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

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

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
   Image Quality: Unnecessarily high  Image Quality: Adequate for diagnosis

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

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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

7. Adjust exposure parameters according to patient and body part

Most body CT examinations should be performed with use of AEC

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

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

<table>
<thead>
<tr>
<th>Examination</th>
<th>Reference Levels (CTD\textsubscript{vol})*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT head</td>
<td>75 mGy</td>
</tr>
<tr>
<td>CT adult abdomen</td>
<td>25 mGy</td>
</tr>
<tr>
<td>CT adult chest</td>
<td>21 mGy</td>
</tr>
<tr>
<td>CT paediatric abdomen (5 y old)</td>
<td>20 mGy</td>
</tr>
<tr>
<td>CT paediatric head (5 y old)</td>
<td>34 mGy</td>
</tr>
</tbody>
</table>

*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

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