

## Digital photography is reliable for shoulder range of motion measurement: a pilot study in healthy adults

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**Question:** Is digital photography reliable as a measurement tool for shoulder range of motion? **Design:** Experimental cross-sectional study. **Participants:** Thirty healthy adults. **Outcome measures:** Digital photographs were taken of each participant's right shoulder/upper-limb in ten randomly assigned joint positions between 0° and 180° of flexion. Positions were set by a physiotherapist and physiotherapy student with a goniometer and plumb line. A blinded assessor subsequently calculated shoulder flexion range of motion from printed photographs on two separate occasions, using a protractor. **Results:** There was a significant and very strong correlation between goniometer and photograph range of motion ( $R = 0.997$ ,  $p < 0.001$ ). Photograph range of motion was significantly higher than goniometer range-of-motion (mean difference: 2.1°, 95% CI: 1.8° to 2.4°). There was a significant and very strong correlation between repeated photograph ranges-of-motion ( $R = 0.999$ ,  $p < 0.001$ ). **Conclusions:** Shoulder range of motion as measured with digital photography correlates very strongly with 'live' goniometry, and demonstrates excellent intra-rater reliability. Given the ubiquity of smart-phone cameras, digital photography is readily accessible in the clinic. Physiotherapists should consider the use of digital photography to measure/document changes in patients' shoulder range of motion over time and with therapeutic intervention.

### Key Practice Points:

- Digital photography can be used to measure shoulder range-of-motion accurately and reliably
- The use of digital photography in the clinic may facilitate/improve documentation of care for the patient with shoulder range of motion restriction.