



Budget impact and capacity–generation analysis of a post–procedural clinical decision support system for length–of–stay optimization in elective percutaneous coronary intervention across two Asia–Pacific public health systems

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BACKGROUND & OBJECTIVES

- Percutaneous coronary intervention (PCI) is among the most frequently performed cardiac procedures, yet post-procedural length of stay (LOS) varies widely.
- Consensus supports same-day and 2–3 day discharge as safe for uncomplicated elective PCI.
- Conservative protocols nonetheless prolong hospitalization — consuming bed-days that constrain throughput and lengthen elective waiting queues.
- A post-procedural clinical decision support system (CDSS) providing algorithmic discharge-readiness scoring can standardize early discharge for eligible patients.

STUDY AIM

Estimate the budget impact, bed-day capacity generation, incremental throughput, and gross procedural revenue of CDSS-enabled LOS optimization versus standard of care, across two Asia-Pacific public health systems (Singapore, Thailand). Payer and societal perspectives; one-year horizon.

METHODS

- Two-arm budget impact and capacity model: CDSS-enabled discharge-readiness scoring vs. standard of care.
- Applied to elective PCI and diagnostic angiography. Emergent PCI excluded.
- Unit of analysis: a representative public hospital, scaled to public-system national PCI volume.

THREE MODEL PRIMITIVES

- 1 Post-procedural bed-days reduced
- 2 Total hospitalization days per patient
- 3 Direct cost per bed-day

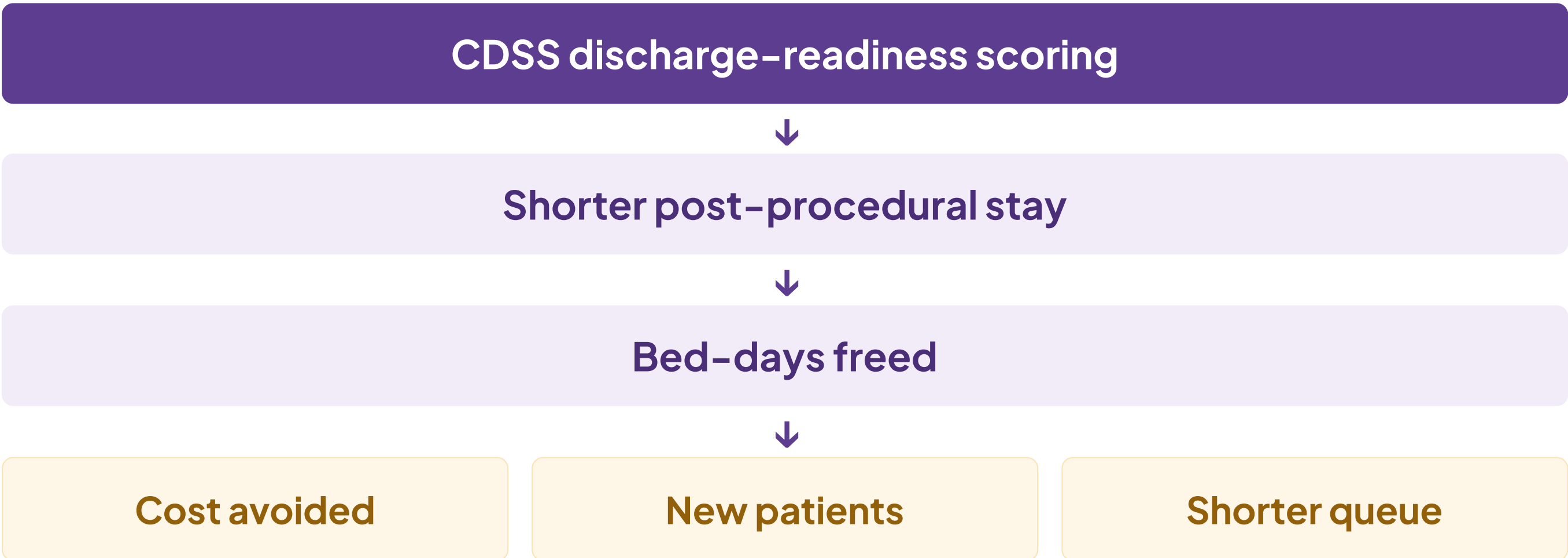
KEY DISTINCTION

Cost savings count **post-procedural** bed-days only (the intervention acts on the post-procedure stay). Throughput counts **total** hospitalization days (a new patient occupies the bed for the full stay).

MODEL INPUTS

- Elective PCI post-procedural LOS: **4→2** days (Singapore); **2→1** day (Thailand)
- Diagnostic angiography: **2.25→1.0** post-procedural days (both markets)
- Costs PPP-adjusted to Intl\$ (SGD 0.84; THB 12.5)
- Thailand: nationwide Thai PCI Registry (22,741 patients, 39 hospitals)
- Singapore: institutional volume and Ministry of Health bill data

FIGURE 1. VALUE MECHANISM



RESULTS — HEADLINE FINDINGS

Combined two-market national estimates, one-year horizon

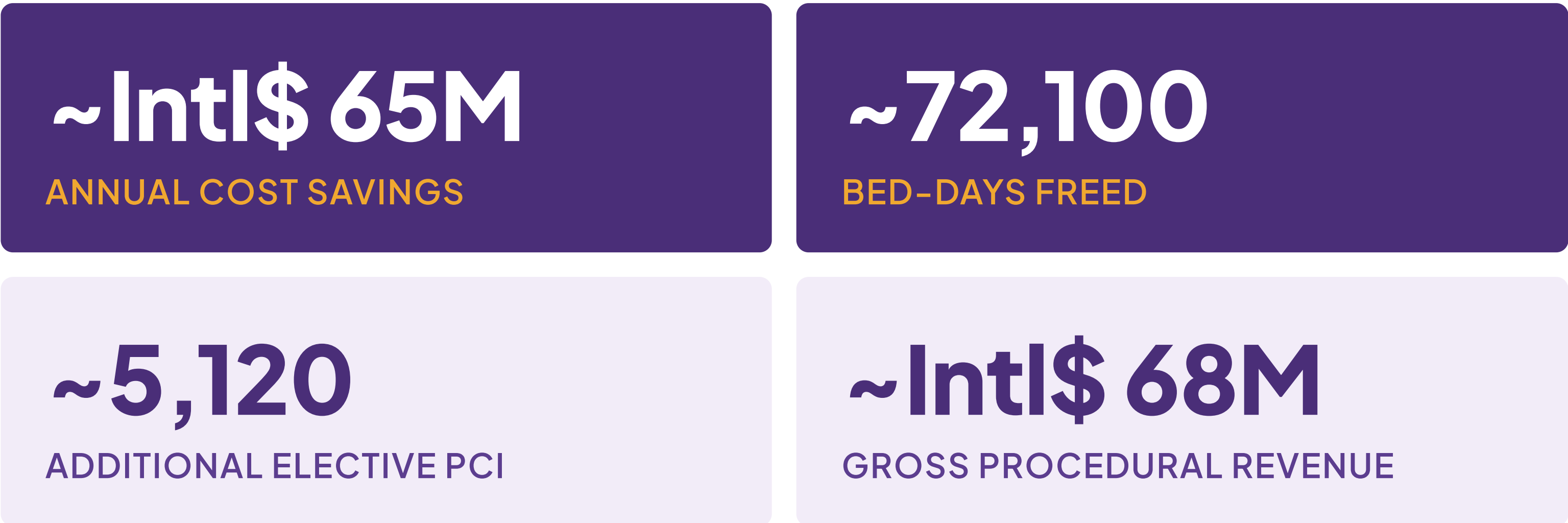
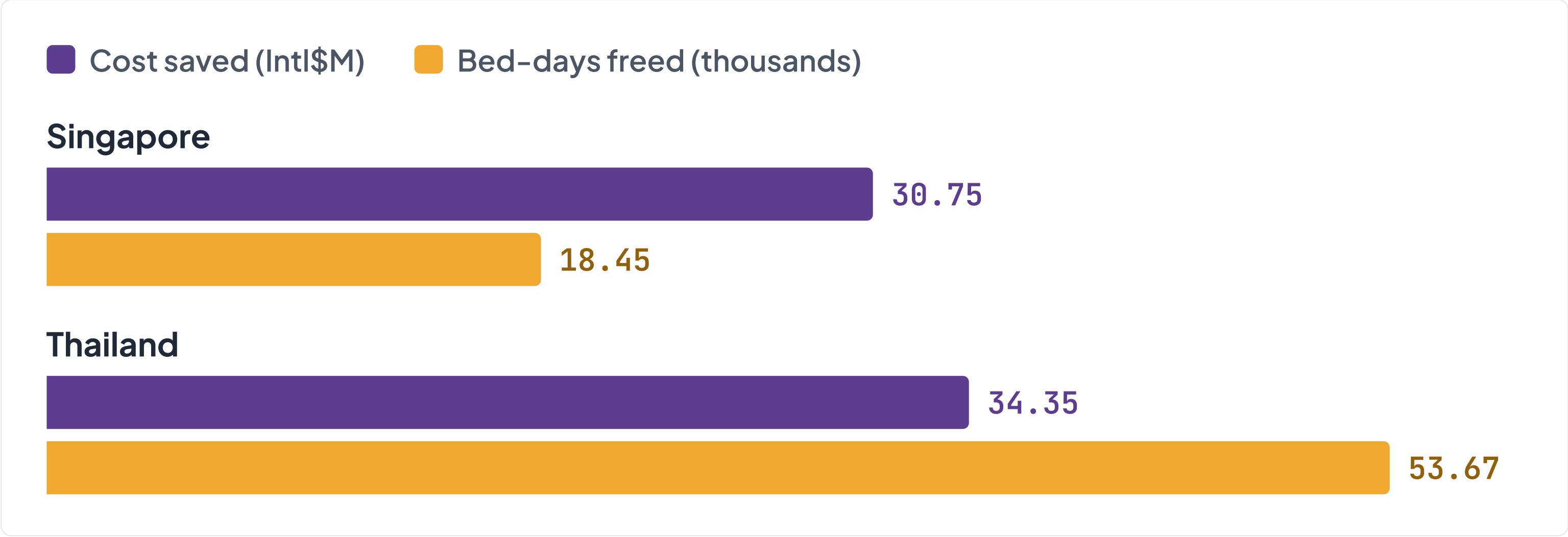


TABLE 1. Six outcomes by market (Intl\$, PPP-adjusted)

	Singapore		Thailand	
Outcome	Hospital	National	Hospital	National
Per-patient saved (elective PCI)	3,333	—	640	—
Per-patient saved (angiography)	2,083	—	800	—
Annual cost saved	10.25M	30.75M	0.91M	34.35M
Bed-days freed / yr	6,150	18,450	1,415	53,672
Incremental patients / yr	480	1,440	97	3,679
Gross procedural revenue / yr	7.43M	22.29M	1.21M	45.92M

FIGURE 2. National impact by market



SENSITIVITY & BREAK-EVEN

- National savings ranged Intl\$ 24.6–36.9M (Singapore) and Intl\$ 27.5–41.2M (Thailand) across ±20% cost-per-bed-day.
- Results were most sensitive to cost per bed-day and elective share.
- Under a deployment model with no hospital-side capital cost, the intervention was net-positive at any post-procedural LOS reduction greater than zero.
- A 0.5-day reduction alone yielded Intl\$ 833 (Singapore) and Intl\$ 320 (Thailand) per patient.

CONCLUSIONS

- CDSS-enabled discharge-readiness scoring generates value through three linked levers: direct cost savings, freed bed-day capacity at zero capital expenditure, and shorter elective waiting times.
- Cost savings and throughput revenue are non-additive value streams.
- Findings were robust across tested parameters and net-positive even at minimal LOS reduction.
- Warrants prospective validation through pilot programs at public institutions.

KEY REFERENCES

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DISCLOSURES

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