

## CT Scan

Axial scan data reconstructed into other views or 3D images without re-scanning.

## Radiation Dose

- Increased by: overuse, multi-detectors (faster scans), high resolution scans, larger area.
- More paediatric scans done as faster (~1s) scans now so less need for sedation.
- Average background radiation = 2.5-3mSv/yr (~25-30 CXRs)

## Typical scan doses

| Modality    | Body Area             | Approx Ave Dose (mSv) | Chest X-ray Equivalent Dose | ~Equivalent Period of Background Radiation |
|-------------|-----------------------|-----------------------|-----------------------------|--|
| Plain X-ray | Limbs                 | 0.005                 | 0.25                        | <1d  |
|             | Chest (PA)            | 0.02                  | 1                           | 3d   |
|             | C-spine series        | 0.2                   | 10                          | 1mo  |
|             | Hip                   | 0.3                   | 15                          | 1.5mo                                      |
|             | Pelvis or Abdomen     | 0.7                   | 35                          | 4mo  |
| CT scan     | Head                  | 2                     | 100                         | 1yr  |
|             | C-Spine               | 6                     | 300                         | 3yr  |
|             | Chest                 | 8                     | 400                         | 4yr  |
|             | CTPA                  | 15                    | 750                         | 7.5yr                                      |
|             | V/Q scan              | 2.2                   | 110                         | 1yr  |
|             | Abdomen-Pelvis        | 10                    | 500                         | 5yr  |
|             | CT angiogram of aorta | 24                    | 1200                        | 12yr                                       |
|             | Trauma pan scan       | 34                    | 1700                        | 17yr                                       |

## Reducing radiation dose

- Is X-ray/CT really necessary
- Is there an alternative modality e.g. USS/MRI
- Focus scanning only on area of interest
- Adjust CT parameters (tube current and pitch) for body type & organ
- CT scans can be performed with lower exposure in children, if employed.
- Use of newer software that improves quality of low dose scan results

## Cancer Risk

- Estimated lifetime cancer mortality risk attributable to a dose similar to an abdo CT:
  - 1yo child: ~0.05% (head) & 0.1% (abdominal), reducing to <0.01% & 0.02% in adults >35y. Overall ~1:1,000-1:10,000 CTs result in a cancer death.
- Risk F>M generally, sig (1.5-2.5x) if radiation of chest(breast) at all ages, or head <35y
- Additional risk is still low ( $\leq 1\%$ ) compared to background risk. (Lifetime risk of cancer in Aus ~25-33%, and lifetime cancer mortality ~10-15%).
- Survivors of atomic bombings @ Hiroshima and Nagasaki were exposed to ave 40mSv.

