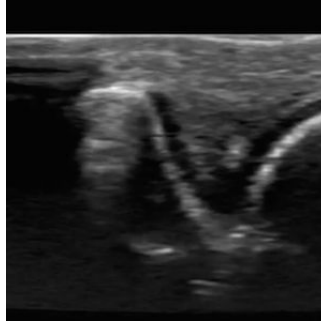


## RSNA15: Knuckles that Snap, Crackle and Pop



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While it's common for joints to crack, pop and snap, little is known about what really causes a knuckle to "crack" out loud. To learn more, researchers at UC Davis examined 40 healthy adults with ultrasound imaging as they attempted to crack the knuckle at the base of each finger — or metacarpophalangeal joint (MPJ). Ultrasound images revealed what looked like "knuckle-cracking fireworks".

"What we saw was a bright flash on ultrasound, like a firework exploding in the joint. It was quite an unexpected finding," said Robert D. Boutin, MD, professor of radiology at UC Davis. The study was presented on Tuesday, 1 December, at the annual meeting of the Radiological Society of North America (RSNA).

In the first study of its kind, the researchers recorded simultaneous audio and visual evidence of knuckles cracking. The participants included 30 individuals with a history of habitual knuckle cracking and 10 without. While some participants stated that they had never intentionally cracked their knuckles, other participants did it frequently every day — up to 20 times per day for the past 40 years.

Orthopaedists blinded to the participants' knuckle-cracking history evaluated the participants for grip strength, range of motion and laxity of each MPJ both before and after the ultrasound examination.

Using a small transducer, a sonographer recorded video images of 400 MPJs, as participants attempted to crack their knuckles. The sonographer also captured static images of each MPJ before and after participants tried their hands at cracking.

Two radiologists interpreted the ultrasound images, looking for sonographic evidence that would correlate with the audible cracks, which occurred in 62 of the 400 joints imaged. Using the "flashes" on the ultrasound images, the radiologists were able to identify the joints with audible cracks with at least 94 percent specificity.

"There have been several theories over the years and a fair amount of controversy about what's happening in the joint when it cracks," Dr. Boutin said. "We're confident that the cracking sound and bright flash on ultrasound are related to the dynamic changes in pressure associated with a gas bubble in the joint." As for which comes first — the cracking sound or the flash of light — Dr. Boutin said that more research is needed.

The physical examinations revealed no immediate pain, swelling or disability in the knuckle-cracking group and no immediate difference in laxity or grip strength between the participants who cracked their knuckles and those who didn't.

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