AbstractID: 10419 Title: The Need and Feasibility of a Modern Software for Reporting Patient Doses from CT Scans

Purpose: To demonstrate the need and feasibility to develop a modern software tool for reporting the organ dose and effective dose for patients undergoing CT examinations. **Method and Materials:** Existing CT dose reporting software do not meet the need because of the simplified anatomical phantoms, updated ICRP data and scanner information. A new software is designed with original dose data derived from Monte Carlo simulations involving CT scanner models from various companies and anatomically realistic phantoms. X-ray sources and protocols are modeled. The Pregnant Women, Adult Male and Adult Female phantoms are utilized. Organ doses and effective doses are computed using both the ICRP-60 and the latest ICRP-103 recommendations. The software is developed using the Visual C#.NET with a modern graphical user interface (GUI) design to allow a user to specify the patient type, body scan region, and scanner operating parameters. Object-oriented programming technology allows the phantoms to be displayed in 3D interactively. **Results:** Compared to values reported by the existing software, the organ dose estimates can be different by a ratio as 0.77 to 1.24 for the organ or tissue covered in the scan range, and 0.13 for the organs out of the scan region between calculations using the anatomically realistic phantoms. In addition to the improved dose accuracy, the new program offers a number pf modern GUI features through which 3D phantoms are vividly inspected for organs that receive a high doses. Based on the user-specified scanning parameters, organ and effective doses are rapidly reported. **Conclusion:** Preliminary results have demonstrated the aim of the new software design in addressing the needs for new CT scanners, ICRP recommendations and anatomically realistic phantoms. When fully developed, this new tool is expected to improve both the accuracy and usability in reporting CT doses in the future.