



Effective Health Care Physical Therapy Interventions in the Hospital Setting

Results of Topic Selection Process & Next Steps

The nominator is concerned that in the acute care setting, physical therapy services are underutilized, and believes an AHRQ evidence review would shed light on the efficacy of physical therapy on a range of outcomes. However, the topic is not feasible for a full systematic review due to the limited data available for a review at this time. No further activity on this topic will be undertaken by the Effective Health Care (EHC) Program.

Topic Brief

Topic Name: Physical Therapy Interventions in the Hospital Setting

Topic #: 0419

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Conflicts of Interest: None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

Summary of Key Findings

- **Appropriateness and importance:** The nomination is both appropriate and important.
- **Duplication:** An evidence review on the topic would not be duplicative. We identified one Cochrane and one other systematic review that were relevant to the revised key question and PICOTS statement. The Cochrane systematic review (2007) examined the use of one type of physical therapy intervention (exercise) sometimes as part of a multicomponent intervention, while the other systematic review (2011) examined the use of higher intensity (dose) versus lower intensity (dose) physical therapy. Please see Table 2 below for more information.
- **Impact:** The impact of this topic is low. There is no partner group committed to disseminating the results of an evidence review to influence practice.
- **Feasibility:** An evidence review on the topic is not feasible at this time. The feasibility scan only resulted in nine studies relevant to the key question between 2010 and 2015. Additionally, 11 clinical trials were found on clinicaltrials.gov that are applicable to the key question.

Table of Contents

| | |
|---|-----|
| Introduction | 1 |
| Methods | 2 |
| Appropriateness and Importance | 2 |
| Desirability of New Review/Duplication | 2 |
| Impact of a New Evidence Review | 2 |
| Feasibility of a New Evidence Review..... | 2 |
| Compilation of Findings | 2 |
| Results | 2 |
| Appropriateness and Importance | 2 |
| Desirability of New Review/Duplication | 3 |
| Impact of a New Evidence Review | 3 |
| Feasibility of a New Evidence Review..... | 3 |
| Summary of Findings | 3 |
| References | 5 |
| Appendices | 7 |
| Appendix A. Selection Criteria Summary | A-1 |
| Appendix B. Search for Systematic Reviews (Duplication) | B-1 |
| Appendix C. Search Strategy & Results (Feasibility)..... | C-1 |

Introduction

Acute care services are those that are effective in time-sensitive situations. According to the World Health Organization, these can include promotive, preventive, curative, rehabilitative, or palliative interventions in which effectiveness is associated with the time-frame during and frequency in which the interventions are provided.¹ Physical therapy is the use of exercise and physiological principles in helping the body recover from or prevent an injury. Respiratory therapy, a type of physical therapy, specifically helps the cardiopulmonary system recover. Characteristics of patients who are appropriate for physical therapy vary. Patients may have prolonged pain when moving, experience decreased mobility, or have recently suffered an injury or medical issue.²

Patients in acute care settings receiving physical therapy may have or be recovering from an urgent medical condition, such as an illness or a surgery. For instance, physical therapy can be useful in helping patients to recover from traumatic injuries such as a fall. Over 700,000 patients each year are hospitalized for a fall.³ They can also help patients recover from surgery (e.g., joint replacements, spine surgeries) or medical conditions (e.g., neurological injuries, stroke).⁴ Physical therapy can also help patients maintain their strength and physical condition during the acute care stay. Patients can be any age and can have any diagnosis to receive physical therapy, but, in general, patients need additional support through therapy to regain full function.⁵

Topic nomination #0419 was received on February 7, 2012. It was nominated by a health care professional. The question for this nomination is:

Key Question 1. What is the comparative effectiveness of early vs. late (and lower dose vs. higher dose) physical therapy in elderly general medical and surgical inpatients in improving a range of outcomes, including cognitive and functional status, as well as resource use?

To define the inclusion criteria for the key questions we specify the population, interventions, comparators, outcomes, timing, and setting (PICOTS) of interest. See Table 1.

Table 1. Key Questions with PICOTS

| | |
|----------------------|---|
| Key Questions | 1. What is the comparative effectiveness of early vs. late (and lower dose vs. higher dose) physical therapy in elderly general medical and surgical inpatients in improving a range of outcomes, including cognitive and functional status, as well as resource use? |
| Population | Patients being treated in the acute care setting (excluding critical care/intensive care unit) including the following subgroups: A) Elderly B) Physical decline prior to admission C) Cognitive decline prior to admission D) Medical vs. surgical |
| Interventions | Early or more intense (higher dose) physical therapy, stratified by deliverer of the intervention |
| Comparators | No physical therapy; later initiation of physical therapy or consultation for physical therapy services; less intense (lower dose) physical therapy; usual care |
| Outcome(s) | Length of Stay, hospital costs, complications of the index condition or of the inpatient stay, mortality, readmissions, cognitive status, functional outcomes |
| Timing | Early versus late initiation of physical therapy |
| Setting | Intervention delivered in acute care setting, excluding critical care/intensive care unit |

Methods

To assess topic nomination #0419 *Physical Therapy Interventions in the Hospital Setting*, for priority for a systematic review or other AHRQ EHC report, we used a modified process based on established criteria. Our assessment is hierarchical in nature, with the findings of our assessment determining the need for further evaluation. Details related to our assessment are provided in Appendix A.

1. Determine the *appropriateness* of the nominated topic for inclusion in the EHC program.
2. Establish the overall *importance* of a potential topic as representing a health or healthcare issue in the United States.
3. Determine the *desirability of new evidence review* by examining whether a new systematic review or other AHRQ product would be duplicative.
4. Assess the *potential impact* a new systematic review or other AHRQ product.
5. Assess whether the *current state of the evidence* allows for a systematic review or other AHRQ product (feasibility).
6. Determine the *potential value* of a new systematic review or other AHRQ product.

Appropriateness and Importance

We assessed the nomination for appropriateness and importance (see Appendix A).

Desirability of New Review/Duplication

We searched for high-quality, completed or in-process evidence reviews pertaining to the key questions of the nomination. Table 2 includes the citations for the reviews that were determined to address the key questions. Appendix B includes the list of the sources searched and potentially relevant titles identified by our research librarian.

Impact of a New Evidence Review

The impact of a new evidence review was assessed by analyzing the current standard of care, the existence of potential knowledge gaps, and practice variation. We considered whether it was hypothetically possible for this review to influence the current state of practice through various dissemination pathways (practice recommendation, clinical guidelines, etc.).

Feasibility of a New Evidence Review

We conducted a literature search for randomized controlled trials in PubMed from 2010-2015. Because a small number of articles were identified, we reviewed all abstracts for inclusion and classified identified studies by study design, to assess the size and scope of a potential evidence review. See *Table 2, Feasibility Column, Size/Scope of Review Section* for the citations of included studies. See Appendix C for the PubMed search strategy and links to the ClinicalTrials.gov search.

Compilation of Findings

We constructed a table outlining the selection criteria as they pertain to this nomination (see Appendix A).

Results

Appropriateness and Importance

This topic is highly appropriate and important. The effectiveness of physical therapy in the acute care setting, including the timing of initiation of physical therapy, is not as commonly researched compared to physical therapy in the outpatient setting. Approximately only a quarter of patients treated in the acute care setting have been found to be treated with physical therapy. Even in conditions for which physical therapy is common, such as joint rehabilitation and stroke, there

seems to be variability in physical therapy practices between hospitals and between patient conditions. See Appendix A for details.

Desirability of New Review/Duplication

We identified one Cochrane and one other systematic review that were relevant to the revised key question and PICOTS statement. The Cochrane systematic review (2007)⁶ examined the use of one type of physical therapy intervention (exercise) sometimes as part of a multicomponent intervention, while the other systematic review (2011)⁷ examined the use of higher intensity (dose) versus lower intensity (dose) physical therapy. Therefore, a systematic review on the early vs. later initiation of physical therapy services in general would not be duplicative.

Impact of a New Evidence Review

The impact of a new evidence review on this topic is unclear. Decision-makers and hospital-based clinicians do not always have a full understanding of the effectiveness of the early initiation of physical therapy. A systematic review on the topic could help inform these decision-makers and improve patient outcomes such as reducing complications as well as system-related outcomes such as reducing LOS, readmissions, and costs. There is not, however, an identified partner group poised to disseminate or implement the findings of an AHRQ evidence review.

Feasibility of a New Evidence Review

An evidence review examining the comparative effectiveness of early vs. late (and lower dose vs. higher dose) physical therapy in elderly general medical and surgical inpatients is not feasible at this time. The feasibility scan only resulted in nine studies⁸⁻¹⁶ relevant to the key question between 2010 and 2015. These studies appear heterogeneous in their outcomes of interest, patient populations, and specific interventions. Additionally, 11 clinical trials were found on clinicaltrials.gov that were applicable to the key question. Two are not yet recruiting;^{17,18} three are currently recruiting;¹⁹⁻²¹ four are active;²²⁻²⁵ and two are complete.^{26,27}

Table 2. Key questions with the identified corresponding evidence reviews and original research

| Key Question | Completed and In-Process Evidence Reviews | Original Research (Published and Ongoing) |
|--|--|--|
| KQ 1: Early vs. late physical therapy | Total number of completed or in-progress systematic reviews – 2 ^{6,7} <ul style="list-style-type: none"> • Cochrane – 1⁶ • Other – 1⁷ | <p><u>Size/scope of review</u> Relevant Studies Identified: 9⁸⁻¹⁶</p> <ul style="list-style-type: none"> • RCT – 8⁸⁻¹⁵ • Prospective Case Series – 1¹⁶ <p><u>Clinical Trials</u> Relevant Trials: 11</p> <ul style="list-style-type: none"> • Not yet recruiting – 2^{17,18} • Recruiting – 3¹⁹⁻²¹ • Active, not recruiting – 4²²⁻²⁵ • Complete – 2^{26,27} |

Abbreviations: KQ=Key Question; n-RCT=non-Randomized Controlled Trial; RCT=Randomized Controlled Trial

Summary of Findings

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- Duplication: An evidence review on the topic would not be duplicative. We identified one Cochrane and one other systematic review that were relevant to the revised key question and PICOTS statement. The Cochrane systematic review (2007) examined the use of one type of physical therapy intervention (exercise) sometimes as part of a

multicomponent intervention, while the other systematic review (2011) examined the use of higher intensity (dose) versus lower intensity (dose) physical therapy. Please see Table 2 below for more information.

- Impact: The impact of this topic is low. There is no partner group committed to disseminating the results of an evidence review to influence practice.
- Feasibility: An evidence review on the topic is not feasible at this time. The feasibility scan only resulted in nine studies relevant to the key question between 2010 and 2015. Additionally, 11 clinical trials were found on clinicaltrials.gov that are applicable to the key question.

References

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2. Clinic C. What Can Physical Therapy Do For Your Back & Neck Pain. *Diseases and Conditions* 2016. Accessed August 30, 2016.
3. Prevention CfDca. Injury Prevention & Control: Data & Statistics (WISQARS). *Injury Center* 2016; <https://www.cdc.gov/injury/wisqars/>. Accessed August 30, 2016.
4. Health USD. Physical Therapy. *Inpatient Acute Rehab Services* 2016; <https://health.ucsd.edu/specialties/rehab/Pages/inpatient-acute-services.aspx>. Accessed August 30, 2016.
5. Health ULA. Inpatient Acute Services. *UCLA Rehabilitation Services* 2016; <http://rehab.ucla.edu/body.cfm?id=31>. Accessed August 30, 2016.
6. de Morton NA, Keating JL, Jeffs K. The effect of exercise on outcomes for older acute medical inpatients compared with control or alternative treatments: a systematic review of randomized controlled trials. *Clin Rehabil*. Jan 2007;21(1):3-16.
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20. Instituto do Cancer do Estado de São Paulo. Effect of an Early Mobilization Program on Outcomes After Major Cancer Surgery. *ClinicalTrials.gov.* 2015;NCT01693172.
21. University Hospital, Angers. Impact of Early Mobilization on Mechanical Ventilation Duration in Intubated Critically Ill Patients (EarlyMob). *ClinicalTrials.gov.* 2016;NCT02520193.
22. McGill University Health Center. Early Mobilization After Colorectal Surgery. *ClinicalTrials.gov.* 2016;NCT02131844.
23. Universidade Federal de Santa Maria. The Impact of Early Mobilization Protocol in Patients in the ICU. *ClinicalTrials.gov.* 2016;NCT01769846.
24. Massachusetts General Hospital. Systematic Team Approach to Guide Early Mobilization in Surgical Intensive Care Unit Patients (mSOMS). *ClinicalTrials.gov.* 2016;NCT01363102.
25. University Hospital, Akershus. The Value of Early Mobilization and Physiotherapy Following Wrist Fractures Treated by Volar Plating. *ClinicalTrials.gov.* 2016;NCT02015468.
26. Instituto do Coracao. Functional Capacity of Exercise and Lung Function in Patients Submitted Early Rehabilitation. *ClinicalTrials.gov.* 2015;NCT02441452.
27. University Hospital, Akershus. Akershus Early Mobilisation in Stroke Study (AKEMIS). *ClinicalTrials.gov.* 2015;NCT00832351.

Appendices

Appendix A: Selection Criteria Summary

Appendix B: Search for Systematic Reviews (Duplication)

Appendix C: Search Strategy & Results (Feasibility)

Appendix A. Selection Criteria Summary

| Selection Criteria | Supporting Data |
|--|--|
| 1. Appropriateness | |
| 1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the U.S.? | Yes, this topic represents a health care drug and intervention available in the U.S. |
| 1b. Is the nomination a request for a systematic review? | Yes, this topic is a request for a systematic review. |
| 1c. Is the focus on effectiveness or comparative effectiveness? | The focus of this review is on effectiveness. |
| 1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic? | Yes, it is biologically plausible. Yes, it is consistent with what is known about the topic. |
| 2. Importance | |
| 2a. Represents a significant disease burden; large proportion of the population | Yes, this topic represents a significant burden. Over 700,000 patients each year are hospitalized for a fall. |
| 2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large proportion of the US population or for a vulnerable population | Yes, this topic affects health care decisions for a large, vulnerable population and there is not a clearly established indication for treatment. |
| 2c. Represents important uncertainty for decision makers | Yes, this topic represents important uncertainty for decision makers. |
| 2d. Incorporates issues around both clinical benefits and potential clinical harms | While the nomination does not specifically ask about benefit and harms, the included literature addresses both. |
| 2e. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers | Yes, this topic represents relatively low cost solutions to a high cost problem. |
| 3. Desirability of a New Evidence Review/Duplication | |
| 3. Would not be redundant (i.e., the proposed topic is not already covered by available or soon-to-be available high-quality systematic review by AHRQ or others) | We identified one Cochrane and one other systematic review that were relevant to the revised key question and PICOTS statement. The Cochrane systematic review (2007) ⁶ examined the use of one type of physical therapy intervention (exercise) sometimes as part of a multicomponent intervention, while the other systematic review (2011) ⁷ examined the use of higher intensity (dose) versus lower intensity (dose) physical therapy. Therefore, a systematic review on the early vs. later initiation of physical therapy services in general would not be duplicative. |
| 4. Impact of a New Evidence Review | |

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|---|---|
| 4a. Is the standard of care unclear (guidelines not available or guidelines inconsistent, indicating an information gap that may be addressed by a new evidence review)? | The impact of this topic is low. While the nominator was an individual, no group has come forward to agree to disseminate the findings of an evidence review. |
| 4b. Is there practice variation (guideline inconsistent with current practice, indicating a potential implementation gap and not best addressed by a new evidence review)? | While there are no comprehensive systematic reviews, and a small library of original search, we are unsure of the quality of available evidence, and its ability to inform changes in practice or in practice variation. |
| 5. Primary Research | |
| 5. Effectively utilizes existing research and knowledge by considering: - Adequacy (type and volume) of research for conducting a systematic review - Newly available evidence (particularly for updates or new technologies) | The feasibility scan only resulted in nine studies relevant to the key question between 2010 and 2015. Additionally, 11 clinical trials were found on clinicaltrials.gov that are applicable to the key question. |

Appendix B. Search for Systematic Reviews (Duplication)

Listed below are the sources searched and results of our search for existing guidance. A research librarian conducted the search and selected potentially relevant evidence based on the key question in the nomination and the associated PICOTS. An investigator reviewed each of the links to evidence below for inclusion. The links below do not represent the evidence selected for inclusion (see main topic brief).

| Source | Evidence |
|---|---|
| AHRQ and Other Federal Products | |
| AHRQ: Evidence reports and technology assessments, USPSTF recommendations, and related DEClIDE projects, and Horizon Scan | <ul style="list-style-type: none"> • Shamliyan TA, Wang SY, Olson-Kellogg B, et al. AHRQ Comparative Effectiveness Reviews. Physical therapy interventions for knee pain secondary to osteoarthritis. Rockville (MD): Agency for Healthcare Research and Quality (US); 2012. • Chesnut RM, Carney N, Maynard H, et al. AHRQ Comparative Effectiveness Reviews. Rehabilitation for traumatic brain injury. Rockville (MD): Agency for Healthcare Research and Quality (US); 1999. • Agency for Healthcare Research and Quality. AHRQ Comparative Effectiveness Reviews. Rehabilitation for traumatic brain injury in children and adolescents. Rockville (MD): Agency for Healthcare Research and Quality (US); 1999. |
| NIH Pathways to Prevention Program | None |
| VA Products: PBM, and HSR&D (ESP) publications, and VA/DoD EBCPG Program | <ul style="list-style-type: none"> • Department of Veterans Affairs, Department of Defense. VA/DoD clinical practice guideline for the rehabilitation of lower limb amputation. 2007. • Department of Veterans Affairs, Department of Defense. VA/DoD clinical practice guideline for the management of stroke rehabilitation. 2010. • Department of Veterans Affairs, Department of Defense. VA/DoD clinical practice guideline for the management of upper extremity amputation rehabilitation. 2014. |
| CMS Policies | None |
| CDC Community Guide | None |
| Cochrane and Other Systematic Reviews | |
| Cochrane Systematic Reviews and Protocols | <ul style="list-style-type: none"> • de Morton NA, Keating JL, Jeffs K. The effect of exercise on outcomes for older acute medical inpatients compared with control or alternative treatments: A systematic review of randomized controlled trials. Clin Rehabil Jan 2007; 21(1):3-16. • Turner-Stokes L, Disler PB, Nair A, et al. Multi-disciplinary rehabilitation for acquired brain injury in adults of working age. Cochrane Database Syst Rev 2005; (3):Cd004170. • Hermans G, De Jonghe B, Bruyninckx F, et al. Interventions for preventing critical illness polyneuropathy and critical illness myopathy. Cochrane Database Syst Rev 2014; 1:Cd006832. • Katsura M, Kuriyama A, Takeshima T, et al. Preoperative inspiratory muscle training for postoperative pulmonary complications in adults undergoing cardiac and major abdominal surgery. Cochrane Database Syst Rev Oct 5 2015; 10:Cd010356. • Handoll HH, Cameron ID, Mak JC, et al. Multidisciplinary rehabilitation for older people with hip fractures. Cochrane Database Syst Rev 2009; (4):Cd007125. |

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| | <ul style="list-style-type: none"> • Smith TO, Hameed YA, Cross JL, et al. Enhanced rehabilitation and care models for adults with dementia following hip fracture surgery. <i>Cochrane Database Syst Rev</i> 2015; 6:Cd010569. • Handoll HH, Sherrington C, Mak JC. Interventions for improving mobility after hip fracture surgery in adults. <i>Cochrane Database Syst Rev</i> 2011; (3):Cd001704. |
| Systematic Reviews and Meta-analyses (PubMed/MEDLINE) | <ul style="list-style-type: none"> • Peiris CL, Taylor NF, Shields N. Extra physical therapy reduces patient length of stay and improves functional outcomes and quality of life in people with acute or subacute conditions: A systematic review. <i>Arch Phys Med Rehabil Sep</i> 2011; 92(9):1490-1500. • English C, Hillier S. Circuit class therapy for improving mobility after stroke: A systematic review. <i>J Rehabil Med Jun</i> 2011; 43(7):565-571. • Leigheb F, Vanhaecht K, Sermeus W, et al. The effect of care pathways for hip fractures: A systematic overview of secondary studies. <i>Eur J Orthop Surg Traumatol Oct</i> 2013; 23(7):737-745. • Ibrahim MS, Alazzawi S, Nizam I, et al. An evidence-based review of enhanced recovery interventions in knee replacement surgery. <i>Ann R Coll Surg Engl Sep</i> 2013; 95(6):386-389. |
| HTA (CRD database): Health Technology Assessments | <ul style="list-style-type: none"> • Centre for Reviews and Dissemination. Inpatient rehabilitation services for the frail elderly. University of York; 2013. • McCurdy B. Inhospital physiotherapy for acute exacerbations of chronic obstructive pulmonary disease (AECOPD): A rapid review. Health Quality Ontario (HQO); 2013. Preoperative physical therapy for severe osteoarthritis of the hip. Lansdale, PA: HAYES, Inc; 2014. • Preoperative physical therapy for severe osteoarthritis of the knee. HAYES, Inc; 2014. • Nikitovic M. Intensity of rehabilitation during the acute hospitalization period after hip or knee arthroplasty: A rapid review. Toronto: Health Quality Ontario (HQO); 2013. |
| PROSPERO Database (international prospective register of systematic reviews and protocols) | None |

Appendix C. Search Strategy & Results (Feasibility)

| Feasibility Scan | |
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| <p>Published primary research studies PubMed/MEDLINE Other applicable databases (e.g., CINAHL, PsycINFO)</p> | <ul style="list-style-type: none"> • Valenza-Demet G, Valenza MC, Cabrera-Martos I, et al. The effects of a physiotherapy programme on patients with a pleural effusion: A randomized controlled trial. <i>Clin Rehabil</i> Nov 2014; 28(11):1087-1095. • Jones C, Kelliher L, Dickinson M, et al. Randomized clinical trial on enhanced recovery versus standard care following open liver resection. <i>Br J Surg</i> Jul 2013; 100(8):1015-1024. • Ahn KY, Hur H, Kim DH, et al. The effects of inpatient exercise therapy on the length of hospital stay in stages I-III colon cancer patients: Randomized controlled trial. <i>Int J Colorectal Dis</i> May 2013; 28(5):643-651. • Lloyd GM, Kirby R, Hemingway DM, et al. The rapid protocol enhances patient recovery after both laparoscopic and open colorectal resections. <i>Surg Endosc</i> Jun 2010; 24(6):1434-1439. • Yosef-Brauner O, Adi N, Ben Shahrar T, et al. Effect of physical therapy on muscle strength, respiratory muscles and functional parameters in patients with intensive care unit-acquired weakness. <i>Clin Respir J</i> Jan 2015; 9(1):1-6. • Kimmel LA, Edwards ER, Liew SM, et al. Rest easy? Is bed rest really necessary after surgical repair of an ankle fracture? <i>Injury</i> Jun 2012; 43(6):766-771. • Pehlivan E, Turna A, Gurses A, et al. The effects of preoperative short-term intense physical therapy in lung cancer patients: A randomized controlled trial. <i>Ann Thorac Cardiovasc Surg</i> 2011; 17(5):461-468. • Savci S, Degirmenci B, Saglam M, et al. Short-term effects of inspiratory muscle training in coronary artery bypass graft surgery: A randomized controlled trial. <i>Scand Cardiovasc J</i> Oct 2011; 45(5):286-293. • Calthorpe S, Barber EA, Holland AE, et al. An intensive physiotherapy program improves mobility for trauma patients. <i>J Trauma Acute Care Surg</i> Jan 2014; 76(1):101-106. • Ang JY, Lua JL, Mathur A, et al. A randomized placebo-controlled trial of massage therapy on the immune system of preterm infants. <i>Pediatrics</i> Dec 2012; 130(6):e1549-1558. • Greening NJ, Williams JE, Hussain SF, et al. An early rehabilitation intervention to enhance recovery during hospital admission for an exacerbation of chronic respiratory disease: Randomised controlled trial. <i>Bmj</i> 2014; 349:g4315. • Jesudason C, Stiller K, McInnes M, et al. A physiotherapy service to an emergency extended care unit does not decrease admission rates to hospital: A randomised trial. <i>Emerg Med J</i> Aug 2012; 29(8):664-669. • Silva YR, Li SK, Rickard MJ. Does the addition of deep breathing exercises to physiotherapy-directed early mobilisation alter patient outcomes following high-risk open upper abdominal surgery? Cluster randomised controlled trial. <i>Physiotherapy</i> Sep 2013; 99(3):187-193. • Labraca NS, Castro-Sanchez AM, Mataran-Penarrocha GA, et al. Benefits of starting rehabilitation within 24 hours of primary total knee arthroplasty: Randomized clinical trial. <i>Clin Rehabil</i> Jun 2011; 25(6):557-566. • Protocols • Taylor NF, Brusco NK, Watts JJ, et al. A study protocol of a randomised controlled trial incorporating a health economic analysis to investigate if additional allied health services for rehabilitation reduce length of stay without compromising patient outcomes. <i>BMC Health Serv Res</i> 2010; 10:308. |

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| | <ul style="list-style-type: none"> • Santaularia N, Caminal J, Arnau A, et al. Randomized clinical trial to evaluate the effect of a supervised exercise training program on readmissions in patients with myocardial ischemia: A study protocol. BMC Cardiovasc Disord 2013; 13:32. • Fleck SJ, Bustamante-Ara N, Ortiz J, et al. Activity in geriatric acute care (AGECAR): Rationale, design and methods. BMC Geriatr 2012; 12:28. • Harvey LA, Dunlop SA, Churilov L, et al. Early intensive hand rehabilitation after spinal cord injury ("hands on"): A protocol for a randomised controlled trial. Trials 2011; 12:14. • Hillier S, English C, Crotty M, et al. Circuit class or seven-day therapy for increasing intensity of rehabilitation after stroke: Protocol of the circuit trial. Int J Stroke Dec 2011; 6(6):560-565. • Simpson AH, Hamilton DF, Beard DJ, et al. Targeted rehabilitation to improve outcome after total knee replacement (TRIO): Study protocol for a randomised controlled trial. Trials 2014; 15:44. |
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