Pneumococcal & Influenza Vaccine Co-Administration in the Incarcerated Population

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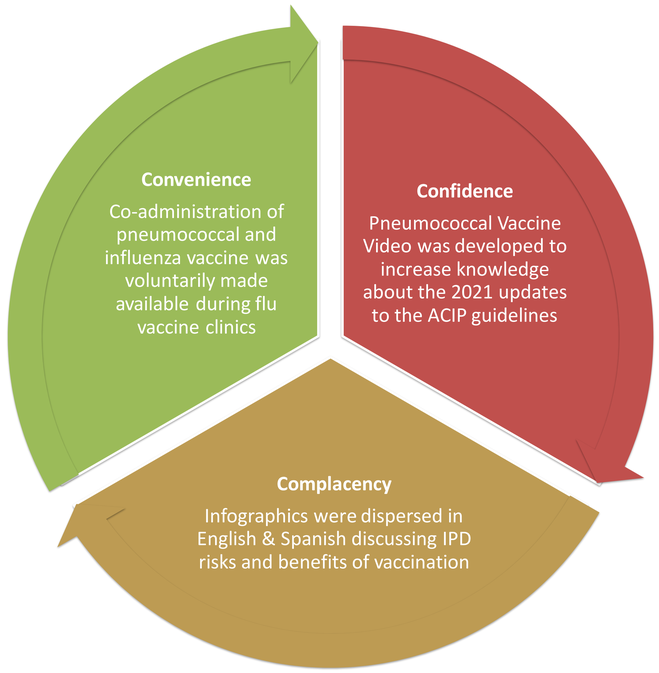
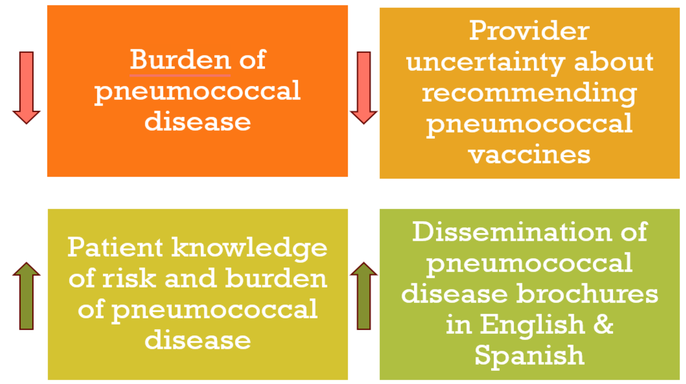
PROBLEM INTRODUCTION

- Streptococcus Pneumoniae causes 20-60% of cases of bacterial pneumonia
- It has a mortality rate of 10-30% depending on risk factors
- Following ACIP Guidelines is 60-70% effective at preventing invasive pneumococcal disease
- Incarcerated individuals have increased risk of contracting pneumococcal disease due to the proximity of living quarters
- Department of Corrections reported 43% of incarcerated individuals <65 & 47% of those >=65 years have received pneumococcal vaccine

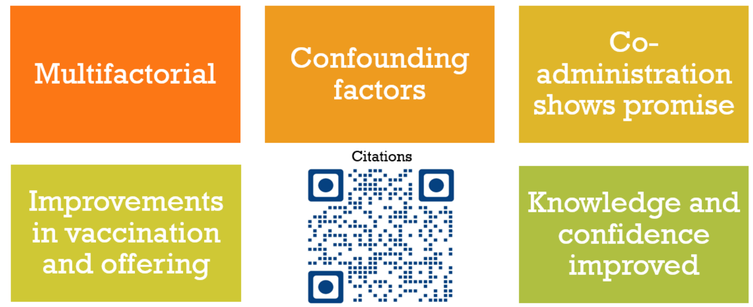
PROJECT METHODS



IMPACT ON PRACTICE



CONCLUSIONS



LITERATURE REVIEW

Risk factors for **deadly** IPD are more common in incarcerated persons

- Asthma is 2x as common
- HIV and Hepatitis B are 3x more common
- Hepatitis C is almost 6x more prevalent

↓

Outbreaks of IPD occur in state prisons

Cigarette smoking is the single most important predictor of disease

↓

Co-administration significantly reduces all-cause mortality, mortality from pneumonia, and vascular-related mortality

It has excellent hazard ratio (0.54-0.72)

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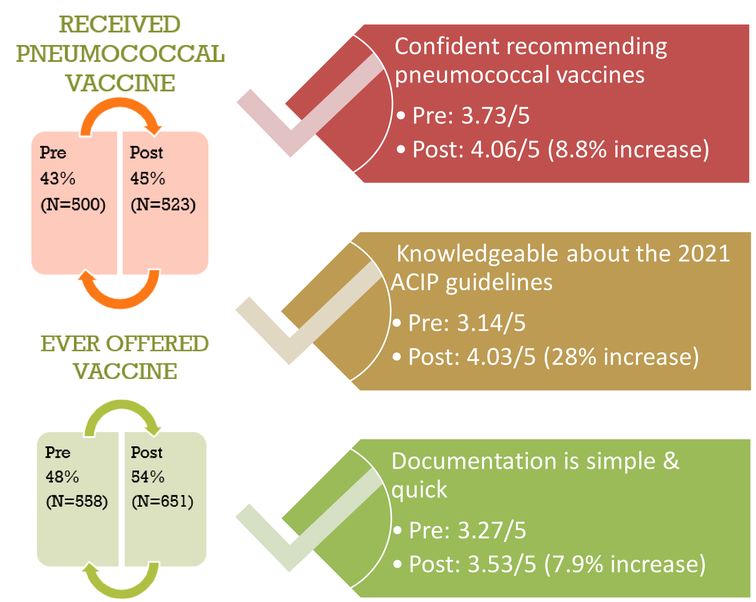
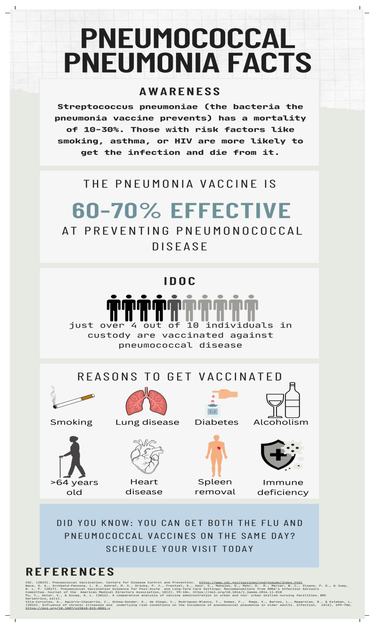
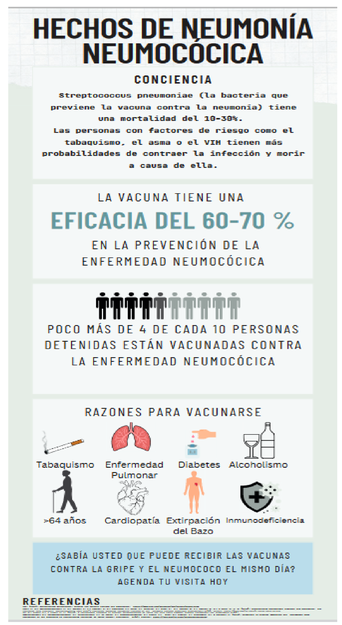
When information is provided by healthcare professional, hesitant individuals more likely to be vaccinated

EVALUATION







Recommendations for Sugammadex Administration in Standard and Special Populations

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PROBLEM

- Lack of standardization for use of sugammdex in standard and special populations including renal failure, breast feeding, pregnancy, and pediatrics at Memorial Hospital Belleville.
- Concerns about lack of evidence-based information about the use of sugammadex, access to quick references, and understanding of the cost analysis about the drug.
- This project will bridge the knowledge gap, provide evidence-based references, and explore causes for barriers to use of the medication.

LITERATURE REVIEW

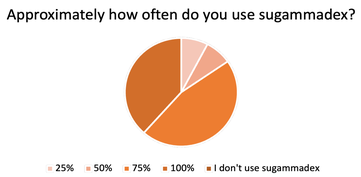
Clinical Relevance	• Inadequate reversal of chemically induced paralysis can lead to increased morbidity & mortality including hypoxia, respiratory failure & increased length of hospital stay (Ayad et al., 2019).
Renal Impairment	• Should not be used if creatinine clearance < 30ml/min • No dose adjustments required. Slightly prolonged onset • High flux dialysis within 24-48 hours of administration (Paredes et al., 2020).
Breast Feeding	• Avoid in the first 10 days postpartum. The large molecule can pass through maternal lactating ducts (Willett et al., 2019). • Weigh risks versus benefits; effects on lactation are unknown (Willett et al., 2019).
Pregnancy	• Avoid in 1st trimester • Safe to use near term (37 weeks) (Willett et al., 2019)
Birth Control	• Utilize nonhormonal birth control for 7 days after administration • Hormonal birth control includes pills, IUDs, vaginal rings & implants (Willett et al., 2019).
Pediatrics	• Not FDA approved in children < 2 years (Merck & Co, 2022). • Safe in children > 2 years; same dosing as adults
Cost Analysis	• Sugammadex resulted in fewer minutes in the OR and PACU when compared to neostigmine (Moss et al., 2022). • Although sugammadex is more costly than neostigmine, saving OR time results in decreased overall costs (Childers & Maggard-Gibbons, 2018).

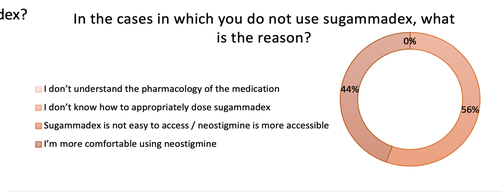
PROJECT METHODS

1. IRB approval was obtained from SIUE and Memorial Hospital Belleville.
2. Non-experimental single group design using a convenience sample of approximately 25 anesthesia providers.
3. Guidelines were created based on the current literature regarding sugammadex in standard and special patient populations.
4. Current guidelines presented to the anesthesia staff. A quick reference card was distributed to all providers for ease of access.
5. A post-implementation survey assessed current use of sugammadex, barriers to use, and understanding of the use in special populations.

EVALUATION

- Multiple choice & Likert-style questions utilized in survey
- 13 total participants included in analysis
- 84.6% of participants indicated an increase in knowledge of sugammadex in standard and special patient populations and increased confidence in using sugammadex after implementation.
- Majority used sugammadex due to its reliable course of reversal and shorter reversal time.
- 100% said they would increase their use of sugammadex if it was accessible in a Pyxis in each OR.





SOUTHERN ILLINOIS UNIVERSITY EDWARDSVILLE
SCHOOL OF NURSING

DOSING

≥ 2 twitches = 2 mg/kg
< 2 twitches or only post-tetanic twitches = 4 mg/kg
Cannot intubate / cannot ventilate = 16 mg/kg

Dose should be calculated on **ACTUAL BODY WEIGHT.**

Side Effects: Most common include rash, bradycardia, hypotension, nausea and vomiting, and prolonged clotting times. More commonly seen with large doses (16mg/kg) (Merck & Co, 2022).

IMPACT ON PRACTICE

Increased use of sugammadex may lead to safer patient outcomes.	Increased confidence in using sugammadex in special populations.
Decreased incidence of postoperative complications from residual neuromuscular blockade.	Easy accessibility to sugammadex when a Pyxis is implemented in each OR.

CONCLUSIONS

Overall, current literature shows that sugammadex is superior to neostigmine in the reversal of steroidal NDMRs. Most of the data for the use of sugammadex in special populations shows that additional research is needed. Sugammadex has shown to decrease time in the OR, potentially further reducing healthcare costs. Further conclusions after implementation showed an increase in provider knowledge about the use of sugammadex in standard and special populations, with additional education and quick reference card. Barriers included lack of accessibility and more comfort with other reversal agents. 100% of participants found the quick reference card user friendly along with an increase in confidence in using sugammadex.

Blunt Cerebrovascular Injury (BCVI): Universal CTA Neck Screening at Level 2 Trauma Center

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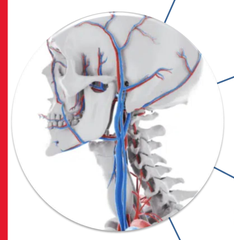
PROBLEM INTRODUCTION

- The project site uses clinical screening criteria (CSC) with extended Denver criteria (eDC), Denver criteria (DC), and the Memphis criteria (MC) to screen for BCVI in patients with blunt-force trauma.
- Relying solely on CSC will result in undiagnosed BCVI (Harper et al. (2022).
- Literature supports the use of CTA neck to screen for BCVI (Ali et al., 2022; Black et al., 2020; Harper et al., 2022; Kim et al., 2020; Leichtle et al., 2020).
- The project aims to implement CTA neck during the initial blunt trauma assessment for early detection & treatment of BCVI in patients who sustained blunt force injuries.

LITERATURE REVIEW



BCVI

- The cervical, carotid, and vertebral arteries are at high risk for injury after blunt-force trauma (Rutman et al., 2018).
- Cause venous occlusion, subintimal dissection, luminal narrowing (Rutman et al., 2018).

OCCURRENCE

- Occurrence of BCVI is thought to be 1-3%
- Untreated BCVI carries high morbidity and mortality (Kim et al., 2020).
- Up to 30% of patients can develop CVA (Kim et al., 2020).
- Stroke typically occurs within 72 hours post-injury, but it can also happen days to months later

CSC

- Can miss > 30% of carotid or vertebral artery injuries (Leichtle et al., 2020).
- DC, eDC, MC sensitivity scores are 57.5%, 74.7%, 47.3% (Black et al., 2020).
- DC, eDC, MC specificity scores are 79.1%, 61.5%, 83.9% (Black et al., 2020).

CTA NECK

- Literature advocates for liberal screening with CTA neck.
- Sensitivity and specificity are 66% and 97% (Black et al., 2020).
- Cost-effective for early detection and treatment (Ali, et al., 2022).
- Decrease mortality & morbidity associated with BCVI (Ali, et al., 2022).

PROJECT METHODS

Trauma registry data achieved a 98% IRR prior to the retrospective analysis

Policy creation

≥15 years old with blunt LI and LII trauma activation

Utilize "Trauma CT Order" form

Multi-detector 128 Somatom X.cite CT scanner

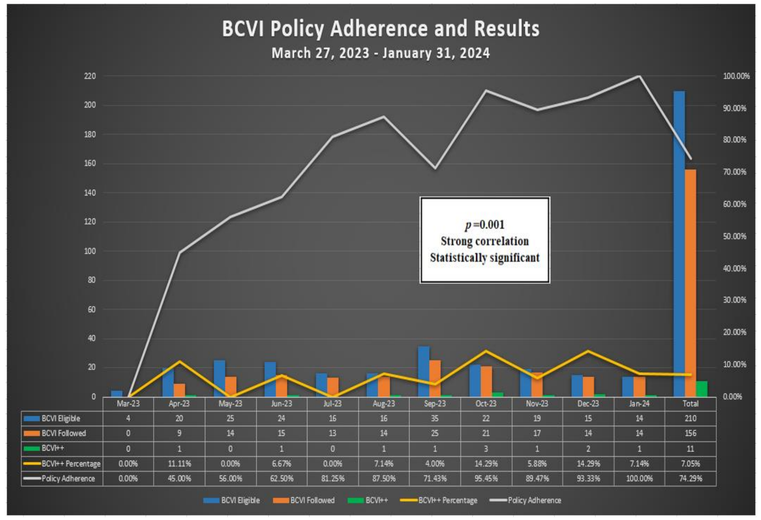
UNIVERSAL SCREENING GUIDELINE:

1. Major blunt force trauma requiring a CT head and C-spine will get Universal BCVI screen with **one** of the following:
   - i. CT Head/Face without contrast
   - ii. CTA Neck or CTA Head/Neck (scan at about 20 seconds)
     - Inject 100mL of Omnipaque 350
       - If pt is under 100 lbs then Omnipque 300 (1mL per pound).
     - Do C-spine reconstructions off of the CTA neck
   - iii. CT Chest/Abd/Pelvis (scan portal venous phase at 1 minute)
     - Do T/L spine reconstructions off of the CAP
   - iv. Delay CT Abd/Pelvis

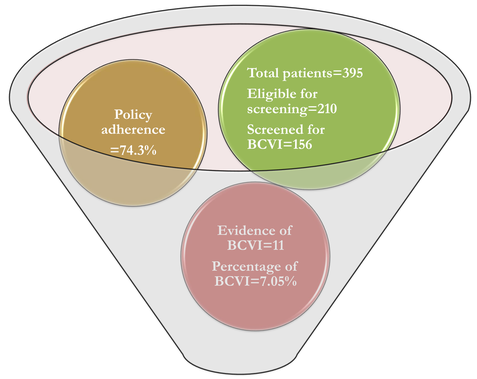
OR If scan includes CTA CAP:

   - i. CT Head/Face without contrast
   - ii. CTA Neck or CTA Head/Neck
     - Inject 70mL of Omnipaque 350 (1st injection)
       - If pt is under 100 lbs then Omnipque 300, 1mL per pound.
     - Do C-spine reconstructions off of CTA neck
   - iii. CTA Chest/Abd/Pelvis
     - Inject 100mL of Omnipaque 350 (2nd injection)
       - If pt is under 100 lbs then Omnipque 300 (1mL per pound).
     - Do T/L spine reconstructions off of CTA CAP
   - iv. Delay CT Abd/Pelvis

EVALUATION



	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Total
BCVI Eligible	4	20	25	24	16	16	35	22	19	15	14	210
BCVI Followed	0	9	14	15	13	14	25	21	17	14	14	156
BCVI++	0	1	0	1	0	1	1	3	1	2	1	11
BCVI++ Percentage	0.00%	11.11%	0.00%	6.67%	0.00%	7.14%	4.00%	14.29%	5.88%	14.29%	7.14%	7.05%
Policy Adherence	0.00%	45.00%	56.00%	62.50%	81.25%	87.50%	71.43%	95.45%	89.47%	93.33%	100.00%	74.29%



r=0.97 showed positive linear relationship between "BCVI Followed" and "Positive BCVI"

p<0.001 emphasized the reliability of the observed correlation

LIMITATIONS

1. Hemodynamically unstable patients did not undergo a complete initial radiographic workup
2. Transfer patients who already had CT scans
3. Human memory resulted in poor compliance during the initial phase of the project.

Improved by sending bi-weekly scorecards to the trauma surgeons

IMPACT ON PRACTICE

- Early screening for BCVI is crucial for early detection & treatment
- BCVI prevalence was higher than expected in this project
- The results validate the relevance & efficacy of the BCVI protocol
- Universal screening with CTA neck is recommended
- Sole reliance on CSC can lead to undiagnosed BCVI
- Median age for stroke-related BCVI is 39 years
- Strokes result in severe long-term disabilities
- Stroke care costs average $140,048 per patient in the U.S
- Impose both economic and human productivity burden

CONCLUSIONS

BCVI
- More prevalent when CTA neck is done on all major blunt force trauma patients

Universal screening with CTA neck
- A logical approach to screen for BCVI
- Early detection and treatment
- Better patient outcome
- A financially viable option

CSC
- Diagnostic accuracy is inadequate

Recommendation
- Establish institutional practice and guideline

REFERENCES

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