

Better In = Better out?

A literature study and case report



Thomas Hoogeboom

What am I talking about:

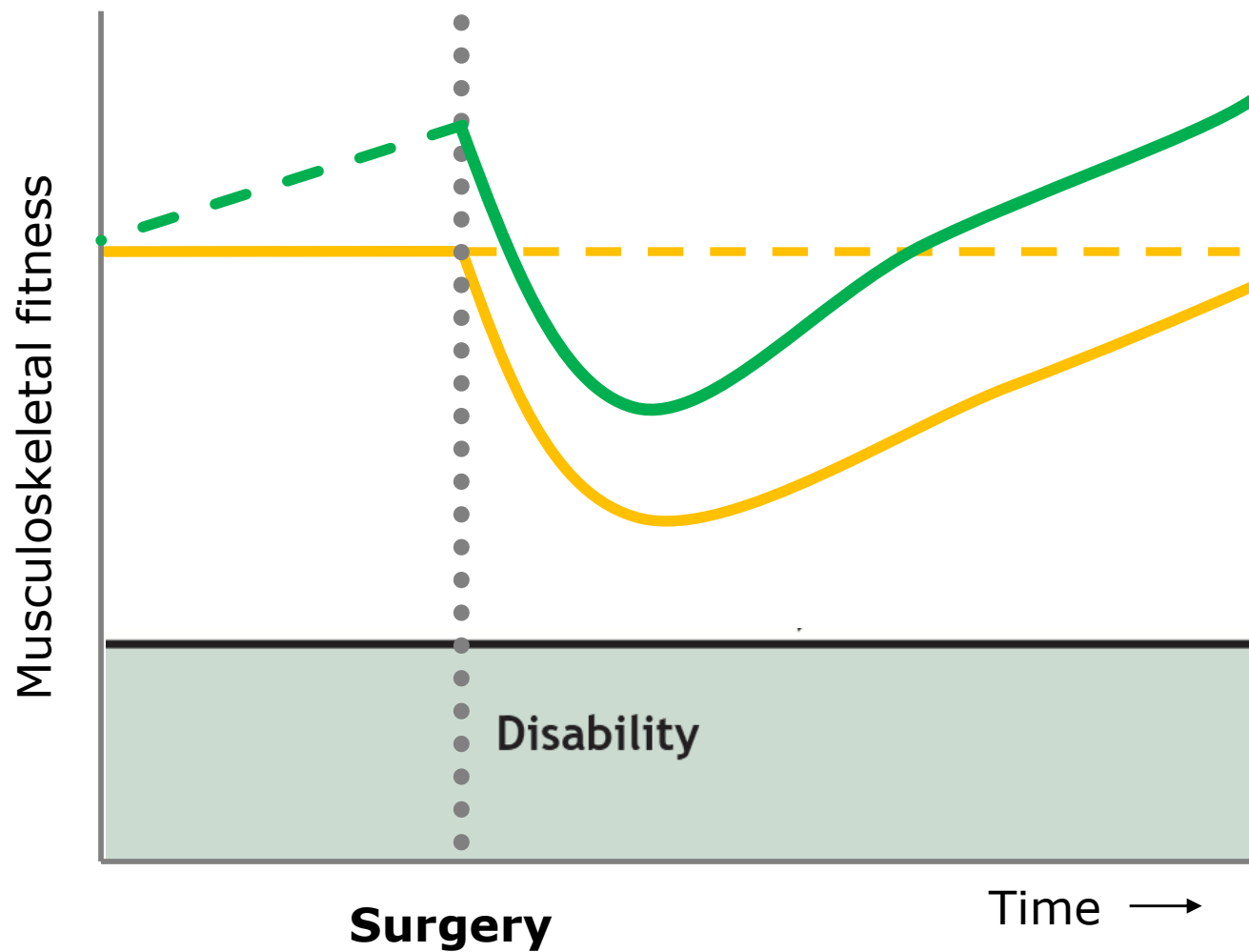
- Rationale for preoperative exercise
- What does the literature tell us?
- How do we practice the evidence?

Preoperative functioning is
related to postoperative
functioning.

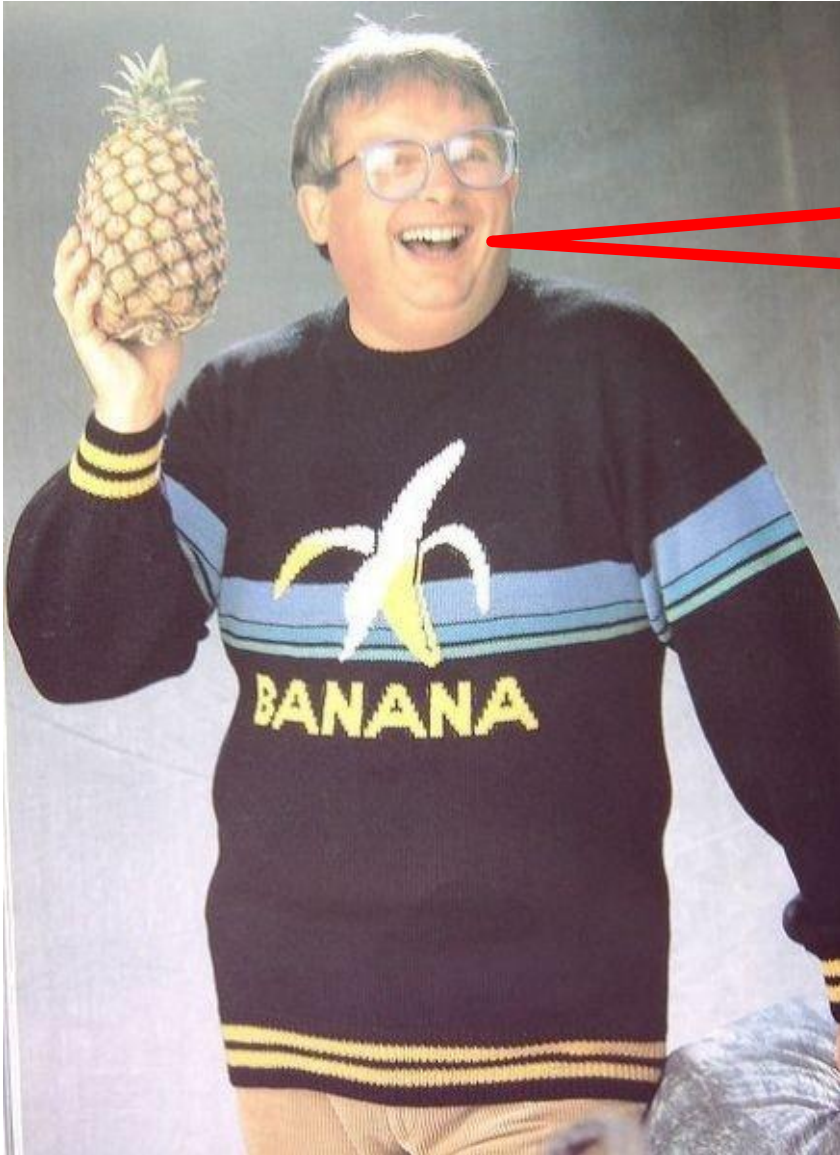
Improve preoperative functioning



Improve postoperative functioning



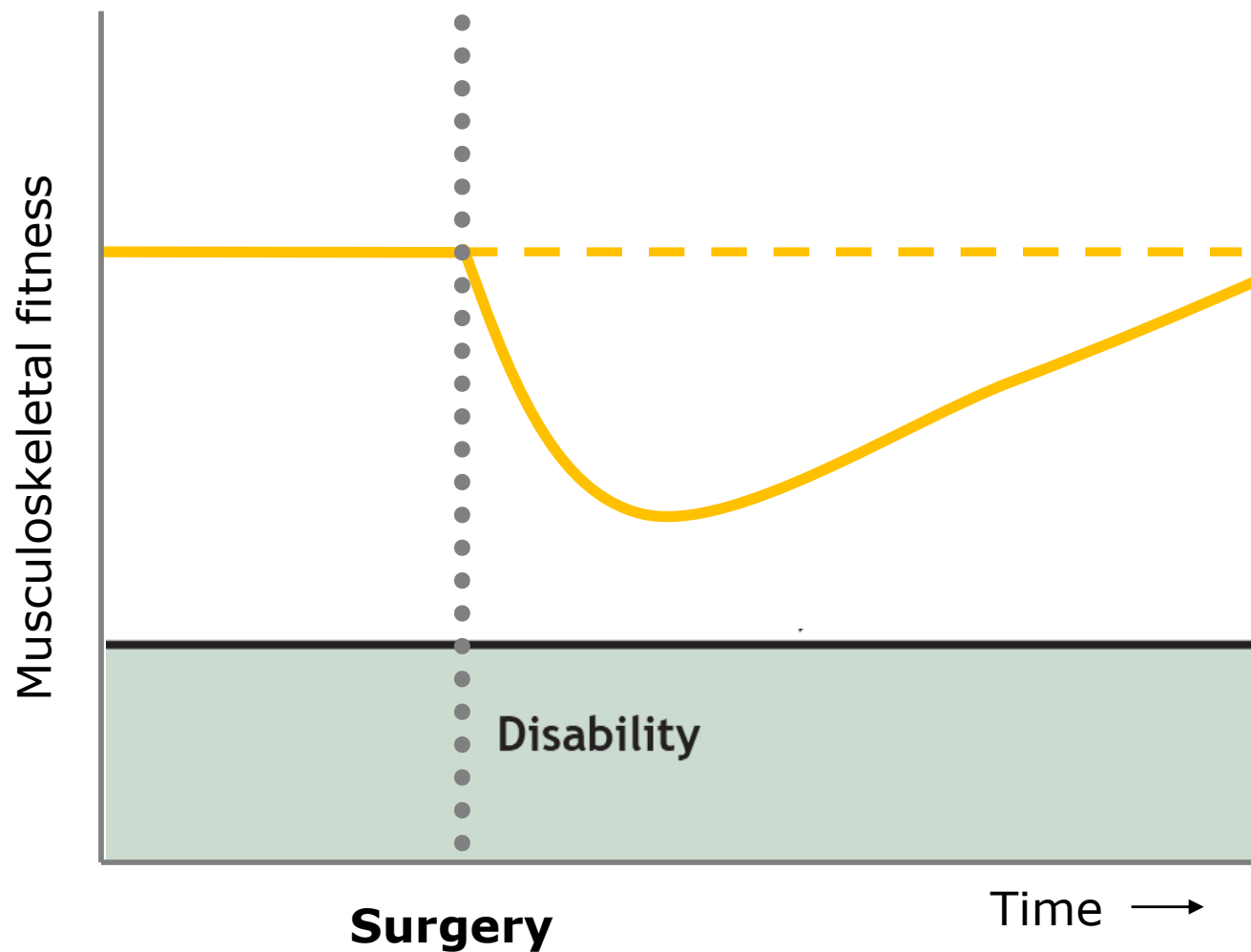
BUT

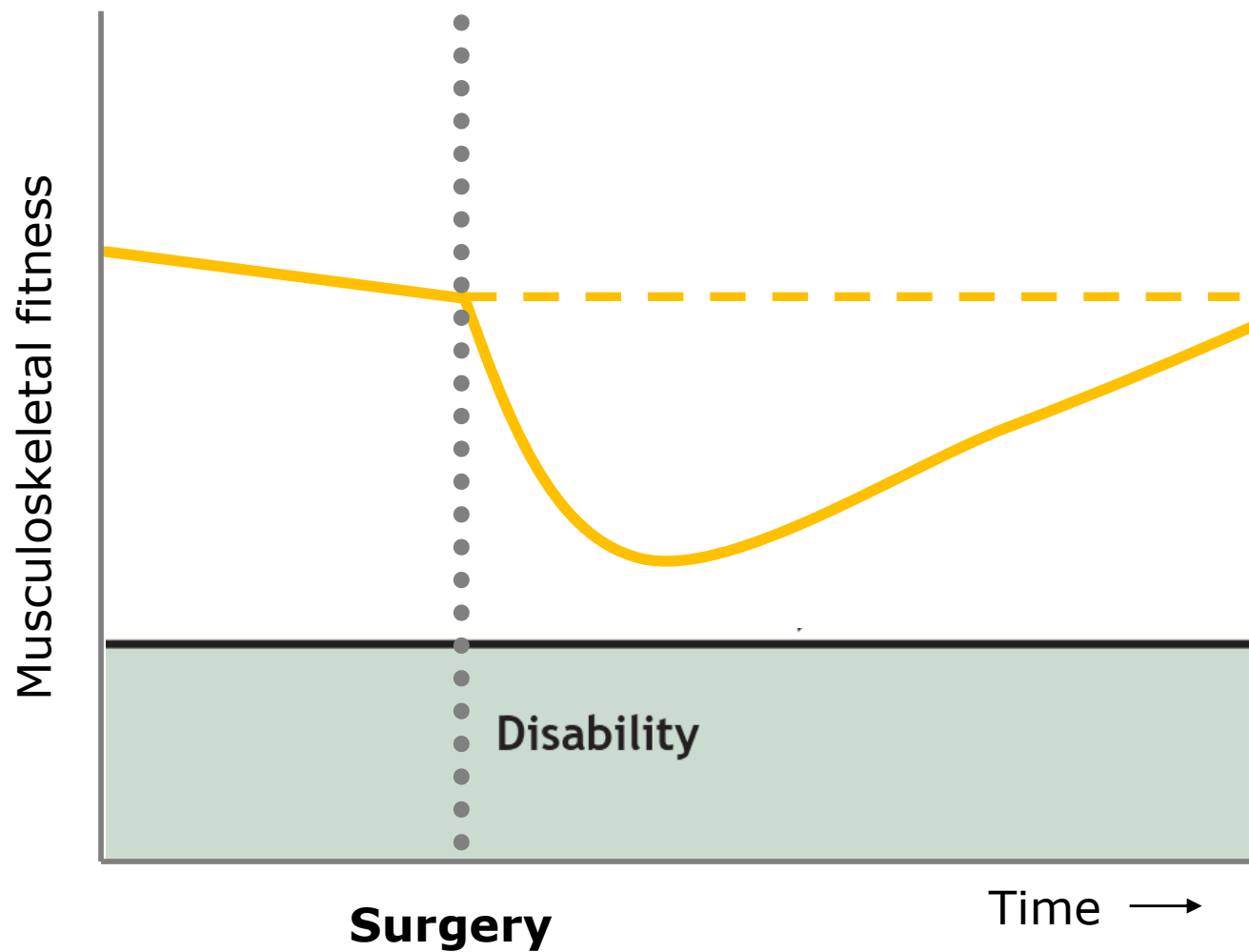


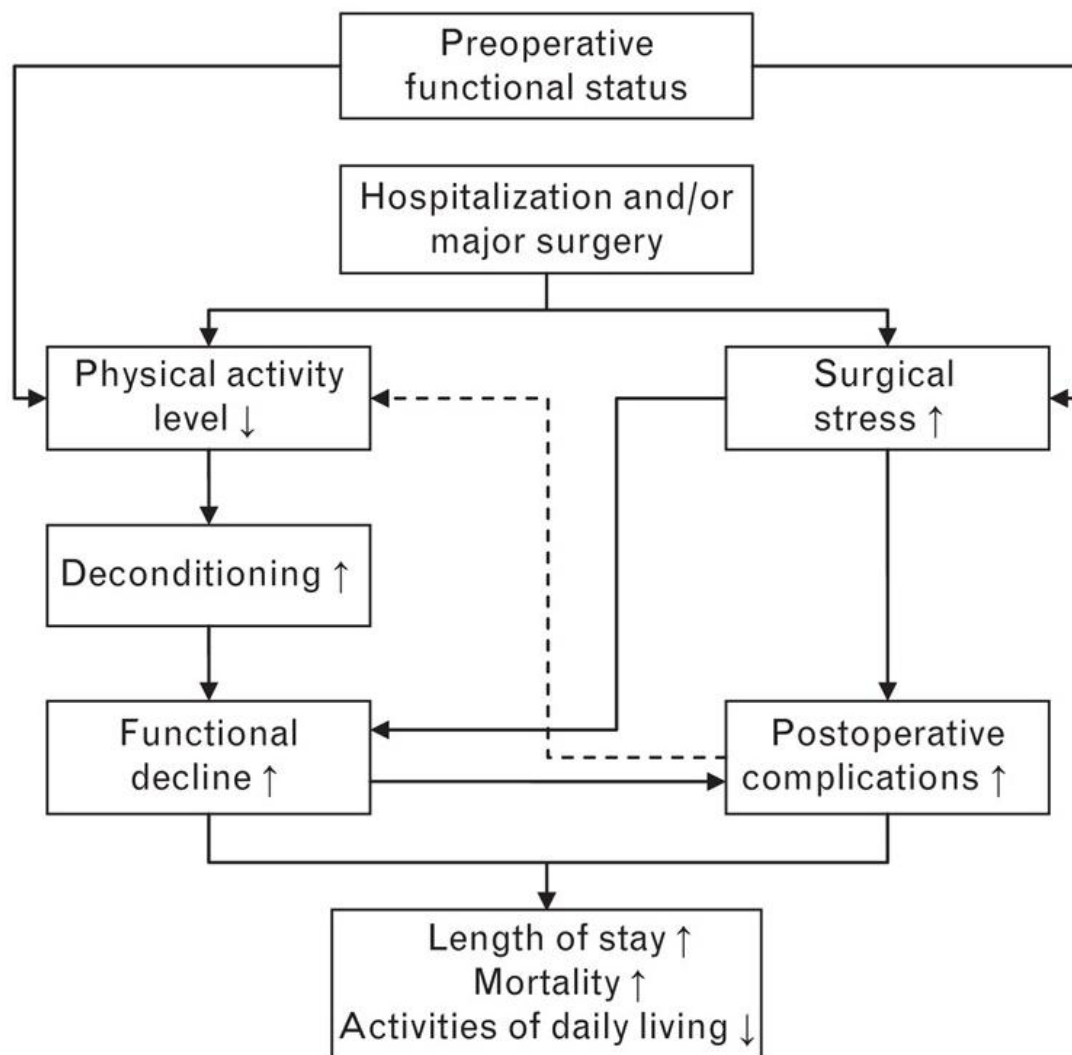
This makes no sense?!

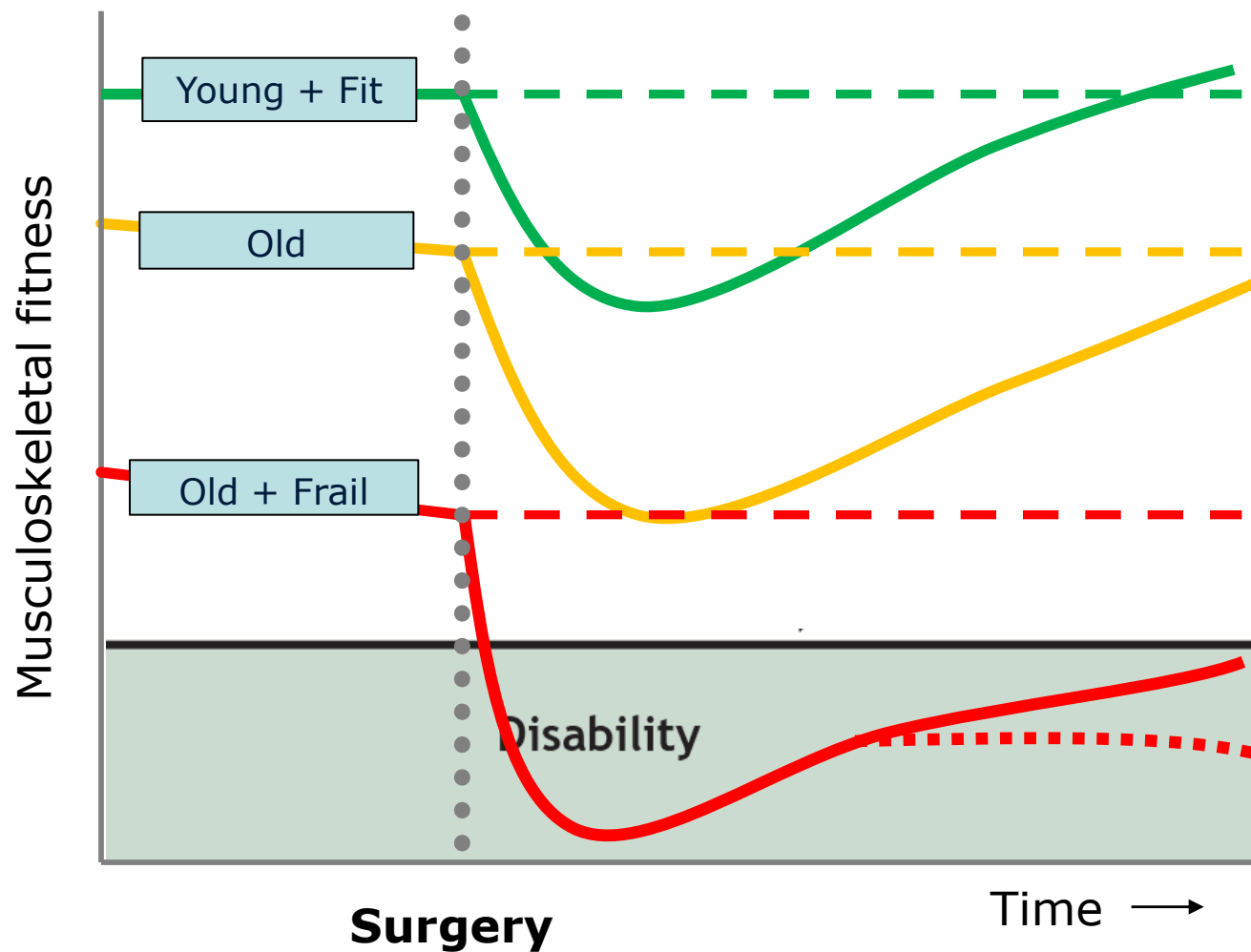
50%

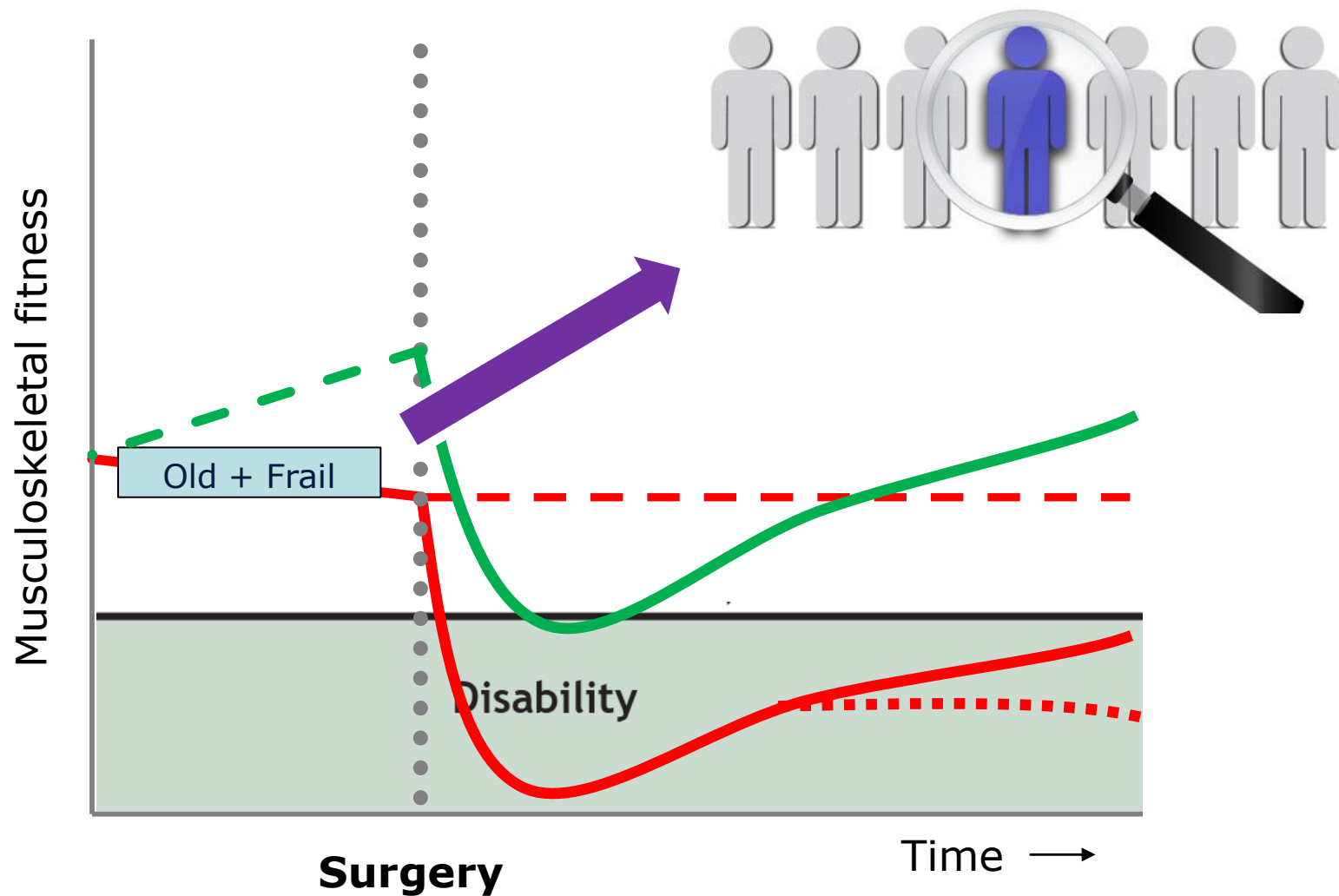
of the people awaiting surgery deteriorates.











Merits of preoperative exercise in:

- Cardiovascular surgery
- Upper and lower abdominal surgery
- Total hip and knee replacement



Preoperative physical therapy for elective cardiac surgery patients (Review)

Hulzebos EHJ, Smit Y, Helders PPJM, van Meeteren NLU

“[...] preoperative physical therapy reduces postoperative pulmonary complications and length of hospital stay in patients under going elective cardiac surgery.”



Phys Ther. 2003 Jan;83(1):8-16.

Prediction of postoperative pulmonary complications on the basis of preoperative risk factors in patients who had undergone coronary artery bypass graft surgery.

Hulzebos EH¹, Van Meeteren NL, De Bie RA, Dagnelie PC, Helden PJ.

Risk Factor	Score (Points)
Age of ≥ 70 y	3
Productive cough	3
Smoking	2
Diabetes mellitus	2
Protective Factor	
Predicted IVC of $\geq 75\%$	-2
Predicted MEP of $\geq 75\%$	-2

-4 to -2 pts = low risk

-1 to 10 pts = high risk.

Postoperative outcomes following preoperative inspiratory muscle training in patients undergoing cardiothoracic or upper abdominal surgery: a systematic review and meta analysis

Christina M Mans¹, Julie C Reeve² and Mark R Elkins³

Clinical Rehabilitation

1–13

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“Preoperative [...] training significantly improves respiratory (muscle) function in the early postoperative period, halving the risk of pulmonary complications.”

Original Article



The association of pre-operative physical fitness and physical activity with outcome after scheduled major abdominal surgery

J. J. Dronkers,¹ A. M. J. Chorus,² N. L. U. van Meeteren^{3*} and M. Hopman-Rock⁴

Predictors for adverse outcomes:

- Low preoperative activity level
- Low inspiratory muscle endurance



OPEN ACCESS



PEER-REVIEWED

RESEARCH ARTICLE

5,847

VIEWS

9

CITATIONS


21

SAVES

9

SHARES

Therapeutic Validity and Effectiveness of Preoperative Exercise on Functional Recovery after Joint Replacement: A Systematic Review and Meta-Analysis

Thomas J. Hoogeboom , Ellen Oosting, Johanna E. Vriesevink, Cindy Veenhof, Petra C. Siemonsma, Rob A. de Bie, Cornelia H. M. van den Ende, Nico L. U. van Meeteren

“Preoperative therapeutic exercise for TJR did not demonstrate beneficial effects on postoperative functional recovery.”

REVIEW




OPEN



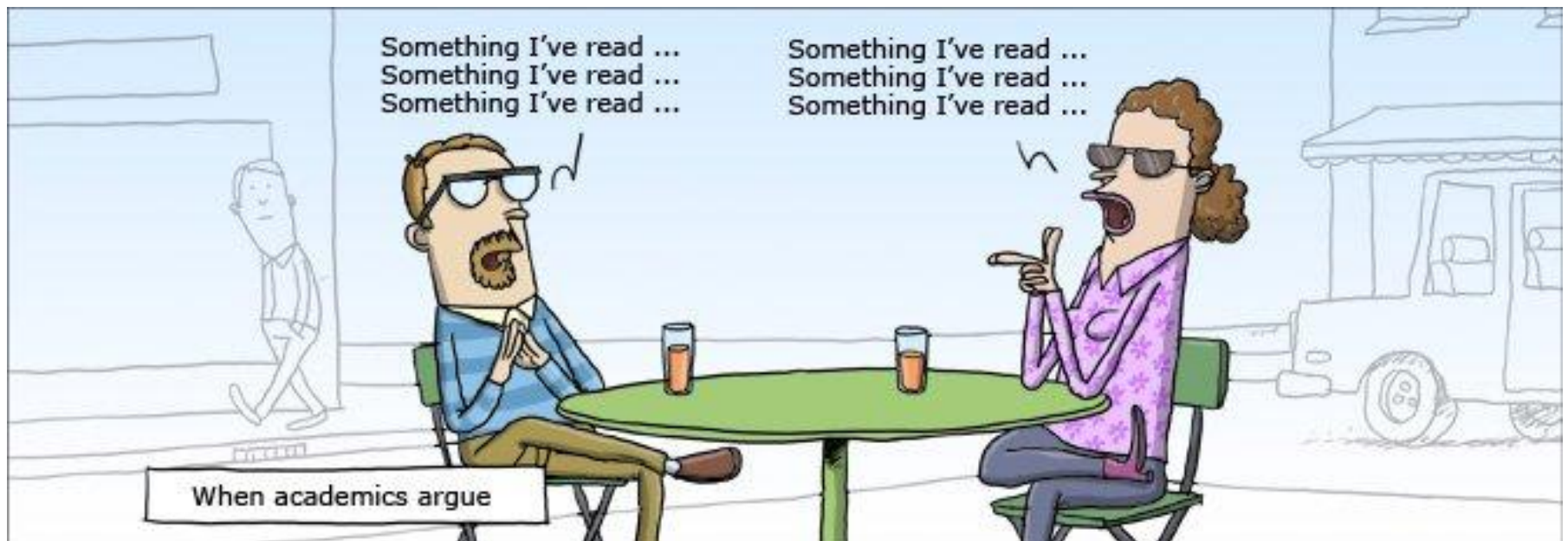
Merits of exercise therapy before and after major surgery

Thomas J. Hoogeboom^a, Jaap J. Dronkers^b, Erik H.J. Hulzebos^c, and
Nico L.U. van Meeteren^{a,d}

Preop exercise in high-risk individuals:

- Length of stay 
- Postoperative functioning 
- Postoperative healthcare use 

So, how do we do this in practice?



Thanks!



Geert van der Sluis, PT MSc

Physiotherapist (1998)

Physiotherapy scientist (2007)



Goal of this case study

Let the patient revolution begin!



Evidence Based Practice

EBP: *"Healthcare decisions should be made by those receiving care, informed by the best available knowledge of those providing care."*

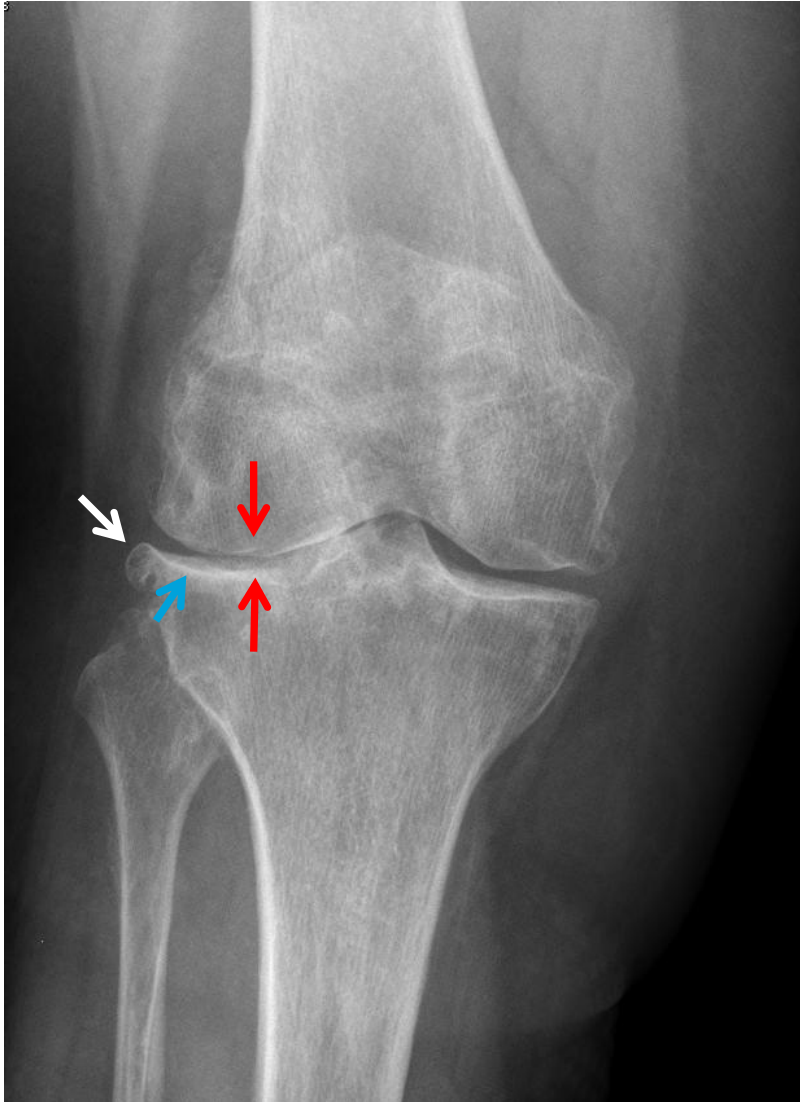
– Sicily Statement 2005

Patient decides:

- when the surgery takes place;
- how to prepare for surgery;
- when to be discharged home;
- where to go after surgery.

Person undergoing hip replacement:

- Name: Jane Do
- Age: 78 year
- Sex: Woman
- Length: 1.56 m
- Weight: 104 kg
- BMI: 41.6 kg/m²
- TUG time: 13.25 seconds



Medical diagnosis:

- Knee osteoarthritis (right):
Kellgren & Lawrence grade 4
- Joint Space Narrowing
 - Osteophytes
 - ~Sclerosis

Preoperative screening

Anamnesis:

- Knee feels instable (doesn't trust her knee)
- Stiffness >> Pain (VAS = 4)
- Patient Specific Complaints:
 - Walking (with a stroler),
 - Daily household chords (receives help)
 - Cycling (impossible)
- Lives on her own (appartement)
- She is a widow

Is Jane at risk for delayed functional recovery (>4 days)?

Factor	Odds ratio	Confidence interval
Age > 70	4.2 ✓	1.7 - 13.0
Sex: Female	2.0 ✓	0.6 - 6.5
BMI > 25 kg/m ²	1.4 ✓	0.3 - 5.5
Timed Up and Go > 10.5 sec	5.2 ✓	1.9 - 14.1

Area under ROC curve = 82%

Yes, Jane has an increased risk

How to prepare for surgery?



What did Jane decide?

- Planned date: 27 january 2014
- Decision Jane: Postpone surgery for 4 weeks to get in better shape.
- Actual date: 25 february 2014

Optimal preparation:

- Preoperative therapeutic exercise
- At least 3 weeks
- Complex, variation and intensive
- Aimed to improve relevant activities
- Supervised: Two days / week
- Unsupervised: Everyday
- Location: At the patient's home

Content of exercise programme

- Circuit training
- Walking exercise (changing context)
- Transfers
- Climbing stairs
- Coach and provide information

Evaluation

Pre- and postoperative:

- Timed Up and Go test
- DEMMI

	0	1	2
Bed			
1. Bridge	<input type="checkbox"/> unable	<input type="checkbox"/> able	
2. Roll onto side	<input type="checkbox"/> unable	<input type="checkbox"/> able	
3. Lying to sitting	<input type="checkbox"/> unable	<input type="checkbox"/> min assist <input type="checkbox"/> supervision	<input type="checkbox"/> independent
Chair			
4. Sit unsupported in chair	<input type="checkbox"/> unable	<input type="checkbox"/> 10 sec	
5. Sit to stand from chair	<input type="checkbox"/> unable	<input type="checkbox"/> min assist <input type="checkbox"/> supervision	<input type="checkbox"/> independent
6. Sit to stand without using arms	<input type="checkbox"/> unable	<input type="checkbox"/> able	
Static balance (no gait aid)			
7. Stand unsupported	<input type="checkbox"/> unable	<input type="checkbox"/> 10 sec	
8. Stand feet together	<input type="checkbox"/> unable	<input type="checkbox"/> 10 sec	
[....]			
Dynamic balance (no gait aid)			
13. Pick up pen from floor	<input type="checkbox"/> unable	<input type="checkbox"/> able	
14. Walks 4 steps backwards	<input type="checkbox"/> unable	<input type="checkbox"/> able	
15. Jump	<input type="checkbox"/> unable	<input type="checkbox"/> able	

Evaluation

Pre- and postoperative:

- Timed Up and Go test
- DEMMI

Clinical phase:

- Iowa Level of Assistance Scale (ILAS)

Iowa Levels of Assistance Scale (ILAS)

- Assistance score 0-6

- Lying down to sitting
- Sitting to lying down
- Sit to stand
- Walking (5 meters)
- Climbing stairs (3 steps)

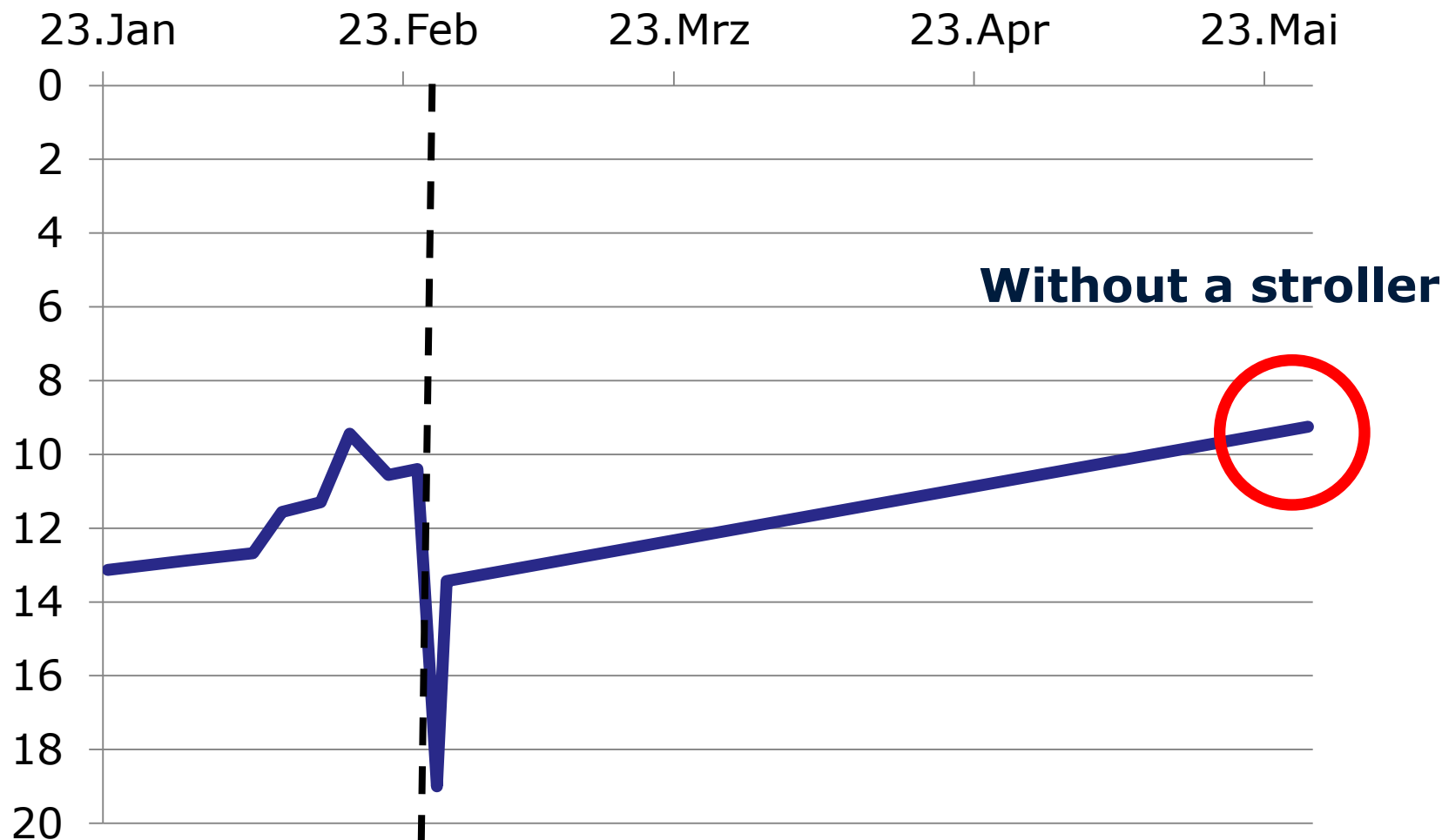
6: not tested
5: impossible
4: much assistance
3: moderate assistance
2: little assistance
1: supervision
0: independently

- Functional recovery if score = 0

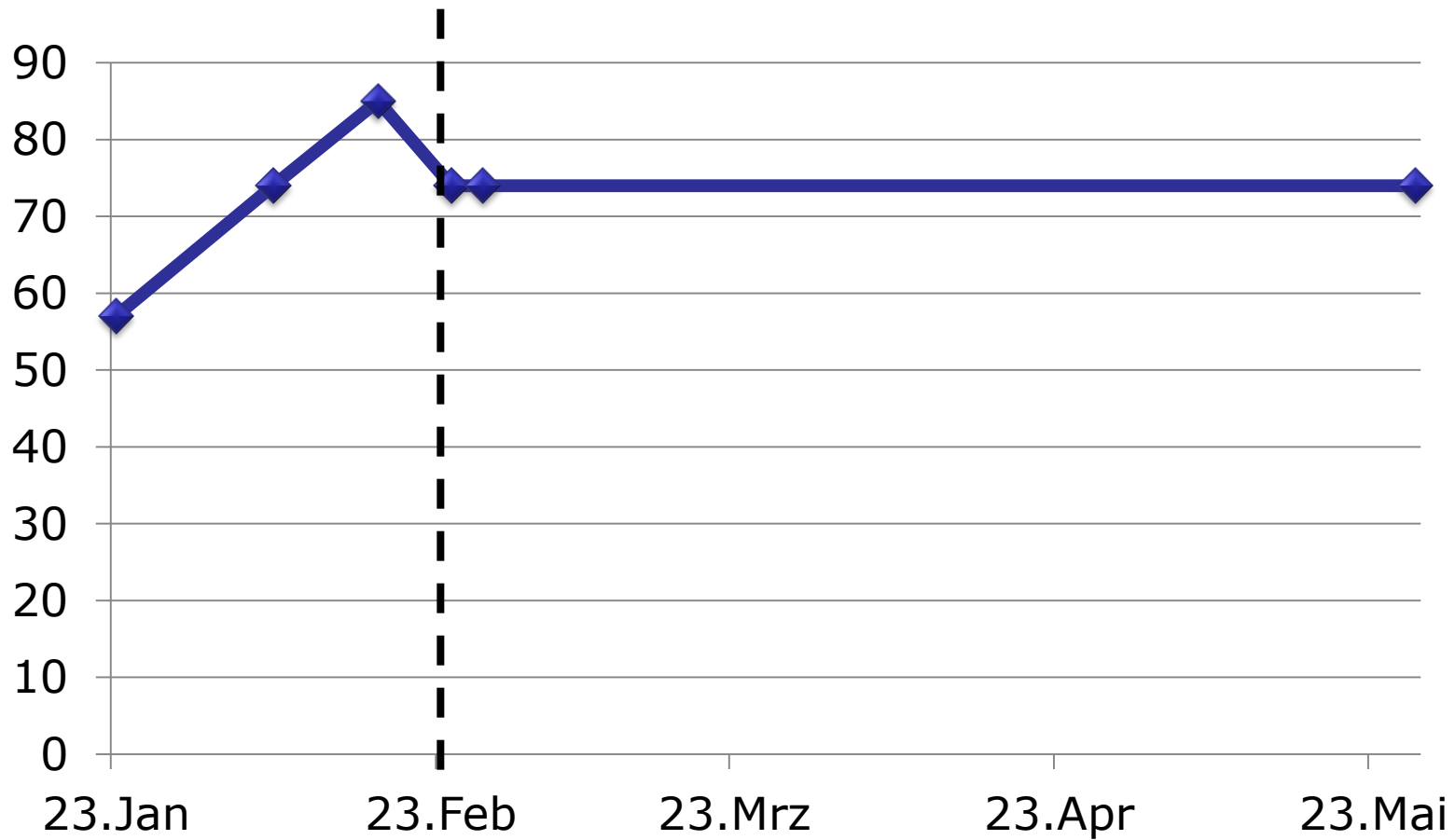


Findings

TUG over time



DEMMI over time



Outcomes during the clinical phase

	Day 0		Day 1		Day 2		Day 3		Day 4		Day 5	
Supine - Sit	3	-	1	0								
Sit - Supine	3	-	1	0								
Sit - Stand	3	-	1	0								
5 meter walk	5	-	1	0								
3 stair flights	6	-	6	6								
Total	20		10	6								

Decision by the patient: When am I going home?

"The nurses want to discharge me on Friday (5 days after surgery), however I feel like I could go home tomorrow."

The physical therapist agreed and so it happened..

Outcomes in the clinical phase

	Dag 0		Dag 1		Dag 2							
Lig - Zit	3	-	1	0	0	-						
Zit - Lig	3	-	1	0	0	-						
Zit - Staan	3	-	1	0	0	-						
5 meter lopen	5	-	1	0	0	-						
3 traptreden	6	-	6	6	0	-						
Totaal	20		10	6	6							

Discharged home

At home (1 week later)

- “I feel really good”
- She visited her grandson’s birthday (participation 5 days after OK)
- VAS pain = 2 (on average)
- Swelling lower extremity ↑
- “I can already cook by myself”
- “I feel as if walking reduces the stiffness in my knee”

“I actually was a really lazy woman”

Thank you for your attention.
Are there any questions?