An Effective Method of Patient Radiation Safety Assessment in a University Medical Center

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- **An Effective Method of Patient Radiation Safety Assessment in a University Medical Center**

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- A bit of history….
  - 2008 questions arose regarding using breast shields with CT modulation.
  - This opened the questions of multiple CT protocols and how confusing they were.
  - 7/9/2009 first meeting of the radiation dose assessment group formed.

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- One of the crucial successes early on were the inclusion of a senior Radiologist as chair of the committee.
- In addition, other members are:

  DABR Imaging Physicist

  Ph.D. CT Physicist

  RSO

  Ad hoc members consisting of shareholders from various areas

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- The first meeting:
  - CT protocols were reviewed.
  - A printout of all the protocols matched to each CT scanner was obtained.

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- Pediatric CT protocols were reviewed and modified when necessary
- weight- stratified pediatric protocols were developed and implemented
- In subsequent meetings, all other protocols were reviewed to make sure they were reasonable.
  - Note: Utilize all help. The Image Gently group was giving good advice on proper protocols for children.

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- The CT physicist reviewed completed pediatric exams to make certain that the new protocols were being used(audit process).
- The only deviation seen were in just a couple of the ER CT trauma cases.
- A reduction in dose of approximately 20% was achieved by this process.

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- An ongoing procedure emanating from this group is to reduce the number of protocols for any CT exam to the minimum necessary for good practice.

Procedure to introduce a new protocol:

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Our Group has enacted the following:

- All CT equipment has individual books with all protocols accounted for in detail
- *Any* changes to protocols goes through committee, permission to research a new protocol is given for a certain number of patients (usually 3-4). Results are examined and a decision is made to create a new protocol.
- Periodic audits are performed for compliance.

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- Radiation Oncology was reviewed
  - CT used in treatment planning

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  - CT used in treatment planning
  - Talk to the Medical Physicist before changing protocols

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Other issues:

- CT Brain perfusion protocols
- Patient trending

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- Head phantom studies have been done to establish shunt doses.
- Follow-up low dose shunt stroke protocols have been developed with
  - Fewer CT exams
  - Lower radiation (as much as 70% less) compared to initial shunt study
  - Increased follow-up for chronic patients with multiple CT history.

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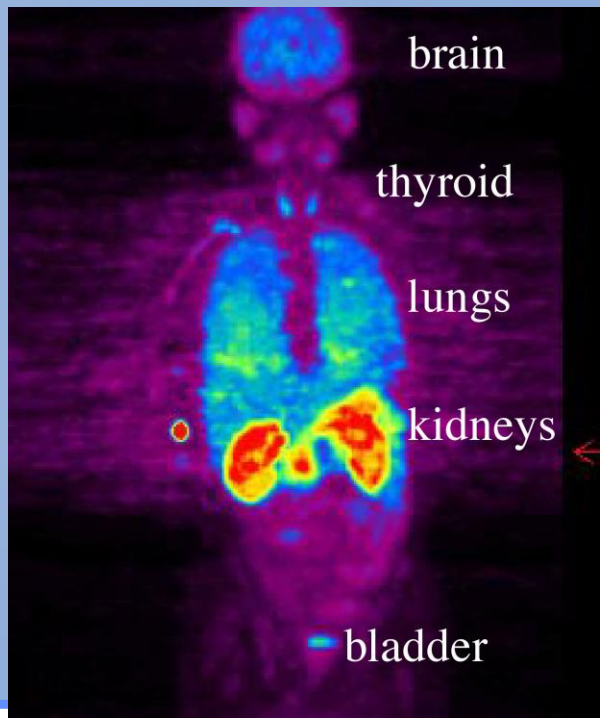
- Nuclear Medicine was also inspected
  - Pet CT and Spect CT protocols were optimized.
  - Nuclear Medicine Technologists received additional substantial training in CT utilization and dose tracking – sending dose to the medical records.
  - CT Dose optimization has led to a decrease CT dose component for PET and SPECT protocols.



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- Digital Radiology
  - Initial setup
  - pediatric

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  - We are now looking at a radiology procedure ordering system that utilizes an appropriateness criteria to make certain that a physician orders the correct procedure and considers non-radiation studies where appropriate.

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- To Summarize

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  - Optimize all CT protocols

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  - Utilize stakeholder input in all areas. Listen carefully to their concerns and ideas

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  - Have a senior member of Radiology on your team to make compliance easier

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  - Utilize stakeholder input in all areas. Listen carefully to their concerns and ideas
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  - Follow-up with each area to assess what the changes have done for their patients. Feedback to the area affected is crucial.

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  - Audit these areas to make sure of compliance.

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  - Follow-up with each area to assess what the changes have done for their patients. Feedback to the area affected is crucial.
  - Audit these areas to make sure of compliance.
  - Create a positive safety culture, everyone wants to help to lower patient dose.

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- Medical doses for ALL radiation procedures are placed into the patient record, no exceptions.
- Any unusual circumstances causes a review of the dose and investigation.
- All unusual cases are forwarded to Risk management
- RSO sits on patient risk committee.

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- Key Point:
- These reductions through utilization of a working group with a Senior Radiology Physician & Stakeholder input.

A Collaborative Approach to Patient Dose and Image Quality Optimization

Questions???