Modelling the Financial Impact of Supersaturated Oxygen Therapy After Primary PCI: A Hospital Perspective

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BACKGROUND

The Clinical Challenge

Left anterior descending ST-elevation myocardial infarction (LAD-STEMI) carries the highest in-hospital mortality of all STEMI presentations.[1] Even after successful primary percutaneous coronary intervention (pPCI), patients remain at substantial risk for heart failure (HF) and all-cause death in the year following their procedure.

What is SSO_2 Therapy?

Supersaturated oxygen (SSO_2) therapy delivers hyperoxemic blood (PO_2 ≥1,000 mmHg) directly into the ostium of the left main coronary artery immediately post-pPCI, extending the therapeutic window for myocardial salvage by reducing ischemia-reperfusion injury.

Clinical Evidence

Published clinical trial data demonstrate SSO_2 therapy reduces:

- All-cause mortality at 1-year post-pPCI[2]
- Heart failure hospitalizations at 1-year[2]

Knowledge Gap

Despite proven clinical benefit, the economic impact of SSO_2 adoption from a hospital perspective has not been well characterized — limiting informed decision-making by hospital leaders.

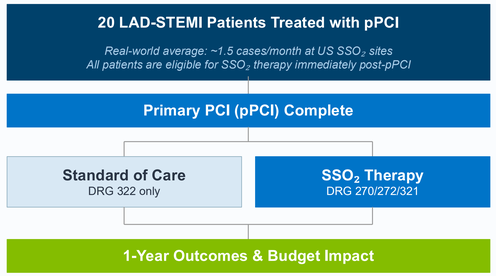
OBJECTIVE

To assess the hospital-level budget impact of introducing SSO_2 therapy for eligible LAD-STEMI patients over a one-year time horizon.

HOW SSO_2 THERAPY WORKS

1. Arterial blood is drawn from the femoral artery during the pPCI procedure
2. Blood is supersaturated with oxygen (PO_2 >1,000 mmHg) using the TherOx® system
3. Hyperoxemic blood is infused directly into the ostium of the left main coronary artery (LMCA)
4. Therapy is delivered for 60 minutes immediately post-pPCI
5. SSO_2 reduces ischemia-reperfusion injury, limiting myocardial damage and improving long-term outcomes

METHODS



Key Model Inputs

Parameter	Value
Eligible patients/year	**20**
Time horizon	1 year
SSO_2 console cost	$77,250
Amortization	5 years
Consumables/patient	$7,250
Additional OR time	60 min
Payor mix (priv./CMS)	69% / 31%
Private payor multiplier	205%
Clinical inputs source	Pub. literature
Cost base year	2023 USD

Uncertainty Analyses

PSA: 1,000 Monte Carlo simulations
OWSA: 10 parameters varied ±20%; results robust

DRG Distribution: SoC vs. SSO_2

DRG Code	Std. of Care	SSO_2	CMS Payment
DRG 270	0%	**26%**	$38,556
DRG 272	0%	**11%**	$18,956
DRG 321	0%	**37%**	$20,424
DRG 322	**100%**	26%	$13,123

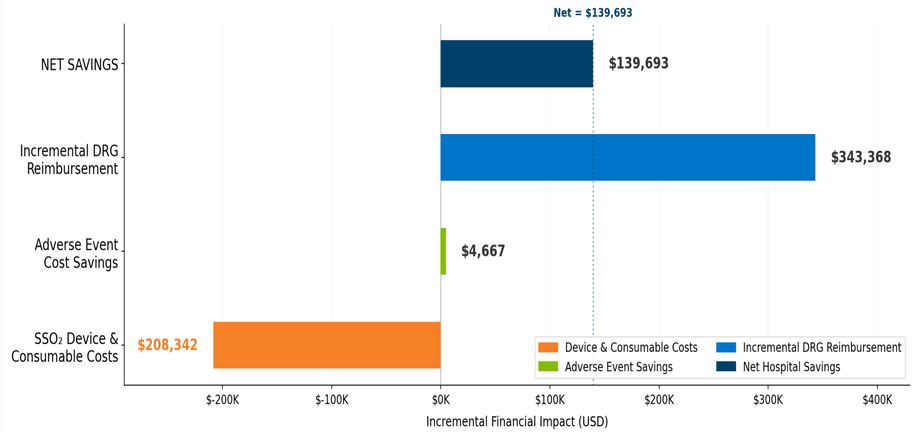
DRG distribution derived from a real-world analysis of SSO_2 vs. non-SSO_2 facilities (Data on file, ZOLL Medical).

RESULTS

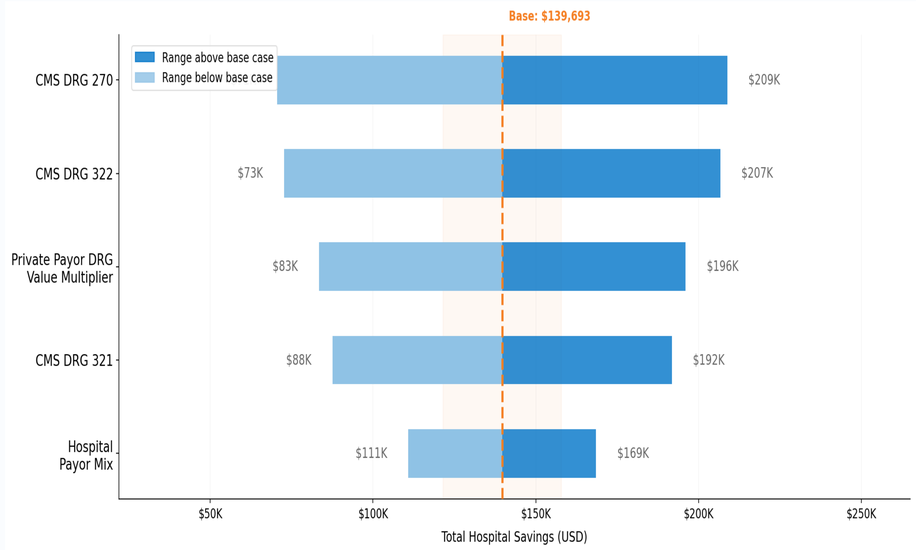
$139,693	2.84	1.28	100%
Annual Hospital Savings	Fewer All-Cause Deaths	Fewer Heart Failure Events	of PSA Simulations Cost-Saving
95% CrI: $76,239–$199,114	*at 1-year post-pPCI*	*at 1-year post-pPCI*	*1,000 Monte Carlo scenarios*

For every 20 patients treated with SSO_2: $139,693 saved | 2.84 fewer deaths | 1.28 fewer HF events | cost-saving in **100% of probabilistic scenarios**

Cost Components: SSO_2 vs. Standard of Care



One-Way Sensitivity Analysis (OWSA) — Top 5 Drivers of Hospital Savings



CONCLUSIONS

SSO_2 therapy is projected to generate **$139,693** in net annual savings for a hospital treating 20 eligible LAD-STEMI patients — with results cost-saving in **100% of probabilistic scenarios** (95% CrI: $76,239–$199,114).

Clinical benefits: 2.84 fewer deaths and 1.28 fewer HF events among eligible patients per year.

Hospitals with higher private-pay rates are projected to realize greater economic benefit, as highlighted by the OWSA.

A key financial driver is differential DRG reimbursement: SSO_2 patients qualify for higher-acuity codes (DRG 270, 272, 321) that generate sufficient incremental revenue to more than offset the device investment ($208,342 vs. $343,368 reimbursement gain).

Limitations

- Single hospital perspective; individual results will vary based on local DRG coding and payor mix
- Clinical inputs derived from published trial data; real-world outcomes may differ
- One-year time horizon does not capture long-term economic value of reduced mortality and HF

Selected References

1. Yan F, et al. J Res Med Sci. 2023;28:17.
2. Chen SL, et al. Catheter Cardiovasc Interv. 2021;97(6):1120–1126. (IC-HOT)

Questions?

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