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The Effect of a Bladder Fill Protocol on Pelvic Radiation Patients

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PICO

Problem- Inconsistent bladder volumes reduce reproducible treatment delivery in pelvic radiation treatment fields and increases GI toxicity.

Intervention- Implement a bladder fill protocol with education for patients. Provide a complimentary graduated water bottle to decrease variability of measure. Increase use of cone beam CT (CBCT) to verify bladder volume.

Comparison- Current state: patients fill bladder to subjective measure of feeling full. Future state: implement bladder fill protocol with written and oral forms of instruction, verified by imaging technique prior to daily treatment.

Outcome- Improve consistency of bladder fill according to dosimetry treatment plan; therefore, reducing small bowel dose.

Practice Question

Does implementing a bladder fill protocol by supplying a graduated water bottle and providing written and oral instructions to the patient improve the consistency of daily bladder volumes as measured by CBCT?

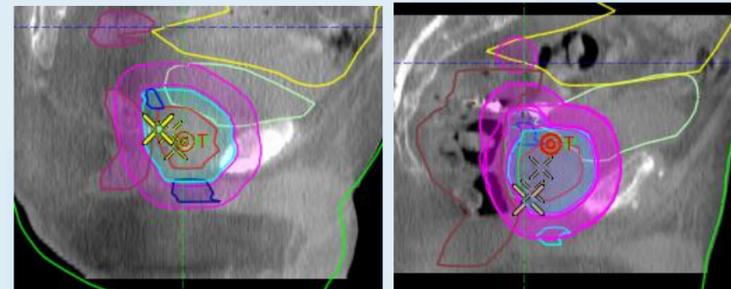
Does improvement of bladder volume consistency correlate with improved GI/GU toxicity grades and frequency?

Recommendation for Change Based on Evidence Synthesis

2004 Gynecologic Oncology: despite the use of bowel displacement systems, dose reduction to small bowel relied on the volume of the patient's bladder

2006 International Journal of Radiation Oncology: bladder scanning and biofeedback methods do not improve consistency of bladder fill

2014 Practical Radiation Oncology Journal: bladder fill protocols are beneficial in improving reproducible bladder volumes. 540ml is an acceptable and more reproducible bladder volume than 1080ml..



Light green is bladder fill goal: homogenous density shows bladder is full here

Heterogenous density within the bladder outline is small bowel which shows bladder is not full

Patient Goals

- Understand the benefit of consistent bladder fill and how to achieve this
- Consistent bladder filling for daily radiation treatments
- Decrease small bowel toxicity from treatment

Translation of Evidence into Practice

- RN provides initial education about benefit to filling the bladder
- Radiation therapists provide the bladder fill protocol and graduated water bottle prior to CT simulation
- Radiation therapists perform CBCT prior to treatment delivery and determine the need for additional volume
- Radiation Oncologist approves CBCT imaging
- RN documents treatment related toxicity on weekly on-treatment-visit (OTV)

Follow-up Actions

- Continue to measure percentage of consistent bladder fill and percentage of inconsistent bladder fill through CBCT
- Continue to measure bowel toxicity

Identified Barriers

- Consistent documentation of acceptable bladder fill by the radiation therapists
- Consistent use and approval by physicians of CBCT

Outcomes

- 80% accuracy of bladder fill on arrival to radiation therapy appointment
- Decreased treatment delays due to incomplete bladder fill
- No treatment breaks due to GI/GU toxicity in pelvic radiation patients
- Decreased GI toxicity in pelvic radiation patients

Moving forward

- Continue the use of a bladder fill protocol
- Continue to measure efficiency of patient time to treatment based on time delay for need to fill bladder after arrival to the radiation department
- Continue to measure GI/GU toxicity in pelvic radiation patients

