



# Modified vs. Standard Sternal Precautions in Pediatrics



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## BACKGROUND & RATIONALE

- In the U.S. ~22,000 pediatric open-heart surgical procedures are performed each year.
- **Sternal precautions goal:** reduce complications, infection, poor healing, and wound separation (Rodman Uher et al., 2016).
- **Aim:** explore modified sternal precaution precaution and standard sternal precaution variations and their role in child development.
- **Standard sternal precautions:** no prone, no pushing/pulling more than 10 lbs, no lifting under shoulders, and no reaching over 90 degrees.
- **Modified sternal precautions:** S.M.A.R.T., Move in the Tube, shorten duration, or modified positioning.

## PICO QUESTION

Do modified sternal precautions improve developmental outcomes in children who underwent (median) sternotomy in a hospital setting compared to those with traditional sternal precautions?

## SEARCH METHODOLOGY

PICO question was developed with professor mentor

Databases were divided amongst members and searched with common search terms

Articles were selected and appraised using specific inclusion/exclusion criteria

Critically appraised papers (CAPS) were created and reviewed by mentor

CAPS were synthesized and integrated into a complete CAT portfolio

## S.M.A.R.T. TIPS

### DO NOT

- pushing or pulling through your arms during
  - lifting objects
  - sitting out of bed
  - standing up from a chair
- Lift your arms about 90

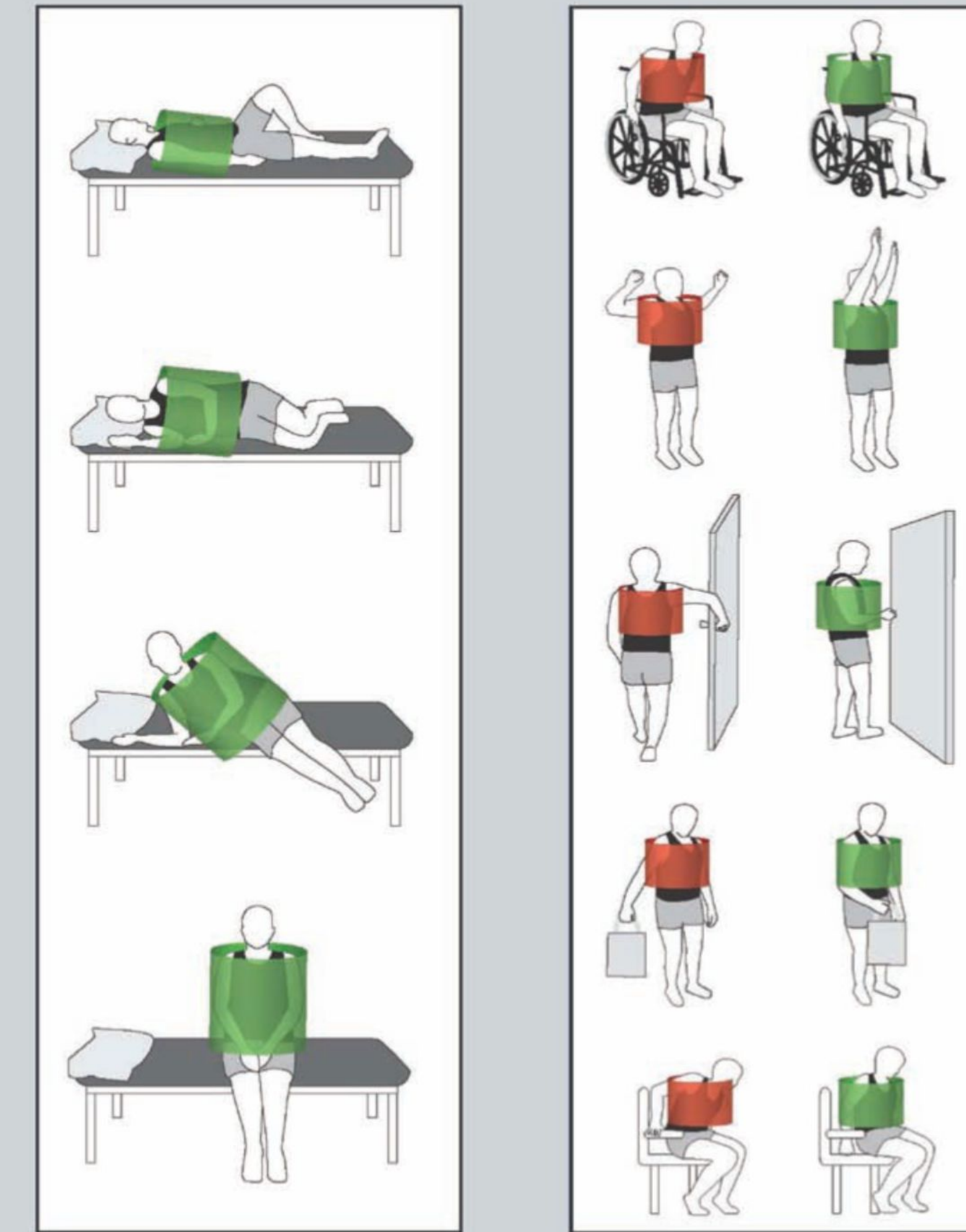
### AVOID

- lifting objects more than 2kg
- placing arms behind your back

### ALWAYS

- support your chest with both arms when coughing

## Keep Your Move in the Tube



## MAIN FINDINGS AND LIMITATIONS

### Main Findings:

- A less restrictive and more active plan of care is warranted and recommended.
- The principles of “Keep Your Move in the Tube” are supported by strong evidence that enables patients to use their arms to perform bed mobility and transfers more efficiently.
- “Keep Your Move in the Tube” patients reported less difficulty in ADLs and functional transfers.
- Modified sternal precautions had a decrease in hospital stays, increase in physical recovery, patient/caregiver satisfaction, and ease of quality of life within post-op phase.
- Prone positioning improved both oxygenation and respiratory system compliance.
- Protracted or excessive physical restriction may have a negative impact on motor and sensory development of the infant after cardiac surgery.
- Current sternal precautions may relate to poorer outcomes.

### Limitations:

- Small sample sizes
- Room for bias
- Limited evidence and research on modified and less restrictive precautions
- Studies only include healthy subjects, cadavers, and models
- CABG surgery
- More evidence on the effectiveness of this strategy is needed.

## SEARCH RESULTS

- Both standard and modified sternal precautions can be effective at improving clinical outcomes among patients.
- Strong higher-level evidence with good internal and external validity to suggest that both interventions are effective.
- Databases: CINAHL, Google Scholar, Embase, PubMed, Pediatric Physical Therapy, Australian Journal of Occupational Therapy Physical and Occupational Therapy in Pediatrics, AJOT, SCOPUS, SAGE Journals, TRIP Database

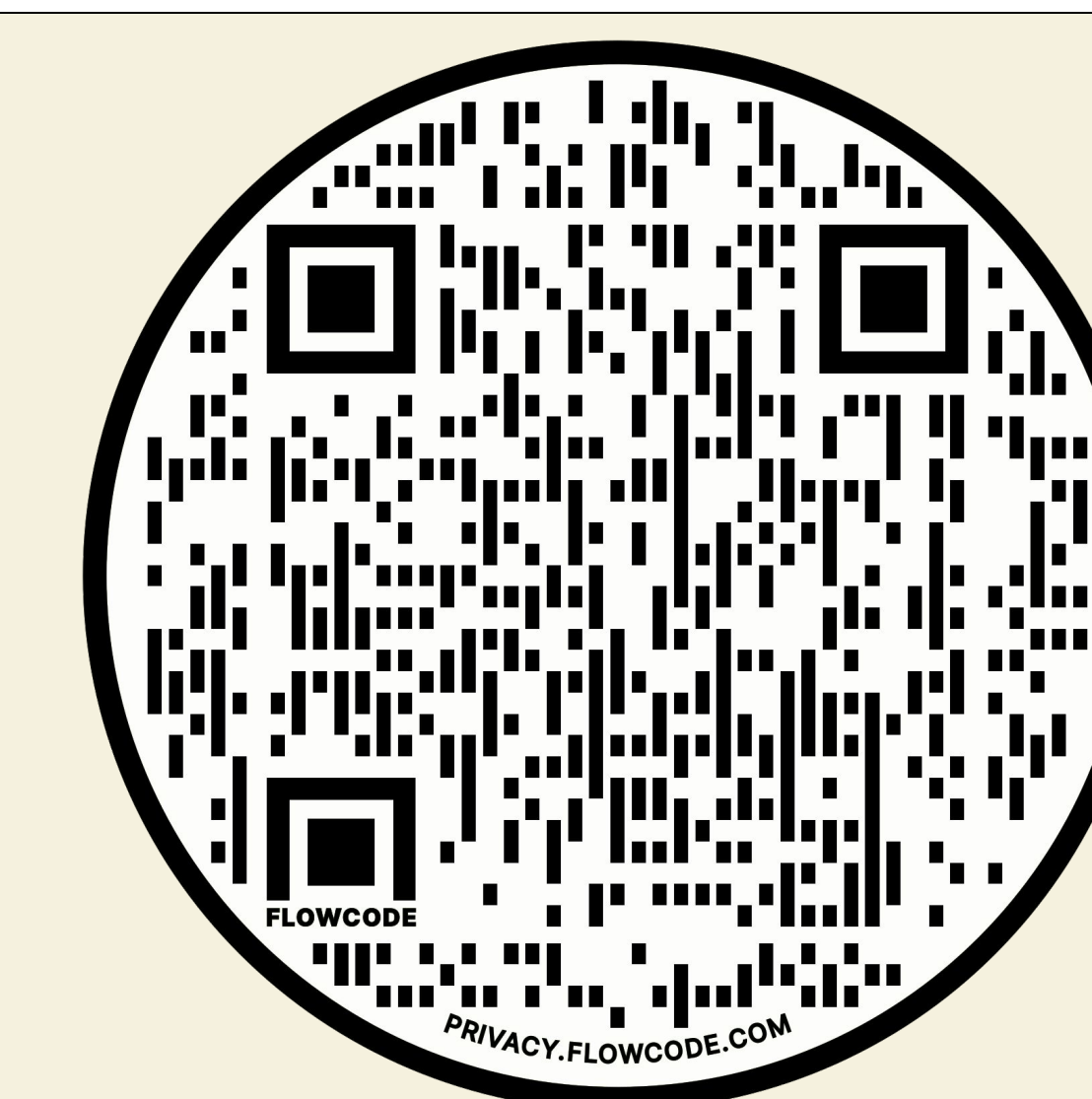
## CLINICAL BOTTOM LINES

- Both standard and modified sternal precautions had no adverse effects and were both proven effective at improving clinical outcomes.
- Utilize modified sternal precautions or standard sternal precautions with caution, due to many studies being conducted with adult patients instead of pediatric patients.

## RECOMMENDATIONS FOR IMPLEMENTATION

- Use standard or modified sternal precautions with caution, results not necessarily generalizable to pediatrics.
- **More research needed:** longitudinal study on the developmental outcomes among pediatric clients who underwent a median sternotomy.
- **Further research:** comparing Keep Your Move in the Tube, S.M.A.R.T., other modified sternal precautions, and standard sternal precautions in pediatric populations.

## CAT PORTFOLIO



## REFERENCES

