

**Recommendations Emerging from the 2<sup>nd</sup> Meeting of the IAEA  
Smart Card/SmartRadTrack Project  
Held in VIC Vienna, 25-27 January, 2010**

**What is the motivation for this project?**

The major driving force for this project is the increasing number of diagnostic and interventional imaging procedures that an individual patient may undergo in few years or during a life time. The situation has been becoming acute as examinations and procedures that deliver relatively higher radiation doses to patients, such as CT and interventional procedures are falling in this category. Reports of patients undergoing more than 10 CT scans in few years or even in a single year and other patients undergoing more than 5 interventional procedures have increased, with calls from many sectors, including regulatory agencies, advocacy groups, and healthcare providers themselves for accountability for medical radiation exposures to patients. This is a phenomenon that has occurred within the last one decade for CT and had started in 1990's for interventional procedures. The cumulative effective dose exceeding 100 mSv and in some cases 1 Sv are being reported and a case has been landing up in US courts with radiation injury to skin from interventional procedures almost every 4 or 6 weeks. Further, the deterministic injuries of hair loss and skin injury from CT examination is a very recent phenomena that started to appear in 2005.

**Is there a change in focus and approach needed?**

Yes. The driving force for radiation protection of patient in the past has been increasing collective doses to the *population* from medical exposure. However, the exposure history of an *individual patient* is an increasingly mandated focus and requires additional considerations. Because of the complexities with different indices of dose for different modalities, ranging from tracking the number of examinations to actual risk estimates based on exposures parameters conveyed in DICOM information from each modality, notwithstanding the variability in being able to archive and transmit this information, it is understandable that these efforts for exposure history and cumulative dose record of an individual patient exposure have been wanting in a large part of the world.

**What actions are recommended?**

The wide ranging recommendations cover actions that manufacturers, regulators, health authorities and IAEA Member States authorities should take:

1. Member States establish, with the aide of a template, policies and mechanisms for tracking indices of radiation exposure for diagnostic examinations and interventional procedures involving ionizing radiation for individual patients.
2. Appropriate groups, including professional societies and organizations, manufacturers, and regulatory agencies agree on reliable and robust radiation dose indices that also will have the most potential to accommodate the evolution in understanding and representation of radiation dose from medical imaging over time.
3. Avail the benefit of current advances in electronic health records to track patient exposures. A significant barrier in assessing radiation dose history from medical imaging arises with current variable and incomplete retrospective tracking and,

therefore, Member States should introduce tracking strategies that will best provide for conversion of available prior exposures to those incurred, once prospective tracking is introduced.

4. Responsible imaging parties (e.g. institutions such as hospitals; out patient facilities) should have a responsibility to employ designated means to track radiation exposure of individual patients developed internally and/or from supervising agencies, such as health ministries
5. Periodic surveillance, such as survey or audit, is conducted to assess endeavours for tracking of patient exposures and radiation doses in different regions, countries, or groups of countries.
6. Pilot studies are recommended to assess development and implementation of programs for tracking of patient exposures and radiation doses, especially for higher dose procedures such as CT and interventional procedures.
7. Apex centres in some countries should prepare locally suited methodologies for radiation dose tracking and for cumulative dose assessment of individual patients over a life time.
8. Manufacturers should develop technology to aid in tracking an individual's radiation dose indices from medical imaging.
9. International standards for tracking radiological examinations and procedures across different countries should be established.
10. Necessary provisions should be made in safety standards to require tracking of radiological examinations and procedures and to assess cumulative radiation dose to individual patients.