

ARE SINGLE-PATIENT-USE ELECTROCARDIOGRAPH CABLE AND LEAD SYSTEMS DURING CORONARY ARTERY BYPASS GRAFT MONITORING A BENEFIT TO HEALTHCARE PAYERS: A BUDGET IMPACT ANALYSIS

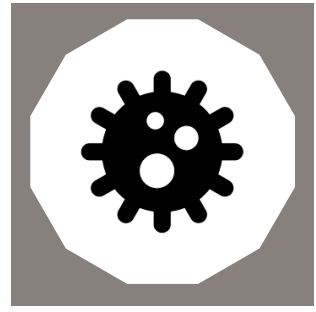
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Background:

- Electrocardiograph (ECG) monitoring is required for coronary artery bypass graft (CABG) surgery patients
- Reusable ECG lead wires (rECG) are standard of care, though a single-patient-use cable and lead system (spECG) has been shown to decrease surgical site infection (SSI)¹ and reduce clinically irrelevant “leads off” ECG alarms⁵

The Reusable ECG Lead Problem:

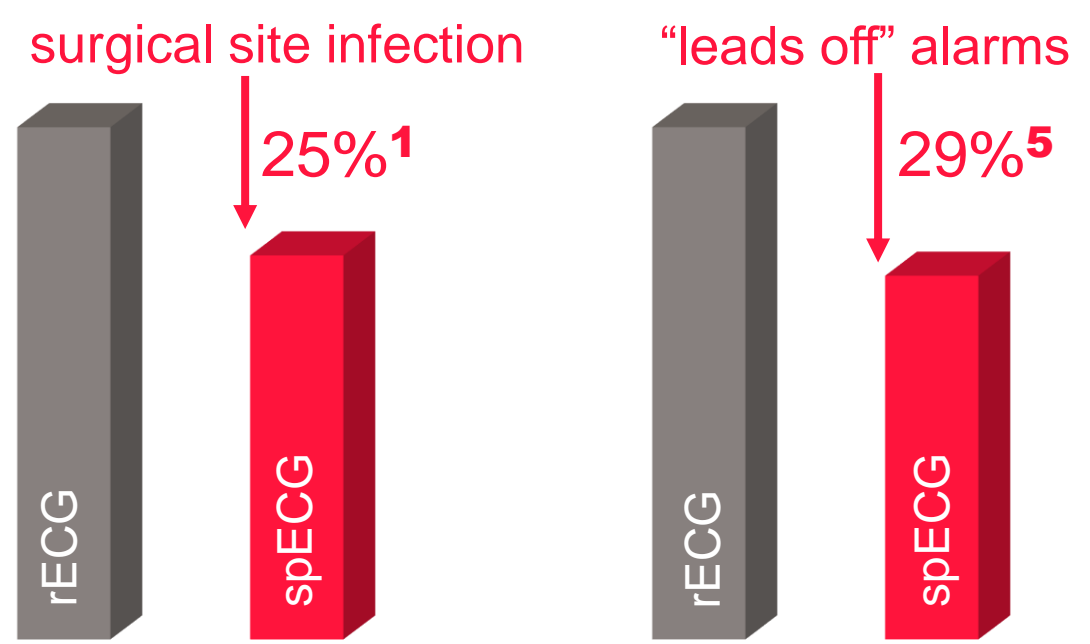


33-77%²⁻⁴ of rECG are contaminated, placing patients at risk of surgical site infections (SSI)



41.8%⁵ of ECG alarms are clinically irrelevant “leads off” alarms

The Single-Patient-Use ECG Cable & Lead System Impact:



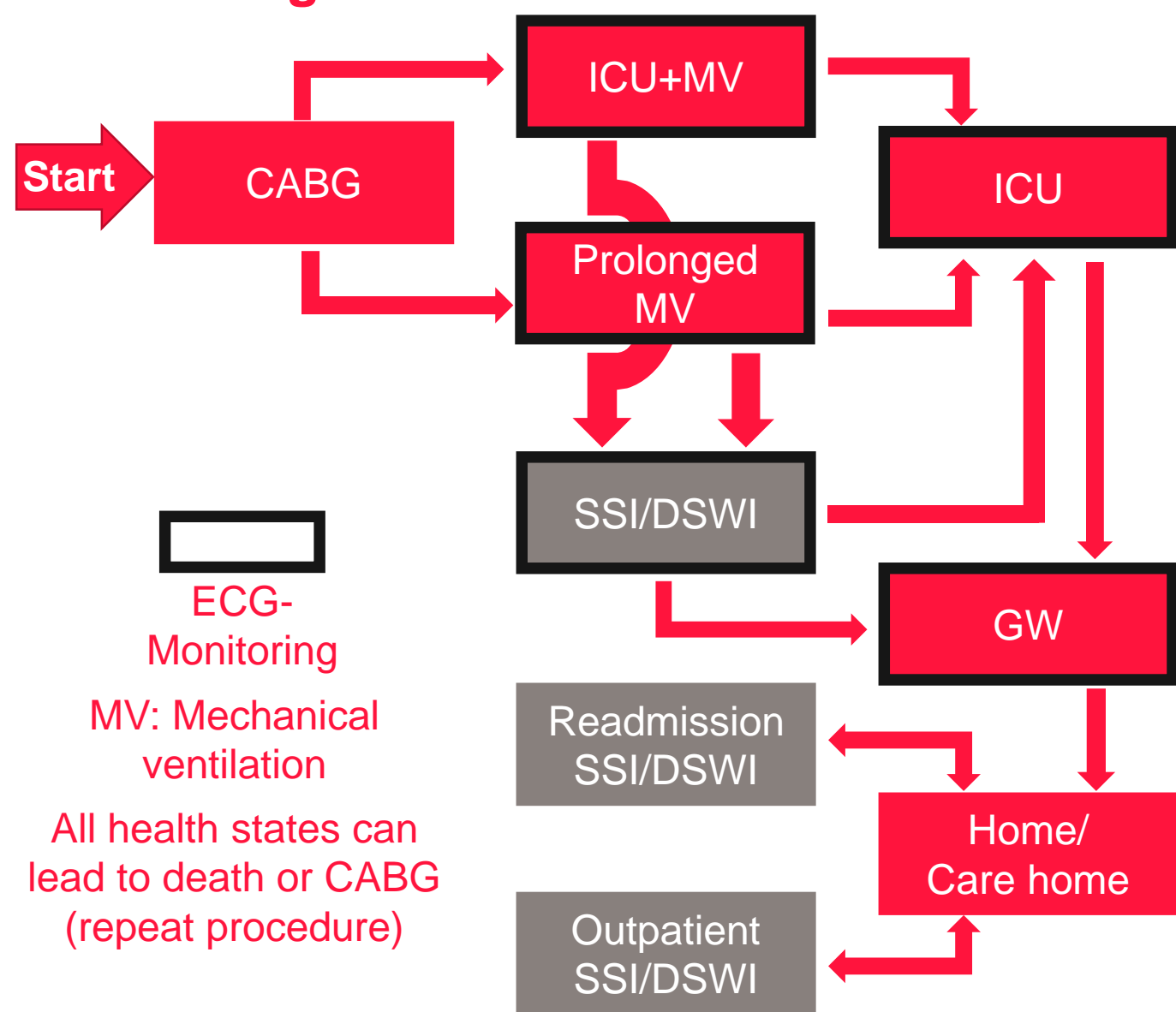
Aim:

- Are the clinical benefits of spECG sufficient to offset the additional per patient acquisition costs?

Methods:

- A 1-year cohort Markov model (Fig.1) simulates the care pathway for a facility performing 200 Medicare CABG procedures annually
- Mean CABG population⁶ : 73 years & 30% female
- After CABG, patients recover in the ICU, then transfer to the general ward (GW) and finally discharge to a care facility (25.5%) or home (74.5%)⁶
- ECG monitoring is for ≤8 days while in hospital⁶
- Complete transition from rECG to spECG
- Significance tested using 2,000 probabilistic sensitivity analyses and one-way sensitivity analysis

Fig.1 Cohort Markov model flow



Parameter	rECG	spECG
Cost per patient	\$9	\$15
“Leads off” alarms/ 100 patient days	40.9 ⁴	29 ⁴
SSIs after 90 days	5.5%*	4.1% [OR 0.74] ¹
LoS ICU/GW	17/7 ⁶ days	
Costs per day ICU/GW	\$2,536 ⁸ / \$2,357 ⁹	
Additional LoS after inpatient SSI/DSWI	13.3 ¹⁰ /24 days ¹¹	
Cost of DSWI readmission	\$23,586 ¹²	

SSI: Surgical site infection, OR: Odds ratio, LoS: Length of stay, ICU: Intensive care unit, GW: General ward, DSWI: Deep sternal wound infection

*Analysis of Medicare 5% professional sample CABG patients over 65 years

Conclusions:

- Model results are in line with real-life costing studies
- Surgical site infections are a cost driver for CABG procedures
- The surgical site infection reduction benefit of Kendall™ DL single-patient-use ECG cable and lead systems are likely to translate into Medicare cost savings
- Reduced “leads off” alarms did not drive cost differences, but may represent a substantial benefit to patient and staff satisfaction

Results:

- Across 200 CABG patients, the annual cost of care with rECG was ~\$7 million (~\$35,000 per patient)
- Both annual costs and costs after 10 days are in line with previous publications^{13,14}
- A combined 2,062 hospital days including 472 ICU days were accumulated
- There were 4.9 readmissions linked to SSIs
- Transition to spECG reduced mean costs by \$100,538 (~\$500 per patient)
- Cost savings derived from a mean of
 - 25.6 fewer hospital days (4.2 in the ICU)
 - 1.3 fewer readmissions

Cost drivers

- The additional LoS due to SSIs and DSWIs on the general ward were key outcome drivers (Fig.2)
- The proportion of SSIs that are DSWIs impacts the cost outcomes substantially (Fig.3)

Sensitivity analysis

- 2,000 iterations showed significant difference (median, 95% credible interval) in all major outcomes:
 - Savings per patient: \$532 (\$230 to \$1,077)
 - Fewer total ICU days: 4.1 (1.5 to 9.6)
 - Fewer total readmissions: 1.3 (0.6 to 2.1)

Fig.2 Time in hospital is the key cost driver

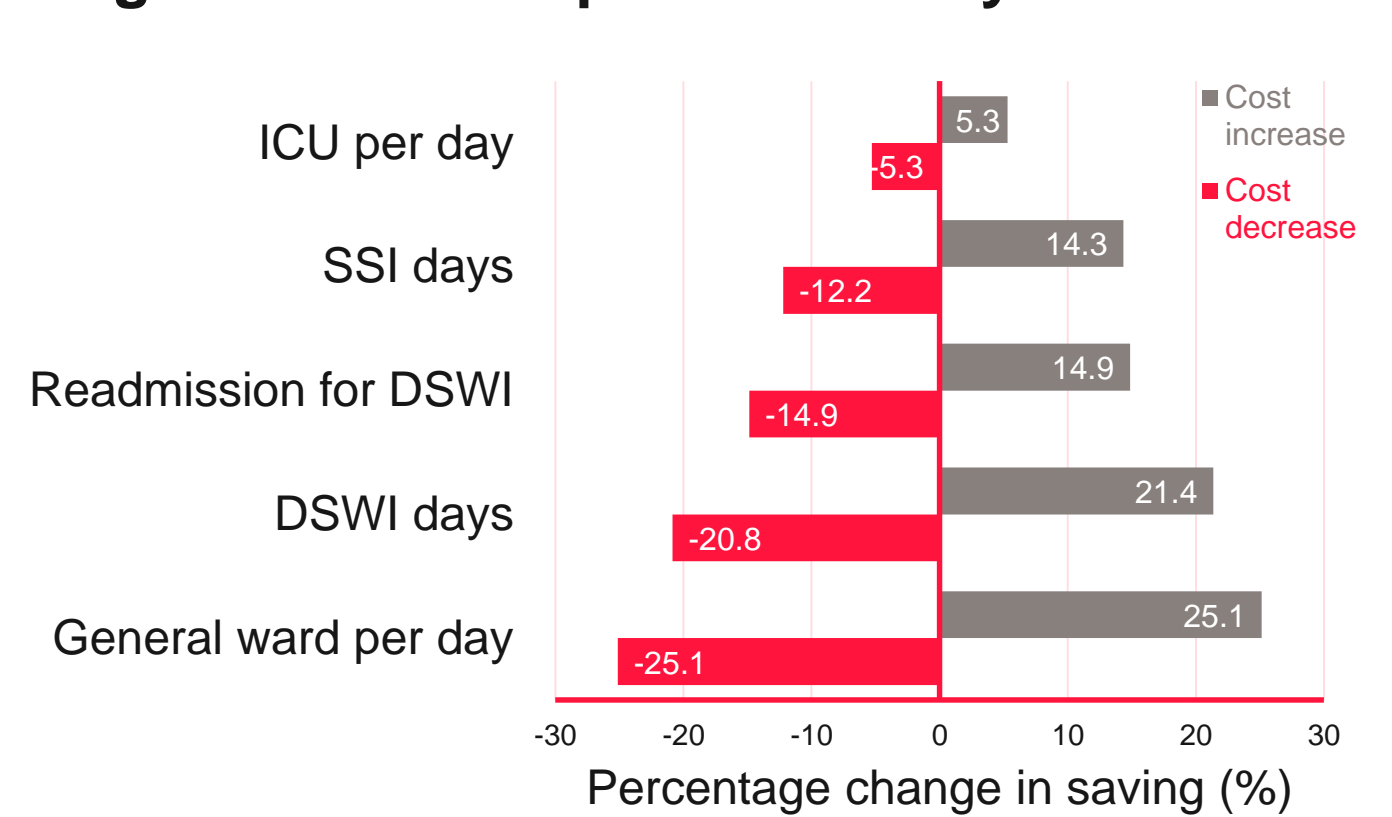
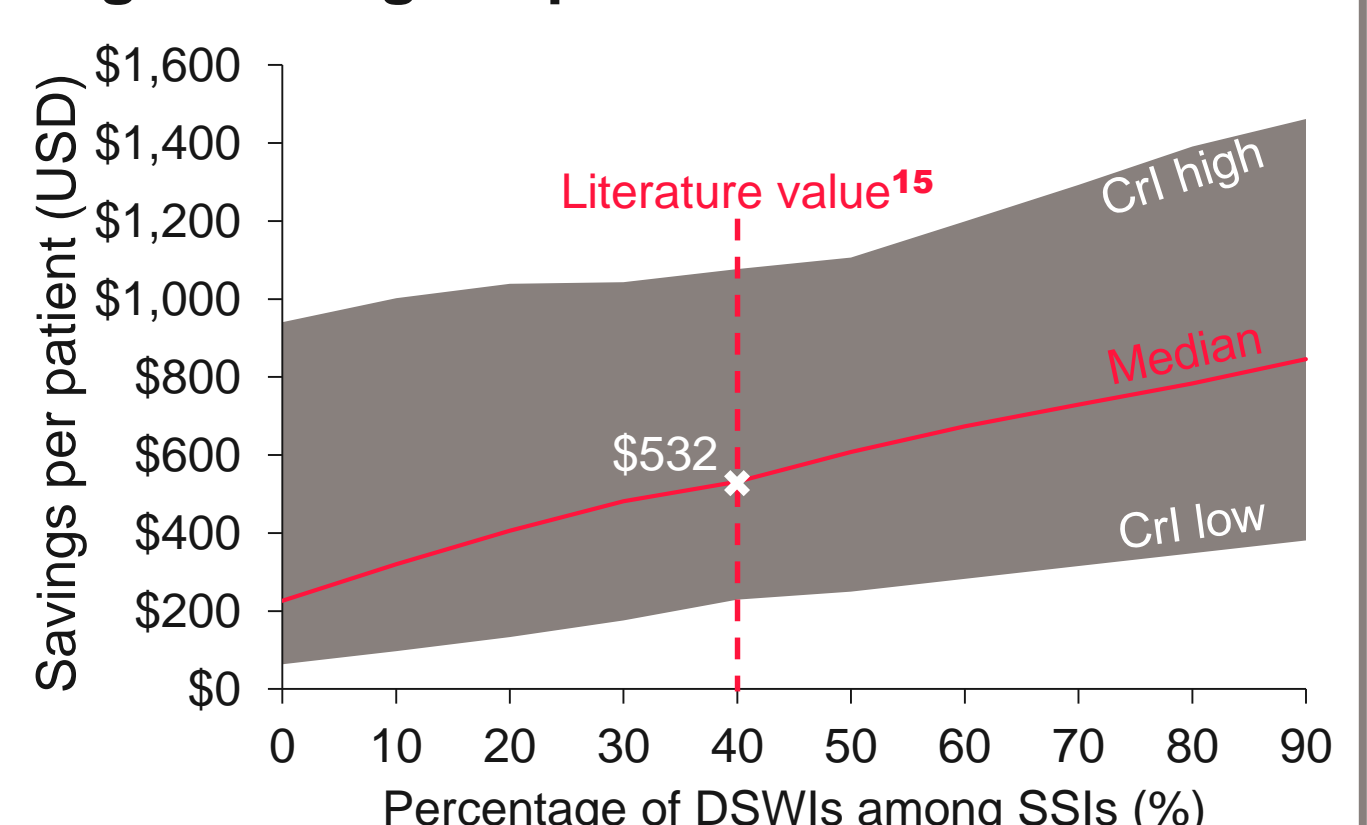


Fig.3 Savings depend on the DSWI rate



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