The potential cost-benefit of introducing single-patient use electrocardiogram monitoring for infection prevention after cardiac surgery in the UK

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Background

- Infection following cardiac surgery can be devastating for patients
- A potential measure to reduce cross-contamination and prevent surgical site infections (SSIs) is single-patient use electrocardiogram (spECG) monitoring[1]
- We investigated the potential for cost savings following anastomosis of mammary artery to left anterior descending coronary artery procedure (OPCS code: K453), a common form of coronary artery bypass graft surgery (CABG)

Methods

- NHS Digital data for SSIs (T814/T826/T827/T846) associated with K453 procedures between March 2019 to February 2020 were assessed
- Centres with >250 K453 procedures were considered for this analysis
- Combined outcomes data were used to update a published health-economic model of the CABG care pathway[1]
- Additional length of stay (LOS), readmissions, and costs were considered as indicators for SSI-related burden

Results

- A combined 13,595 K453 procedures were reported in the 27 centres meeting inclusion criteria
- SSIs occurred during the index admission in 698 (5.1%) of procedures
  - 290 (2.1%) SSIs occurred during the hospital stay; these increased mean LOS by 18.1 days
  - The 408 (3.0%) post-discharge SSIs required readmissions, having a mean LOS of 10.6 days
- Entering these data into the model resulted in a cost of care of £8,417 per patient, which fits official reports of £7,830 to £8,784[2] from centres performing over 1,000 cardiac procedures in 2019
- The routine use of spECG was estimated to reduce the cost of care by £108 per patient (£8,309), representing more than an 11-fold return on investment
- Individual centre results varied (median saving £30.24 per patient, range -£2.95 to £165.55) as they were linked to reported SSI rates (**Figure 1**)
- Of the 27 centres, 26 were expected to reduce costs with use of spECG
- Fewer SSIs, resulting in reduced LOS and fewer readmissions were the main drivers for these savings
- Changes in the cost of ICU stay had the largest effect on overall savings (**Figure 2**)

Discussion

- The reported NHS data does not differentiate SSI rates for superficial and deep SSIs or clarifies the severity required to be considered an SSI
- The considerable variance off SSI rates between hospitals (0.7 to 9.6%) may partially be attributed to inconsistent definition of an SSI or inconsistent coding

Conclusion

SSIs following CABG are a burden to the NHS and model results suggest that spECG monitoring is likely to offset its initial cost by reducing the incidence of SSIs following CABG

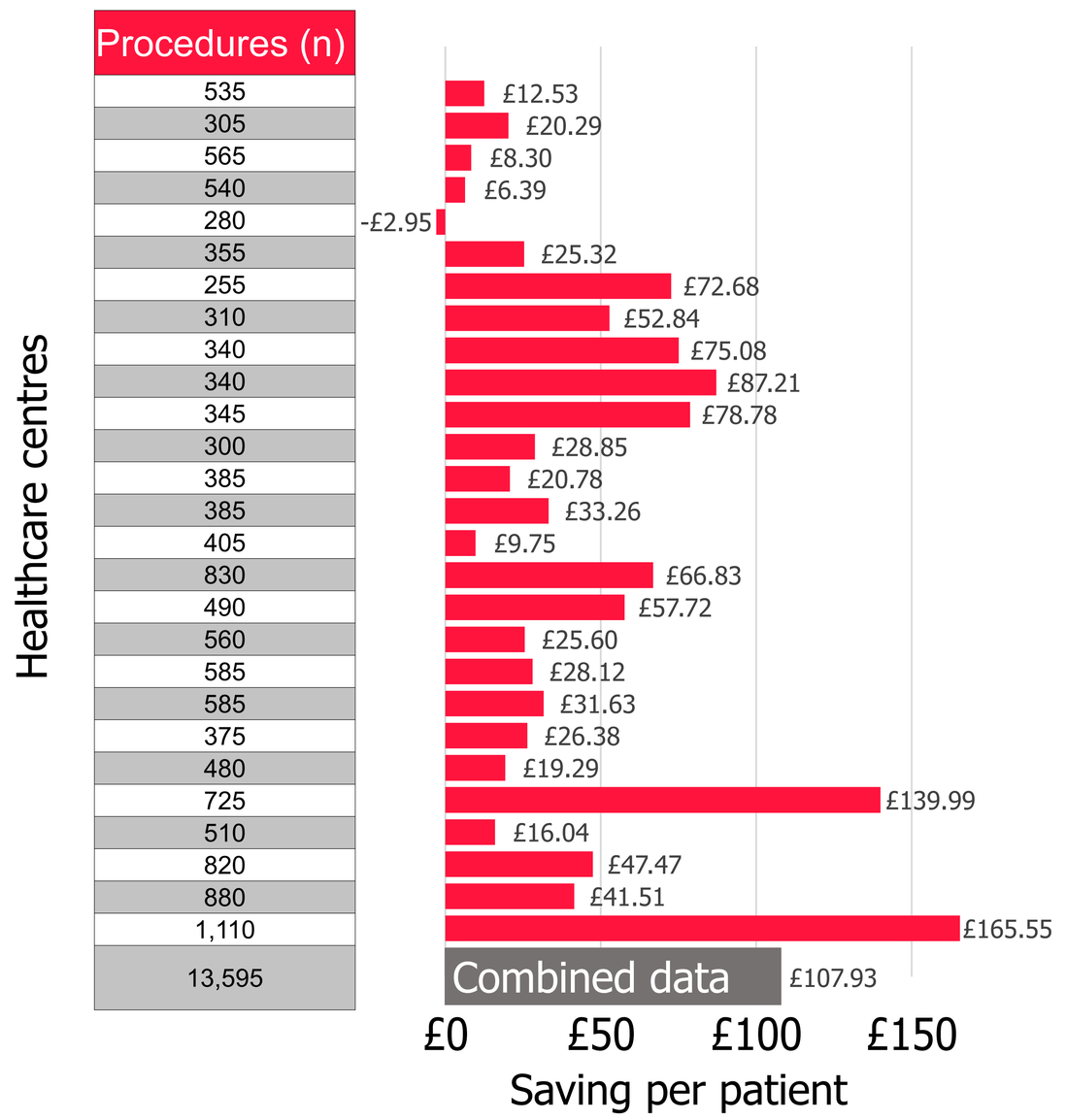

Figure 1 Savings per patient for the 27 individual healthcare centres and for all healthcare centres combined. The table on the left lists how many procedures occurred in each healthcare centre.

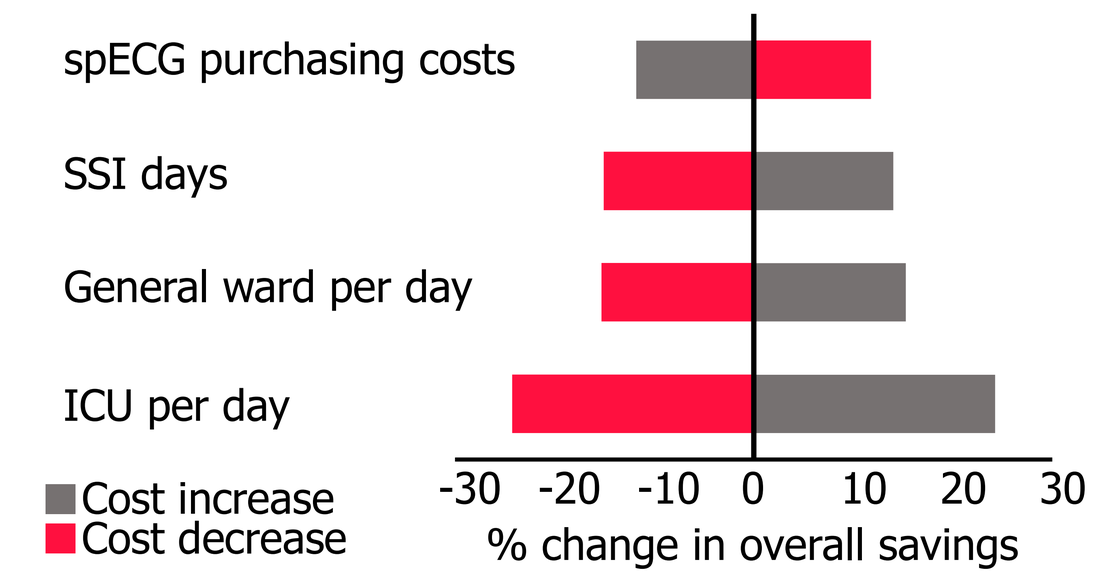

Figure 2 Effects of a 25% change in costs for several key parameters of the model

References
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2. R040X: SPECIALTY GROUP COSTS - INPATIENTS IN ALL SPECIALTIES (EXC LONG STAY), cardiac surgery data used

Disclosure
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