

A photograph showing a person's arm and hand. A small, clear, rectangular device with the word 'fractal' printed on it is being held by a hand and applied to the back of another person's hand/wrist. The device has a yellow sensor area. Another hand is visible near the elbow, possibly applying a bandage or another device.

Fractal

A low-cost method of detecting
and monitoring fractures

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Interactive Device Design
Summer 18, UC Berkeley

>50%

lacks access to
basic radiography

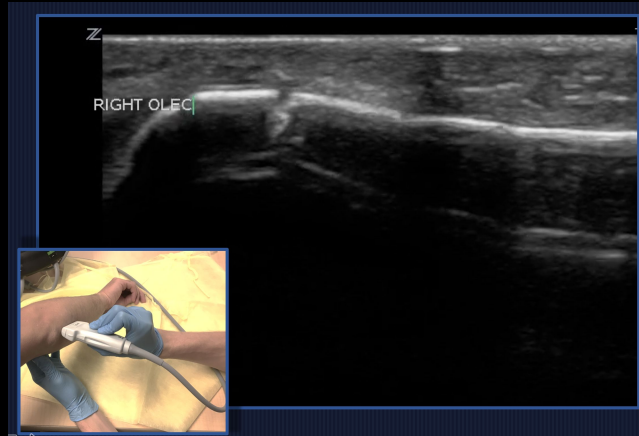
>80%

of severe fractures
occur in developing
countries

Source: Ngoya PS, Muhogora WE, Pitcher RD. Defining the diagnostic divide: an analysis of registered radiological equipment resources in a low-income African country. The Pan African medical journal. 2016;25. Gellman RE. Fracture Care Challenges in the Austere and Humanitarian Environments. Current Trauma Reports. 2016 Jun 1;2(2):100-5. Melton III LJ. Hip fractures: a worldwide problem today and tomorrow. Bone. 1993 Jan 1;14:1-8. Noun Project, Delwar Hossain.

\$20B

incurred to the U.S.
healthcare system





Squeeze Test



Tuning fork and stethoscope
(auscultatory percussion)

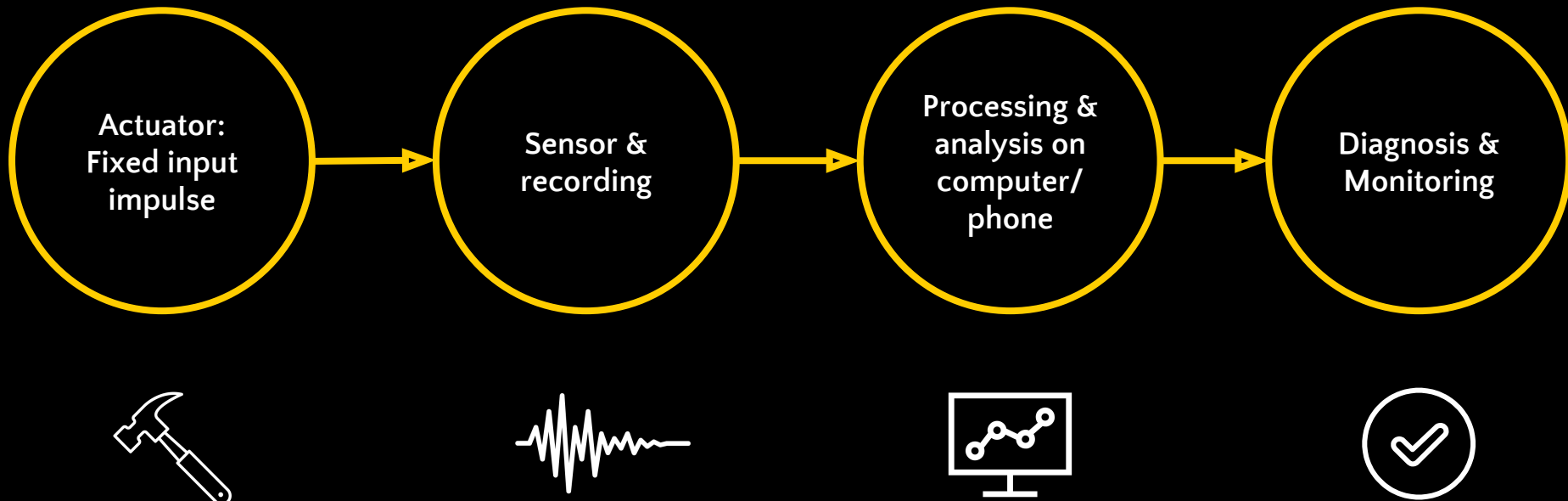


Tuning fork and stethoscope

- Immediate results with little to no pain or discomfort
- 80% diagnostic accuracy
- Subjective assessment



fractal







piezo

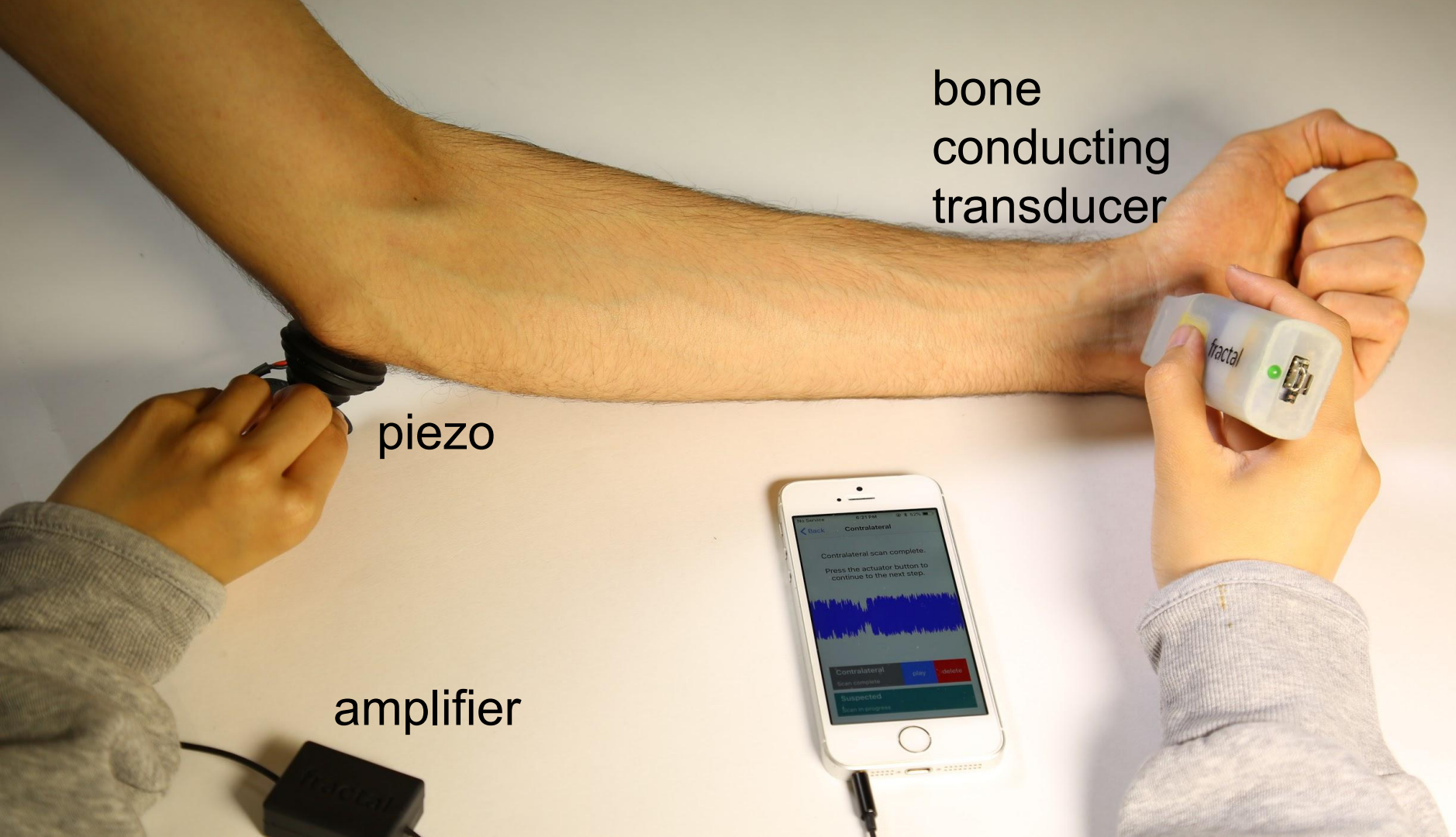
amplifier



bone
conducting
transducer

piezo

amplifier

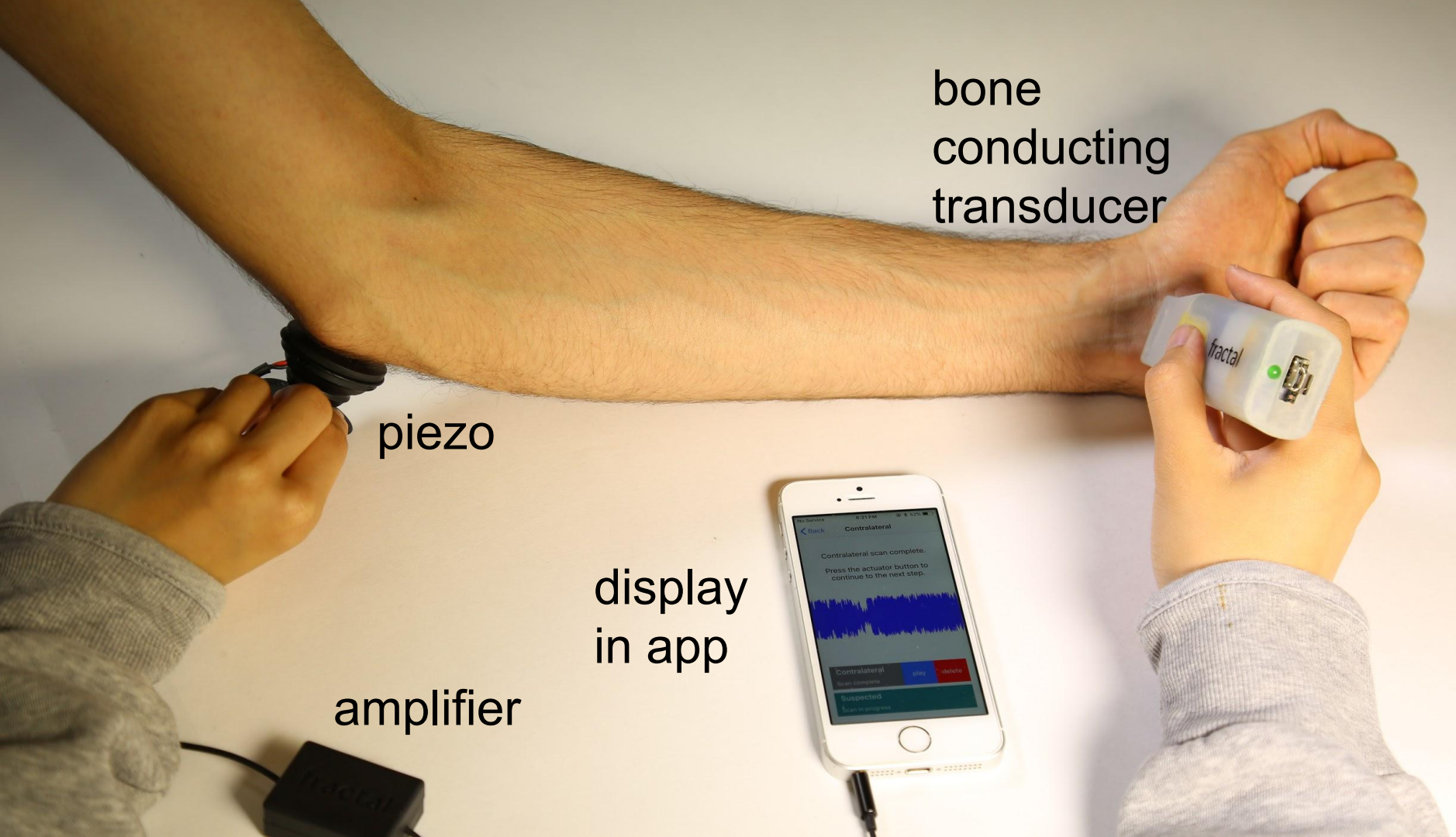


bone
conducting
transducer

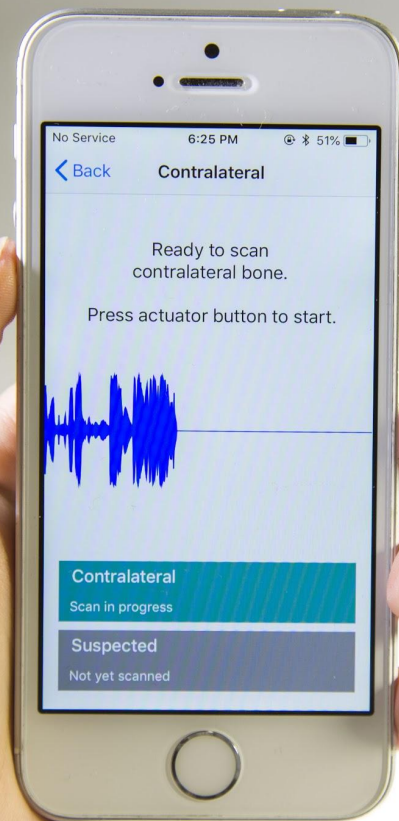
piezo

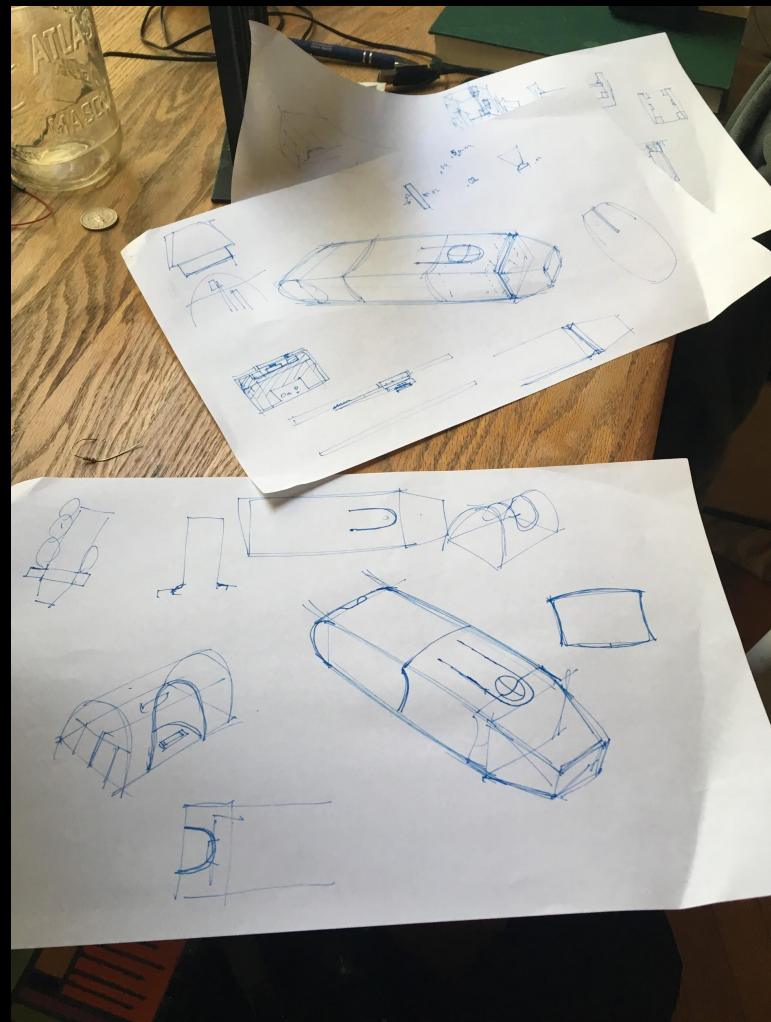
display
in app

amplifier

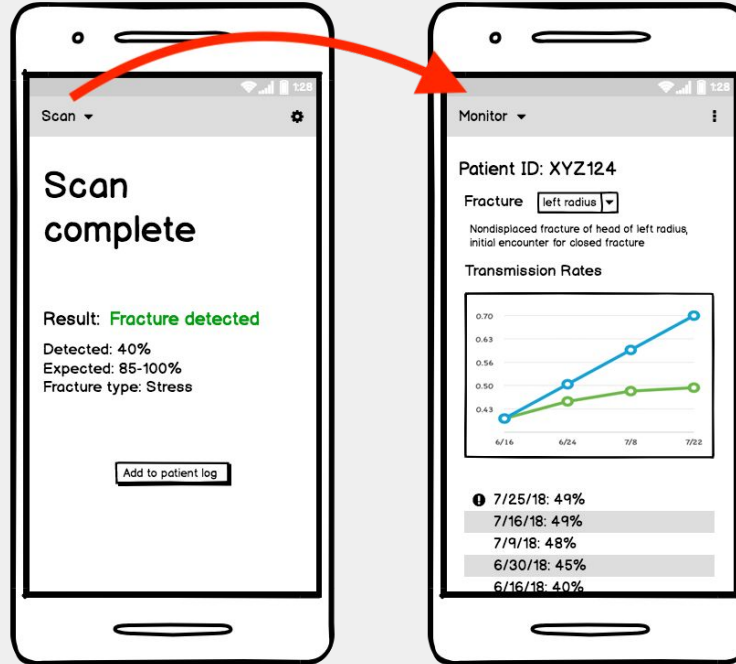


todo video





sensor data is
processed and
outputs a
prediction



Future goals

- Monitor fracture healing over time
- Precise actuator and sensor
- Report what *type* of fracture, if any, is present

