

# Comprehensive Conservative Management of the Rib Fracture Patient Population

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## INTRODUCTION

- **Rib fractures:**
  - Account for approximately 10% of bone fractures.
  - Are the most common injury associated with trauma to the thorax.
  - Increase in incidence with age.
- **Patients with rib fracture(s) struggle with:**
  - Significant pain
  - Difficulty breathing
  - Impaired functional mobility
  - Poor exercise tolerance
  - Decreased quality of life.
- **There are few non-invasive treatments for rib fracture in the literature.**

## PURPOSE

We hypothesized that the implementation of collaborative care with physical therapy intervention would have a significant impact on reducing pain ratings for the non-surgical rib fracture population.

A multidisciplinary team, including Cardiothoracic Surgery and Physical Therapy, implemented a non-invasive clinical approach that addressed multiple aspects of rib fractures.

## METHODS

Rib fracture patient referred to Cardiothoracic Surgeon

Cardiothoracic Surgeon recommends conservative management and refers patient to Physical Therapy

Patient works with Physical Therapist for evaluation and treatment of musculoskeletal dysfunctions, functional mobility, and pain management

*Electronic medical record review was performed on patients utilizing this referral pathway over a 17-month time period, with a focus on numeric pain ratings*

## RESULTS

Simple Statistics of Patient Sample					
Variable	N	Mean	Standard Deviation	Minimum	Maximum
Number of Ribs Fractured	30	3.33	1.73	1	8
Age	31	57.77	15.18	18	84
Number of Physical Therapy visits	31	3.77	2.65	1	10
Displaced Fractures	13	43.33%			
Non-displaced Fractures	17	56.67%			
Gender- Male	15	48.39%			
Gender- Female	16	51.61%			

Means Procedure and Paired T Test				
Variable	N	Mean	Std Dev	
Pain First Physical Therapy Visit	21	8.52381	1.83355	
Pain Last Physical Therapy Visit	21	3.52381	2.50238	
Difference Pain First to Last Visit	21	5	2.4698	
Mean Difference in Pain	Degrees of Freedom	95% Confidence Interval	T Test Value	P Value
5	20	(3.8758,6.1242)	9.28	<0.0001

## DISCUSSION

Physical Therapy intervention in the conservatively managed rib fracture population resulted in a significant reduction in pain, with a mean reduction of 5 points ( $p < 0.0001$ ) across a sample of 21 patients. No statistically significant correlation was found between amplitude of pain reduction during Physical Therapy and the following variables: number of ribs fractured; displaced vs non-displaced fractures; age of patient; and gender of patient.

Data suggest that physical therapy utilization in the conservatively managed rib fracture population improves pain outcomes. The small visit number of physical therapy sessions (mean of 4 visits) in this study highlights the cost effectiveness of this intervention.

## CLINICAL RELEVANCE

This study brings to light the importance of utilizing innovative collaborative care partnerships within health care to maximize patient outcomes while controlling health care cost. This study paves the way for future endeavors focused on not only pain, but also quality of life measures. Future studies utilizing a control population will assist in discerning the varying impacts of physical therapy intervention, analgesia medication, and time passed since injury.