Models Matter!

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H₀: dose ≠ risk
H_{LNT}: as dose ↑, risk ↑
H_{AR}: at low doses ↓ at high doses ↑

Don’t Be A

The Contenders
It Matters to Me!
Ulsh, Brant

12:52 PM CT GT 8KNS W/O DON

It Matters to Her!
Screening mammography and risk of breast cancer in BRCA1 and BRCA2 mutation carriers: a case-control study

Mammographic screening before age 50 years in the UK comparison of the radiation risks with the mortality benefits
A Berrington de González* and G Reeves

British Journal of Cancer (2006) 93, 583–592
2006 Cancer Research UK. All rights reserved 0007-0920. $30.00
www.bjcancer.com

(Ratanpalan et al AJR 2004)
"We Are Not Giving Ourselves Cancer"!!

Diagnosis of:
- Lung cancer
- Appendicitis
- Vascular conditions
- Blunt trauma survival
- Shorter hospital stays
- Stroke treatment
- Cardiac treatment

Predictions of hypothetical cancer incidence and deaths in patient populations exposed to such low doses are highly speculative and should be discouraged.

...the radiation used in CT scans has not been proven to cause cancer during a child's lifetime.
...the computation of cancer deaths based on collective effective doses involving trivial exposures to large populations is not reasonable and should be avoided.

Welcome to the Club!

Disaster in Japan
Sunshine or A Lump of Coal?
“...global nuclear power has prevented an average of 1.84 million air pollution-related deaths...”.
(Karecha and Hansen, Environ Sci Tech 2013)

Reasonable?

15,887 dead

~1,600 dead

0 dead

Putting the “R” Back in ALARA
making every reasonable effort to maintain exposures to ionizing radiation as far below the dose limits as practical...
...taking economic and other societal considerations into account.
Why Take Two When One Will Do?

All Things Equal?

- Bryan Salinas fell 5 feet
- “A CT scan exposes a child to radiation equal to 300 X-rays, and can require sedation, which is risky” (American Academy of Pediatrics)
- Bryan died hours later from a subdural hematoma

All Things Are ≠

- Trading minimal dose for diagnostic quality
- Population ≠ individual
- Ignoring uncertainties
- Flawed logic
- Frightening patients
- Overweighting radiation risk

Source: (Brody and Guillerman, Thorax, 2014)
This Matters!!

Foot-O-Scope

7-14 R to the feet

Source: http://www.orau.org/ptp/collection/shoefittingfluor/shoe.htm

Baby ≠ Bathwater
What to Do?

“A lie gets halfway around the world before the truth has a chance to get its pants on”

Medical Imaging Saves Lives !!!