Published Research -SQCCCRC

Other | Multi-Program

2023

Radiology & Nuclear Medicine

1. **Abubakar S, More S, Tag N, Olabinjo A, Isah A, Lawal I. Differences in Tumour Aggressiveness Based on Molecular Subtype and Race Measured by [18F] FDG PET Metabolic Metrics in Patients with Invasive Carcinoma of the Breast. Diagnostics (Basel). 2023 Jun 14;13(12):2059. doi: 10.3390/diagnostics13122059. PMID: 37370954; PMCID: PMC10297178.**

   An investigation into PET/CT quantitative parameters as marker of breast ca aggressiveness. We were able to demonstrate the utility of FDG PET/CT quantitative parameters as a marker of aggressiveness. For the first time, as far as we know, we also demonstrated significantly increased parameters in different racial groupings based on known differences in aggressiveness as published in prior epidemiological and non-imaging studies. For the patient, the research reinforces the fact that certain racial groups are prone to more aggressive tumors and should be treated more aggressively.

2. **Usmani S, Riyami KA, Abubakar S, Jain A, Busaidi AA. Tumor sink effect on 68Ga-PMSA PET/CT: A case of diffuse metastatic disease of prostate cancer. J Pak Med Assoc. 2023;73(6):1344-1345. doi:10.47391/JPMA.23-45.**

   68Ga-PMSA imaging has revolutionized both diagnosis and radioligand therapy selection in patients with metastatic prostate cancer. We report a case of a 59-year-old recently diagnosed prostate cancer with high PSA level pf >2000ng/ml referred for 68Ga-PSMA PET/CT. 68Ga-PSMA PET/CT showed diffuse intense tracer uptake throughout the axial and appendicular skeleton with significantly lower uptake of 68Ga-PSMA in normal organs in a configuration of "tumor sink effect". Findings are in keeping with diffuse skeletal infiltration and suspected marrow infiltration. Given the extensive nature of bone disease and pattern, 177Lu-PSMA-targetted radioligand therapy was thought to be more appropriate in a given situation with a favorable toxicity profile.

3. **Usmani S, Jain A, Al-Riyami K, Abubakar S. Accumulation of 131Iodine in the nasolacrimal sac/duct after radioiodine therapy for papillary thyroid cancer. J Pak Med Assoc. 2023;73(3):713-714.**

   PECT/CT is a powerful tool for assessing unexpected concentrations of radioiodine resulting from benign uptake in organs with sodium-iodide symporter (NIS) expression. SPECT/CT images localized the focal tracer uptake in the nasolacrimal sac/duct likely due to nasolacrimal duct obstruction secondary to prior radioiodine or iodine therapies. Hybrid SPECT/CT allows precise anatomical localization and helps differentiate benign mimics of disease, which can alter patient management.

4. **Usmani S, Jain A, Riyami KA, Abubakar S, Rashid Al-Sukaiti. The role of 18F-FDG PET/CT in evaluation of Primary CNS lymphoma: The path less travelled. J Pak Med Assoc. 2023;73(8):1744-1746.**

   Primary central nervous system lymphoma (PCNSL) is a rare but highly aggressive lymphoma with increasing incidence in immunocompromised patients. MRI is the modality of choice in evaluating brain lesions. However, MRI is often challenging in the detection of early recurrence, assessing residual disease and response evaluation in PCNSL. 18F-FDG PET/CT has superior diagnostic performance compared with body CT in the evaluation of lymphoma. 18F-FDG PET-CT is helpful in evaluating evaluation of disease extent and differentiating primary CNS lymphoma from systemic lymphoma. Besides diagnostic and prognostic value in primary CNS lymphoma, it might also be helpful in response assessment. The role of FDG-PET in PCNSL is not fully defined. In this article we have reviewed the potential role of 18F-FDG PET/CT in initial diagnosis, baseline staging, restaging, evaluation of treatment response, prognostication, and survival analysis of PCNSL. Keywords: 18F-FDG PET/CT; CNS lymphoma; brain tumors.

5. **Usmani S, Jain A, Riyami KA, Akhtar SMJ, Abubakar S, Busaidi AA. 18F-FDG PET/CT Imaging of Pulmonary Hamartomas: Metabolic and Functional Characterization. Clin Nucl Med. 2023.**

   Pulmonary hamartoma is the most common benign tumor of the lung and often discovered incidentally on imaging. We report a case of 49-year-old women recently diagnosed left breast cancer with suspicious left axillary

lymph nodes. 18F-FDG PET/CT show well-circumscribed, lobulated low attenuation soft tissue mass in the right lower lobe lung with mild to no significant metabolic activity. CT guided biopsy showed, the lesion composed of fat, cartilage, and smooth muscle, admixed with fibroconnective tissue. The findings are consistent with pulmonary hamartoma. The presence of fat in a well-circumscribed solitary pulmonary nodule along with low metabolic activity help in the characterization of the lesion, which can alter patient management.

6. **Usmani S, Jain A, Al Riyami K, Munir J, Abubakar S. Accumulation of 18F-FDG at Anomalous Systemic Arterial Supply to Normal Lung on 18 F-FDG PET/CT. Clin Nucl Med. 2023;48(8):e385-e386.**

   Anomalous systemic arterial supply to normal lung is an anatomical variant in which a portion of the lung is supplied by a systemic vessel without a distinct pulmonary sequestration. Hybrid PET/CT allows precise anatomical localization and helps in differentiating benign mimics of disease, which can alter patient management. 18F-FDG localizes the uptake in the tortuous artery arising from the descending aorta with similar uptake to that of descending aorta. These findings are suggestive of anomalous systemic arterial supply to normal segments of the lung.

7. **S. Kheruka, P. Titus, A.A. Waheed, A. Jain, S. Gambhir, R.A.L. Sukaiti, N. Al Maymani. QUANTIFICATION OF RADIATION DOSE TO THE RADIOLOGIST'S EYES ASSOCIATED WITH VARIOUS INTERVENTION PROCEDURES. MEDICAL PHYSICS INTERNATIONAL Journal, Vol.11, No.1, 2023 72-77.**

   This study aimed to measure equivalent doses to the eyes of intervention radiologists during various procedures using an organ TLD dosimeter and compare them with the threshold radiation dose to the eyes. The study was conducted at the Interventional Radiology Department of the Sanjay Gandhi Post Graduate Institute of Medical Sciences in Lucknow, Uttar Pradesh. A TLD eye dosimeter (Head badge) comprising three CaSO4: Dy Teflon TL discs (0.4 mm thickness, 5.0 mm diameter) was used to measure radiation dose to the eyes. Doses were evaluated using the standard dose evaluation algorithm employed in TLD personal monitoring services, with a PC-based Nucleonic TL Research Reader (Type TL 1009I). Additional data collected included procedure type, fluoroscopy duration, primary doctor, secondary doctor (assisting physician), and machine model. The dose received in mSv/hr by an interventional radiologist was converted to

mSv/yr based on the specified working hour limits by the International Commission on Radiological Protection (ICRP).The study revealed the highest ocular radiation dose during gastroenterological procedures at 2.9 mSv/h, followed by vascular and neurological procedures at 0.69 and 0.41 mSv/h, respectively. The primary operators received higher doses compared to the secondary auxiliary physicians. On average, the radiation exposure to the eyes of doctors (205 mSv/yr) exceeded the acceptable equivalent annual dose limit for the eye, which is 20 mSv/year, as recommended by ICRP 103 (2007).The study highlights that interventional radiologists at our center are exposed to significantly higher doses to the eyes than the recommended levels, which may lead to long-term adverse side effects. Alongside strict radiation dose monitoring, implementing measures such as an increase in the frequency of rotating intervention radiology postings and providing appropriate radiation protection (Ceiling shield for Eye) could help prevent high radiation exposure to the eyes

8. **Lawal IO, Abubakar S, Ankrah AO, Sathekge MM. Molecular Imaging of Tuberculosis. Semin Nucl Med. 2023 Jan;53(1):37-56. doi: 10.1053/j.semnuclmed.2022.07.001. Epub 2022 Jul 23. PMID: 35882621.**

   A review of the role of molecular imaging in Tuberculosis focusing on FDG PET/CT. The review serves as update to knowledge of nuclear medicine physician in image interpretation and encourages non-invasive monitoring of treatment response in TB patients.

9. **Bouchareb, Yassine & Tag, Naima & Sulaiman, Hajir & Riyami, Khulood & Jawa, Zabah & Dhuhli, Humoud.(2023). Optimization of BMI-Based Images for Overweight and Obese Patients — Implications on Image Quality, Quantification, and Radiation Dose in Whole Body 18F-FDG PET/CT Imaging. Nuclear Medicine and Molecular Imaging. 10.1007/s13139-023-00795-5.**

   In PET/CT imaging, the activity of the 18F-FDG activity is injected either based on patient body weight (BW) or body mass index (BMI). The purpose of this study was to optimise BMI-based whole body 18F-FDG PET images obtained from overweight and obese patients and assess their image quality, quantitative value and radiation dose in comparison to BW-based images.

10. A practical Guide For pediatric Nuclear Medicine Published by Springer: Hardcover ISBN 978-3-662-67630-1 Published: 21 September, 2023 Softcover ISBN 978-3-662-67633-2, eBook ISBN 978-3-662-67631-8, DOI: https://doi.org/10.1007/978-3-662-67631-8. Authors: Gopinath Gnanasegaran, Sharjeel Usmani, Helen Nadel. Editors: Zvi Bar-Sever, Francesco Giammarile, Ora Israel, Helen Nadel

    Identifies and describes the most common nuclear medicine procedures in pediatric patients. Presents a practical hand on approach into pediatric nuclear medicine with more than 100 clinical cases. Provides tools for a successful routine use of diagnostic nuclear medicine procedures in children. This book is open access, which means that you have free and unlimited access.

Radiation Oncology

1. Al Mandhari Z, Galerani-Lopes AP. Which Criteria Should We Use To Determine An Adequate Number Of Linear Accelerators In Emerging Economy Countries?. 2023.

    This study was conducted to estimate the demand for radiotherapy services in Oman, using the most common methods and recommendations available in the literature. The following calculation methods were analyzed: COCIR - targets a density of 7 radiotherapy units/ million persons; ESTRO/QUARTS - 1 LINAC per 400 patients/year or 1 LINAC per 180,000 persons; and IAEA method that utilizes a combination of cancer incidence, number fractions per cancer type, and machine workload. For the COCIR, ESTRO/QUARTS, and IAEA recommendations, the range was 2.8 to 32 of LINACS for adequate coverage in Oman (respectively 32; 4 to 25; and 2.8). In conclusion, the analysis of the recommended guidelines for calculating the required number of LINACS in Oman showed a wide range. While in practice we know currently the number of LINACS required for our population is 5, for emerging economies the ESTRO/QUARTS recommendations of 1 LINAC per 400 patients/year, or the IAEA calculation methods are the closest approximation to the actual needs.

2. Outcomes of quality indicators in a new tertiary cancer and research centre SFA Hashmi, Altaf F, AMH Khan, Yilmaz N, Al Mandhari Z, Al Amri I, N Pervez N;2023/5/1; Journal: Radiotherapy and Oncology; 182; S2085-S2086.

3. Global village oncology network (gvon)–an emerging platform from an emerging country-an international working initiative Khan AMH, Tariq M, Hina M, Ali T, Jawwad U, Rehman A, Usmani S, Pervez N, Burney I, Abbasi NA ;2023/8/7; PJR 33 (2).

4. Alamri I, Alfishawy M, Babu N, Gurmani MA. Should we implement TRS 483 recommended correction factors for CK cones output in various detector types. 2023.Conference: CARO 2023

5. Cyberknife S7 Synchrony System For Moving Target. Gurmani MA, AlAmri I, AlFishawy M, AlMandhari Z. 2023-05-20. Conference: MEFOMP 2023

Intensive Care Medicine

1. Paul J. Young, Abdulrahman Al-Fares, Diptesh Aryal, Yaseen M. Arabi, Muhammad Sheharyar Ashraf, Sean M. Bagshaw, Abigail Beane, **Airton L. de Oliveira Manoel**, Layoni Dullawe, Fathima Fazla, Tomoko Fujii, Rashan Haniffa, Carol L. Hodgson, Anna Hunt, Bharath Kumar Tirupakuzhi Vijayaraghavan, Giovanni Landoni, Cassie Lawrence, Israel Silva Maia, Diane Mackle, Mohd Zulfakar Mazlan, Alistair D. Nichol, Shaanti Olatunji, Aasiyah Rashan, Sumayyah Rashan, Jessica Kasza (2023). **Protocol and statistical analysis plan for the mega randomised registry trial comparing conservative vs. liberal oxygenation targets in adults with sepsis in the intensive care unit (Mega ROX Sepsis)**. Critical Care and Resuscitation, 25, Issue 2, 106-112. doi.org/10.1016/j.ccrj.2023.04.008.

   The Mega-ROX Sepsis trial is an international randomized clinical trial that will be conducted within an overarching 40,000-patient registry-embedded clinical trial comparing conservative and liberal ICU oxygen therapy regimens. We anticipate that between 10,000 and 13,000patients with sepsis who are receiving unplanned invasive mechanical ventilation in the ICU will been rolled in this trial.

2. Paul J. Young, Abdulrahman Al-Fares, Diptesh Aryal, Yaseen M. Arabi, Muhammad Sheharyar Ashraf, Sean M. Bagshaw, Mohd Basri Mat-Nor, Abigail Beane, Giovanni Borghi, **Airton L. de Oliveira Manoel**, Layoni Dullawe, Fathima Fazla, Tomoko Fujii, Rashan Haniffa, Carol L. Hodgson, Anna Hunt, Cassie Lawrence, Diane Mackle, Kishore Mangal, Alistair D.

Nichol, Shaanti Olatunji, Aasiyah Rashan, Sumayyah Rashan, Bruno Tomazini, Jessica Kasza (2023). **Protocol and statistical analysis plan for the mega randomised registry trial comparing conservative vs. liberal oxygenation targets in adults with nonhypoxic ischaemic acute brain injuries and conditions in the intensive care unit (Mega-ROX Brains).** Critical Care and Resuscitation, 25, Issue 2, 53-59. doi.org/10.1016/j.ccrj.2023.04.011.

Mega-ROX Brains is an international randomized clinical trial, which will be conducted within an overarching 40,000-participant, registry-embedded clinical trial comparing conservative and liberal ICU oxygen therapy regimens. We expect to enroll between 7500 and 9500 participants with nonhypoxic ischemic encephalopathy acute brain injuries and conditions who are receiving unplanned invasive mechanical ventilation in the ICU.

3. Nelson SE, Fragata I, Rowland M and **de Oliveira Manoel AL** (2023) Editorial: Outcomes in subarachnoid hemorrhage. Front. Neurol. 14:1186473. doi: 10.3389/fneur.2023.1186473.

   This is an Editorial written for the Research Topic on "Outcomes in subarachnoid hemorrhage" in Frontiers in Neurology.

4. Zampieri FG, Cavalcanti AB, Taniguchi LU, Lisboa TC, Serpa-Neto A, Azevedo LCP, Nassar AP Jr, Miranda TA, Gomes SPC, de Alencar Filho MS, da Silva RTA, Lacerda FH, Veiga VC, **de Oliveira Manoel AL**, Biondi RS, Maia IS, Lovato WJ, de Oliveira CD, Pizzol FD, Filho MC, Amendola CP, Westphal GA, Figueiredo RC, Caser EB, de Figueiredo LM, de Freitas FGR, Fernandes SS, Gobatto ALN, Paranhos JLR, de Melo RMV, Sousa MT, de Almeida GMB, Ferronatto BR, Ferreira DM, Ramos FJS, Thompson MM, Grion CMC, Santos RHN, Damiani LP, Machado FR; MAPA investigators, the BRICNet. Attributable mortality due to nosocomial sepsis in Brazilian hospitals: a case-control study. Ann Intensive Care. 2023 Apr 26;13(1):32. doi: 10.1186/s13613-023-01123-y. PMID: 37099045; PMCID: PMC10133434.

   We aimed to estimate attributable mortality fraction (AF) due to nosocomial sepsis. 3588 patients from 37 hospitals were included. 470 sepsis episodes occurred in 388 patients (311 in cases and 77 in control group), with pneumonia being the most common source of infection (44.3%). The impact of nosocomial sepsis on outcome is more pronounced in medical admissions and tends to increase over time.

Academic accreditation and quality

1. Al-Ruzzieh, M. A., Eddin, R., **Ayaad, O.**, Kharabsheh, M., & Al-Abdallah, D. (2023). Examining Nurse and Patient Factors Before and After Implementing an Oncology Acuity Tool: A Mixed Methods Study. Journal of Nursing Measurement.

   The study aimed to assess nurse documentation compliance, pressure injury compliance, and fall prevention compliance before and after implementing an oncology acuity tool (OAT) at a specialized cancer center in Jordan. Employing a mixed methods design, the research utilized a qualitative approach involving semistructured interviews with 15 purposively selected nurses, alongside a quantitative analysis of pre- and post-implementation data to evaluate the impact of OAT adoption on nursing documentation and the application of fall and pressure injury-prevention measures. The thematic analysis of the qualitative data revealed seven themes, encompassing topics such as oncology acuity score (OAS) and assignment processes, OAS and patient outcomes, OAS and nurse outcomes, limitations of the OAT, driving forces, restraining forces, and recommendations. The findings demonstrated significant improvements in nursing documentation ($p = .0385$), as well as the application of pressure injury ($p \leq .00001$) and falling precaution measures ($p \leq .00001$). In conclusion, the implementation of the OAT led to enhanced nurse assignment, nursing compliance, and improved outcomes for both patients and nurses at the specialized cancer center.

2. Ayyad M, **Ayaad O**, Alkhatatbeh H, Sawaqed F, AlRawashdeh S, Qaddumi B. The effectiveness of gabapentin in treating overactive bladder: a quasi-experimental study. Immunopathol Persa. 2023;x(x):e40574. DOI:10.34172/ipp.2023.40574.

   This study conducted at a private clinic in Jordan from 2020 to 2022 aimed to assess the efficacy of gabapentin in treating Overactive Bladder (OAB). Involving 50 patients and utilizing a one-group pre- and post-test design, the intervention consisted of administering a daily 400 mg dose of gabapentin. Using the Overactive Bladder Symptom Score (OABSS) questionnaire before and after a six-week treatment period, the study found that all OABSS variables, including urgency, frequency, nocturia, and urgency incontinence, exhibited significant reductions post-intervention. The mean total OABSS score also showed a substantial decrease from 14.6 to 6.8, with statistical analysis confirming its significance. These findings

suggest that gabapentin could be a promising treatment option for OAB patients, with the potential to alleviate their symptoms effectively.

3. Shamieh, O., Alarjeh, G., Qadire, M. A., Amin, Z., AlHawamdeh, A., Al-Omari, M. **Ayaad O**,, ... & Hui, D. (2023). Validation of the Arabic Version of the Edmonton Symptom Assessment System. International Journal of Environmental Research and Public Health, 20(3), 2571.

   The study aimed to validate the Arabic version of the Edmonton Symptom Assessment System (ESAS-A) as a tool for monitoring symptom changes in cancer patients. In phase one, two versions of ESAS-A were created through translations and expert panel evaluation, and a final version was developed after piloting with 20 patients. Phase two involved validating ESAS-A with 244 adult patients diagnosed with advanced cancer and comparing its results to two other symptom survey tools. The ESAS-A items demonstrated good internal consistency (average Cronbach's alpha of 0.84), and it showed good agreement with other symptom survey tools like EORTC QLQ-15 PAL and HADS regarding anxiety and depression. The ESAS-A was found to be responsive to symptom changes and had a short median completion time of 3.73 minutes. Overall, the study concludes that ESAS-A is a reliable, valid, and practical tool for monitoring symptom changes during cancer treatment.