Prehabilitation and rehabilitation – what do we really know?

- A debate built on the ISSLS membership







 Helena Brisby
 Mari Lundberg

 Professor
 Associate Professor

 Dep of Orthopaedics
 Dep Health and Rehabilitation

 University of Gothenburg
 University of Gothenburg

Kristin Archer Associate Professor Dep of Orthopaedics Vanderbilt University Medical Center



Disclosures

Financial:

Brisby: None

Lundberg: None

Archer: American Physical Therapy Association; Physical Therapy – editorial board

Research reported in this presentation was funded through awards from Patient-Centered Outcomes Research Institute (CER-1306-01970) and NIAMS (R21 AR062880)





Outcome of the surgery?

• What do we want to achieve with our treatment?

More important:

• What do the patients expect/want?

Overall:

...to have a life as good as possible.



OUNIVERSITY O GOTHENBURG

Frequently used outcome measures

Pain - VAS/NRS.... QoL - EQ5D, SF36... Function (in relation to pain) - ODI....

More focus on ?

Activity level, funtion to meet daily life demands

- functional tests, motion tracking devices....









ONIVERSITY C

The ISSLS survey: through e-mail

(A kind reminder if you are a surgeon and have not done the survey yet)	
To the members of ISSLS – if you are a spinal surgeon	
Drs. Brisby, Lundberg and Archer are leading a debate on preoperative and postoperative rehabilitation at the Annual Meeting in Japan.	
They are requesting your help in understanding current practice patterns for preoperative and postoperative management of patients undergoing lumbar fusion.	MAN
Please consider helping them by completing the following brief questionnaire: https://is.gd/ISSLS	
Results from the survey will be presented on June 4 at the following Debate: Prehabilitation and postoperative rehabilitation – what do we really know?	SFEP2
We look forward to seeing you at the 46th ISSLS Annual Meeting in Kyoto.	Thank you, Katarina





- Private practice (15%)









What sh	nould the prehabilita	tion contain?
	 what does the literature 	say?
Reference	Content	Effect
Nielsen et al 2010 Denmark)	1) Extensive training 2) EDA (Analgesia 3) Intesified mobilization 4) Protein supplements	Effect on disability at the time of surgery
Rolving et al 2015 (Denmark)	9 times of multidisciplinary CBT sessions	Effect on catastrophizing and fear-avoidance beliefs 6 months after
Lindbäck et al 2017 (Sweden)	18 times of PT 1) treatment based classification 2) tailor made supervised exercise program 3) behavioral approach to reduce fear avoidance and increase activity level	Effect on physical activity level
Lotzke et al 2019	4 sessions of CBT (Pain Education, Adressing fear-avoidance)	Effect on EQ5D 1 week preop (ES=0.57)













Summary prehabilitation

(O) UNIVERSITY O GOTHENBURG

A prehabilitation program is safe (no side effects)

□ Improves physical activity and health (not disability)

- $\Box\mbox{Kinesiophobia}$ and low self-efficacy contributes to low level of physical activity
- Gaps Reconsider the outcome (health and patient selected outcomes instead of disability?)

Gaps - what kind of exercise?



Postoperative Rehabilitation: optimize functional outcomes after lumbar surgery

Kristin R. Archer, PhD, DPT Associate Professor and Vice Chair, Department of Orthopaedics Associate Professor, Department of Physical Medicine and Rehabilitation Director, Vanderbilt Center for Musculoskeletal Research Vanderbilt University Medical Center

46th ISSLS Annual Meeting June 4, 2019





Postoperative Physical Therapy Program

- How many physiotherapy sessions?
- Mean 9.3 (SD: 11.4); Median 7





Oniversity of gothenburg

Postoperative Physical Therapy Program

- · Main reason you refer?
- Improve function/physical activity (28%)
 Faster/earlier recovery (28%)
- Regain strength, flexibility, balance (23%
- Gain confidence/motivation (6%) Improve mental health (3%)
- Reduce pain (1%)
- Other providers? (7% always; 23% sometimes, 70% never)
- Occupational therapist
- Acupuncture
 Clinical psychologist
- Chiropractor

0

Figure 1. Flowchart of responders.

 Social worker Exercise physiologist

0

Survey of Current Physiotherapy Practice Server Volume 19, Number 23, pp E1300 E1337 02014, Lippicor Williams & William for Patients Undergoing Lumbar Spinal Fusion in the United Kingdom

A. Rushton, EdD,* C. Wright, BSc,* A. Heap, MSc,† L. White, MSc,† G. Eveleigh, MSc,* and N. Heneghan, PhD* Survey in United Kingdom of physiotherapists
 71 returned out of 85 (84%)

- · Referred to postoperative rehabilitation specific to lumbar fusion
- ------ и рискурна ими в напалінаtion specific to lumbar fusion 41% прогла rotaria 1% прогла rotaria Ресорятики visit, previute signey, multiple comorbidities, reduced preop function, severe pain Prosperative visit, severe pain, reductions in function, poor neural ability, fear avoidance, slow recovery
- Start of physiotherapy: 2-6 weeks postoperatively
- Average 6 visits · Top treatments:
- Back and abdominal exercises
 Neurodynamic mobilization
 Cardiovascular exercise

Spinal Surgeons' Opinions on Pre- and SINK Volume 43, Number 10, pp 712-719 ^o 2018 Wolters Klauer Health, Inc. All rights reserved. Postoperative Rehabilitation in Patients Undergoing Lumbar Spinal Fusion Surgery A Survey-Based Study in the Netherlands and Sweden Reni M.A. van Erp, MSc,* Jetse Jelsma, MSc,¹ Ivan P.J, Huijnen, PhD,*⁴ Mari Lundberg, PhD,^{§,¶} Paul C. Willems, PhD,^{||} and Rob. J.E.M. Smeets, PhD*** The Netherlands Sweden 105 emails sent 140 emails sent Non-responders (n=92) 40 surveys turned (38%) 48 surveys returned (34%) Incomplete survey (n=6)

34 surveys included for analysis (32%) 48 surveys included for analysis (34%)



ONIVERSITY C

What is the evidence base for postoperative rehabilitation?

Rehabilitation Following Surgery for Lumbar Spinal Stenosis SPINE Volume 39, Number 13, pp 1044-1054 02014, Lippincott Williams & Wilkins

A Cochrane Review

Alison H. McGregor, PhD,* Katrin Probyn, MPHJ.* Suzie Cro, MSc,† Caroline J. Doré, BSc,† A. Kim Burton, PhD,‡ Federico Balagué, MD,§ Tamar Pincus, PhD,¶ and Jeremy Fairbank, PhD∥

UNIVERSITY O GOTHENBUR

What is the evidence base for postoperative rehabilitation?

Rehabilitation Following Surgery for Lumbar Spinal Stenosis

Rehabilitation Following Lumbar Fusion Surgery: A Systematic Review and Meta-Analysis

James Greenwood, BSc (hons), MRes, Alison McGregor, PhD,* Fiona Jones, PhD,† Jacqueline Mullane, BSc (hons), MSc, † and Michael Hurley, PhD[§]

SPINE Volume 41, Number 1, pp E28–E36 © 2016 Wolters Kluwer Health, Inc. All rights reserved

0 Rehabilitation Following Surgery for Lumbar Spinal Stenosis Std. Mean IV, Fixer Alson H. McGregor, PhD,* Karsin Probyn, MPL* Suzie Cro, MSc.† Caroline J. Doré, ISc.† A. Kim Barno, PhD,+ Federico Balagoi, MD,5 Tanae Piscos, PhD,+ and Perery Faitbark, PhD Total (95% CI Heterogeneity: Test for merai -1 -0.5 0 0.5 1 Favours rehab Favours control orest plot of comparison: Long-term, outcome: Functional status long-term on pg scale Active rehab is more effective Dop Scale Construction Construction</te than usual care: · Moderate-quality evidence for short term and long term function and back pain Forest plot of comparison: Long-term, outcome: Low back pain long-term on log Moderate-quality evidence for . Scale Math Commit Mate Shiftware Mate Shiftware Opt (Laborg A 1.04 (Math A 9.10 (Math A 9.10 (Math A 10.10 (Math A< long term leg pain Low-quality evidence for short term leg pain Low-quality evidence for short Forest plot of comparison: Long-term, outcome: Leg pain long-term on log scale. term and long term general health

0

Rehabilitation Following Lumbar Fusion Surgery: A Systematic Review and Meta-Analysis SPINE Volume 41, Number 1, pp E28–E36 © 2016 Wolters Kluwer Health, Inc. All rights reserved

ireenwood, BSc (hons), MRes, Alison McGregor, PhD,* Fiona Jones, PhD,* ine Mullane. BSc (hons), MSc⁺ and Michael Hurley, PhD⁸

Figure 5. Meta-analysis results, long-term low back pain. (A) Meta-analysis results, long-term (B) Meta-analysis results, long-term

	Coper	inter			ierro			Sed. Mean Difference	Sed	Mean OiFference	
Shally or Sabgreap	Reas	10	Total	Mean	10	Tetal	Weight	IV, Fixed, 55% CI	n	C Fixed, 91% CI	
Abbott 2000 Mantikane 2014	-25.5 -13.08	22.8 7.33	33 65	-13	14.5	34 65	47.5% 52.5%	-0.581-0.97, -8.200 -1.08[-1.44, -6.71]	-	-	
Total (95% CI) Heteropeneity Chr ² - Test for several effect	125.00	-10	- 0.07	k I' - 6	rs.	119	300.0%	-0.84 [-1.110.58]	14 . A.		i
	Lope	iver	tal.		larceo		-	Std. Mean Difference	585	Mean Difference	-
Seavy or surgroup		10.1	1944		1114	1044	acque.	W. Kangoli, Stocks		Kanarak, Story	
		7.23	61	-1.72	7,48	65	\$4.33	-1.45[-1.84, -1.06]	-		
Montkione 2014											
Nonticore 2014 Total (95% CD			114			119	100.0%	-1.40[-1.69, -1.12]	•		

Factors complex solution from

Complex rehabilitation is more effective than usual care:

· Low-guality evidence for short term and long term disability and fear avoidance

Disability improvement is clinically significant (>12.4% in ODI).

۲

EFFECTIVENESS OF POSTOPERATIVE HOME-EXERCISE COMPARED WITH USUAL CARE ON KINESIOPHOBIA AND PHYSICAL ACTIVITY IN SPONDYLOLISTHESIS: A RANDOMIZED CONTROLLED TRIAL J Rehabil Med 2017: 49: 751-75

Oud IUVES, NSC, 97-2, Arja HÄKKINEN, PhD, PT-1, Joost DEKKER, PhD', Marko WAHLMAN, MD', Sami TARNANEN, NSC, PT-, Lisar PEKKAHER, MD, MD', Jahr YLINEN, PhD, MD', Hannu KAUTIAIKEN, SA' and Marko IEVA, PLD, MD' Finand Healt, Care Distoric, Juyksky, Finand, 'Department of Arbitalitation Medican and Department of Polytokity, Vul University Medical Cetter, Amsterdam, The Netherlands, 'Department of Orthopacitic and Tearum, Tampere Liviersky fiscalita, Tampere, "Department of Orthopacity Health International Theory of Default Sciences, Physical Health Cetter, Amsterdam, The Netherland, 'Department of Orthopacitic and Tearum, Tampere Liviersky fiscalita, Limenes, Tampere, Department of Orthopacity Health, Carellon of Nethics, Jusky and Mecan Foundation, Meedaski, Frainde



start to us sing	ing 3 month ual care in physical act	gressive 1 ns postope decreasing ivity in spo	.2-month ratively wa kinesioph ondylolisthe	home-exer as not supe obia or inc esis.	cise erior rea-
Table II. Charg	es in kinesiophobia, physic Before intervention	al activity and pain inter	sity during the 12-mon Change during the ini	th exercise intervention	
fable II. Cherry	es in kineslephoble, physic Before intervention LSF-DX Median (Q1; Q3)	al activity and pain inter	sity during the 12-mon Change during the in LSF-EX Median (Q1; Q3)	th exercise intervention servention LSF-UC Modem (Q1; Q3)	p-value between g
Table IL. Cheng	es in kinesisphobia, physic Before intervention LSI-DX Modian (Q1; Q3) 32.5 (28.6) 37.0)	al activity and pain inter LSF-UC Median (Q1; Q3) 30.4 (X5.6; 36.4)	Change during the 12-mon Change during the int LSF-EX Hecker (Q1; Q3) -1.0 (-6.0; 3.0)*	th exercise intervention covertion LSF-UC Modian (Q1; Q3) -0.5 (-5.8; 5.0)	p-value between g 0.17
Table IL. Cherry	es in kinesisphobia, physic Before intervention LSF-DX Nodian (Q1; Q3) 20.5 (29.6; 20.0) 1.655 (1.640; 3.042)	al activity and pain inter LSF-UC Median (Q1; Q3) 2049 (15:00; 40/75) 2,599 (1,500; 40/75)	Sity during the 12-mon Change during the int LSF-EX Heatian (Q1; Q3) -1.0 (-6.4) 2.0 (* 333 (-296; 4.273)*	th exercise intervention covertion LSP-UC Median (Q1; Q3) -6.5 (-5.8 (-5.0) 445 (-553; 3.227)*	p-value bebeen 0.57 0.52



Importance of the Back-Café Concept to Rehabilitation After Lumbar Spinal Fusion: A Randomized Clinical Study With a 2-Year Follow-Up

SPINE Volume 28, Number 23, pp 2561–2569 ©2003, Lippincott Williams & Wilkins, Inc.

Finn B. Christensen, MD, PhD, Ida Laurberg, RPT, and Cody E. Bünger, MD, DMSc

- Back-Café Concept (peer support group)
- Café group vs. PT vs. Video (N=81)
 - Café group
 The trace (it of)
 Solution
 Solution
 Solution
 Troup
 Rehab 2x/week for 8 weeks (1.5 hours)
- · 2-years improved function/leg pain/RTW in Café group
- Questions importance of intensive exercise
- · Demonstrates relevance of coping strategies



Kristin R. Archer, *1 Clin Sharon E. Phillips, [‡] Stew Oran S. Aaronson, [‡] Jose	iton J. Devin, * Susan en Z. George, * Matth sph S. Cheng, * and S	h W. Vanston, hew J. McGin Stephen T. W	.* Tatsuki Koy t, [•] Dan M. Sp egener**	ama, [‡] engler,*				
Oran S. Aaronson, Jose	eph S. Cheng, and S	Stephen T. W	egener**					
	Table 3. Prima	ary Outcon	ne Scores a	ind Change from Pr	etreatment to Pos	ttreatment and 3-	Month	
	Follow-Up by	y Group		M. C		Brown Group Demonstr		
		CRPT	Francisco	MIAN CRANEL IN	OM PRIMAMENT	Between-Group Diversence		
	VARIABLE	MEAN (SD)	MEAN (SD)	CBPT	EDUCATION	CBPT vs EDUCATION	P VALUE	
	BPI: back pain							
	Pretreatment	3.0 (2.2)	2.8 (2.0)					
	Posttreatment	2.9 (2.6)	2.5 (2.0)	08 (65 to .49)	3 (68 to .08)	22 (- 45 to 9)	52	
	3 mo	1.9 (2.0)	2.5 (2.4)	-1.1 (-1.5 to74)	26 (76 to .23)	88 (-1.5 to25)	.007	
	BPI: leg pain							
	retreament	2.5 (2.6)	2.2 (2.0	101 0111 00	0011 2411 40	534 A 4 10 0 0	07	
	Postreatment	2.1 (2.2)	23(2.2)	48(91(006)	.05 (13(310 30	007	
		1.5 (2.1)	2.1 (2.0)	-1.3 (-1.5 (072)	1(75.00.55)	=1.2 (=2.1 (0 = .34)	.007	
	Rft interference							
	BPI: interference Protreatment	38/300	31/26					
	BPI: interference Pretreatment Postreatment	3.8 (3.0) 3.2 (3.2)	3.1 (2.6) 2.8 (2.9)	65 (-1.16 to14)	3 (84 to .24)	25 (1.1 to 20)	24	
	8PI: interference Pretreatment Posttreatment 3 mo	3.8 (3.0) 3.2 (3.2) 2.1 (2.5)	3.1 (2.6) 2.8 (2.9) 2.8 (2.8)	65 (-1.16 to14) -1.7 (-2.4 to -1.1)	3 (84 to .24) 26 (89 to .38)	-1.5 (-2.4 to -57)	.002	
	BPI: interference Pretreatment Posttreatment 3 mo ODI score	3.8 (3.0) 3.2 (3.2) 2.1 (2.5)	3.1 (2.6) 2.8 (2.9) 2.8 (2.8)	65 (-1.16 to14) -1.7 (-2.4 to -1.1)	3 (84 to .24) 26 (89 to .38)	-1.5 (-2.4 to57)	24 .002	
	BPL interference Pretreatment Posttreatment 3 mo ODI score Pretreatment	3.8 (3.0) 3.2 (3.2) 2.1 (2.5) 38.8 (17.3)	3.1 (2.6) 2.8 (2.9) 2.8 (2.8) 34.0 (16.7)	65 (-1.16 to14) -1.7 (-2.4 to -1.1)	3 (84 to .24) 26 (89 to .38)	-1.5 (-2.4 to57)	24 .002	
	8H: interference Protreatment Posttreatment 3 mo ODI score Protreatment Posttreatment	3.8 (3.0) 3.2 (3.2) 2.1 (2.5) 38.8 (17.3) 28.6 (17.6)	3.1 (2.6) 2.8 (2.9) 2.8 (2.8) 34.0 (16.7) 27.9 (19.4)	65 (-1.16 to14) -1.7 (-2.4 to -1.1) -9.8 (-12.1 to -7.5)	3 (84 to .24) 26 (89 to .38) -6.1 (-10.5 to -1.7)	25 (-1.1 to 20) -1.5 (-2.4 to57)	24 .002	

ONIVERSITY OF GOTHENBUR

Phase III Trial: Objective

We aimed to compare which of two treatments delivered by telephone - cognitive-behavioral based physical therapy (CBPT) program or an Education program – are more effective for improving patient-centered outcomes in patients following lumbar spine surgery.

- Disability (Oswestry Disability Index)
- Pain (Brief Pain Inventory)

Archer et al., J Pain, 2016; Archer et al., Phys Ther, 2013

- General Health (SF-12)
- Physical activity (accelerometer)
 Health care utilization (patients and hospital billing records)





			Between-Group	
	Mean Change f	Mean Change from 6 Weeks		
	CBPT	Education	CBPT vs Education	
Outcome	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	p
Disability (ODI:	0 to 100)			
6 months	-7.90 (-10.51, -5.30)	-6.61 (-9.01, -4.21)	-1.29 (-4.81, 2.23)	0.47
12 months	-8.30 (-11.39, -5.21)	-4.55 (-7.30, -1.80)	-3.75 (-7.86, 0.35)	0.07
Back Pain (BPI	sub-scale: 0 to 10)			
6 months	-0.41 (-0.83, 0.01)	-0.45 (-0.80, -0.09)	0.04 (-0.50, 0.58)	0.88
12 months	-0.23 (-0.68, 0.23)	-0.26 (-0.67, 0.14)	0.03 (-0.57, 0.64)	0.92
Leg Pain (BPI su	ub-scale: 0 to 10)			
6 months	-0.08 (-0.57, 0.41)	0.15 (-0.35, 0.65)	-0.23 (-0.93, 0.47)	0.52
12 months	0.10 (-0.40, 0.59)	0.59 (0.03, 1.15)	-0.49 (-1.24, 0.25)	0.19
General Physic	al Health (PCS SF-12: 0 t	o 100)		
6 months	6.30 (4.35, 8.25)	5.17 (3.50, 6.83)	1.13 (-1.41, 3.68)	0.38
12 months	6.04 (3.85, 8.23)	3.68 (1.68, 5.68)	2.36 (-0.59, 5.31)	0.12
General Menta	I Health (MCS SF-12: 0 t	o 100)		
6 months	1.88 (-0.13, 3.89)	0.85 (-1.18, 2.88)	1.03 (-1.81, 3.87)	0.48
12 months	1.64 (-0.55, 3.82)	0.70 (-1.37, 2.78)	0.93 (-2.07, 3.93)	0.54

ONIVERSITY C

Summary and Discussion

- Majority of surgeons are referring to physical therapy (PT) after fusion - Moderate-quality evidence for traditional active rehab vs. usual care
- Majority of surgeons start PT immediately to 1 week after fusion
- One study demonstrates timing is important
 3 months may be better than 6 weeks
- Number of sessions is variable (median 7)
- No study to date has examined # of sessions
 Trials include programs that range from 3-12 sessions
- · Majority of surgeons are not referring for psychosocial rehabilitation
- Low-quality evidence for psychosocial vs. usual care
- Preliminary evidence for targeted assessment and treatment



