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	0.05	12h
	Chest (PA & Lat)	0.1	1	10d
	C-spine	0.2	2	20d
	Pelvis or hip	0.6	6	2mo
	Abdomen	7	70	2yr
CT scan	Head	2	20	8mo
	C-Spine	6	60	2yr
	Chest	8	80	2.75yr
	CTPA	15	150	5yr
	V/Q scan	2.2	22	9mo
	Abdomen-Pelvis	14	140	5yr
	CT angiogram of aorta	24	240	8yr
	Trauma pan scan	34	340	10yr

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 (≤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.