Health System Resilience in Cesarean Delivery During COVID-19

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Background

- Perioperative efficiency → critical for patient safety, throughput, & resource utilization
- COVID-19 introduced:
  - Infection control constraints
  - Staffing shortages
  - OR workflow disruptions

Objective

- Evaluate impact of COVID-19 on cesarean efficiency across time.

Hypothesis

- Efficiency would ↓ during pandemic, then recover

Mass General Brigham

Study Design & Methods

Design

- **N = 33,562** Cesarean Deliveries
- January 2019 – April 2025
- Multicenter:
  - 1 Community Hospital, 2 Academic Centers
- Periods:

1*	Pre-COVID	Jan 2019-Dec 2019
2*	Early COVID	Jan 2020-Mar 2020
3*	Late COVID	Apr 2020-Dec 2021
4	Post-COVID	Jan 2022-Apr 2025

*Periods 1-3 established in Mi et al., JAMA 2022.

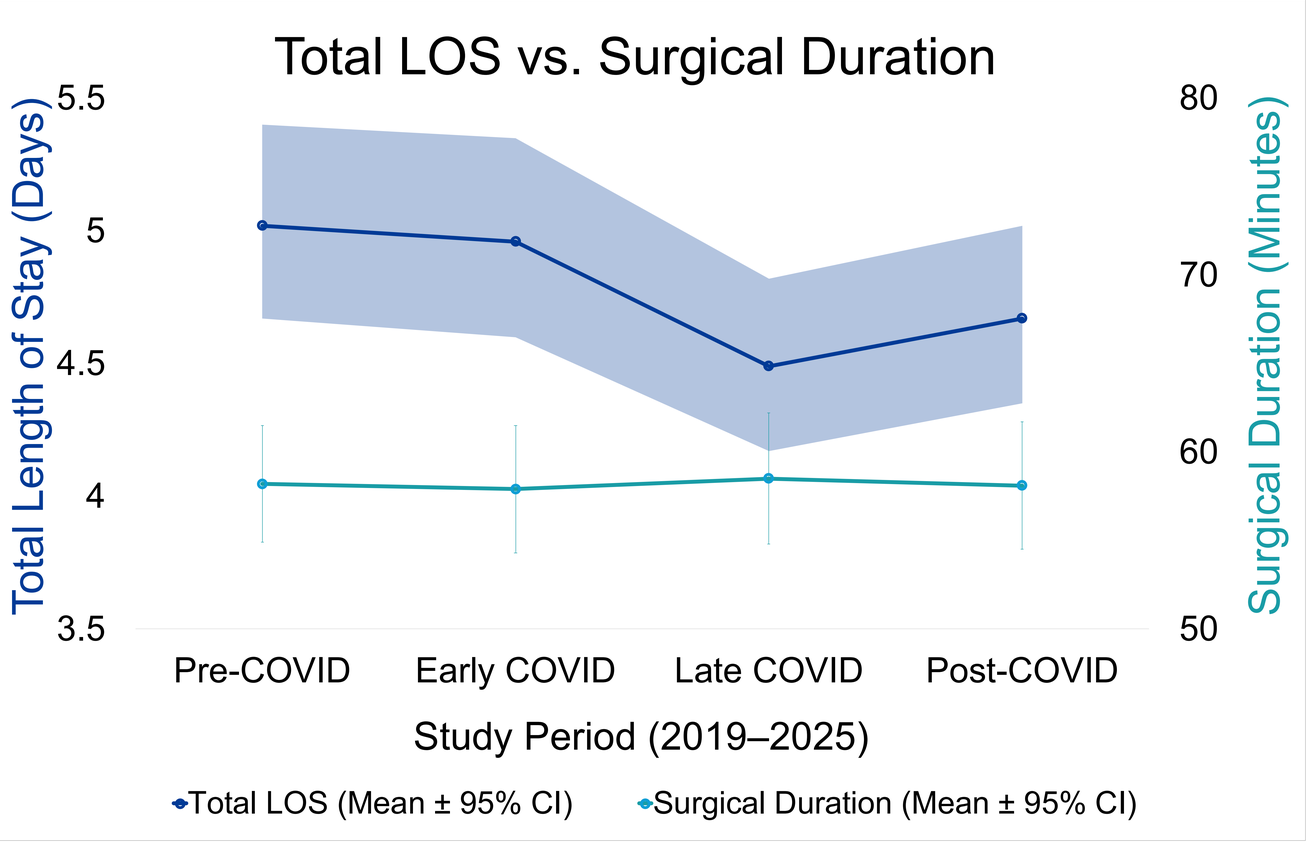
Outcomes

- Hospital LOS + 5 perioperative intervals:
  - Anesthesia start-to-incision
  - Incision-to-procedure end
  - Procedure end-to-out of room
  - Out of room-to-anesthesia stop
  - Anesthesia stop-to-discharge

Analysis

- Multivariable negative binomial regression
- Adjusting for hospital site, ASA class, and case mix

Primary Outcome:
Significant and Sustained LOS Reduction



KEY FINDINGS:

LOS ↓ significantly across periods ($p < 0.0001$)

- Pre → Late COVID: Δ = **-0.50 days**
- Pre → Post-COVID: Δ = **-0.35 days**

Recovery time ↓ ($p < 0.0001$)

- Pre → Post-COVID: Δ = **-0.28 days**

Surgical duration = unchanged

Some perioperative intervals ↑ slightly

Efficiency improved despite pandemic stress.

Resilience of Perioperative Systems Under Stress

Conclusion

- Efficiency **did not** decline during COVID
- LOS improved by **0.35 days**
- Driven by **postoperative recovery**, not operative speed

Interpretation

- Systems demonstrated adaptive capacity under stress

Implication

- Crisis-driven changes may reveal scalable sustainable workflow improvements for cesarean throughput