

10 Pearls: Radiation protection of *patients* in CT

1. Perform scan only if it is indicated!

It is estimated that a significant number of imaging examinations are unnecessary

Consultation between the referring physician and the radiologist is recommended



US

Ultra Sound

MRI

Magnetic Resonance Imaging

2. Encourage use of alternative non-ionizing imaging (MRI,US) when appropriate especially in younger patients

3. Always check if patient may be pregnant

Use special signs and informative material notifying patients that they **MUST** disclose any possibility of pregnancy



Please notify staff if you think you might be pregnant!

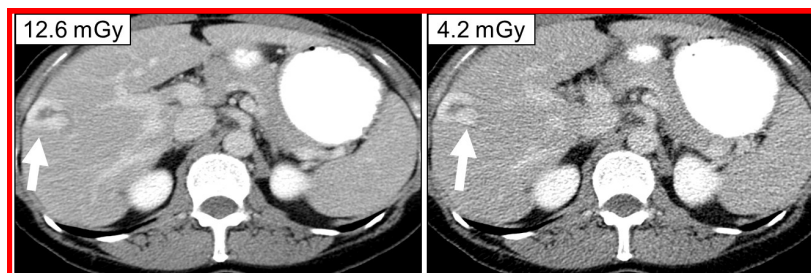


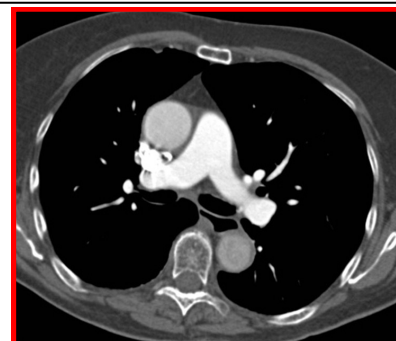
Image Quality: Unnecessarily high

Image Quality: Adequate for diagnosis

4. High quality /Crisp images may look nice but they impart higher radiation dose to patients Start using images with some noise without loss of diagnostic information

Images courtesy of: MK Kalra, S. Singh, MGH Webster Center for Advanced Research and Education in Radiation

5. Use indication-specific CT protocols for each body region, e.g. for lung nodule follow up or kidney stones, diagnostic images can be obtained at 50-75% lower radiation dose compared to routine or general use protocols



RPOP
Radiation
Protection of
Patients

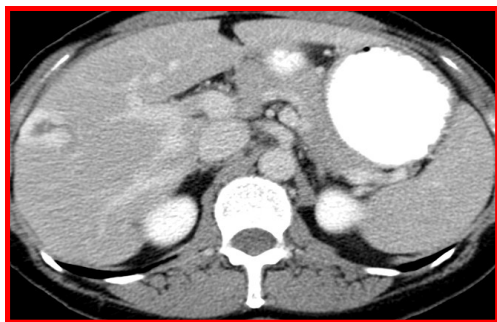
Related Poster!

10 Pearls: Appropriate referral of CT examinations

<https://rpop.iaea.org/RPOP/RPoP/Content/Documents/Whitepapers/poster-ct-appropriate-referrals.pdf>

<http://rpop.iaea.org>

10 Pearls: Radiation protection of *patients* in CT



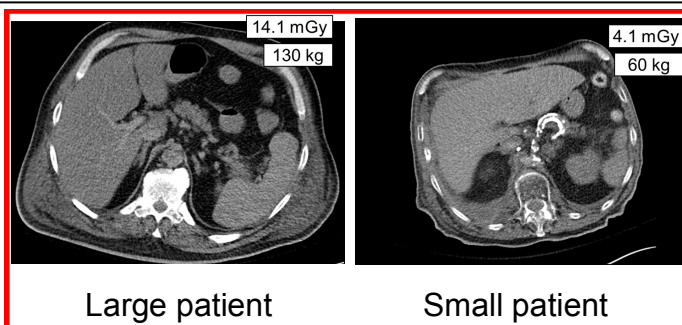
6. Multiple pass or phase CT should NOT be performed routinely

Multiphase CT can increase the dose by as much as 2-3 folds over single phase CT

Images courtesy of: MK Kalra, S. Singh, MGH Webster Center for Advanced Research and Education in Radiation

7. Adjust exposure parameters according to patient and body part

Images courtesy of: MK Kalra, S. Singh, MGH Webster Center for Advanced Research and Education in Radiation



Large patient

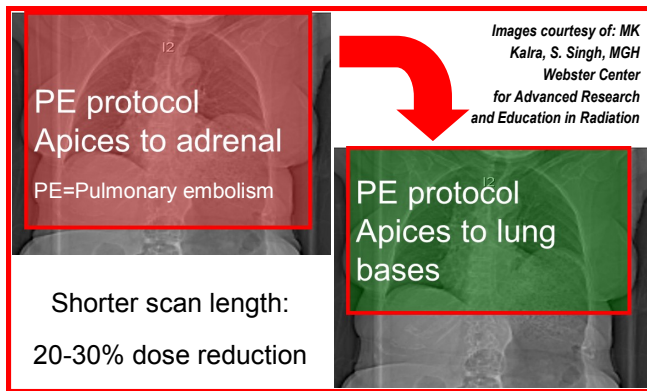
Small patient

8. Know your equipment: Learn how to adjust the parameters of the automatic exposure control (AEC) system to fine tune radiation dose for different clinical indications and body regions

Most body CT examinations should be performed with use of AEC

9. Good technique:

- Lower kVp, mAs,
- Higher pitch
- Restrict scan length to what is necessary
- Always center the area of interest in isocenter of CT gantry
- All CT protocols should state the start and end location for different clinical indications
- Thin slices only when necessary



Examination	Reference Levels (CTDI _{vol})*
CT head	75 mGy
CT adult abdomen	25 mGy
CT adult chest	21 mGy
CT paediatric abdomen (5 y old)	20 mGy
CT paediatric head (5 y old)	34 mGy

*NCRP Report No. 172

10. Pay attention to radiation dose values and compare with diagnostic reference levels (DRLs)

Be aware of CT dose metrics and recommended dose levels for different body regions



RPOP
Radiation
Protection of
Patients

Related Poster!

10 Pearls: Appropriate referral of CT examinations

<https://rpop.iaea.org/RPOP/RPoP/Content/Documents/Whitepapers/poster-ct-appropriate-referrals.pdf>

<http://rpop.iaea.org>