Improving acute cardiac and stroke treatment times by streamlining multi-disciplinary communication

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AMBULANCE VICTORIA

BENDIGO HEALTH

Background

- Rapid treatment of patients with suspected acute stroke or cardiac events involves pre-hospital (paramedics) and hospital clinicians from multiple departments including: emergency, medical, neurology or cardiology, radiology or catheterisation laboratory.

- Clinicians repeat patient details using multiple communication methods (phone, fax, pager, face-to-face) and record details in various systems (Figure 1).

- Inefficient communication may contribute to treatment delays for these time-critical conditions.
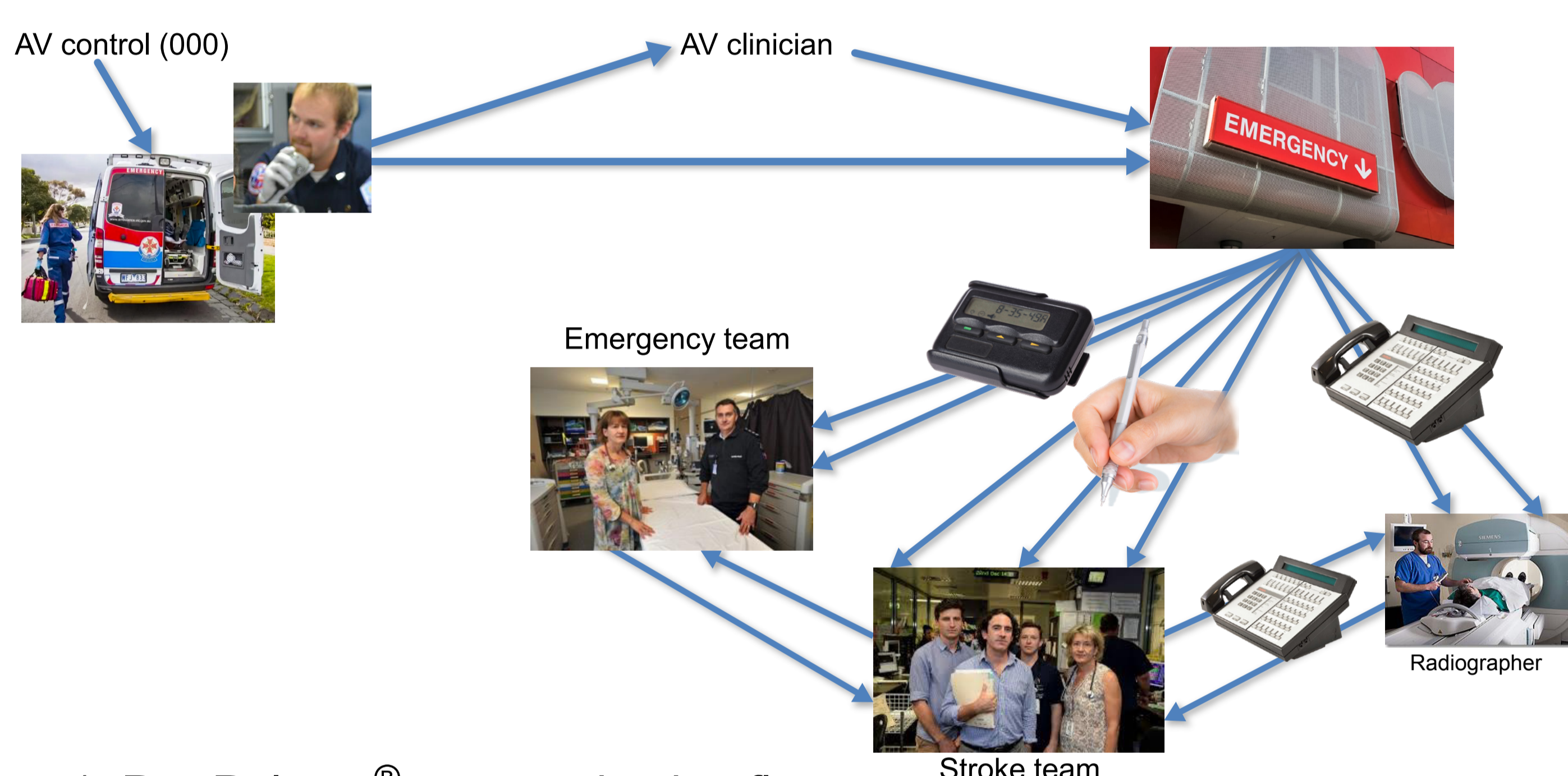

Figure 1: Pre-Pulsara® communication flow

Aim

To determine if a smartphone communication app improves management timelines for patients with suspected acute stroke or cardiac events.

Methods

- A pilot study with a 6 month pre-post historical control design was used. Participants were patients with a suspected acute stroke or cardiac event in a Victorian regional hospital and 11 Ambulance Victoria (AV) branches.

- The Pulsara® Stop Stroke™/STEMI™ smartphone app (Pulsara www.pulsara.com) was deployed to paramedics, and hospital clinicians and departments. Pulsara® is designed for secure, two-way, real-time communication with all personnel receiving the same information simultaneously (Figure 2), including photos (e.g., drivers licence for pre-registration, medication lists; Figure 3), estimated time of arrival and case summary post-treatment delivery.

- Clinical care process times (hospital arrival, assessment, treatment) were captured from usual AV and hospital systems.
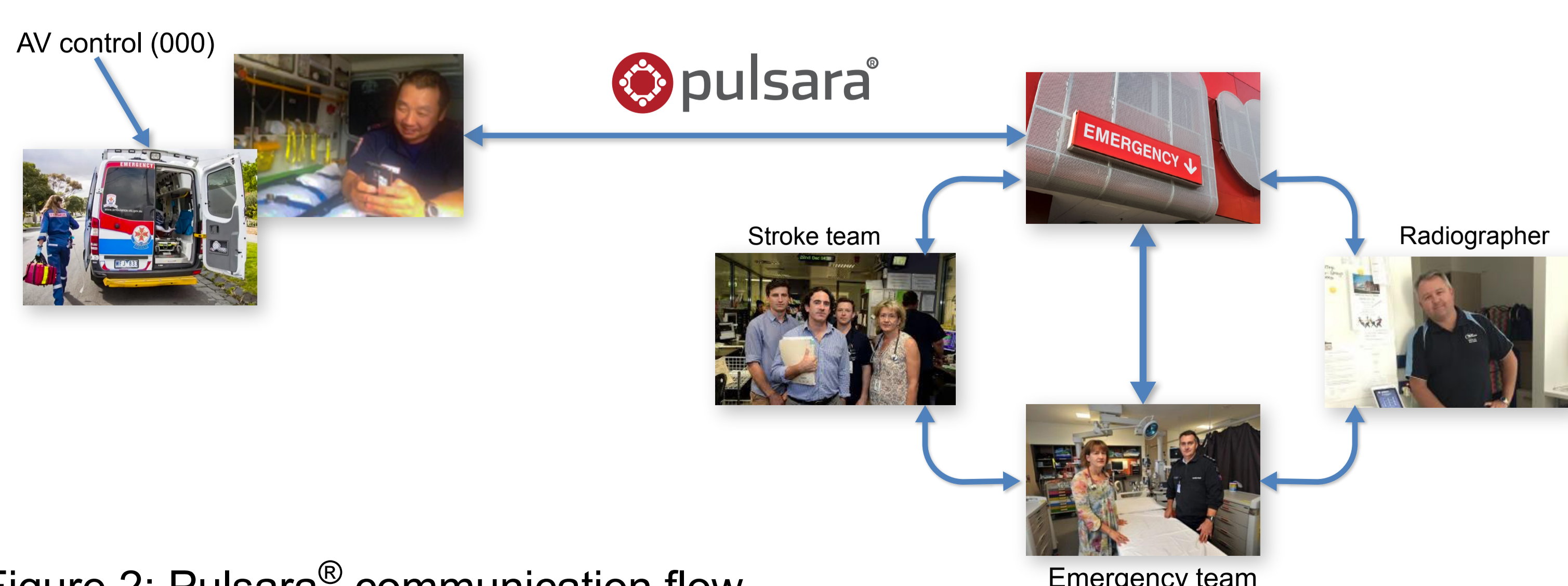

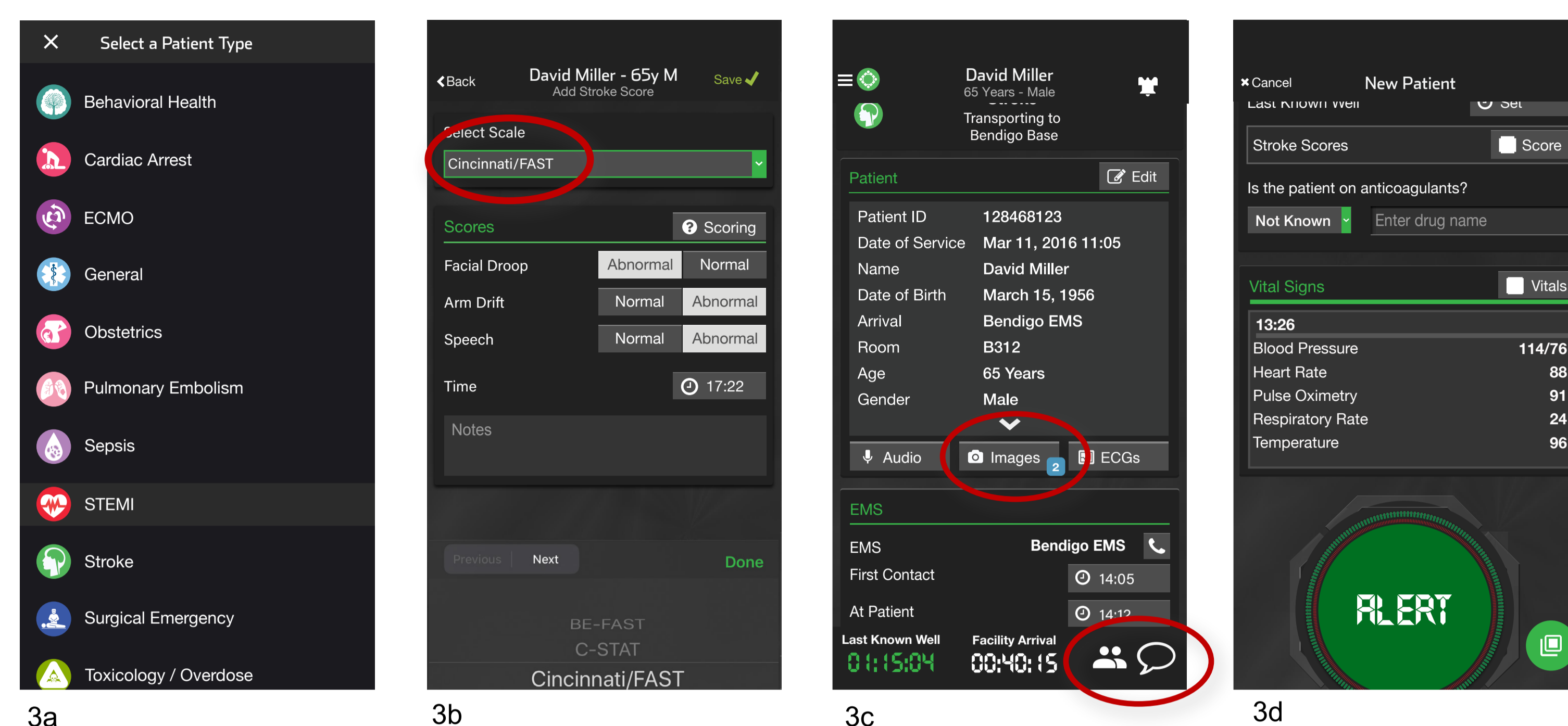Figure 2: Pulsara® communication flow

Figure 3: Pulsara app screen shots: a) select patient condition, b) enter patient symptoms, c) adding images (e.g., drivers licence) or messages, d) alert ED.

Results

- Pulsara was activated by AV (n=45) and Hospital (n=23).

- Cohorts were similar for suspected stroke (pre/post: n=107/176 patients; median age 80/77 years; 49%/48% male) but an older, fewer male suspected cardiac pre cohort (pre/post: n=11/24 patients; median 71/60 years; 67%/79% male).

- Median minutes and interquartile ranges reported.

✓ Faster AV metrics when Pulsara used:

- **Hospital arrival to triage time 2 & 3 minutes faster, $p \leq .002$**
  STEMI: pre n=11, 5 mins (2,7), post n=14, 3 mins (2,4)
  Stroke: pre n=28, 7 mins (4,14), post n=42, 4 mins (2,7)

- **Hospital arrival to off-stretcher 5 & 8 minutes faster, $p<.01$**
  STEMI: pre n=11, 12 mins (7,35), post n=14, 7 mins (4,12)
  Stroke: pre n=28, 20 mins (13,31), post n=42, 12 mins (4,14)

- **Hospital arrival to departure 10 minutes faster, $p=.006$**
  Stroke: pre n=28, 55 mins (44,62), post n=42, 45 mins (35,52)

✓ Reduced times for hospital processes recorded:

- **Stroke door-to-CT completed 23 minutes faster, $p=.00$**
  pre n=48, 46 mins (28,76), post n=33, 23 mins (16,40)

- **Stroke door-to-needle times 33 minutes faster, $p=.02$**
  pre n=5, 111 mins (84,113), post: n=9, 78 mins (61,91); more patients <60 minutes: pre 0/5 (0%), post 2/8 (25%)

- **STEMI Door-to-balloon times faster by 28 minutes**
  compared to VCOR hospitals with pre-notification n=717, 55 mins (40,76), Pulsara n=5, 27 mins (26,31)

Conclusion

- The Pulsara® app was implemented for the first time outside of America, and was well-utilised by paramedics and hospital clinicians.

- Pilot results indicated faster timelines for the delivery of care to patients with acute stroke or acute cardiac events. These changes improved AV and hospital metrics.

- A 12-month trial is now underway involving two regional hospitals in Victoria and 25 AV branches.