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Intensity of Rehabilitation After Hip Fracture: A Rapid Review

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Conflict of Interest Statement

All reports prepared by the Division of Evidence Development and Standards at Health Quality Ontario are impartial. There are no competing interests or conflicts of interest to declare.

Rapid Review Methodology

Clinical questions are developed by the Division of Evidence Development and Standards at Health Quality Ontario in consultation with experts, end-users, and/or applicants in the topic area. A systematic literature search is then conducted to identify relevant systematic reviews, health technology assessments, and meta-analyses; if none are located, the search is expanded to include randomized controlled trials (RCTs), and guidelines. Systematic reviews are evaluated using a rating scale developed for this purpose. If the systematic review has evaluated the included primary studies using the GRADE Working Group criteria (http://www.gradeworkinggroup.org/index.htm), the results are reported and the rapid review process is complete. If the systematic review has not evaluated the primary studies using GRADE, the primary studies included in the systematic review are retrieved and a maximum of two outcomes are graded. If no well-conducted systematic reviews are available, RCTs and/or guidelines are evaluated. Because rapid reviews are completed in very short timeframes, other publication types are not included. All rapid reviews are developed and finalized in consultation with experts.

Disclaimer

This rapid review is the work of the Division of Evidence Development and Standards at Health Quality Ontario, and is developed from analysis, interpretation, and comparison of published scientific research. It also incorporates, when available, Ontario data and information provided by experts. As this is a rapid review, it may not reflect all the available scientific research and is not intended as an exhaustive analysis. Health Quality Ontario assumes no responsibility for omissions or incomplete analysis resulting from its rapid reviews. In addition, it is possible that other relevant scientific findings may have been reported since completion of the review. This report is current to the date of the literature search specified in the Research Methods section, as appropriate. This rapid review may be superseded by an updated publication on the same topic. Please check the Health Quality Ontario website for a list of all publications: http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations.

About Health Quality Ontario

Health Quality Ontario is an arms-length agency of the Ontario government. It is a partner and leader in transforming Ontario's health care system so that it can deliver a better experience of care, better outcomes for Ontarians, and better value for money.

Health Quality Ontario strives to promote health care that is supported by the best available scientific evidence. Health Quality Ontario works with clinical experts, scientific collaborators, and field evaluation partners to develop and publish research that evaluates the effectiveness and cost-effectiveness of health technologies and services in Ontario.

Based on the research conducted by Health Quality Ontario and its partners, the Ontario Health Technology Advisory Committee (OHTAC)—a standing advisory subcommittee of the Health Quality Ontario Board—makes recommendations about the uptake, diffusion, distribution, or removal of health interventions to Ontario's Ministry of Health and Long-Term Care, clinicians, health system leaders, and policy makers.

Rapid reviews, evidence-based analyses and their corresponding OHTAC recommendations, and other associated reports are published on the Health Quality Ontario website. Visit http://www.hqontario.ca for more information.

About Health Quality Ontario Publications

To conduct its rapid reviews, Health Quality Ontario and/or its research partners reviews the available scientific literature, making every effort to consider all relevant national and international research; collaborates with partners across relevant government branches; consults with clinical and other external experts and developers of new health technologies; and solicits any necessary supplemental information.

In addition, Health Quality Ontario collects and analyzes information about how a health intervention fits within current practice and existing treatment alternatives. Details about the diffusion of the intervention into current health care practices in Ontario can add an important dimension to the review. Information concerning the health benefits, economic and human resources, and ethical, regulatory, social, and legal issues relating to the intervention may be included to assist in making timely and relevant decisions to optimize patient outcomes.

Permission Requests

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http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations/rapid-reviews.

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List of Abbreviations

ADL	Activities of Daily Living
FIM	Functional Independence Measure
RCT	Randomized controlled trial

Background

As legislated in Ontario's *Excellent Care for All Act*, Health Quality Ontario's mandate includes the provision of objective, evidence-informed advice about health care funding mechanisms, incentives, and opportunities to improve quality and efficiency in the health care system. As part of its Quality-Based Funding (QBF) initiative, Health Quality Ontario works with multidisciplinary expert panels (composed of leading clinicians, scientists, and administrators) to develop evidence-based practice recommendations and define episodes of care for selected disease areas or procedures. Health Quality Ontario's recommendations are intended to inform the Ministry of Health and Long-Term Care's Health System Funding Strategy.

For more information on Health Quality Ontario's Quality-Based Funding initiative, visit www.hqontario.ca.

Objective of Analysis

The objective of this analysis was to assess if increasing the intensity of the same types of rehabilitation after hip fracture improves patient functional recovery.

Clinical Need and Target Population

Hip fractures often result in significant morbidity, with most people failing to regain their prefracture levels of mobility and activity. (1) Rehabilitation after hip fracture has been recommended to improve patient recovery. (1-3) However, the dose or level of intensity of this rehabilitation is unknown.

For the purposes of this review, rehabilitation intensity was defined as different doses of the same therapy. Differences in doses of rehabilitation therapy can be reflected by the amount of time spent in therapy (e.g., time per session, frequency of sessions, and/or duration of the intervention) or the amount of work or power required to perform the same exercise (e.g., increased weights used in resistance training).

Rapid Review

Research Question

Does increasing the intensity of rehabilitation improve functional recovery following hip fracture?

Research Methods

Literature Search

A literature search was performed on February 12, 2013, using OVID MEDLINE, OVID MEDLINE In-Process and Other Non-Indexed Citations, OVID EMBASE, EBSCO Cumulative Index to Nursing & Allied Health Literature (CINAHL), the Wiley Cochrane Library, and the Centre for Reviews and Dissemination database, for studies published from January 1, 2002, until February 12, 2013. Abstracts were reviewed by a single reviewer and, for those studies meeting the eligibility criteria, full-text articles were obtained. Reference lists were also examined for any additional relevant studies not identified through the search.

Inclusion Criteria

- English language full-text reports
- published between January 1, 2002, and February 12, 2013
- health technology assessments, systematic reviews, meta-analyses, randomized controlled trials (RCTs) and guidelines
- adult hip fracture population
- studies comparing 2 or more levels of intensity (as defined above) of the same type of rehabilitation

Exclusion Criteria

- observational studies, case reports, editorials
- studies where outcomes of interest cannot be abstracted
- studies that compared 1 dose of therapy with no treatment
- studies that compared 1 dose of therapy with different types of treatment (e.g., weight-bearing exercises versus non-weight-bearing exercises)
- studies that did not describe the control or usual care group intensity
- studies in which experimental and control groups were not treated in the same setting

Outcomes of Interest

- Two or more measures of activities of daily living (ADLs), prioritized as follows:
    1. Functional independence measure (FIM)
    2. Validated measure of instrumental ADLs
    3. Validated measure of ADLs

Expert Panel

In December 2012, an Expert Advisory Panel on Episodes of Care for Hip Fractures was struck. Members of the panel included physicians, personnel from the Ministry of Health and Long-Term Care, and representation from the community.

The role of the Expert Advisory Panel Episodes of Care for Hip Fractures was to contextualize the evidence produced by Health Quality Ontario and provide advice on the appropriate clinical pathway for a hip fracture in the Ontario health care setting. However, the statements, conclusions and views expressed in this report do not necessarily represent the views of Expert Advisory Panel members.

Results of Literature Search

The database search yielded 786 citations published between January 1, 2002, and February 12, 2013 (with duplicates removed). Articles were excluded based on information in the title and abstract. The full texts of potentially relevant articles were obtained for further assessment.

Two systematic reviews were identified that evaluated the effectiveness of intensive physiotherapy compared to nonintensive physiotherapy after hip fracture within a larger assessment of mobilization strategies for hip fracture. (2;4) The review conducted by the National Clinical Guideline Centre (NCGC) for the National Institutes of Clinical Excellence (NICE) defined intensity broadly to include comparisons of different types of exercises or self-defined intensive programs in comparison to usual care. (2) The 3 RCTs included in the review were obtained for further assessment; however, none met the inclusion criteria of this rapid review. The Cochrane systematic review identified 2 RCTs comparing intensive physiotherapy to standard physiotherapy, defined by the amount of treatment received. (4) No outcomes of interest were reported by the Cochrane review, which was further confirmed on reviewing the RCTs.

The literature search did not identify any RCTs that assessed the effectiveness of increased intensity of rehabilitation compared with a lower dose of the same therapy. Individual RCTs or observation studies categorized as assessing intensity of rehabilitation from broad, general systematic reviews evaluating mobilization strategies or rehabilitation practices after hip fracture were further reviewed for potential inclusion. (5;6) No studies were identified that met the specific inclusion criteria of the current review. Most individual trials were designed to evaluate different types of therapy, augmentation of one therapy with another, or the effects of a therapy compared with no treatment, placebo treatment, or an undefined or multicomponent usual care intervention.

Clinical Guidelines

No clinical guidelines were identified that provided an evaluation or recommendations on the intensity of rehabilitation subsequent to hip fracture.

Conclusions

No systematic reviews, meta-analyses, health technology assessments, or randomized controlled trials (RCTs) were identified that directly evaluated the evidence for increased intensity of rehabilitation on activities of daily living (ADL) after hip fracture.

Acknowledgements

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Kellee Kaulback, BA(H), MISt

Expert Panel for Health Quality Ontario: Episode of Care for Hip Fracture

Name	Role	Organization
Chair		
Dr. James Waddell	Orthopedic surgeon	St. Michael's Hospital, Toronto
Orthopedic Surgery		
Dr. John P. Harrington	Orthopedic surgeon	William Osler Health System, Toronto
Dr. Mark Harrison	Orthopedic surgeon	Queen's University, Kingston
Dr. Hans J. Kreder	Professor	Division of Orthopaedics, Department of Surgery, University of Toronto
Dr. Allan Liew	Orthopedic surgeon	Department of Surgery, University of Ottawa
Dr. Mark MacLeod	Orthopedic surgeon	London Health Sciences Centre
Dr. Aaron Nauth	Orthopedic surgeon	St. Michael's Hospital/University of Toronto
Dr. David Sanders	Orthopedic surgeon	London Health Sciences Centre
Dr. Andrew Van Houwelingen	Orthopedic surgeon	St. Thomas Elgin General Hospital
Anesthesiology		
Dr. Nick Lo	Staff anesthesiologist	St. Michael's Hospital, Toronto
Emergency Medicine		
Dr. Michael O'Connor	Emergency medicine	Kingston General Hospital
Dr. Lisa Shepherd	Emergency medicine	South West Local Health Integration Network (LHIN), London
Family Medicine		
Dr. Christopher Jyu	Physician lead, primary care	Central East LHIN, Ajax
Geriatrics		
Dr. Anna Byszewski	Geriatrician	The Ottawa Hospital
Dr. Maria Zorzitto	Chief of geriatric medicine	St. Michael's Hospital, Toronto
Physiotherapy		
Ruth Vallis	Physiotherapist	University Health Network, Toronto
Rehabilitation		
Charissa Levy	Executive director	GTA Rehab Network
Dr. Peter Nord	Vice president, chief medical officer and	Providence Healthcare, Toronto

Name	Role	Organization
	chief of staff	
Research		
Dr. Susan Jaglal	Chair	Toronto Rehabilitation Institute, University of Toronto
Dr. Valerie Palda	Associate professor	Department of Medicine and Institute of Health Policy, Management and Evaluation, University of Toronto
Administration		
Jane de Lacy	Executive director, patient services	William Osler Health System, Toronto
Brenda Flaherty	Executive vice president and chief operating officer	Hamilton Health Sciences
Jo-anne Marr	Executive vice president and chief operating officer	Mackenzie Health, Richmond Hill
Malcolm Moffat	Executive vice president, programs	Sunnybrook Health Sciences Centre, Toronto
Kathy Sabo	Senior vice president, clinical programs/operations	University Health Network, Toronto
Community Care Access Centres		
Patricia (Tricia) Khan	Senior director, client services	Erie St. Clair Community Care Access Centre, Chatham
Janet McMullan	Project director, consultant	Bone and Joint Canada
Professional Organizations		
Ravi Jain	Director, Ontario osteoporosis strategy	Osteoporosis Canada
Rhona McGlasson	Executive director	Bone and Joint Canada

Appendices

Appendix 1: Literature Search Strategies

Search date: February 12, 2013
Databases searched: OVID MEDLINE, MEDLINE In-Process and Other Non-Indexed Citations, EMBASE; CINAHL; Cochrane Library; CRD

Limits: 2002-current; English
Filters: Meta-analysis, systematic reviews, heath technology assessments, RCTs and guidelines

Database: Ovid MEDLINE(R) <1946 to January Week 5 2013>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 11, 2013>, Embase <1980 to 2013 Week 06>
Search Strategy:

#	Searches	Results
1	exp Hip Fractures/ use mesz	16222
2	exp Hip Fracture/ use emez	26495
3	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) adj4 fracture*).ti,ab.	55825
4	((hip* or ((femur* or femoral*) adj3 (head or neck or proximal))) adj4 fracture*).ti,ab.	38575
5	or/1-4	69278
6	exp Rehabilitation/	332918
7	Rehabilitation Nursing/	1961
8	exp Rehabilitation Centers/ use mesz	11332
9	exp rehabilitation center/ use emez	8264
10	exp "Physical and Rehabilitation Medicine"/ use mesz	18976
11	exp rehabilitation medicine/ use emez	4537
12	exp rehabilitation research/ use emez	284
13	exp rehabilitation care/ use emez	7452
14	exp Hip Fractures/rh [Rehabilitation]	2151
15	exp hip fracture/rh [Rehabilitation]	2151
16	exp Physical Therapy Modalities/ use mesz	114382
17	exp physical medicine/ use emez	363451
18	exp mobilization/ use emez	15408
19	(rehabilitat* or habilitat* or movement therap* or physiotherap* or physical therap* or exercis* or occupational therap* mobili?ation or strength train*).ti,ab.	655369
20	or/6-19	1281990
21	Meta Analysis.pt.	36967
22	Meta Analysis/ use emez	68832
23	Systematic Review/ use emez	57208
24	exp Technology Assessment, Biomedical/ use mesz	8791
25	Biomedical Technology Assessment/ use emez	11440
26	(meta analy* or metaanaly* or pooled analysis or (systematic* adj2 review*) or published studies or published literature or medline or embase or data synthesis or data extraction or cochrane).ti,ab.	302266
27	((health technolog* or biomedical technolog*) adj2 assess*).ti,ab.	3953
28	exp Random Allocation/ use mesz	76124
29	exp Double-Blind Method/ use mesz	117322

30	exp Control Groups/ use mesz	1362
31	exp Placebos/ use mesz	31199
32	Randomized Controlled Trial/ use emez	336877
33	exp Randomization/ use emez	60702
34	exp Random Sample/ use emez	4568
35	Double Blind Procedure/ use emez	113044
36	exp Triple Blind Procedure/ use emez	37
37	exp Control Group/ use emez	41888
38	exp Placebo/ use emez	212539
39	(random* or RCT).ti,ab.	1412123
40	(placebo* or sham*).ti,ab.	454632
41	(control* adj2 clinical trial*).ti,ab.	39053
42	exp Practice Guideline/ use emez	285751
43	exp Professional Standard/ use emez	275459
44	exp Standard of Care/ use mesz	620
45	exp Guideline/ use mesz	23122
46	exp Guidelines as Topic/ use mesz	102366
47	(guideline* or guidance or consensus statement* or standard or standards).ti.	222418
48	(controlled clinical trial or meta analysis or randomized controlled trial).pt.	455849
49	or/21-48	3032841
50	5 and 20 and 49	1269
51	limit 50 to english language	1163
52	limit 51 to yr="2002 -Current"	914
53	remove duplicates from 52	695

CINAHL

#	Query	Limiters/Expanders	Results
S1	(MH "Hip Fractures+")	Search modes - Boolean/Phrase	3,713
S2	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) N4 fracture*)	Search modes - Boolean/Phrase	6,343
S3	((hip* or ((femur* or femoral*) N3 (head or neck or proximal))) N4 fracture*)	Search modes - Boolean/Phrase	5,032
S4	S1 OR S2 OR S3	Search modes - Boolean/Phrase	6,352
S5	(MH "Rehabilitation+")	Search modes - Boolean/Phrase	130,686
S6	(MH "Rehabilitation Nursing")	Search modes - Boolean/Phrase	1,982

S7	(MH "Rehabilitation Centers+")	Search modes - Boolean/Phrase	5,305
S8	(MH "Hip Fractures+/RH")	Search modes - Boolean/Phrase	487
S9	(MH "Physical Therapy Practice, Evidence-Based")	Search modes - Boolean/Phrase	1,172
S10	(MH "Physical Medicine")	Search modes - Boolean/Phrase	821
S11	(rehabilitat* or habilitat* or movement therap* or physiotherap* or physical therap* or exercis* or occupational therap* or mobili?ation or strength train*)	Search modes - Boolean/Phrase	179,950
S12	S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11	Search modes - Boolean/Phrase	231,805
S13	S4 AND S12	Search modes - Boolean/Phrase	1,297
S14	(MH "Random Assignment") or (MH "Random Sample+") or (MH "Meta Analysis") or (MH "Systematic Review") or (MH "Double-Blind Studies") or (MH "Single-Blind Studies") or (MH "Triple-Blind Studies") or (MH "Placebos") or (MH "Control (Research)") or (MH "Practice Guidelines") or (MH "Randomized Controlled Trials")	Search modes - Boolean/Phrase	Display
S15	((health technology N2 assess*) or meta analy* or metaanaly* or pooled analysis or (systematic* N2 review*) or published studies or medline or embase or data synthesis or data extraction or cochrane or random* or sham*or rct* or (control* N2 clinical trial*) or guideline* or guidance or consensus statement* or standard or standards or placebo*)	Search modes - Boolean/Phrase	Display
S16	S14 or S15	Search modes - Boolean/Phrase	Display
S17	S13 AND S16	Search modes - Boolean/Phrase	309
S18	S13 AND S16	Limiters - English Language Search modes - Boolean/Phrase	303
S19	S13 AND S16	Limiters - Published Date from: 20020101-20131231; English Language Search modes - Boolean/Phrase	248

Cochrane Library

ID	Search	Hits
#1	MeSH descriptor: [Hip Fractures] explode all trees	968
#2	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) near/4 fracture*):ti (Word variations have been searched)	1418
#3	((hip* or ((femur* or femoral*) adj3 (head or neck or proximal))) near/4 fracture*):ti (Word variations have been searched)	801
#4	#1 or #2 or #3	1712
#5	MeSH descriptor: [Rehabilitation] explode all trees	12263
#6	MeSH descriptor: [Rehabilitation Nursing] explode all trees	33
#7	MeSH descriptor: [Rehabilitation Centers] explode all trees	511
#8	MeSH descriptor: [Physical Therapy Modalities] explode all trees	12803
#9	MeSH descriptor: [Physical Medicine] explode all trees	293
#10	(rehabilitat* or habilitat* or movement therap* or physiotherap* or physical therap* or exercis* or occupational therap* mobili?ation or strength train*):ti (Word variations have been searched)	20590
#11	#5 or #6 or #7 or #8 or #9 or #10	35148
#12	#4 and #11 from 2002 to 2013	111

CRD

Line	Search	Hits
1	MeSH DESCRIPTOR hip fractures EXPLODE ALL TREES	167
2	((hip* or femur* or femoral* or trochant* or petrochant* or intertrochant* or subtrochant* or intracapsular* or extracapsular*) adj4 fracture*)):TI	126
3	((hip* or ((femur* or femoral*) adj3 (head or neck or proximal))) adj4 fracture*)):TI	104
4	#1 OR #2 OR #3	212
5	MeSH DESCRIPTOR rehabilitation EXPLODE ALL TREES	1376
6	MeSH DESCRIPTOR rehabilitation nursing EXPLODE ALL TREES	6
7	MeSH DESCRIPTOR rehabilitation centers EXPLODE ALL TREES	74
8	MeSH DESCRIPTOR physical therapy modalities EXPLODE ALL TREES	1588
9	MeSH DESCRIPTOR physical medicine EXPLODE ALL TREES	88
10	(rehabilitat* or habilitat* or movement therap* or physiotherap* or physical therap* or exercis* or occupational therap* mobili?ation or strength train*):TI	1291
11	#5 OR #6 OR #7 OR #8 OR #9 OR #10	2962
12	#4 AND #11	19
13	(#12):TI FROM 2002 TO 2013	12

References

(1) McGlasson R, MacDonald V, Lo N, Spafford D, McMullan JL, Beaupre L, et al. Waddell J,editor. National hip fracture toolkit [Internet]. Bone and Joint Decade Canada. 2011 [cited 2013 Feb]. 73 p. Available from: www.boneandjointcanada.com

(2) National Clinical Guideline Centre. The management of hip fracture in adults: methods, evidence & guidance [Internet]. London, UK: National Clinical Guideline Centre; 2011 [cited 2013 Feb]. 658p. Available from: www.ncgc.ac.uk.

(3) Mak JC, Cameron ID, March LM. Evidence-based guidelines for the management of hip fractures in older persons: an update. Med J Aust. 2010;192(1):37-41.

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(5) Chudyk AM, Jutai JW, Petrella RJ, Speechley M. Systematic review of hip fracture rehabilitation practices in the elderly. Arch Phys Med Rehab. 2009;90(2):246-62.

(6) Crotty M, Unroe K, Cameron ID, Miller M, Ramirez G, Couzner L. Rehabilitation interventions for improving physical and psychosocial functioning after hip fracture in older people. Cochrane Database of Systematic Reviews. 2010; Issue 1. Art No.: CD007624. DOI: 10.1002/14651858.CD007624.

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