

RFID driven surgical tray rationalisation

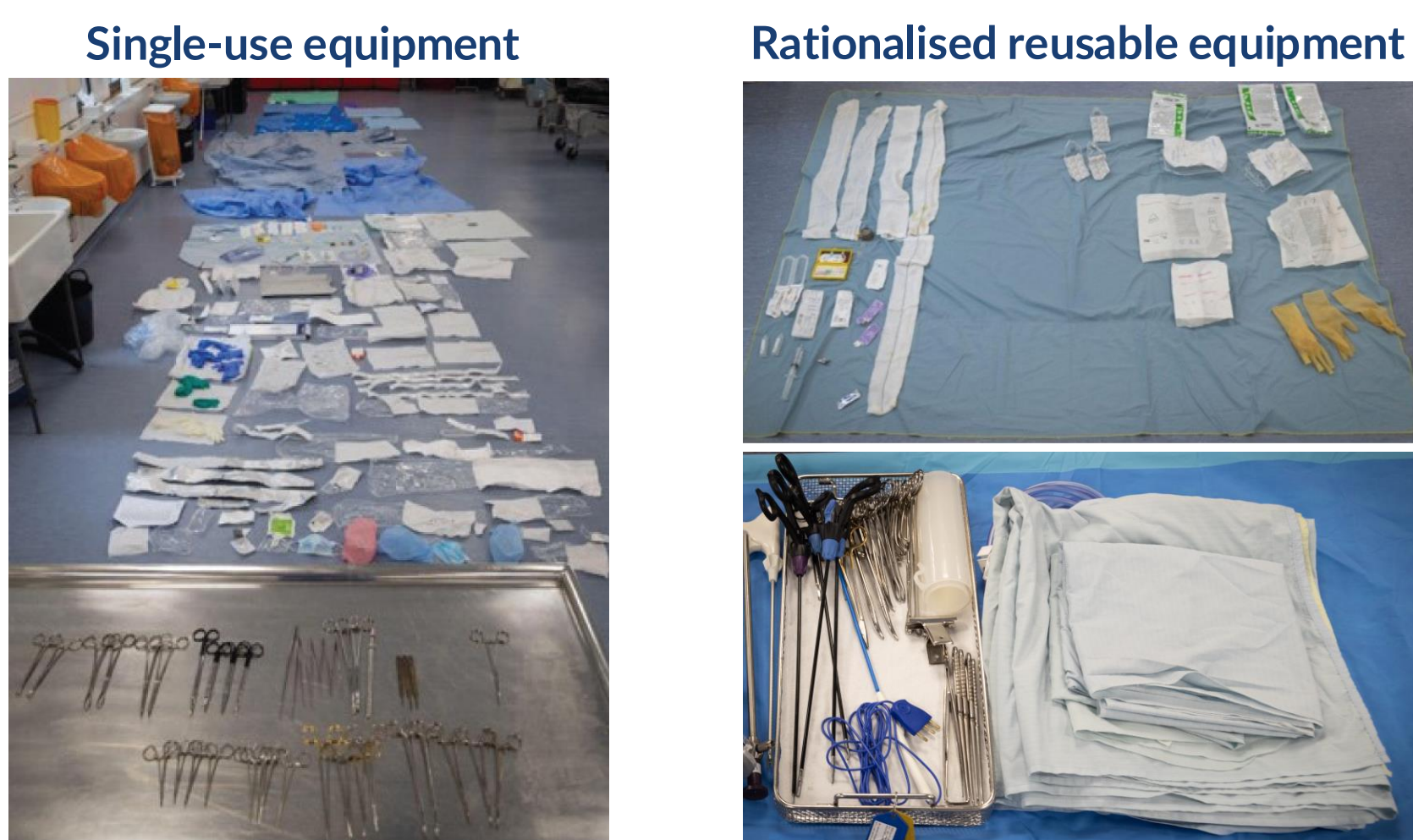
Rory P. Turnbull, Zahrina Marina, Dil Rathore, Adam Peckham-Cooper, Peter Culmer

4.4% of global emissions from Healthcare [1]
5th largest emitter if it was a country [2]
25 MT CO₂eq NHS England and Wales [3]

Surgery = 33%
With 75% of instruments unused [4]

Tray Rationalisation

- Measure instrument usage
- Analyse trends
- Remove unused instruments



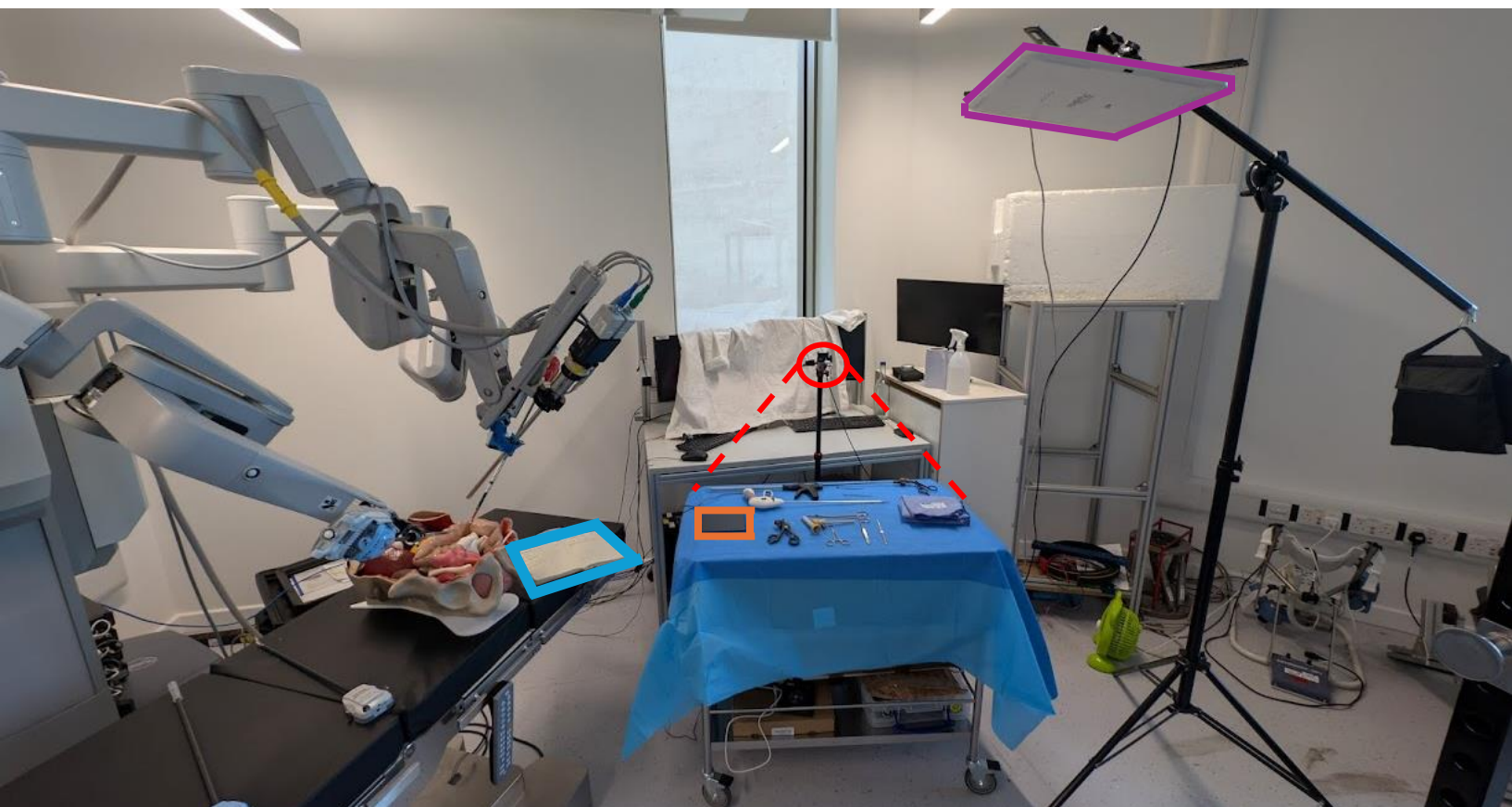
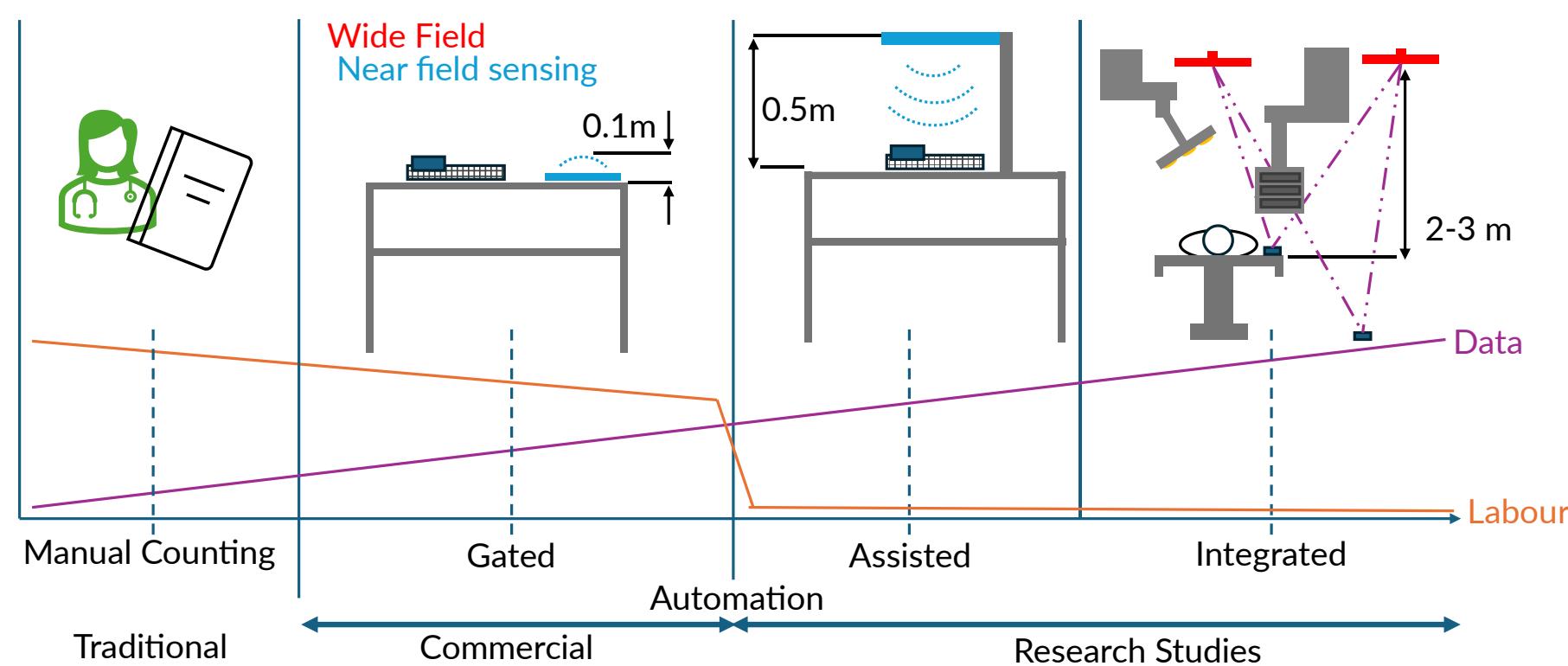
Green Surgery Challenge Winners 2021

Method Limitations

- Time and labour intensive
- Additional work burden
- Disruptive

Solution = Automation

LEVELS OF AUTOMATION

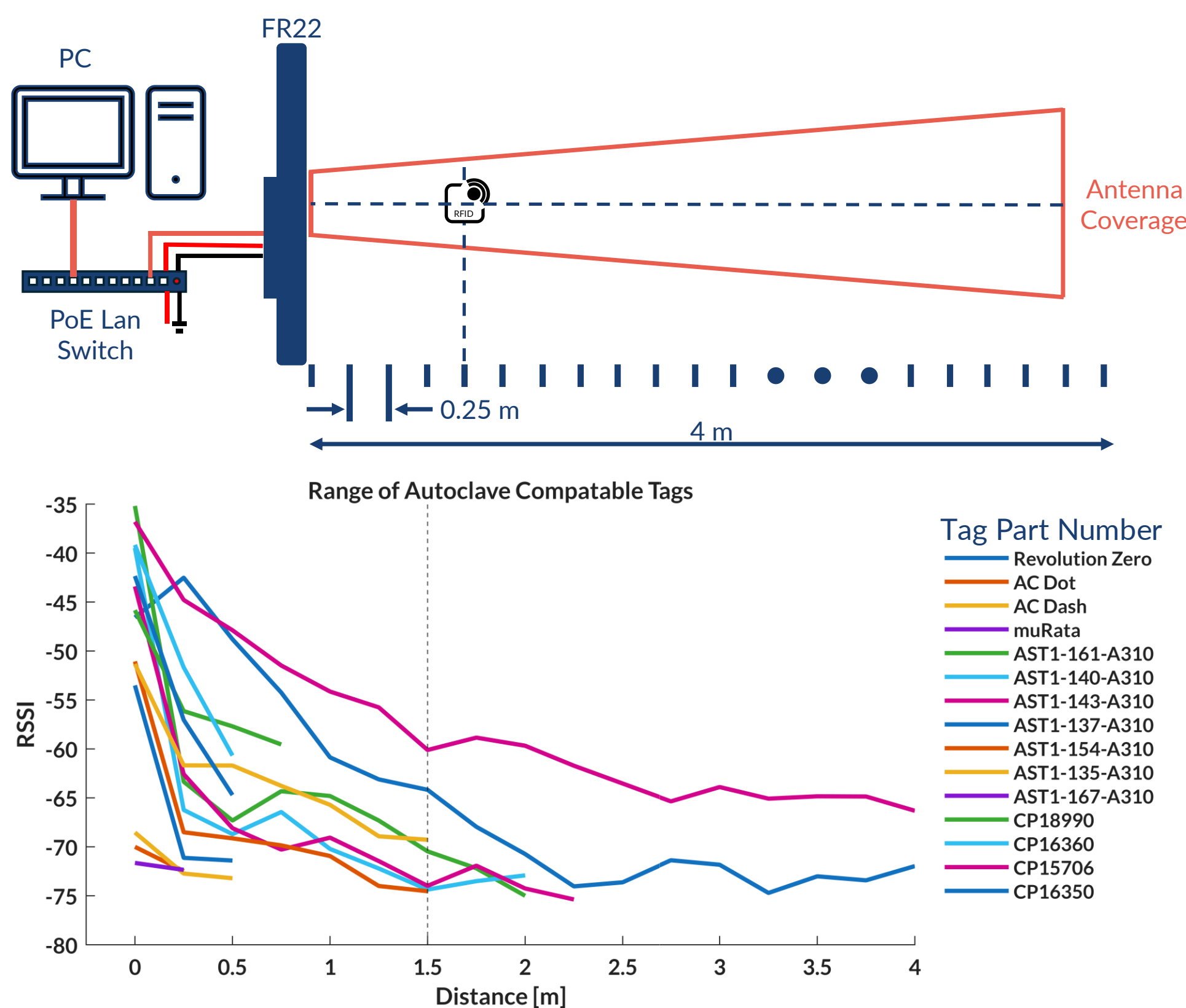


Manual (Blue), Gated (Orange), Assisted (Red), "Integrated" (Purple)

Key RFID Tag Requirements

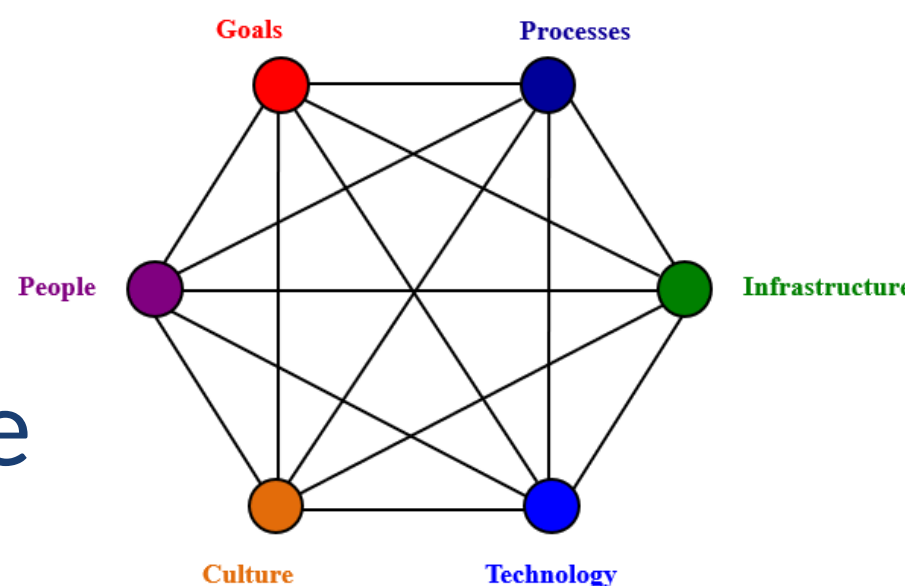
- Autoclave compatible
- Suitable size relative to instruments
- Range > 1.5 m
 - Based on Received Signal Strength Indicator (RSSI)

RFID Tag Ranging



Clinical Engagement - [Ongoing]

- Five theatre teams
- Assessing levels of automation
- Identify human factors impacting adoption
 - Barriers
 - Benefits
 - Acceptance



[1] ARUP, 'Health care climate footprint report', Health Care Without Harm, Green Paper, 2019.
[2] P. Pichler, et al 'International comparison of health care carbon footprints. doi: 10.1088/1748-9326/ab19e1.
[3] Imogen et al Health care's response to climate change: a carbon footprint assessment of the NHS in England, The Lancet Planetary Health, Volume 5, Issue 2, e84 - e92
[4] E. W. Stockert and A. Langerman, 'Assessing the magnitude and costs of intraoperative inefficiencies attributable to surgical instrument trays', doi: 10.1016/j.jamcollsurg.2014.06.019.