



Cooper Medical School  
of Rowan University

# Debate: Surgical vs Nonsurgical Care of Mildly Displaced Calcicle Fracture

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10<sup>th</sup> Annual Philadelphia Orthopaedic Trauma Symposium  
June 9, 2018

- no disclosures



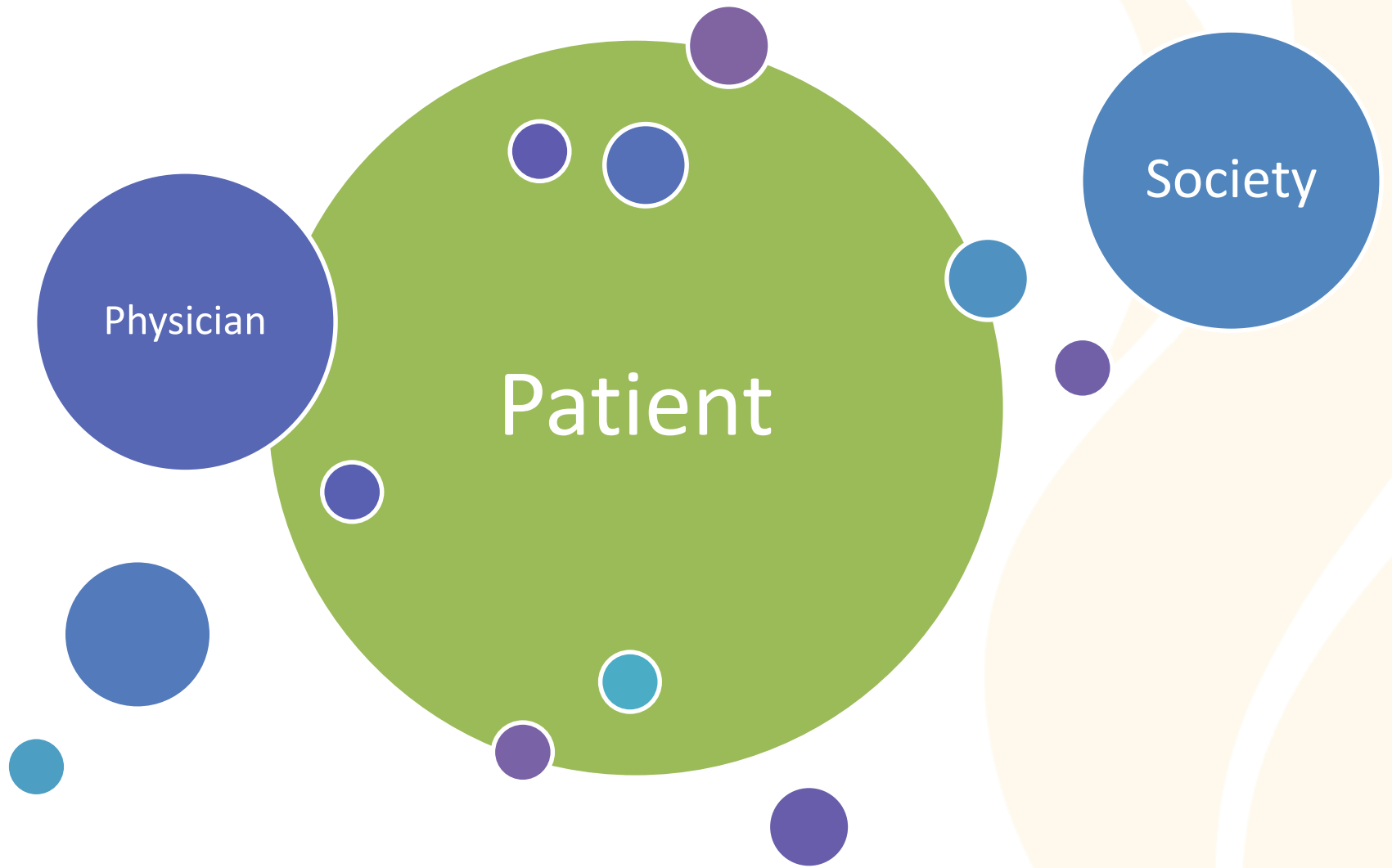
## Clavicle fractures – operative vs nonop

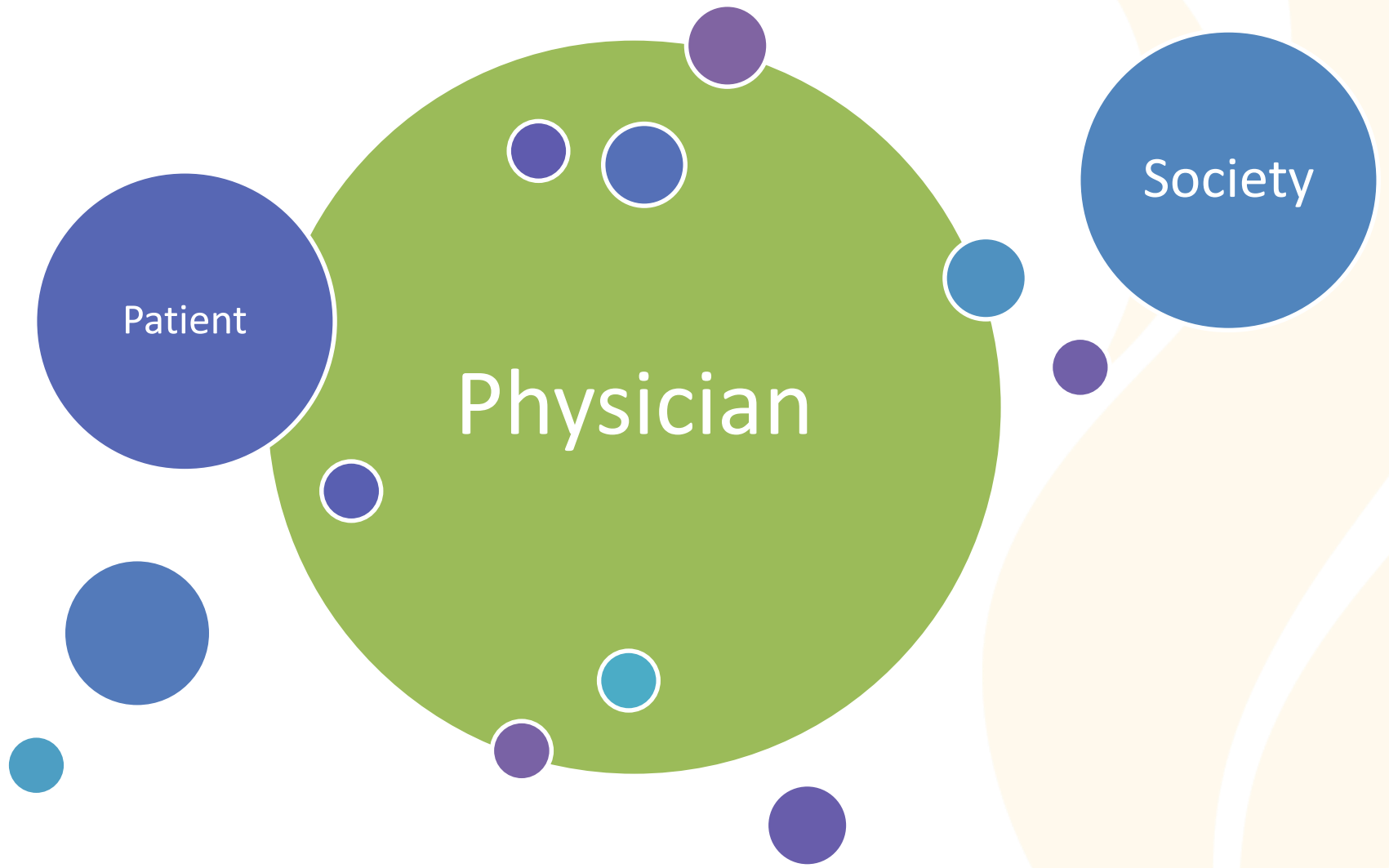
- 36 yo male with fall playing tackle football on weekend with his buddies
- Isolated injury
- No major medical problems
- RHD. Works as an accountant
  
- Fuller – nonoperative
- Kazanjian - operative

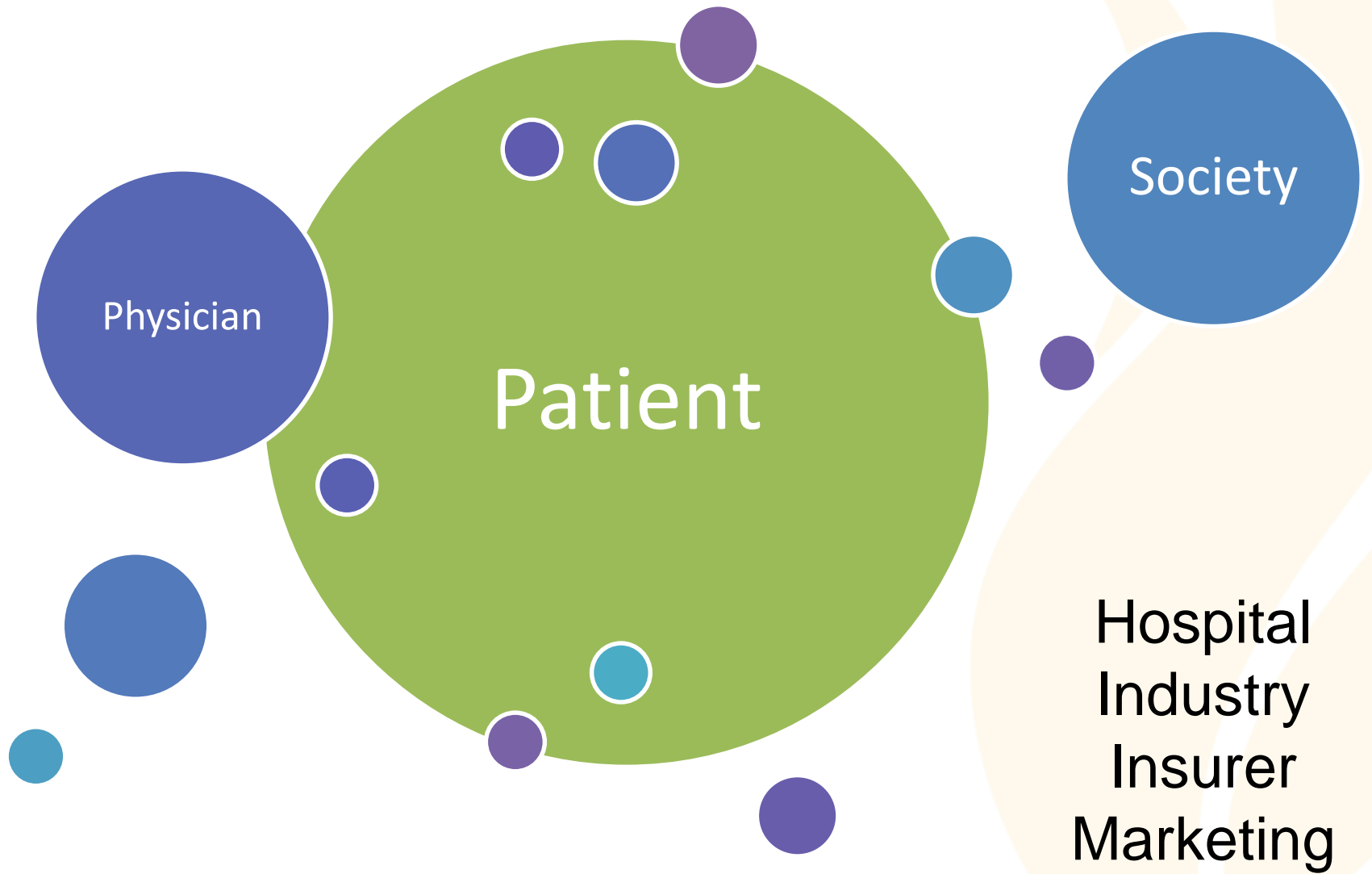
# decision

who is making the decision ?

to whose benefit is the decision being made ?







# Decision Matrix

	Option Rating: <b>COST</b>	Option Rating: <b>RELIABILITY*</b>	Option Rating: <b>EFFICIENCY*</b>	Option Rating: <b>DESIRABILITY</b> *
New Chevrolet	0.12	0.24	0.40	0.65
Used Mercedes	0.33	0.37	0.10	0.22
Pre-Owned Ford	0.01	0.37	0.49	0.12
Uncle Henry's Car	0.54	0.01	0.01	0.01



# Decision Matrix - Clavicle Fracture

## Ideal Treatment

Functional Outcome: Full Recovery

Time to Recovery: Immediate

Variability: 100% Predictable

Cost: No Cost

Desirability: High

The closer we can get to these, the better

# Clavicle Fracture: Decision Matrix

	Functional Outcome	Time Investment	Predictability	Cost	Desirability
Nonsurgical	a	b	c	d	e
Surgical	1-a	1-b	1-c	1-d	1-e

# Functional Outcome and Time:

## Nonoperative Treatment Compared with Plate Fixation of Displaced Midshaft Clavicular Fractures

A Multicenter, Randomized Clinical Trial

By the Canadian Orthopaedic Trauma Society

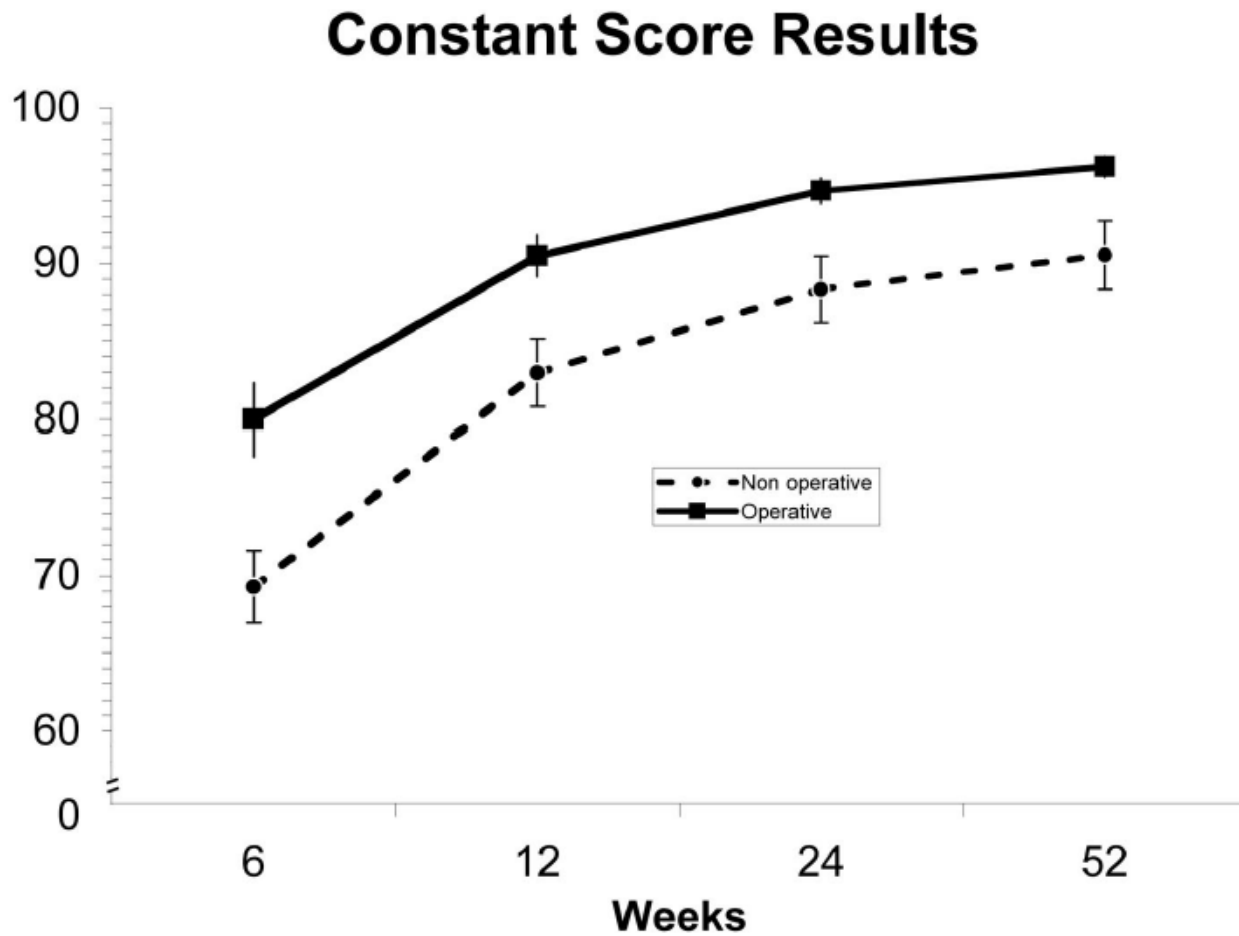
132 Patients

Randomized

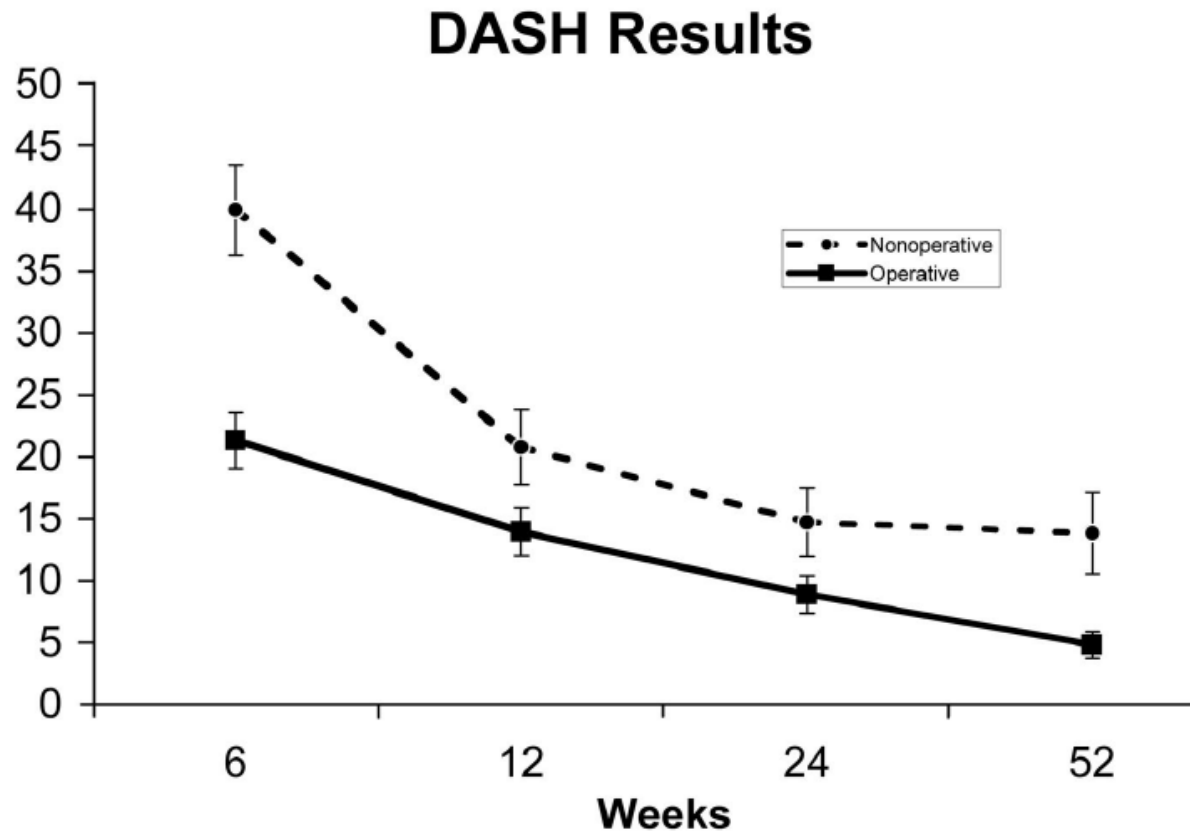
2007

JBJS

# Outcome:



# Outcome:



# Functional Outcome and Time:

## The Clavicle Trial

A Multicenter Randomized Controlled Trial Comparing Operative with Nonoperative Treatment of Displaced Midshaft Clavicle Fractures

Philip M. Ahrens, FRCS(Tr&Orth), Nicholas I. Garlick, FRCS(Tr&Orth), Julie Barber, PhD,  
Emily M. Tims, MSc, and The Clavicle Trial Collaborative Group

*Investigation performed at the Department of Trauma and Orthopaedics, Royal Free Hampstead NHS Foundation Trust, London, United Kingdom*

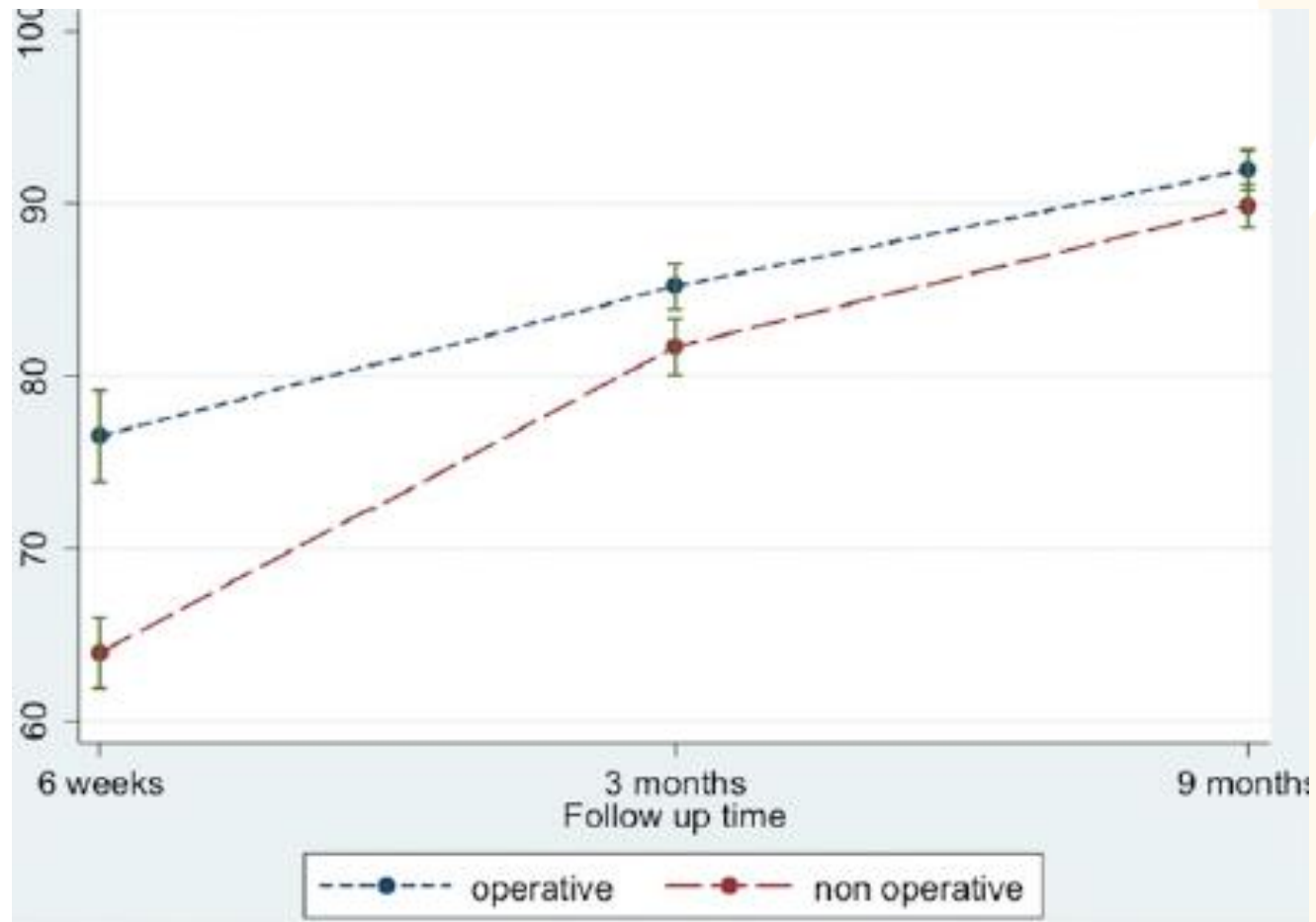
301 Patients

Randomized

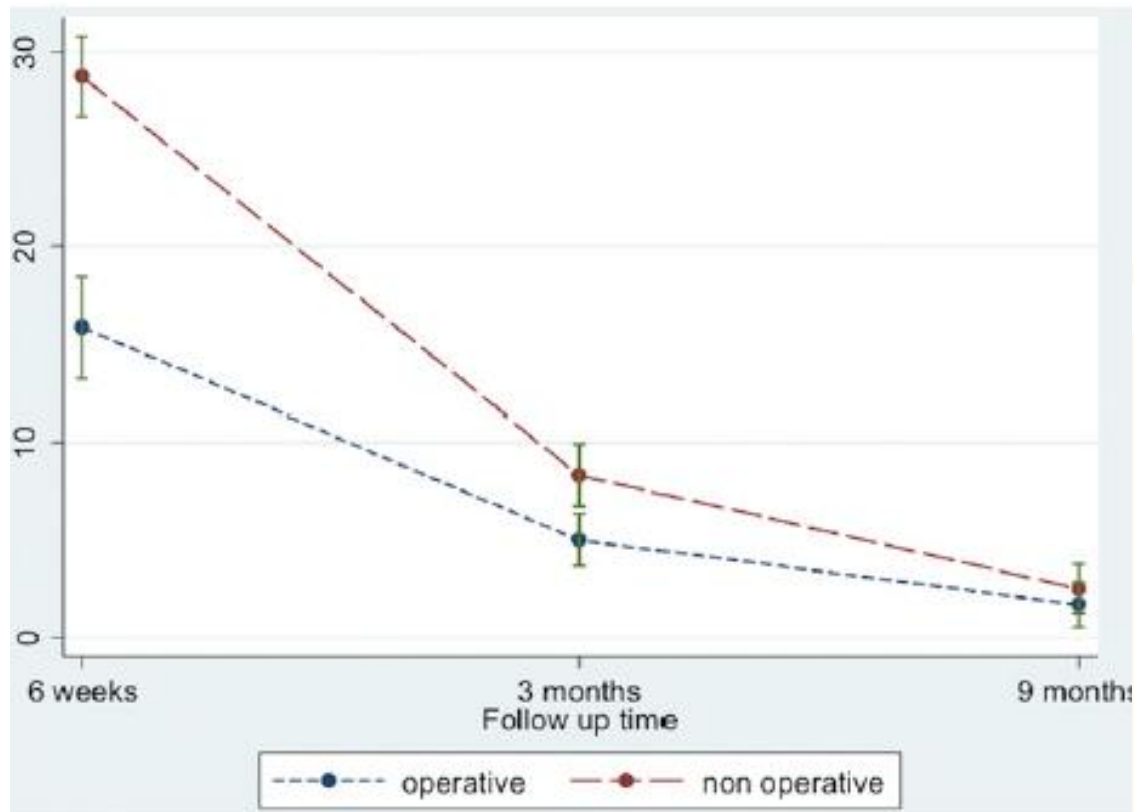
2017

JBJS

# Outcome: Constant Score



# Outcome: DASH Score





# Outcome:

## The Clavicle Trial

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Our conclusion is that the outcome of a united midshaft clavicle fracture is good, regardless of whether the patient was treated operatively or nonoperatively. Both treatment modalities are safe, with few substantial complications demonstrated in this study population.

# Predictability (Complications) :

## NonSurgical

Nonunion - 10%

Malunion

Aesthetic Deformity - bump  
drooping shoulder

## Surgical

Infection, including osteomyelitis

Nonunion

Chest Wall Numbness

Prominent Hardware

Aesthetic Deformity (ugly scar)

Other .....

# Cost

ORIGINAL ARTICLE

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## A Cost Analysis of Internal Fixation Versus Nonoperative Treatment in Adult Midshaft Clavicle Fractures Using Multiple Randomized Controlled Trials

*Blaine Walton, MD, Karim Meijer, MD, Keith Melancon, MD, and Michael Hartman, MD*

Expected Cost:

Surgical:       **\$14,763.21**

Nonsurgical:   **\$3,112.65**

# Epidemiology

Clavicle Fracture Annual Incidence: 5.8/10,000

US Population: 323.13 million

Clavicle Fracture: 80% midshaft, 50% displaced

$323,130,000 \times 5.8/10,000 = 187,415$  clavicle fx/year US

$187,415 \times \$14,763.21 = \mathbf{\$2,766,847,002.15}$

# Desirability

No Surgery beats Surgery



## Clavicle fractures – operative vs nonop

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# Clavicle Fracture: Decision Matrix

	Functional Outcome	Time Investment	Predictability	Cost	Desirability
Nonsurgical					
Surgical					

# Clavicle Fracture: Decision Matrix

	Functional Outcome	Time Investment	Predictability	Cost	Desirability
Nonsurgical	.5				
Surgical	.5				



# Clavicle Fracture: Decision Matrix

	Functional Outcome	Time Investment	Predictability	Cost	Desirability
Nonsurgical	.5	.6			
Surgical	.5	.4			

# Clavicle Fracture: Decision Matrix

	Functional Outcome	Time Investment	Predictability	Cost	Desirability
Nonsurgical	.5	.6	.5		
Surgical	.5	.4	.5		

# Clavicle Fracture: Decision Matrix

	Functional Outcome	Time Investment	Predictability	Cost	Desirability
Nonsurgical	.5	.6	.5	.2	
Surgical	.5	.4	.5	.8	

# Clavicle Fracture: Decision Matrix

	Functional Outcome	Time Investment	Predictability	Cost	Desirability
Nonsurgical	.5	.6	.5	.2	1.0
Surgical	.5	.4	.5	.8	0

# Summary Thoughts:

## Complex Decision Making

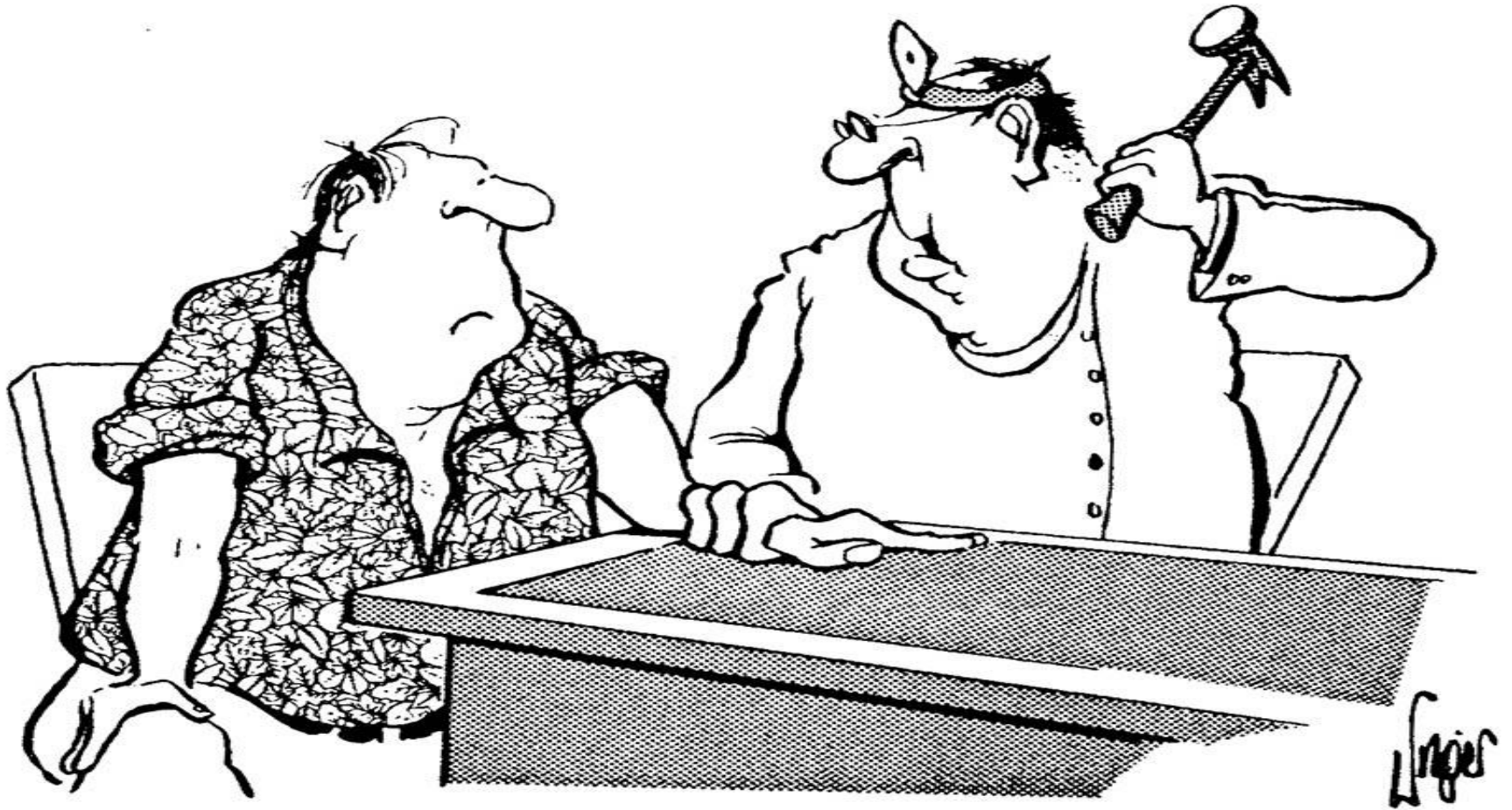
Functional Outcome, Time Investment, Predictability,  
Cost and Desirability, considered together, ....

**Favor Nonsurgical Care** attempting decision  
optimization *for this particular patient*

This argument can be biased by focusing too heavily on  
a single component

Or the argument can be perverted by focusing on  
optimizing outcome of individual players who may be  
acting out of self interest





**“The way we treat shoulder pain here is to divert your attention to something else.”**