Updated Sternal Precautions: Evidence-Based Initiative to Improve Independence with Activities of Daily Living and Safely Increase Discharge Home Following Cardiac Surgery

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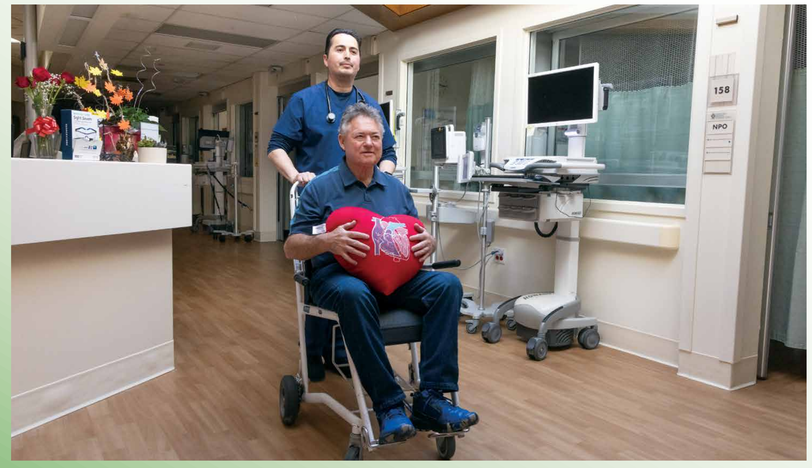
Background

Median sternotomies performed during cardiac surgery require patients to receive educational guidance on sternal precautions to avoid sternal wound complications (Borrows et al., 1990). Although traditional sternal precautions are meant to protect patients, they lack supporting evidence and may impede recovery, decrease independence with activities of daily living (ADLs), reinforce fear of activity leading to muscular atrophy and deconditioning, and increase post-acute care utilization (Adams et al., 2016; Parker et al.,2008; Wall et al., 2013). Additionally, restrictions vary widely in medical facilities across the United States (Balachandran et al., 2014; Cahalin et al., 2011).

As a result, Baylor University Medical Center performed numerous studies to measure the forces exerted on the sternum during various common activities and their loads, with the goal of identifying the appropriate load restriction to prescribe to patients (Adams et al., 2008; Parker et al., 2008; Adams et al., 2014). The alternative approach developed was Keep Your Move in the Tube™ (KYMITT), which has been both utilized and evaluated in the research for application in current patient care. This approach applies standard kinesiological principles and teaches patients how to perform load-bearing movements in a way that avoid excessive stress to the sternum. Cardiac surgery patients utilizing KYMITT were three times more likely to be discharged home versus to inpatient rehabilitation or skilled nursing facility than standard sternal precaution patients and had significantly higher odds of demonstrating independent functional status on final patient physical therapy treatments (Adams et al., 2014; Gach et al., 2021; Stein et al., 2024).

At Salinas Valley Health Medical Center, we utilized the traditional approach and recognized that these sternal precautions were resulting in fear of mobility and impairing ADLs. The purpose of this initiative, led by Rehabilitation Services, was to transition from restrictive traditional sternal precautions to an evidence-based, alternative approach that promotes patient safety, facilitates mobility, improves independence with ADLs, and reduces the need for post-acute care discharge.



Methods

A literature review was conducted in CINAHL, PubMed®, and MEDLINE from 2008-2024 utilizing the following search terms: rehabilitation, Keep Your Move in the Tube, sternal precautions, functional outcomes, home discharge, sternotomy, cardiac surgery, and readmission rates. We used the evidence-based practice model for physical therapists as a method of clinical decision-making and practice that assists with integrating the best available scientific evidence with clinical expertise and a patient's values and circumstances (Schreiber et al., 2005). The literature review and synthesis support a shift away from traditional sternal precautions to the use of KYMITTs as a safe and effective approach for sternal precautions after cardiac surgery. Due to demonstrated positive outcomes in the literature, which showed increased rates of discharge home, improved independence with ADLs, reduced complications post-operatively, and improved mobility, we recommend utilizing KYMITT for sternal precautions at Salinas Valley Health Medical Center.

The target population will include our cardiac surgery patients with subsequent sternotomies. The steps for implementation include discussions with clinical care teams [physicians, nursing, Cardiac Wellness, physical therapy (PT), occupational therapy (OT), speech therapy, exercise physiologists]; completion of our Cardiac Surgery Patient Education Handbook (a collaborative hospital-wide initiative); creating e-learnings and live demonstrations with staff (rehabilitation and nursing); updating clinical competencies; and creating data repositories to assess results. A data repository will be created to collect all pertinent data and assess quarterly (e.g., discharge disposition, post-operative sternal wound complications, 30-day readmission, and functional status upon discharge). Additionally, superusers will be trained on each unit (ICU/CCU and Heart Center) to allow for a resource if any questions arise. Rehab Services superusers will check in weekly during the first 2 weeks of the initial rollout and be readily available for any questions or concerns.

Results

This initiative is currently in progress, and will replace traditional restrictions for patients undergoing median sternotomy with the KYMITT approach starting October 22, 2024. Once all clinical staff are competent with the new sternal precautions, data collection will begin and be evaluated quarterly. The new sternal precautions and cardiac rehabilitation protocol will be added to Meditech. The main outcome measures will be discharge disposition, post-operative sternal wound complications, 30-day readmission, and functional status upon discharge. Pain will be assessed for each patient before treatment, during mobility, and after treatment sessions for both OT and PT. Patient satisfaction will be evaluated through rehabilitation leader patient rounding to determine if the new sternal precaution approach allowed for ease of mobility and comfort with discharge home.

Conclusions

The aim of this initiative is to improve the quality of care to patients by increasing ease of overall mobility and ADLs, increasing discharge home for cardiac surgery patients without increasing risk of adverse events, and reducing utilization of post-acute care facilities. Once implementation is complete, data will be evaluated to determine needed process improvements and enhancements. Additionally, we plan to implement a research study by assessing KYMITT's impact on functional outcomes as well as the ability to begin outpatient services at earlier time frames, therefore improving overall health outcomes.

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