

Defining Successful Total Joint Replacement

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Current Orthopaedic & Physiotherapy Concepts
Following Joint Arthroplasty
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Objectives

- Background
- Measuring clinically important change
- Purpose
- Methods
- Results
- Summary comments

Question #1

- One year after surgery,

How much 'better' would you have to 'get' to say your TJR was successful?

- a little
- somewhat
- moderately
- a good deal
- a great deal
- a very great deal

Question #2

- One year after TJR,

What would 'make' you say:

“Knowing what I know now,
I would not go through that TJR again”

Background

- Ontario Joint Replacement Registry
- prospective study to evaluate relationship between:

3. How to define successful surgery?

4. Any change from surgery should be a **clinically important difference**

Post surgical outcome

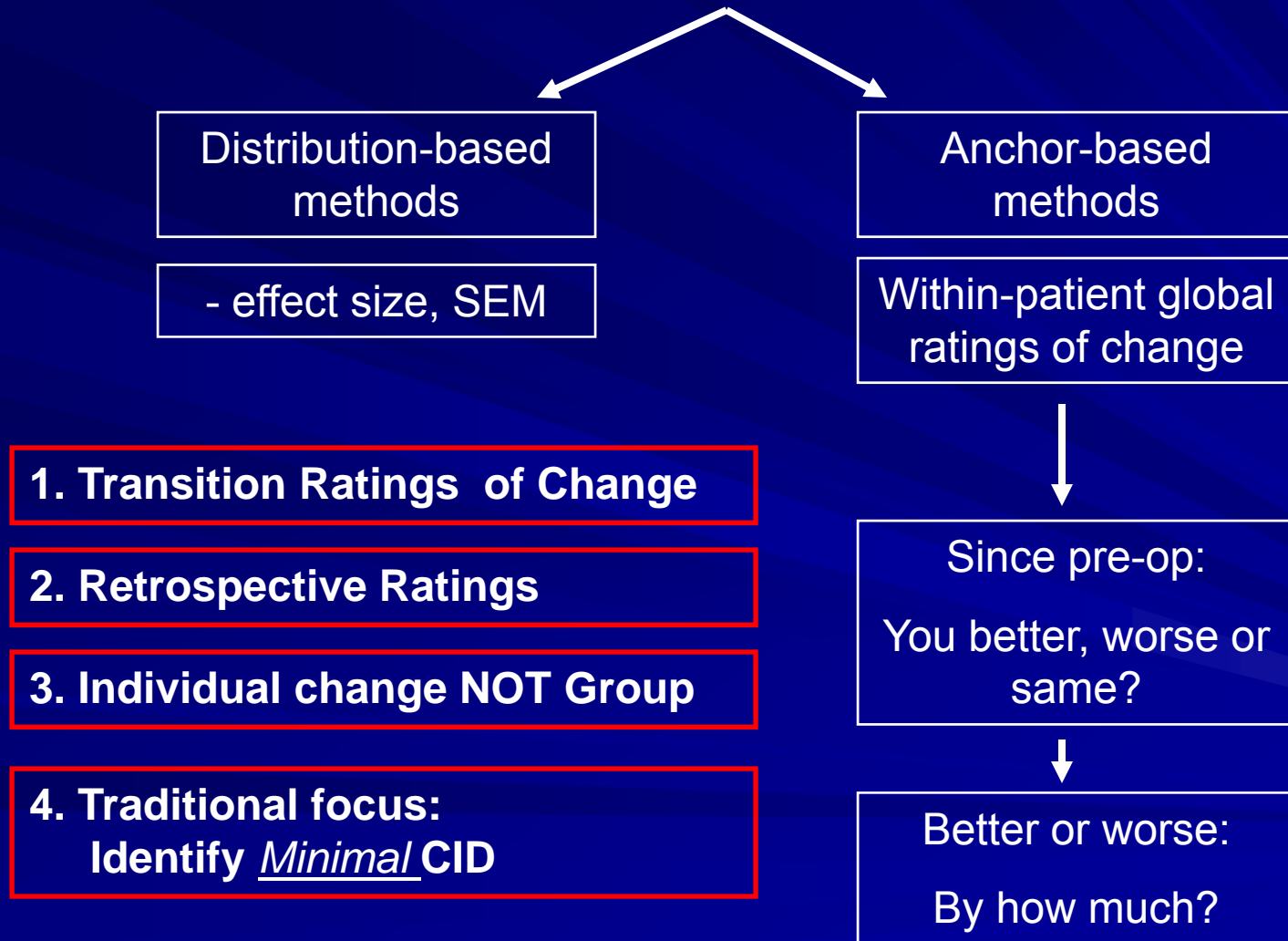
Wait for surgery

Severity at decision for surgery

1. How much wait is too long?

2. How 'severe' should you be to warrant queue jumping to front of line?

How do we measure a clinically important difference (CID)?



Why is THR/TKR surgery done?

- Clinical perspective?
 - NOT for small improvements
 - IS for BIG change
- Literature show?
 - shows large effects from THR & TKR surgery
- Clinically Important Difference (CID) for TJR
 - should be large
 - not minimal

How transition ratings define a CID

Since you filled out a WOMAC when you went on your surgeon's waiting list, is your pain...

- Better?.....
- About the same?.....
- Worse?.....

If you said your pain is better, tell us how much by answering the question below.

1. almost the same hardly any better at all...
2. a little better.....
3. somewhat better.....
4. moderately better.....
5. a good deal better.....
6. a great deal better.....
7. a very great deal better...

If you said your pain is worse, tell us how much by answering the question below.

1. almost the same hardly any worse at all...
2. a little worse.....
3. somewhat worse.....
4. moderately worse.....
5. a good deal worse.....
6. a great deal worse.....
7. a very great deal worse...

Do TJR Surgery to get at least a good deal better

Problems with retrospective ratings of change

- Reliability of transition ratings

Want consistent ratings

- Validity of transition ratings

- Difficulty of making unbiased, retrospective judgments of change in health status

Want ratings of change to correlate with measured change

Purpose

- identify individual-level CID from primary THR/TKR
 - using Western Ontario McMaster University OA Disability Index (WOMAC)
- validate:
 - the WOMAC change score that best defines the CID
- estimate reliability:
 - of transition ratings used to identify the CID

Methods

At Decision for surgery
IN CLINIC

e.g. age, gender, joint,
diagnosis, dependent for ADL

- decision date for surgery
- WOMAC

On Day of
Surgery

▶ Health status:
ASA-PS score
More healthy
vs
Less healthy

- surgery date

At 1 year
BY MAIL

Transition ratings for CID
- rate change in function
- rate change in pain

Independent change criterion
- willingness to undergo that
specific surgery again
(yes, uncertain, no)

- post-op complication
requiring overnight hospital
stay (yes/no)

- WOMAC

WOMAC scoring

- 3 domains
 - 5 pain items
 - 2 stiffness
 - 17 function
- 5-point Likert
 - None
 - Mild
 - Moderate
 - Severe
 - Extreme

Alternative scoring

- Reversed
- **Low is worst**
- **High is best**
- Standardized out of 100

-Scale

0-100

worst-best

Analysis

ROC curves

- change score 'best' identifies pain/function "good deal better"

validate CID: ROC curves

- change score 'best' identifies "yes, would have sx again"

validate CID:

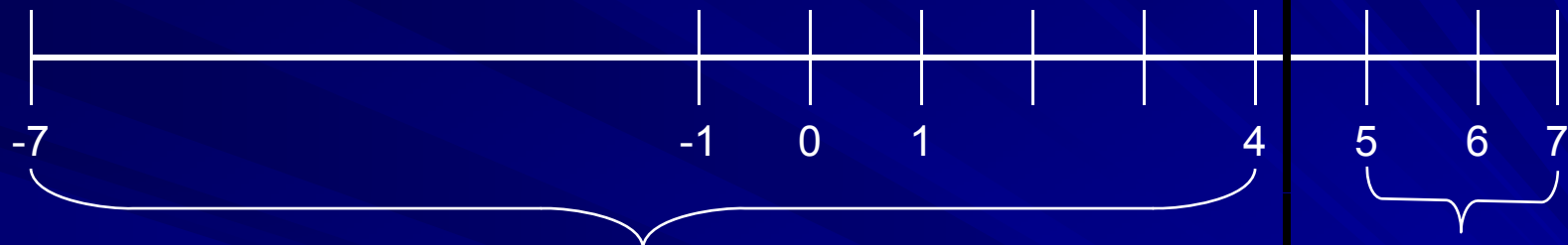
- change scores: transition ratings vs. willingness to have sx again

reliability of transition ratings

- Cronbach's alpha: pain and function ratings

Validate transition rating with independent criterion

Transition rating scale



All other responses

Good deal better or more

Knowing what your hip or knee replacement surgery did for you, if you could go back in time, would you still have undergone this surgery?

No

Uncertain

Yes

Results (n = 2,709)

	<u>THR</u>	<u>TKR</u>
n	1,131	1,578
Sex (% F)	57	62
Health Status (ASA: % more healthy)	61	62
Employment (% retired)	71	76
Depend Someone for ADL (% yes)	24	16
Would still have had the surgery (%)		
Yes	96	90
Uncertain	3	6
No	1	4

THR: what WOMAC change best predicts a CID?

CID definition	Construct	
	Pain	Function
“Good Deal Better” or more	≥ 41	≥ 34
“Yes- Would have surgery again”	≥ 36	≥ 34

A red box labeled "Different" is positioned above the horizontal red double-headed arrow connecting the Pain and Function thresholds for the "Good Deal Better" definition.

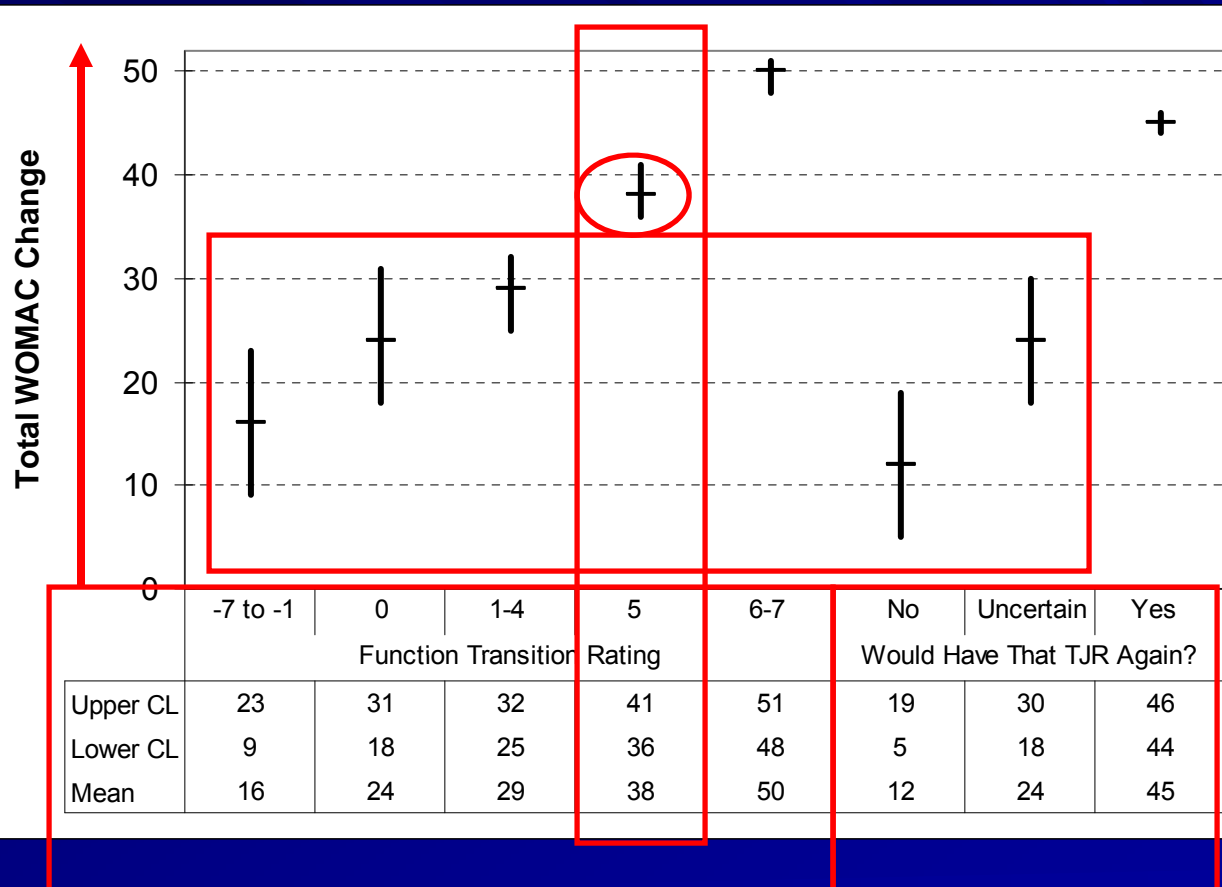
A red box labeled "Reveals bias" is positioned to the left of the vertical red double-headed arrow connecting the Pain thresholds for the "Good Deal Better" and "Yes- Would have surgery again" definitions.

TKR: what WOMAC change best predicts a CID?

	Construct	
	Pain	Function
CID definition		
“Good Deal Better” or more	≥ 36	≥ 33
“Yes- Would have surgery again”	≥ 31	≥ 26

Validating WOMAC change (n = 2,709)

Mean Total WOMAC Change Scores with 99% CI



At group level: good deal better valid threshold for CID

Validity and reliability

- Valid transition ratings

- rating of change & WOMAC change
- $r = 0.59$ to 0.63

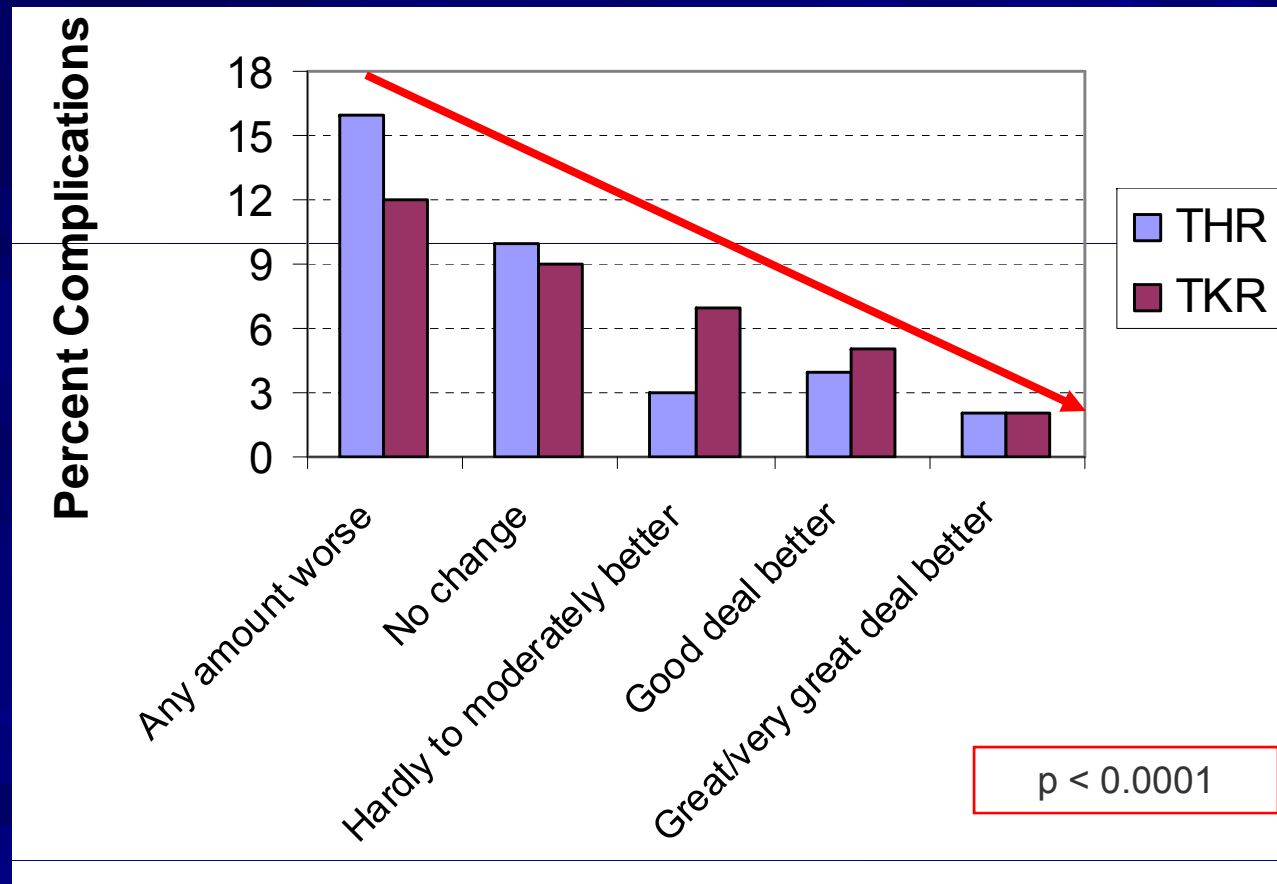
Acceptable correlation between WOMAC change and rated change

- Reliable transition ratings

- Internal consistency of pain & function ratings
- Cronbach's alpha = 0.86

Acceptable consistency of pain and function transition ratings

Complications inversely related to ratings of improved function



Summary

- THR CID
 - pain: ≥ 41
 - function: ≥ 34
- TKR CID
 - pain: ≥ 36
 - function: ≥ 33
- “good deal better” aligns well with willingness to re-do sx

Reasonable to define successful surgery with these values

- post-op complications affect judgments about outcome

Thank you

- Study team members
 - Nizar N. Mahomed, MD
 - Robert B. Bourne, MD
 - Aileen M. Davis, PhD
 - OJRR Study Group

Publication available:

Willingness to go through surgery again validated the WOMAC clinically important difference from THR/TKR surgery. **Journal of Clinical Epidemiology** In press, corrected proof available on-line first: February 14, 2008.

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CID using raw scoring method

Joint	Construct	
	Pain	Function
THR	$\geq 8/20$	$\geq 23/68$
TKR	$\geq 7/20$	$\geq 22/68$