# Impact of single-patient use electrocardiogram monitoring in the cost of care and infection prevention of CABG surgery patients in the USA

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## Background

- In the US, nearly 400,000 Coronary Artery Bypass Graft (CABG) surgeries are performed yearly.[1]
- Sternal wound infections (SWI) developed after CABG are burdensome to both patients and health systems.[2]
- Single-patient use electrocardiogram (SPU-ECG) cable and lead systems reduce the risk of cross-contamination, helping reduce this burden.[3]
- This study assessed the budget impact of implementing SPU-ECG compared to reusable cables and leads for CABG patients in the USA.

## Methods

- A budget-impact analysis was performed based on a published Markov model simulating the CABG patient journey.
- A cohort of patients was modelled to move between the Markov states depending on the settings (ICU/general ward/home), mechanical ventilation status (Yes/No), infection status (none/superficial SWI/deep SWI) and death. (**Figure 1**)
- For the base case analysis, cost of care for 400,000 CABG patients over a year was estimated using the latest available literature data, adjusted to 2023 USD (**Table 1**).
- Additional length of stay (LOS), readmissions, and costs were considered as indicators for SWI-related burden.
- **Table 1** presents the key inputs used in the present model

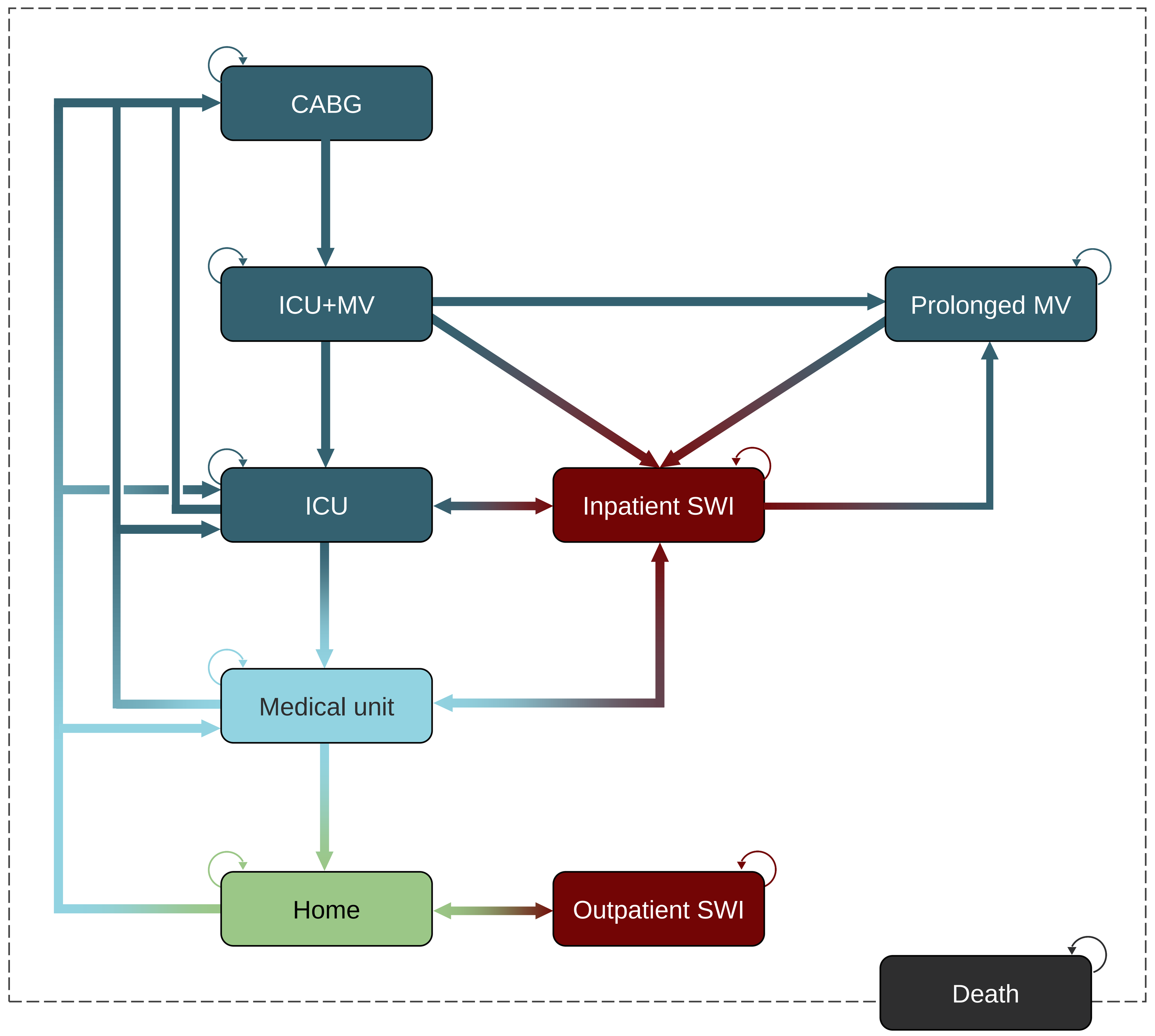


**Figure 1** Model structure
CABG: Coronary artery bypass graft; ICU: Intensive care unit; MV: Mechanical ventilation; SWI: Sternal wound infection

## Results

- Introducing SUP-ECG cables is expected to prevent 9,134 (95%CI: 4,179 to 14,732) **SWIs**. (**Figure 2**)
- **False and leads-off alarms** were reduced by 225,162 (95% CI: 31,168 to 401,641) and 246,453 (95% CI: 94,022 to 414,646), respectively. (**Figure 2**)
- This is estimated to save 19,965 **hours** of addressing clinically irrelevant alarms.
- The reduction in SWIs resulted in 7,693 (95% CI: 4,137 to 14,732) fewer **readmissions**, 2,359 of which were prevented within the first 30 days. (**Figure 3**)
- The model estimated that using SPU-ECG would reduce the **total cost of care** by USD 299,230,128 (95%CI USD 167,820,359 – USD 464,887,953) for 400,000 patients, corresponding to USD 748 per patient. (**Figure 4**)

**Table 1** Key model inputs

| Input | Unit | SoC |
|---|---|---|
| Hospital Length of Stay | Days | 6[4] |
| …duration in ICU | Days | 2.7[4] |
| …duration in MV | Days | 0.5[5] |
| SWI rate in CABG | Rate | 5.7%[6] |
| False alarms | Per 100 patient days | 57[7] |
| Leads off alarms | Per 100 patient days | 41[7] |
| Time spent to address false and leads-off alarms | Min | 2.54[8†] |
| SPU-ECG effect on SWI rate | Rate | -25%[9] |
| SPU-ECG effect on false and leads-off alarms | Rate | -29%[7] |
| Cost of ICU per day | USD | $2,568[10*] |
| Cost of general ward per day | USD | $1,518[10*] |

ICU: Intensive care unit; MV: Mechanical ventilation; SWI: Sternal wound infection, CABG: Coronary artery bypass graft; SPU-ECG: Single-patient use electrocardiogram; † Calculated from Tungol et al. *Costs are presented and inflated to 2024 USD.

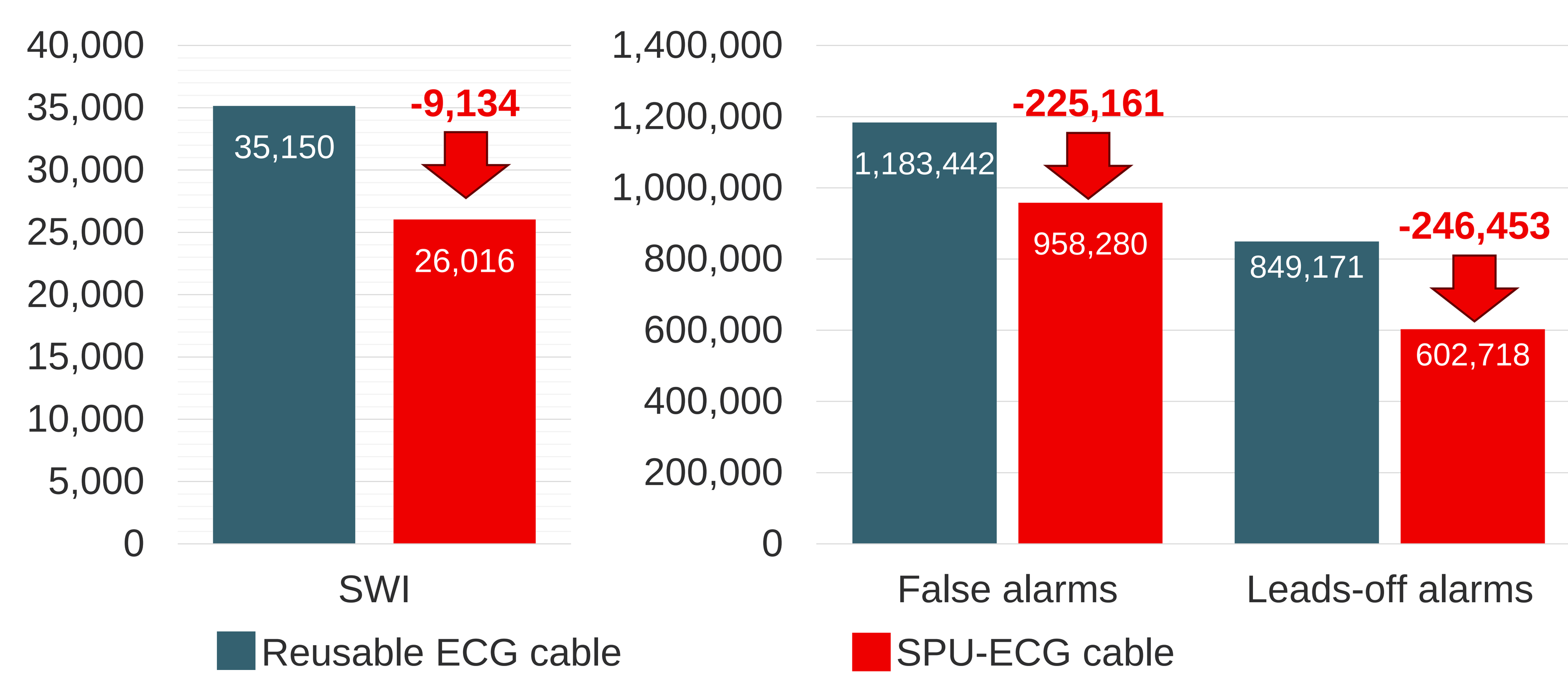


**Figure 2** Sternal wound infections, false, and leads-off alarms

### Disclaimer

CFB, MB, and TM are employees, and RS is the owner of Coreva Scientific, which received consulting fees for this work.
AV is employed by HEOR Pro, who received consultation fees from Cardinal Health to design and carry out the work presented here.
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## Conclusion

This budget impact analysis suggests that the usage of single-patient use electrocardiogram cable and lead systems in the US would result in cost-savings by reducing the burden of sternal wound infections related to CABG surgery.

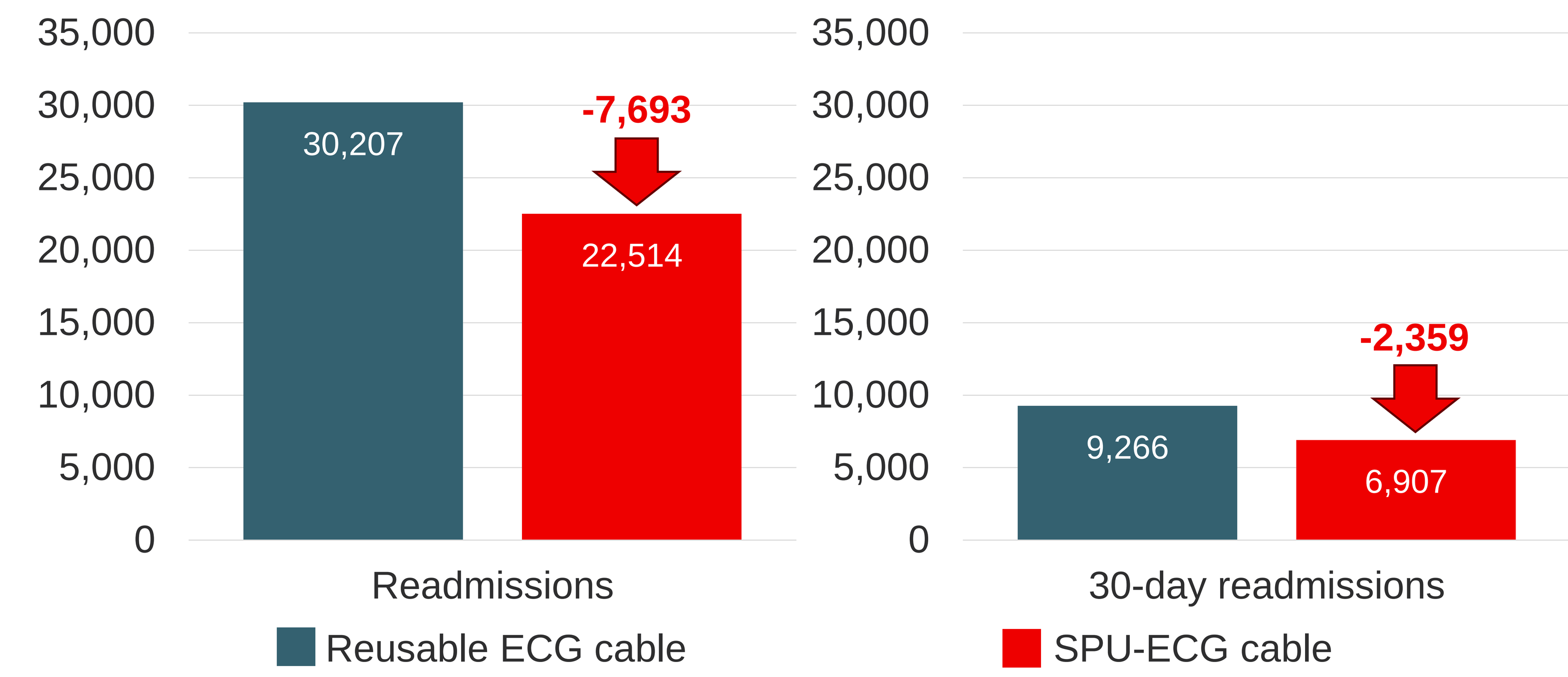


**Figure 3** Total readmissions and readmissions within 30 days

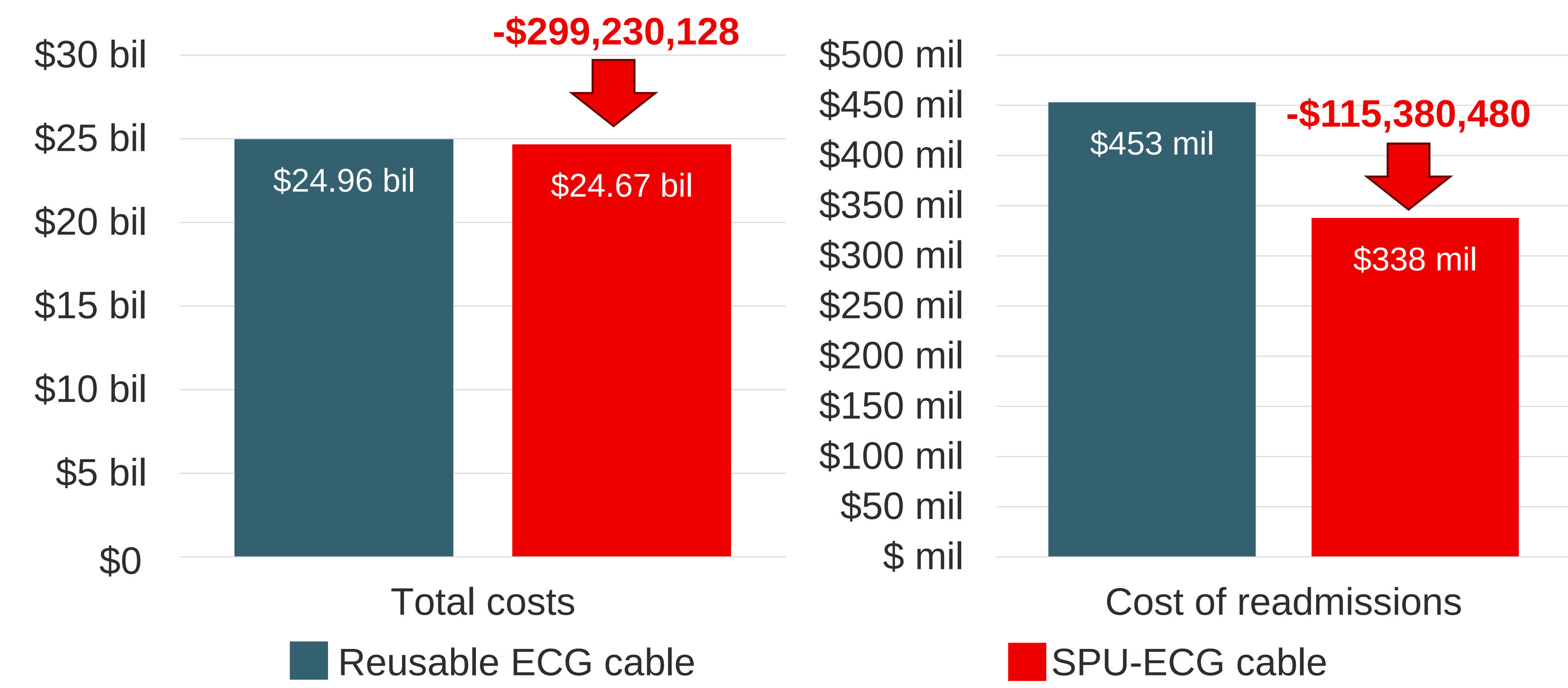


**Figure 4** Cost results

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