DOI: 10.1007/s00259-020-04988-4

EANM'20

Annual Congress of the

European Association of Nuclear Medicine
October 22 – 30, 2020
Virtual

Abstracts

European Journal of Nuclear Medicine and
Molecular Imaging (2020) 47 (Suppl 1): S1–S753
10.1007/s00259-020-04988-4

This supplement was not sponsored by outside commercial interests. It was funded entirely by the association's own resources.

analysis of selected clinical trials showed that the reported results of treatment efficiency rather well correspond to the model predictions. However, the results of DVHs calculated for real patients' anatomical data showed that even small volumes of the tumour that were irradiated to doses less than 70 Gy in 35 fractions could significantly decrease the expected TCP value. The results of simulation and analysis of clinical practice show that the DVH of each patient should be analyzed on the expected TCP. ***References:*** None

EP-42

Technical Studies -> Instrumentation -> SPECT and SPECT/CT

e-Poster Area

EP-303

Scatter correction in ^{99m}Tc SPECT by energy window narrowing and Monte Carlo simulation

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Aim/Introduction: Two novel methods, energy window narrowing in digital SPECT/CT scanner and Monte Carlo simulation -based method, were evaluated for ^{99m}Tc SPECT scatter correction. ***Materials and Methods:*** A Jaszczak phantom was filled with 442 MBq of ^{99m}Tc-pertechnetate and scanned using Discovery NM/CT 670 CZT camera (GE Healthcare, Tirat Hacarmel, Israel) as follows: wide-energy high resolution collimators, 120 projections over 360° with 39-s acquisition time per view, 128 × 128 matrix, and 15% energy window centered at 140 keV. A low-dose CT scan was performed for attenuation map. The SPECT acquisition was performed in list mode, which allowed generation of additional sinograms with narrower energy windows. The energy window was narrowed from 15 to 6% in one percentage point intervals producing ten separate sinograms. The data of each sinogram were reconstructed with and without Monte Carlo simulation -based scatter correction using HybridRecon-Oncology (version 3.0, Hermes Medical Solutions AB, Stockholm, Sweden) and ordered-subset expectation-maximization algorithm with six iterations and 15 subsets. Attenuation and collimator response corrections were always used, and the images were post-filtered using a Gaussian filter with 7-mm full width at half maximum. From the reconstructed images, a 15 x 15 -pixel uniform region was segmented as background, and the five largest cold spheres were segmented using spherical volumes of interest with the actual diameters (9.5 - 31.8 mm) of the spheres. Total counts, background noise, and cold sphere contrasts were measured from all 20 SPECT images. ***Results:*** Energy window narrowing from 15 to 6% reduced the number of total counts by up to 35% and increased background noise from 6 to 16%. Depending on the energy window width (EWW), Monte Carlo -simulation further reduced total counts by 12 (EWW = 6%) to 19 % (EWW = 15%) and increased background noise by 0 to 2 percentage units. Average contrast of the five largest cold spheres was not affected by EWW until it was set narrower than 9%. Then the average contrast started to decrease from 44% (EWW = 9%) to 38% (EWW = 6%). Depending on the EWW, Monte Carlo -simulation increased the average contrast by 7 (EWW = 6%) to 15 % (EWW = 15%) compared to the images without Monte Carlo -simulation. ***Conclusion:*** Monte Carlo -simulation based scatter correction increases the contrast of cold spheres in ^{99m}Tc SPECT scan when energy window narrowing preserves the contrast. ***References:*** None

EP-43

Technical Studies -> Radiation Protection -> Radiation Exposure and Protection

e-Poster Area

EP-304

Internal Audits: an Ally in the Promotion of a Radiation Protection Culture

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Aim/Introduction: Internal audits are between the most important tools supporting the management board of any organization. Regardless if they are conducted by an internal or an external auditor, the goals are to assist the organization in defining areas of improvement, while providing precise information needed to accomplish the established goals. We aim to contribute to improving the community awareness of the value of conducting regular audits and its impact on promoting a culture of radiation protection. ***Materials and Methods:*** In our department, the first audit started informally, essentially consisting of a checklist of legal requisites to become licensed. Further, the implementation of a quality management system created the need for undergoing regular internal audits on a process-centered analysis. Key staff members received formal training on defining goals and conducting internal audits. The main goals for internal audits are: continuously monitoring and analyzing the risks (either new or previously identified), the implemented mitigation

measures to address those risks; verifying the compliance regarding the legal framework; identifying opportunities for improvement, and any non-conformities; making recommendations to the board. ***Results:*** Currently, the outcomes and the level of compliance of several processes are systematically checked. Examples of audited processes are patients' and referring physicians' satisfaction, work practices regarding radiation protection issues, nosocomial infection prevention and control, and written records and record keeping. During auditing, items of a checklist are scored according to the level of conformance. When no or partial conformance is detected, a recommendation is released. In the next auditing, particular attention is given to the previously identified items to check whether the level of conformance has improved and the specific issue has been completely solved. If not, a new recommendation is released. The regular auditing process had a significant impact on the overall quality of services. It also led to changes in work practices such as the implementation of stricter rules regarding record keeping, equipment quality control, survey areas for radioactive contamination, cleaning procedures, waste management, and the correct use of shielding devices. ***Conclusion:*** The auditor's role in challenging the implemented practices in a pedagogic, non-penalizing way, as well as the involvement of the management board and the entire staff, demonstrated to be THE key to a successful outcome. By challenging the implemented practices and looking at them from a different angle, we created a safer, more effective, and efficient working environment, solidifying a stronger culture on radiation protection. ***References:*** None

EP-305

Attitude and commitment of Nuclear Medicine staff towards Safety Culture working in Nuclear Medicine department

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Aim/Introduction: This study aimed to measure and access the knowledge, attitude and commitment that Nuclear Medicine staff had toward safety culture in Nuclear Medicine department ***Materials and Methods:*** The study is survey based upon a questionnaire designed to access attitude towards Safety Culture.This questionnaire consisted of 10 safety culture aspects: job satisfaction, knowledge, feedback and communication about errors, teamwork, communication openness, management support, frequency of error reported, non punitive response to errors and working conditions. Nuclear Medicine staff grouped into 4 as physicians, technologists, Pharmacists and Physicists. 28 questionnaires forms have been distributed with a response rate of 100%. ***Results:*** Analysis provided an insight into attitude and commitment towards safety culture. Analysis of 10 of the broad domains of safety culture resulted: 4 of them showed strength, 4 of them has potential improvement and 2 has come up as weakness towards safety culture. Team work resulted as greatest strength while in contrary communication openness identified as weakest link towards safety culture. The survey result indicates that technologists working in Nuclear Medicine department consider the support from department and management inadequate, they report fewer incidents among the 4 professions. Punitive response analysis signifies that significant number restrain from reporting errors and events, and highlights that disciplinary response to events are major barrier to reporting. Staff have positive attitude towards safety culture, technologist have insufficient knowledge about safety culture. Positive attitude towards communicating errors is seen in maximum number of staff. Technologists do not have the required knowledge regarding safety culture as participant respondents shows the absence of training courses and unavailability of any protocols directing the staff behavior toward safety measures ***Conclusion:*** Safety Culture is vital component of safety in Nuclear Medicine. The survey suggested presence of management committed towards patient safety and encourages to report errors and near misses, who aim to improve communication and to eliminate the blame culture will serve to improve safety culture. Number of events reported can be increased by creating openness to communication. Importance of near misses is to be understood because these are powerful in identifying work process problems that can lead to an incident. Nuclear Medicine is technologically demanding field which is dependent on well trained and highly skilled staff, better safety culture demands continuous training of staff ***References:*** 1. Pfeiffer Y. Manser T. Development of the German version of the Hospital Survey on Patient safety Culture Saf Sci.2010;48:1452-1462

EP-306

Estimation of Conversion Cactors for Quality Reference mAs for Child to Adult Reference Patient in Child SPECT-CT Protocols

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Aim/Introduction: CT image quality and radiation dose are influenced by tube voltage (kV), tube current (mAs) and patient size and shape. CARE Dose 4D modulates mAs according to patient size and shape, performing topogram (scout scan) and angular based modulation, whilst maintaining a user-defined reference image quality. On the Symbia SPECT-CT systems, the reference patient for child scans was a 20kg child prior to software version