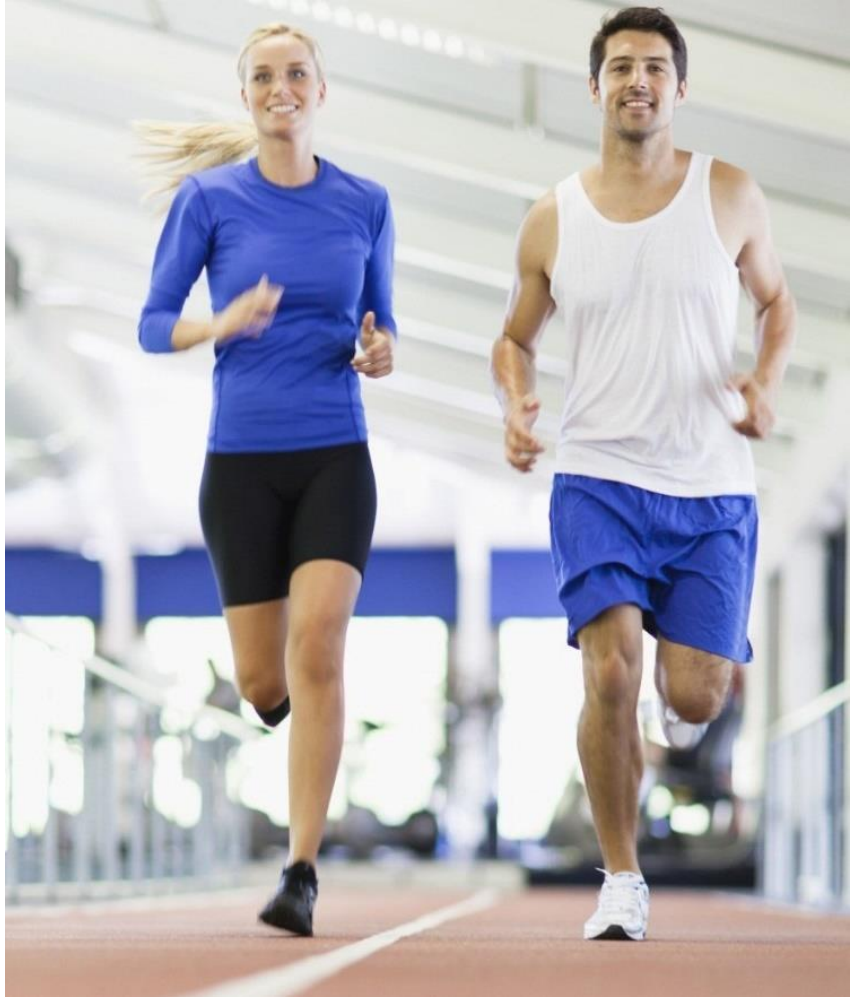


PERIOPERATIVE REHABILITATION IN SPINE SURGERY

MOHAMMAD ZARRABIAN
BA,BSC,DC,MD,FRCSC

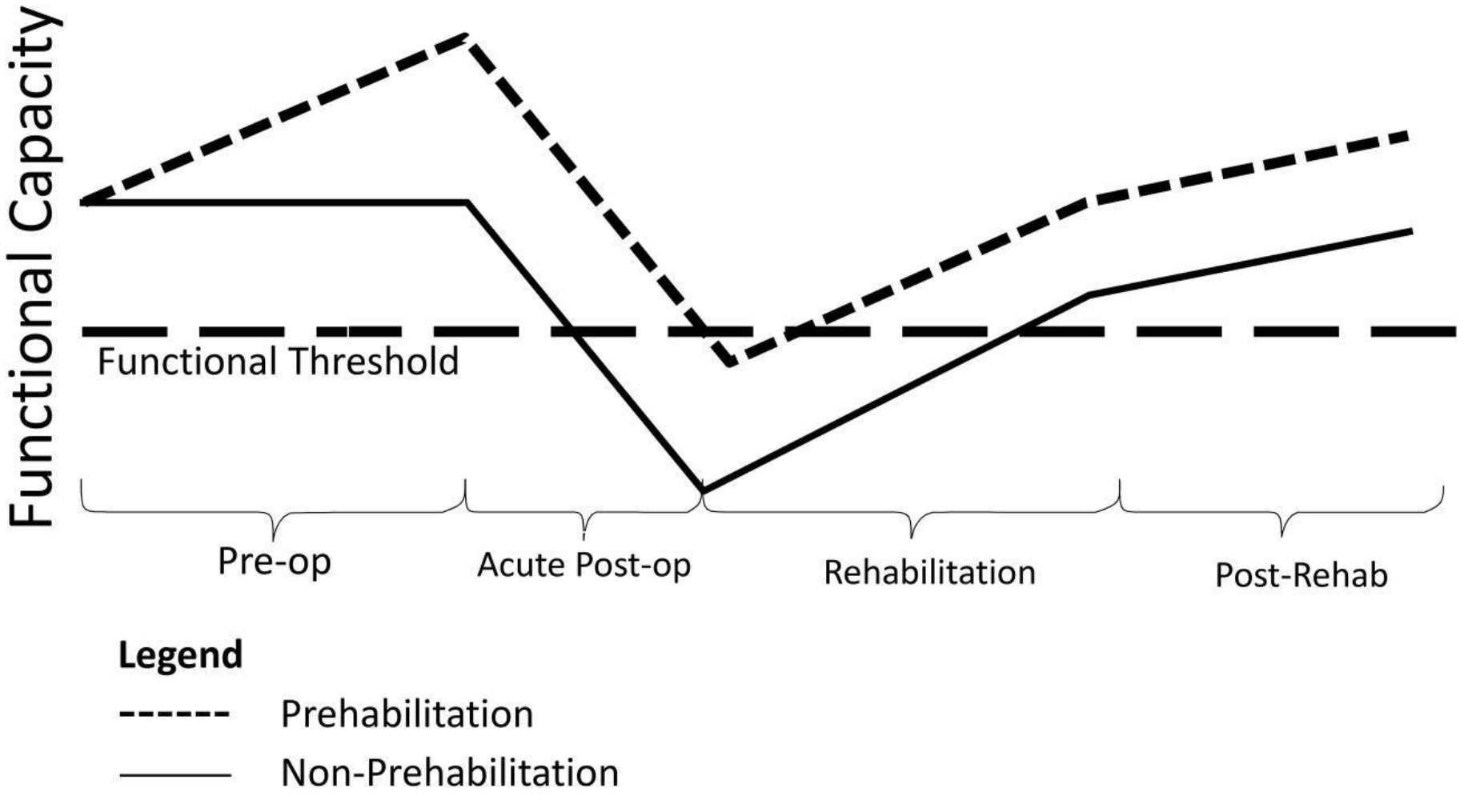
THE PLAN

- Prehab, the general concept
- Prehab in other aspects of surgery
- Prehab in ortho
- Prehab in spine
- Our research
- Rehab in spine

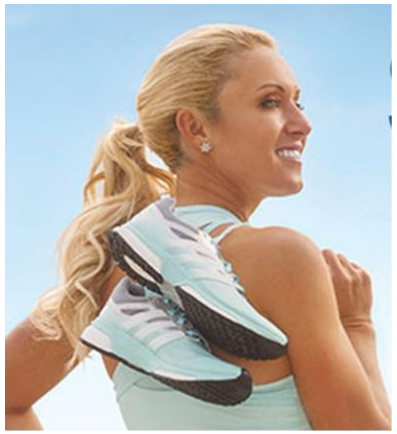
PREHABILITATION

The process of enhancing one's functional and mental capacity to buffer against potential deleterious effects of a significant stressor [1]

PREHABILITATION



ADD A SLIDE TITLE - 3



Health Sciences Centre
Winnipeg

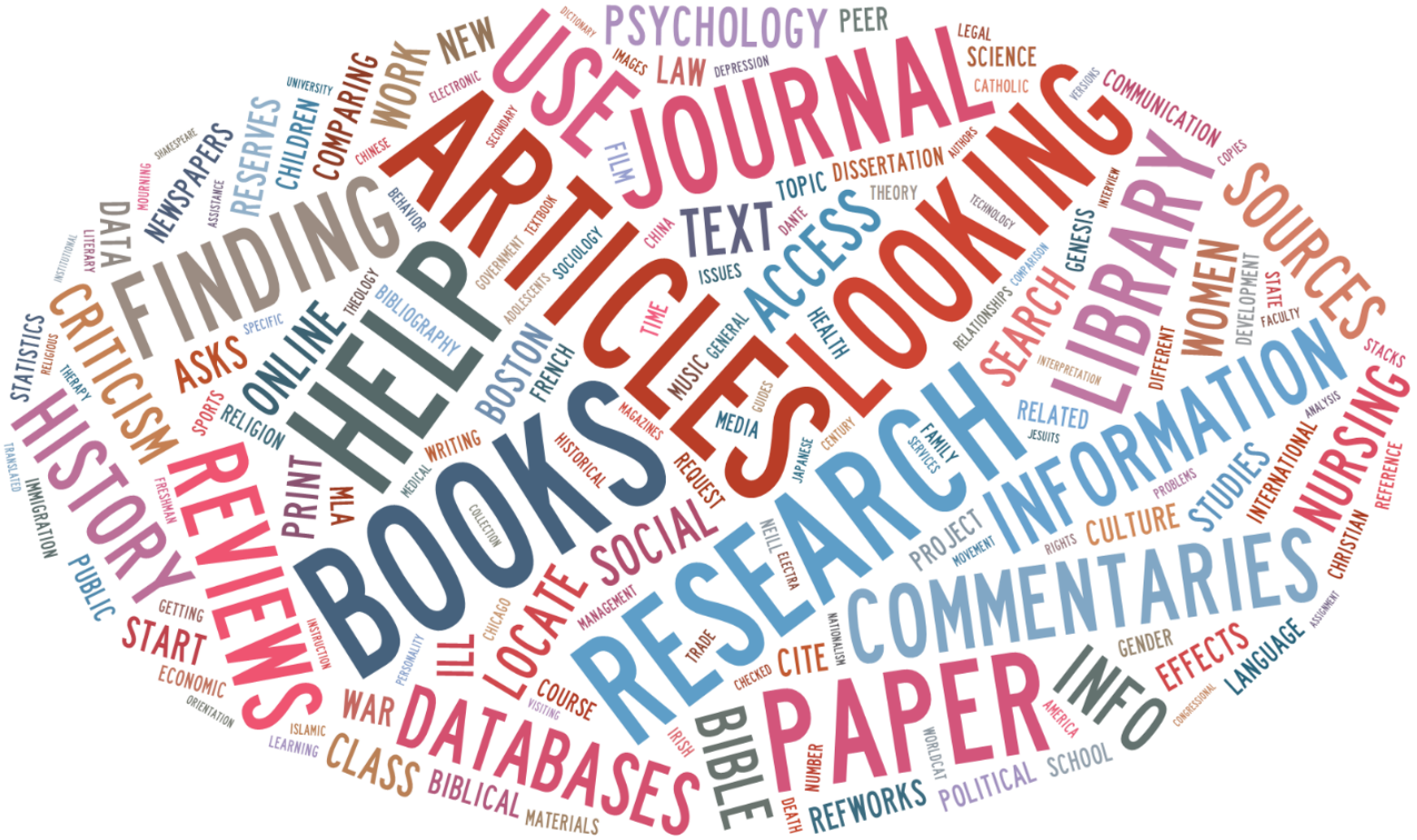
PREHABILITATION

- Interventions have commonly employed systemic(general) exercise and/or tissue-specific (therapeutic) exercise
- Former addresses the expected musculoskeletal/cardiovascular deconditioning
- Latter approach is beneficial for localized morbidity
  - knee flexion/extension exercises for knee replacement surgery patients
  - Deep breathing in thoracic patients
- Can include: Education and nutrition

PREHABILITATION

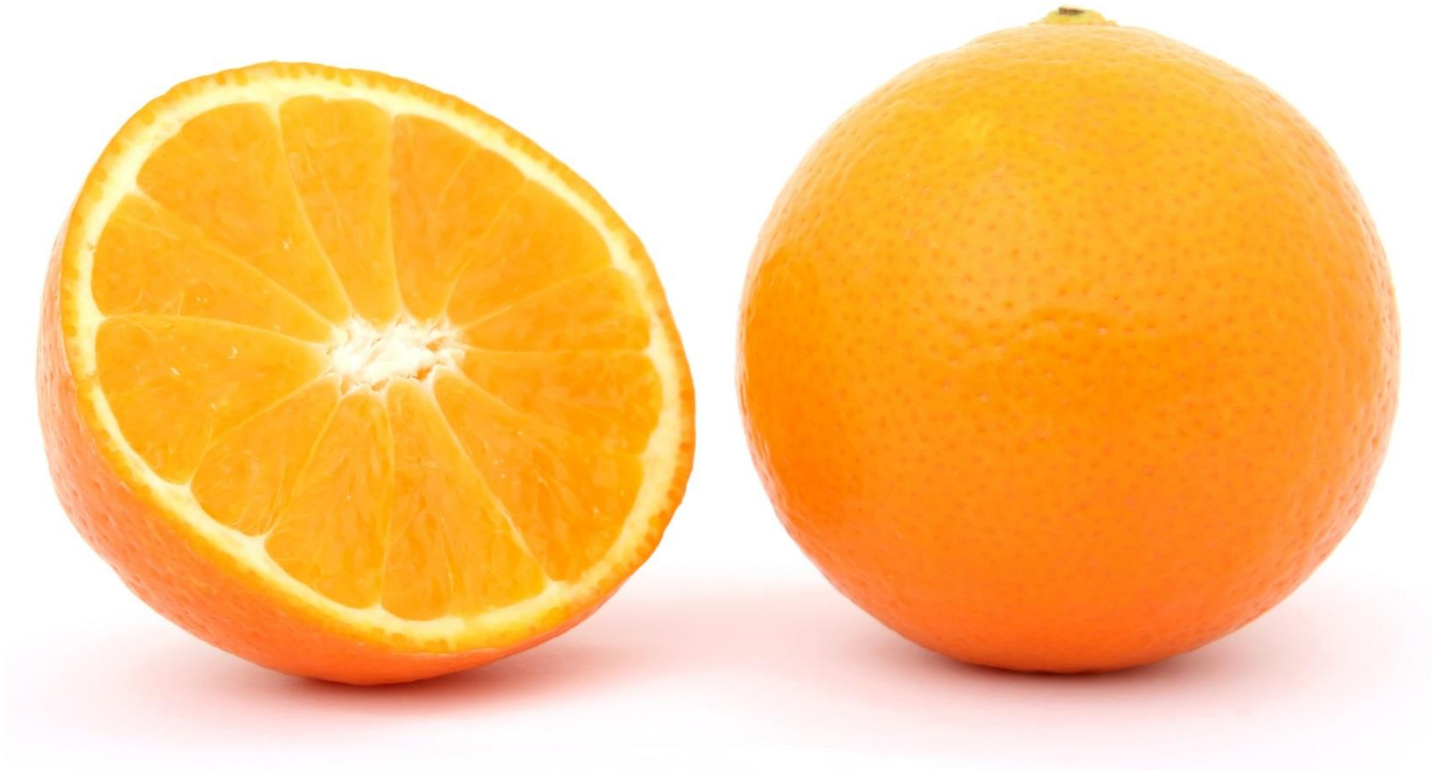
- Preoperative time period is unique:
  - Better physical condition of the patient
  - The opportunity to effectively use surgical wait-times
  - “Teachable moment” for the patient that accompanies reflection upon the need for major surgery

PREHABILITATION

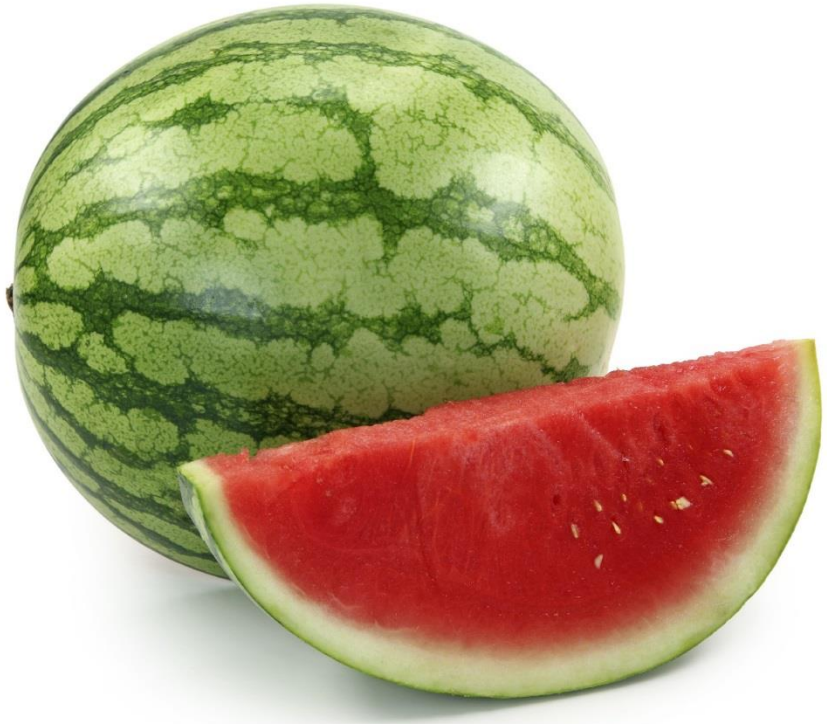


PREHABILITATION

PREHABILITATION



PREHABILITATION



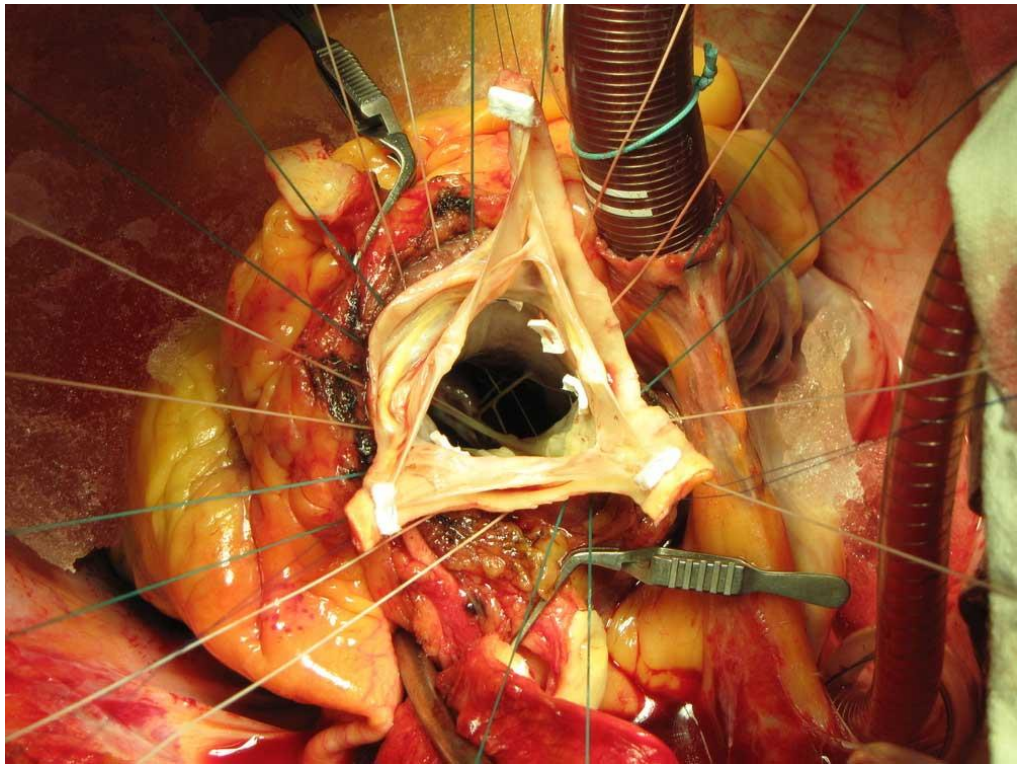
PREHABILITATION IN SURGERY

- Prehab and abdominal surgery
  - Prehab programs before abdominal surgery generally increased physical fitness [2-4]
  - Improved functional walking capacity, reduced length of hospital stay and lower complication rates [5-6]

PREHABILITATION IN SURGERY

- Prehab and cardiac surgery

- A Cochrane review by Hulzebos et al showed that prehabilitation programs resulted in fewer postoperative pulmonary complications and a drop in length of hospital stay [(6)]



PREHABILITATION IN SURGERY

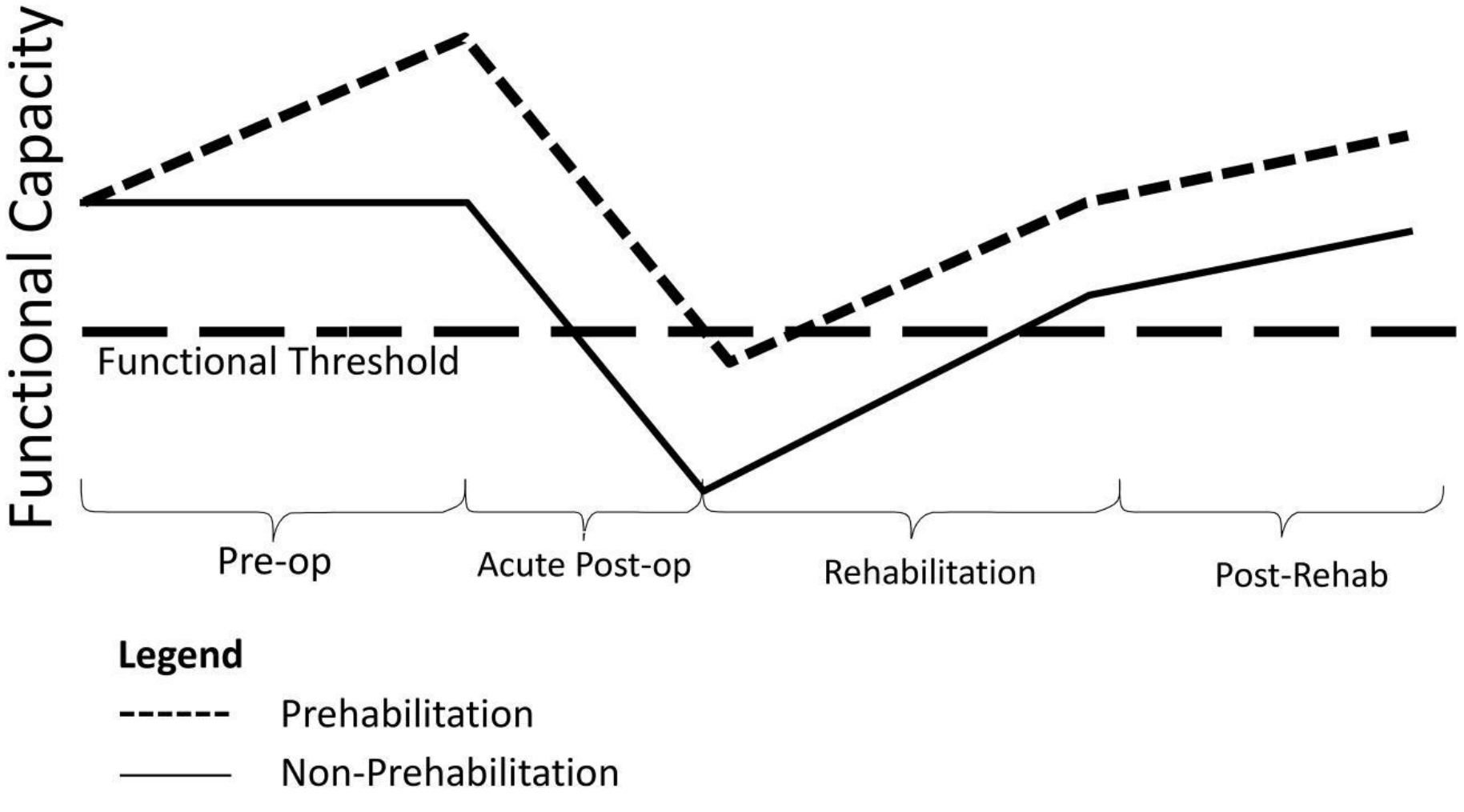
- Arthroplasty

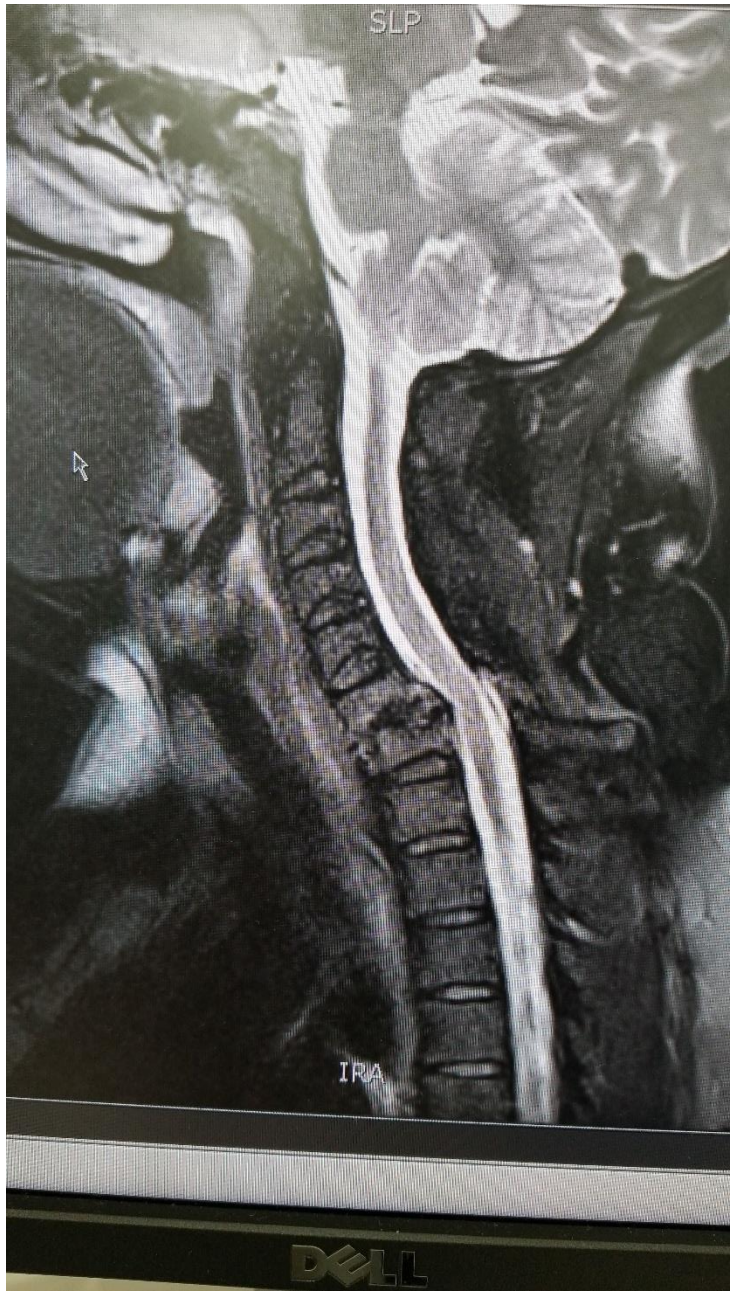
- Silkman Baker et al: Prehabilitation reduced the length of hospital stay in patients undergoing knee replacement surgery [7]

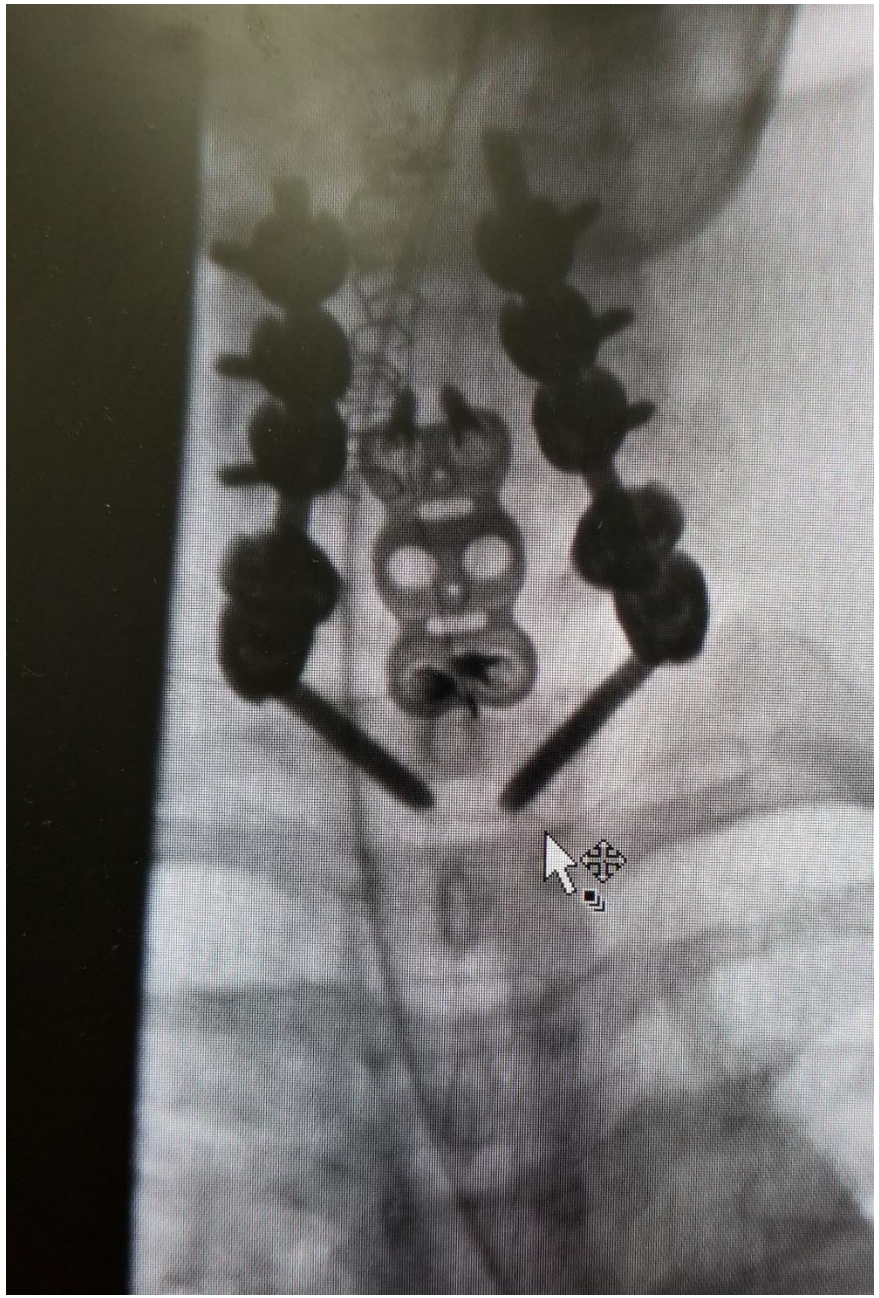
- Gill et al: Prehabilitation reduced pain and improved physical function in patients awaiting hip arthroplasty [8]

- Two studies concluded that prehabilitation is not effective at all in improving outcome after either knee or hip replacement [9-10]

PREHABILITATION




SLP
IRA
DELL



THE SPINE

Clinical Rehabilitation 2010; **24:** 137–148

Prehabilitation and early rehabilitation after spinal surgery: randomized clinical trial

Per Rotbøll Nielsen Anaesthesiology Department, Centre of Head and Orthopaedics, Rigshospitalet and WHO Collaborating Centre for Health Promotion in Hospitals & Health Services, Bispebjerg Hospital, **Lars Damkjær Jørgensen**, **Benny Dahl** Orthopaedic Clinic, Centre of Head and Orthopaedics, Rigshospitalet. University of Copenhagen, **Tom Pedersen** Centre Director, Rigshospitalet. University of Copenhagen and **Hanne Tønnesen** WHO Collaborating Centre, Bispebjerg Hospital, Copenhagen, Denmark

Received 23rd December 2008; returned for revisions 14th April 2009; revised manuscript accepted 28th July 2009.

THE SPINE

- Prehab + rehab vs rehab

- Inclusion criteria:
  - Fusion, decompression, disc replacement; maximum two levels

- Follow up period:
  - 6 months

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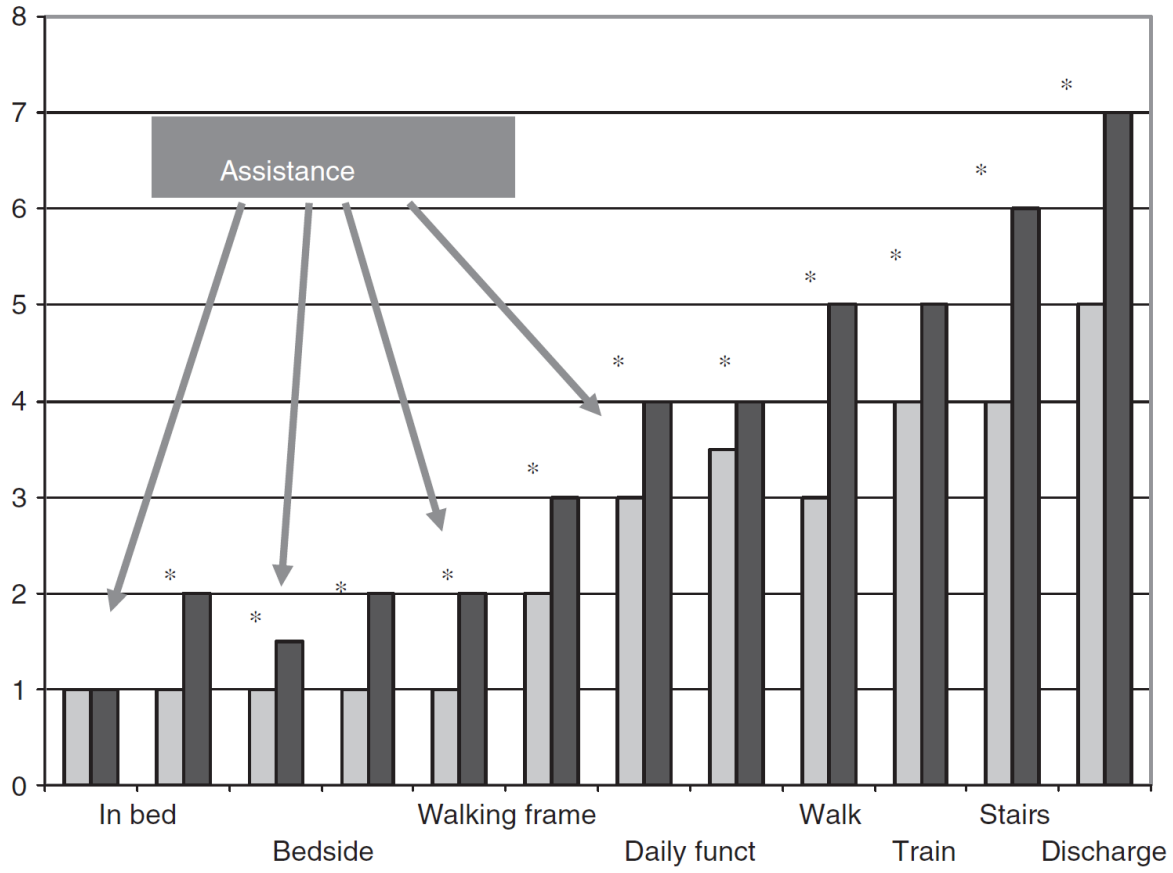

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THE SPINE

- Intervention group:
  - Discharge from hospital at day 5 vs day 7
  - Reported less pain at discharge
  - Higher statisfaction at discharge and at 6 months

Clinical Rehabilitation 2010; **24:** 137–148

Prehabilitation and early rehabilitation after spinal surgery: randomized clinical trial

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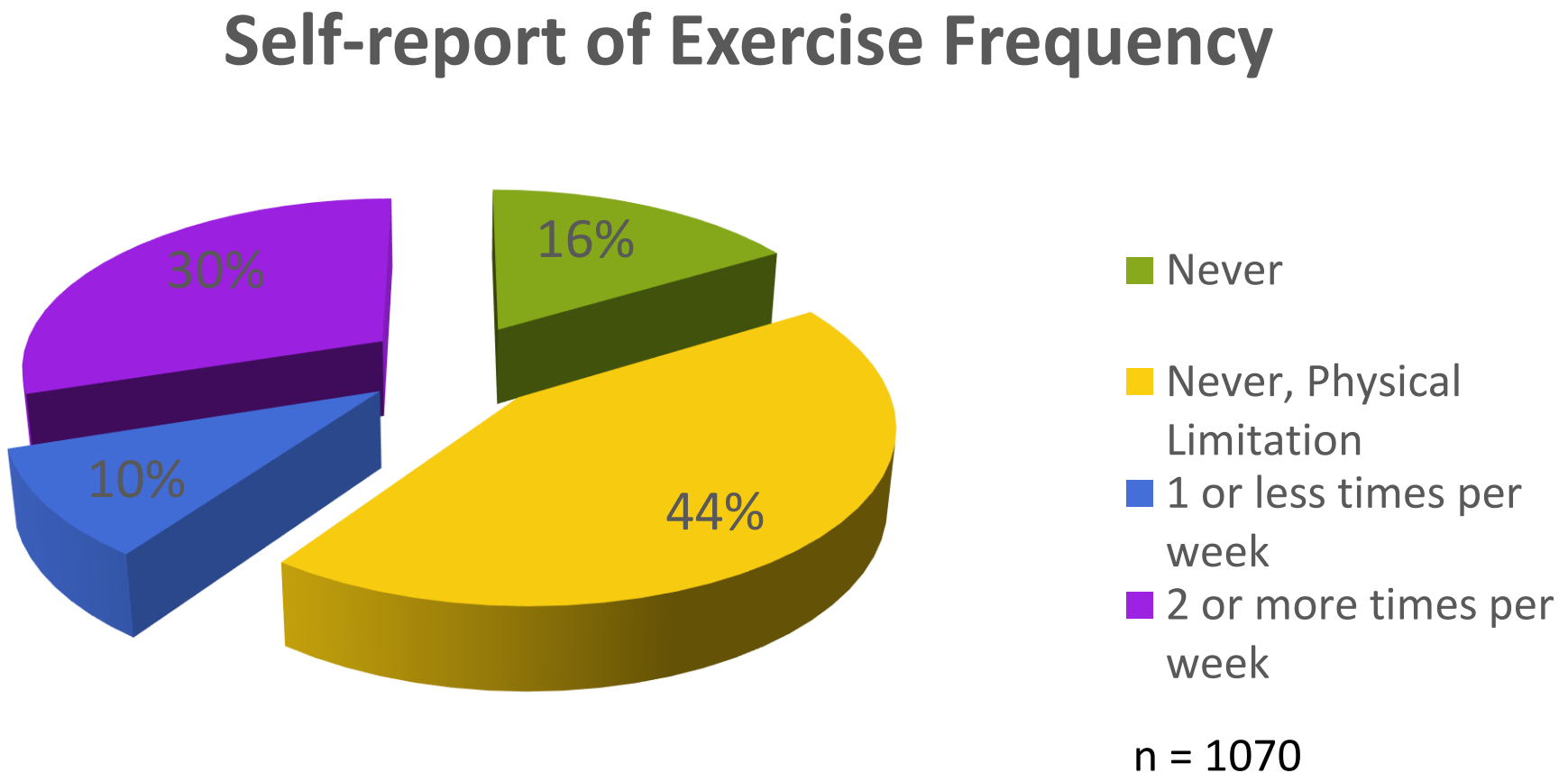
THE SPINE

- Retrospective analysis of prospectively collected data from Canadian Spine Outcomes and Research Network (CSORN)

THE SPINE


Self-report of Exercise Frequency
16%
44%
10%
30%
Never
Never, Physical Limitation
1 or less times per week
2 or more times per week
n = 1070

THE SPINE

ODI

	Exercise Frequency	Number	Mean	Std. Deviation	Std. Error Mean
*Preoperatively	none	1077	53.15	14.525	.443
	some	734	45.77	16.432	.607
*6 month follow-up	none	930	31.61	19.188	.629
	some	624	26.06	17.795	.712
*12 month follow-up	none	637	25.07	18.968	.752
	some	355	20.65	17.320	.919
24 month follow-up	none	116	22.32	16.736	1.554
	some	61	23.43	20.523	2.628

THE SPINE

Health State

	Exercise Frequency	Number	Mean	Std. Deviation	Std. Error Mean
* Preoperatively	none	442	48.66	21.283	1.012
	some	441	53.62	21.430	1.020
**6 month follow-up	none	419	66.51	19.329	.944
	some	402	69.65	17.560	.876
***12 month follow-up	none	243	68.18	18.558	1.190
	some	173	73.62	18.423	1.401
24 month follow-up	none	102	68.01	20.342	2.014
	some	51	70.27	19.367	2.712

THE SPINE

Back Pain

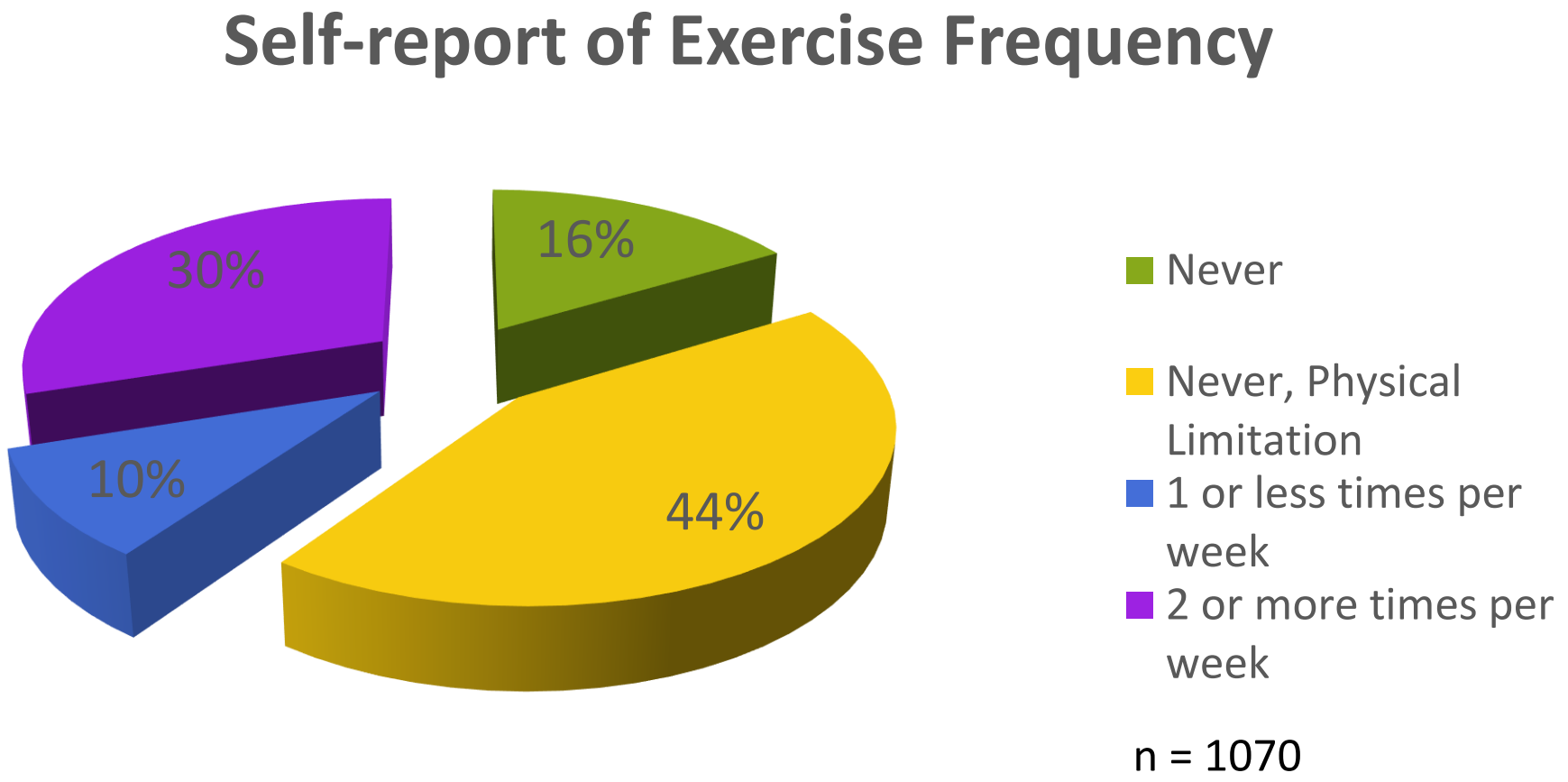
	Exercise Frequency	Number of Patients	Mean	Standard Deviation	Standard Error
* Preoperatively	none	1106	7.23	2.124	.064
	some	742	6.74	2.311	.085
**6 month follow-up	none	855	3.68	2.539	.087
	some	598	3.30	2.354	.096
12 month follow-up	none	626	3.54	2.622	.105
	some	353	3.30	2.486	.132
24 month follow-up	none	393	3.79	2.777	.140
	some	187	3.52	2.773	.203

THE SPINE

Leg Pain

	Exercise Frequency	Number	Mean	Std. Deviation	Std. Error Mean
* Preoperatively	none	1107	7.47	2.198	.066
	some	741	6.76	2.599	.095
**6 month follow-up	none	855	3.58	3.022	.103
	some	598	3.11	2.826	.116
12 month follow-up	none	627	3.44	3.002	.120
	some	353	3.24	2.786	.148
24 month follow-up	none	393	3.72	3.046	.154
	some	188	3.43	2.988	.218

THE SPINE


Self-report of Exercise Frequency
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44%
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1 or less times per week
2 or more times per week
n = 1070

Patient Activation and Functional Recovery in Persons Undergoing Spine Surgery

Richard L. Skolasky, ScD, Ellen J. Mackenzie, PhD, Stephen T. Wegener, PhD, and Lee H. Riley III, MD

Investigation performed at the Departments of Orthopaedic Surgery and Physical Medicine and Rehabilitation, the Johns Hopkins University School of Medicine, and the Department of Health Policy and Management, the Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland

THE SPINE

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- Patient activation:
  - Individual's propensity to engage in adaptive health behavior

THE SPINE

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- 65 patients undergoing decompression or decompression and fusion
- Divided into 4 stages of patient activation as per preoperative questionnaires
- Followed over 2 years

THE SPINE

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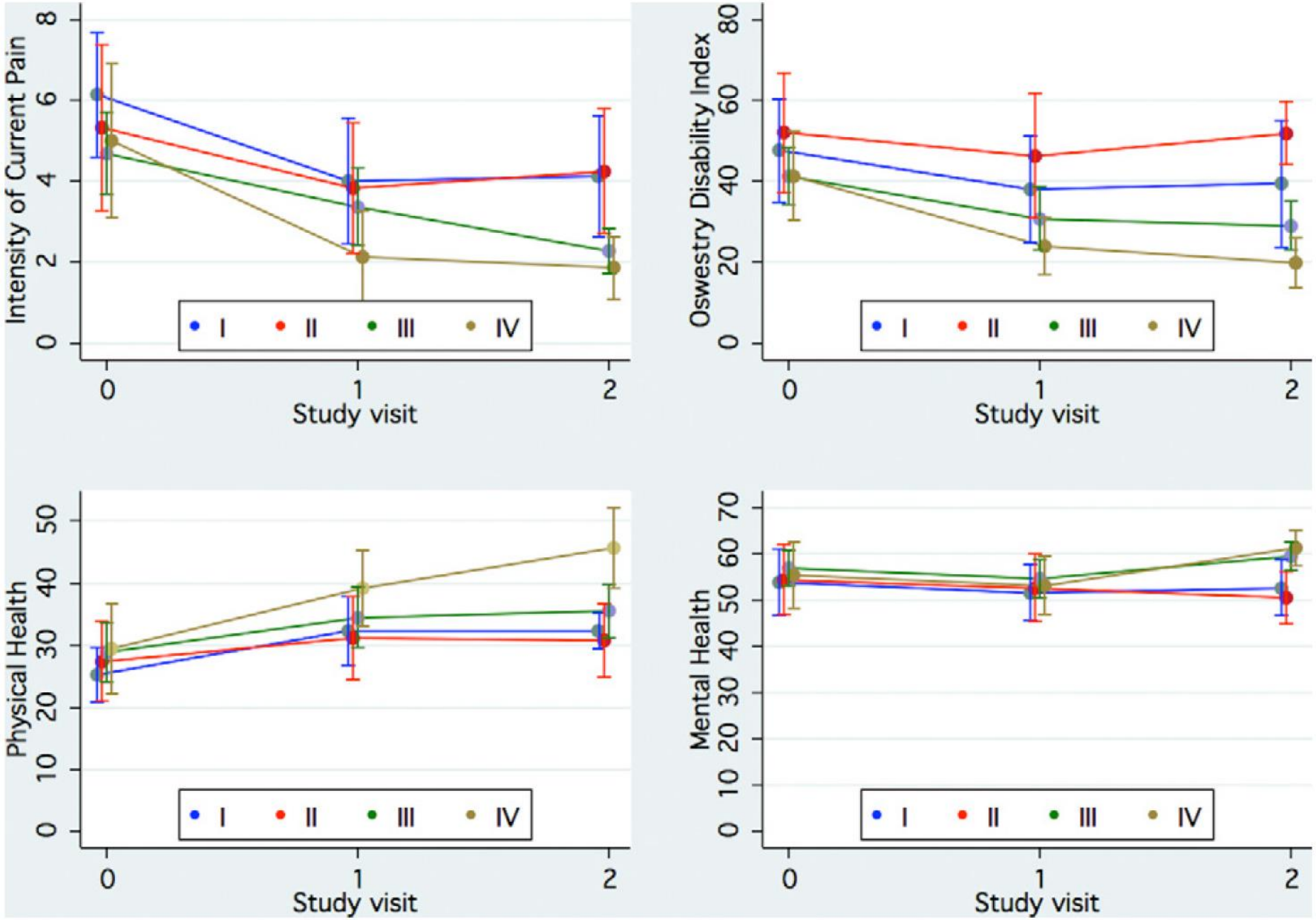
- Stage I - overwhelmed and unprepared to play an active role
- Stage II - individuals who lack knowledge and confidence for self-management
- Stage III - beginning to take action but lack the confidence and skill
- Stage IV - Have behaviors supportive to their health but may not be able to maintain them in the face of life stressors


Intensity of Current Pain
0
2
4
6
8
0
1
2
Study visit
I
II
III
IV
Oswestry Disability Index
0
20
40
60
80
0
1
2
Study visit
I
II
III
IV
Physical Health
0
10
20
30
40
50
0
1
2
Study visit
I
II
III
IV
Mental Health
0
10
20
30
40
50
60
70
0
1
2
Study visit
I
II
III
IV


REHAB
IS FOR QUITTERS

Current Practices in Lumbar Surgery Perioperative Rehabilitation: A Scoping Review

Andrée-Anne Marchand, DC, MSc,[a] Julie O'Shaughnessy, DC, MSc,[b]
Claude-Édouard Châtillon, MD, MSc, FRCSC,[c] Karin Sorra, PhD,[d] and Martin Descarreaux, DC, PhD[e]

ABSTRACT

Objective: The objective of this review was to identify current practices and relevant patient-reported and objective outcome measures with regard to rehabilitation protocols directed at the lumbar spine in perioperative procedure settings in order to inform clinical practice and future research.

Methods: A literature search was performed in MEDLINE, CINAHL (Cumulative Index to Nursing and Allied Health Literature), the Cochrane Central Register of Controlled Trials, PEDro (Physiotherapy Evidence Database), and PubMed using terms relevant to surgical interventions, rehabilitation, and the lumbar spine.

Results: Twenty-nine studies met the inclusion criteria, and 28 investigated postoperative forms of rehabilitation. Patient-reported outcomes typically used were pain and disability, although a wide range of objective measures based on physical capacities were often reported. Rehabilitation programs, for the most part, included some form of strengthening exercises alone or in combination with stabilization exercises, aerobic conditioning, stretching, or education. Despite most studies reporting statistically significant results between intervention groups, considering clinically significant improvement within intervention groups yielded a different portrait.

Conclusions: A wide range of objective and subjective outcomes is used to document changes after active rehabilitation. Program components include both active and assisted interventions combined with various means of education and discussion. Multimodal rehabilitation protocols after lumbar surgery may be used to improve patient-reported and objective outcome measures such as pain, disability, and physical function. Further research should be conducted on the effects of preoperative rehabilitation programs. (J Manipulative Physiol Ther 2016;39:668-692)

Key Indexing Terms: *Patient Outcome Assessment; Rehabilitation; Review; Exercise Therapy; General Surgery; Low Back Pain*

REHABILITATION

- Discectomy
  - Pain
  - Disability
  - Lumbar extension
  - Abdominal strength
  - Hip and lumbar mobility
  - Walking abilities
  - Activity levels
  - Satisfaction regarding received care
  - Earlier return to work

REHAB

- Vertebral Fusion:
  - Cardiovascular exercise has been shown to decrease pain and increase function post lumbar spine surgery
  - Measured increases in core strength correlated to lower Oswestry Disability Index (ODI) scores
  - An RCT demonstrated that rehabilitation that started 12 weeks post op had lower disability and ODI scores at 6 months and 1 year follow up.

REHAB

- Vertebroplasty:
  - Back muscle exercises added to usual postoperative medication and advice after percutaneous vertebroplasty improved disability and pain level

Study	Strengthening	General Conditioning	Motor Control	Stretching/Passive Intervention	Others
Aalto 2011[39]	○				○ Control group
Abbott 2010[28]		●			● Home-based exercises + 3 education sessions
Chen 2012[27]			●		● Education
Choi 2005[14]	●				● Usual care
Christensen 2003[34]		○			● Education + group discussion
					○ Education
Danielsen 2000[26]	●				● Education
Dolan 2000[25]		●			○ Education
Donaldson 2006[38]	●				● Control group
Erdogmus 2007[33]		○			○ Sham intervention
Filiz 2005[24]		●		●	○ Control group
Häkkinen 2005[22]	○			○	
Johansson 2009[21]		●			● Home-based exercises
Ju 2012[32]	○				○ Control
Kang 2012[31]	●		●	●	
Kim 2010[29]			○		
Kulig 2009[37]	●				○ Education
Mannion 2007[41]		○	○		
McGregor 2011[19]		●			● Education
					● Usual care
					● Education + rehabilitation
Millisdotter 2007[30]		●	●		
Nielsen 2010[40]					○ Preoperative combined interventions
					● Postoperative combined interventions
Oestergaard 2012[35]			●		
Ostelo 2003[16,17]		●			● Usual care
Yilmaz 2003[15]	●		●		○ Control group
Interpret with caution[a]:					
Gencay-Can 2010[23]		●		●	
Kjellby-Wendt 2001[20]	●				● Passive pain-coping mechanism + strengthening exercises
Newsome 2009[18]				○	

REHAB

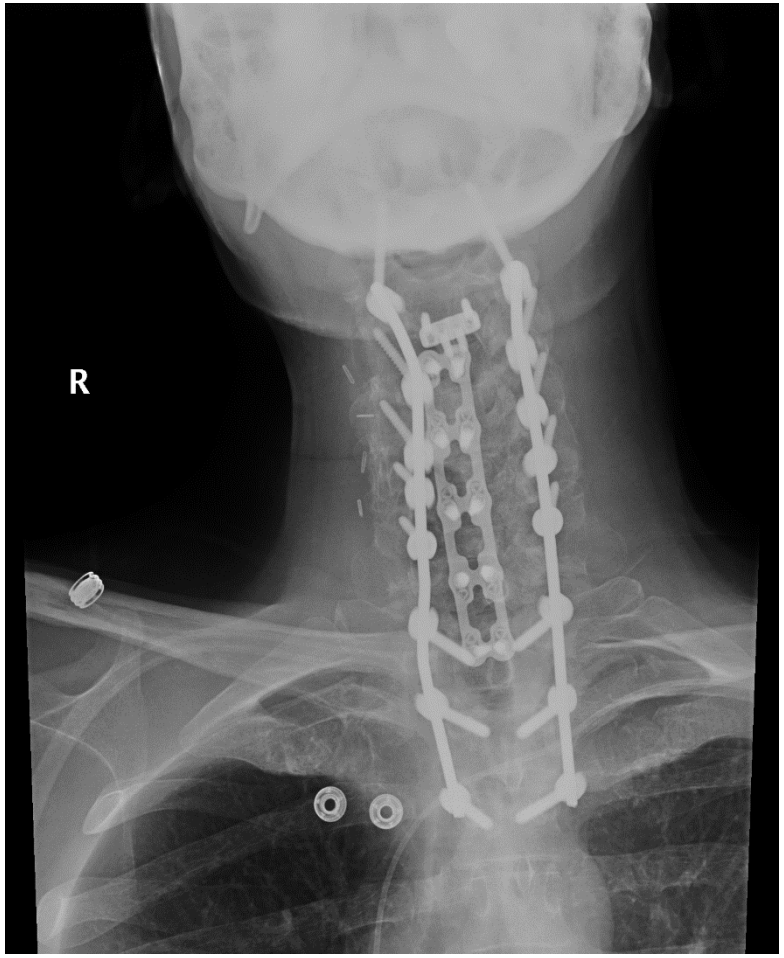
- In the 1st week:
  - Education, nerve glides, and a walking program
  - Established during preoperative rehabilitation and reinforced in acute care settings

- 3 months:
  - Isometric exercises beginning at 3 months

- 6 months:
  - Strengthening exercises and cardiovascular exercise

REHAB

- Preop psychological testing prior to lumbar fusion & postop psychological coping techniques in rehabilitation should be considered to optimize outcomes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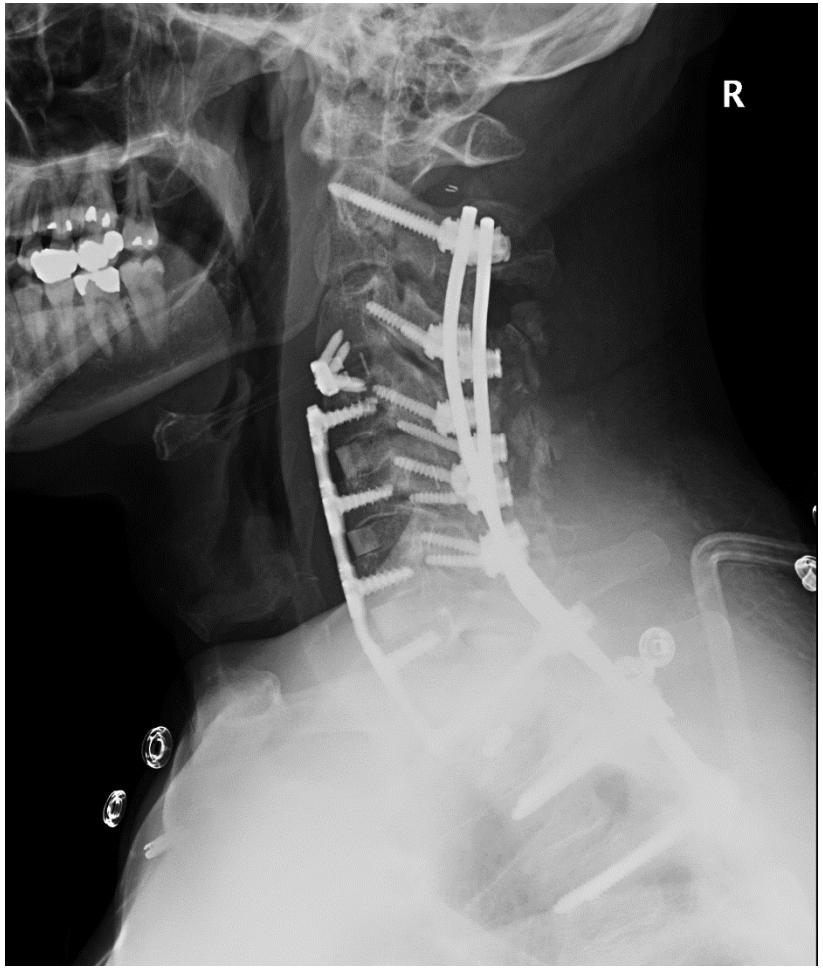
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