Risk vs. Benefit

- Benefit
  - Advantage or good result arising from a specific activity
- Risk
  - Probability of injury, ailment or death resulting from an activity

- Effective communication of the benefits compared to risk of the procedure is very important

Risks

- **Somatic Effects** – Can affect all cells in the human body. Biologic damage after being exposed to ionizing radiation

- **Genetic** – Affects future generations of those who received the radiation.

Risks

- **Stochastic**– Mutational, **randomly occurring** biological somatic changes (e.g., cancer and genetic anomalies).
- NON THRESHOLD
- Minimize the probabilistic (stochastic) effects by using lead protection and using the least amount of technique that will produce an optimal image.

Risks

- **Tissue Reactions** – Biological somatic effects of ionizing radiation **directly related to the received dose** (e.g., early: loss of hair, late: reduced fertility).
  - Prevent any radiation-induced deterministic (non-stochastic) effects by adhering to the dose limits that are beneath the threshold levels.

Communicating with Patient

- Effective communication is an essential part of the job
- If patient asks questions:
  - Answer all questions within your scope of responsibility
  - Explain the benefits and risks of the exam
  - Read and discuss the requisition with the patient and staff, if assistance is required
  - Ensure the appropriate exam and views are ordered and that they match the patient's history
  - Promote patient and staff understanding

Communicating Benefits and Risks

- Communicate benefit of exam
- Communicate purpose of exam
- Explain that an appropriate amount radiation must be used
- Emphasize your departments expertise
- Explain appropriate QC terms and ensure patient of QC programs
- Minimize use of numbers/stats
- Include comparative risks

Communication of Risks

- Lifetime Risk
  - Can be useful for comparison, based on extrapolations, difficult for patients to understand
  - There is a NATURAL cancer incidence
- Environmental Comparison
  - Radon, BERT
- Comparison to standard exam
  - chest x-ray
- Compared to travel by air
  - 0.005mSv/hour

Patient Communication during exam

- Instruct the patient (and support staff) about the procedure, breathing instructions and any changing information
- Communication reduces fear and anxiety
- Co-operation is key to minimizing repeat exams and producing quality diagnostic images the first time
- Establish possibility of pregnancy
- Explain and provide gonadal shielding
- Explain to patients and staff the reasons why people not involved in the x-ray are asked to leave the room or go behind the control panel.

Best Practices

- ALARA – "as low as reasonably achievable"
- Good radiation protection programs/practices which are effective in keeping the average and individual exposures for monitored workers below the limit
- Radiographers/radiologists share in this responsibility to keep occupational and non-occupational dose limits as low as possible!
- DRL are to be below maximum allowable levels

Communicating with Staff

- Doing it right the first time will save dose to the technologist, radiologist, staff and patient.
- Communication between individual techs is essential for a successful DI department.
- Inform each other and the appropriate staff of operational, safety and equipment problems.
- When equipment is not working correctly, contact the QC tech - never assume someone else has reported it!

Current Literature and Limitations

- Responsible for continuing education and keeping up with current changes in technology
- It is important for a technologist to abide by the scope of practice and ethics
- Technologist must recognize the limitations of their professional responsibilities as set out by our governing body, the CAMRT
- Guiding documents are available on the CAMRT website