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Lollies, vitamins and fish-shaped sauce containers hit the MRI mark

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For children fearful of undergoing MRI scans, an inexpensive everyday item used as a marker, such as a jelly baby lolly or a plastic, fish-shaped soy sauce container, might make the process a little less intimidating.

And thanks to a QUT study, these and other relatively cheap, common items have been shown to be visible, effective MRI markers, when placed on a patient's skin, to pinpoint specific anatomical areas or pathologies being scanned.

The study findings have been published in the *British Medical Journal*'s *BMJ Open*.

Senior Research Fellow Dr. Paige Little, from the QUT Biomechanics and Spine Research Group, said MRI uses strong magnetic fields to generate images of organs, bone and tissue inside the body and the loud noises made by the equipment adds to the challenges radiographers face to perform MRI scans successfully on children.

She said the impetus for looking at alternatives to commercial markers was the group's collaborative sleep postures research project.

"Single-use commercial markers cost between $6 and $10 each, and for our sleep posture study we had 50 participants, and we needed 50 markers for each participant, which made the cost prohibitive," Dr. Little said.

"We needed to find a marker that was small, inexpensive and easily sourced, which showed up clearly on MRI and was easily distinguishable from bone and soft tissue.

"While makeshift markers of various types, including fish oil capsules, have been anecdotally trialled in clinical radiology departments over the years, we couldn't find a study in the scientific literature, so we did our own trial.

"We tested 17 items, including different lollies, a coffee bean, vitamin tablets and capsules, and the capped fish-shaped soy sauce containers

that you can get when you buy sushi."

Dr. Little said all the alternative markers, plus a commercial product for comparison, were tested on the thigh of a member of the research team, and scanned at Mater Medical Imaging using the five most commonly ordered MRI sequences.

"The visibility of some of the items, like the coffee bean, was poor, but overall we found the vitamin D capsule proved to be the best substitute for a commercial marker for all tests, and particularly good for smaller areas of the body like fingers and toes," Dr. Little said.

"The jelly baby lolly, fish-shaped sauce container, and the fish oil capsule were also viable alternatives for some, although not all, of the MRI sequences.

"Our conclusion was that depending on the reason for imaging and the sequence selected, these four items were cheap and reliable alternatives to a commercial marker.

"Single-use markers are a significant component of an imaging department's costs, and also for researchers, so we thought this study was a practical examination of viable alternatives.

"And if using something familiar would help make the imaging process less frightening for children, particularly those children who have experienced many medical procedures, then that is a terrific bonus."

Dr. Little said while the study didn't test at what point a vitamin capsule or sauce container might rupture and spill its contents, the research group has since used vitamin D capsules routinely in spinal studies, and in its Sealy of Australia-supported Science of Sleep postures project, requiring multiple markers under body weight throughout extended MRI

scanning sessions, and none had ruptured or degraded.

More information: Maree T Izatt et al. Determining a reliably visible and inexpensive surface fiducial marker for use in MRI: a research study in a busy Australian Radiology Department, *BMJ Open* (2019). DOI: 10.1136/bmjopen-2018-027020

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