

Implementation of a Spinal-Induced Hypotension Bundle in Total Hip Arthroplasty Patients

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Problem Statement

An estimated **85%** of patients undergoing a **total hip arthroplasty (THA)** were experiencing **spinal-induced hypotension (SIH)** at a small community hospital in Maryland.

Problem Significance: Peri-operative hypotension **increases** the risk of adverse medical events:

- stroke
- myocardial ischemia
- acute kidney injury

An estimated **\$1.7 billion** was spent in 2021 treating adverse medical events related to intraoperative hypotension and hypertension.

Project Purpose & Goals

Purpose Statement: To reduce the incidence of **SIH** in elderly patients **over the age of 60** undergoing a **THA** at a community hospital in Maryland.

Process Goals:

100% of anesthesia providers will administer:

- **10ml/kg crystalloid co-load**
- **4 mg IV Ondansetron** within 5 min of spinal anesthesia
- A **low-dose weight-based phenylephrine drip** immediately after performing the spinal anesthetic

Methods

Setting: A small community hospital in Maryland.

Population: All patients over the age of 18 receiving a THA under spinal anesthesia.

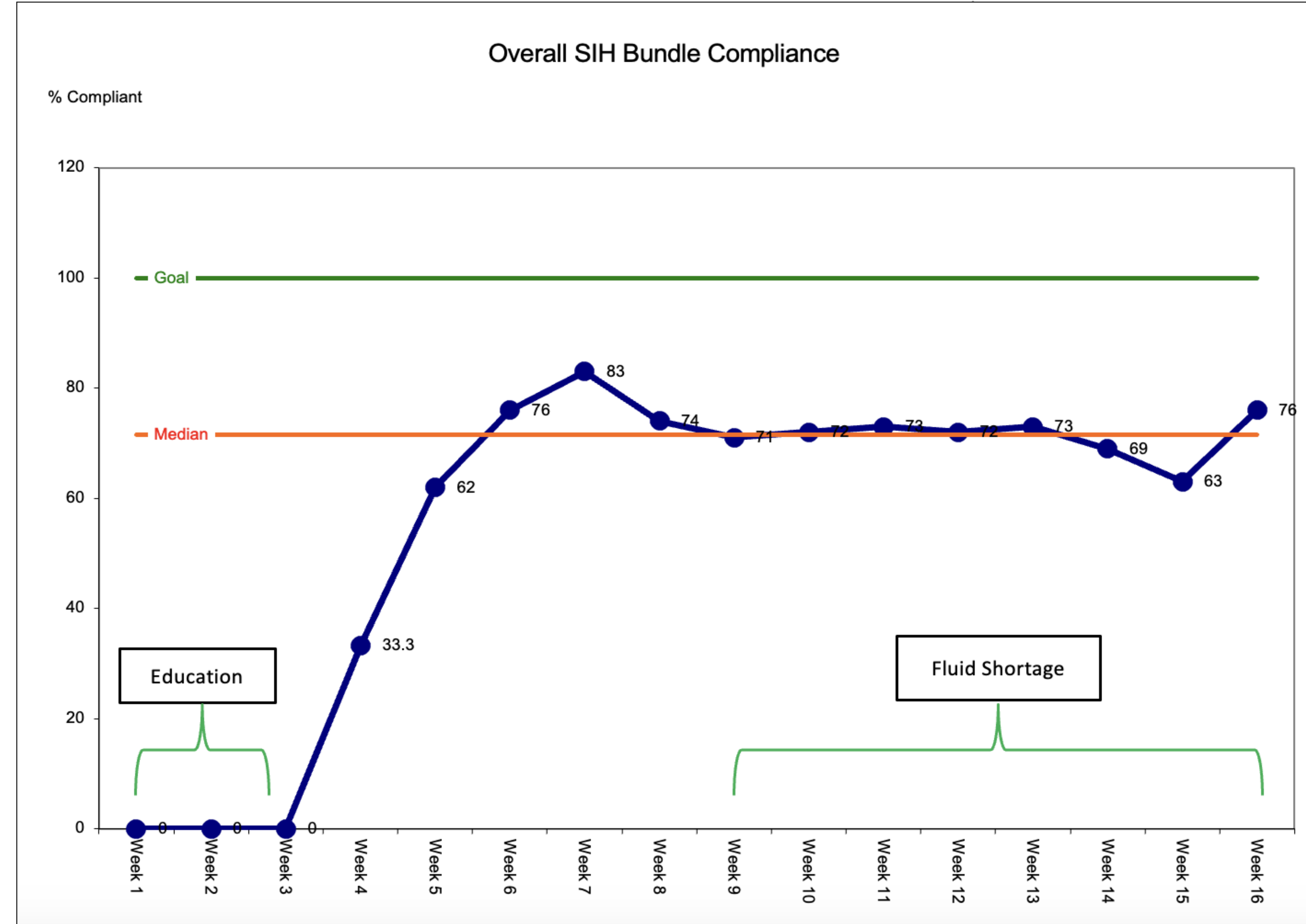
Intervention: Evidence-based 3-part SIH bundle including administration of; a 10ml/kg crystalloid co-load, 4 mg IV Ondansetron within 5 min of spinal anesthesia and a low-dose weight-based phenylephrine drip immediately after performing the spinal anesthetic.

Implementation Strategies:

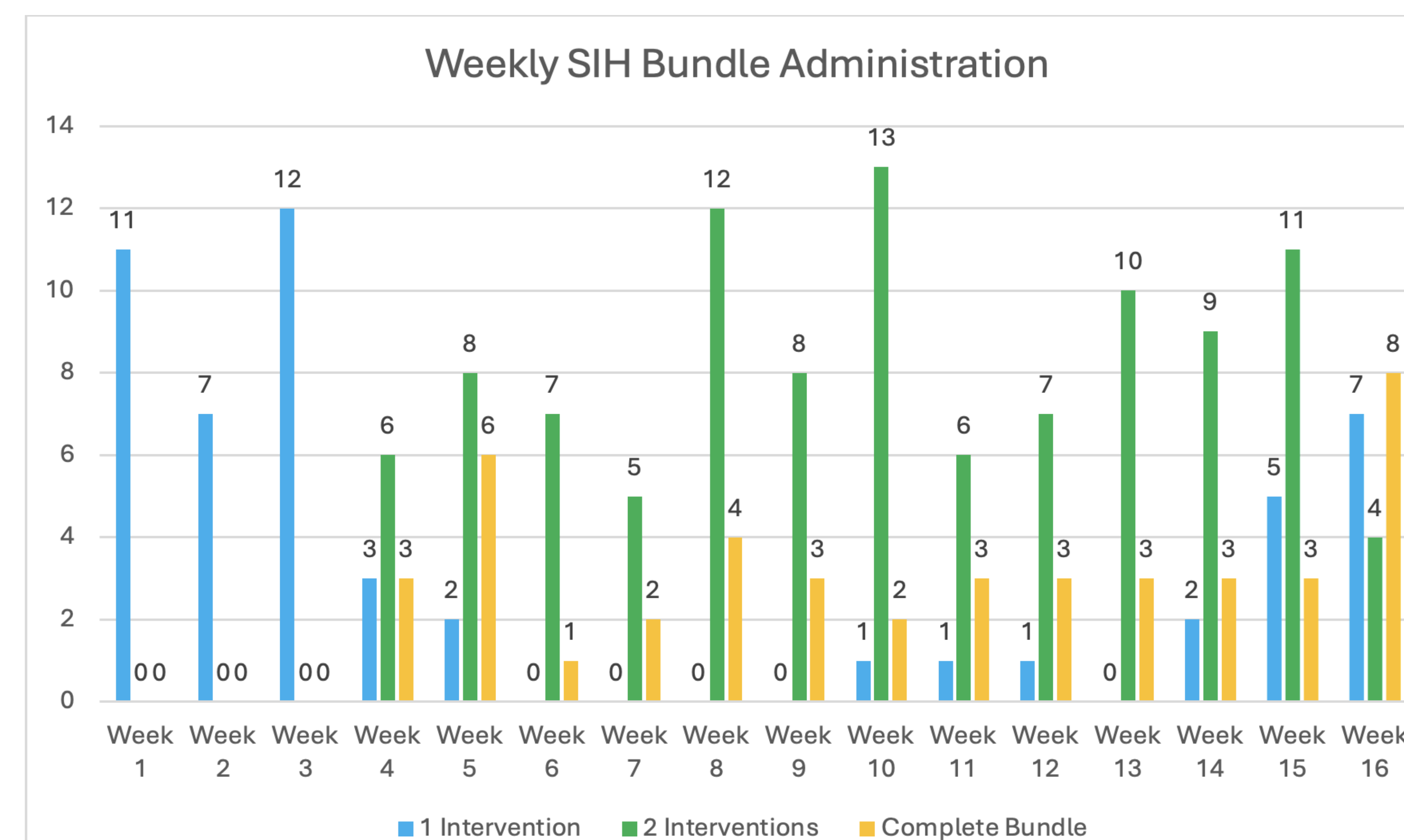
- Obtained **formal commitments** from key stakeholders
- early identification and adoption of **change champions**
- education meetings
- **weekly dissemination** of printed project progress data in the staff lounge

Measures: Retrospective chart audit data for compliance with each intervention and overall bundle adherence.

Results



The **Overall SIH Bundle adherence peaked at 83% in week 7** and had a **median compliance rate of 71.5 %**. The two interventions with the highest compliance rates were the **10ml/kg crystalloid fluid co-load and the 4 mg of IV Ondansetron administration**.



Discussion

Goal Achievement & Impact

- Anesthesia providers on-site were trained before these evidence-based interventions and had **limited knowledge and experience** with their combined effects.
- After provider education and project implementation, anesthesia providers **significantly decreased the incidence of SIH**.
- Evidence-based research demonstrates that the **concurrent use of multiple interventions is superior to a single intervention** to combat SIH.
- The SIH bundle, concurrently implemented with stakeholder buy-in and effective implementation strategies, **sustained a successful evidence-based practice change**.

Limitations

- The **national IV fluid shortage** began during week 9, with the damages from Hurricane Helene & Milton to major fluid manufacturing plants in North Carolina and Florida. Limiting the ability to perform the 10ml/kg crystalloid co-load.
- Technical difficulties related to **infusion pump malfunctions** limited the provider's ability to initiate a phenylephrine drip.

Conclusion

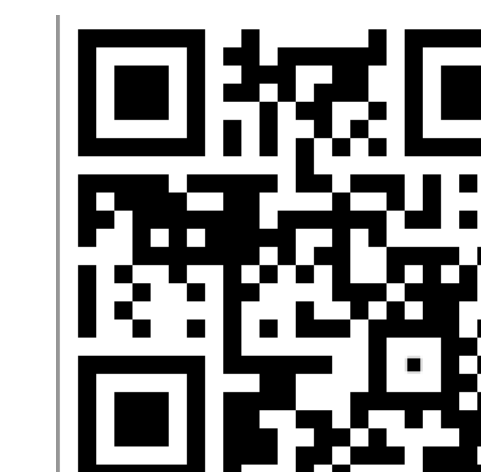
Contribution, Spread, Sustainability, Next Steps

- Anesthesia providers who implement a bundle of interventions to combat SIH **reduce their patient's risk of developing serious adverse medical events after surgery** along with additional costs to the healthcare system.
- This project implementation **did not increase cost**.

Acknowledgements

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References



Please contact Amanda Sce at amanda.sce@umaryland.edu for more information regarding the project