IMPLEMENTATION OF ULTRASOUND BLADDER VOLUME SCANNING FOR PATIENTS RECEIVING INTENSITY - MODULATED RADIOTHERAPY TO THE CERVIX OR ENDOMETRIUM: CLINICAL EXPERIENCES FROM A UNITED KINGDOM RADIOTHERAPY DEPARTMENT

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Abstract
Achieving daily consistent bladder volume is acknowledged as challenging for patients undergoing radiotherapy to the cervix or endometrium. We investigated if use of an ultrasound bladder volume scanner (BioCon-700) improves bladder reproducibility when used during an active volume correction protocol.

During our method-comparison study, prospectively recruited patients (*n*=20) followed a fluid-loading protocol to achieve acceptable bladder volume. Bladder ultrasound was performed daily to verify planned volume, with patients actively correcting volumes outside a planned range up to a maximum of three times. Using the Bland–Altman method, we compared mean ultrasound readings (US_{Mean}) with mean cone-beam computed tomography (CBCT) volumes ($CBCT_{Mean}$). We also conducted staff focus groups exploring issues encountered during implementation of bladder scanning.

Comparing US_{Mean} with $CBCT_{Mean}$ produced a mean of the differences −10±49·92 mL (1 SD), demonstrating that bladder volume scanning is equivalent to our standard measure for the stated confidence levels. The cohort mean bladder volume decrease from week 1 to 5 was only 8·4%. Mean US_{Mean} was 323 mL, mean $CBCT_{Mean}$ was 313 mL. Staff experience with the scanner overall was positive.

The BioCon-700 is suitable for the purpose of daily pre-treatment volume verification, facilitating daily assessment and modification of bladder volume, resulting in reproducible treatment volumes.

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