subtype 2 (SSTR2) positive tumors; however, responses remain heterogeneous. SSTR2-antagonists, such as [177Lu]Lu-DOTA-JR11, deliver higher absorbed tumor doses and target-to-background ratios compared to agonists, but studies suggest higher risk for hematotoxicity. Aims: safety and progression-free survival (PFS) of [177Lu]Lu-DOTA-JR11 were assessed with an individual dosing approach in SSTR2 positive tumors resistant to standard therapy..

Methods and Materials: Retrospective analysis of patients treated with [177Lu]Lu-DOTA-JR11 under investigational compassionate use at our institution from 2019-2025 (minimum follow-up: 6-months). We included patients with SSTR2-expressing tumors progressing on ≥1 conventional therapy. Patients received 1–5 cycles of body surface area-adjusted [177Lu]Lu-DOTA-JR11 (2 GBq/m²; 2.8–4.2 GBq per cycle) every 10–12 weeks; 85% (n=34/40) had received prior [177Lu]Lu-DOTA-TOC (5.2–8.3 GBq). Safety was graded according to Common Terminology Criteria for Adverse Events (CTCAE) v5.0 and PFS was assessed from the first cycle of PRRT based on MRI and CT imaging (RECIST 1.1).

Results: Interim analysis included 40 patients, with a 15-month median follow-up (6-52 months) and a median total activity of 4.5 GBq (2.6-19.0 GBq). Grade 3/4 hematotoxicity occurred in 75% of patients (30 grade 3, of whom 5 also had grade 4); 40% were fully reversible, 27% partially reversible, and 33% irreversible. No grade 5 events, myelodysplastic syndrome, or secondary tumor occurred. Median PFS was 12 months (95% CI: 9–16 months).

Conclusion: [177Lu]Lu-DOTA-JR11 is effective and safe in pretreated SSTR2-expressing tumors; with 70% of patients having favorable safety outcomes (reversible or no toxicity).

A39

Preclinical Comparison of 177Lu- and 161Tb-labeled FAP Radioligands using a Fibrosarcoma Model

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Purpose: The aim of this study was to evaluate and compare the cell uptake and tissue distribution of ^{177}Lu- and ^{161}Tb-labeled DOTA-FAPI-46 and the dimer DOTAGA-Glu-(FAPI)$_2$, that was reported to have enhanced tumor retention.

Methods and Materials: Cell uptake of the FAP inhibitors (FAPI) after 4 h incubation was determined using FAP-transfected and wildtype fibrosarcoma cell lines HT1080-FAP and HT1080, respectively. Biodistribution studies were performed at 4 h post injection (p.i.) of the radioligands in mice with HT1080-FAP and HT1080 tumors. Tissue distribution of a mixture containing a ^{177}Lu-labeled FAPI and its ^{161}Tb-based counterpart was visualized through dual-isotope SPECT/CT imaging.

Results: The uptake of ^{177}Lu- or ^{161}Tb-labeled DOTA-FAPI-46 in HT1080-FAP cells was 41– 44% of the added activity at 4 h after incubation, while ~81% was measured for ^{177}Lu- or ^{161}Tb-based DOTAGA-Glu-(FAPI)$_2$. The uptake of the radioligands in HT1080 cells was <1.0%.
In vivo, the accumulation of [^{177}Lu]Lu-DOTA-FAPI-46 or [^{161}Tb]Tb-DOTA-FAPI-46 in HT1080-FAP tumor was 7.0–8.0% IA/g at 4 h p.i., while 8.2–9.6% IA/g was measured after the injection of [^{177}Lu]Lu-DOTAGA-Glu-(FAPI)$_2$ or [^{161}Tb]Tb-DOTAGA-Glu-(FAPI)$_2$. The uptake of the radioligands in HT1080 tumor was <3.5% IA/g, whereas 1.4–3.0% IA/g was found in the kidneys. Dual-isotope SPECT/CT images similarly illustrated the accumulation of ^{177}Lu- and ^{161}Tb-based DOTA-FAPI-46 in HT1080-FAP tumor, which was, however, cleared at 24 h p.i..
Mice injected with [^{177}Lu]Lu-DOTAGA-Glu-(FAPI)$_2$ and [^{161}Tb]Tb-DOTAGA-Glu-(FAPI)$_2$ also showed uptake in HT1080-FAP tumor, but activity distribution was more dispersed.

Conclusion: Cell uptake and biodistribution of the FAPI were similar, irrespective whether the ligand was labeled with Lu-177 or Tb-161. The findings, however, inferred that these FAPI still have limited tumor retention to perform preclinical therapy studies.

A231

Clinical and imaging-based prediction of eligibility for [^{177}Lu]Lu-PSMA therapy in de novo metastatic prostate cancer: comparative performance of individual and combined predictive models

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Purpose: To evaluate multivariable models incorporating clinical, pathological, and PSMA PET imaging parameters for predicting ^{177}Lu-PSMA RLT eligibility in de novo metastatic prostate cancer.

Methods and Materials: In this retrospective study, 76 patients with de novo metastatic prostate were evaluated for ^{177}Lu-PSMA RLT eligibility based on multidisciplinary consensus, integrating PSMA PET imaging criteria (PSMA-positive lesion count, SUVmean, and total lesion activity) with clinical and pathological assessment. Three stepwise logistic regression models (clinical, PSMA-PET, and combined) were developed and internally validated.
Performance was assessed via bootstrap internal validation with discrimination, calibration, optimism correction, and decision curve analysis, with ROC curve comparisons using DeLong's test.

Results: 43/76 patients (56.6%) were deemed eligible for RLT. Optimism-corrected AUCs were 0.794, 0.871, and 0.894 for respectively clinical, PSMA PET, and combined model. The combined model significantly outperformed the clinical model (p=0.027) but showed borderline superiority over the PSMA-PET model (p=0.063). Key PET predictors were higher PSMA-positive lesion count and SUVmean (p<0.01). Clinical predictors comprised older age (p=0.02), high-volume disease per CHAART-ED criteria (p<0.01), absence of neuroendocrine differentiation (p=0.10), and lower ISUP grade (p=0.08). In the combined model, prior docetaxel exposure decreased eligibility (p=0.03), while higher total lesion activity showed a positive association (p=0.07).

Conclusion: Multivariable models show good discrimination and calibration for predicting ^{177}Lu-PSMA RLT eligibility demonstrating that integration of PSMA PET imaging parameters substantially enhances prediction accuracy and supporting implementation of standardized multivariable selection protocols to reduce inter-operator variability in clinical decision-making.

A253

Evaluating radiation exposure from patients after Lutetium-177-Radionuclide therapy

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Purpose: In June 2025, the Swiss Federal Office to Public Health (FOPH) published new recommendations for patients following discharge after radionuclide therapy (https://www.bag.admin.ch/dam/de/sd-web/vsVY-Ulb8caju/V2_250624_Strahlenschutz_Wegleitung_Radionuklidtherapie_DE.pdf).
From our perspective, these recommendations are very strict. Therefore we aimed to measure the actual patient dose rates at discharge following Lutetium-177-Therapy and to assess the potential radiation exposure to close contacts.

Methods and Materials: Dose rate measurements were performed in 40 patients after radionuclide therapy with either Lu-177-PSMA I&T or Lu-177-DOTATOC. The ambient dose rate was measured at a distance of 1m from the patient 24 and 48 hours after administration. Data collection adhered to the Swiss Federal radiation protection guidelines.
Based on these data, we estimated the potential cumulative dose for a close contact person over one week.

Results: A total of 40 patients underwent Lu-177 radioligand therapy (29 PSMA and 11 DOTATOC). The mean dose rate at 1 meter distance was 4.06 (SD ± 2.75) µSv/h at 24 hours and 2.62 (SD ± 2.32) µSv/h at 48 hours after administration. Assuming continous presence of a family member at 1 meter distance for one week, the maximum cumulative dose would be less than 440 uSv, which corresponds to roughly 10% of the average annual natural background radiation in Switzerland.

Conclusion: Our measurements indicate that radiation exposure to family members after radionuclide therapy is low and well below levels of concern. Especially the PSMA-patients are in the late stage of their life and social contacts are of immense importance to them.
The recently published FOPH recommendations, which advise sleeping alone for two weeks and maintaining a minimum distance of 2 meters from others, appear to be unnecessarily
restrictive in light of these findings.

A163

Could we reduce salivary gland uptake of [177Lu]Lu-PSMA radioligand therapy with cooling?

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Purpose: Xerostomia is a significant side effect of [177Lu]Lu-PSMA targeted radioligand therapy (RLT) in patients with prostate cancer. The purpose of this study was to investigate the impact of localized cooling on salivary gland uptake on quantitative [177Lu]Lu-PSMA posttreatment scans.

Methods and Materials: This retrospective analysis of patients treated with [177Lu]Lu-PSMA at two different RLT centers in Switzerland, with or without cooling of the salivary glands (4 hours) was approved by the ethics committee. In Center A (CenA), a cooling device (Hilotherm Clinic®) was used 30 min prior to 3h after injection. Center B did not apply any cooling (CenB). CenA used [177Lu]Lu-PSMA-I&T and [177Lu]Lu-PSMA-617, while CenB used only [177Lu]Lu-PSMA-I&T. Quantitative SPECT/CT scans were performed 48 h after injection using a Siemens SPECT/CT (Symbia). ROI were put manually over the right parotid gland. A mixed-effects model was used to evaluate the impact of cooling on the quantitative evaluation of parotid uptake between [177Lu]Lu-PSMA-I&T or [177Lu]Lu-PSMA-617 with cooling in CenA and [177Lu]Lu-PSMA-I&T in CenB.

Results: In CenA, 17 patients treated with [177Lu]Lu-PSMA-617 and 16 with [177Lu]Lu-PSMA-I&T were included. In center CenB, 20 patients treated with [177Lu]Lu-PSMA-I&T were identified. The mixed model revealed a significant association between number of cycles and salivary gland uptake, with a decrease of -0.1 (CI -0.16 / -0.04) SUV per cycle (p<0.001).

Cooling however, lead only to a non- significant decrease of -0.23 (CI-0.78/0.32, p=0.4), for [177Lu]Lu-PSMA-I&T and -0.09, (CI -0.63/0.44, p=0.7) for [177Lu]Lu-PSMA-617 in CenA, compared to the activity in CenB, respectively.

Conclusion: Cooling of the salivary glands does not appear to reduce tracer accumulation on post-therapy scans after [177Lu]Lu-PSMA RLT.

A164

Could we reduce renal toxicity of [177Lu]Lu-PSMA radioligand therapy with furosemide?

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Purpose: Impaired renal function after [177Lu]Lu-PSMA radioligand therapy (RLT) might become more important as the field is moving forward to earlier applications. This study evaluates the impact of furosemide administered shortly after [177Lu]Lu-PSMA RLT, based on long term follow up of renal function and quantitative assessment of renal uptake.

Methods and Materials: Retrospective analysis of patients treated with a least 4 doses of [177Lu]Lu-PSMA in two Swiss RLT centers with 40 mg furosemide 30 min after injection in Center A (CenA) and without in center B (CenB). CenA used [177Lu]Lu-PSMA-I&T and [177Lu]Lu-PSMA-617, while CenB used only [177Lu]Lu-PSMA-I&T. A mixed-effects model was used to evaluate eGFR change per cycle in the first cohort. To increase the number for renal uptake for [177Lu]Lu-PSMA-I&T in CenA, supplementary patients with less than 4 cycles were included for quantitative SPECT assessment.

Results: In CenA 24 patients with 5.4±0.8 doses (17 [177Lu]Lu-PSMA-617 / 7 [177Lu]Lu-PSMA-I&T) were followed over 202.0±58 days. In center CenB 20 patients with 5.4±0.9 doses were followed over 210.6±48 days. CenB had a significant drop in eGFR per cycle of -2ml/min/1.73m2 (CI −2.8, −1.1), p < 0.001, while CenA had no significant decrease (0.2ml/min/1.73m2 (CI−0.6, 1.0), p = 0.587). For quantitative analysis 20 patients with [177Lu]Lu-PSMA-I&T in CenB had a mean SUVpeak of 8.0±3.0, while 16 patients in CenA with [177Lu]Lu-PSMA-I&T had a mean SUVpeak of 7.1±3.1 and 17 patients with [177Lu]Lu-PSMA-617 had a mean of 6.2±1.8.

Conclusion: Furosemide is reducing tracer accumulation in the kidneys on posttherapy scans after [177Lu]Lu-PSMA RLT. Higher renal uptake might explain the significant decrease in eGFR observed in CenB not using furosemide, that was not seen in CenA. If diuretics have the potential to reduce renal toxicity without impaired efficacy warrants further prospective evaluation.

A189

Patient Understanding and Experience of PSMA Radioligand Therapy: A Prospective Survey from a Swiss Tertiary Center

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Purpose: Radioligand therapy with [177Lu]Lu-PSMA is increasingly used for metastatic castration-resistant prostate cancer (mCRPC). Although clinical outcomes are well documented, patient understanding of the treatment and radioprotection measures remains poorly studied. We aimed to evaluate communication quality, comprehension, and patient-reported experience at our institution.

Methods and Materials: A prospective survey was conducted among patients treated with at least two cycles of [177Lu]Lu-PSMA at Lausanne University Hospital between 2020–2025. A 10-item questionnaire (Likert scales, yes/no, free-text) assessed communication before, during, and after therapy. Descriptive statistics and thematic analysis of comments were performed.

Results: Twenty-nine patients completed the survey (response rate: 21%, 29/138) Pre-treatment communication was rated highly (scores 4–5 in 86%). Clarity of radiation-safety instructions was similarly well perceived (86%), and 97% judged the information adequate.
Understanding of the treatment reached scores ≥4 in 79%. Side-effect burden during hospitalization was low (62% scored ≤2). After discharge, 97% reported sufficient explanations for daily-life management and 66% reported minimal difficulty applying radioprotection rules at home. Overall satisfaction was high (mean 4.4/5), and 83% reported stable or improved quality of life. Qualitative comments highlighted global satisfaction, occasional fatigue and xerostomia, and concerns regarding length of hospital isolation.

Conclusion: Patients reported high satisfaction and strong comprehension of PSMA radioligand therapy, including radiation-safety instructions, when supported by structured communication. Results support maintaining standardized information pathways and developing complementary digital tools to further optimize patient understanding and adherence.

A255

A Head-to-Head Comparison of ^{68}Ga-DOTATATE PET/CT and MRI for Meningioma Diagnosis: The added value of Partial Volume Correction

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Purpose: 68Ga-DOTA-TATE PET/CT, which targets somatostatin receptors, is being used for diagnosing meningioma. However, the correlations between its imaging features and biochemical, clinicopathological characteristics remain poorly defined. Our study aimed to:
1) compare the diagnostic accuracy of PET and MRI for detecting meningiomas; 2) correlate tumour sizes measured on imaging with post-surgical histopathological findings; and 3) assess imaging-derived metrics against patients' biochemical and clinicopathological characteristics.

Methods and Materials: We conducted a comparative analysis of ^{68}Ga-DOTA-TATE PET/CT and MRI (incorporating diffusion-weighted and structural sequences) in 180 patients to evaluate their utility in meningioma management. All PET data were processed with various partial volume correction techniques, including iterative Yang, Richardson-Lucy, and reblurred Van-Cittert.

Results: We retrospectively analyzed 180 patients and found that the median SUVmax on ^{68}Ga-DOTATATE PET/CT was significantly elevated in meningiomas with high WHO grades and positive SSTR2a immunohistochemical expression. ^{68}Ga-DOTATATE PET/CT demonstrated higher sensitivity and specificity for tumor detection than MRI. Additionally, the application of partial volume correction, using MRI as an anatomical template, enhanced the quantitative assessment of SUV and improved tumor boundary delineation.

Conclusion: ^{68}Ga-DOTATATE PET/CT demonstrated superior diagnostic accuracy for meningioma detection compared to MRI, and was further enhanced by the application of partial volume correction. Furthermore, SUVmax values were significantly elevated in high-grade tumors. These results indicate that partial volume correction-corrected PET can improve surgical planning by providing superior tumor boundary delineation. Diameter of the tumor was measured for the MRI, PET images and compared with ground-truth from the surgical operation.

A268

Diagnostic accuracy of long-axial-field-of-view [18F]FET PET/CT in high-grade glioma - assessing semi-quantitative cutoff values for recurrence detection

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Purpose: Long-axial field-of-view (LAFOV) PET/CT has shown improved image quality due to its higher sensitivity. In this work, we aimed to determine new cutoff values for LAFOV [18F]FET PET/CT in high-grade glioma for early differentiation between tumour recurrence and radiation necrosis.

Methods and Materials: In this ongoing retrospective evaluation, 11 patients (age 61±10y; range 22–80y, 15 lesions) with high-grade glioma underwent LAFOV [18F]FET PET/CT (Biograph Vision Quadra, Siemens Healthineers) for the assessment of tumour recurrence after surgery and radiation therapy. Dynamic scans were acquired for 40 minutes upon injection of 191±10 MBq [18F]FET. Last 20 minutes of the data were used to reconstruct static PET images. Lesions were manually delineated; parameters of interest were the maximum standardized uptake value (SUVmax) and tumour-to-background ratios (TBR).
Background uptake was assessed at the semioval centre of the contralateral hemisphere.
Mean follow-up duration was 8.8 months. For diagnostic accuracy a composite reference standard (histopathology, imaging and follow-up) was used. Receiver operating characteristic (ROC) curve analysis was performed to determine optimal TBR cutoff values.

Results: Tumor recurrence was detected in 7/15 lesions. Mean values for SUV_{max}, TBR_{max} and TBR_{mean} were 3.99±2.34, 3.69±1.66 and 2.56±0.81, respectively. ROC analysis identified an optimal TBR_{max} cutoff of 2.75 (sensitivity 87.50%, specificity 85.7%, AUC 0.88) and TBR_{mean} cutoff of 2.02 (sensitivity 100%, specificity 85.7%, AUC 0.89) for differentiating recurrent glioma from radiation necrosis.

Conclusion: Our preliminary results confirm the existing cutoff values remain suitable for LAFOV [18F]FET PET/CTfor accurately differentiating tumour recurrence from treatment-related changes. However, a larger patient cohort is needed to validate these findings.

A135

Carotid Calcified Inflammatory Plaques and Cardiocerebrovascular Events: A 68Ga-DOTA-TOC PET/CT study in an oncological setting

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Purpose: Overexpression of somatostatin receptors (SSTR2) in activated M1-macrophages has emerged as a potential marker of plaque vulnerability. PET-based evaluation of plaque vulnerability in coronary arteries has proven useful in the assessment of cardiovascular risk.
Same value may pertain also to vulnerable carotid plaque for the risk assessment of cerebrovascular events. We aimed to investigate, whether SSTR2-overexpressing carotid calcified plaques may be predictive of major cerebrovascular events.

Methods and Materials: 363 oncological patients undergoing 68Ga-DOTA-TOC PET/CT imaging for oncologic reasons were included. Plaque calcifications and 68Ga-DOTA-TOC uptake in the carotid arteries were evaluated visually and semi-quantitatively. During a median follow-up of 54 months, data on cardio- and cerebrovascular events (myocardial infarction, hospitalization for myocardial ischemia, coronary artery revascularization, stroke) and all-cause death were collected. The incidence of major adverse events between groups with and without 68Ga-DOTA-TOC uptake was compared.

Results: 128 patients (35.3%) showed carotid artery calcification of any degree in at least one side, with a mean calcification volume of 51.6±147.6 cm3. In total, 71 focal 68Ga-DOTA-TOC uptakes (41 left, 30 right) were seen in 48 patients (13.2%) with SUVmax 1.76 ± 0.35 and TBR 2.23 ± 0.98, respectively. In patients with detectable 68Ga-DOTA-TOC uptake, stroke occurred more frequently (8.3% vs. 2.5%, p = 0.036). The incidence of MACE was also significantly higher in patients with increased 68Ga-DOTA-TOC uptake compared to those without uptake (8.3% vs. 2.2%, p = 0.021). Patients with concurrent carotid artery calcification and increased 68Ga-DOTATOC uptake exhibited the highest incidence of stroke and MACE (11.4 %).

Conclusion: In an oncological setting, SSTR2-overexpressing carotid calcified plaques in 68Ga-DOTA-TOC PET/CT are predictive of higher risk of developing cardio- and cerebrovascular events.

A156

Fully Automatic Left Ventricle Segmentation in Dynamic 82Rb PET/CT Using Deep Learning

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Purpose: To develop and evaluate a fully automatic deep learning–based method for left-ventricular (LV) segmentation in dynamic 82Rb PET/CT, building on a robust manual multi-modal LV delineation protocol to further enable advanced endo-to-epicardial myocardialperfusion analysis.

Methods and Materials: This retrospective study included 40 non-gated dynamic PET/CT volumes from 20 patients who underwent 82Rb PET/CT examinations for revascularization, each with rest and stress scans. The cohort included cases with apical thinning and hypoperfused septal and lateral walls, with a median LV percentage of necrosis of 21% and a median ischemia of 5.5%. LV contours were manually delineated across multiple time frames, excluding the blood pool, using CT images to ensure that contours remained within the myocardium. This dataset was used to train and evaluate a 3D nnU-Net architecture with 5-fold cross-validation, using the last 5 frames of the dynamic PET as input channels.
Performance was assessed using Dice coefficient, precision, and recall. A simple semi- automatic baseline based on thresholding (35% of SUVmax) was also implemented for comparison.

Results: nnU-Net achieved a mean Dice of 0.8778 and mean precision and recall of 0.8809 and 0.8904 across folds. The best semi-automatic thresholding configuration reached a mean Dice of 0.7509, with mean precision and recall of 0.7018 and 0.8255, underperforming the nnU-Net. Thresholding especially failed to contour the LV in patients with marked hypoperfusion and apical thinning, where nnU-Net segmentations remained substantially closer to the manual reference, although these cases remained the most challenging.

Conclusion: Deep convolutional neural networks enable fully automatic LV segmentation in dynamic 82Rb PET and substantially reduce manual effort. The nnU-Net model achieves high overall performance and outperforms simple threshold-based methods, including in hypoperfused and thinned regions, supporting reliable quantification of myocardial perfusion.

A235

Enhanced accuracy of cardiac 82Rb PET functional parameters with 16-gate imaging on a long-axial-field-of-view PET system: validation against echocardiography.

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Purpose: Cardiac ^{82}Rb-PET is limited by low count statistics in gated imaging, reducing the accuracy of LV volumes and LVEF. Although 16 ECG-gated frames offer improved temporal sampling, insufficient counts usually restrict protocols to 8 frames unless activity is increased, raising radiation exposure. LAFOV PET/CT scanners provide higher sensitivity and may enable accurate 16-gated imaging even at low activities. This study assessed whether increasing gating from 8 to 16 frames improves ^{82}Rb-PET functional accuracy compared with TTE.

Methods and Materials: A total of 124 patients undergoing rest–stress 82Rb-PET (370 MBq each) on a LAFOV-PET were included. PET data were reconstructed with 8 and 16 gated frames to determine LVEF, EDV, and ESV, with corresponding TTE values extracted from clinical reports. Agreement between PET and TTE was assessed using paired t-tests, Pearson correlation and Bland–Altman analysis. Differences between 8- and 16-gated PET were compared with paired t-tests after normal distribution.

Results: Mean LVEF at rest was 52.3±15.5% (8-gated), 58.1±13.5% (16-gated), and 57.7±9.7% (TTE). 16-gated PET closely matched TTE (mean difference +0.45%, p=0.58, R=0.65), while 8-gated PET significantly underestimated LVEF (mean difference –5.5%, p<0.001, R=0.38). EDV was similarly estimated by both PET modes (8G: mean difference +11.3 mL, p=0.060; 16G: mean difference +10.8 mL, p=0.067). For ESV, 16G PET showed slight overestimation (mean difference +10.1%, p=0.085), whereas 8G PET markedly overestimated ESV (mean difference +31.6%, p=0.002).

Conclusion: 16-gated 82Rb-PET on LAFOV systems showed close agreement with TTE for LVEF, EDV, and ESV, demonstrating superior accuracy over standard 8-gated imaging, which consistently underestimated cardiac function. High accuracy was achieved despite ultra-low activity. These results support implementing 16-gated protocols on LAFOV PET to improve functional cardiac assessment while minimizing radiation exposure.

A251

Phantom-Based Comparison of Image Quality for [124I]MIBG PET/CT Imaging Using Long Axial Field-of-View, Digital, and Conventional PET/CT Scanners: Implications for Reducing Radiation Exposure in Clinical Practice

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Purpose: The assessment of cardiac sympathetic innervation predicts cardiac events after myocardial infarction. [^{124}I]metaiodobenzylguanidine ([^{124}I]MIBG) can fit this need, but radiation exposure is high with analog PET. We aimed to compare a simulated study using a phantom across analog, digital standard axial field-of-view (SAFOV) and long axial field-of-view (LAFOV) PET, in order to assess the feasibility of reduced administered activity.

Methods and Materials: A thoracic cardiac phantom with and without transmural (TD) and non-transmural (NTD) left ventricular (LV) wall defect insert was scanned on 3 PET/CT systems (analog, digital SAFOV, LAFOV) using 1- and 5-min acquisitions. Volumes-of-interest were placed to measure mean activity, noise variance, and LV/TD, LV/NTD, and LV/Cavity contrasts. Contrast-to-noise ratio (CNR) was defined as (wallmean – defectmean)/σ_background, and SNR as wallmean/σ(cavity). Lesion detectability and image quality were also visually rated on a 5-point Likert scale (1 = poor, 5 = excellent).

Results: At 1 min, LAFOV achieved the highest LV/Cavity contrast and lesion detectability (CNR_TD = 17.1, CNR_NTD = 16.1, Likert = 4/5) with lower noise variability than SAFOV and similar to analog PET. Its superior count statistics yielded sharp images despite short acquisition time. With 5 min scans, noise decreased across systems and CNR improved, particularly for SAFOV and analog, achieving image quality similar to that of LAFOV 1 min. SNR remained comparable among scanners.

Conclusion: LAFOV PET/CT achieved the best image quality and lesion detectability with 1min acquisition, effectively compensating for the physical limitations of [^{124}I]. With longer scans, SAFOV and analog systems reached similar image quality, indicating that [^{124}I]MIBG imaging can be performed on LAFOV with reduced scan time or dose.

A99

[68Ga]Ga-DOTA-Exendin-4 PET/CT for the localization of insulinoma: Results of an international, dual-center, retrospective, open-label real-world imaging study

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Purpose: Benign insulinomas are the main cause of endogenous hyperinsulinemic hypoglycemia (EHH) in adults, with surgery as the only cure. Pancreas-preserving procedures are preferred, making precise localization crucial. Recent studies indicate that GLP-1R imaging, such as [68Ga]Ga-DOTA-exendin-4 PET/CT, outperforms conventional imaging in identifying insulinomas. The goal of this study was to generate real-life data for the detection rate of insulinoma with [68Ga]Ga-DOTA-exendin-4 PET/CT in patients with negative/inconclusive workup on prior conventional imaging.

Methods and Materials: In this retrospective, real-life, dual-center imaging study, patients with biochemically proven EHH and/or a positive Whipple triad underwent [68Ga]Ga-DOTA-exendin-4 PET/CT at two tertiary centers between April 2017 and March 2024. Endpoints: [68Ga]Ga-DOTA-exendin-4 PET/CT detection rate after inconclusive conventional workup (gold standard: histology) and impact on patient management.

Results: Hundred and one patients were enrolled, of which 87 (86%) received conventional workup prior to [68Ga]Ga-DOTA-exendin-4 PET/CT. [68Ga]Ga-DOTA-exendin-4 PET/CT was positive in 42 out of the 58 patients with negative conventional workup leading to a PET/CT detection rate of 72% in this challenging patient group. 30/42 (71%) patients with positive results only with [68Ga]Ga-DOTA-exendin-4 PET/CT were confirmed by histology for either insulinoma (29 cases) or nesidioblastosis (1 case).

Conclusion: In a real-life setting, [68Ga]Ga-DOTA-exendin-4 PET/CT effectively detects insulinomas and nesidioblastosis in patients with inconclusive conventional workup, achieving a 72% detection rate. Histology confirmed insulinomas or nesidioblastosis in all operated patients with positive [68Ga]Ga-DOTA-exendin-4 PET/CT results, highlighting its impact on patient management.

A248

Metabolic PET predictors of survival in melanoma patients treated with immunotherapy at baseline and early follow-up

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Purpose: FDG PET/CT is widely used to assess response to immune checkpoint inhibitors (ICI) in metastatic melanoma. While global metabolic parameters are well described, the prognostic value of lesion-level metabolic progression remains unclear. This study evaluated whether baseline PET metrics and early lesion-level metabolic changes predict overall survival (OS) in melanoma patients treated with ICI.

Methods and Materials: Seventeen patients who underwent baseline and early follow-up FDG PET/CT after starting immunotherapy were retrospectively analysed. Lesions were matched across scans using lesion identifiers. For each lesion, the change in TLG and in SUVpeak between baseline and follow-up was computed. Focal progression was defined as the largest TLG increase, corresponding to the highest positive TLG change among a patient's lesions. Baseline metrics included total TLG, total MTV, SUVmax and mean SUVpeak. OS was measured from ICI initiation. Prognostic value was assessed using Kaplan–Meier, log-rank tests and Cox models.

Results: A total of 83 matched lesions were analysed. The largest TLG increase was significantly associated with OS (log-rank p = 0.034; HR 7.5, 95% CI 0.9–65.8): patients with a marked increase in TLG in at least one lesion had much shorter survival (median 49.1 months) compared with those without focal metabolic progression (median not reached).
Among baseline variables, mean SUVpeak at baseline showed a strong trend toward poorer survival (log-rank p = 0.059; HR 2.8, 95% CI 0.5–15.4). Other global PET metrics, including MTV and total TLG, were not predictive.

Conclusion: Early focal metabolic progression, captured by the largest TLG increase, appears to be a strong prognostic marker in melanoma immunotherapy. Baseline mean SUVpeak also shows a promising signal. These exploratory results highlight the potential added value of lesion-level metabolic assessment for risk stratification and warrant confirmation in a larger patient cohort.

A267

Impact of Nuclear Medicine Technologist(NMT)-led patient release after PET/CT on workflow efficiency, safety and continuous NMT education at CHUV

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Purpose: Post-PET/CT patient release was historically performed by nuclear medicine physicians, a process that could introduce variable waiting times in busy clinical settings. In March 2025, our department introduced a NMT-led release model supported by a continuous education program and a standardized rapid screening checklist for urgent imaging findings. We evaluated its impact on workflow performance and diagnostic safety after 8 months of use.

Methods and Materials: All PET/CT procedures from two periods were analyzed: November 2024 (physician-led release) and March 2025 (NMT-led release). Primary outcome was the interval between end of acquisition and patient release. NMT training included structured teaching sessions, supervised case-based learning, and certification on the standardized checklist, with direct escalation pathways to nuclear medicine physicians, when needed.

Results: Two hundred PET/CT examinations were included. NMT-led release substantially shortened post-exam waiting times (median 4.5 min [IQR 3–9]) compared with physician-led release (17.5 min [10–31]), corresponding to a 74% reduction and a fourfold improvement in workflow speed. Variability decreased substantially (max 36 vs 137 min), eliminating long delays and improving patient comfort and waiting times.

Within the education program, NMT correctly identified relevant critical abnormalities (pulmonary embolism, vertebral compression, intracranial hemorrhage/mass effect, vascular anomalies, atypical metabolic patterns). No missed events with direct patient safety implications were recorded, and no patient required recall for additional imaging.

Conclusion: A NMT-led patient release model, reinforced by continuous education and a standardized checklist, significantly improves workflow efficiency and patient experience, and preserves high diagnostic safety. This approach strengthens NMT autonomy while standardizing and streamlining the post-PET/CT process.

A101

Design and preclinical evaluation of uPAR-targeting radiopeptides modified with albumin-binding entities

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Purpose: The urokinase plasminogen activator receptor (uPAR) is a membrane protein, expressed in various solid tumors, while expression in healthy tissue is generally low. This makes uPAR an attractive tumor-associated marker for targeting with diagnostic and therapeutic radiopharmaceuticals. Our study aimed to develop uPAR-targeting radiopeptides with pharmacokinetic properties suitable for therapeutic application.

Methods and Materials: Based on a previously described uPAR-binding peptide, referred to as AE105, 12 new peptides were synthesized, incorporating different combinations of albumin binders, linkers, and chelators. The 177Lu-labeled peptides were investigated in cell experiments using uPAR-transfected HEK cells. The radiopeptides' affinity to plasma proteins was determined. SPECT/CT and quantitative biodistribution studies were conducted in HEK-uPAR-xenografted mice.

Results: Biodistribution studies confirmed the specific accumulation of the radiopeptides in HEK-uPAR xenografts at 3.6–16% IA/g 4 h p.i., which was significantly higher than the 0.87 ± 0.05% IA/g uptake reached after injection of [177Lu]Lu-DOTA-AE105 ($p<0.05$). In particular, [177Lu]Lu-uPAR-11, a p-tolyl-modified radiopeptide comprising a PEG4-linker and a DOTA-chelator, displayed a favorable biodistribution profile, as demonstrated by a xenograft accumulation of 16% IA/g 4 h p.i. Furthermore, [177Lu]Lu-uPAR-11 was rapidly eliminated from the bloodstream with uptake values reaching 5.0 ± 0.6% IA/g and 0.03 ± 0.01% IA/g at 4 and 24 h p.i., thereby lowering systemic radiation exposure and the risk of hematopoietic toxicity.

Conclusion: The xenograft uptake of all albumin-binding radiopeptides was successfully increased in comparison to [177Lu]Lu-DOTA-AE105. The favorable pharmacokinetic profile of [177Lu]Lu-uPAR-11 justifies further preclinical investigation with regard to its testing for therapeutic purposes.

A45

Scandium-47-Labeled GRPR Antagonist: High Potential for Prostate and Breast Cancer Theranostics

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Purpose: Gastrin-releasing peptide receptor (GRPr) radioantagonists represent a promising approach for imaging and targeted radionuclide cancer therapy. GRPr is overexpressed in various malignancies including prostate and breast cancer, making it an attractive target for cancer management. This study investigates the theranostic potential of a 47Sc-labeled antagonist targeting the gastrin-releasing peptide receptor (GRPR) in prostate and breast tumors.

Methods and Materials: A statine-based GRPR antagonist (AAZTA5-Pip-D-Phe-Gln-Trp-Ala-Val-Gly-His-Sta-Leu-NH2: LF1) was radiolabeled with scandium-47. Detailed in vitro evaluation was carried out in PC3 and T47D cancer cells. In vivo studies, including blood and organ clearance, plasma protein binding, metabolic stability and SPECT/CT imaging, were performed in PC3- and T47D-mice. To assess its therapeutic efficacy, PC3-mice were treated with [47Sc]Sc-LF1 either alone or in combination with everolimus.

Results: [47Sc]Sc-LF1 exhibited high binding affinity, low internalization rate (<10% in PC3 and T47D cells), and favorable pharmacokinetics, including rapid blood clearance and low plasma protein binding. In PC3-mice, it demonstrated high and specific tumor uptake (45.4±3.9 and 4.9±1.6 % I.A./g at 4 and 96 h p.i., respectively), while lower GRPR density in T47D-mice led to reduced uptake (6.1±3.9 and 0.7±0.1 % I.A./g at 4 and 72 h p.i.). Its pharmacokinetics enabled high-contrast SPECT/CT imaging in both models. Combined treatment with everolimus and [47Sc]Sc-LF1 in PC3-mice, significantly inhibited tumor growth compared to monotherapies.

Conclusion: The high tumor uptake in two cancer entities with elevated expression of GRPR and the tumor response (tumor size and survival rate) highlight the significant theranostic potential of [47Sc]Sc-LF1 for SPECT imaging and radionuclide targeted therapy

A127

GMP Production of 68Ga Labelled Radiopharmaceuticals using Gallium 68 from Cyclotron

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Purpose: Gallium-68 is a key radionuclide for PET imaging, especially in PSMA- and somatostatin-receptor–based theranostics. Most imaging centers currently rely on 68Ge/69Ga generators, which offer simple operation but suffer from limited yield, declining performance, high cost, and supply constraints. This work evaluates cyclotron-based production of gallium-68 at SWAN Isotopen AG as a scalable alternative capable of delivering higher activities and supporting GMP radiopharmaceutical manufacturing.

Methods and Materials: 68Ga was produced via the 68Zn(p,n)68Ga reaction on a medical cyclotron using a hybrid solid target with automated dissolution and purification. Proton energy was reduced to 12 MeV to minimize 66Ga and 67Ga formation. Commercially available consumables were used for purification to yield GMP-grade [68Ga]GaCl3.

Radiosynthesis of several 68Ga-based tracers was performed on automated synthesizers, and the final products were analyzed according to the Ph. Eur. monographs for accelerator- produced 68Ga.

Results: Up to 100 GBq of 68Ga at end of bombardment was consistently obtained.
Radionuclidic impurities remained below the 2% pharmacopeial limit. The resulting [68Ga]GaCl3 met all Ph. Eur. specifications and was successfully used to produce up to 30GBq of 68Ga-labelled radiopharmaceuticals with high radiochemical purity and stability for several hours. The automated process ensured reproducibility and eliminated radiation exposure to personnel.

Conclusion: Cyclotron production of 68Ga is feasible, robust, and fully compatible with GMP manufacturing. High and controllable activity output enables multiple daily syntheses, regional distribution, and reduced dependence on generator supply. This approach offers a scalable foundation for a future network of sites producing 68Ga-labelled radiopharmaceuticals and supports the growing demand of the global theranostic landscape.

A283

Automated Whole-Body NET-Segmentation on 68Ga-DOTATATE-PET/CT using a Deep Convolutional Neural network

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Purpose: To develop and evaluate a deep learning-based model for whole-body tumor segmentation on 68Ga-DOTATATE PET/CT images in NET patients developed from single-center data and reasonable physician time.

Methods and Materials: An expert nuclear medicine physician segmented the ground truth tumor volumes by placing isocontour-based volumes of interest on all NET lesions in 100 68Ga-DOTATATE PET/CT scans of 74 patients. These segmentations were used to train an nnU-Net model (3D full-resolution) that uses PET and CT to segment 11 labels, including NET lesions and ten organs. The anatomical context helps the model converge more quickly during training and improves its ability to handle negative cases. The model was trained for 1,000 epochs with 5-fold cross-validation. We evaluated voxel- and lesion-level performance using standard metrics and reported medians with interquartile range (IQR).

Results: The distribution of lesions was classified as solitary (n=14), oligometastatic (2-5 lesions; 21), multiple (6-20; 30) and disseminated (>20; 35). The model showed voxel-level performance comparable to a larger prior cohort of 915 PET/CT studies (DSC 65%, IQR 49–73%). At the lesion-level, the model correctly identified most tumor lesions (F1-Score 83%, IQR 75–89%), with high precision and recall (0.87, IQR 0.75–1.00, and 0.86, IQR 0.71–1.00). Notably, the model performed best in patients with disseminated metastases, where automatic segmentation offers the greatest time savings (Voxel-level DSC 69%, IQR 53–74% and lesion-level F1-Score 84%, IQR 79–88%).

Conclusion: Training on 100 single-center DOTATATE PET/CT scans annotated by a single physician resulted in good automated AI based NET segmentation performance, comparable with models trained on larger datasets annotated by multiple physicians. This represents a cost-effective approach to create a performant automated segmentation model, tailored to an institution's hardware, tracer, and imaging protocols.

A167

Evaluation of a deep learning-based tumor segmentation algorithm developed for [177Lu]Lu-PSMA SPECT/CT quantification.

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Purpose: The introduction of quantitative SPECT/CT improved response assessment of [177Lu]Lu-PSMA treatment, yet heterogeneous responses can result in subjective interpretation. Objective values like total tumor volume (TTV) and SUV metrics could improve assessment, but their assessment is often labor-intensive. Here, we introduce a deep learning algorithm for automatic lesion segmentation from [177Lu]Lu-PSMA SPECT/CT scans.

Methods and Materials: In this single institution, retrospective, IRB approved study, patients that gave their general consent for further use of their data and underwent [177Lu]Lu-PSMA therapy were selected. The study included 27 subjects with 1-6 therapy cycles, totaling 102 clinically adequate SPECT/CT scans. All suspicious lesions were manually delineated. 54 scans were used for training and 48 for evaluation. An nnUNet model (SPECT-Model) utilized SPECT and CT inputs to learn biodistribution and anatomical context. The network was trained for 1000 epochs with 5-fold cross-validation. For comparison, a separately trained [18F]F-PSMA-1007 segmentation network (PET-Model) was evaluated. Performance was assessed via Dice score, tumor volume similarity, and SUVmean.

Results: In the evaluation cohort a total of 1302 lesions were annotated, with a mean of 14.5 (range 0 - 56) lesions per subject and an average ground truth TTV per patient of 440 ml (range 0 – 2032 ml). Comparing SPECT-Model vs PET-Model: Dice score was 0.66 vs 0.46, false positives 2.6 vs. 4.8, tumor volume similarity -28% vs. -48%, SUVmean absolute error was 1.49 vs. 4.1 respectively. Visual analysis of the SPECT-Model output demonstrated, that patterns of physiological radiotracer uptake were consistently ignored.

Conclusion: The proposed deep learning-based segmentation algorithm for automatic quantification of tumor volumes and SUV metrics for SPECT-Model outperformed the PET- Model and reached a high accuracy in the validation cohort, offering a mean TTV underestimation of 28%.

A79

Imaging the Druggable Genome

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Purpose: To create and clinically validate a versatile framework that connects approved drugs, their molecular targets, and imaging agents, enabling visualisation of the entire Druggable Genome in the human body as a foundation for imaging-based companion diagnostics.

Methods and Materials: We retrieved ~1,300 diseases, ~1,700 approved drugs and 704 molecular targets from pharmacologic resources and intersected with ~7,000 radiotracers.
Directly imageable targets and tracers were identified from this atlas. For indirectly imageable targets, transcriptomic data from > 240,000 open-sourced patient samples were analyzed to detect co-expressed imaging surrogates. The framework was clinically validated in 38 capecitabine treated. colorectal adenocarcinoma patients and 174 docetaxel treated breast carcinoma patients using multivariable Cox regression for progression-free survival.

Results: Among 704 drug targets, 347 were directly imageable by 3,061 tracers, enriched in oncology, neurology, immunology and cardiology, while 357 were indirectly imageable via co-expressed surrogates. In neurology, 64 targets were indirectly imageable; SCN8A (eslicarbazepine target) co-expressed with SV2A (r=0.87), enabling imaging with [^{18}F]SynVesT-2. In cardiology, 72 targets were indirectly imageable; GUCY1A1/B1 (riociguat targets) co-expressed with phosphodiesterase-5A (r=0.67),which can be imaged via pyridopyrazinone derivatives. Clinically, high thymidylate synthase expression predicts longer progression-free survival (PFS) in capecitabine-treated colorectal cancer (HR 0.52) and bing imaged via [18F]FLT; while TUBB6 and its imaging surrogate PIM1 both predicted shorter PFSl in docetaxel-treated breast cancer patients (HR 2.0) and being imaged via [^{11}C]CX-6258.

Conclusion: By linking pharmacology, transcriptomics, and molecular imaging, this study delivers the first comprehensive blueprint for imaging the Druggable Genome, bridging diagnostic imaging and therapeutics to advance truly image-guided precise medicine.

A136

New PET/CT diagnostic reference levels in Switzerland

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Purpose: Considering the increasing use of new radiotracers and advances in PET technology, this study aimed to update Switzerland's national DRLs for PET/CT examinations.

Methods and Materials: A nationwide survey of all PET-equipped nuclear medicine (NM) centers in Switzerland was sent to collect anonymised PET/CT patient data (weight, administered activity, CT dose metrics) for 8 clinical indications and 9 radiotracers.
Paediatric data were included when available. National DRLs were derived according to ICRP 135.

Results: Data collected from 35 NM centres (100% response rate) covering 45 PET devices enabled national DRLs updates for 3 PET examinations (general tumour search, brain tumour search and parathyroids examination) and led to the inclusion of 6 new national DRLs for oncologic, inflammation/infection, neuroendocrine, neurological and cardiac examinations. Compared to previous DRLs, injected activities were generally reduced and are typically low in international comparison. The new national DRLs for CT dose indicators (CTDI and DLP) of low-dose localisation/attenuation correction (AC) scans are decreasing and are consistent with international values. Higher-dose diagnostic CT scans, not considered in the survey, highlighted the variability in imaging practices within hybrid PET/CT examinations. Paediatric data were insufficient to define national DRLs, though most specific activities ranged between 1.0 and 3.5 MBq/kg, approximately half of those recommended in the 2016 EANM Dosage Card.

Conclusion: This work established Swiss DRLs for 9 current or emerging PET exams and for AC CT scan, providing the foundation for updating the current national PET/CT DRL directive. These findings will help centres identify outliers and optimise PET/CT protocols.
Survey data suggest that administered activity was significantly reduced in children. The EANM Dosage Card for paediatric examinations is under revision, and the national directive will be updated accordingly.

A26

Less Time Coding, More Time Caring: How ChatGPT Speeds Up ICD-10 Coding

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Purpose: Radiologists commonly work more than five extra hours per week, largely due to administrative tasks. Since 2015 radiology reports also in the U.S. must be assigned to an ICD-10 code for insurance reimbursement. We aimed to investigate whether ChatGPT 5 can be consulted to assist in assigning ICD-10 codes to radiology reports and whether this leads to a measurable time advantage.

Methods and Materials: 2,738 fictious reports were derived from the PARROT database. Additionally, one hundred fictitious PET/CT reports were created. Each report was assigned a single, most relevant ICD-10 code. For PARROT, ChatGPT derived codes were compared with database reference labels. For PET/CT, ChatGPT derived codes codes were compared with an independent manual coder. In case of a mismatch, a blinded rater selected the most fitting ICD-10 code.

Results: Coding PARROT, exact-code concordance was 1,590/2,738 (58.1%). In a random subset of 200 mismatches, blinded adjudication preferred the assisted code in 124 and the reference label in 76 ($p<0.001$). Regarding PET/CT reports, median coding time was 8 seconds with ChatGPT and 135 seconds without. The median time saved was 127 seconds per report.

Conclusion: In summary, higher correctness of codes might reduce billing errors, while saved time could be reallocated to patient care. Radiologists commonly work more than five extra hours per week, largely due to administrative tasks. Extra hours and a high administrative workload among radiologists are a global problem and a well-known risk factor for burnout. Large language models, such as ChatGPT, are commercially available worldwide. However, evidence on their (cost-)efficiency as in clinical environments as provided by our study remains limited, which is crucial for justifying adoption into clinical workflows.

A42

Intégration de la musique dans le parcours patient en médecine nucléaire pourréduire l'anxiété

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Learning objectives: Evaluer si l'intégration de la musique dans le parcours patient contribue à réduire l'anxiété perçue et à améliorer l'expérience global de l'examen, en vue d'une mise en place dans l'ensemble du service.

Background: Une étude prospective a été conduite auprès de 24 patients ayant bénéficié d'un examen SPECT-CT. Un questionnaire standardisé leur a été remis afin d'évaluer l'impact de la musique diffusée pendant l'examen. L'étude s'est déroulée dans une salle SPECT-CT, la seule équipée d'un système de diffusion musicale.

Imaging findings or procedure details: Les résultats indiquent que les patients se sont sentis plus détendus, moins stressés et ont apprécié la présence de la musique durant l'examen. Ils ont également rapporté une amélioration de leur expérience globale. Ces constats rejoignent les données de la littérature dans d'autres spécialités médicales et suggèrent que les bienfaits de la musique pourraient être transposables en médecine nucléaire. Une grande partie a mentionné un sentiment de détente, d'apaisement, voire une sensation de se sentir "comme à la maison". L'un des effets relevés concerne la perception du temps : 88% des patients ont déclaré avoir eu l'impression que l'examen était plus court.

Conclusion: Cette étude met en évidence les effets positifs de la musique sur les patients. La diminution de l'anxiété, l'amélioration de l'expérience globale, ainsi qu'une perception plus agréable du temps d'examen témoignent du potentiel de la musique comme outil simple, non invasif et efficace pour humaniser le parcours de soins. Ces résultats confirment les données de la littérature et ouvrent la voie à une intégration plus large de la musique dans les pratiques cliniques.

A205

Research Skills Education in Radiographer Undergraduate Programs: Academics' and Students' Perspectives

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Purpose: This study aims to explore research skills that are taught and assessed in different radiographer higher education institutions internationally, focusing on the curricula, experience of students and academics.

Methods and Materials: This study used a two-phase data collection approach. The first phase consisted of analysing curriculum documents from radiography undergraduate programs, including programme length, research credit allocation, taught subjects, and teaching strategies. The second phase involved semi-structured focus groups with students and academic staff. The sessions were audio-recorded using Zoom, and transcribed verbatim. The focus group data were analysed with NVivo software using reflexive thematic analysis.

Results: Data were gathered from nine institutions representing three continents. Curriculum review indicated wide international variability in the extent and timing of research integration, with diverse subjects incorporated at different stages of the degree. Reflexive thematic analysis of participant data generated three major themes: 1) research skills embedded in the curriculum, 2) the experience of engaging with research learning, and 3) the development of professional identity and practice.

Conclusion: The study highlights substantial variability in the approaches used to embed research within radiography education. Across academics and students, there was a shared view that research skills should be systematically scaffolded, integrated with clinical learning, and vertically structured across the curriculum.

A172

Opinion of radiographers on pre-prescribed radiography as a professional development in emergency departments in Western Switzerland

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Purpose: To gather the opinions of radiographers pre-prescribed radiography as a professional development initiative.

Methods and Materials: Ethical approval was obtained from the Research Ethics Committee of Lausanne Universiy Hospital, and informed consent was obtained prior to each interview. This is a prospective, exploratory, qualitative study based on semi-structured interviews guided by a standardized interview framework . Data collection will take place between December 2025 and February 2026 and will include a maximum of nine interviews. Participants will be radiographers holding a Bachelor's degree or an equivalent diploma recognized by the Swiss Red Cross. They will have experience in emergency radiography and will be recruited from institutions with varied legal statuses. The interviews will be recorded and transcribed, then analysed using vertical content analysis and horizontal thematic analysis.

Results: The results are expected to reveal a variety of opinions: some radiographers may be expected to view this as a meaningful development aligned with their competencies , while others might express reservations related to professional responsibility or legal constraints.
The study should also highlight key skills – clinical reasoning, interprofessional communication, and radiation protection – as well as the need for additional training.

Conclusion: This research will contribute to a better understanding of radiographers' perspectives on pre-prescribed radiography and contribute to shaping professional practices optimized for emergency department workflows in Western Switzerland.

A208

Management of anxious patients in MRI in the French part of Switzerland

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Purpose: To map the current practices of radiographers regarding the management of anxious patients in MRI in the French part of Switzerland.

Methods and Materials: A cross-sectional study was conducted to map the radiographers' current practices. An anonymous online survey was distributed to radiographers working in MRI across French-speaking Switzerland. The questionnaire included sociodemographic items, questions on initial and continuing education, and an assessment of the methods available and used to manage patient anxiety. Facilitators and barriers for the management of anxious patients were equally investigated. Descriptive statistics and inferential analysis were conducted with Stata software.

Results: Most respondents reported having received no specific or insufficient training on anxiety management during their initial education, and most had never attended continuing education dedicated to this topic. Despite this, radiographers reported using various strategies, including communication techniques, patient preparation, and available institutional resources. Respondents highlighted limited resources, heterogeneity of practices, and a strong interest in structured training, particularly in therapeutic communication and non-pharmacological anxiety management techniques, like hypnosis.

Conclusion: This study reveals substantial variability in practice and a lack of formal training in managing anxious patients in MRI among radiographers in French-speaking Switzerland. Participants expressed a clear need for structured continuing education to harmonise practice and improve patient care. The development of institutional guidelines and dedicated tools could enhance the effectiveness of currently used strategies.

A34

Stratégies des technicien·ne·s en radiologie médicale pour la prise en soin des patients atteints de troubles neurocognitifs

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Purpose: Investiguer les stratégies utilisées par les Techniciens en radiologie médicale (TRM) et les institutions de Suisse romande relative à la pris en soin des patients atteints de troubles neurocognitifs (TNC), en caractérisant le ressenti des TRM et en identifiant les stratégies comportementales et envionnementales implémentées.

Methods and Materials: Un questionnaire en ligne, diffusé d'octobre 2024 à janvier 2025, comportait quatre sections : données sociodémographiques, ressenti des TRM, stratégies comportementales et environnementales. Il s'adressait aux TRM ayant pris en charge au moins un patient atteint de TNC durant l'année. La validité et la fiabilité du questionnaire ont été évaluées. Les données quantitatives ont été analysées par statistiques descriptives et les réponses ouvertes par analyse thématique. L'étude a été approuvée par la Commission d'éthique du CHUV.

Results: Parmi 160 réponses valides, la majorité des TRM étaient des femmes (58%), âgées de 30 à 39 ans (37%), travaillant surtout en milieu public (66%) et en IRM (36%). Au total, 80% utilisaient la Validation de Naomi Feil, 66% les 10 commandements, et 81% impliquaient les proches aidants. Côté environnement, 22% réduisaient le nombre de personnes en salle et 43% favorisaient la privacité. Les mesures institutionnelles restaient limitées (formations : 85%, directives : 78%). Un temps supplémentaire était accordé dans 34% des cas. La cohérence interne du questionnaire était bonne (α=0.84).

Conclusion: Les TRM utilisent souvent les stratégies comportementales, comme la validation et les 10 commandements. Toutefois, le soutien institutionnel reste limité. Malgré une perception globalement positive de cette patientèle, un manque de connaissances sur les TNC persiste.

A114

Swiss survey uncovering opportunities to optimise practices and reduce iodinated contrast agents in oncological CT

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Purpose: The aim of this study was to map and document the clinical patterns related to contrast injection protocols for oncological body CT imaging in Western Switzerland.

Methods and Materials: An online survey was specifically designed, piloted and disseminated by using LimeSurvey platform to 74 medical imaging institutions to collect data about: a) socio-demographic characteristics of contrast users, b) technical acquisition protocols, c) injection protocols, d) optimisation practices in place, e) clinical information.
The survey was composed of closed and open-ended questions. Statistical analysis was performed with Stata, with Kolmogorov–Smirnov test applied to determine the normal distribution of the data. Descriptive statistics were performed for continuous variables with normal distribution.

Results: The survey was completed by 42% (31/74) of the invited institutions. Protocols commonly involved single-energy equipment (74%;23/31) instead of dual-energy (26%;8/31). Iterative reconstruction algorithms (68%;21/31) were the most selected instead of deep-learning-based reconstruction algorithm (10/31). Contrast volume was primarily calculated based on total body weight (84%;27/31), with an average 3mL/s injection rate. The most used iodine concentrations were 350mg I/mL (55%;17/31) and 400mg I/mL (29%;9/74).
Radiographers (90%;28/31) and application engineers (77%;17/31) were the specialists most involved in protocol optimisation, both collaboratively and individually. Dose adjustments were reported in cases of renal impairment (84%;22/31) and based on patient morphology (58%;19/31).

Conclusion: These results highlight heterogeneity in contrast-enhanced CT patterns across French-speaking Switzerland, with significant potential for optimisation through underutilised technologies such as dual-energy CT and deep learning-based reconstruction.

A193

Radiation Therapy Technologists' approach to person-centered care in Western Switzerland

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Purpose: This research investigated the ways in which Radiation Therapy Technologists (RTT) in Western Switzerland provide person-centered care (PCC) based on the framework developed by McCormack and McCance.

Methods and Materials: The study adopted a qualitative methodology, applying thematic analysis to data collected from five semi-structured interviews with RTT.

Results: RTT demonstrated a limited conception of PCC, primarily viewing it as a set of communication and relational skills for managing patients' marked emotional expression.
They acknowledged the valuable contribution of nurses, who were often entrusted with elements of PCC, such as listening, advising, or providing emotional reassurance, mainly because of limited time. While RTT acknowledged the benefits of PCC in fostering better patient experience and engagement, its application seems to be hindered by their strong emphasis on technical to deliver the appropriate dose and ensure patient safety.

Conclusion: According to the study, a lack of time represents the main barrier that hinders RTTs from establishing high-quality relationships with their patients although they are the ones in direct daily contact with patients. While approaches to provide PCC exist, their successful implementation depends on both specific skills and appropriate resources. At the beginning of treatment, patients voice strong demands for being heard, receiving reassurance, and obtaining clear explanations, making the presence of RTT essential. Nevertheless, temporal, material, organizational, and institutional constraints restrict its practical implementation. Introducing RTT-led consultations within radiation oncology services prior to the start of treatment could provide a valuable opportunity to enhance PCC and strengthen the caring and therapeutic role of radiographers.

A198

Procedural Pain in Nuclear Medicine: Prospective Baseline Evaluation Using EVA Scores

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Purpose: Patients undergoing n.m examinations often present with chronic or unexplained symptoms, contributing to anticipatory anxiety that may amplify pain perception. To guide the implementation of structured comfort interventions, we conducted a baseline evaluation of procedural pain associated with common nuclear medicine workflows.

Methods and Materials: Patient-reported pain was assessed prospectively using a standardized Visual Analog Scale (VAS/EVA, 0–10, rounded to 0.5). EVA scores were collected immediately after three predefined steps: (1) intravenous catheter placement, (2) subcutaneous radiopharmaceutical injection when applicable, and (3) final positioning on the imaging table. Data were recorded on a structured paper form and categorized by type of examination and procedural act. Descriptive statistics were used to characterize pain intensity.

Results: A total of 124 procedural acts were recorded in 86 patients (50% women; median age 63 years). At least one moderate pain episode (EVA ≥3) was reported by 37% of patients, while 17% experienced severe pain (EVA ≥5). Pain intensity varied notably by step: subcutaneous injections yielded the highest scores (median 3.0; IQR 2.0–4.0), catheter placement was generally mild (median 0.5), and table positioning showed wide variability (median 1.0; range 0–9). Sentinel lymph node procedures exhibited the highest overall pain levels. Documentation of comfort aids, mainly cushions, positioning supports, arm-position adaptations, or short breaks, was rare (<5%), and occasional free-text remarks mentioned prior analgesic or topical anesthesia use.

Conclusion: This first prospective EVA-based assessment shows that procedural pain in nuclear medicine is common and heterogeneous. These baseline results support the upcoming implementation of structured non-pharmacological interventions aimed at improving patient experience and humanizing care

A117

Comparative evaluation of quantitative T1-mapping sequences for musculoskeletal oncologic MRI

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Purpose: To compare 4 T1-mapping sequences against an inversion-recovery (IR) turbo spin echo (TSE) reference and identify the approach best suited for musculoskeletal oncologic applications.

Methods and Materials: A standardized phantom and one healthy volunteer were scanned on a 3T MRI system (MAGNETOM VIDA, Siemens Healthineers, Forchheim, Germany) using spine 32 and contour 24-channel coils. Axial pelvic imaging with 4 T1 mapping strategies were evaluated: spoiled gradient-echo VIBE with 2 flip angles (VIBE-2fa) and 5 flip angles (VIBE-5fa), Modified Look-Locker inversion recovery (MOLLI), and a research radial Look- Locker (LL) sequence. For reference, an IR TSE with multiple TI was acquired. Regions of interest were drawn in muscles. The volunteer scan was repeated twice for inter scan variability evaluation.

Results: In the phantom, VIBE-5fa shows the highest SNR (78%), whereas radial-LL the lowest (13%). Relative to the IR reference, MOLLI demonstrated the lowest T1 deviation (10%), followed by the radial-LL (33%) and VIBE-5fa (34%). In vivo, both VIBE sequences exhibited high heterogeneity due to B1 sensitivity, an effect which was not observed in other sequences. We find the same results concerning the SNR, with the lowest variation for the MOLLI sequence (25%) when compared to reference IR sequence. Test-retest analysis showed that VIBE-2fa achieved the lowest inter-scan variability (0.2%), whereas the radial-LL highest (13%).

Conclusion: The radial-LL approach, while sampling-efficient, yielded lower SNR and higher variability. Despite good SNR in VIBE-5fa, MOLLI exhibited the lowest deviation from reference IR sequence in both phantom and in vivo experiments and therefore appears more suitable for future musculoskeletal oncologic studies.

A50

DEEP BRAIN STIMULATION (DBS) DEVICES IN MRI: CHALLENGES, PROTOCOLS, AND SOLUTIONS

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Purpose: The increasing prevalence of patients implanted with deep brain stimulation (DBS) devices presents a growing challenge for MRI departments.
Strict adherence to MR conditions is crucial since deviation can result in permanent brain damage.
This study aims :
1. To describe the institutional protocol implemented in our university hospital for a safe management of MRI examinations in patients with DBS systems.
2. To analyze the evolution in the number of MRI exams performed in this population.
3. To compare imaging protocols used for patients with and without DBS.

Methods and Materials: A retrospective analysis was conducted over a 4-year period at a university hospital. The number and type of MRI scans performed on patients with implanted DBS systems were recorded and tracked over time, along with the total number of unique patients. The types of implanted DBS systems and their respective MRI conditions were reviewed.
Sequence parameters and image quality were compared between standard MRI (non-DBS patients) and those adapted for patients with DBS.

Results: A notable increase in MRI procedures involving DBS patients was observed, from 4 patients/5 exams in 2022 to 8 patients/12 exams in 2024 and already 5 patients/5 exams at end of April 2025. Among the 16 patients included, 6 underwent a single MRI exam, and 10 had between 2 and 4 scans. All examinations, except two, were performed on a Philips Ingenia 1.5T scanner, offering the capacity of limiting SAR or B1+rms levels via dedicated software.
Brain MRI accounted for 40% of the indications, lumbar spine for 20%, and the remaining exams were distributed across various clinical indications.

Conclusion: The implementation of a standardized MRI protocol for DBS patients, including multidisciplinary coordination and tailored protocols enabled a safe, scalable response to growing imaging needs.
Greater harmonization of device labeling, specifically regarding B1+rms values remains necessary to enhance care accessibility and consistency.

A226

Feasibility of high b-value for the detection of ischemic stroke in the posterior fossa: head-to-head comparison with standard b-value.

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Learning objectives: Diffusion weighted imaging (DWI) sequence is one of the key MRI sequences for diagnosing acute ischemic stroke (AIS). This pilot study aimed to evaluate the feasibility of high b-value DWI in patients with acute ischemic stroke (AIS) in the posterior fossa.

Methods and Materials: 30 patients (mean age 72.5 years,) underwent brain MRI on a 3T scanner including DWI sequences b=1000 s/mm² (b1000) and b=2000 s/mm² (b2000).
Qualitative assessment (visual grading analysis (VGA), artefact scoring and lesion classification according to size and location-supratentorial or infratentorial) was performed independently by three blinded readers. Lesion volume was obtained by manual delineation.
Quantitative analysis included SNR and CNR measurement. Comparisons between b-values were performed using Wilcoxon and Kruskal Wallis tests. Inter-reader concordance for image quality and lesion volume was evaluated using Gwet's coefficient and Lin's test, respectively. Statistical significance was set at $p<0.05$.

Results: Both DWI sequences were successfully acquired in all participants with small acquisition time difference (1.56 versus 2.20 min). Image quality and artefact scores were significantly higher with b1000 for Reader 2 (2.5±0.6 vs 1.9±0.7; $p<0.0001$) and Reader 3 (3.0±0.2 vs 2.3±0.5; $p<0.0001$) with low to moderate inter-reader agreement. Quantitatively, overall SNR and CNR did not differ significantly between b-values. Inter-reader concordance for lesion volume estimation was moderate for small lesions (<5mm, Pearson'r=0.45 at b1000 and 0.43 at b2000), and excellent for larger lesions (>5mm, Pearson'r=0.92 at b1000 and 0.89 at b2000).
Etiology-based common pathologies will also be presented: compression, variant anatomy, tumor lesions, inflammatory (local, systemic) and trauma.

Conclusion: High b-value DWI acquisition is feasible. It maintains clinically acceptable image quality and allows confident lesions delineation in the posterior fossa. Broader evaluation of high b-value diffusion imaging is needed to determine its potential role for improving early stroke diagnosis.

A209

A Comprehensive Look at Acoustic Noise Reduction in MRI Sequences

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Purpose: This study synthesises current evidence on acoustic noise–reducing MRI sequences and highlights their benefits, limitations, and clinical applicability.
Methods and Materials: A review was performed according to JBI methodology using PubMed and Embase as databases. Eligible studies were published in English or French after 2014. Search strategies combined keywords and MeSH terms related to acoustic noise and magnetic resonance imaging (MRI). Two independent reviewers screened titles, abstracts, and full texts, with disagreements resolved by consensus, when necessary.
Results: The search yielded 371 articles, of which 13 met inclusion criteria (reduction of noise, MRI). Three main categories of noise-reduction strategies were identified: (1) gradient waveform modifications, (2) k-space filling strategies such as radial acquisitions, and (3) combined or specialised techniques. Across studies, these methods achieved meaningful reductions in acoustic noise and improvements in patient comfort. Reported drawbacks identified in the studies included potential reductions in image quality, increased acquisition times, and technical or clinical implementation constraints. Despite these limitations, several studies found that diagnostic image quality remained acceptable for diagnostic purposes, answering the clinical question.
Conclusion: Current evidence showed that acoustic noise in MRI can be substantially reduced using gradient modifications, radial k-space sampling, and combined techniques, while maintaining diagnostic image quality. These developments offer promising opportunities to enhance patient comfort, particularly in vulnerable groups, and to support broader adoption of quiet or silent MRI protocols. Future work should investigate the contribution of AI-based approaches to further improve image quality and reduce scan times.

A206

Comparative Image Quality Assessment of AI-Enhanced and Fat-Saturation Techniques in Lumbar Spine T2-Weighted MRI

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Purpose: To assess the performance of artificial intelligence (AI)–based image reconstruction methods with different fat saturation methods in T2 sequences of lumbar spine MRI.

Methods and Materials: An exploratory study was conducted to evaluate artificial intelligence (AI) based image reconstruction and fat saturation methods in MRI for lumbar spine investigation. T2 FSE, T2 FS FSE, T2 STIR FSE and T2 Dixon FSE in sagittal view were acquired. Protocols were optimised to enhance image quality(IQ) and reduce acquisition time. The final protocol was validated with 10 healthy volunteers with variable BMIs at three Tesla. A visual assessment of the acquired images was conducted three MRI-experienced observers using the ViewDEX software. Descriptive and inferential statistics were performed to analyse the data.

Results: AI-based reconstruction led to a clear improvement in overall image quality across all T2-weighted lumbar spine sequences, with sharper anatomical detail and reduced noise.
Optimised protocols combined with AI also shortened acquisition times, T2 FSE(35%), T2 FS FSE(36%), T2 STIR FSE(25%) and T2 DIXON FSE(30%), while maintaining diagnostic quality.
Among the fat-saturation methods, all sequences benefited noticeably from AI enhancement. However, the Dixon method had less improvement.
During protocol optimisation, increased oversampling reduced phase-encoding aliasing artefacts that were increased with AI-based reconstruction.

Conclusion: This study demonstrates that the use of AI in lumbar MRI investigations has a tangible impact on overall image quality, as well as on acquisition time, which was reduced.
Further research is required to emphasise the clinical validation of the results with a larger sample size and pathological conditions.

A207

AI-Enhanced Knee MRI Imaging Can Improve Image Quality and Acquisition Time

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Purpose: To quantitatively and qualitatively evaluate AI-based image reconstruction algorithms for knee MRI in comparison with a conventional reference protocol.

Methods and Materials: This exploratory study compared AI-based MRI reconstruction techniques with a standard knee protocol. Optimised sagittal T1 FSE, PD FSE FS, and T2 FSE sequences, together with axial and coronal PD FSE FS, were acquired at 3T MRI equipment in ten healthy volunteers with varied BMI. Three experienced musculoskeletal MRI experts independently assessed image quality using ViewDEX. Evaluation included Visual Grading Analysis (VGA), inter-observer agreement (Cohen's Kappa), and Visual Grading Characteristics (VGC) to compare diagnostic performance between AI-reconstructed and standard images.

Results: AI-reconstructed achieved consistently higher or comparable VGA ratings across key anatomical and image quality criteria, demonstrating clear clinical value. The AI protocol reduced total acquisition time by 36.9% (8:22 min vs. 13:15 min), offering a substantial workflow advantage for radiographers. Inter-observer agreement was moderate to good for AI images (κ = 0.44–0.71), exceeding or matching that of the standard protocol (κ = 0.13–0.71). VGC analysis confirmed a statistically significant overall performance gain with AI reconstruction (AUCVGC) 0.76–0.81, 95% CI, $p \leq 0.05$), supporting its robustness and diagnostic reliability in clinical practice.

Conclusion: AI-based reconstruction improved knee MRI image quality while reducing scan time by 36.9%, demonstrating clear potential for faster and more efficient clinical workflows.
Validation in patients with pathology is needed.

A246

Explainable Artificial Intelligence for PET Denoising: A user-oriented integration into clinical workflows

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Purpose: AI-based denoising is shifting Positron Emission Tomography (PET) reconstruction from deterministic to probabilistic approaches, with a potential risk of hallucinations affecting clinical interpretation. Explainability is essential for safe integration into workflows.
This study aimed to develop and evaluate user-centered explainable AI (XAI) tools for PET denoising by identifying users' needs, predicting similarity with Ground Truth (GT), generating XAI outputs, and identifying user preferences.

Methods and Materials: The study was conducted in three steps. (1) A focus group of ten radiographers identified user requirements for clinical implementation and trust in AI predictions. (2) PET data from 47 patients and 141 lung lesions were reconstructed at six dose levels (100% to 1%) and denoised using a 3D convolutional neural network. From each image, 872 features (quantitative PET metrics, radiomics and visual scores) were extracted.
Four classifiers (Support Vector Machine (SVM), Logistic Regression (LR), random forest and k-nearest neighbour) were trained to predict image similarity. (3) Four different XAI formats were developed: similarity scores, SHapley Additive exPlanations (SHAP) and textual explanations. A questionnaire identified users' preferences.

Results: Radiographers asked for a confidence score with optional, multi-format explanations. SVM and LR achieved the highest patient-level accuracy (0.95), and SVM performed best at the lesion level (0.77). Most predictive features were anatomical detail, artefact presence and lung textural radiomics (patient level), SUVmax, SUV skewness, detection score, texture strength (lesion level). The mean predicted similarity score was 0.44 ± 0.36 (range: 0.10–0.87). Among 106 respondents, similarity scores were preferred (32%), followed by text (27%) and SHAP (22%), with most (n=64) preferring a multiformat approach.

Conclusion: This study demonstrates the feasibility and clinical relevance of user-centered XAI for PET denoising.

A28

Building Trust in Artificial intelligence by using Explainable PET/CT Image Denoising

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Purpose: Explainable AI (XAI) in PET/CT image denoising aims to enhance transparency and trust in practice. This study evaluated healthcare professionals' perceptions and preferences on different explanations and their impact on trust, satisfaction, usability, and understanding.

Methods and Materials: A survey was distributed using a snowball sampling approach to reach European nuclear medicine professionals via professional associations and social media. Socio-demographic data, 3 sections addressing global and local explanations (similarity score, textual explanations, and SHAP plots) for similar and non-similar patients were explored. Each assessed satisfaction, trust, usability, and mental model formation.
Descriptive and thematic analysis were performed on responses collected to date (still ongoing).

Results: Thirty-four participants (27 radiographers, 7 physicians; mean age 43.1±10.2 years, experience 16.1±10.4) from ten European countries completed the survey. Global explanations showed low satisfaction (40–85% disagreement); 67% found them insufficiently detailed, and only 39% trusted the AI-denoising algorithm. Most required support (65%) and training (85%) before using these tools. Local explanations for similar patients were preferred, improving satisfaction (47%), usefulness (62%), and trust (74%), supported by visual comparisons and similarity scores. For non-similar cases, satisfaction decreased (44%). Cognitive load was higher for global (81.7±32.8) than local (50.5± 34.0) explanations. Participants preferred a layered design: starting with similarity scores, then textual summaries, and SHAP plots for experts. They valued transparency but requested simple, clinically contextualised explanations and practical training.

Conclusion: Healthcare professionals value XAI transparency, but they need specific training in the field. Simplified, layered explanations with practical education could strengthen trust, promote implementation and adoption of AI in PET/CT practice.

A96

A Serious Game to Support Radiographers' Learning of Artificial Intelligence Fundamentals

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Purpose: This study investigates the development of a Serious Game (SG) to learn the fundamentals of AI and its applications in radiology, assessing students' motivation and engagement with the SG.

Methods and Materials: The intervention involved three groups : second and third year Bachelor radiographer students (BSc2 and BSc3), as well as radiographers in continuing education (CE), all of whom received an introduction to AI fundamentals in radiology. The SG was designed as a board game and incorporated learning objectives and content into the game design and mechanics. Data to assess participants' motivation and engagement were collected through a post-intervention satisfaction questionnaire and an observation sheet completed by facilitators. This evaluation was based on two dimensions : acceptability (ACC) and gameplay experience (XPJ).

Results: A total of 59 participants took part in the study (BSc2=22, BSc3=18 and CE=19). Sessions lasted approximately 90 minutes for Bachelor students and 70 minutes for CE participants, allowing BSc2 to partially complete three rounds of the game and BSc3/CE participants to fully complete two rounds. For BSc3 and CE sessions, adjustments were made to the game mechanics : a 60-second time limit per answer and the option to answer as a team at any time. After each session, participants completed the 4-point Likert scale questionnaire. Results showed an average ACC score of 3.45 ± 0.41, with a slightly lower score for CE participants, and an average XPJ score of 3.39 ± 0.35.

Conclusion: The SG was well received, with high acceptability and gameplay experience scores. These findings support the relevance of SGs for introducing AI in radiology and for fostering engagement and motivation in training. Although pedagogical effectiveness was not assessed, future studies could explore this aspect.

A43

IgeaNet: A deep learning model for opportunistic osteoporosis screening from chest X-ray images

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Purpose: To develop and validate a multimodal deep learning model for opportunistic screening of osteoporosis by classifying bone mineral density (BMD) from chest radiographs integrated with clinical metadata.

Methods and Materials: This retrospective study included 833 adult patients who underwent chest radiography and Dual-Energy X-ray Absorptiometry (DEXA) within 12 months (January 2018-December 2024). A convolutional neural network (CNN) model was developed using a convolutional branch to process chest radiographs, while a dense branch processed patient demographics (age, sex, height, and weight). The two representations were merged into a fully connected classifier optimized end-to-end.

Results: The dataset comprised training (n=589), validation (n=124), and testing (n=120) sets. On the test set, the model achieved 85.8% accuracy (95% CI: 78.5-90.9%), F1-macro 0.86, and AUC-macro 0.95. Class-specific performance showed sensitivity/specificity of 84.2%/91.4% for normal, 90.2%/77.1% for osteopenia, and 82.3%/91.9% for osteoporosis, with 14.2% misclassification rate. Analysis of DEXA anatomical site distribution revealed wrist as the determining site in 302 patients (36.3%), hip in 384 patients (46.1%), and lumbar spine in 141 patients (16.9%). Inclusion of wrist measurements changed diagnostic classification in 115 patients (13.8%), with 34 patients reclassified from normal to osteopenia, 14 from normal to osteoporosis, and 67 from osteopenia to osteoporosis. This differential diagnostic yield reflects distinct bone composition differences, as wrist cortical bone may reveal mineral density reductions undetected at predominantly trabecular sites

Conclusion: Integration of chest radiographs and clinical data by residual network withattention allows accurate classification of BMD without additional radiation exposure.

A229

Performance evaluation of the Hyperscint™ RP-200 scintillation detector for dosimetry in FLASH radiotherapy

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Purpose: Accurate dosimetry is essential for clinical implementation of FLASH radiotherapy (FLASH-RT) and this study evaluates the performance of the Hyperscint™ RP-200 plastic scintillation detector for routine dosimetry in FLASH-RT, in comparison with detectors considered as references.

Methods and Materials: The experiments were performed with the Oriatron eRT6 linear accelerator (CHUV, Lausanne) delivering 6 MeV pulsed electron beams in conventional (CONV) and FLASH modes. In this quantitative study the RP-200 was tested for linearity, pulse dose response (PDR), repetition rate (PRF), and depth dose profiles (DDP). The measurements were compared with those of a AdvancedMarkus ionisation chamber and Gafchromic™ EBT3 films. Each measurement was done twice to calculate the mean. The data were normalised by beam monitor and analysed by linear regression and dose ratios.

Results: The RP-200 demonstrated excellent linearity in CONV mode (R^2=0.9996) with doses consistent with the reference detectors. In FLASH mode, a systematic underestimation occurred with deviations of 9 to 30%, increasing with PRF and dose per pulse (DPP). PDD profiles differed from the references, particularly at a source-surface distance of 600 mm.
These results confirm the limitations of the RP-200 in UHDR conditions, potentially related to Cherenkov light contamination.

Conclusion: Although reliable in conventional dosimetry, the RP-200 requires correction factors for routine dosimetry in FLASH-RT. Newer models such as the RP-100 may offer better UHDR performance and further research is needed to optimise scintillator dosimetry in clinical FLASH-RT.

A194

Influence of Cast Type and Exposure Parameters on Ankle Radiographic Image Quality and Radiation Dose Using a Phantom Model

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Purpose: This study aimed to assess the impact of different types of cast materials and exposure parameter adjustments (kV, mAs, copper filtration) on radiation dose, signal-to-noise ratio (SNR), and contrast-to-noise ratio (CNR) during ankle imaging.

Methods and Materials: This phantom experiment included plaster of Paris (wet and dry), plastic, and 3D-printed casts. AP and lateral radiographs were acquired using tube voltages of 50–70 kV, tube current–time products of 3.2–4.5 mAs, and Cu filtration ranging from 0.0 to 0.1 mm. EI and DAP values were recorded, while SNR and CNR were computed with ImageJ. Statistical evaluation employed non-parametric tests in SPSS, with significance set at $p < 0.05$.

Results: DAP and EI showed no significant differences among casts in the AP projection. In the lateral projection, EI differed between wet/dry plaster and 3D-printed casts. SNR and CNR varied across cast types ($p < 0.001$), with the plastic cast highest in AP SNR/CNR, and wet cast highest SNR and dry/plastic highest CNR in lateral views ($p < 0.001$). Cu filtration reduced DAP significantly, with little impact on EI, SNR, or CNR except for plastic casts. Tube voltage affected all parameters, while mAs had no effect.

Conclusion: Cast material significantly affects image quality (SNR and CNR) but has minimal impact on radiation dose. Consistent with prior studies, copper filtration effectively reduces dose without notably degrading image quality, with slight variations across cast types. Using Cu filtration with optimized kV settings can enhance the diagnostic quality of post-cast ankle radiographs while maintaining dose efficiency. These findings support the optimization of imaging protocols for immobilized ankles.

A199

Reliability of ultrasound measurement of arm thickness at rest and during maximal isometric contraction, and its relationship to strength

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Purpose: Relationship between muscle thickness and strength at rest and at maximum isometric contraction, and variability according to gender, physical activity and dominant arm

Methods and Materials: Prospective study conducted in July 2025. 24 participants (ages ranging from 19 to 57y.o.; mean: 28.1 +/-10.7y.o.; 17 women; 7 men) completed a survey assessing their demographics, sports habits, and dominant arm. Ultrasound images were captured at rest and under stress in Fowler position, at the distal two-thirds of the arm, using a SonoScape Doppler. Pilot established parameters: linear probe, depth of field at 6cm, focus at 5cm. Strength was measured using a MicroFET2 dynamometer between a strap and the wrist. Arm thickness was measured using MicroDicom Viewer. Data was stored in Microsoft Excel and analysed using Jamovi. Reliability was measured using the intraclass correlation coefficient (ICC) and correlations between data were calculated using Spearman's correlation coefficient. Ethic autorisations were given through acknowlegdement of the study program by the head of the Factulty of Health Sciences at the University of Ljubljana

Results: ICC values indicated good to excellent intra-observer (>0.837) and inter-observer (>0.781) reliability in both states. Significant correlations ($p<0.001$) between muscle thickness and strength were observed: rs=0.737 (relaxed) and rs =0.748 (contracted). In low-to-moderate activity group (n=15), correlations were respectively rs =0.829 and rs =0.850.
No significant correlations were found in the high activity group (n=9). For arm dominance (n=21), significant correlations ($p<0.001$) were found for both dominant and non-dominant arms: respectively rs =0.748 and rs =0.700, rs =0.670 and rs =0.778

Conclusion: Results show reliable measurement of upper arm muscle with this protocol in each observed state, and strong correlation between thickness and strength. Results are comparable to other studies

A152

Real-Time MRI-guided radiotherapy for Prostate Cancer : First Clinical Experience with Comprehensive Motion Management on a 1.5T MR Linac

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Purpose: The integration of high-field MRI with linear accelerators has opened new perspectives for prostate stereotactic body radiotherapy (SBRT), enabling precise target visualization and adaptive dose delivery. MR-guided radiotherapy (MRgRT) on the 1.5T MR-linac (MRL) allows daily online plan adaptation to manage inter-fraction anatomical variations with superior soft-tissue contrast.
This study reports the first clinical experience of prostate SBRT implementation using MRgRT with Comprehensive Motion Management (CMM), highlighting the role of real-time MRI in intra-fraction motion control and treatment precision.
Methods and Materials: Twenty patients with low- to intermediate-risk prostate cancer were treated on the 1.5T MRL using CMM. Seven patients received ultra-hypofractionated radiotherapy (SBRT), and thirteen received hypofractionated radiotherapy (hypoRT). The CMM system continuously monitored the prostate position with real-time eine MRI and automatically paused beam delivery when target displacement exceeded a threshold set at 1 00% of the GTV volume.
Results: A total of 295 fractions were delivered. The median beam-on time was 11 min. Beam-hold events occurred in 35% of fractions, averaging 24 interruptions per session. Both acute and late toxicities remained low, with no Grade >2 events observed.
Conclusion: This study demonstrates the successful clinical implementation of prostate SBRT using MR-guided radiotherapy with CMM. The continuous real-time MRI monitoring enabled effective intra-fraction motion management without prolonging treatment times. These results confirm the feasibility of precise, image-guided SBRT on the MR-linac, suggesting the potential for further PTV margin reduction and improved treatment accuracy.

A97

Image Quality Assessment of Chest X-Rays in Clinical Routine

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Purpose: To establish a baseline assessment of chest X-ray (CXR) quality performed in routine practice at a university hospital.

Methods and Materials: This retrospective study included 2,400 anonymized frontal CXRs acquired between January and December 2024. A standardized evaluation framework based on structured quality-criteria guidelines—comprising 16 criteria covering positioning, quality parameters, inspirium, and artifacts—was developed by expert radiographers and refined through a pilot test with an independent radiographer and chest radiologist. Four trained radiographers assessed the CXRs using ViewDEX. 200 images were read by all four readers for inter-observer agreement; the remaining images were distributed uniquely. Associations between each criterion and global quality will be examined using chi^2 tests with Cramér's V ($p < 0.01$), and predictors will be identified using a proportional-odds ordinal logistic regression model.

Results: Among the 2,400 CXRs, patient age ranged from 23–102 y.o. (med./mean 61.5), with 43% women. Most exams were performed in emergency radiology (84%). Preliminary results from 1,291 CXRs show global image quality was strongly influenced by technical and positioning criteria. Adequate SNR (Cramér's V = 0.41), absence of artifacts (0.40), cleared scapulae (0.40), adequate contrast (0.38), and clear retrocardiac visualization (0.37) showed the strongest associations with overall quality (all $p < 10^{-30}$). Absence of artifacts yielded 76–93% "Good/Excellent" ratings, while artifacts produced 67% "Poor."

Conclusion: These preliminary results align with prior research identifying SNR, contrast, positioning, and artifact control as key determinants of diagnostic CXR quality. This baseline assessment will guide targeted radiographer training to enhance image quality and strengthen professional competencies.

A153

Implementation of a dedicated pelvic PET-CT workflow with furosemide diuresis for simulation and dosimetric planning in radiotherapy : a single-center experience.

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Purpose: PET-CT is essential in oncology for staging, response assessment, and follow-up. Its integration into pelvic radiotherapy (RT) planning is increasing. However, nuclear medicine (NM) and RT have conflicting bladder requirements : NM prefers a tracer-depleted bladder, while RT requires a full bladder to protect organs at risk. We aimed to establish a unified PET-CT and RT planning workflow using a single acquisition protocol with furosemide-induced diuresis, enabling optimal PET fusion and direct use for dosimetric planning.

Methods and Materials: From 2018 to 2025, 90 patients (prostate, gynecologic, rectal, and SBRT for nodal lesions) underwent PET-CT simulation with intravenous furosemide (20 mg administered 20 minutes after tracer injection), prior to bladder voiding. Image acquisition was performed under radiotherapy positioning conditions, using a flat tabletop and a 120 kV helical CT (native acquisition with contiguous slices). Hounsfield Unit (HU) measurements on a phantom containing inserts of known density were used to correlate HU values with electron density, ensuring the accuracy of the data for dosimetric calculations.

Results: The workflow was feasible and well tolerated. Furosemide achieved a full, tracer-poor bladder, meeting both NM and RT requirements. The PET-CT dataset was directly usable for planning, enabling optimal PET fusion and precise target delineation. Minor adjustments were required in cases of excessive diuresis.

Conclusion: This dedicated pelvic PET-CT workflow with standardized furosemide diuresis is feasible, reproducible, and constitutes a protocol meeting RT technical requirements, allowing optimal fusion for dosimetric planning.

A177

Optimised Technical Parameters for High-Quality Wrist Radiographs Under Cast

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Purpose: Post-cast wrist radiography is essential for confirming fracture alignment; however, cast materials can degrade image quality, and no standard technical guidance exists in Swiss clinical practice. This study aims to identify optimal exposure parameters (kVp, mAs, FDD and additional filtration) for posteroanterior and lateral wrist radiographs performed through plaster of Paris and synthetic casts.

Methods and Materials: An experimental study will be conducted using a forearm phantom immobilised with plaster of Paris and synthetic cast materials applied by a certified technician. Radiographs will be acquired on a Siemens Multix Fusion Digital system while adjusting exposure parameters, and added filtration. Air Kerma will be measured using a DOSIMAX Plus A dosimeter. Image quality will be evaluated through objective analysis (SNR, CNR, and anatomical contrast) and subjective assessment by radiographers, emergency physicians and orthopedic surgeons using a standardized 4 points-Likert scale. Effective dose will be calculated to determine optimal balance between radiation exposure and diagnostic image quality. The study aims to generate evidence directly applicable to Swiss radiographers.

Results: Data collection is scheduled for early 2026. All available findings at the time of the congress, including image quality performance, dose levels, and the most promising parameter combinations will be presented, with emphasis on clinically applicable optimization strategies.

Conclusion: This study aims to provide standardised recommendations for post-cast wrist radiography to harmonise imaging practice in Switzerland. By identifying exposure settings that enhance image quality while respecting radiation protection principles, the findings are expected to support radiographers in delivering more consistent, high-quality, patient-centred imaging.

A10

Learning curves for ultrasound-guided placement of peripheral veinous catheter

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Purpose: Ensuring safe and effective ultrasound-guided peripheral catheter insertion requires structured training. At the CHUV, the PICC Team has extensive experience in this field and provides a local reference model for this technique. In addition, the demand from nurses for support in managing difficult peripheral venous access in the emergency setting represents a growing challenge.
However, learning curves vary significantly from one individual to another when acquiring this technical skill. Therefore, it is essential to define a performance benchmark to validate nurses upon completion of the training.

Methods and Materials: Data from our quality insurance database were retrospectively analyzed to model learning curves using a cumulative sum (CUSUM) to reach predefined competency thresholds. These data allowed to assess the proportion of successful attempts required to demonstrate competency.

Results: Based on this analysis, the modeling of a learning curve enabled the identification of three distinct phases: the initial phase reflecting early acquisition of basic skills, the intermediate phase characterized by a balance between successes and failures, and the final phase who represent a stage of comprehension and adaptation, culminating in the consolidation and refinement of the acquired technical skill.

Conclusion: This study underscores the importance of a structured training for US-guided peripheral catheter insertion skills followed by a comprehensive documentation of the initial 30 to 50 peripheral venous catheter placements.
By identifying phases of learning curves using CUSUM analysis, we established a 75% of success rate as the beginning of the consolidation phase ensuring the achievement of training skill and set a baseline for effective and safe clinical practice.

A237

The correlation of computed tomography (CT)-based body composition and survival in pancreatic cancer patients: A systematic Review

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Purpose: The aim of this systematic review was to assess the correlation between body composition (BC) parameters and survival outcomes in pancreatic cancer patients, focusing on overall survival.

Methods and Materials: A comprehensive literature search was done in compliance with the PRISMA guidelines and was conducted including three main components: pancreatic cancer, BC, and survival outcomes. PubMed and SCOPUS were screened for studies published between 2014 and 2024. Inclusion criteria were: 1) publications written in English; 2) available full free text and/or open access; 3) adults only. Exclusion criteria were: 1) Studies that did not present original data; 2) non-CT-based BC assessment; 3) focus on other cancer types; or 4) animal studies. Information extracted were: basic study data (country of origin, year of publication, study design) and population characteristics (number of patients, sex, age and sarcopenic status and several BC features). To facilitate comparisons between studies, we grouped BC features as: fatty muscle infiltration, muscle attenuation, muscle mass, skeletal muscle indices, total adiposity, subcutaneous adipose tissue and index, visceral adipose tissue and index..

Results: The search resulted in 497 findings. According to the inclusion/exclusion criteria, 23 studies were included. Sample size ranged from 53 to 476 patients. The mean age of participants ranged from 59.5 to 74.6 years. The mean or median BMI ranged from 21.0 to 28.7 kg/m². Sarcopenic patients ranged from 32.2 to 65.1% in studies with this data. All studies used diagnostic CT scans at the L3 body for body composition analysis. Our findings indicate that BC can serve as a predictor of survival in pancreatic cancer patients, with 21 studies reporting a significant correlation. The most frequently observed predictor was not a baseline parameter but rather changes in parameters over time during treatment.

Conclusion: Specific BC parameters hold potential as prognostic indicators of survival in pancreatic cancer patients.

A211

Feasibility of 4D free-running Motion-Resolved Liver MRI at Low Field

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Purpose: To evaluate the feasibility of free-running 3D radial MRI with respiratory motion-resolved reconstruction at low-field for improving liver image sharpness and reducing motion artifacts.

Methods and Materials: Five volunteers (4 female, 29.6±8.9y/o) were scanned at 0.55T (MAGNETOM Free.Max, Siemens Healthineers) using an untriggered free-breathing 3D radial GRE sequence (1.4mm3, TA:8:47, TR/TE:6.4/2.7ms, 3D phyllotaxis trajectory). Data were retrospectively reconstructed into multiple respiratory bins (4-6-8-10)(I4DFRF) using the Free-Running Framework (FRF). To enable motion quantification, sagittal 2D cine MRI (1.0×1.0×50.0 mm³, tmp-res:600ms) were acquired to measure liver displacement over the respiratory cycle and used to calculate the motion averaged within and between bins. Image quality—assessed by liver dome edge sharpness and liver–inferior vena cava contrast ratio—of the I4DFRF was compared with the clinical reference 3D StarVIBE sequences in both breath-hold (ISVbh) and free-breathing (ISVfb) acquisitions (1.4mm3, TA:11:47, DIXON).

Results: Quantitative analysis showed residual intra-bin motion of up to 7.09±2.67mm in the 4-bin I4DFRF and inter-bin variability of 1.29±0.34mm. The average maximum liver displacement in the 10-bin I4DFRF was 17.6mm, representing about 71% of the total motion measured in the cine MRI. Liver dome edge sharpness increased with the number of bins, reaching a 63% improvement in the 10-bin I4DFRF (1.5±0.7) compared to ISVfb (0.4±0.1). The contrast ratio remained consistent across I4DFRF reconstructions but was about 29% lower than ISVfb and 35% lower than ISVbh.

Conclusion: The 3D-FRF yielded sharper images and clearer liver anatomy, demonstrating the feasibility of motion-resolved low-field liver MRI. It captures respiratory motion, reduces blurring, preserves contrast, enhancing clinical usability and patient comfort.

A158

SwissHCCSeg: a multiparametric liver MRI dataset with multiple tumor and liver segmentations of pre-treatment hepatocellular carcinomas.

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Purpose: Hepatocellular carcinoma (HCC) is the most common primary liver cancer and a leading cause of cancer-related death. While MRI is crucial for HCC diagnosis, the development of AI models for automated detection and characterization is hindered by the lack of publicly available annotated datasets. The purpose of this study was to develop and share a new annotated multiparametric liver MRI database from patients with HCC: the SwissHCCSeg dataset.

Methods and Materials: We included 132 adult patients from a prior retrospective cohort conducted at our institution. All subjects had chronic liver disease and underwent MRI examination between 2011 and 2020 for HCC screening or lesion characterization. The dataset comprises 63 HCC-positive and 69 HCC-negative cases. HCC-positive MRIs contained at least one lesion scored LI-RADS 5, tumor in vein (TIV), or a biopsy-proven LI-RADS 4/M lesion. Up to five lesions per positive scan were manually segmented across each sequence and expert-validated. Metadata include LI-RADS score, lesion size, liver segment location, advanced radiological descriptors and background parenchymal findings. In addition, liver masks for all T1-WI phases were generated using a pre-trained nnU-Net model, and pre-computed registration transforms across T1-WI phases are provided.

Results: PIn total, 139 lesions were annotated, including 97 confirmed HCCs (mean size: 20 mm, range: 5–78 mm), the majority of which were classified as LI-RADS 5 (87.6%). Among non-HCC lesions, 37 were presumed or biopsy-proven dysplastic nodules and 5 were hemangiomas.

Conclusion: By providing a comprehensive, well-annotated, and standardized collection of liver MRI examinations, SwissHCCSeg aims to support the development of advanced computational methods for automated HCC detection, segmentation, and characterization, fostering progress toward precision imaging and personalized treatment planning.

A243

Differentiation of adrenal lesions by Spectral Computed Tomography

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Purpose: Adrenal lesions, while common on routine abdominal computed tomography, give rise to diagnostic uncertainty and frequently require additional imaging to rule out malignancy. We sought to examine whether advanced imaging parameters derived from spectral computed tomography aid in differentiating benign from malignant growth, i.e. adenomas from metastases.

Methods and Materials: This work is a quality improvement project exempt from IRB approval. We searched clinical records for patients undergoing computed tomography with findings of nodular adrenal lesions. We decomposed Spectral Base Images of venous-phase contrast-enhanced scans into Hounsfield density, iodine concentration, effective atomic number and electron density. Adrenal lesions were quantified by simple circular regions of interest. Entities were determined according to a composite standard considering histology, positron emission tomography and follow-up. Groups were compared by two-sided t-tests.

Results: Forty patients were included (median age 63 years, standard deviation 12.7 years, range 21 – 86 years), of which twenty each were diagnosed with benign adenoma and metastasis. Measured values for adenomas vs. metastases were 53 ± 26 vs. 87 ± 21 Hounsfield units ($p = 0.00055$), 1.9 ± 0.9 vs. 2.3 ± 0.6 mg/mL of iodine ($p = 0.10$), 8.3 ± 0.4 vs. 8.5 ± 0.3 effective atomic number ($p = 0.11$) and 101.4 ± 1.1 vs. 103.5 ± 1.2 % electron density ($p = 0.00001$ - all data median ± standard deviation). Receiver operator characteristics indicated a threshold of 102.8 % electron density for an area under the curve of 0.884.

Conclusion: Differences in Hounsfield densities in venous-phase computed tomography between adrenal adenomas and metastases result from underlying differences in electron density, but not contrast enhancement or effective atomic number. Electron density maps may be useful for classifying adrenal lesions.

A166

Acute Pancreatitis Revisited: Key Insights for Radiologists Based on the 2025 International Association of Pancreatology (IAP) Revised Guidelines

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Learning objectives:
- Apply guideline-based indications and timing of CT/MRI in acute pancreatitis
- Optimize CT/MRI protocols for detecting disease-related complications
- Recognize key imaging findings of complications, with a brief summary of evidence-based management

Background: The 2025 International Association of Pancreatology (IAP) guidelines on acute pancreatitis substantially expand the prior 2013 version, refining definitions and management pathways, clarifying intervention thresholds, and strengthening guidance on various complications. Imaging is still crucial for identifying complications of acute pancreatitis and for planning multidisciplinary management.

Imaging findings or procedure details:
- **Indications:** CT only for diagnostic uncertainty, lack of improvement, or deterioration (update removes CT for severity confirmation)
- **Timing:** ≥72–96 h (update specifies timing for necrosis evaluation)
- **CT:** Slice thickness ≤2 mm (update), pancreatic/ portal venous phase, arterial phase only if vascular involvement is suspected (update)
- **MRI:** T1w fat sat (FS) and T2w FS; contrast only if replacing CT (update); T2w FS sufficient for debris detection (new)
- **Key imaging features of complications & management** ***(poster provides tips for confident detection, highlights pitfalls, and summarizes updated management recommendations):*** (peri-)pancreatic necrosis, large symptomatic collections with mass effect, infected collections, hemorrhage/pseudoaneurysm, splanchnic venous thrombosis, abdominal compartment syndrom

Conclusion: The 2025 guidelines emphasize appropriate imaging indications, timing, and protocol selection, focusing on complication-oriented interpretation. By integrating these recommendations, radiologists can enhance diagnostic accuracy, severity assessment, and intervention planning, thereby playing a key role in the multidisciplinary management of acute pancreatitis.

A239

Free breathing diffusion-weighted imaging of the liver

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Purpose: Diffusion-weighted imaging (DWI) plays a central role in liver pathology, providing non-contrast lesion detection and characterization, and monitoring treatment response, and is therefore a core component of all clinical liver MRI protocols. However, current liver DWI rely on respiratory gating or repeated breath-holds, resulting in unpredictable and prolonged scan times, variable image quality, low SNR, and increased patient stress. In this work we developed retrospective slice-alignment and signal loss mitigation techniques that can enable free breathing DWI of the liver.
Methods and Materials: The respiratory signal was recorded during acquisition and used for retrospective slice binning and cross-bin registration. Signal-loss maps came from dividing each filtered repetition by the max-intensity projection; the final image was the sum of all repetitions normalized by the sum of their magnitude maps.
Simulation: A high-SNR, respiratory-triggered liver DWI volume served as the simulation reference. The respiratory signal was divided into 12 magnitude bins, each assigned motion parameters. The simulated acquisition timeline of a standard DWI EPI sequence was mapped to these bins, and the corresponding motion parameters were applied to the data.
In-vivo: Free-breathing liver DWI was acquired in three healthy volunteers on a 0.55 T MAGNETOM Free.Max scanner with Biomatrix 6-channel and 9-channel spine coils. A single-shot DW-EPI sequence was used (FOV 420 × 288 mm^2; voxel 2.96 × 2 × 6 mm^3; 30 slices, 1.2 mm gap; b = 50/800 s/mm^2 with 4/10 repetitions; TE/TR 75/5300 ms, GRAPPA R = 2, Biomatrix sensor for respiratory signal).
Results: As compared to non-motion-compensated approach, both simulation and in-vivo results show improved DW image sharpness and reduced signal loss appearance. In in-vivo data, reduction in ADC overestimation, especially in the left liver lobe can be observed.
Conclusion: With the proposed approach, free-breathing DWI in the liver was shown to be feasible.

A141

Vision-Language Models in Radiology: Starting Points for Clinical Validation

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Learning objectives:
- Review the potential applications of Vision-Language Models in radiology
- Define prerequisites for implementation and validation of Vision-Language Models
- Summarise prominent research directions related to Vision-Language Models in radiology

Background: Emerging AI models support radiologists with lesion identification and time-consuming segmentation tasks, with many now integrated into clinical radiology systems. Large Language Models are proving a powerful aid for structuring radiology reports. Vision-language models (VLMs), which understand images and text, are a more recent, promising development. Medical VLMs display a breadth of clinical knowledge and surprisingly strong medical reasoning, although such models are not ready for widespread deployment yet.
For specific use cases, however, VLMs perform very well, so clinical validation and development of the user-experience, i.e. how these models can be incorporated into medical practice, are essential next steps.

Imaging findings or procedure details: In this work, we present some starting points for researchers to start experimenting with VLMs.
We outline several radiological applications, including report generation and patient communication , where they can integrate into the workflow of radiologists. Additionally, we describe the type and scale of data required to begin trials, and expect many researchers already have access to enough data. Particularly fields that use two-dimensional images, such as X-Ray, can reap large benefits from existing VLMs.
We provide clinicians and researchers with some research directions, the most prominent being validation in clinical practice, and summarise common pitfalls, along with strategies to address them.

Conclusion: VLMs are a prominent development in modern AI research, yet their clinical validation remains limited. This work provides a set of starting points for researchers to experiment with these models and aims to encourage clinical studies, validation, and ultimately, responsible clinical adoption.

A57

Automated and manual AI frameworks for MRI: Performance and usability for liver parenchyma segmentation

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Purpose: AI models for 3D segmentation in CT and MRI are widely adopted in clinical research. In this work, we compare two prominent automatic pipelines with a manually optimised segmentation model on a private dataset, aiming to guide researchers and clinicians in model and framework selection.

Methods and Materials: We used a dataset of 200 liver MRI acquisitions (non-contrast T1-VIBE Dixon in-phase), with vessels and Couinaud segments annotated. A manually optimised model was trained using an in-house framework based on PyTorch Ignite and MONAI.
Results were compared with two automated frameworks, nnUNet and MONAI Auto3DSeg. Model training used 170 patients for training/validation, and 30 for evaluation. Quantitative and qualitative analyses of the resulting segmentation masks were performed. The in-house framework and configurations will be shared publicly.

Results: The three frameworks achieved highly comparable results, implying that they reach optimal performance for our dataset. The nnUNet model reached an overall Dice score of 76%, the in-house model reached 75%, and the MONAI Auto-model reached 73%.
Qualitatively, the segmentation masks from the three models were very similar, and they contained similar errors, implying that the limiting factor for segmentation quality is the quality and scale of the dataset.
Differences existed mainly in the usability of the frameworks.
MONAI Auto3DSeg had a simpler data format and easier configuration, while nnUNet allowed for easier generation of model predictions. Our in-house framework required more manual tuning to reach good training results, but was otherwise much simpler.

Conclusion: The three frameworks achieve comparable results on this dataset. Differences mainly relate to usability.

A124

MSXplain Web – A Platform for AI-based Multiple Sclerosis Lesion Segmentation, Localization, and Reporting in MRI

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Purpose: In the project MSXplain, funded by the Hasler Foundation, we developed a web platform to facilitate the use of Artificial Intelligence (AI) in neuroimaging by providing researchers and clinicians access to automatic segmentation and quantification of multiple sclerosis (MS) white matter lesions (WMLs). It includes a fully automated AI pipeline for processing MRI data from MS patients, offering WML segmentation and anatomical localization, automated reporting, as well as a DICOM viewer, all containerized using Docker for local secure deployment.

Methods and Materials: MSXplain Web integrates established preprocessing neuroimaging tools (FSL, ANTs, HD-BET models, Elastix) with a pretrained U-Net model from MONAI to automatically detect and segment WMLs. The input consists of MPRAGE and FLAIR MRI sequences. The model was trained on data from 479 patients (3001 studies), validated on 120 patients (695 studies), and tested on 200 patients (1208 studies). WMLs are automatically localized based on the overlap between the dilated anatomical regions obtained with SAMSEG and the U-Net lesion mask. The processed images and lesion maps are exported to an ORTHANC DICOM server, allowing interactive visualization with the OHIF viewer.

Results: The U-Net model for WMLs segmentation achieves a Dice score of 0.665±0.156 and a normalized Dice score of 0.790±0.099 in the test set. The automated report informs on the load of WMLs and their anatomical distribution as juxtacortical, periventricular, infratentorial, and deep white matter. MSXplain Web allows users to run the entire pipeline without coding or installing advanced AI tools.

Conclusion: MSXplain Web provides a fully automated framework for MS lesion detection, anatomical mapping, and DICOM-based visualization, facilitating clinical interpretation and integration of AI-generated results into radiological workflows. Future versions will incorporate explainability methods tailored to MS, which are often lacking in AI-based solutions for MS lesion management.

A162

Congenital abnormalities of the posterior fossa: pearls and pitfalls

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Learning objectives: To give an overview of the posterior fossa anatomy and its most important congenital abnormalities.
To enable radiologists to accurately diagnose the various posterior fossa malformation subtypes with a special focus on the cystic ones.

Background: Congenital abnormalities of the posterior fossa may result from genetic or disruptive etiologies. The spectrum of these pathologies is wide. Several classifications, based on anatomical abnormalities or neuroimaging pattern, exist in literature. Beyond classification, cystic abnormalities, combining neurological disorders as well as normal variants, are the most common ones, both in pre-natal and post-natal life. As such, they constitute an important neuroradiological entity to recognise, because of the genetic implications and neurodevelopmental outcome.

Imaging findings or procedure details: Cystic posterior fossa malformations mainly include Dandy-Walker malformation continuum, Blake pouch cyst, mega cisterna magna and posterior fossa arachnoid cyst. These entities can be distinguished from each other based on neuroimaging features such as the presence/absence of hypoplastic vermis, abnormal inferior opening of the fourth ventricle, enlarged posterior fossa and hydrocephalus. Tailored high resolution MRI sequences, such as 3D T1-weighted, T2-weighted, and CISS 3D, together with a solid understanding of posterior fossa anatomy, are essential for differentiating these pathologies. Given the educational aim of this poster, practical examples, mimics and pitfalls, along with a diagnostic algorithm, will be provided.

Conclusion: Accurate diagnosis of posterior fossa malformations is crucial as it determines the inheritance pattern, indicates potential involvement of other organs and informs prognosis. Radiologists should therefore be familiar with the spectrum of these malformations, as well as with the imaging features and MRI sequences that help distinguishing in-between entities.

A176

Role of Perfusion-Weighted Imaging in evaluating response of cerebral metastases treated with SRS

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Learning objectives:
- Review perfusion-weighted imaging (PWI) techniques and their acquisition parameters.
- Emphasize the role of perfusion-weighted imaging (PWI) in differentiating between radiation necrosis (RN) and tumor recurrence (TR) after stereotactic radiosurgery (SRS).
- Recognize the PWI imaging features relevant to the identification of RN.

Background: Brain metastases (BM) are the most frequent intracranial tumors and affect 30-40% of adults with solid malignancies. Stereotactic radiosurgery (SRS) has become a well-established treatment modality. Even if SRS seems to offer excellent local control it can also be associated with delayed complications such as radiation necrosis (RN). Additionally, RN and tumor recurrence (TR) can present similar clinical and radiological features, making their differentiation particularly challenging. Nonetheless, accurate distinction between these two entities is crucial, as they require different therapeutic management strategies.

Imaging findings or procedure details: Advanced magnetic resonance imaging (MRI) modalities such as perfusion-weighted imaging (PWI) have demonstrated some potential as effective tools for improving diagnostic differentiation between RN and TR. Although several PWI techniques are commonly used in clinical practice, current literature data lacks widely accepted reference values for perfusion metrics and standardized guidelines for combining PWI with morphological MR sequences. The aim here is first to review PWI techniques, with a focus on DSC (Dynamic Susceptibility Contrast), and then to describe and illustrate PWI patterns of SRS treated BM. Tips and clues to improve differentiation between RN and TR are additionally presented.

Conclusion: Accurate use of PWI to distinguish between RN and TR is essential in order to avoid unnecessary treatments (e.g. surgery and re-irradiation), or prompt others. A systematic analysis of MR imaging including PWI offers a valuable non-invasive tool to support clinical decision-making.

A154

CNS Lymphoma: Patterns, Pitfalls and Pearls

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Learning objectives:
- Review typical and atypical CT and MRI features of CNS lymphoma, and its histological subtype
- Identify key enhancement, diffusion and perfusion patterns
- Describe imaging pitfalls and pearls that help differentiate lymphoma from mimickers

Background: CNS lymphoma is a highly cellular aggressive neoplasm. Its radiologic appearance can closely mimic other intracranial pathologies such as high-grade glioma, metastases, infectious or inflammatory lesions. A detailed understanding of typical and atypical imaging features is essential for accurate diagnosis, particularly in immunocompromised patients.

Imaging findings or procedure details: Diffuse large B-cell lymphoma (90 -95% of CNS lymphoma)
Primary CNS lymphoma:
· Typical locations: periventricular, corpus callosum, basal ganglia
· Other locations: cortical
Secondary CNS lymphoma: leptomeningeal ± parenchymal lesion
Mild oedema and mass effect
CT:
· Hyperattenuating lesions
MRI:
· Hypo-T2
· Marked restricted diffusion
· Homogeneous and strong enhancement
· Linear enhancement along perivascular spaces
· Low rCBV (enhancement-perfusion mismatch)
· Typical time-intensity curve exceeding baseline
· Prominent lipid peak on MR spectroscopy
Immunodeficiency-associated CNS lymphoma
· Thalamic and basal ganglia predilection
· Heterogeneous, necrosis and hemorrhage
· Irregular pr interrupted open ring enhancement, notch sign
· DD: metastases, glioblastoma
Intravascular large B-cell lymphoma
· Vasculitis-like pattern
· Ischemic-like lesions with perivascular linear enhancement
· Parenchymal punctate/patchy foci on T2-FLAIR with restricted diffusion and minimal enhancement
Lymphomatoid granulomatosis
· Brain and lung involvement (angiocentric and angiodestructive infiltration)
· Perivascular nodular pattern
· More necrotic
MALT lymphoma of the dura
· Dural based mass without extensive bone destruction
· DD: meningioma

Conclusion: Recognizing the typical and atypical presentations of CNS lymphoma is essential, as it can drastically alter patient management. When lymphoma is suspected, corticosteroids should be avoided until a definitive diagnosis is established.

A83

"Transvenous sinus stenting for idiopathic intra-cranial hypertension (HTIC)": state of the art practice from a tertiary center with regional collaboration

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Learning objectives: To learn the radiological signs of idiopathic HTIC.
To be introduced to transvenous sinus stenting as minimally invasive treatment for idiopathic HTIC.

Background: Idiopathic HTIC is characterized by elevated intracranial pressure (ICP) without evidence of a secondary cause.
Symptoms include headaches, tinnitus, diplopia, blurred vision, papilledema.
It is an underdiagnosed pathology that can lead to irreversible visual loss and affects especially young women.
The goal is to improve intracranial venous outflow, lower intracranial pressure, and stabilize or improve visual function.
Weight loss and acetazolamide are first-line therapies.
More invasive treatments may be required, including depletive lumbar puncture, neurosurgical procedures (optic nerve sheath fenestration, CSF diversion) and recently venous sinus stenting in selected individuals with significant trans-stenotic pressure gradient.

Imaging findings or procedure details: MRI demonstrates supportive signs : empty sella, distension of the perioptic subarachnoid spaces, tortuosity of the optic nerves, posterior globe flattening, and transverse sinus stenosis or narrowing of venous outflow pathways.
Transvenous sinus stenting is performed under general anesthesia using fluoroscopic guidance, typically via femoral venous access. A catheter is navigated anterogradely into the transverse–sigmoid sinus junction.
Venous manometry is performed to measure pressure gradient across the stenosis before and after stenting.
Post stenting antiplatelet therapy include : 3 months dual antiplatelet therapy to prevent in-stent thrombosis, followed by 12-month single antiplatelet therapy.

Conclusion: Idiopathic HTIC is an underdiagnosed pathology than can lead to irreversible visual loss.
For general radiologists, timely recognition is crucial to prevent permanent visual impairment.
Transvenous sinus stenting is a minimally invasive approach that can be curative by suppressing the trans-stenotic venous gradient.

A48

Choroid plexus alterations in autism spectrum disorder: A PET-MRI study

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Purpose: Investigation of volumetric and metabolic alterations of the choroid plexus (CP) as a new neuroimmune biomarker in autism spectrum disorder (ASD).

Methods and Materials: In this case-control study, 65 adults with ASD and controls {CON) completed a simultaneous [^{11}C]PBR28 PET-MRI scan on a 3T scanner with an 8-channel head coil and a BrainPET camera between 11 /2013-03/2023. lnstitutional approval of the study protocol and informed consent was obtained. 24 ASD males, 19 CON males, 12 ASD females, and 1 O CON females were included in the analysis. Mean age ± SD (range) in years was 24.4 ± 5.1 (18-37) in ASD and 25.7 ± 5.2 (18-38) in CON. Around 15 mCi of [^{11}C]PBR28 was administered i.v. to assess in vivo translocator protein (TSPO) expression. SUVR maps were reconstructed using PET data from 60-90 min postradioligand injection. CP volume was measured based on manual segmentations of the lateral ventricles CP on T1 images using OsiriX. Multivariable linear regressions assessed group effects or association with ASD symptoms while controlling for age, sex, intracranial volume and TSPO genotype.

Results : CP volume was larger in ASD vs. CON (CP volume mean ± SD: ASD 2517.53 ± 916.55 mm^3, CON 1866.90 ± 460.84 mm^3), controlling for age, sex, and ICV (mean group Δ. 677.80, 95 % Cl [331.00,1025.00], p =0.0002). The CP volume of 11 adults with ASD (9 males, 2 females; ~ 30 % of ASD) was more than 2 SD above the mean CP volume of CON. CP volume was associated with more severe symptoms in ASD males (estimated ß: 153.10, 95 % Cl [50.03, 256.30], p = 0.005) and TSPO was elevated in ASD females (SUVR mean group h. 0.12, 95% Cl [0.03, 0.21], p = 0.01).

Conclusion: The CP volume is higher in ASD adults and is associated with symptom severity in ASD men, while CP TSPO is elevated in ASD women. These results contextualize the CP as a novel neuroimaging biomarker and suggest immune involvement in ASD.

A77

The Greater Occipital Nerve: Anatomical Landmarks, Imaging Approaches, and Image-Guided Infiltration Techniques

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Learning objectives: Identify the key anatomical landmarks of the greater occipital nerve (GON).
Describe ultrasound (US) and computed tomography (CT) approaches for accurate localization.
Review infiltration techniques, their indications, advantages, and limitations.

Background: Occipital neuralgia (Arnold's neuralgia) is characterized by paroxysmal occipital pain radiating to the vertex.
Arnold's neuralgia can exhibits a refractory course despite conventional pharmacological and conservative management.
In these cases, image-guided occipital nerve infiltrations can be performed to achieve pain relief, reduce neurogenic inflammation, and improve functional outcomes.

Imaging findings or procedure details: The GON arises from the dorsal ramus of C2, emerging between the posterior arch of C1 and the lamina of C2. It passes around the inferior oblique muscle, pierces the semispinalis capitis and trapezius, and becomes subcutaneous near the superior nuchal line.
Three main entrapment zones are described:
1. compression between the C1–C2 joint;
2. at the first loop, it ascends between the posterior surface of the inferior oblique and the semispinalis capitis muscle and can be stretched during head motion;
3. constriction at its aponeurotic exit, where it passes through the aponeurotic dedoubling of the trapezius insertion.
US guidance allows real-time visualization of the GON as a slight hyperechoic fascicle between the inferior oblique and semispinalis muscles, close to the occipital artery. It enables exploration and guidance for injection mainly at the second and third entrapment zones, while avoiding neurovascular injury.
CT-guided infiltration targets mainly the first and second entrapment zone, using iodine contrast to control the correct position. CT has higher spatial resolution and more independence from operator skill, offering objective and panoramic assessment of injected solution spread.

Conclusion: Understanding GON anatomy and imaging landmarks is crucial for safe and effective image US-guided and CT-guided infiltration.

A129

NI-RADS in Post-Treatment Head and Neck Cancer Imaging: Practical Application, Pitfalls, and Reporting Pearls

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Learning objectives:
- Review NI-RADS categories and their corresponding clinical recommendations.
- Illustrate typical post-treatment imaging appearances across modalities, including CT, MRI, and FDG-PET/CT.
- Recognize common interpretative pitfalls that may mimic recurrence.
- Apply NI-RADS systematically through representative real-world cases.

Background: The Neck Imaging Reporting and Data System (NI-RADS), developed by the American College of Radiology, provides a standardized framework for interpreting and reporting post-treatment imaging in head and neck cancer. Structured around a 1–4 scoring scale for both the primary site and neck nodes, NI-RADS links imaging appearances to evidence-based management recommendations. This system enhances communication between radiologists and clinicians and improves consistency in surveillance reporting.

Imaging findings or procedure details: Through multiple case examples, the poster demonstrates characteristic features of NI-RADS 1–4 categories, including benign post-therapeutic changes, low-suspicion findings requiring short-interval follow-up, high-suspicion lesions prompting biopsy, and definitive recurrence. Particular emphasis is placed on PET/CT pitfalls—physiologic uptake patterns, treatment-related inflammation, and asymmetric muscular activity—which may falsely elevate suspicion.

Conclusion: NI-RADS offers a reliable, pragmatic algorithm for post-treatment surveillance. While NI-RADS 1 and 4 are typically straightforward, categories 2 and 3 demand careful correlation and awareness of pitfalls. Consistent use of NI-RADS supports clearer interdisciplinary communication and more confident clinical decision-making.

A257

Effects of varying mandibular protrusion on the morphometric features of the upper airway in healthy subjects

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Purpose: Mandibular Advancement Devices (MADs) assist patients suffering from Obstructive Sleep Apnea (OSA) by opening the airway at night, thereby improving sleep. However, the exact physiological relationship between the degree of protrusion and its effects on the upper airway has not been thoroughly investigated. We investigate the impact of mandibular protrusion on morphometric features of the upper airway in healthy subjects by assessing Minimal Cross-Sectional Area (CSA_{MIN}) and Total Airway Volume V_{TOT} in MRI scans.

Methods and Materials: Customised MADs were acquired from a commercial provider for ten healthy volunteers (5 males 5 females, age 21-53 years). A 3D isotropic T1-weighted MPRAGE anatomical image was acquired on a 3.0T scanner (MAGNETOM Prisma, Siemens Healthcare AG Zurich) for three fixed mandibular positions (rest position, middle-protrusion, maximum protrusion). Airway volumes were manually segmented using the following boundaries: spina nasalis posterior (upper boundary), the upper margin of the epiglottis (lower boundary), pharyngeal wall (posterior boundary), and the posterior margin of the oral cavity (anterior boundary). Mixed linear model statistics performed in SPSS V29 (IBM, Armonk, New York) and Matlab R2023a (The Mathworks Inc., MA, USA) were used to assess changes in CSA_{MIN} and V_{TOT}.

Results: A significant increase in both mean CSA_{MIN} ($p = 0.002$) and V_{TOT} ($p = 0.004$) was observed between the rest position and maximum protrusion position across the entire group. However, in individual cases, decreases with increased protrusion was observed in CSAMIN (three participants) and VTOT (five participants), highlighting individual anatomical variations in response. No significant differences were found between genders for either parameter.

Conclusion: An increase in V_{TOT} and CSA_{MIN} was observed with MAD-induced mandibular protrusion in healthy subjects at a group level. However, individual variations in response prohibit the definitive prediction of MAD-induced changes in airway volume.

A71

An international survey of diffusion and perfusion magnetic resonance imaging implementation in the head and neck

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Purpose: The goal of this international survey was to understand how diffusion (DWI) and perfusion imaging (PWI) are being applied to clinical head and neck imaging.

Methods and Materials: An online questionnaire focusing on acquisition, clinical indications, analysis, and reporting of qualitative DWI (QlDWI), quantitative DWI (QnDWI) and dynamic contrast-enhanced PWI (DCE-PWI) in the head and neck was circulated to members of the American Society of Head and Neck Radiology (ASHNR) and European Society of Head and Neck Radiology (ESHNR) over a 3-month period. Descriptive statistics and group comparisons were calculated with SPSS® v27.

Results: There were 294 unique respondents (17.6% response rate) from 256 institutions (182 ESHNR, 74 ASHNR). DWI was routinely acquired for some head and neck indications at 95.7% of the respondents' institutions, with 92.5% of radiologists interpreting QlDWI but only 36.7% analysing QnDWI. QlDWI was most frequently applied to primary mucosal masses or the middle ear, whilst QnDWI was routinely used to distinguish tumour histologies, and primary or recurrent carcinoma. DCE-PWI was routinely acquired at 53.6% of institutions and used by 40.8% of respondents, however, there was no clinical scenario in which it was routinely applied by most users. DCE-PWI analysis methods varied, with time-intensity curve classifications being the most frequently reported. Lack of standardisation was identified as a key reason for not implementing QnDWI, whilst numerous factors prevented the adoption of DCE-PWI.

Conclusion: There is widespread routine interpretation of QlDWI by head and neck radiologists, but there is considerable variation in the application and analysis of head and neck QnDWI and DCE-PWI.

A247

Simulator Training on Neurointerventional Skill Acquisition in Novices: A Pilot Study

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Purpose: Simulation-based training is a promising tool to support skill acquisition in neurointerventional stroke treatment without exposing patients to procedural risks. As the global demand for thrombectomy rises, training strategies that ensure procedural competence while addressing workforce constraints are increasingly important.

Methods and Materials: Six novice participants performed two neurointerventional tasks: vascular access and mechanical thrombectomy (MTE). After a baseline assessment, three participants received standard model-based training (control group), and three received additional simulator training using a high-fidelity angiography simulator (Mentice VIST G5). Performance was reassessed after four weeks using technical and clinical surrogate metrics, which were ranked and analyzed.

Results: No relevant group differences were observed for the vascular access task. In contrast, the simulator group showed superior improvements in the MTE task, with greater gains in efficiency, autonomy, and procedural safety.

Conclusion: Even brief simulator exposure may support skill acquisition in complex endovascular procedures such as MTE. While conventional training may suffice for basic skills, simulation appears beneficial for accelerating learning in more advanced tasks.

A286

AI Model Assisted Chest X-Ray Training for Medical Students: A Pilot Study

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Learning objectives: To evaluate the educational impact and diagnostic accuracy of an AI supported, scenario based chest X-ray training platform by assessing both student performance and model detection performance in a pilot study.

Background: AI assisted medical imaging tools are increasingly used in medical education to support image interpretation and clinical reasoning however evidence on their integration with structured clinical scenarios is limited. This study introduces a hybrid educational platform combining a YOLOv8 model with interactive, case based chest X-ray scenarios for medical students.

Imaging findings or procedure details: In this pilot study, n = 30 students completed repeated chest X-ray interpretation sessions using a web based training platform. Each session included a randomly assigned radiograph, a structured clinical scenario, diagnostic questions and an AI model prediction. Student diagnoses and clinical reasoning texts were recorded, and diagnostic performance was analyzed descriptively based on correctness rates. Model performance was evaluated on the internal validation set using standard object detection metrics. Class wise analysis showed that model performance was highest for cardiomegaly (F1 score = 0.66) while it was limited for other pathologies, particularly infiltrate and pneumonia, likely due to severe class imbalance. Student diagnostic accuracy across repeated attempts was moderate to high depending on pathology, with an overall correctness rate of approximately 70%. User satisfaction scores from a 12 item Likert scale form indicated high perceived educational benefit.

Conclusion: This pilot study shows that an AI supported, scenario-based chest X-ray training environment is a feasible and well accepted educational tool. Despite variable model performance across pathologies, it's integration into an interactive learning framework provided meaningful educational value. Further multi-center studies with balanced datasets are required to validate this hybrid approach.

A223

AI-driven diagnostic system for 1225 different chest-X-ray patterns and diagnoses

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Purpose: This study aimed to evaluate the diagnostic performance of a holistic computer-assisted diagnosis (CAD) system for chest radiographs and to compare its accuracy with that of experienced radiologists.

Methods and Materials: The analysis was conducted using a dataset of 224,300 chest X-rays (CXR) with the corresponding radiological reports from 2003 to 2024 from our institution. A generic CXR-pattern classification system was introduced by a board certified radiologists with 25 years of experience in chest imaging. This system provided each possible radiological expression of each CXR pattern (n=1225), pooled into diagnoses (n=201).

A Dataset: Large Language Model (QWEN3) based recognition and classification of all possible CXR patterns (n=1225) in each radiological report for labelling the corresponding images.

B Classifier training: The CAD system employed a deep convolutional neural network pretrained on image-net and trained on labeled radiographic images, using efficientNet-B4 in a dual net configuration (frontal and lateral CXR view). A test set of 14'000 CXR was used and validated by the same expert radiologist. Performance was assessed using standard metrics, including precision, recall, and class weighted F1 score for all patterns first, then for the pooled diagnoses second.

Results: The CAD model achieved an overall class weighted F1 score of 82.2% for all patterns, demonstrating for instance individual F1 scores of 99.6%, 91.3% and 84.1% for diagnosis like radiopaque devices (catheters), consolidation and airspace, respectively. These scores are comparable to human experts across all disease categories (overall CXR accuracy of radiologists=80%).

Conclusion: Non-inferiority of an AI-driven chest diagnostic system for 1225 patterns and diagnoses compared to human radiologists can meaningfully improve radiological practice.

A169

Explainability in Clinical AI: Mapping XAI Methods for Thoracic Pathologies

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Purpose: Different explainable artificial intelligence (XAI) methods support the interpretation of different aspects of a model's decision process. Radiological readings are similarly multifaceted and comprise different diagnostic tasks, depending on the imaging purpose, modality, and disease. However, there is no comprehensive mapping linking XAI methods to their clinical applications. In this project, we demonstrate the suitability of different XAI methods to support radiological readings of common thoracic pathologies.

Methods and Materials: Thoracic pathologies with high global prevalence or incidence, e.g. lung cancer, interstitial lung diseases (ILDs), and pneumonia are mapped to five XAI methods: saliency maps, textual explanation, counterfactual generation, prototype-based explanation, retrieval example explanation. For every pathology, method suitability is scored on a scale of 1 to 5, with 5 indicating the strongest suitability. Suitability scores are based on consensus from interdisciplinary discussion, involving two radiologists, one clinician, and two AI researchers.

Results: Saliency maps indicate the presence and location of certain structures, making them well-suited for detection tasks, e.g. of pulmonary embolism. Prototype-based explanations indicate a ranked set of diagnostic features contributing to the model decision, making them helpful for diseases with characteristic imaging features, e.g. in sarcoidosis, enlarged hilar lymph nodes, perilymphatic micronodules, and apical predominance could be listed as decisive features. The retrieval of similar cases aids most in complex diseases with multiple differentials or look-alikes, e.g. to distinguish between different ILDs.

Conclusion: Image modality, disease characteristics, and purpose of imaging co-determine which XAI method is appropriate for explaining different pathologies. There is a need for continued interdisciplinary discussion to guide XAI development towards clinical application.

A151

Smoking-Related Interstitial Fibrosis (SRIF): what radiologists need to know

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Learning objectives:
- Understand the radiologic–pathologic characteristics of smoking-related interstitial fibrosis (SRIF).
- Recognize key high-resolution CT (HRCT) features that suggest SRIF in daily practice.
- Distinguish SRIF from other fibrosing and smoking-related interstitial lung diseases, particularly usual interstitial pneumonia (UIP).

Background: Smoking-related interstitial fibrosis (SRIF) represents a distinct fibrotic pattern occurring in current or former smokers. It often coexists with emphysema and respiratory bronchiolitis and has been described under related terms such as respiratory bronchiolitis–associated interstitial lung disease (RB-ILD) with fibrosis (RBF) or airspace enlargement with fibrosis (AEF). Reported prevalence varies widely depending on population and sampling. Recognizing SRIF is important because its imaging appearance may mimic other interstitial lung diseases, yet it usually follows a more stable clinical course.

Imaging findings or procedure details: SRIF presents on CT as clusters of small (>15 mm), thin-walled (>1 mm) irregular cystic lucencies with a subpleural distribution that does not directly abut the pleura, helping differentiate it from honeycombing. The pattern shows upper- and mid-lung predominance with relative sparing of the juxtadiaphragmatic lower lobes, although a basal predominance can sometimes be seen. Associated features include ground-glass opacities, respiratory bronchiolitis, airway wall thickening, and emphysema. Compared to UIP, SRIF generally has less traction bronchiectasis, coarse reticulation, and basal subpleural honeycombing. These distinctions are essential when evaluating smokers with fibrotic or cystic changes.

Conclusion: SRIF is an under-recognized but distinctive smoking-related fibrosing pattern. Familiarity with its HRCT feature enables radiologists to differentiate SRIF from UIP and other interstitial lung diseases.

A47

DIffuse Idiopathic Pulmonary NEuroendocrine Cells Hyperplasia (DIPNECH). Imaging Clues to a Not-So-Rare Pulmonary Entity

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Learning objectives:
-Understand the physiopathology of DIPNECH
-When to suggest it? Typical imaging aspects
-Possible mimics and pitfalls

Background: DIPNECH is a rare and probably under diagnosed pulmonary disorder characterized by diffuse proliferation of neuroendocrine cells within the bronchiolar epithelium. It predominantly affects middle-aged to elderly non-smoking women and represents a potential precursor for carcinoid tumor development. Clinical manifestations are often nonspecific, including dry cough, dyspnea, or non existant, making imaging pivotal for early recognition.

Imaging findings or procedure details: High-resolution CT typically shows a combination of small, bilateral pulmonary nodules and features of small airway disease. Nodules may represent tumorlets or carcinoids, and peri-bronchovascular distribution is common. 18F-FDG PET-CT often shows little or no uptake, whereas 68Ga-DOTATATE PET-CT better highlights somatostatin receptor–positive lesions. The radiologic spectrum parallels histopathologic findings ranging from linear neuroendocrine proliferation to overt carcinoid tumors. Key differential diagnoses include hypersensitivity pneumonitis, bronchiolitis obliterans, and metastatic disease. The role of the radiologist is essential since imaging is in many cases typical of that syndrome.

Conclusion: DIPNECH, though rare, has highly suggestive clinical and radiologic patterns. Recognizing the constellation of multiple small nodules, mosaic attenuation, and the appropriate demographic profile enables radiologists to confidently suggest the diagnosis. Awareness of this entity and its imaging spectrum helps guide appropriate follow-up, pathology correlation, and management, making DIPNECH an "easy diagnosis for the prepared radiologist."

A126

Cystic lung diseases in the daily routine: a comprehensive step-wise algorithm for the radiological diagnosis of cystic lung lesions.

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Learning objectives: To present a comprehensive, step-by-step diagnostic algorithm that enables radiologists to accurately characterise cystic lung lesions and differentiate among diseases presenting lung cysts or cyst mimics.

Background: Cystic lung lesions and diseases encompass a broad spectrum of entities that are often difficult to diagnose and distinguisch due to similar morphologic apprearance, overlapping features and frequent coexistance of multiple conditions.

Imaging findings or procedure details: The poster presents a clear and structured approach to cystic lung lesions guiding radiologists through three key steps: (1) Confirmation of whether a lesion fulfills the radiologic criteria for a true pulmonary cyst (thin-walled ≤2mm, well-circumscribed, air-containing structure) and their differentiation from cysts mimics such as bullae, pneumocele, bronchocele, etc.; (2) Evaluation of different aetiologies including congenital, inflammatory, senescent, neoplastic, diffuse cystic lung diseases; and (3) Recognition of characteristic CT imaging patterns in Diffuse cystic lung diseases (DCLDs) including Lymphangioleiomyomatosis, Birt-Hogg-Dubé Syndrome, Pulmonary Langerhans Cell Histiocytosis, Lymphoid Interstitial Pneumonia, Light-chain Deposition Disease, and Neurofibromatosis Type 1, as well as associated thoracic and extrathoracic findings.

Conclusion: Radiologists should be familiar with cystic lung lesions and their common mimics to enable correct classification of findings and accurate diagnosis. A broad spectrum of conditions and aetiologies come into question: from congenital, to senescent, neoplastic and in the setting of diffuse cystic lung diseases. This poster provides radiologists with a clear and strucutred algorithm to address cystic lung lesions, aiming to improve diagnosis and ultimately enhance clinical decision-making and patient management.

A32

Imaging Features Associated with Clinical Risk in Bronchiectasis: A Retrospective Two-Center Cohort Study

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Purpose: To characterize radiological features in patients with bronchiectasis stratified into High risk and Low risk subgroups, and to determine imaging findings associated with increased clinical risk.

Methods and Materials: This retrospective two-center study included 286 patients with bronchiectasis who underwent chest CT. Patients were stratified into a High Risk group (≥2 exacerbations/pneumonias within 6 months or ≥3 per year; n=52) and a Low Risk group (n=234). CT features - including extent of bronchiectasis, mucus plugging, consolidations, ground-glass opacities, emphysema, nodules, and air trapping - were extracted from structured review. Group differences were assessed using Fisher's exact test, odds ratios (OR), and descriptive comparisons.

Results: Mucus plugging was the strongest differentiating feature, present in 65.4% of High Risk patients compared with 15.8% of Low Risk patients (OR 10.06; p<0.01). High Risk patients also showed significantly higher rates of consolidations (53.8% vs 20.5%; OR 4.53; p<0.01) and ground-glass opacities (46.2% vs 23.5%; OR 2.79; p<0.01). Nodular abnormalities were more frequent in the High Risk group (57.7% vs 44.9%; OR 1.68; p=0.12), though not statistically significant. Air trapping was rare in both subgroups (3.8% vs 3.0%; OR 1.30; p=0.67). The extent of bronchiectasis (focal vs diffuse) did not differ meaningfully between groups.

Conclusion: High risk bronchiectasis patients demonstrated not only a greater prevalence of bronchiectasis but also more extensive and complex involvement, with mucus plugging emerging as a key distinguishing feature. Air trapping was confined to the High risk group. These findings underscore the structural and functional disease burden in High risk bronchiectasis and highlight imaging biomarkers that may aid in risk stratification.

A290

Value of chest CT in pediatric polytrauma patients: could it be replaced by chest x-ray?

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Purpose: Our purpose is to show that conventional chest x-rays combined with abdominal CT is sufficient for the reliable detection of relevant traumatic lung and chest wall injuries in children.

Methods and Materials: This is a monocentric retrospective study approved by the ethics committee and patients' written consent. We included all polytrauma children (≤18y) addressed to our emergency department between 2005 and 2023 who underwent whole-body CT and chest x-ray within 24 hours. Exclusion criteria were the absence of trauma or missing chest/abdominal CT or chest X-ray. A total of 168 patients were analyzed (mean age 11y5m ±4.87y, range 7m–16y11m; 112 males). Clinical data including trauma mechanism, final diagnoses, invasive treatment of the chest lesions and immediate outcome were collected. Three radiologists independently and blindly evaluated each chest x-ray, focusing on traumatic chest lesions, especially pneumothorax. Results were compared with abdominal CT and chest CT, which was the standard of reference. Diagnostic performance and inter-rater reliability were calculated using RStudio.

Results: Chest CT revealed pneumothorax in 40 patients (23.8%), haemothoraces in 5 (3%), and lung contusions in 91 (54.2%). The accuracy for pneumothorax of chest x-ray ranged from 84-95%, while the one of abdominal CT was 97%. Cohen's kappa reliability among the three readers was <0.8, moderate. Pneumothorax was the main lesion requiring invasive treatment, since 12 patients underwent pleural drainage. One patient required bronchoscopy for aspiration, while all the other traumatic chest lesions were conservatively treated. Missed pneumothoraces on abdominal CT didn't need invasive treatment.

Conclusion: Combining chest x-ray with abdominal CT leads to a reliable detection of relevant traumatic chest lesions in children, with no negative impact on patient management, obviating an additional chest CT examination.

A269

Retrospective observational study of contrast agent extravasation.

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Purpose: Contrast media extravasation (CMEx) is one of the most common und probably widely underreported minor adverse events in radiology. Severe complications are very rare, but the potential impact on patient and referrer satisfaction is significant.

Methods and Materials: In our department a CMEx reporting system has been established including a standardized documentation form and standardized treatment guidelines for CMEx. In this retrospective observational study the forms from 01.01.2020 up to 25.11.2025, including CMEx from contrast enhanced CT, MRI and PET-CT, were analyzed. Statistical computations were performed with R for statistical programming. Continuous variables are given as mean±SD.

Results: We report a total of 229 CMEx in a total of 333 129 contrast applications, resulting in an incidence of 69/100 000 contrast applications (0.07%). Mean age was 65.8±18 years. The most common injection site was the antecubital fossa (74%, 170/229), followed by the lower arm (17%, 40/229). The mean extravasate volume was 70.5±49.9 ml (contrast agent plus saline chaser). 83 patients received a high flow examination (≥3.5ml/s). Around half of the injection lines were placed by the radiographer (49%, 112/229) or the radiologists (2%, 5/229) while half of CMEx were from cannulas placed by the referrer (49%, 112/229). There were prior vein punction on the same extremity in 17% (39/229) and saline control application was performed in 98% (225/229). Nearly all patients displayed swelling of the injection site (83%, 190/229) and/or pain (65%, 148/229). In two patients (0.9% of CMEx) more serious complications of necrosis and skin sloughing occurred.

Conclusion: CMEx is uncommon during radiological contrast procedures but serious complications may occur. Awareness of risk factors may have the potential to reduce the occurrence of CMEx.

A170

Endovascular treatment of hepatic artery bleeding and pseudoaneurysms using stent-grafts: a retrospective single-center analysis

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Purpose: To assess the technical and clinical success and complications of treating hepatic artery bleeding or pseudoaneurysms using stent-grafts.

Methods and Materials: This single-centre retrospective study included patients who underwent attempted hepatic artery stent-grafting for active bleeding or pseudoaneurysm between January 2010 and June 2021 at Heidelberg University Hospital's Radiology Department.
Patient characteristics, procedural parameters, technical success, primary and secondary clinical success and complications were analysed. The study was approved by the medical faculty's ethics committee (S-354/2022). Statistical analysis was performed using SPSS (v27) with significance set at $p \leq 0.05$.

Results: Technical success was achieved in 96.6% (56/58) of cases. Primary clinical success was 87.9% (51/58), increasing to 91.4% (53/58) after reintervention (secondary success). Undersizing of the stent-graft by ≥1 mm was documented in 19 cases, mostly in vessels ≥6 mm, and was associated with primary clinical failure in 3 cases.
Take-off angle of the celiac trunk was significantly smaller in patients treated via a transbrachial approach (30 ± 10°) or a steerable sheath (23 ± 18°), compared to successful transfemoral procedures using non-steerable sheaths (54 ± 19°, $p = 0.03$ and $p = 0.05$, respectively).
Kaplan–Meier analysis showed a median occlusion-free survival of 763 days. Patency rates were 65.4 ± 8.6% at 90 days and 46.2 ± 11.8% at 2 years. Early occlusion (≤ 30 days) was associated with significantly smaller stent-graft diameters (mean 4.7 ± 0.7 mm vs. 5.4 ± 0.7 mm, $p = 0.012$).

Conclusion: Molecular imaging may help diagnosing this rare disease and can guide successful biopsy.

A165

Validation of Peak Skin Dose estimation using Radimetrics in C-arm systems

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Purpose: This study aims to provide the first quantitative evaluation of Peak Skin Dose (PSD) estimates generated by the Radimetrics dose management software for fixed C-arm angiography systems during interventional radiology procedures. A broader objective is to assess the reliability of PSD calculations for retrospective dose monitoring and skin injury risk analysis across 7 fixed C-arm angiography units in cardiology and hybrid operating rooms at the Ente Ospedaliero Cantonale, and to evaluate feasibility on about 15 mobile C-arm imaging systems.

Methods and Materials: Radimetrics was configured to calculate PSD based on exposure parameters provided by the Radiation Dose Structured Report (RDSR). Accurate PSD estimation depends both on details reported in the RDSR, like the beam quality and the exposure geometry, and on correction factors for table attenuation and the backscattering. The latter are provided by default by lookup tables within Radimetrics. The PSD validation involves the comparison of the software estimations with direct dosimetric measurements performed on phantoms using Gafchromic films and TLDs. Clinical validation through in vivo data is part of the intended workflow.

Results: Initial testing confirms successful integration of angiographic RDSR data into Radimetrics. Generated PSD maps are consistent with expected spatial distributions based on procedural geometry. Preliminary phantom measurements demonstrate feasibility of physical validation. Quantitative results will be presented at the congress, with focus on accuracy and potential systematic deviations.

Conclusion: This work establishes the feasibility of comparing Radimetrics generated PSD maps to measurement-based skin dose estimates. Preliminary observations support the potential of this methodology for retrospective patient dose evaluation in clinical practice. Quantitative accuracy and clinical implications will be shown in the full presentation.

A103

VACTILib: An open-source software for objective assessment of CT image quality

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Purpose: Objective assessment of CT image quality is essential to optimize exam protocols, particularly patient dose; however only a handful of open source libraries with reference datasets are currently available. ACTILib is a library designed to provide a documented and validated implementation of key quality metrics for CT images, based exclusively on freely available software.

Methods and Materials: ACTILib was developed in Python and relies only on commonly available packages. The core library implements core functions for analysing noise (Global Noise Level, Noise Power Spectrum), frequency response (e.g. Task Transfer Function) and the model observer based detectability index (d'), in addition to other low-level helper functions. These functions can be individually tested and used in programs to batch process CT datasets; the documentation includes references to the underlying literature.
Small graphic interfaces have been added to inspect images, facilitate the definition of ROIs and preview the analysis results.
A reference dataset of phantom CT images is also included in the library to facilitate testing and comparisons.

Results: The library has been tested against two other commonly used softwares with good performance in terms of deviations from the reference, Pearson correlation and t-test for compatibility. Isolated deviations can be explained in terms of the characteristics of the specific implementation. The public repository is available for collaborations.

Conclusion: ACTILib is a documented, validated and publicly available library that can be used to perform automated objective assessment of CT images.

A233

Designing and Evaluating Integration of Uncertainty Quantification in AI-Assisted Multiple Sclerosis Imaging: An Ongoing Multi-Stakeholder Study

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Purpose: Artificial intelligence (AI) is increasingly used to support MRI-based assessment of multiple sclerosis (MS), yet current systems rarely communicate how confident they are in their outputs. To address this gap, and in line with the expectations of clinicians, engineers, regulators, and ethicists, we launched an online study in November 2025 to examine how uncertainty information—how stable an AI prediction remains under slightly different conditions—should be communicated. We also investigate how such communication influences trust and perceived transparency.

Methods and Materials: This ongoing study builds on two prior investigations: (1) Development of uncertainty quantification metrics in MS automatic lesion segmentation (Molchanova et al., 2025), and (2) a participatory design workshop exploring how multidisciplinary stakeholders understand and prioritise human interpretable uncertainty-related indicators. Insights from these studies informed the design of an online survey targeting clinicians. The survey assesses participants' interpretations of certainty and uncertainty, their preferences for visualisation strategies (including feature-based explanations), and their perceived impact on trust. The target sample size is 90 participants.

Results: Our study is ongoing. Preliminary results suggest heterogeneous expectations: clinicians want to understand why a model is certain, whereas engineers focus on explaining why a model is uncertain. These divergences highlight the need for display formats that bridge technical meaning and clinical relevance.

Conclusion: This study will provide the first systematic evidence on how uncertainty visualisations can be designed to meet the needs of diverse stakeholders while supporting transparency, oversight, and trust in AI-assisted MS imaging. We aim to present the first results at the upcoming event.

A110

Individual patient dose in Computed Tomography: where do we stand?

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Purpose: In the diagnostic domain Computed Tomography is the primary source of radiation exposure to the population; an accurate estimation of patient dose is therefore essential for assessing the risk to the individuals in addition to optimize the clinical protocols. In this work the current standard for estimating the patient dose is discussed, together with its limitations and some proposed alternatives.

Methods and Materials: The most established patient dose metric, the CT Dose Index (CTDI), has been analyzed in terms of historical development, standard definition, clinical meaning and limitations, with support of examples from the daily practice. A literature-based review of proposed developments for patient dose estimation resulted in a number of solutions currently in use or being investigated, ranging from updated definitions to completely new approaches to patient dose estimation; these solutions have been discussed in terms of their strenghts and weaknesses.

Results: Although well-defined and widely accepted, CTDI suffers from significant limitations. Studies have been made in three different directions: a) by applying operational changes to the existing definition, b) by substantially altering the definition, and c) moving to a completely different method. None of the currently available approaches significantly reduces the challenges posed by the estimation of the individual the patient dose.

Conclusion: CTDI remains the most practical tool for the estimation of patient dose and optimization of scan protocols, however the estimation of the individual patient dose remains a challenge.

A232

Why Some Effusions Appear Hyperdense at Low keV on Photon-Counting CT: Could Chloride-Related Attenuation Explain the Phenomenon?

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Purpose: High attenuation in pleural or pericardial effusions on low-keV Photon-Counting CT (PCCT) can raise concern for hemothorax or occult enhancement. Serous fluids usually approximate serum electrolyte composition (sodium ~135–145 mmol/L, chloride ~100–115 mmol/L), yet chloride levels may be higher in transudates from heart failure. Clarifying the impact of NaCl on monoenergetic HU values is essential for accurate interpretation.

Methods and Materials: A phantom containing NaCl solutions (0 - 3.6%) was scanned on a Siemens NAEOTOM Alpha PCCT system (140 kVp, pitch 0.8, Qr40f, 29 mAs). Monoenergetic images from 40 -190 keV were reconstructed. Mean HU values and HU-per-%NaCl slopes were quantified and compared with expected behavior (~12.6 HU/% at ~70 keV).

Results: Attenuation increased linearly with NaCl concentration and showed strong energy dependence, with slopes decreasing from ~25.9 HU/% at 40 keV to ~11.6 HU/% at 70 keV and ~5.8 HU/% at 190 keV, reflecting diminishing photoelectric contribution at higher energies. A 3.6% NaCl solution yielded up to ~90 HU at 40 keV. Extrapolation to physiologic chloride concentrations indicated that even chloride-enriched transudates would achieve only ~10–20 HU at 40 keV, well below values associated with hemothorax or contrast contamination. Thus, chloride concentrations achievable in vivo cannot explain pronounced hyperattenuation.

Conclusion: Although chloride increases low-keV attenuation via photoelectric effects, physiologic or moderately elevated chloride levels are insufficient to generate substantially hyperdense effusions. Marked attenuation elevations more likely reflect hemorrhage, protein-rich exudates, high cellularity, or spectral beam-hardening from adjacent contrast-enhanced structures. Multi-keV image evaluation remains essential to differentiate electrolyte-driven attenuation from clinically significant high-density effusions.

A92

Healthy knee cartilage T2 mapping assessed with GRAPPATINI and multi-echo spin-echo (MESE) at 3T: regional values, longitudinal repeatability and method agreement.

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Purpose: To compare T2 relaxation times in healthy knee cartilage using conventional multi-echo spin-echo (MESE) and accelerated GRAPPATINI MRI sequences, and to assess their reliability in a test-retest design.

Methods and Materials: The cohort was extracted from a prospective multicentric study of knee cartilage transplant, approved by the local ethics committee (BASEC-ID 2023-02168) with written informed consent. Nine patients (mean age: 38 ± 6 years, 6 men, 3 women) underwent baseline and follow-up knee MRI at 3T (MAGNETOM Prismafit, Siemens Healthineers, Forchheim, Germany) at 3, 6, and 12 months from June 2023 to April 2025, yielding 22 exams. Both sagittal T2 mapping MESE and accelerated GRAPPATINI sequences were acquired using a 15-channel knee coil. Regions of interest were delineated in normal cartilage of the medial and lateral femoral condyles and patella, segmented into superficial, intermediate, and deep layers. T2 values were compared using linear mixed-effects models; agreement and reproducibility were assessed by Bland-Altman, linear regression, and intra-class correlation coefficients (ICC).

Results: Mean T2 values ranged from 30.1 to 45.2 ms (MESE) and 27.8 to 47.7 ms (GRAPPATINI), varying significantly by cartilage depth ($p<0.001$). Both sequences showed no significant difference overall, except in the superficial lateral condyle ($p=0.022$). Bland-Altman analysis showed no systematic bias (mean difference: −0.26 ms). GRAPPATINI achieved higher reproducibility (regression slope=0.91; test-retest ICC=0.75) compared to MESE (slope=0.56; ICC=0.61), with shorter scan times (4:45 vs. 7:24 min).

Conclusion: Both T2 mapping methods provide consistent quantification of healthy knee cartilage, but GRAPPATINI offers superior reproducibility and reduced acquisition time. Depth-dependent T2 differences highlight the importance of layer-specific cartilage assessment in clinical and research settings.

A173

MRI Assessment of Anterior Cruciate Ligament Tears and Beyond: Associated Injuries and the Emerging Role of Kaplan Fibers

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Learning objectives: To provide an overview of ACL tears and their commonly reported associated lesions, with an emphasis on Kaplan fibers, a recently characterized anatomical structure.

Background: Anterior cruciate ligament (ACL) tears are among the most impactful knee injuries, often leading to long-term instability, cartilage degeneration, and early osteoarthritis. Delayed or incomplete management is associated with poorer outcomes, underscoring the importance of an early and comprehensive diagnostic assessment. MRI plays a key role by enabling both reliable confirmation of ACL rupture and detailed assessment of associated lesions that significantly affect prognosis. These include meniscal injuries—particularly ramp and Wrisberg lesions—as well as osteochondral, capsuloligamentous, and posterolateral corner involvement.

Increasing attention has been given to the Kaplan fibers, fascial extensions linking the iliotibial band to the distal femur. Their disruption contributes to rotational instability and may influence the success of isolated ACL reconstruction. Recognizing their importance has encouraged renewed interest in lateral extra-articular procedures aimed at improving rotational control and reducing the risk of reinjury.

Imaging findings or procedure details: This exhibit provides a pictorial review using a selection of cases from our institutional database, demonstrating the most illustrative examples of associated injuries. In addition, we detail the normal appearance and characteristic imaging features of newly recognized Kaplan fiber injuries, supported by high-resolution imaging examples.

Conclusion: A thorough MRI evaluation of ACL tears should systematically assess associated injuries such as meniscal, osteochondral, capsuloligamentous, and anterolateral lesions. The emerging recognition of Kaplan fiber involvement refines the understanding of rotational instability and should be incorporated into routine imaging.

A284

Gantry-based Cone-beam CT of the thoracolumbar spine: A phantom comparison with Photon-Counting CT and Energy-Integrating CT

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Purpose: While cone beam CT (CBCT) is commonly used in musculoskeletal imaging of the extremities, its application in spinal imaging has been restricted by small field-of-view (FOV) coverage. Recent advancements in gantry-based CBCT systems promise to enable comprehensive imaging of the spinal column. This study aimed to evaluate the performance of a novel gantry-based, multi-scan CBCT system for spinal imaging with complete anatomic coverage and compare it to energy integrating (EI)CT and photon counting (PC)CT using dose-matched protocols.

Methods and Materials: An anthropomorphic torso phantom was used to simulate human anatomy. Gantry-based CBCT scans of the thoracolumbar spine were performed using different presets (low-dose, enhanced, best quality), while EICT and PCCT scans followed dose-matched clinical protocols. Qualitative image analysis was assessed by three blinded readers using a 4-point Likert scale, and quantitative analysis was conducted using global noise level (GNL) measurements.

Results: CBCT achieved diagnostic-quality imaging for the thoracic and lumbar spine, particularly with "best" and "enhanced" presets. Subjective image quality was highest for PCCT, followed by EICT and CBCT. CBCT demonstrated lower GNL than EICT, nearing PCCT levels. However, high radiation doses (5 mGy) were required for CBCT imaging of the upper thoracic spine (Th1–Th6) due to anatomical complexity, while low doses (0,5 mGy) sufficed for the lower thoracolumbar spine (Th7–S1).

Conclusion: Gantry-based CBCT generated diagnostic-quality images of large spinal regions at relatively low radiation doses, although the upper thoracic spine (above Th6) required higher doses. The overall subjective image quality remained below EICT and PCCT.

A24

Anatomical features of the coracoacromial ligament in patients with and without rotator cuff tears: MRI study, measurement validation, and correlation with intraoperative findings

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Purpose: To evaluate anatomical characteristics of the coracoacromial ligament (CAL) on 3T arthro-MRI and their potential association with rotator cuff disease...

Methods and Materials: This single-center retrospective study included shoulder 3T arthro-MRIs of patients divided in three groups according to the presence of supraspinatus tendon lesion alone, supraspinatus tendon lesion and impingement at intra-operative findings, and patients without arthro-MRI abnormalities. Two musculoskeletal radiologists (5 years of experience) evaluated sagittal CAL thickness (at the acromial attachment, midportion, and coracoid insertion) and coronal CAL morphology (flat or upward-convex). Inter-reader reproducibility was assessed using intra-class correlation coefficients (ICCs) and Cohen's κ. Associations of CAL characteristics with rotator cuff disease were evaluated with non-parametric statistics.

Results: 161 patients (mean age 52±14.8 years, range 17–84 years; 60/161 females, 41.0%) were included, 72 without arthro-MRI rotator cuff abnormalities and 89 with rotator cuff disease confirmed intra-operatively. Inter-reader reproducibility was high for the evaluation of CAL thickness (at the acromial attachment: ICC 0.93, 95% CI 0.90–0.95; at the midportion: ICC 0.82, 95% CI 0.75–0.86; at the coracoid insertion: ICC 0.93, 95% CI 0.90–0.95) and CAL coronal morphology (κ=0.91, 95% CI 0.85–0.98). CAL thickness at the acromial and coracoid insertion was associated with supraspinatus pathology ($p<0.001$), especially with supraspinatus lesion and impingement (adjusted $p<0.001$). CAL convex shape was associated with cuff pathology ($p=0.019$), especially with supraspinatus lesion and impingement (adjusted $p=0.028$).

Conclusion: Increased CAL thickness at the acromial and coracoid insertions and CAL convex morphology are significantly associated with rotator cuff lesions and subacromial impingement

A85

Ultrasound of the Ulnar Nerve in Cubital Tunnel Syndrome: Anatomy, Compression Sites, Dynamic Evaluation, and Postoperative Assessment

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Learning objectives: To review the detailed anatomy of the ulnar nerve at the elbow and its common compression sites, establish a practical approach for static and dynamic ultrasound evaluation, characterize key sonographic markers of neuropathy, and define criteria for interpreting postoperative changes.

Background: Cubital tunnel syndrome represents the second most common entrapment neuropathy of the upper limb, after carpal tunnel syndrome. Although compression most frequently occurs at the cubital tunnel, several proximal and distal transition zones along the ulnar nerve may contribute to symptoms. High-resolution ultrasound allows a detailed assessment of the nerve and its surrounding anatomical environment.

Imaging findings or procedure details: The examination follows the ulnar nerve from the axillary fossa to the mid-forearm, focusing on its main sites of entrapment, including the medial intermuscular septum, the arcade of Struthers, the supracondylar region, the cubital tunnel, and the flexor carpi ulnaris aponeurosis. Assessment integrates qualitative and quantitative evaluation of nerve morphology, contours, course, and the adjacent soft-tissue and bony environment. Ultrasound provides continuous assessment of the nerve, allowing evaluation during dynamic maneuvers and identification of anatomical variants. Postoperative assessment focuses on nerve position, structural remodeling, and dynamic instability, allowing detection of incomplete release, perineural scarring, or new entrapment. A clear understanding of the standard surgical approaches is essential for reliable interpretation of postoperative ultrasound findings.

Conclusion: Ultrasound plays a central role in anatomical mapping, dynamic evaluation, and postoperative follow-up of the ulnar nerve in cubital tunnel syndrome. A standardized, anatomy-based protocol increases diagnostic confidence and optimizes management of compressive neuropathies at the elbow.

A53

Association of Diabetes Status with Bone Mineral Density Categories and Identification of High-Risk Age Strata in a Georgian Cohort: A Retrospective DXA Analysis

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Purpose: The well-established detrimental effect of diabetes mellitus on skeletal health frequently culminates in diminished Bone Mineral Density (BMD) and a heightened susceptibility to osteoporotic fractures. This study sought to quantify the prevalence of suboptimal BMD across diabetic status and identify the critical high-risk age bracket within this Georgian patient population.

Methods and Materials: We conducted a retrospective quantitative analysis on a cohort of 895 patients (aged 21 to 85 years) who received Dual-energy X-ray Absorptiometry (DXA) screening between 2023 and 2025 at two clinical facilities in Georgia. Data collected included age, sex, diabetic status, and other established factors influencing BMD. BMD was classified using standard WHO T-score and Z-score criteria into normal, osteopenia, and osteoporosis. The rates of low BMD were contrasted between diabetic and non-diabetic groups, supported by detailed age-stratified descriptive analysis.

Results: In the total cohort of 895 patients, 43.60% (n = 390) were diagnosed with osteopenia, and 27.6% (n = 247) with osteoporosis. The age stratum carrying the maximal burden of low BMD was 51–70 years, constituting 61% (n = 546) of the total study population. Diabetes was confirmed in 14.75% (n = 132) of patients; within this diabetic subgroup, 43.90% displayed osteopenia and 26.60% had osteoporosis. The descriptive analysis indicates that 70.5% of diabetic patients in this cohort exhibited low BMD (osteopenia or osteoporosis). Statistical analysis demonstrated that diabetes is an independent risk factor for low Bone Mineral Density (BMD) in the age-adjusted model.

Conclusion: These results highlight a substantial osteopenic burden within the diabetic patient population, primarily concentrated in the 51–70 year age range. Therefore, diabetic patients have a significantly higher risk of low BMD compared to non-diabetic individuals, underscoring the disease's role as an early and significant contributor to bone pathology.

A100

Imaging of the Ankle and Foot in Athletes – Common Pitfalls and Findings

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Learning objectives:
- To become familiar with the most common physiological adaptations and their imaging appearance in the ankle and foot of athletes.
- To differentiate between normal findings and true pathology in symptomatic athletes.
- To learn about foot and ankle pathologies commonly encountered in athletes.

Background: Injuries of the ankle and foot account for up to 40% of all sports-related trauma. In this setting, MRI plays a unique role, offering detailed insights into bone, cartilage, ligament, and tendon pathology. However, many athletes present normal physical changes related to training and repetitive load, which may mimic pathology on imaging. Recognizing these findings is critical, as misinterpretation can lead to over- or undertreatment, unnecessary restrictions and, for professional athletes, potentially lasting career and economic consequences. The poster will highlight five key pitfall areas in MRI assessment where normal anatomical variants and physiological adaptations may be mistaken for pathology.

Imaging findings or procedure details: Each of the five key pitfall areas will be provided with visual examples, demonstrating applied diagnostic reasoning and real-world scenarios to help distinguish normal findings from clinically relevant abnormalities.

Conclusion: A solid knowledge of anatomical variants and physiological adaptations is essential to confidently and accurately interpret the ankle and foot of athletes, enabling appropriate care and supporting long-term performance.

A20

Comparison of radiomics-based models for detection of Modic type 1 changes in photon counting detector CT images of the lumbar spine

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Purpose: To compare different radiomics-based machine learning models for detecting Modic type 1-changes of the lumbar spine in photon-counting detector CT images, using MRI as the reference standard.

Methods and Materials: Lumbar spine CT images from 60 patients with corresponding MRI showing at least one level of Modic type 1 changes between L1 and S1 were analyzed, and 105 radiomic features were extracted from 360 segmented vertebral bodies. Using nested cross-validation, Least Absolute Shrinkage and Selection Operator (LASSO), Random Forest, Extreme Gradient Boosting (XGBoost), and support vector machines (SVM), were trained and evaluated based on area under the receiver operating characteristic curve (AUC). AUC values were compared using the DeLong Test. Additionally, sensitivity, specificity and the F1-score were calculated for each model.

Results: LASSO achieved the highest AUC (0.842); no statistically significant differences in AUC across the models were observed (p=0.337). Sensitivity was highest for LASSO (0.756), whereas specificity was highest for SVM (0.929). The highest F1-score was observed for XGBoost (0.625).

Conclusion: Four radiomics-based machine learning models demonstrated high discriminatory performance but differing diagnostic performance for detecting Modic type 1-changes on photon-counting CT images. These results support the utilization of radiomics models to expand the use of CT scans for evaluating a broader range of pathologies beyond visual inspection.

A263

Impact of CT-like MRI on radiological and surgical assessment of thoracolumbar spine fractures

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Purpose: Diagnostic workup of thoracolumbar fractures often requires both CT and MRI for the preoperative assessment of osseous and discoligamentous structures, as conventional MRI often fails to adequately visualize bone. This study aimed to compare the diagnostic utility and morphometric accuracy of 3D-spoiled gradient echo (3DGRE) sequences against standard CT for spine fracture assessment.

Methods and Materials: This retrospective study evaluated 38 patients with acute thoracolumbar compression or burst fractures who underwent both CT and MRI with 3DGRE sequences. Two radiologists performed qualitative (image quality, diagnostic confidence, delineation of osseous contours, Genant classification, visibility of the fracture line) and quantitative analysis (geometric measurements of vertebral bodies and pedicles). In 15 cases, AO fracture classification will be performed by 3 spine surgeons on different image sets (MRI±3DGRE;MRI+CT), to assess impact on treatment decisions. Interferential comparison used Benjamini-Hochberg adjusted p-values.

Results: Qualitative scores and geometric measurements were statistically comparable across both modalities (corrected p-value > 0.05). A significant difference was observed only in the rating of imaging artifacts (corrected p-value = 0.04), with the MRI showing higher mean artifact score (1.71) compared to CT (1.00). No significant effect of different CT scanners was found, including photon-counting CT (corrected p-value > 0.05). Interreader agreement was moderate to substantial. Surgical AO classifications will be compared between modality combinations.

Conclusion: Our results suggest that CT-like 3DGRE MRI provides widely comparable diagnostic assessment and morphometric accuracy to standard CT for the pre-surgical workup of thoracolumbar spine fractures. The ability to acquire detailed bone and soft tissue information in a single, non-ionizing examination may streamline treatment decisions.

A1

Does Extra-Skeletal Chondrosarcomas manifest distinct MRI radiomics features compared to myxoid liposarcoma and pleomorph sarcoma, and does it have common features with skeletal chondrosarcoma?

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Purpose: The aim of the study was to assess if some features of radiomics are common to extra-skeletal chondrosarcoma (ESC) and skeletal chondrosarcoma (SC), and to distinguish this rare entity from the most frequent encountered soft tissue sarcoma (myxoid liposarcoma MLS and pleomorphic sarcoma PS) in MRI imaging.

Methods and Materials: Retrospective study on our radiological data base (PACS archive) confronted to data from multidisciplinary sarcoma Concilium, with the evaluation of 150 radiomics features that were extracted from volume-of-interest on T1 and T2-weighted spin-echo MRI, from 19 tumor cases (4 ESC, 5 CS, 5 PS and 5 MLS, based on histopathological diagnosis). These radiomics features were then used to train Random Forests to select the best 10 features for the classification of the 4 types of tumors. Then we used a logistic regression to evaluate the best pair of features for dichotomy classification: EOC and OC versus the other types (MLS, PS).

Results: The visual evaluation of the feature scatter plot confirms the separability of the ESC and SC against the other types of tumours. The evaluation of the logistic regression resulted of a sensitivity of 0.93 specificity of 0.92 for an overall accuracy of 0.92 with the following features: gray level co-occurrence matrix (GLCM) inverse difference moment normalized (on T2 sequences) and GLCM correlation (on T1 sequences). We consider this preliminary study promising for the use of radiomic features in the differentiation of extra-skeletal and skeletal chondrosarcoma from other soft tissue tumors.

Conclusion: Despite being developed on few cases, 2 radiomics features accurately distinguishes the chondrosarcoma group (ESC + SC) from the MLS and PS on MRI with an overall accuracy of 0.92. We as well evaluated that the chondrosarcoma group had identical profiles on all the radiomic features tested.

A293

Seeing the Unseen: Clinical Validation of Deep Learning-Based Opportunistic Bone Density Assessment on Routine MRI

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Purpose: Osteoporosis often remains undetected until fragility fractures reveal reduced bone mineral density (BMD). Dual-energy X-ray absorptiometry (DXA), the reference standard for BMD assessment, is typically performed only in at-risk patients, leaving many cases unrecognized. Routine spinal MRI offers a radiation-free, cost-neutral opportunity for opportunistic bone assessment.

Methods and Materials: This retrospective study evaluated a deep learning model's (DLM) ability to detect low BMD on thoracic and lumbar spine MRI, using DXA as the reference standard. The DLMl segments vertebrae, classifies each vertebra's bone mineral density (healthy, osteopenia, osteoporosis), and returns a single classification per MRI scan. 120 lumbar and thoracic MRI scans from 118 patients were paired with DXA scans obtained within 30 days before or 90 days after MRI (100 women, mean=64.4 years SD=10). Performance was measured by the DLM´s ability to flag low BMD (defined as osteopenia or osteoporosis) and the accuracy of its classifications.

Results: The model achieved low-BMD detection with a sensitivity of 0.65 and a specificity of 0.85. Agreement with DXA was 0.51 (95% CI=0.35–0.65) and the F1-score was 0.71. Subgroup analyses confirmed consistent performance across age, sex, manufacturer and whether the MRI preceded or succeeded the DXA scan.

Conclusion: This study provides the first evidence that DLM can reliably detect low BMD on routine lumbar and thoracic spine MRI, with clinically meaningful agreement to DXA. AI-enabled MRI screening offers a promising avenue to close the preventative gap in osteoporosis care.

A190

The impact of iodinated contrast medium on bone mineral density (BMD) quantification in computed tomography: a monocentric retrospective study evaluating phases, sex and age differences

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Purpose: The primary purpose of this study was to assess the impact of iodinated contrast medium on bone mineral density (BMD) measurement in CT scans. The secondary purpose was to evaluate the impact of contrast medium on different acquisition phases, stratified by sex and age.

Methods and Materials: CT examinations acquired in the emergency room between January 2019 and September 2021, before and after contrast medium administration, were included. On axial images, a round region of interest was traced on the first lumbar vertebra and the Hounsfield units (HU) values were recorded. Statistical analysis compared BMD differences across different acquisition phases. Stratified analyses by sex and age were also performed. Significance was set at $p<0.05$.

Results: A total of 295 CT acquisitions from 100 patients (52 males; 48 females) were included. There was a significant difference in BMD among native, arterial and portal venous phases ($p<0.001$). Specifically, BMD in arterial and venous phases differed significantly from the native phase ($p=0.007$ and $p<0.001$, respectively). Males showed a BMD higher of 19.1 points compared to females ($p=0.0007$); younger people showed a higher BMD compared to older people ($p<0.001$). Overall, significant differences in density emerged between phases in all stratified analyses.

Conclusion: Unenhanced and enhanced CT show significant differences in BMD quantification, particularly when comparing the venous and native phases. These differences were consistent across analyses performed according to sex and age.

A281

Radiomics and Visual Ultrasound Assessment as Predictors of Sarcopenia in Geriatric Inpatients

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Purpose: Muscle ultrasound (US) is increasingly used to assess sarcopenia, yet the relationship between visual interpretation, quantitative radiomics, and functional outcomes remains unclear. This study investigated whether visual ultrasound features and radiomics-derived texture parameters reflect clinically relevant sarcopenia indicators in geriatric inpatients..

Methods and Materials: Thirty-six inpatients (86.6 ± 5.7 years; 51% female) underwent US of the rectus femoris, vastus lateralis and gastrocnemius medialis. Visual assessments (architecture, echogenicity, Heckmatt grade, global interpretation) were aggregated per patient using worst-category scoring. Radiomics features were extracted from all muscles and summarized using the median. Associations with SARC-F, Nutritional Risk Score (NRS), and maximal handgrip strength (HGS_max) were tested using Mann–Whitney U and Spearman correlation, all ($p<0.05$). A logistic model evaluated predictors of SARC-F ≥4.

Results: SARC-F ≥4 was significantly associated with worse ultrasound features: architecture ($p=0.034$), echogenicity ($p=0.041$), Heckmatt grade ($p=0.013$) and global interpretation ($p=0.005$). Multiple wavelet-based ClusterShade radiomics features showed moderate negative correlations with visual severity ($\rho=-0.40$ to -0.51, $p<0.02$), decreasing progressively from normal to severe categories. No associations were found with NRS. In logistic regression, global interpretation independently predicted SARC-F ≥4 (OR=6.9, 95%CI 1.3–36.6, $p=0.023$), achieving an AUC of 0.82. ClusterShade did not remain significant when interpretation was included, suggesting collinearity.

Conclusion: Visual muscle US abnormalities strongly reflect functional sarcopenia risk, and radiomics, quantitatively capture the same structural deterioration seen by clinicians. Combined multi-muscle ultrasound assessment with radiomics offers a pathway toward automated, objective muscle quality evaluation in geriatric care.

A187

Can Coxa Valga or Trochanter Minor Size predict Femoral Antetorsion?

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Purpose: Femoral torsion (FT) contributes to hip pain in femoroacetabular impingement (FAI) and hip dysplasia (DDH). Coxa Valga et antetorta was historically described in children.The current standard for assessing FT is CT / MRI but it remains unclear if FT can be estimated on AP pelvic radiographs using the neck shaft angle (NSA) or the size of the lesser trochanter (LT).

Methods and Materials: A retrospective analysis of 508 hips in 437 patients (01/2011–12/2015) with CT/MRI and radiographs was performed. Inclusion criteria were symptomatic hips with FAI or DDH, availability of standard supine AP pelvic radiographs obtained at our institution, and availability of CT or MRI including the distal femur condyles.
FT was measured using the Murphy method on CT/MRI. The LT profile size on AP radiographs was assessed using two measurement techniques.
NSA was measured on AP radiographs to assess coxa valga (NSA> 140) or coxa vara.
Subgroup analyses were performed based on femoral neck-shaft angle (CCD angle), femoral antetorsion(FT>25°), femoral retrotorsion (FT <0°), cam-type FAI, and DDH. Pearson correlation was assessed between NSA and FT and also between LT size and FT.

Results: No significant correlation was found between coxa valga and femoral antetorsion (r=0.11) and between NSA and FT (r=0.27)
No significant correlation was found between LT size and FT (r = 0.11-0.21).
In patients with femoral retrotorsion, normal FT and femoral antetorsion the NSA was 131°, 131° and 135°
and the LT size was 7 mm, 8mm and 9 mm . No significant differences between the three subgroups were found.

Conclusion: Femoral torsion (FT) is important in patients with hip pain due to femoroacetabular impingement (FAI) and hip dysplasia (DDH). Neither NSA nor LT size showed a correlation with FT, that underlines that FT can not be predicted on conventional AP pelvic radiographs. This study confirms, that the standard for assessing FT is CT / MRI.

A213

Can Pelvic morphology and pelvic width predict Acetebular Anteversion and Acetabular Retroversion?

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Purpose: Acetabular Version (AV) is important for patients with pain due to femoroacetabular impingement or hip dysplasia. Unfortunately Clinical test and the especially the anterior hip impingement test are unspecific. cross over sign is mainly used for diagnosis of acetaublar retroversion, unfortunately this sign is highly prevalent and unspecific.It is unclear if pelvic morphology or pelvic width can predict Acetabular Retroversion.

Methods and Materials: A retrospective analysis of 181 hips in 150 patients (01/2011–12/2015) with CT/MRI and radiographs was performed. Inclusion criteria were symptomatic hips with FAI or DDH, availability ofstandard supine AP pelvic radiographs obtained at our institution, and availability of CT or MRI including the entire pelvis.
Acetabular version was measured central and cranial using the axial CT/MRI.
Pelvic withd index and Foramen obturator index was evaluated and correlation with AV was assessed.
Three subgroups were compared: Patients with cam-type FAI, hip dysplasia and with acetabular retroversion.

Results: A significant correlation between Pelvic width and central acetabular version was found (r=0.61).No significant correlation between Pelvic width and cranial acetabular version was found (r=0.2).
Patients with hip dysplasia had higher AV and higher pelvic width index compared to patients with acetabular retroversion.
No significant correlation between Foramen obturator index and central acetabular version was found (r=0.18).

Conclusion: Pelvic width measured on AP radiographs correlates with central Acetabular Version.Patients with acetabular Retroversion can be detected on AP radiographs and this study could help to predict acetabular retroversion on AP radiographs, especially because the currently used cross over sign is unspecific.
This study has implications for patients with pincer-type FAI due to acetabular retroversion and for planning of hip preservation surgery.

A287

Automated baseline osteophyte volumes are associated with 4-year osteoarthritis progression

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Purpose: To examine the association between baseline osteophyte volumes and 4-year osteoarthritis (OA) progression in the Foundation for the National Institutes of Health (FNIH) Osteoarthritis Initiative (OAI) nested case–control cohort.

Methods and Materials: Data were analyzed from the FNIH OAI nested case–control cohort. Eligible participants had at least one knee with frequent pain and a baseline Kellgren–Lawrence grade (KLG) of 1–3. Knees were classified as progressors (cases) or non-progressors (controls) based on 4-year outcomes. Progression was defined as a minimum joint space width (minJSW) loss ≥0.7 mm and a persistent increase ≥9 points on the WOMAC pain subscale (0–100). Cases (n=163) and controls (n=179) were matched for age, sex, body mass index (BMI), and baseline radiographic severity (KLG, minJSW). Baseline sagittal DESS MRI scans were segmented using a 3D convolutional neural network trained on 28 external scans to quantify osteophyte volumes automatically. The automated measure demonstrated excellent validity relative to the gold-standard grading (Spearman's ρ = 0.86). Logistic regression was used to estimate adjusted odds ratios (OR) for progression based on a one–standard deviation increase in osteophyte volume.

Results: Higher baseline osteophyte volume was significantly associated with OA progression (OR 1.4, 95% CI 1.1–1.8, p = 0.005). Baseline demographic and radiographic characteristics (age, sex, BMI, minJSW, KLG) did not differ between groups, consistent with the matched cohort design.

Conclusion: In this cohort, automated baseline osteophyte volume was significantly associated with 4-year OA progression. Automated osteophyte volume quantification shows promise as an imaging biomarker for identifying individuals at risk of progression.

A225

Meckel's Diverticulum: the great radiologic mimicker.

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Learning objectives: To review the embryology and epidemiology of Meckel diverticulum; to illustrate its diverse clinical and imaging presentations in children; and to provide practical multimodality tips for accurate identification of the diverticulum and its complications.

Background: Meckel diverticulum, a remnant of the omphalomesenteric duct, is the most common congenital gastrointestinal anomaly, present in up to 2% of the population. Pediatric patients frequently present with complications rather than incidental detection. The clinical spectrum, -- including painless rectal bleeding, inflammation, perforation, intussusception, and small-bowel obstruction -- creates significant diagnostic overlap with appendicitis and other abdominal emergencies. Imaging thus plays a central role in timely diagnosis and management.

Imaging findings or procedure details: This exhibit showcases typical and atypical imaging features across ultrasound, CT, and MRI. Ultrasound may reveal a blind-ending, thick-walled tubular structure arising from the distal ileum, sometimes with surrounding fat stranding or hyperemia. Inflammatory forms mimic appendicitis, whereas intussusception-related presentations may show a trapped, non-compressible diverticulum within the intussusceptum. CT and MRI help identify a fluid- or gas-filled diverticulum, transitional points in obstruction, or complications such as volvulus around a fibrous band. Some diagnostic pitfalls are confusion with enteric duplication cysts, appendix duplication, or small-bowel loops.

Conclusion: Understanding the wide imaging spectrum of Meckel diverticulum is essential for radiologists evaluating acute pediatric abdomen. Familiarity with key diagnostic signs and common mimics enables earlier recognition, guides appropriate surgical intervention, and reduces morbidity. This educational review equips clinicians with practical tools to improve diagnostic confidence in this often-elusive condition.

A236

Ovarian Lesions in Girls - Challenge accepted

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Learning objectives: Ovarian lesions in the pediatric population range from non-neoplastic, such as functional cysts, torsion, endometrioma, lymphangioma and infectious changes to neoplasms, which are divided into germ cell (Mature teratoma, Immature teratoma, Dysgerminoma), epithelial, sex-cord stromal and miscellaneous tumors. There exist even mixed forms that are especially difficult to diagnose.

Background: Adnexal masses, including both non-neoplastic lesions and neoplastic tumors, can occur in all age groups. The incidence, clinical presentation and histological distribution of such lesions in children and adolescents are distinct from those in adults. Abdominal masses in girls most commonly originate from the ovaries. Clinical manifestations are usually non-specific and vary from abdominal pain, palpable mass, nausea/vomiting and endocrine alterations, such as menstrual abnormalities, precocious puberty and virilization. Therefore it is important to know the specific imaging diagnostic criteria for the different lesions.

Imaging findings or procedure details: This poster enhances specific diagnostic patterns (ultrasound and MRI) for the different entities, starting with the normal appearance of cyclic changes in the ovaries, divided into two main phases - the follicular phase and the luteal phase - to the different neoplastic ovarian masses. It shows pitfalls and demanding cases, especially in the detection of malignant neoplasms. With the help of the International Ovarian Tumor Analysis (IOTA) the risk of malignancy in adnexal masses can be estimated using ultrasound features while the Ovarian-Adnexal Reporting and Data System (ORADS) provides a scoring system that uses MRI criteria for the risk stratification.

Conclusion: Ovarian pathologies in children and adolescents require a particularized diagnostic and therapeutic approach. It is fundamental to understand the different image appearances of the ovarian cycle and different ovarian masses, especially the criteria for malignancy, in the pediatric population.

A91

Pediatric Venous Thrombosis

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Learning objectives: Pediatric venous thrombosis(VT) is a rare but life-threatening condition with severe consequences. Its etiology and management in children differ significantly compared to the adult population. The purpose of this educational review is to consider imaging findings according to risk factors for pediatric VT.

Background: Pathophysiology in pediatric VT is based on Virchow's triad but with different triggers. Children's population is not typically exposed to acquired factors such as atherosclerosis, hypertension or diabetes. Chronic diseases lead to repetitive use of catheters, surgical interventions with prolonged immobilization and higher rate of infections. The factors mentioned lead to higher thrombotic risk affecting mainly neonates and adolescents.

Common etiologies:

- Iatrogenic factors: central venous catheters are considered the number one cause of VT as they induce endothelial injury and disrupt laminar blood flow.
- Inflammation: acute or chronic inflammatory states activate a wide range of pro-thrombotic mediators, lead to dehydration and consequently blood stasis.
- Anatomic variant: congenital vascular anomalies such as duplicate Inferior Vena Cava predispose to venous stasis and can lead to thrombus formation with minor triggers like dehydration.

Imaging findings or procedure details: CT was the method of choice as all of the exams were performed in an emergency setting and thrombosis was rarely expected. Pediatric CT protocols were used with the lowest possible radiation dose and contrast volume at a lower rate. One patient was already known to have congenital anomaly so ipsilateral leg venous access was used.

Conclusion: Pediatric venous thrombosis is considered a critical medical emergency with life threatening consequences. Radiologists play a crucial role in its timely and efficient diagnosis. Higher attention is demanded for children with congenital vascular anomalies or inflammatory conditions even when symptoms point otherwise. Recognizing this condition in time is crucial for correct diagnosis and treatment

A230

Implementation of a Playful MRI Simulator at Neuchâtel Hospital: Protocol and Expected Benefits

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Purpose: To describe the implementation of a playful MRI simulator at Neuchâtel Hospital and to evaluate its expected impact on reducing general anesthesia use and improving cooperation and workflow in pediatric MRI.

Methods and Materials: A playful MRI simulator (DOmed, Lyon) was installed in a dedicated room adjacent to the MRI unit. The targeted population includes children aged 3–8 years without significant developmental delay. Sessions consist of immersive simulation with MRI-like sounds, tunnel environment, table motion and video distraction to promote immobility. Data being collected include patient age, MRI indication, diagnostic MRI completion without general anesthesia (GA), need for secondary GA, image quality, workflow duration and parental satisfaction. Costs are evaluated in Swiss francs, comparing MRI with and without GA.

Results: Data collection is ongoing. Based on published experiences from European centers, a substantial reduction in GA use, cost savings of several hundred CHF per avoided GA, shorter waiting times for anesthetized MRI slots and improved workflow are expected. High parental satisfaction and improved child experience are consistently reported.

Conclusion: The implementation of a playful MRI simulator is expected to enhance cooperation, reduce reliance on general anesthesia and improve workflow efficiency in pediatric MRI. Ongoing analysis of local data will determine its real-world impact within the Swiss healthcare system.

A254

Optimization of Dental Implant Imaging using Photon Counting Detector Computed Tomography in Dentomaxillofacial Surgery

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Purpose: To determine optimal reconstruction parameters for dental implant imaging using photon-counting detector CT (PCD-CT), including ultra-high resolution (UHR) images, virtual monoenergetic images (VMI) and optional iterative metal artifact reduction (iMAR).

Methods and Materials: In this ex vivo study, six pig mandibles, each with two titanium implants, were imaged on a PCD-CT at Sn140 kV. Data were reconstructed as UHR images at 0.2 mm and as 0.4-mm VMI from 70–190 keV, each with and without iMAR. Non-iMAR series used a sharp Hr76 kernel; iMAR series used Hr56. Two independent readers rated image quality and artifact severity on five-point scales (5=excellent, no or minimal artifacts; 1=non-diagnostic, severe artifacts). Artifact magnitude was quantified by two readers using regions of interest placed in the most pronounced streaks adjacent to the implants.

Results: UHR images without iMAR yielded high image quality (median 5, for both readers) with minor artifact severity (median 4, for both), whereas iMAR reduced image quality (median 3, for both). VMI without iMAR showed decreasing artifacts with higher energy levels. VMI at 120-130 keV achieved optimal image quality (median 5, for both at 120 keV and medians 4 and 5 at1 30 keV) with minimal artifacts (median 5, for all), whereas iMAR again reduced visual rating scores. Quantitative artifact burden decreased with increasing energy levels. The use of iMAR worsened the artifact burden for VMI at 130 keV (median 121 HU, IQR 60-224 HU versus median 182 HU, IQR 61-262 HU) and for UHR images (median 206 HU, IQR 156–350 HU versus median 373 HU, IQR 201-441 HU).

Conclusion: PCD-CT effectively reduces metal-induced artifacts in dental implant imaging, with UHR reconstructions and VMI at 120–130 keV combined with a sharp reconstruction kernel providing optimal image quality, while additional iMAR application offered no further benefit.

A128

MRI and Endometriosis ESUR Consensus 2025

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Learning objectives: Understand MRI indications for suspected endometriosis, apply the ESUR recommended protocol, recognize key imaging features across pelvic compartments, and produce structured reports that improve surgical planning and assessment of disease extent and associated findings.

Background: Endometriosis is a chronic condition with an average diagnostic delay of 7-10 years. MRI plays a crucial role in reducing this medical wandering by enabling accurate detection, mapping, and characterization of deep pelvic disease to guide optimal management.

Imaging findings or procedure details:
MRI indications:
- Transvaginal ultrasound inconclusive or negative, in a symptomatic patient
- Transvaginal ultrasound not feasible (virgins, too painful,...)
- Before pre-surgical or pre interventional radiological treatment, for mapping
- Post-operative evaluation if symptoms persist

Recommended MRI Protocol (ESUR 2025) :
Sequences : multiplanar T2W sequences, a T1W sequence, and a kidney visualization sequence.
Field of view : Entire pelvis.
Preparation recommended : antispasmodic, moderate bladder filling, and fasting.
Contrast injection: Not systematic, except in case of suspected tumor.
Structure of the MRI Report :
Describe the anatomical compartments (anterior, middle, posterior).
Specify : endometriosis, nodules, adhesions, ureteral or digestive involvement.
Conclude with a synthesis : type, extension.

Conclusion: MRI is the reference examination for preoperative mapping. Standardized descriptive terminology, compartment-based analysis, and strucuredand synthetic reporting, provide a powerful tool for communication with surgeons.

A90

Clinical evaluation of an AI-based prototype for breast lesion classification in ultrafast dynamic contrast enhanced MRI

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Purpose: This study presents the development, external validation, and preliminary clinical evaluation of a AI prototype for breast lesion classification using ultrafast DCE-MRI.

Methods and Materials: The algorithm, trained on data from a Geneva clinical site, automatically processes MR images while integrating lesion geometry and patient information. It was deployed as a cloud-based application accessible via standard web browsers, eliminating the need for specific hardware or operating systems.
External validation was performed on an independent dataset from Neuchâtel canton, acquired on a different MRI manufacturer's scanner and including 248 lesions. To assess clinical relevance, semi-structured interviews with three radiologists were conducted prior to deployment to identify expectations for AI-assisted breast MRI classification. Their feedback guided system design.
Post-deployment, user experience and usability were evaluated using the standardized Computer System Usability Questionnaire (CSUQ), completed by the same radiologists..

Results: Pre-deployment interviews with three radiologists highlighted priorities such as classification accuracy, false-positive reduction, structured reporting (including lesion size and localization), and AI transparency.
Algorithm performance decreased compared to internal validation (Area under ROC curve: 78.9% vs 92.8%; Sensitivity: 70.9% vs 86.7%; Specificity: 71.6% vs 86.3%).
Despite the system's integrated a radiological viewer and automated reports, data upload was considered cumbersome due to platform restrictions. Consequently, usability testing focused on reviewing classification results with supporting training material, and further clinical testing is ongoing.

Conclusion: The developed AI prototype represents a valuable step toward identifying current limitations and clinical expectations prior to conducting a prospective evaluation.

A270

A practical case of head and neck CT protocol optimization

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Purpose: We assessed strategies to optimize CT protocols for head and neck imaging. Current practice uses sequential head and neck scans, causing overlap on organs like the eye lens. Two alternatives were tested. Approach 1: extending the head scan to include the neck, enabling single acquisition but limiting bowtie filter flexibility; Approach 2: separate brain and neck scans with optimized overlap to reduce radiation to radiosensitive organs. This study evaluates dosimetry and image quality for these approaches.

Methods and Materials: Experiments used a CIRS anthropomorphic phantom on a Siemens SOMATOM Drive CT. Standard protocols for brain, head, and neck were applied with variations in dose modulation (on/off) and bowtie filter size (16/32 cm). Organ doses were measured using a 20 mm^2 scintillator with optical fiber at eye lens and thyroid, normalized to the eye lens dose of a reference protocol, and compared with Dose Management System data. Image quality was assessed via SNR and CNR on selected slices. Descriptive statistics summarize organ doses and image quality metrics.

Results: Eye-lens dose was 1.2 a.u. for current practice, 0.8 a.u. for approach 1, and 1.1 a.u. for approach 2; thyroid dose was 0.8, 0.7, and 0.7 a.u., respectively. Effective dose: 4.3 mSv (current), 5.0 mSv (approach 1), 4.0 mSv (approach 2). Both alternatives maintained diagnostic image quality. Dose reductions ranged from 33% to 9% for eye lens and 11% for thyroid, with effective dose varying between +16% and -7%.

Conclusion: Both approaches offer dose reduction without compromising image quality. Further optimization, including gantry tilt and tailored bowtie filters, is under study.

A6

Monocentric Experience with Photon-Counting CT for Cardiac Imaging: Preliminary Evaluation of Radiation Dose and Image Quality Compared to a Dual-Source Energy-Integrating Detector CT

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Purpose: To evaluate the radiation dose and image quality in coronary CT angiography (CCTA) examinations performed on a dual-source photon-counting CT (PCCT) scanner compared to a previous-generation dual-source CT scanner with energy-integrating detectors (EID).

Methods and Materials: We retrospectively selected and anonymised ECG-triggered CCTA examinations using prospective sequential scanning protocol in late-diastolic phase acquisition window (60-80% of the R-R interval), divided into four groups: one group was performed on a dual-source EID-CT scanner with optimised protocol; the other three groups underwent the examination on a dual-source PCCT scanner, each group with different mA values for radiation dose reduction. The EID-CT protocol used 100 kVp while the PCCT protocol used 140 kVp by exploiting complete spectral post-processing. Quantitative analysis was performed by measuring enhancement and calculating both CNR and SNR. ROIs were placed in the right-coronary artery and myocardium. CTDIvol and DLP were compared across groups. Dedicated cardiologists and radiologists assessed subjective analysis in terms of overall image quality.

Results: 52 CCTA examinations were included: one group (n=13) was performed on a dual-source EID-CT scanner, the other 3 groups (each n=13) underwent the examination on a dual-source PCCT scanner. CNR and SNR did not show significant difference among the four groups (0.35)

Conclusion: This initial evaluation of radiation dose and image quality demonstrates that PCCT enables cardiac imaging at a lower radiation dose compared to conventional EID-CT maintaining a similar or even better CNR and SNR value. Further optimisation of protocols and larger studies are warranted to confirm these promising preliminary results.

A74

Diagnostic value of non-contrast CT for detecting acute aortic syndrome

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Purpose: Acute aortic syndrome (AAS) is a life-threatening condition requiring rapid diagnostic triage. Although contrast-enhanced CT-angiography is the reference standard, non-contrast CT (NCCT) is often the first imaging step in the emergency setting. The standalone diagnostic performance of NCCT and the added value of technical parameters (ECG-gating, small field of view) or secondary imaging signs (e.g., aortic dilatation, hemopericardium, intimal flap) remain insufficiently characterized.

Methods and Materials: In this retrospective, IRB-approved study, 80 patients who underwent triphasic aortic CT (non-enhanced, arterial and venous injection) for suspected AAS between 2012 and 2024 were included, with 40 confirmed positive cases and 40 negative cases. Two blinded radiologists evaluated NCCT images for the presence of AAS and to assess secondary criteria. Sensitivity, specificity and accuracy were calculated for the direct and indirect criteria.

Results: The study population (51 males [64%], 29 females [36%],mean age 65 ± 15 years) included 30 Stanford type A dissections (75%), 7 type B dissections (17.5%), 2 intramural hematomas (5%), and 1 penetrating atherosclerotic ulcer (2.5%). NCCT correctly identified 37/40 positive cases (93% sensitivity) and 38/40 negative cases (95% specificity), yielding an overall accuracy of 94%. In the subgroup of 28 examinations acquired with ECG-gating and a small field of view, both sensitivity and specificity reached 100%. Calcified intimal flap, non-calcified intimal flap, and hemopericardium were the most specific findings (specificity 100%, 93%, and 95%, respectively), whereas aortic dilatation and periaortic fat infiltration were the most sensitive (each 90%).

Conclusion: Non-contrast aortic CT shows high sensitivity and specificity for detecting acute aortic syndrome and can serve as a first-line exam to guide subsequent contrast-enhanced protocols, particularly with CT systems using ECG-gating and small-FOV reconstructions, in the absence of suggestive secondary signs.

A89

Time-Efficient Fat Suppression for 5D Flow MRI using HydrOptiFrame

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Purpose: To reduce 5D Flow measurements variability induced by the proximity of fat patches integrating an optimized water excitation (WE) RF pulse into free-running (i.e.without triggering or gating) 3D radial flow acquisition without increasing scan time.

Methods and Materials: N=4 healthy volunteers (27±2Y;3F) were prospectively included after written informed consent and scanned at 3T(PrismaFit, Siemens). B-spline-interpolated WE-RF pulse was optimized using HydrOptiFrame(HOF) and integrated into free-running 3D radial flow acquisition (5D Flow). The protocol included: 5D Flow with standard 0.50ms non-selective RF excitation, 5D Flow with 0.51ms optimized WE pulse (5D Flow+HOF), reference 2D Flow in ascending aorta, descending aorta, main pulmonary artery, left and right pulmonary arteries, and superior vena cava, and multi-echo Dixon sequence. Fat suppression efficacy was evaluated using water-to-fat contrast ratio. Flow measurement accuracy was assessed comparing net volume and peak flow against 2D Flow using linear regression, Bland-Altman analysis, and Wilcoxon signed-rank tests.

Results: Water-to-fat contrast ratio was 0.73±0.52 for 5D Flow+HOF vs -0.13±0.37 for standard 5D Flow. Improved correlation was found for 5D Flow+HOF with 2D Flow for net volume and peak flow compared to standard 5D Flow. Bland-Altman analysis showed 5D Flow+HOF had lower bias and narrower limits of agreement for net volume (bias=2.56%,LOA=[-30.75%,35.88%]) and peak flow (bias=-1.36%,LOA=[-36.92%,34.21%]) vs standard 5D Flow for net volume (bias=15.22%,LOA=[-28.58%,59.01%]) and peak flow (bias=11.45 %,LOA=[-28.61%,51.52%]). Significant differences existed between 2D Flow and standard 5D Flow (p=0.004) but not with 5D Flow+HOF (p=0.62,p=0.90).

Conclusion: Optimized WE-RF pulse successfully achieved fat suppression in 5D Flow MRI while preserving quantitative flow accuracy without increasing scan time. Future work should include phantom study, larger cohorts, and recruitment of patients with high adipose tissue.

A168

Time-resolved contrast-enhanced MR angiography for therapy monitoring in venous malformations

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Purpose: Current static MR imaging protocols are lacking post-therapeutic perfusion effects that are readily appreciated on post-interventional DSA or duplex ultrasound, limiting reliable assessment of treatment response. Therefore, we aimed to investigate the feasibility of time-resolved MR angiography (trMRA) for the quantification of hemodynamic changes in venous malformations (VM) after percutaneous ethanol sclerotherapy.

Methods and Materials: In a secondary analysis of a prospective cohort (2018–2022), MRI before and after sclerotherapy with ethanol was performed, including time-resolved MRA (trMRA) at both time points. A model calculation based on time–intensity curves was performed. Parametric maps were calculated with the parameters wash-in, wash-out, arrival time, time to peak, peak enhancement intensity (PEI) and initial area under the curve (iAUC).

Results: 15 patients were analyzed (mean age 22 years; median 21 years, range 5–46 years; 10 female). After treatment, perfusion of the VM was reduced, reflected by a reduction in contrast agent wash-in (0.42±0.53 vs 0.15±0.25, p=.003). Accordingly, PEI (0.36±0.19 vs 0.16±0.14, p<.001) and iAUC (0.17±0.15 vs 0.06±0.08, p<.001) were reduced. The other investigated parameters did not significantly change.

Conclusion: Functional assessment of VM by analysis of post-treatment hemodynamic changes is feasible. Hence, trMRA should be considered as a functional extension to standard MRI protocols in VM.

A21

Diagnostic Performance of Coronary CT Angiography to Diagnose Acute Spontaneous Coronary Artery Dissection

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Purpose Spontaneous coronary artery dissection (SCAD) is a rare disease predominantly affecting young to middle-aged women presenting with acute chest pain. Diagnosis is made with invasive catheter angiography (ICA). The literature on the performance of coronary CT angiography (CCTA) for diagnosing SCAD is sparse.Therefore the purpose was to evaluate the diagnostic performance of CCTA for acute spontaneous coronary artery dissection (SCAD).

Methods and Materials: In this prospective single-center study, 52 patients with SCAD confirmed by ICA and 70 patients who underwent CCTA for chest pain but without SCAD (control group) were included. CCTA readout was performed by two independent, blinded readers. Accuracy, sensitivity, and specificity were calculated using ICA as the reference standard. CCTA imaging features of SCAD including both vessel abnormalities and myocardial hypodensity were recorded and correlated with the confidence of diagnosis with multivariable regression analysis. Interreader agreement was determined by Cohen's Kappa.

Results: At the patient level, sensitivity of CCTA to diagnose SCAD ranged between 52% and 58%, specificity was 97%, and accuracy 78% and 80% for both readers (almost perfect interreader agreement Kappa = 0.891). Performance was higher for proximal (sensitivity 67% and 73%; specificity 97%; accuracy 93% and 94%) than distal SCAD (sensitivity 40% and 49%; specificity 97%; accuracy 76% and 80%). The presence of concomitant myocardial hypodensity improved confidence in both readers. Rating myocardial hypodensity positive for SCAD increased sensitivity (71% and 65%) and decreased specificity (91%) of both readers.

Conclusion: CCTA demonstrates variable sensitivity for the diagnosis of SCAD, which remains limited in proximal SCAD lesions. In contrast, specificity remained high irrespective of the SCAD location. Thus, patients with CCTA positive for SCAD might be deferred from ICA when conservative management is intended.

A201

High-Z Contrast Media for Coronary Photon Counting Detector CT Angiography: Improved Quantification of Calcified Stenoses

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Purpose: Calcified-plaque blooming can obscure the vessel lumen and lead to stenosis overestimation on CCTA. Photon-counting CT (PCD-CT) enables virtual monoenergetic imaging (VMI), where high-energy VMI reduce blooming but also diminish iodine contrast. This study assessed whether contrast agents with higher atomic numbers (high-Z) preserve vascular contrast at high VMI energies and improve stenosis quantification.

Methods and Materials: A phantom with 4 mm and 6 mm rods simulating vessels containing eccentric calcified plaques (25%, 50%, 75% stenosis) was scanned using dual-source PCD-CT. Five contrast media (iodine, tungsten, holmium, hafnium, bismuth) were tested. VMI reconstructions ranged from 40–190 keV (1 keV increments). Vessel attenuation, contrast-to-noise ratio (CNR), and stenosis measurements were obtained; image quality was qualitatively scored.

Results: Iodine showed high attenuation at low energies but fell below 250 HU above 100 keV. In contrast, all high-Z agents maintained >250 HU across the entire energy range. Iodine CNR decreased markedly at higher keV, while tungsten and hafnium showed increasing and then stable CNR, reaching ~40 at high energies. Across all stenosis grades, low-energy VMI produced substantial stenosis overestimation (24–32.5% at 40 keV). Overestimation decreased with increasing energy (0–13.5% at 190 keV). At 190 keV, tungsten, hafnium, and bismuth showed ≤2.5% overestimation, whereas iodine remained higher (10–13.5%). High-Z media also achieved higher image-quality scores at high energies, while iodine peaked only at 55–70 keV and degraded substantially thereafter.

Conclusion: Compared with iodine, very high-Z contrast agents provide better lumen visualization and markedly improve stenosis accuracy at high monoenergetic levels, enabling effective blooming reduction with preserved vascular contrast.

A14

The potential of high-Z contrast media for vessel visualization near metal implants: A photon-counting detector CT phantom study with virtual monoenergetic images and iterative metal artifact reduction

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Purpose: Metal artifacts in CT can be reduced with high energy virtual monoenergetic images (VMI) and iterative metal artifact reduction (IMAR) algorithms. At high VMI energies, however, iodinated contrast media (CM) show decreased attenuation. High atomic number (high-Z) CM potentially preserve vessel contrast near metal implants even at high VMI energies. Hence, the purpose of this study was to assess the effect of high-Z CM on vessel visualization near metal implants in photon-counting detector (PCD)-CT across VMI energies, with and without IMAR and for different metal types.

Methods and Materials: A pelvis phantom containing titanium or steel inserts and with CM rods including iodine, bismuth, holmium, or tungsten was scanned using PCD-CT. VMI reconstructions (40–190 keV, 1 keV steps) were performed with and without IMAR. Quantitative analysis included vessel attenuation, background noise, and metal artifact measurements from predefined regions-of-interest. An artifact-adjusted contrast-to-noise ratio (CNR) was calculated. Peak CNR was the maximum value across the entire energy range.

Results: Metal artifacts reduced with increasing VMI energy. Titanium caused fewer artifacts than steel, and IMAR further reduced artifacts from both metal types. At 40–90 keV in titanium with IMAR, holmium showed the highest vessel attenuation and CNR (451 HU/24), followed by iodine (296 HU/15), bismuth (267 HU/14) and tungsten (259 HU/13). At 140–190 keV, tungsten showed the highest vessel attenuation and CNR (269 HU/19), followed by bismuth (250 HU/17), holmium (144 HU/10) and iodine (31 HU/2). Peak CNR (34) was achieved with holmium, titanium, IMAR, and VMI at 40 keV.

Conclusion: High-Z CM provide superior vessel contrast compared to iodine near metal implants in PCD-CT, both at low VMI energy with holmium and at high VMI energy with tungsten and bismuth, where metal artifacts are additionally reduced. Under metal artifact conditions, vessel contrast can be further improved by applying IMAR.

A13

Photon-counting detector computed tomography compared with cardiac magnetic resonance imaging for myocardial extracellular volume quantification in spontaneous coronary artery dissection

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Purpose: To quantify myocardial extracellular volume (ECV) in patients with spontaneous coronary artery dissection (SCAD) using late iodine enhancement (LIE) imaging with photon-counting detector CT (PCD-CT), and to compare with CMR.

Methods and Materials: In this prospective study, 20 patients with SCAD undergoing LIE PCD-CT between March 2021 and August 2024 were included. Global ECVCT was quantified as the mean across the entire myocardium; lesion ECVCT was quantified using a threshold-based approach with lesions exceeding an ECVCT of 40%. Relative lesion volume was calculated as the proportion of lesion to total myocardial volume.

Results: CMR was available in a subgroup of 13 patients (15 scans). Global ECVCMR was calculated as the mean across all myocardial segments, lesion ECVCMR was derived from manual segmentation. In the 20 patients, lesion ECVCT was 45.2% (IQR: 44.2–46.8%) compared to a global ECVCT of 28.5 ± 5.3%. Relative lesion volume (5.2%, IQR: 2.4–9.6%) correlated with global ECVCT (Spearman $\rho = 0.938$, $P < 0.001$). A global ECVCT cut-off of 28.5% predicted relative lesion volumes <5% with an AUC of 0.956 (CI: 0.752–0.999) and a PPV of 82%. In the subgroup with both CT and CMR, global ECVCT (28.0 ± 5.2%) and global ECVCMR (29.3 ± 4.2%) were comparable ($P = 0.085$), with a mean difference of 1.4% (95% limits of agreement: −4.2%–7.0%). Lesion ECVCT (45.2%, IQR: 44.6–46.8) and lesion ECVCMR (45.0%, IQR: 39.4–48.6) were also similar ($P = 0.340$).

Conclusion: LIE PCD-CT enables myocardial ECV quantification in SCAD patients, showing a strong agreement with CMR.

A240

Clinical Significance of Thyroid Incidentalomas on Hybrid PSMA-PET: A Single Institution Retrospective Study

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Purpose: To determine the prevalence and malignancy risk of PSMA-avid thyroid incidentalomas detected on hybrid PSMA-PET.

Methods and Materials: Retrospective single-center study approved by the Cantonal Ethics Committee Zurich. All prostate cancer patients undergoing PSMA-PET/CT or PET/MR between 05/2016 and 01/2025 were screened for thyroid incidentalomas. Inclusion criteria were incidental focal thyroid uptake, available cytology or histopathology, or adequate imaging follow-up. Exclusion criteria were history of thyroid malignancy or prior thyroid surgery, or lack of consent. [^{18}F]PSMA-1007 or [^{68}Ga]Ga-PSMA-11 were used as radiotracers. Imaging was performed on various PET/CT scanners and PET/MR systems used clinically at our institution. SUVmax, TI-RADS classification, nodule size, and cytology or histopathology results were recorded. Lesions were categorized as benign or malignant based on Bethesda cytology, histology, or adequate imaging follow-up. Statistical analysis included Mann–Whitney U and Spearman correlation tests.

Results: In 3'140 PSMA-PET examinations, a total of 33 (1.0%) thyroid incidentalomas was identified, thereof 16 met all inclusion criteria. The median patient age was 67 years (range 50–80). TI-RADS classification was 3 (18.8%), 4 (62.5%), and 5 (18.8%).
After diagnostic work-up with cytology and/or diagnostic thyroidectomy, the overall rate of malignancy (ROM) was 25.0%. Malignancy prevalence increased with TI-RADS category (0% in TI-RADS 3, 20% in TI-RADS 4, 66.7% in TI-RADS 5) but did not correlate with lesion SUVmax ($p = 0.862$). SUVmax did not correlate with TI-RADS ($p = 0.193$) or nodule size ($p = 0.185$).

Conclusion: PSMA-avid thyroid incidentalomas are rare but carry a clinically relevant malignancy risk and therefore require structured diagnostic workup. TI-RADS reliably stratified risk, while SUVmax alone has no diagnostic value in our small sample. Further management should be guided by ultrasound and cytology rather than by PSMA SUVmax.

A123

Prevalence and malignancy risk of breast incidental uptake detected by PET/CT with different radiopharmaceuticals: an updated systematic review and meta-analysis

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Purpose: Meta-analyses on the prevalence and clinical significance of breast incidental uptake (BIU) at PET/CT are available only for [^{18}F]FDG, showing that BIU is rare but malignant in a substantial proportion of cases. This study aimed to update pooled preva-lence and malignancy risk of BIU using different PET radiotracers, expanding [^{18}F]FDG-based evidence.

Methods and Materials: A comprehensive literature search of studies on BIU was carried out in two bibliographic databases and literature was screened up to 25 May 2025. Only original articles reporting BIU were selected. A proportion meta-analysis was conducted on a patient-based analysis using a random-effects model to estimate pooled prevalence, malignancy rate, and histological distribution.

Results: 29 studies were included in the systematic review and meta-analysis. PET/CT was performed using [^{18}F]FDG (n = 25), radiolabeled somatostatin analogues (SSA) (n = 3), or [^{18}F]fluorocholine (n = 1). The pooled prevalence of BIU was 0.5% for [^{18}F]FDG PET/CT, 3.4% for SSA PET/CT and 2.6% for [^{18}F]fluorocholine. The pooled malignancy rate among BIU (female patients) was 33.5% for [^{18}F]FDG, 86.4% for SSA and 70% for [^{18}F]fluorocholine PET/CT. Histological data were mainly available for [^{18}F]FDG PET/CT, showing ductal carcinoma as the most frequent malignant histotype (pooled value 42.2%) and fibroadenoma (pooled value 14.8%) as the most frequent benign histotype.

Conclusion: Similar to [^{18}F]FDG, BIU using other PET radiopharmaceuticals is uncommon but often malignant. Therefore BIU warrants dedicated breast assessment and histological diagnosis when appropriate. Further well-designed studies are needed to clarify the clinical impact of BIU detection and the prevalence and clinical significance of BIU using other tracers than [^{18}F]FDG.

A180

Absolute Quantification of ^{123}I-MIBG xSPECT/CT as a Biomarker of Aggressiveness in Pediatric Neuroblastic Tumors

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Purpose: Neuroblastic tumors show wide biological heterogeneity, and early risk stratification remains challenging. ^{123}I-MIBG is the reference radiotracer for staging, but routine assessments are often qualitative or semi-quantitative and may not capture tumor biology consistently across centers. Modern xSPECT/CT enables absolute activity quantification (SUV), potentially providing harmonized metrics linked to aggressiveness. We evaluated whether quantitative xSPECT/CT uptake associates with metastases at diagnosis.

Methods and Materials: We retrospectively included nine children (6 males; mean age 3years, range 26days–7.8years) who underwent pre-therapeutic ^{123}I-MIBG SPECT/CT with absolute SUV quantification (2016–2025). Metrics were tumor SUVmax, tumor-to-liver SUVmax ratio (T/Lmax) and tumor-to-liver SUVmean ratio (T/Lmean). Metastatic status was defined by MRI and by ^{123}I-MIBG for bone metastasis assessment. Group comparisons used Mann–Whitney U; associations used Spearman's rank correlation.

Results: Four patients presented with metastatic disease and showed consistently higher uptake values. Median SUVmax was 18.3 in metastatic patients versus 6.5 in non-metastatic patients (p=0.064, Mann–Whitney); median T/Lmax was 4.37 versus 1.23 (p=0.016), and median T/Lmean was 5.95 versus 1.66 (p=0.016). Spearman's correlation confirmed positive associations between uptake and metastatic status, with ρ=0.693 (p=0.039) for SUVmax and ρ=0.866 (p=0.003) for both T/Lmax and T/Lmean.

Conclusion: In this pilot cohort, higher absolute ^{123}I-MIBG uptake on xSPECT/CT, particularly liver-normalized ratios, was associated with the presence of metastases. These findings support absolute xSPECT/CT quantification as a candidate imaging biomarker of aggressiveness in pediatric neuroblastic tumors and justify validation in larger prospective studies with standardized acquisition/reconstruction and biological correlates.

A157

Prostatic incidental uptake on PET/CT: a systematic review and meta-analysis of prevalence and malignancy risk

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Purpose: Prostatic incidental uptake (PIU) may have clinical relevance, and progress in molecular imaging is likely to increase its detection. This study aimed to provide updated pooled estimates of the prevalence and malignancy risk of PIU identified on [18F]-FDG positron emission tomography/computed tomography (PET/CT) and on PET/CT scans using radiotracers other than [18F]FDG.

Methods and Materials: A comprehensive search for studies on PIU was performed in two databases, screening all available literature up to 30 October 2025. Only original articles reporting PIU were included. A proportion meta-analysis was conducted on a patient-based analysis using a random-effects model to calculate pooled prevalence and malignancy rates. In addition, several variables were evaluated as potential predictors of malignant PIU.

Results: Twenty-four studies met the inclusion criteria. PET/CT was performed with [18F]FDG in 23 studies and with radiolabeled somatostatin analogues (SSA) in one study. The pooled prevalence of PIU was 1.7% for [18F]FDG PET/CT and 4.5% for SSA PET/CT (based on a single study). The pooled malignancy rates among PIU cases that underwent further evaluation or biopsy were 21.3% and 59.7%, respectively; no malignant lesions were reported in the SSA study. Malignant PIUs showed a higher mean age and a higher mean SUVmax compared with benign PIUs. A peripheral location of PIU emerged as a predictor of malignancy.

Conclusion: PIU is detected in approximately 1.7% of [18F]-FDG PET/CT scans in men and is associated with a relevant risk of malignancy. For this reason, any PIU finding should be followed by additional assessment to exclude malignancy. More well-designed studies are required to better define the clinical impact of PIU and to determine its prevalence and clinical relevance when using PET tracers other than [18F]FDG.

A278

Image interpretation of intraoperative AURA-10 PET/CT of Prostatectomy Specimens After ^{68}Ga-PSMA-11 Injection: A Single-Center Initial Experience

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Purpose: Assess and implement real-time analysis of margin status on prostate surgical specimens using AURA intraoperative PET technology with very low injected doses of 68Ga-PSMA-11 (1MBq/kg, potentially down to 0.5MBq/kg).

Methods and Materials: 21 patients underwent radical prostatectomy with pre-operative 68Ga-PSMA-11 injection (mean time from injection to acquisition: 138.8min±35.4, mean injected dose: 83.2MBq±17.0). Two blood samples were used as baseline activity phantoms. Resected specimens were extracted intraoperatively and ex-vivo imaging on the AURA-10 PET/CT system performed immediately after. PET findings were documented (SUVmax, SUVmean, TBR, PRIMARY score, lesion size) and margins assessed by visual reading supported by segmentation (30% and 41% fixed thresholds and tumor-volume iterative method) using histopathology as standard of truth.

Results: Early observations indicate smooth workflow integration. Based on the gold standard, four cases displayed positive surgical margins . In two of these, prostate specimens showcased low tracer uptake pre and postoperatively (PRIMARY-score-2a), limiting margins assessment. In the other two, two index lesions were correctly identified with visual inspection and segmentation. In one case, ex-vivo PET/CT imaging of a non-index lesion showed focal uptake visually and with both thresholding methods reaching specimen borders, despite histopathology confirming negative margins. This false positive is likely attributed to the specimen positioning inside the holder (lesion facing down). Data collection is ongoing and full sample analysis will be presented.

Conclusion: Preliminary insights suggest that intraoperative AURA-10 PET/CT of prostatectomy specimens is feasible, rapid, and compatible with ultra low radiotracer doses. Our current observations indicate that preoperative uptake and specimen placement are key parameters and that a definition of a visual reading strategy supported by semi-quantitative indices is important in perspective of clinical use.

A259

Pearls of Unusual Uptake Patterns and Pitfalls in PSMA PET/CT

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Learning objectives: The objective of this educational poster is to show nuclear medicine physicians atypical, unexpected sites of metastases detected with PSMA PET/CT in staging and restaging of prostate cancer encountered in clinical practice in a case-based educational approach.

Background: Prostate-specific membrane antigen (PSMA) PET/CT imaging has revolutionized staging and restaging of prostate cancer. With the high sensitivity of PSMA PET/CT detection of unsuspected rare sites of metastases has been observed in clinical practice, often with subcentimeter size and important impact on therapy.

Imaging findings or procedure details: This educational poster presents illustrative cases demonstrating unusual, unexpected, rare sites of metastases in staging and restaging of prostate cancer with PSMA PET/CT observed in routine clinical practice collected at two PET/CT centres. Biopsy or imaging/clinical follow-up served as reference standard in all cases. Each case is accompanied by PET/CT images and interpretative pearls.
For each case, the imaging features, clinical context, and key differentiating clues are discussed to aid accurate interpretation.

Conclusion: PSMA PET/CT is a powerful widely used tool in prostate cancer staging and restaging. Awareness of pearls of unexpected, rare sites of metastases is essential to avoid misdiagnosis and guide treatment. Through a case-based educational approach, this poster equips clinicians with practical insights to enhance diagnostic confidence and optimize patient management.

A216

Pearls of Unusual Uptake Patterns and Pitfalls in PSMA PET/CT

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Purpose: Theranostic radiopharmaceuticals are transforming oncology and nuclear medicine, but their clinical translation is hindered by the difficulty of selecting appropriate targets and lead compounds for specific indications. To address this gap, we developed the Theranostic Genome database and pipeline, a resource that (1) catalogues radiopharmaceuticals described in the literature, (2) links them to their targetable gene products, and (3) characterises target expression across multiple cancers and healthy tissues.

Methods and Materials: To build the Theranostic Genome database, we used deep-learning–based text mining tools alongside with human expertise to extract radiotracer–protein relations from the biomedical literature, mapped them to their corresponding genes, and integrated these targets with large-scale tumour and healthy tissue transcriptomic datasets to enable systematic, large-scale drug repurposing.

Results: Our pipeline identified 649 radiotracers targeting 257 genes, located on all chromosomes except Y and encoding proteins that fall into 13 major drug-target families (including GPCRs, integrins, tyrosine kinases and folate receptors). Notably, 82% of these molecules had not been labelled with therapeutic radioisotopes at the time of the study, underscoring the substantial drug-repurposing potential revealed by our approach. Some examples of proposed new indications for existing molecules include the CCR5-binding peptide DOTA-DAPTA, repurposed as a theranostic agent for diffuse large B-cell lymphoma, kidney clear cell carcinoma, mesothelioma and testicular germ cell tumours, and the cholecystokinin receptor CCKBR, which emerges as an alternative target candidate to PSMA in advanced prostate cancer (neuroendocrine subtype).

Conclusion: The Theranostic Genome database and accompanying AI pipeline systematically connect radiopharmaceuticals, gene targets, and tumour expression, enabling discovery, repurposing, and subtype-specific tailoring of theranostics.

A191

Swiss Key Opinion Leader Perspectives on Implementing [177Lu]Lu-PSMA Radioligand Therapy: A National Survey of Oncologists and Nuclear Medicine Physicians

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Purpose: Radioligand therapy with [177Lu]Lu-PSMA is increasingly used for metastatic castration-resistant prostate cancer. While clinical evidence is well established, less is known about how clinicians directly involved in this therapy perceive referral pathways, practical challenges, and future needs. This study evaluated national expert perspectives from oncologists and nuclear medicine (NM) physicians routinely engaged in PSMA-RLT in Switzerland.

Methods and Materials: A nationwide survey was distributed between April and September 2025 to oncologists and NM physicians working in major and high-volume Swiss cancer centers. The questionnaire included multiple-choice and free-text items addressing practice setting, referral behavior, perceived barriers, radioprotection considerations, workflow coordination, and expectations for future developments. Descriptive and thematic analyses were performed.

Results: Thirteen clinicians participated (7 oncologists, 6 NM physicians), all actively referring or delivering PSMA-RLT (response rate: 72%, 13/18). All oncologists reported frequent referrals. Main oncologist-reported barriers included insufficient clinical data for specific scenarios, and concerns regarding reimbursement or infrastructure availability. NM physicians reported similar issues, with room capacity being the leading limitation, followed by scheduling difficulties, radioprotection constraints, and variable familiarity with PSMA-RLT among referring clinicians. Both groups noted a rising demand for PSMA-RLT and highlighted the need for clearer referral pathways, improved interdisciplinary communication, and better educational tools.

Conclusion: Key opinion leaders among oncologists and NM physicians report strong clinical interest in PSMA-RLT but highlight significant logistical and organizational barriers. They insights support the need to expand treatment capacity, standardize referral pathways, and strengthen interdisciplinary coordination to ensure the sustainable growth of PSMA-RLT programs in Switzerland.

A258

Standard to total body FOV PET/CT OMNI systems simulated by GATE: NEMA-Based Evaluation and Experimental Validation

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Purpose: To investigate how different axial field-of-view (FOV) configurations affect PET/CT performance using a realistic GATE Monte Carlo simulation framework, and to validate the simulations against experimental NEMA sensitivity, NECR, and scatter-fraction measurements.

Methods and Materials: PET/CT systems with varying axial FOVs were modeled in GATE following NEMA NU-2 protocols. The NEMA sensitivity test and the NECR test were simulated, the latter reproducing the physical system's sequential acquisitions as a line source decays across activity concentrations from 888 kBq/ml (total activity: 5 GBq) to 0.4 kBq/ml (total activity: 2.5 MBq). In simulation, each activity level was implemented as an independent, parallel run to efficiently cover the full NECR range. The complete digitizer chain was included to mimic detector energy resolution, temporal resolution, dead-time, and the appropriate coincidence time window, ensuring accurate representation of physical and electronic processes. The appropriate phantoms were simulated together with detailed scanner geometries were incorporated to match real-device behaviour. Simulation outputs were validated against corresponding physical measurements.

Results: Simulated sensitivity, NECR curves, and scatter metrics showed strong agreement with experimental data. The scatter fraction comparison demonstrated very good correspondence, with a p-value of 0.015, confirming the accuracy of the modelled physical processes. Performance analysis indicated that increasing the axial FOV substantially improved system sensitivity and NECR, whereas shorter FOV designs offered advantages in count-rate handling and scatter behaviour.

Conclusion: The MC simulation accurately reproduced the physical characteristics of PET detectors and provided reliable predictions of performance across different axial FOV configurations. This approach offers a robust tool for evaluating PET/CT system design choices and optimizing imaging protocols.