

The Effects of Air-Cell Based Cushions on Pressure Relief for Adults with Spinal Cord Injury: A Critically Appraised Topic

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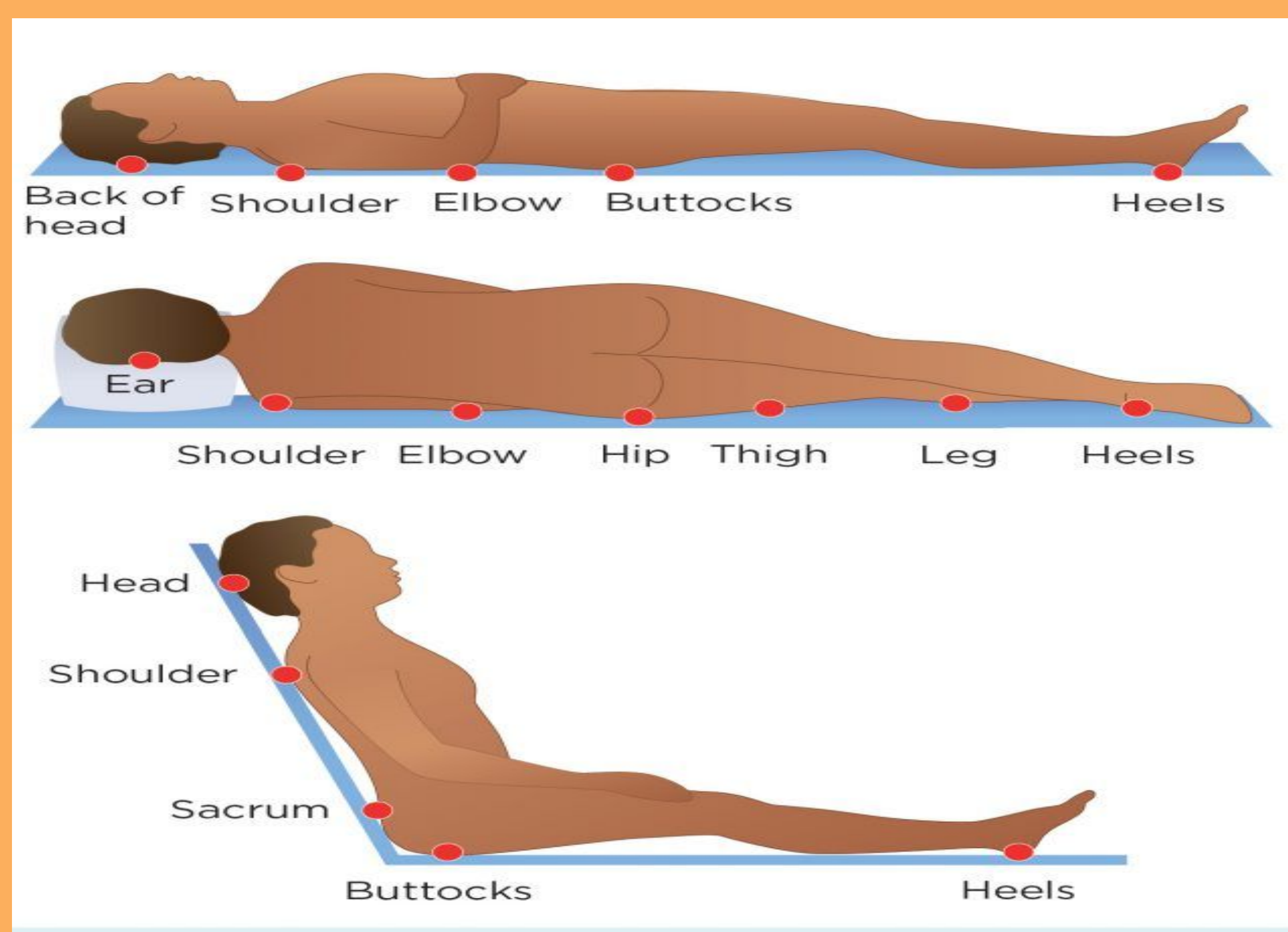
PICO QUESTION

Are air-cell based (ACB) cushions effective for reducing pressure and development of pressure ulcers among adults with spinal cord injury who are unable to independently perform pressure relief?

BACKGROUND & RATIONALE

- Regional One Hospital sees patients at the acute level; most patients are unable to independently perform pressure relief
- Important to provide a cushion to minimize development of pressure ulcers

PRESSURE AREAS AT RISK



Fletcher J (2020) Pressure ulcer education 5: Keeping patients moving. *Nursing Times [online]*; 116: 2, 28-30.

REVIEW PROCESS

Consulted with UTHSC librarian and completed individual searches

Databases searched: CINAHL, Scopus, Embase, Clinical Key, PubMed, Google Scholar

CAPs developed using extraction and quality rating forms; reviewed by professor

Peers, clinical mentor, and professor reviewed the CAT for quality control

SEARCH METHODS

POPULATION

(SCI OR Quadripleg* OR "spinal cord injury" OR "dependent pressure relief")

INTERVENTION

("Gaymar cushion" OR "air-filled cushion" OR "Stryker Sof-Care")

OUTCOMES

(Reduc* OR decreas* OR prevent* OR "reducing pressure ulcers" OR "promoting skin integrity" OR pressure wounds")

Inclusion Criteria

- Population: SCI/Dependent
- Age: Adults
- Quadriplegia
- Air Cushion
- Quantitative Articles

Exclusion Criteria

- Independent Pressure Relief
- Comorbidities (Obesity, CVA)
- Publication date >10 Years
- Qualitative articles

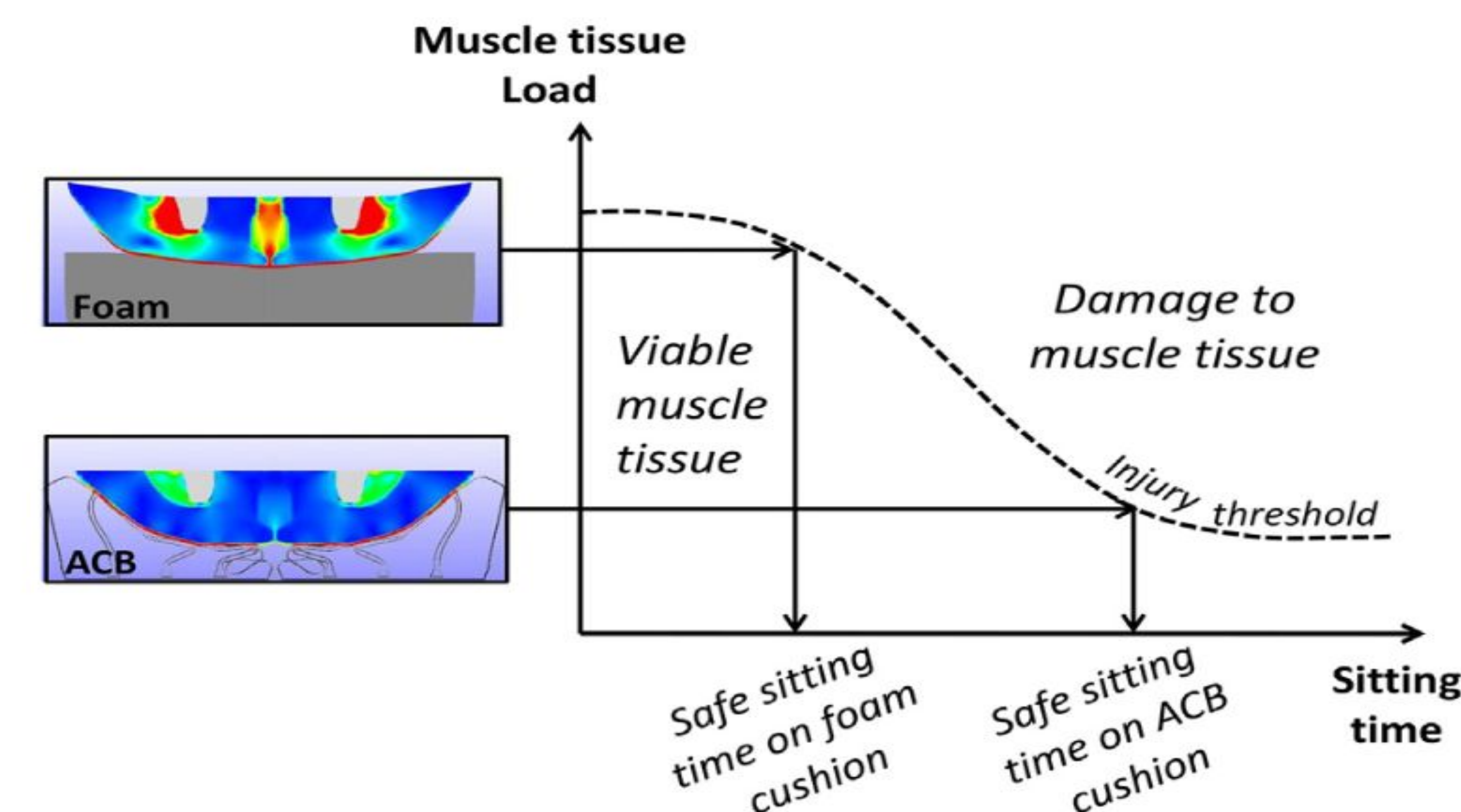
SEARCH RESULTS

Study	Advantages of ACB	Limitations
Level II		
Damiao & Gentry (2021) • Systematic Review • Quality Score: 70%	• Superior immersion and shear reduction.	• Small number of included studies, results challenging to compare
He & Shi (2020) • Rapid Review • Quality Score: 90%	• More consistently effective in interface pressure reduction	• Small number of included studies
Level III		
Wu & Bogie (2014) • Time Series • Quality Score: 77%	• Dynamically and continuously alters IP distribution • Sustained positive tissue effects	• Standardized air cell layout and inflation/deflation cycle for the Alternating Pressure ACB may affect generalization for other cell layouts
Level IV		
Levy, Kopplin, & Gefen (2014) • Single Case Design • Quality Score: 86%	• Lower stress in muscle, fat, and skin • Greater immersion, lowering internal tissue loads	• Inherent limitations of the computational modeling related to the 2D slice

CLINICAL BOTTOM LINES & RECOMMENDATIONS

- Overall, there is strong evidence that ACB cushions are superior to other typical cushions used in the clinical setting regardless of brand.
- Monitoring of skin integrity every 2 hours in a Stryker Chair
- More research needed

AIR-CELL BASED CUSHION RELIEF



Levy, A., Kopplin, K., & Gefen, A. (2014). An air-cell-based cushion for pressure ulcer protection remarkably reduces tissue stresses in the seated buttocks with respect to foams: Finite element studies. *Journal of Tissue Viability*, 23(1), 13-23. <https://doi.org/10.1016/j.jtv.2013.12.005>

POSTER



REFERENCES

