And now...the rest of the story...

- Paul Harvey
Clinical Case Type 3 – Multi Discipline Procedures
(Unkown Unkowns)

• Patient Information:
  • 64 y/o male
  • BMI 24.3 kg/m²
  • Post surgical internal pelvic bleeding

• Patient referred to IR for diagnosis and treatment

• Following procedures were performed over a 3-week period
Peak Skin Dose (PSD)

- Estimated contribution to a given field per procedure:
  1. Day 0 – 3.8 Gy
  2. Day 7 – 9.2 Gy
  3. Day 10 – 1.3 Gy
  4. Day 16 – 2.2 Gy

- Total estimated PSD = 16.6 Gy

- BUT……..
OARs?

• Skin
  • EBRT ranged from 0.2 to 10 Gy (target dose of 20 Gy)
  • FGI PSD ~ 16 Gy to same anatomic region (RBE of 1.2 – 1.3, not accounted for)

• Bladder? Sacral vertebrae? Gonads?
  • EBRT ranged from 1 to 20 Gy (RBE ~ 1)
  • FGI largely unknown, not typically considered

• Diagnostic and Therapy physicists speak about dose in different ways ($K_a,r$ and AKAP vs Target and OAR doses)
Isolated Instance?

- Review of patients undergoing FGIs and external beam radiation therapy within a quaternary care medical center
  - AAPM 2018 Abstract – Zhoa, Wunderle, Godley

- Over a 3 yr period ~ 25 patients/yr had fluoro procedure > 3 Gy $K_{a,r}$ within 12 months of EBRT (before or after) in similar anatomic region
Unknowns

• How can we track radiation doses for these patients?
  • No current dose tracking system accounts for this

• How do we identify and manage these patients?

• Can we change clinical care?
  • What if high fluoro dose is first?
  • Can treatment plan avoid skin entrance from FGI?
Where do we go from here?