BMJ Open

# Development of a longlist of healthcare quality indicators for physical activity of patients during hospital stay: a modified RAND Delphi study



| | |
|---|---|
| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2019-032208 |
| Article Type: | Research |
| Date Submitted by the Author: | 07-Jun-2019 |
| Complete List of Authors: | Koenders, Niek; Radboudumc, Radboud Institute for Health Sciences, Department of Rehabilitation - Physical Therapy<br>van den Heuvel, Stein; Radboudumc, Radboud Institute for Health Sciences, Department of Rehabilitation - Physical Therapy<br>Bloemen, Shanna; Radboudumc, Radboud Institute for Health Sciences, Department of Rehabilitation - Physical Therapy<br>Van der Wees, Philip; Radboud university medical center, Radboud Institute for Health Sciences, IQ healthcare<br>Hoogeboom, Thomas J; Radboud university medical center, Radboud Institute for Health Sciences, IQ healthcare |
| Keywords: | Healthcare quality indicator, Performance indicator, Quality measure, Physical activity |
| | |

## TITLE

# Development of a longlist of healthcare quality indicators for physical activity of patients during hospital stay: a modified RAND Delphi study


## AUTHOR NAMES AND AFFILIATIONS

Niek Koenders[a], MSc.; Stein van den Heuvel[a], MSc.; Shanna Bloemen[a]; prof. dr. Philip J van der Wees[b]; dr. Thomas J Hoogeboom[b]

[a] Department of Rehabilitation – Physical Therapy, Radboud Institute for Health Sciences, Radboud university medical center, Nijmegen, the Netherlands.

[b] IQ healthcare, Radboud Institute for Health Sciences, Radboud university medical center, Nijmegen, the Netherlands.

## CORRESPONDING AUTHOR

Niek Koenders

Department of Orthopaedics – Physical Therapy

Radboud university medical center, Nijmegen, the Netherlands

Radboud Institute for Health Sciences

Full postal address: Geert Grooteplein Zuid 10, 6525 GA NIJMEGEN, the Netherlands

Email: niek.koenders@radboudumc.nl

Telephone number: 0031-024 36 13812


## RUNNING TITLE

Indicators for inpatient physical activity


## KEYWORDS

Healthcare quality indicator, performance indicator, quality measure, physical activity

**WORD, REFERENCE AND GRAPHICS COUNT**

Abstract: 298

Main text: 2932

References: 55

Tables: 2

Figures: 1

**BRIEF SUMMARY**

A longlist of 23 quality indicators was constructed to grade, monitor, and improve care for hospitalized adults of all ages with (or at risk for) low physical activity during hospital stay.

## ABSTRACT

### Objective

To develop a longlist of healthcare quality indicators for the care of hospitalized adults of all ages with (or at risk for) low physical activity during the hospital stay.

### Design

A modified RAND/UCLA Appropriateness Method Delphi study.

### Setting and Participants

Participants were physical therapists, nurses, and managers working in Dutch university medical centers.

### Methods

The current study consisted of three phases. Phase 1 was a systematic literature search for quality indicators and relevant topics. Phase 2 was a survey amongst healthcare providers to collect additional data. Phase 3 consisted of three consensus rounds. In round one, experts rated the relevance of the potential indicators online (Delphi). The second round was a face-to-face expert panel meeting managed by an experienced moderator. The second round was a face-to-face expert panel meeting. Acceptability, feasibility, and validity of the quality indicators were discussed by the panel members. Disagreements were solved online (Delphi) in the third round.

### Results

The search retrieved 1,556 studies of which 53 studies were assessed full-text. Data from seventeen studies were included in a first draft longlist of indicators. Eighteen nurses and

one physical therapist responded to the survey and added data for a second draft of the longlist. Experts constructed the final longlist with 23 indicators in three consensus rounds. Eight themes were identified: “Aim”, “Patient-tailored physical activity plan”, “Evaluation of physical activity”, “Information on physical activity”, “Equipment to stimulate physical activity”, “Policy regarding physical activity”, “Attitude related to physical activity”, and “Other”.

**Conclusion and Implications**

The healthcare quality indicators developed in this study could help to grade, monitor, and improve healthcare for hospitalized adults of all ages with (or at risk for) low physical activity during the hospital stay. Future research will focus on the psychometric quality of the indicators and selection of key performance indicators.

**Strengths and limitations of this study**

- The current study consists of a systematic review with duplicate study selection, an extra survey in healthcare providers, and three consensus rounds with a panel meeting
- The panel meeting has been moderated by an internationally experienced moderator
- The longlist of healthcare quality indicators was developed without the involvement of patients, healthcare insurers, and external review

## INTRODUCTION

Quality of healthcare can be graded as "*the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and healthcare consistent with current knowledge*".[1] Healthcare quality indicators are used all over the world to quantify, grade, monitor, and improve the quality of healthcare.[2-4] Quality indicators, also known as performance indicators or quality measures, are often outlined as a trinity of quality: structure, process, and outcome indicators.[5 6] Structure refers to relatively stable characteristics, tools, and resources of the providers of healthcare related to the physical and organizational settings in which they work.[7] The process focuses on the interpersonal aspects of treatment components and technical skill in the delivery of services.[7] Outcome concentrates on the change in the patient's health status that can be attributed to preceding healthcare.[7] Recently, qualitative indicators have been introduced to express matters that are hard to capture quantitatively such as having confidence in being safe in a community.[8] Quality indicators are used in hospital care to provide information for quality improvement initiatives to, for example, decrease hospital mortality and complications.[9 10]

For decades, studies report low physical activity during the hospital stay in elderly[11-13] and remarkably even in patients who are able to walk independently[14]. More recently, studies suggest that the "physical inactivity epidemic" affects all hospitalized adults of all ages.[15] In adults and elderly, physical inactivity is related to an increased risk of iatrogenic disability[16 17] and adverse outcomes such as prolonged hospital stay and institutionalization are common and unnecessary[18 19]. Several quality improvement initiatives have been developed in hospital care to improve physical activity of patients during the hospital stay.[20-24] Quality improvement studies aiming to improve physical activity in hospitalized adults of all ages

have been described, but quality indicators to measure the results of such quality improvement strategies are scarce and mainly focus on physical activity of elderly.[25-27] Improving the quality of healthcare related to physical activity might require different age-related strategies, as barriers to physical activity are multi-factorial and include age-related expectations [28] and age-sensitive communication [29].

Quality indicators could be helpful to capture persisting barriers in an attempt to improve the physical activity of all patients.[30] As a first step, a longlist of relevant quality indicators is needed to serve as a database for healthcare providers, clinical teams and organizations to measure performance for quality improvement and accountability purposes.[27] Therefore, the aim of this study is to develop a longlist of quantitative and qualitative quality indicators for the healthcare in hospitalized adults of all ages with (or at risk for) low physical activity during the hospital stay.

## METHODS

### Design and setting

A modified RAND/UCLA Appropriateness Method Delphi study[31] was used to develop a longlist of quality indicators which meets the requirements of the Appraisal of Guidelines for Research and Evaluation (AGREE) II Healthcare Quality Indicator tool.[32] The AGREE II tool was used as a guiding checklist for study development (Supplementary Table A1). The reporting of this study followed guidelines of the Standards for QUality Improvement Reporting Excellence (SQUIRE 2.0).[33] The study was conducted in masked in accordance with the principles of the Declaration of Helsinki[34] and Good Clinical Practice Guideline[35]. Full ethical consideration was waived by the Ethics Committee of the masked in accordance with the

Dutch Medical Research with Human Subjects Law. There were no patients involved in this study.

All phases from the RAND/UCLA method were followed (Figure 1). Phase 1 was a systematic literature search to identify indicators and relevant topics for potential indicators. Phase 2 was an extra survey amongst healthcare providers to provide additional relevant topics. This extra survey was a modification to the original RAND/UCLA method to obtain as many relevant indicators and topics as possible. Phase 3 consisted of three consensus rounds in which potential indicators were rated for their relevance by experts.

**Literature search**

The literature search was conducted to develop the first draft of longlist of quality indicators for physical activity of hospitalized adults of all ages. CINAHL, MEDLINE, and EMBASE were systematically searched for studies up to 24 January 2018 using a pre-defined search strategy (Supplementary Table A2). The search strategy was compiled with the help of an experienced librarian (masked). All studies were independently screened by two researchers (masked) and data were extracted in duplicate.[36] An indicator was considered relevant if a definition, numerator, and denominator were described in the literature and related to physical activity of patients during the hospital stay. A topic was considered relevant when information in the text of articles commented on the physical activity of patients during the hospital stay.

**Extra survey**

All indicators and topics were then translated into the Dutch language and presented to a convenience sample of healthcare providers and managers of one Dutch academic hospital using an online questionnaire in LimeSurvey.[37] The participants were requested to suggest

additional topics related to physical activity of hospitalized adults of all ages. Furthermore, problems as a result of unclear translation or unclear formulation were solved with the help of the participants. The second draft was constructed by two researchers (masked) with quality indicators from both the literature review and additional input from healthcare providers and managers. Each topic was converted into an indicator by formulating a definition, numerator, and denominator. All converted topics were checked for loss of information due to the translation by a third researcher (masked).

**Consensus rounds**

The second draft of the longlist with quality indicators was presented for relevance rating in the three consensus rounds with experts[38] For inclusion in the consensus rounds with experts, a purposive sample was recruited with national expert physical therapists, nurses, and managers in hospitals who had expert knowledge about physical activity of patients during hospital stay.[39] Inclusion criteria for experts were: working as a physical therapist, nurse or manager in a university medical center; and member of an acknowledged national workgroup related to physical activity of patients during the hospital stay. The researchers (masked) identified 28 experts who were approached by email and telephone for participation within the current study.

In the first consensus round (Delphi method), the experts received the longlist of quality indicators online in LimeSurvey. All indicators were rated on relevance by the experts for the first consensus label: *selection*, *discussion* or *no selection*. In the second round, all quality indicators were discussed in a panel meeting with experts (panel members) moderated by an experienced moderator (masked). First, the panel members discussed the acceptability to healthcare providers and managers, the feasibility of use, and the validity in terms of

providing more appropriate care and optimizing patient outcomes.[31] Finally, all panel members voted (yes or no) for final consensus on *selection*, *discussion*, or *no selection* of the quality indicators. A methodologist (masked) observed the panel meeting from the side-line and intervened if methodological errors occurred. In the third consensus round (Delphi method), all panel members received only the modified quality indicators and quality indicators which were still under discussion online in LimeSurvey for final consensus.

**Data analysis**

The experts were instructed to rate the quality indicators on relevance only, not on e.g. feasibility or reliability. The relevance was scored using a 9-point Likert scale ranging from 1 *not relevant* to 9 *very relevant*. Consensus outcomes were calculated from the relevance ratings using the *masked*.[40] The consensus outcomes were based on the median score and the highest tertile, which resulted in labels: *selection*, *discussion*, or *no selection* (Table 1). Quality indicators were labeled *selection* when the median score was ≥8 on the 9-point Likert scale and ≥70% of the responses were in the highest tertile. *Discussion* was the label as a result of three possible outcomes, 1) the median score was ≥8 though less than 70% of the responses were in the highest tertile, 2) the median score was <8 though more than 70% of the responses were in the highest tertile, or 3) 30% of the responses were in the lowest and highest tertile. An indicator was labeled *no selection* when the median was ≤7 and less than 70% of the responses were in the highest tertile.

*Table 1. Labels corresponding to the consensus outcomes following different quantitative relevance ratings of experts in the consensus rounds using the IQ healthcare consensus tool.*

| | **≥70% in the highest tertile** | **≥30% in the lowest tertile, and ≥30% in the highest tertile** | **<70% in the highest tertile** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Median ≤ 3** | Discussion | Discussion | No selection |
| **Median 4 ≤ 7** | Discussion | Discussion | No selection |
| **Median ≥ 8** | Selection | Discussion | Discussion |

In the second consensus round (panel meeting), the panel members received information on all first-round outcomes with corresponding labels per quality indicator. The panel members voted yes or no for final *selection*, *discussion*, or *no selection* with consensus if at least 75% of the members voted for one final outcome. The quality indicators were – if needed – modified to improve the concise formulation. If modification(s) were suggested, the quality indicators were reformulated and rated (online and anonymous) for a second time by the panel members. The quality indicators which remained under discussion were – if needed – modified and rated by the panel members in the third online consensus round. After the third consensus round, only quality indicators which were labeled *selection* were included in the longlist of quality indicators. Ultimately, all selected quality indicators were charted by theme and translated into the English language with a standardized forward-backward by the Language Centre of the MASKED.

## RESULTS

### Literature search

The systematic literature search retrieved a total of 1,556 studies, including 8 studies through searching the grey literature (Supplementary Table A2, Supplementary Figure A1). Fifty-three studies were assessed on full-text for eligibility, ultimately resulting in the inclusion of 17 articles.[11 14-17 19 25-27 41-48] Data extraction resulted in the identification of 29

unique indicators and 5 topics related to hospitalized adults of all ages with (or at risk for) low physical activity during hospital stay for a first draft longlist of quality indicators.

**Extra survey**

The 29 indicators and 5 topics were translated into the Dutch language and surveyed amongst 296 healthcare providers. Eighteen nurses and 1 physical therapist responded and they suggested 20 additional topics. Twenty-five topics were reformulated and converted into indicators, ultimately resulting in 54 unique indicators in the second draft longlist of quality indicators (Supplementary Table A3).

**Consensus rounds**

Consensus round 1 – Twenty-eight experts were invited to participate in the first online Delphi round. Ultimately, 14 experts responded: 8 physical therapists, 4 nurses and 2 managers. A total of 22 indicators were labeled *selection*, 12 indicators *discussion*, and 20 indicators *no selection* as a result of the first round. A detailed overview of ratings and selections is provided in Supplementary Table A4.

Consensus round 2 – The panel meeting lasted three hours with a total of 5 panel members: 4 physical therapists and 1 nurse. At the start, the moderator asked to discuss two key issues which were identified in the first Delphi round. Firstly, the concept of physical activity during hospital stay was discussed and operationalized for the panel meeting as *"an active transfer of a body(part) by a hospitalized patient*". This did not include exercises or a transfer of a body(part) using a machine or object such as a standing aid or hospital bed. Secondly, the physical activity plan was operationalized as *"an object in which physical activity should be reported, tailored at individual patients' needs, with a specific structure stating personal goals, frequency, intensity, time, and type of physical activity. In addition, the amount of*

*support needed for mobilization should be described, for example, the need for a walking aid*". Of all 22 indicators with the label *selection*, the panel members voted consensus for *selection* of 15 indicators, *discussion* of 5 indicators, and *no selection* of 2 indicators. Of all 12 indicators with the label *discussion*, the panel members voted consensus for *selection* of 5 indicators, *discussion* of 1 indicator, and *no selection* of 6 indicators. Of all 20 indicators with the label *no selection*, the panel members voted consensus for *discussion* of 1 indicator and *no* selection of 19 indicators. As a result of the second consensus round, 20 indicators were *selected*, 7 indicators remained under *discussion* and were included in round 3, and 27 indicators were *not selected* (Supplementary Table A4).

Consensus round 3 (Delphi) – In the third round, the final rating of the 7 remaining indicators resulted in the *selection* of 3 indicators, *discussion* of 3 indicators, and *no selection* of 1 indicator. The discussion remained on three indicators (numbers 30, 32, 47) resulting in *no selection* due to a lack of consensus (Supplementary Table A4). A flow diagram of the quality indicators selection is presented in Figure 1.

Please insert Figure 1 'Flow diagram showing the selection of healthcare quality indicators in all phases of the study' about here.

**Final longlist indicators**

The final longlist of quality indicators includes 23 indicators which were categorized in eight themes (Table 2). The first theme, "*Aim"*, consists of one indicator that describes the intention of achieving physical activity of patients within 48 hours after hospital admission. The second theme, "*Patient-tailored physical activity plan"*, describes quality indicators related to the use and follow-up of a patient-tailored physical activity plan that "*should be reported, tailored at individual patients' needs, with a specific structure stating personal*

*goals, frequency, intensity, time, and type of physical activity".* The third theme, "*Evaluation of physical activity"* includes quality indicators on timely documentation and assessment of physical activity of patients by a healthcare provider. The fourth theme, *"Information on physical activity"*, describes two quality indicators related to the provision of educational information to both patients and close-relatives. The fifth theme includes quality indicators on *"Equipment to stimulate physical activity"*. Within this theme, specific attention is given to limited use of freedom and mobility limiting equipment such as five-point fixation, intravenous lines, and urinary catheters. The sixth theme describes two quality indicators in the theme "*Policy regarding physical activity"* to evaluate institutional characteristics of the hospital (ward) in which healthcare providers work. The seventh theme describes three qualitative quality indicators in which the "*Attitude related to physical activity"* of physicians and nurses should be assessed. At last, three quality indicators were labeled as "*Other"*.

*Table 2. The final longlist healthcare quality indicators for the care of patients with (or at risk for) low physical activity during the hospital stay.*

| Theme | | Healthcare quality indicators |
|---|---|---|
| **1. Aim** | ***Title:*** | **1. Patients should be physically active within 48 hours after hospital admission (Outcome indicator)** |
| | *Numerator:* | The number of patients who were physically active within 48 hours after hospital admission. |
| | *Denominator:* | The number of patients. |
| | | *Adapted from Arora et al.[26]* |
| **2. Patient-tailored physical activity plan** | ***Title:*** | **2. Patients should have a physical activity plan (Process indicator)** |
| | *Numerator:* | The number of patients who had a physical activity plan within 48 hours after hospital admission. |
| | *Denominator:* | The number of patients. |
| | | *Adapted from Growdon et al.[43] and Lafont et al [17]* |
| | ***Title:*** | **3. Patients in need for support during mobilization should have a physical activity plan (Process indicator)** |

| | | |
|---|---|---|
| | *Numerator:* | The number of patients, who needed the support of (at least) one person for mobilization, with a physical activity plan. |
| | *Denominator:* | The number of patients who needed the support of at (least) one person for mobilization. |
| | | *Adapted from Growdon et al.[43] and Lafont et al.[17]* |
| | ***Title:*** | **4. Patients without need for support during mobilization should have a physical activity plan (Process indicator)** |
| | *Numerator:* | The number of patients, who did not need the support of a person for mobilization, with a physical activity plan. Patients who only use (a) walking aid(s) are considered independent. |
| | *Denominator:* | The number of patients who did not need the support of a person for mobilization. |
| | | *Adapted from Growdon et al.[43] and Lafont et al.[17]* |
| | ***Title:*** | **5. Patients should perform physical activities as described in their physical activity plan (Outcome indicator)** |
| | *Numerator:* | The number of patients who performed physical activities as described in their physical activity plan. |
| | *Denominator:* | The number of patients with a physical activity plan. |
| | | *Adapted from Growdon et al.[43] and Lafont et al.[17]* |
| **3. Evaluation of physical activity** | ***Title:*** | **6. Nurses or physical therapists should evaluate the preadmission physical ability (Process indicator)** |
| | *Numerator:* | The number of patients in which the preadmission physical functioning was evaluated within 24 hours after hospital admission. |
| | *Denominator:* | The number of patients. |
| | | *Adapted from Brown et al.[11], Pedersen et al.[14], Lafont et al.[17], Zisberg et al.[19], Covinsky et al.[41], Bail et al.[25], Arora et al.[42], Tropea et al.[27], and Counsell et al.[47]* |
| | ***Title:*** | **7. Nurses or physical therapists should evaluate the mobility (Process indicator)** |
| | *Numerator:* | The number of patients in which the mobility was evaluated within 24 hours after hospital admission. |
| | *Denominator:* | The number of patients. |
| | | *Adapted from Covinsky et al.[41]* |
| | ***Title:*** | **8. Patients should be evaluated after a fall incident (Process indicator)** |
| | *Numerator:* | The number of patients in which a fall incident was evaluated within 24 hours after the fall. |
| | *Denominator:* | The number of patients with a fall incident. |
| | | *Adapted from Arora et al.[26] and Tropea et al.[27]* |
| **4. Information on physical activity** | ***Title:*** | **9. Patients should be informed about the importance of physical activity (Process indicator)** |
| | *Numerator:* | The number of patients who were informed about the |

| | | |
|---|---|---|
| | | importance of physical activity during the hospital stay. |
| | *Denominator:* | The number of patients<br>*Adapted from Bail et al.*[25] |
| | *Title:* | **10. Close-relatives of patients should be informed about the importance of physical activity (Process indicator)** |
| | *Numerator:* | The number of close-relatives of patients who were informed about the importance of physical activity during the hospital stay. |
| | *Denominator:* | The number of patients with close-relatives.<br>*Adapted from Bail et al.*[25] |
| **5. Equipment to stimulate physical activity** | ***Title:*** | **11. Patients should have adequate walking aids (Structure indicator)** |
| | *Numerator:* | The number of patients who were advised to use (a) walking aid(s), with (an) adequate walking aid(s) available. |
| | *Denominator:* | The number of patients who were advised to use (a) walking aid(s).<br>*Expert opinion* |
| | ***Title:*** | **12. Nurses should evaluate freedom limiting equipment (Process indicator)** |
| | *Numerator:* | The nurses performed a daily assessment of the use of freedom-limiting equipment. Examples are five-point fixation, wheelchair tables, and wheelchair brakes. |
| | *Answer:* | Yes or no.<br>*Adapted from Inouye et al.*[44] *and Sourdet et al.*[16] |
| | ***Title:*** | **13. Nurses should evaluate mobility limiting equipment (Process indicator)** |
| | *Numerator:* | The nurses performed a daily assessment of the use of mobility-limiting equipment in patients. Examples are intravenous lines, urinary catheters, and oxygen tubes. |
| | *Answer:* | Yes or no.<br>*Adapted from Inouye et al.*[44] *and Sourdet et al.*[16] |
| | ***Title:*** | **14. The hospital (ward) should provide adequate resources to stimulate physical activity (Structure indicator)** |
| | *Numerator:* | The hospital (ward) provided physical activity stimulating resources. Examples are: walking routes, treadmills, ergometers. |
| | *Answer:* | Yes or no.<br>*Adapted from Bail et al.*[25] *and Covinsky et al.*[41] |
| | ***Title:*** | **15. The hospital (ward) should have orientation promoting resources (Structure indicator)** |
| | *Numerator:* | The hospital (ward) provided orientation stimulating resources. Examples are: maps, direction signs, banners with route information |

| | | |
|---|---|---|
| | *Answer:* | Yes or no.<br>*Adapted from Bail et al.[25] and Covinsky et al.[41]* |
| **6. Policy regarding physical activity** | ***Title:*** | **16. The hospital (ward) should have the policy to improve the physical activity of patients (Structure indicator)** |
| | *Numerator:* | The hospital (ward) policy was to inform patients to be physically active during the hospital stay. |
| | *Answer* | Yes or no.<br>*Expert opinion* |
| | ***Title:*** | **17. The hospital (ward) should have the policy to inform close-relatives about physical activity (Structure indicator)** |
| | *Numerator:* | The hospital (ward) policy was to inform close-relatives of patients about the importance of physical activity during the hospital stay. |
| | *Answer:* | Yes or no.<br>*Expert opinion* |
| **7. Attitude related to physical activity** | ***Title:*** | **18. Physicians should stimulate the physical activity of patients (Qualitative indicator)** |
| | *Numerator:* | The number of physicians who had a stimulating attitude towards the physical activity of patients during the hospital stay |
| | *Denominator:* | The number of physicians.<br>*Adapted from Inouye et al.[44] and Sourdet et al.[16]* |
| | ***Title:*** | **19. Nurses should stimulate the physical activity of patients (Qualitative indicator)** |
| | *Numerator:* | The number of nurses who had a stimulating attitude towards the physical activity of patients during the hospital stay. |
| | *Denominator:* | The number of nurses<br>*Adapted from Inouye et al.[44] and Sourdet et al.[16]* |
| | ***Title:*** | **20. Nurses should stimulate independent functioning in daily activities of patients (Qualitative indicator)** |
| | *Numerator:* | The number of nurses who had a stimulating attitude towards independent physical functioning in daily activities of patients during the hospital stay. |
| | *Denominator:* | The number of nurses.<br>*Adapted from Sourdet et al.[16], Pedersen et al.[14], and Brown et al.[11]* |
| **8. Other** | ***Title:*** | **21. Patients should receive support for mobilization (Process indicator)** |
| | *Numerator:* | The number of patients who received the support of (at least) one person for mobilization. |
| | *Denominator:* | The number of patients who needed the support of (at least) one person for mobilization.<br>*Adapted from Growdon et al.[43] and Lafont et al.[17]* |

| | | |
|---|---|---|
| | ***Title:*** | **22. Patients should have an acceptable degree of pain (Outcome indicator)** |
| | *Numerator:* | The number of patients who scored *pain at rest* and *pain during physical activities* with a Numeric Pain Rating Scale ≤4. |
| | *Denominator:* | The number of patients. *Adapted from Sourdet et al.[16], Covinsky et al.[41], and Arora et al.[42]* |
| | ***Title:*** | **23. Nurses should have followed education related to physical activity of patients (Structure indicator)** |
| | *Numerator:* | The number of nurses who followed education concerning the importance of physical activity of patients during the hospital stay. |
| | *Denominator:* | The number of patients. *Adapted from Bail et al.[25]* |

## DISCUSSION

The current study presents the development of a longlist with quantitative and qualitative healthcare quality indicators for the healthcare of hospitalized adults of all ages with (or at risk for) low physical activity during the hospital stay. A multidisciplinary expert panel agreed on a list of 23 quality indicators with important themes such as an aim, patient-tailored physical activity plan, evaluation of physical activity, information on physical activity, equipment to stimulate physical activity, policy regarding physical activity, and attitude related to physical activity. The quality indicators involve several stakeholders such as patients, close-relatives, and healthcare providers (i.e. physical therapists, nurses, and physicians), which is consistent with the multi-factorial nature of the low physical activity of patients during the hospital stay.[41]

In the view of current literature related to indicator development in secondary healthcare, several studies reported on physical activity of the elderly.[25-27] In contrast to our study, none of these aimed to evaluate physical activity in hospitalized adults of all ages during the hospital stay. Bail et al.[25] performed a literature review and constructed a theoretical

framework called 'Failure to maintain'. This study suggested quality indicators on physical environment factors and process factors (treatment and regimes that may affect the patient) to increase physical activity in complex older patients and ultimately decrease the incidence of urinary tract infections, pneumonia, delirium, and pressure injuries. Arora et al.[26] also performed a literature review for the general medical care of hospitalized vulnerable elderly. Out of thirty reported quality indicators, only two related to physical activity of patients during hospital stay: mobilization and inpatient fall evaluation. These two themes are likely to be important, although only two quality indicators do not completely address the complex issue of low physical activity in patients during the hospital stay.[49] Tropea et al.[27] performed a Delphi study with anonymous voting rounds and a panel meeting similar to the current study, ultimately resulting in a set of quality indicators for healthcare in older hospitalized patients. Three quality indicator themes related to physical activity in patients during hospital stay with five relevant quality indicators: inpatient fall evaluation, fall-related injuries including fractures, pressure ulcer risk assessment, discharge assessment, and assessment of physical function.

Interestingly, the current study found two quality indicators with a focus on hospital (ward) policy. Quality improvement studies which aim to improve physical activity in hospitalized adults of all ages should include the perspective of local hospital policy in their study development and process evaluation in line with the Medical Research Council recommendations.[50] Furthermore, qualitative quality indicators were described to evaluate the attitudes of healthcare providers related to physical activity. Attitudes are often hard to measure and therefore ignored in other studies,[8] despite the knowledge that attitudes of different stakeholders play an important role in healthcare quality improvement.[51] With low physical activity during hospital stay being a multi-factorial issue in hospitalized adults of all

ages, the current study provides crucial knowledge to evaluate healthcare for hospitalized adults of all ages (with or) at risk for low physical activity during the hospital stay.

**Strengths and limitations**

The current study has several strengths. First, all methods as suggested by the modified RAND/UCLA are followed in detail. The use of a rigorous systematic review with duplicate study selection, an extra survey in healthcare providers, and consensus rounds with a panel meeting is considered as a very rigor quality indicators development procedure.[52] Second, the panel meeting has been moderated by an internationally experienced moderator (masked) which contributed to an efficient and systematic discussion of all quality indicators.

There are also a number of limitations to the current study that need to be discussed. First, only five panel members participated in the panel meeting which is lower than the preferred seven to fifteen members within the RAND/UCLA method.[31] Despite the reduced diversity of representation, the smaller group size was found to stimulate the involvement of every panel member in the group discussion. Second, two items of the AGREE II are not met.[32] The quality indicators are not submitted to external review, and stakeholders such as patients, managers, and healthcare insurers are insufficiently included in the process of quality indicators development. However, the limited external review and stakeholder involvement could be adequately addressed in future research.

**Recommendations for future research**

The longlist of quality indicators needs to be applied in practice to further assess the acceptability to healthcare providers and managers, the feasibility of use, and the validity. A validation study following the Delphi technique of Hasson et al.[52] in a team of national and international experts would provide crucial information on the appropriateness of care and

optimization of patient outcomes. To improve feasibility in daily practice, it would be useful to select approximately three or four key performance quality indicators from the current longlist. Ultimately, a quality improvement study should use the key performance quality indicators in daily healthcare and assess their effect on patient outcomes such as physical activity and iatrogenic disability.

**Conclusions and Implications**

The healthcare quality indicators developed within the current study form a rigorous basis to evaluate healthcare for hospitalized adults of all ages with (or at risk for) low physical activity during the hospital stay. Improvement in the healthcare related to low physical activity of patients during the hospital stay is urgently needed, as the epidemic of low physical activity already lasts for decades with known, well-reported adverse outcomes such as iatrogenic disability. Quality improvement projects to increase the physical activity of patients during the hospital stay using currently developed healthcare quality indicators are promising, relevant, and will improve outcomes in hospitalized adults of all ages.

**ACKNOWLEDGEMENTS**

We would like to thank librarian On Ying Chan for her help in the systematic literature search. Inge Janssen and Rebecca Cooke of the Language Centre (HAN University of Applied Sciences, Nijmegen, the Netherlands) are thanked for their forward-backward translation of the longlist of healthcare quality indicators. All members of the Dutch expert group *Beweegziekenhuizen* are thanked for their help in study conceptualization and data collection.

**COMPETING INTERESTS**

All authors declare that they have no competing interests.

**FUNDING**

This research did not receive and funding from agencies in the public, commercial or not-for-profit sectors.

**AUTHORS' CONTRIBUTIONS**

NK, SH, and TH contributed to study conceptualization. Data collection and analysis was handled by NK, SH, PW, and TH. SB provided resources and contributed to project administration. PW and TH supervised all research activities. All authors reviewed concept drafts of the manuscript and approved submission of the final draft.

**DATA AVAILABILITY**

No additional data available. All data is provided in detail in the online Supplementary File.

## REFERENCES


1. Mitchell PH. Defining patient safety and quality care2008.
2. Petersson IF, Strömbeck B, Andersen L, et al. Development of healthcare quality indicators for rheumatoid arthritis in Europe: the eumusc. net project. *Annals of the rheumatic diseases* 2013:annrheumdis-2013-203765.
3. Steinke S, Beikert FC, Langenbruch A, et al. Measurement of healthcare quality in atopic dermatitis - development and application of a set of quality indicators. *Journal of the European Academy of Dermatology and Venereology : JEADV* 2018 doi: 10.1111/jdv.15074 [published Online First: 2018/05/16]
4. Bellmunt S, Roque M, Osorio D, et al. Healthcare quality indicators of peripheral artery disease based on systematic reviews. *European journal of vascular and endovascular surgery : the official journal of the European Society for Vascular Surgery* 2014;48(1):60-9. doi: 10.1016/j.ejvs.2014.02.001 [published Online First: 2014/03/22]
5. Donabedian A. The quality of care: how can it be assessed? *Jama* 1988;260(12):1743-48.
6. Salzer MS, Nixon CT, Schut LJA, et al. Validating quality indicators: Quality as relationship between structure, process, and outcome. *Evaluation Review* 1997;21(3):292-309.
7. Donabedian A. Explorations in Quality Assessment and Monitoring: The definition of quality and approaches to its assessment. 1980. *Ann Arbor, Health Administration Press*
8. Church C, Rogers MM. Designing for results: Integrating monitoring and evaluation in conflict transformation programs: Search for Common Ground 2006.
9. Wright J, Dugdale B, Hammond I, et al. Learning from death: a hospital mortality reduction programme. *Journal of the Royal Society of Medicine* 2006;99(6):303-08.
10. Haynes AB, Weiser TG, Berry WR, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *New England Journal of Medicine* 2009;360(5):491-99.
11. Brown CJ, Redden DT, Flood KL, et al. The underrecognized epidemic of low mobility during hospitalization of older adults. *Journal of the American Geriatrics Society* 2009;57(9):1660-5. doi: 10.1111/j.1532-5415.2009.02393.x [published Online First: 2009/08/18]
12. Warshaw GA, Moore JT, Friedman SW, et al. Functional disability in the hospitalized elderly. *Jama* 1982;248(7):847-50. [published Online First: 1982/08/20]
13. Lazarus BA, Murphy JB, Coletta EM, et al. The provision of physical activity to hospitalized elderly patients. *Archives of internal medicine* 1991;151(12):2452-6. [published Online First: 1991/12/01]
14. Pedersen MM, Bodilsen AC, Petersen J, et al. Twenty-four-hour mobility during acute hospitalization in older medical patients. *The journals of gerontology Series A, Biological sciences and medical sciences* 2013;68(3):331-7. doi: 10.1093/gerona/gls165 [published Online First: 2012/09/14]
15. Mudge AM, McRae P, McHugh K, et al. Poor mobility in hospitalized adults of all ages. *Journal of hospital medicine* 2016 doi: 10.1002/jhm.2536 [published Online First: 2016/01/23]
16. Sourdet S, Lafont C, Rolland Y, et al. Preventable Iatrogenic Disability in Elderly Patients During Hospitalization. *Journal of the American Medical Directors Association* 2015;16(8):674-81. doi: 10.1016/j.jamda.2015.03.011 [published Online First: 2015/04/30]
17. Lafont C, Gerard S, Voisin T, et al. Reducing "iatrogenic disability" in the hospitalized frail elderly. *The journal of nutrition, health & aging* 2011;15(8):645-60. [published Online First: 2011/10/05]
18. Boyd CM, Landefeld CS, Counsell SR, et al. Recovery of activities of daily living in older adults after hospitalization for acute medical illness. *Journal of the American Geriatrics Society* 2008;56(12):2171-79.
19. Zisberg A, Shadmi E, Sinoff G, et al. Low mobility during hospitalization and functional decline in older adults. *Journal of the American Geriatrics Society* 2011;59(2):266-73. doi: 10.1111/j.1532-5415.2010.03276.x [published Online First: 2011/02/15]

20. Liu B, Moore JE, Almaawiy U, et al. Outcomes of Mobilisation of Vulnerable Elders in Ontario (MOVE ON): a multisite interrupted time series evaluation of an implementation intervention to increase patient mobilisation. *Age and ageing* 2018;47(1):112-19. doi: 10.1093/ageing/afx128 [published Online First: 2017/10/07]
21. Oliver D. David Oliver: Fighting pyjama paralysis in hospital wards. *BMJ (Clinical research ed)* 2017;357:j2096. doi: 10.1136/bmj.j2096 [published Online First: 2017/05/04]
22. Booth KA, Simmons EE, Viles AF, et al. Improving Geriatric Care Processes on Two Medical-Surgical Acute Care Units: A Pilot Study. *Journal for healthcare quality : official publication of the National Association for Healthcare Quality* 2018 doi: 10.1097/jhq.0000000000000140 [published Online First: 2018/05/26]
23. Teodoro CR, Breault K, Garvey C, et al. STEP-UP: Study of the Effectiveness of a Patient Ambulation Protocol. *Medsurg nursing : official journal of the Academy of Medical-Surgical Nurses* 2016;25(2):111-6. [published Online First: 2016/06/22]
24. Brown CJ, Foley KT, Lowman JD, et al. Comparison of posthospitalization function and community mobility in hospital mobility program and usual care patients: a randomized clinical trial. *JAMA internal medicine* 2016;176(7):921-27.
25. Bail K, Grealish L. 'Failure to Maintain': A theoretical proposition for a new quality indicator of nurse care rationing for complex older people in hospital. *International journal of nursing studies* 2016;63:146-61. doi: 10.1016/j.ijnurstu.2016.08.001 [published Online First: 2016/09/23]
26. Arora VM, McGory ML, Fung CH. Quality indicators for hospitalization and surgery in vulnerable elders. *Journal of the American Geriatrics Society* 2007;55 Suppl 2:S347-58. doi: 10.1111/j.1532-5415.2007.01342.x [published Online First: 2007/10/04]
27. Tropea J, Amatya B, Brand CA. Use of consensus methods to select clinical indicators to assess activities to minimise functional decline among older hospitalised patients. *Australian health review : a publication of the Australian Hospital Association* 2011;35(4):404-11. doi: 10.1071/ah09790 [published Online First: 2011/12/01]
28. So C, Pierluissi E. Attitudes and expectations regarding exercise in the hospital of hospitalized older adults: a qualitative study. *Journal of the American Geriatrics Society* 2012;60(4):713-8. doi: 10.1111/j.1532-5415.2012.03900.x [published Online First: 2012/03/21]
29. Boltz M, Capezuti E, Shabbat N. Nursing staff perceptions of physical function in hospitalized older adults. *Applied nursing research : ANR* 2011;24(4):215-22. doi: 10.1016/j.apnr.2010.01.001 [published Online First: 2010/10/27]
30. Hoyer EH, Friedman M, Lavezza A, et al. Promoting mobility and reducing length of stay in hospitalized general medicine patients: A quality-improvement project. *Journal of hospital medicine* 2016;11(5):341-7. doi: 10.1002/jhm.2546 [published Online First: 2016/02/06]
31. Fitch K, Bernstein SJ, Aguilar MD, et al. The RAND/UCLA appropriateness method user's manual: RAND CORP SANTA MONICA CA, 2001.
32. Abrahamyan L, Boom N, Donovan LR, et al. An international environmental scan of quality indicators for cardiovascular care. *The Canadian journal of cardiology* 2012;28(1):110-8. doi: 10.1016/j.cjca.2011.09.019 [published Online First: 2011/12/14]
33. Ogrinc G, Davies L, Goodman D, et al. SQUIRE 2.0 (Standards for QUality Improvement Reporting Excellence): revised publication guidelines from a detailed consensus process. *BMJ quality & safety* 2016;25(12):986-92. doi: 10.1136/bmjqs-2015-004411 [published Online First: 2015/09/16]
34. Association WM. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *Jama* 2013;310(20):2191.
35. Grimes DA, Hubacher D, Nanda K, et al. The Good Clinical Practice guideline: a bronze standard for clinical research. *The Lancet* 2005;366(9480):172-74.
36. Higgins JP, Green S. Cochrane handbook for systematic reviews of interventions: John Wiley & Sons 2011.

37. N. S, J. W, A. M, et al. The impact of psychological distress on functional disability in asthma: Results from The Canadian Community Health Survey. *Psychosomatics* 2009;50(1):42-49.
38. Boulkedid R, Abdoul H, Loustau M, et al. Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. *PloS one* 2011;6(6):e20476.
39. Portney LG, Watkins M. Foundations of clinical research: applications to pratice: FA Davis Company/Publishers 2015.
40. Stienen J, Ouwens M, Pols M, et al. Hoe kom je tot de kern van de zaak? *Tijdschrift voor gezondheidswetenschappen* 2011;89(8):405-08.
41. Covinsky KE, Pierluissi E, Johnston CB. Hospitalization-associated disability:"She was probably able to ambulate, but I'm not sure". *Jama* 2011;306(16):1782-93.
42. Arora VM, Plein C, Chen S, et al. Relationship between quality of care and functional decline in hospitalized vulnerable elders. *Medical care* 2009;47(8):895-901. doi: 10.1097/MLR.0b013e3181a7e3ec [published Online First: 2009/07/15]
43. Growdon ME, Shorr RI, Inouye SK. The Tension Between Promoting Mobility and Preventing Falls in the Hospital. *JAMA internal medicine* 2017;177(6):759-60. doi: 10.1001/jamainternmed.2017.0840
44. Inouye SK, Brown CJ, Tinetti ME. Medicare nonpayment, hospital falls, and unintended consequences. *The New England journal of medicine* 2009;360(23):2390-3. doi: 10.1056/NEJMp0900963 [published Online First: 2009/06/06]
45. Grube MM, Dohle C, Djouchadar D, et al. Evidence-based quality indicators for stroke rehabilitation. *Stroke* 2012;43(1):142-6. doi: 10.1161/strokeaha.111.627679 [published Online First: 2011/10/25]
46. Le H, Khankhanian P, Joshi N, et al. Patients recovering from abdominal surgery who walked with volunteers had improved postoperative recovery profiles during their hospitalization. *World journal of surgery* 2014;38(8):1961-5. doi: 10.1007/s00268-014-2491-5 [published Online First: 2014/03/13]
47. Counsell SR, Holder CM, Liebenauer LL, et al. Effects of a multicomponent intervention on functional outcomes and process of care in hospitalized older patients: a randomized controlled trial of Acute Care for Elders (ACE) in a community hospital. *Journal of the American Geriatrics Society* 2000;48(12):1572-81. [published Online First: 2000/12/29]
48. Fisher SR, Kuo YF, Sharma G, et al. Mobility after hospital discharge as a marker for 30-day readmission. *The journals of gerontology Series A, Biological sciences and medical sciences* 2013;68(7):805-10. doi: 10.1093/gerona/gls252 [published Online First: 2012/12/21]
49. Koenders N, van Oorsouw R, Seeger JPH, et al. "I'm not going to walk, just for the sake of walking...": a qualitative, phenomenological study on physical activity during hospital stay. *Disability and rehabilitation* 2018:1-8. doi: 10.1080/09638288.2018.1492636 [published Online First: 2018/08/11]
50. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ (Clinical research ed)* 2008;337:a1655-a55. doi: 10.1136/bmj.a1655
51. Wensing MJP, Grol RPTM. Implementatie: Effectieve verbetering van de patiëntenzorg: Bohn Stafleu van Loghum 2017.
52. Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. *Journal of advanced nursing* 2000;32(4):1008-15. [published Online First: 2000/11/30]

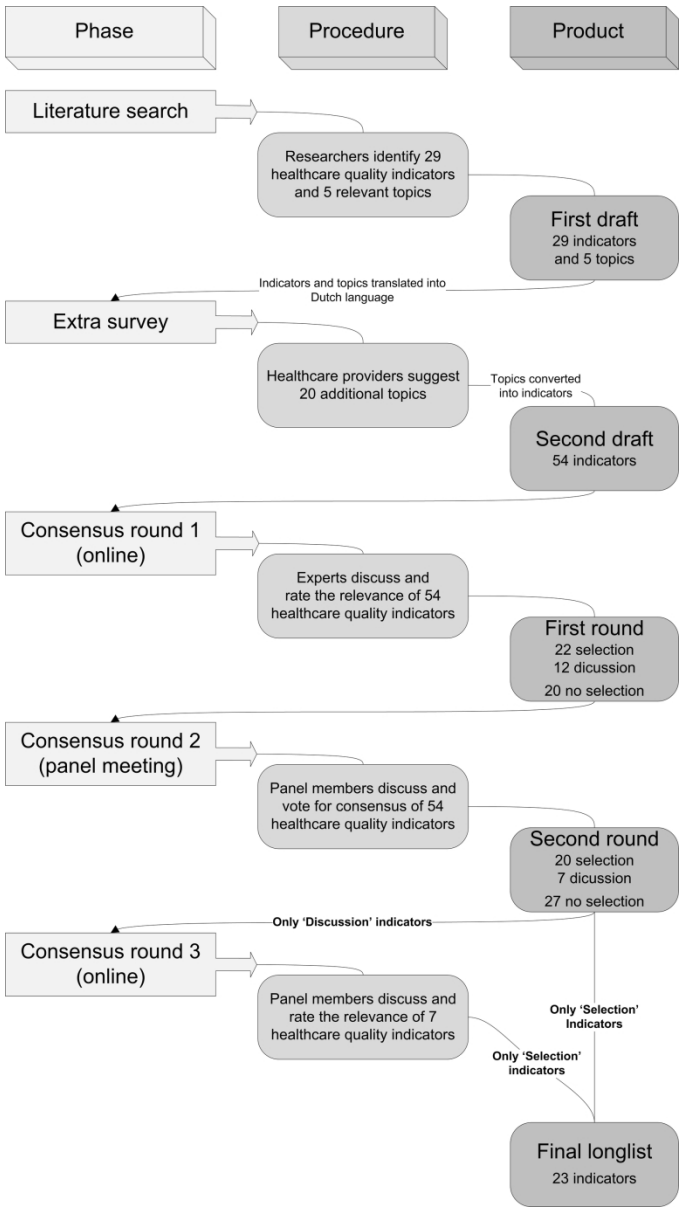



Figure 1 'Flow diagram showing the selection of healthcare quality indicators in all phases of the study

160x284mm (300 x 300 DPI)

*Supplementary Table A1. Agree II quality indicator tool: Quality items and followed procedures for the development of healthcare quality indicators for the care of patients with (or at risk for) low physical activity during hospital stay. Adapted from Peter et al.*[55]

| | |
|---|---|
| **Domain 1. Scope and purpose** | |
| The overall objectives of the quality indicator development initiative are specifically described. | The purpose of this quality indicators development was to assess the quality of care for patients with (or at risk for) low physical activity during hospital stay. |
| The population to whom the indicators are meant to apply is specifically described. | Adult hospitalized adults of all ages during hospital stay, with specific attention for patients with (or at risk for) low physical activity. |
| **Domain 2. Stakeholder involvement** | |
| The indicator development group includes individuals from relevant professional groups in line with the overall objective. | First, an acknowledged group of experts in physical activity of patients during hospital stay was contacted. From this group with healthcare providers, researchers, innovators, and implementation experts, a multidisciplinary expert panel was formed. |
| The target users of the indicators are clearly defined. | The target users of the quality indicators are physical therapists and nurses working in hospital care, treating patients with low physical activity during hospital stay. |
| **Domain 3. Rigour development** | |
| Systematic methods were used to search for evidence. | Evidence was based on a systematic literature search conducted in CINAHL, MEDLINE, and EMBASE. Details are provided in Supplementary Table A2 and Supplementary Figure A1. |
| The criteria for selecting the indicators are clearly described. | A RAND/UCLA-modified Delphi method was used for the selection of quality indicators. The *masked* was used to calculate consensus and provide information on selection, discussion or no selection according to pre-defined cut-off values. |
| The methods for formulating the indicators are clearly described. | Formulation of the quality indicators was done by the researchers (masked) and checked by a third researcher (masked). The formulation was subsequently discussed by all healthcare providers and experts participating in this study before the second draft of the longlist of quality indicators. The expert panel commented on the formulation of all quality indicators before discussing indicator selection and the final draft of the longlist of quality indicators. |
| There was a predefined quantitative process for indicator selection. | A numeric rating scale from 1 (completely irrelevant) to 9 (extremely relevant) was used for scoring by the expert panel. Details for quantitative quality indicators |

| | |
|---|---|
| | selection are provided in Supplementary Table 2. |
| An explicit link between the indicators and supporting evidence is provided. | For each quality indicator, relevant studies were provided in summary and full-text. If no relevant evidence was available, it was stated that the quality indicator was based on expert opinion. |
| The indicators have been externally reviewed by experts/end-users prior to publication. | An external review was not conducted. A subsequent study will be conducted to test the feasibility, validity, and implementation of the quality indicators suggested in the final draft longlist of quality indicators. |
| A procedure for updating the indicators is provided and/or the indicator set has been updated. | The quality indicators will be updated every five years in collaboration with the national professional association for hospital physical therapy. |
| **Domain 4. Clarity of presentation** | |
| The indicators are specific and unambiguous. | For each quality indicator, a numerator and denominator were formulated to quantify the indicator, so that they are suitable for assessing the quality of care. |
| **Domain 5. Applicability** | |
| The indicators are supported with tools for use | Tools suggested for usage were electronic medical records, direct observations using behavioral mapping, and interviews. |
| The potential organizational barriers to applying the indicators have been discussed. | Potential organizational barriers were suggested such as the need to include more stakeholders (i.e. patients, health insurers), and the degree in which all quality indicators could be measured validly. Those barriers will be handled within the subsequent feasibility, validity, and implementation study. |
| The indicator development initiative is editorially independent from the funding body. | This research was conducted without any funding. |
| Comparing interests of indicator development group members have been recorded and addressed. | All authors declared that there were no conflicts of interest. |
| **Domain 6. 'Rate the overall quality of this initiative'** | Not applicable to quality indicators development. |

*AGREE, Appraisal of Guidelines for Research and Evaluation; RAND/UCLA, Research and Development/University of California, Los Angeles*

*Supplementary Table A2. Literature search details.*

| *PubMed:* |
| --- |
| **Domain:**<br><br>(Inpatients[MeSH] OR Hospitalization[MeSH] OR "Adolescent, Hospitalized"[MeSH] OR "Child, Hospitalized"[MeSH] OR inpatient*[tiab] OR hospitalized[tiab] OR hospitalization*[tiab] OR hospitalised OR hospitalisation*[tiab] OR hospital[tiab])<br><br>**Determinant:**<br><br>Early Ambulation[MeSH] OR Exercise[MeSH] OR Iatrogenic Disease[MeSH] OR Locomotion[MeSH] OR Motor Activity[MeSH] OR Muscle Fatigue[MeSH] OR Muscle Strength[MeSH] OR Physical Endurance[MeSH] OR Physical Exertion[MeSH] OR Physical Fitness[MeSH] OR Physical Therapy Modalities[MeSH] OR Posture[MeSH] OR Sedentary lifestyle[MeSH] OR Self Care[MeSH] OR "Mobility Limitation"[MeSH]OR Ambulation[tiab] OR Exercis*[tiab] OR Fitness[tiab] OR Hospital Acquired Condition*[tiab] OR Iatrogenic disabilit*[tiab] OR Iatrogenic Disease*[tiab] OR Iatrogenic disorder*[tiab] OR Immobil*[tiab] OR Locomot*[tiab] OR mobil*[tiab] OR motor activity[tiab] OR Muscle Fatigue[tiab] OR Muscle Strength[tiab] OR Muscular Fatigue[tiab] OR Physical activ*[tiab] OR Physical Effort*[tiab] OR Physical Endurance*[tiab] OR Physical Exertion*[tiab] OR Physical inactivity[tiab] OR Physical therap*[tiab] OR Physiotherap*[tiab] OR Posture*[tiab] OR Seated Position*[tiab] OR Sedentary behavior[tiab] OR Sedentary behaviour[tiab] OR Sedentary lifestyle[tiab] OR Self Care[tiab] OR Self Management[tiab] OR Sitting Position*[tiab] OR Standing Position*[tiab] OR stepping[tiab] OR hospital associated disorder*[tiab]<br><br>**Outcome:**<br><br>"Quality indicators, Health Care"[MeSH] OR Healthcare Quality indicator*[tiab] OR Health care Quality indicator*[tiab] OR Healthcare Global Trigger Tool*[tiab] OR Health care Global Trigger Tool*[tiab] OR structure indicator*[tiab] OR process indicator*[tiab] OR performance |

| |
|---|
| indicator*[tiab] OR Health indicator*[tiab] OR health status indicator*[tiab] OR qualitative indicator*[tiab] OR quantitative indicator*[tiab] |
| *EMBASE:*<br><br>**Domain**<br><br>'hospital patient'/exp OR 'hospitalization'/exp OR (inpatient* OR hospitalized OR hospitalization* OR hospitalised OR hospitalisation* OR hospital):ti,ab,kw<br><br>**Determinant**<br><br>'mobilization'/exp OR 'exercise'/exp OR 'endurance'/exp OR 'physical activity'/exp OR 'physical capacity'/exp OR 'physical inactivity'/exp OR 'iatrogenic disease'/exp OR 'patient mobility'/exp OR 'physical mobility'/exp OR 'locomotion'/exp OR 'muscle strength'/exp OR 'muscle fatigue'/exp OR 'fitness'/exp OR 'sedentary behavior'/exp OR 'sedentary lifestyle'/exp OR 'cardiorespiratory fitness'/exp OR 'physiotherapy'/exp OR 'body position'/exp OR 'self care'/exp OR 'walking difficulty'/exp OR 'stepping'/exp OR 'immobility'/exp OR Ambulation:ti,ab,kw OR Exercis*:ti,ab,kw OR Fitness:ti,ab,kw OR ('Hospital Acquired' NEXT/1 Condition*):ti,ab,kw OR (Iatrogenic NEXT/1 disabilit*):ti,ab,kw OR (Iatrogenic NEXT/1 Disease*):ti,ab,kw OR (Iatrogenic NEXT/1 disorder*):ti,ab,kw OR Immobil*:ti,ab,kw OR Locomot*:ti,ab,kw OR mobil*:ti,ab,kw OR 'motor activity':ti,ab,kw OR 'Muscle Fatigue':ti,ab,kw OR 'Muscle Strength':ti,ab,kw OR 'Muscular Fatigue':ti,ab,kw OR (Physical NEXT/1 activ*):ti,ab,kw OR (Physical NEXT/1 Effort*):ti,ab,kw OR (Physical NEXT/1 Endurance*):ti,ab,kw OR (Physical NEXT/1 Exertion*):ti,ab,kw OR 'Physical inactivity':ti,ab,kw OR (Physical NEXT/1 therap*):ti,ab,kw OR Physiotherap*:ti,ab,kw OR Posture*:ti,ab,kw OR (Seated NEXT/1 Position*):ti,ab,kw OR 'Sedentary behavior':ti,ab,kw OR 'Sedentary behaviour':ti,ab,kw OR 'Sedentary lifestyle':ti,ab,kw OR 'Self Care':ti,ab,kw OR 'Self Management':ti,ab,kw OR (Sitting NEXT/1 Position*):ti,ab,kw OR (Standing NEXT/1 Position*):ti,ab,kw OR stepping:ti,ab,kw OR 'hospital associated disorder':ti,ab,kw |

| |
|---|
| **Outcome**<br><br>'health status indicator'/exp OR 'clinical indicator'/exp OR 'performance measurement system'/exp OR 'public health systems research'/exp OR ('Healthcare Quality' NEXT/1 Indicator*):ti,ab,kw OR ('Health care Quality' NEXT/1 Indicator*):ti,ab,kw OR ('Healthcare Global Trigger' NEXT/1 Tool*):ti,ab,kw OR ('Health care Global Trigger' NEXT/1 Tool*):ti,ab,kw OR (structure NEXT/1 indicator*):ti,ab,kw OR (process NEXT/1 indicator*):ti,ab,kw OR (performance NEXT/1 indicator*):ti,ab,kw OR (Health NEXT/1 indicator*):ti,ab,kw OR ('health status' NEXT/1 indicator*):ti,ab,kw OR (qualitative NEXT/1 indicator*):ti,ab,kw OR (quantitative NEXT/1 indicator*):ti,ab,kw' |
| *CINAHL* |
| **Domain**<br><br>(MH "Inpatients+") OR (MH "Hospitalization+") ) OR TI inpatient* OR AB inpatient* OR TI hospitalized OR AB hospitalized OR TI hospitalization* OR AB hospitalization* OR TI hospitalised OR AB hospitalised OR TI hospitalisation* OR AB hospitalisation* OR TI hospital OR AB hospital<br><br>**Determinant**<br><br>(MH "Early Ambulation") OR (MH "Exercise+") OR (MH "Physical Therapy+") OR (MH "Iatrogenic Disease") OR (MH "Physical Endurance+") OR (MH "Physical Fitness+") OR (MH "Body positions+") OR (MH "Locomotion+") OR (MH "Muscle Fatigue") OR(MH "Muscle strength+") OR (MH "Life Style, Sedentary") OR (MH "Self Care+") OR (MH "Physical Mobility") OR (MH "Physical Mobility Impairment (Saba CCC)") OR (MH "Impaired Physical Mobility (NANDA)") OR (MH "Immobility") OR (MH "Immobility Management (Iowa NIC)") OR(MH "physical activity") OR TI(Ambulation OR Exercis* OR Fitness OR "Hospital Acquired Condition*" OR "Iatrogenic disabilit*" OR "Iatrogenic Disease*" OR "Iatrogenic disorder*" OR Immobil* OR Locomot* OR mobil* OR "motor activity" OR |

"Muscle Fatigue" OR "Muscle Strength" OR "Muscular Fatigue" OR "Physical activ*" OR "Physical Effort*" OR "Physical Endurance*" OR "Physical Exertion*" OR "Physical inactivity" OR "Physical therap*" OR Physiotherap* OR Posture* OR "Seated Position*" OR "Sedentary behavior" OR "Sedentary behavior" OR "Sedentary lifestyle" OR "Self Care" OR "Self Management" OR "Sitting Position*" OR "Standing Position*" OR stepping) OR AB (Ambulation OR Exercis* OR Fitness OR "Hospital Acquired Condition*" OR "Iatrogenic disabilit*" OR "Iatrogenic Disease*" OR "Iatrogenic disorder*" OR Immobil* OR Locomot* OR mobil* OR "motor activity" OR "Muscle Fatigue" OR "Muscle Strength" OR "Muscular Fatigue" OR "Physical activ*" OR "Physical Effort*" OR "Physical Endurance*" OR "Physical Exertion*" OR "Physical inactivity" OR "Physical therap*" OR Physiotherap* OR Posture* OR "Seated Position*" OR "Sedentary behavior" OR "Sedentary behavior" OR "Sedentary lifestyle" OR "Self Care" OR "Self Management" OR "Sitting Position*" OR "Standing Position*" OR stepping OR 'hospital associated disorder')

**Outcome**

(MH "Health Status Indicators") OR (MH "Quality of Health Care") OR (MH "Performance Measurement Systems") OR TI("Healthcare Quality indicator*" OR "Health care Quality indicator*" OR "Healthcare Global Trigger Tool*" OR "Health care Global Trigger Tool*" OR "structure indicator*" OR "process indicator*" OR "performance indicator*" OR "Health indicator*" OR "health status indicator*") OR AB("Healthcare Quality indicator*" OR "Health care Quality indicator*" OR "Healthcare Global Trigger Tool*" OR "Health care Global Trigger Tool*" OR "structure indicator*" OR "process indicator*" OR "performance indicator*" OR "Health indicator*" OR "health status indicator*" OR "qualitative NEXT/1 indicator*" OR "quantitative NEXT/1 indicator*")

*Supplementary Table A3. The second draft of the longlist healthcare quality indicators for the care of patients with (or at risk for) low physical activity during the hospital stay: Dutch version.*

| | |
|---|---|
| *Indicator 1:* | **Het percentage klinische patiënten die zelfstandig kunnen lopen, met een beschreven activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Er is een activiteitenplan beschreven, waarin dagelijkse loopmomenten worden beschreven voor patiënten die zelfstandig lopen. |
| **Teller:** | Het aantal opgenomen klinische patiënten, dat in staat is om zelfstandig te lopen, waarbij een activiteitenplan is beschreven. |
| **Noemer:** | Het aantal opgenomen klinische patiënten, dat in staat is om zelfstandig te lopen. |
| *Indicator 2:* | **Het percentage dagelijkse loopmomenten van klinische patiënten die zelfstandig kunnen lopen, zoals beschreven in het activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Patiënten lopen dagelijks zelfstandig, zoals beschreven in het activiteitenplan. |
| **Teller:** | Het aantal opgenomen klinische patiënten dat dagelijks zelfstandig loopt, zoals beschreven in het activiteitenplan. |
| **Noemer:** | Het aantal opgenomen klinische patiënten met een activiteitenplan, dat in staat is om zelfstandig te lopen. |
| *Indicator 3:* | **Het percentage van klinische patiënten die ondersteuning nodig hebben met lopen van één of meerdere personen, met een beschreven activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Er is een activiteitenplan beschreven, waarin dagelijkse loopmomenten worden beschreven voor patiënten die ondersteuning nodig hebben met lopen. |
| **Teller:** | Het aantal opgenomen klinische patiënten die ondersteuning nodig hebben bij het lopen van een persoon, bij wie een activiteitenplan is beschreven. |
| **Noemer:** | Het aantal opgenomen klinische patiënten met een activiteitenplan die lopen met ondersteuning van een persoon. |
| *Indicator 4:* | **Het percentage dagelijkse loopmomenten van klinische patiënten die ondersteuning nodig hebben met lopen van een persoon, zoals beschreven in het activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Er is een activiteitenplan beschreven, waarin dagelijkse loopmomenten worden beschreven voor klinische patiënten die ondersteuning nodig hebben met lopen. |
| **Teller:** | Het aantal opgenomen klinische patiënten die dagelijks lopen met ondersteuning van een persoon, zoals beschreven in het activiteitenplan. |
| **Noemer:** | Het aantal opgenomen klinische patiënten met een activiteitenplan, die lopen met ondersteuning van een persoon. |
| *Indicator 5:* | **Het percentage klinische patiënten met fysiotherapeutische begeleiding.** |
| **Thema:** | Standaard consult fysiotherapie. |
| **Item:** | De klinische patiënt ontvangt fysiotherapie begeleiding. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling met fysiotherapie begeleiding. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling. |
| *Indicator 6:* | **Percentage klinische patiënten met een activiteitenplan binnen 48 uur na opname.** |
| **Thema:** | Een gestructureerd activiteitenplan. |

| | |
|---|---|
| **Item:** | Patiënten hebben binnen 48 uur na opname een activiteitenplan. |
| **Teller:** | Het aantal klinische patiënten per afdeling met een activiteitenplan binnen 48 uur na opname. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 7:* | **Het percentage klinische patiënten, die voor opname mobiel waren, die worden gemobiliseerd binnen 48 uur post operatief.** |
| **Thema:** | Mobiliseren. |
| **Item:** | Tijdig mobiliseren. |
| **Teller:** | Het aantal klinische patiënten per afdeling die binnen 48 uur postoperatief mobiliseren. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling na een operatie. |
| *Indicator 8:* | **Het percentage klinische patiënten met lichamelijke beperking, met een oefenprogramma.** |
| **Thema:** | Een passend oefenprogramma. |
| **Item:** | Als een klinisch opgenomen patiënt moeite heeft met het looppatroon, kracht (MRC 4 of ondersteuning van de armleuningen om op te staan vanuit de stoel), of uithoudingsvermogen (bijv. dyspneu bij lichte vermoeidheid), dan moet er een oefenprogramma worden aangeboden. |
| **Teller:** | Het aantal opgenomen klinische patiënten met een beperking in lichamelijk functioneren per afdeling, met een oefenprogramma. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling met een beperking in lichamelijk functioneren. |
| *Indicator 9:* | **Het percentage klinische patiënten met een beperking in dagelijkse activiteiten, met een oefenprogramma.** |
| **Thema:** | Een passend oefenprogramma. |
| **Item:** | Als een klinisch opgenomen patiënt moeite heeft met het looppatroon, kracht (MRC 4 of ondersteuning van de armleuningen om op te staan vanuit de stoel), of uithoudingsvermogen (bijv. dyspneu bij lichte vermoeidheid), dan moet er een oefenprogramma worden aangeboden. |
| **Teller:** | Het aantal opgenomen klinische patiënten met een beperking in dagelijkse activiteiten per afdeling, met een oefenprogramma. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling met een beperking in dagelijkse activiteiten. |
| *Indicator 10:* | **Het percentage klinische patiënten dat in staat is zonder hulp te bewegen, bij ontslag.** |
| **Thema:** | Verandering in mobiliteit. |
| **Item:** | Percentage van patiënten die bij ontslag in staat zijn om zelfstandig te verplaatsen, eventueel met behulp van een rolstoel, van de patiënten die immobiel of afhankelijk van een rolstoel waren bij opname. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren, en bij ontslag zelfstandig te verplaatsen, eventueel met behulp van een rolstoel. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren. |
| *Indicator 11:* | **Het percentage klinische patiënten dat in staat is zonder hulp te lopen, bij ontslag.** |
| **Thema:** | Patiëntenmobiliteit. |
| **Item:** | Het inzichtelijk krijgen van het percentage van klinische patiënten die in staat zijn |

| | |
|---|---|
| | zelfstandig te lopen bij ontslag, eventueel met loophulpmiddel, van de patiënten die immobiel waren of afhankelijk van een rolstoel bij opname. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren, en bij ontslag zelfstandig lopen, eventueel met behulp van een loophulpmiddel. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren. |
| *Indicator 12:* | **Het percentage artsen, dat gelooft dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen.** |
| **Thema:** | Stimuleren zelfstandig ADL. |
| **Item:** | De artsen stimuleren klinische patiënten om hun algemeen dagelijkse levensverrichtingen zelfstandig uit te voeren. |
| **Teller:** | Het aantal artsen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen. |
| **Noemer:** | Het aantal artsen per afdeling. |
| *Indicator 13:* | **Het percentage verpleegkundigen, dat gelooft dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen.** |
| **Thema:** | Stimuleren zelfstandig ADL. |
| **Item:** | De verpleegkundigen stimuleren klinische patiënten om hun algemeen dagelijkse levensverrichtingen zelfstandig uit te voeren. |
| **Teller:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling. |
| *Indicator 14:* | **Het percentage fysiotherapeuten, dat gelooft dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen.** |
| **Thema:** | Stimuleren zelfstandig ADL. |
| **Item:** | De fysiotherapeuten stimuleren klinische patiënten om hun algemeen dagelijkse levensverrichtingen zelfstandig uit te voeren. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling. |
| *Indicator 15:* | **Het percentage artsen, dat gelooft dat ze klinische patiënten stimuleren in het zelfstandig lopen.** |
| **Thema:** | Stimuleren lopen. |
| **Item:** | De artsen stimuleren klinische patiënten om zelfstandig te lopen van het bed naar de stoel. |
| **Teller:** | Het aantal artsen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| **Noemer:** | Het aantal artsen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| *Indicator 16:* | **Het percentage verpleegkundigen, dat gelooft dat ze klinische patiënten stimuleren in het zelfstandig lopen.** |
| **Thema:** | Stimuleren lopen. |
| **Item:** | De verpleegkundigen stimuleren klinische patiënten om zelfstandig te lopen van het bed naar de stoel. |

| | |
|---|---|
| **Teller:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| *Indicator 17:* | **Het percentage fysiotherapeuten, dat gelooft dat ze klinische patiënten stimuleren in het zelfstandig lopen.** |
| **Thema:** | Stimuleren lopen. |
| **Item:** | De fysiotherapeuten stimuleren klinische patiënten om zelfstandig te lopen van het bed naar de stoel. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| *Indicator 18:* | **Het percentage klinische patiënten met vrijheidsbeperkende middelen.** |
| **Thema:** | Immobilisatie. |
| **Item:** | Inventariseren van gebruik van vrijheidsbeperkende middelen voor het voorkomen van vallen. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling waarbij vrijheidsbeperkende middelen zijn ingezet. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling. |
| *Indicator 19:* | **Het percentage klinische patiënten met een valincident, waarbij het valincident binnen 24 uur wordt geëvalueerd.** |
| **Thema:** | Evaluatie vallen. |
| **Item:** | Er vindt een evaluatie plaats van een valincident binnen 24 uur. De evaluatie bestaat uit ten minste medicijngebruik en aan- of afwezigheid van (voortekenen van) ziekte. |
| **Teller:** | Het aantal klinische patiënten per afdeling met een valincident, waarbij dit geëvalueerd is binnen 24 uur. |
| **Noemer:** | Het aantal klinische patiënten per afdeling met een valincident. |
| *Indicator 20:* | **Het percentage klinische patiënten met documentatie van een valincident.** |
| **Thema:** | Documentatie vallen. |
| **Item:** | Er vindt documentatie plaats van een valincident, waarbij de potentiële oorzaken zijn beschreven. |
| **Teller:** | Het aantal klinische patiënten per afdeling met een documentatie van een valincident. |
| **Noemer:** | Het aantal klinische patiënten per afdeling met een valincident. |
| *Indicator 21:* | **Het percentage klinische patiënten met documentatie van preopname functioneren.** |
| **Thema:** | Preopname functioneren. |
| **Item:** | Er vindt documentatie plaats van het preopname functioneren. De documentatie betreft beschrijven van het valrisico, gebruik van rollator of stok en de onafhankelijkheid in het uitvoeren van algemeen dagelijkse levensverrichtingen voor opname. |
| **Teller:** | Het aantal klinische patiënten per afdeling, waarbij het preopname functioneren is gedocumenteerd. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 22:* | **Het percentage klinische patiënten, bij wie tijdens opname een evaluatie van de mobiliteit plaatsvindt.** |
| **Thema:** | Evaluatie mobiliteit. |

| | |
|---|---|
| **Item:** | Bij opname in het ziekenhuis worden de volgende transfers geëvalueerd: van lig naar zit transfereren zonder hulp; uit bed komen en tot stand komen vanuit bed; een aantal passen lopen, en het gebruik maken van een stok of een rollator zo nodig. |
| **Teller:** | Het aantal klinische patiënten per afdeling waar bij opname een evaluatie van mobiliteit plaatsvindt. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 23:* | **Het percentage klinische patiënten met geïnformeerde familie.** |
| **Thema:** | Informeren familie. |
| **Item:** | De klinische patiënten en familie zijn geïnformeerd over het belang van bewegen. |
| **Teller:** | Het aantal klinische patiënten met familie per afdeling, die zijn geïnformeerd over het belang van bewegen. |
| **Noemer:** | Het aantal klinische patiënten met familie per afdeling. |
| *Indicator 24:* | **Het percentage klinische patiënten dat is geïnformeerd over hun zorgtraject.** |
| **Thema:** | Informeren patiënt. |
| **Item:** | Het zorgtraject met betrekking tot bewegen wordt samen met de klinische patiënt besproken. Een zorgtraject met betrekking tot bewegen bestaat onder andere uit het bespreken van het benodigde niveau van fysiek functioneren voor ontslag. |
| **Teller:** | Het aantal klinische patiënten per afdeling, waar bij het zorgtraject met betrekking tot bewegen is besproken. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 25:* | **Het percentage artsen, dat bedrust beschouwt als de dagelijkse gang van zaken.** |
| **Thema:** | Mindset. |
| **Item:** | De mindset van artsen draagt bij aan bedrust bij klinische opgenomen patiënten als een dagelijkse gang van zaken. |
| **Teller:** | Het aantal artsen per afdeling die geloven dat bedrust behoort tot de dagelijkse gang van zaken. |
| **Noemer:** | Het aantal artsen per afdeling. |
| *Indicator 26:* | **Het percentage verpleegkundigen, dat bedrust beschouwt als de dagelijkse gang van zaken.** |
| **Thema:** | Mindset. |
| **Item:** | De mindset van verpleegkundigen draagt bij aan bedrust bij klinische opgenomen patiënten als een dagelijkse gang van zaken. |
| **Teller:** | Het aantal verpleegkundigen per afdeling die geloven dat bedrust behoort tot de dagelijkse gang van zaken. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling. |
| *Indicator 27:* | **Het percentage fysiotherapeuten, dat bedrust beschouwt als de dagelijkse gang van zaken.** |
| **Thema:** | Mindset. |
| **Item:** | De mindset van fysiotherapeuten draagt bij aan bedrust bij klinische opgenomen patiënten als een dagelijkse gang van zaken. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling die geloven dat bedrust behoort tot de dagelijkse gang van zaken. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling. |
| *Indicator 28:* | **Het percentage klinische patiënten met bedrust zonder medische noodzaak.** |
| **Thema:** | Bedrust. |

| | |
|---|---|
| **Item:** | Bedrust zonder medische noodzaak is van belang bij de hoeveelheid bewegen voor de klinisch opgenomen patiënt. |
| **Teller:** | Het aantal klinische patiënten per afdeling dat bedrust heeft voorgeschreven gekregen, zonder medische noodzaak. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 29:* | **Het percentage lager opgeleide zorgverleners op de afdeling.** |
| **Thema:** | Niveau van opleiding. |
| **Item:** | Lager opgeleide zorgmedewerkers geven een lagere prioriteit aan het mobiliseren van patiënten dan hoger opgeleide zorg medewerkers. |
| **Teller:** | Het aantal lager opgeleide zorgverleners op de afdeling. |
| **Noemer:** | Het aantal zorgverleners op de afdeling. |
| *Indicator 30:* | **Het percentage zorgverleners, dat aangeeft dat werkdruk een beperkende factor is voor het mobiliserende van klinische patiënten.** |
| **Thema:** | Werkdruk. |
| **Item:** | Werkdruk heeft een negatief effect op het structureel bewegen van patiënten. |
| **Teller:** | Het aantal zorgverleners op de afdeling, die aangeeft dat de eigen werkdruk een beperkende factor is voor de optimale hoeveelheid beweging van patiënten. |
| **Noemer:** | Het aantal zorgverleners op de afdeling. |
| *Indicator 31:* | **Het percentage klinische patiënten, dat ervaart te vroeg ontslagen te zijn.** |
| **Thema:** | Triagesysteem. |
| **Item:** | Met de invoering van het triagesysteem ligt er druk op het ontslaan van patiënten minder op zelfstandig kunnen bewegen. |
| **Teller:** | Het aantal klinische patiënten dat wordt ontslagen, en ervaart dat ze te vroeg ontslagen worden. |
| **Noemer:** | Het aantal klinische patiënten dat wordt ontslagen. |
| *Indicator 32:* | **Het percentage klinische patiënten, dat wordt beperkt in het uitvoeren van transfers door meubilair.** |
| **Thema:** | Meubels. |
| **Item:** | Het gebruik van hoge bedden met bedrekken en stoelen die moeilijk bereikbaar zijn is van invloed op het bewegen van klinische patiënten. |
| **Teller:** | Het aantal opgenomen klinische patiënten, die beperkt worden in het zelfstandig uitvoeren van transfers door hoge bedden, hoge stoelen, of het gebruik van bijvoorbeeld bedrekken. |
| **Noemer:** | Het aantal opgenomen klinische patiënten. |
| *Indicator 33:* | **Het percentage van klinische patiënten, dat de beschikking heeft over een geadviseerd loophulpmiddel.** |
| **Thema:** | Hulpmiddelen. |
| **Item:** | Er moeten voldoende loophulpmiddelen beschikbaar zijn om het bewegen van patiënten mogelijk te maken. |
| **Teller:** | Het aantal klinische patiënten per afdeling die beschikking hebben over een geadviseerd loophulpmiddel. |
| **Noemer:** | Het aantal klinische patiënten per afdeling, dat geadviseerd wordt te lopen met een loophulpmiddel. |
| *Indicator 34:* | **Het percentage van klinische patiënten die beschikking hebben over een relax stoel.** |
| **Thema:** | Hulpmiddelen. |

| | |
|---|---|
| **Item:** | Er moeten voldoende relaxstoelen beschikbaar zijn om het bewegen van patiënten mogelijk te maken. |
| **Teller:** | Het aantal klinisch patiënten per afdeling die beschikking hebben over een relaxstoel. |
| **Noemer:** | Het aantal klinisch patiënten per afdeling. |
| *Indicator 35:* | **Het percentage van klinische patiënten die beschikking hebben over een bedfiets.** |
| **Thema:** | Hulpmiddelen. |
| **Item:** | Er moeten voldoende bedfietsen beschikbaar zijn om het bewegen van patiënten mogelijk te maken. |
| **Teller:** | Het aantal klinisch patiënten per afdeling met het advies gebruik te maken van de bedfiets, die beschikking hebben over een bedfiets. |
| **Noemer:** | Het aantal klinisch patiënten per afdeling, dat geadviseerd wordt gebruik te maken van een bedfiets. |
| *Indicator 36:* | **Het percentage van artsen dat is geschoold in het aanbieden van beweegzorg bij klinische patiënten.** |
| **Thema:** | Scholing. |
| **Item:** | Er wordt scholing aangeboden met betrekking tot het aanbieden van beweegzorg bij patiënten voor alle artsen medewerkers/zorgverleners die werkzaam zijn op de afdeling. |
| **Teller:** | Het aantal artsen dat scholing heeft gevolgd met betrekking tot het aanbieden van beweegzorg bij klinische patiënten. |
| **Noemer:** | Het aantal artsen dat op de afdeling werkt. |
| *Indicator 37:* | **Het percentage van verpleegkundigen dat is geschoold in het aanbieden van beweegzorg bij klinische patiënten.** |
| **Thema:** | Scholing. |
| **Item:** | Er wordt scholing aangeboden met betrekking tot het aanbieden van beweegzorg bij patiënten voor alle verpleegkundigen die werkzaam zijn op de afdeling. |
| **Teller:** | Het aantal verpleegkundigen dat scholing heeft gevolgd met betrekking tot het aanbieden van beweegzorg bij patiënten. |
| **Noemer:** | Het aantal verpleegkundigen dat op de afdeling werkt. |
| *Indicator 38:* | **Het percentage van fysiotherapeuten dat is geschoold in het aanbieden van beweegzorg bij klinische patiënten.** |
| **Thema:** | Scholing. |
| **Item:** | Er wordt scholing aangeboden met betrekking tot het aanbieden van beweegzorg bij patiënten voor alle fysiotherapeuten die werkzaam zijn op de afdeling. |
| **Teller:** | Het aantal fysiotherapeuten dat scholing heeft gevolgd met betrekking tot het aanbieden van beweegzorg bij patiënten. |
| **Noemer:** | Het aantal fysiotherapeuten dat op de afdeling werkt. |
| *Indicator 39:* | **Het percentage van artsen dat gelooft beweeggedrag te stimuleren bij patiënten.** |
| **Thema:** | Mindset artsen. |
| **Item:** | De mindset van artsen draagt bij aan het motiveren, stimuleren en initiëren van beweeggedrag bij patiënten. |
| **Teller:** | Het aantal artsen per afdeling, die geloven dat ze beweeggedrag stimuleren bij patiënten. |
| **Noemer:** | Het aantal artsen per afdeling. |
| *Indicator 40:* | **Het percentage van verpleegkundigen dat gelooft beweeggedrag te stimuleren bij patiënten.** |

| | |
|---|---|
| **Thema:** | Mindset verpleegkundigen. |
| **Item:** | De mindset van verpleegkundigen draagt bij aan het motiveren, stimuleren en initiëren van beweeggedrag bij patiënten. |
| **Teller:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze beweeggedrag stimuleren bij patiënten. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling. |
| *Indicator 41:* | **Het percentage van fysiotherapeuten dat gelooft beweeggedrag te stimuleren bij patiënten.** |
| **Thema:** | Mindset fysiotherapeuten. |
| **Item:** | De mindset van fysiotherapeuten draagt bij aan het motiveren, stimuleren en initiëren van beweeggedrag bij patiënten. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze beweeggedrag stimuleren bij patiënten. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling. |
| *Indicator 42* | **Het percentage klinische patiënten, dat loopt met een vrijwilliger** |
| **Thema:** | Vrijwilligers. |
| **Item:** | Klinische patiënten lopen zoveel mogelijk als zijn of haar conditie toelaat met een vrijwilliger in het ziekenhuis. |
| **Teller:** | Er is/zijn vrijwilliger(s) aanwezig op de afdeling die ondersteunen bij lopen. |
| *Indicator 43* | **Het percentage klinische patiënten, dat loopt met familie.** |
| **Thema:** | Familie. |
| **Item:** | Klinische patiënten lopen zoveel mogelijk als zijn of haar conditie toelaat met familie in het ziekenhuis. |
| **Teller:** | Er zijn familieleden aanwezig op de afdeling die ondersteunen bij lopen. |
| *Indicator 44* | **Mobiliteit beperkende middelen worden dagelijks geëvalueerd.** |
| **Thema:** | Evaluatie immobilisatie. |
| **Item:** | Regelmatige evaluatie van de inzet van mobiliteit beperkende middelen bij klinische patiënten, zoals zuurstofslangen, blaas katheters en intraveneuze katheters. |
| **Teller:** | Er vindt dagelijks per afdeling een evaluatie plaats over de inzet van mobiliteit beperkende middelen bij klinische patiënten. |
| *Indicator 45* | **Patiëntenmobiliteit is opgenomen in de normen van het ziekenhuis.** |
| **Thema:** | Cultuur. |
| **Item:** | De norm in het ziekenhuis is dat patiënten regelmatig lopen, als ze dat kunnen. |
| **Teller:** | In de normen van het ziekenhuis staat beschreven dat er verwacht wordt dat patiënten regelmatig lopen als ze dat kunnen. |
| *Indicator 46* | **Vrijheidsbeperkende middelen worden dagelijks geëvalueerd.** |
| **Thema:** | Evaluatie immobilisatie. |
| **Item:** | Er vindt regelmatig evaluatie plaats van de inzet van vrijheidsbeperkende middelen bij klinische patiënten, zoals buikband, vijfpunt fixatie, rolstoelblad, rem van de rolstoel. |
| **Teller:** | Er vindt dagelijks per afdeling een evaluatie plaats over de inzet van vrijheidsbeperkende middelen bij klinische patiënten. |
| *Indicator 47* | **Het ziekenhuis heeft een kritische houding ten aanzien van het inzetten van immobiliserende middelen bij valgevaarlijke patiënten.** |
| **Thema:** | Cultuur. |
| **Item:** | De norm van het ziekenhuis is een kritische houding te hebben ten aan zien van de inzet |

| | |
|---|---|
| | van immobiliserende middelen bij valgevaarlijke klinische patiënten. |
| **Teller:** | In de normen van het ziekenhuis staat beschreven dat de inzet van immobiliserende middelen bij valgevaarlijke klinische patiënten kritisch wordt bekeken. |
| *Indicator 48* | **De inzet van pijnstillende middelen wordt dagelijks geëvalueerd ten behoeve van het pijn vrij mobiliseren van de klinische patiënt.** |
| **Thema:** | Evaluatie pijnmedicatie. |
| **Item:** | Er vindt regelmatige evaluatie plaats van pijnmedicatie bij de klinische patiënt, ten behoeve van het bewegen. |
| **Teller:** | Er vindt dagelijks per afdeling een evaluatie plaats van de inzet van pijnstillende middelen bij klinische patiënten, ten behoeve van het bewegen. |
| *Indicator 49* | **Het informeren van de familie van de klinische patiënt ten aanzien van het belang van bewegen is een norm van het ziekenhuis.** |
| **Thema:** | Cultuur. |
| **Item:** | De norm van het ziekenhuis is het informeren van de familie van de klinische patiënt ten aanzien van het belang van bewegen. |
| **Teller:** | In de normen van het ziekenhuis staat beschreven dat de familie van de klinische patiënt geïnformeerd wordt over het belang van bewegen. |
| *Indicator 50* | **Het aantal stappen dat een klinische patiënt loopt.** |
| **Thema:** | Bewegen. |
| **Item:** | De totale hoeveelheid stappen die een klinische patiënt per dag loopt. |
| **Teller:** | Het aantal stappen dat een klinisch opgenomen patiënt loopt per dag. |
| *Indicator 51* | **De klinische patiënt kan zich goed oriënteren in het ziekenhuis.** |
| **Thema:** | Ziekenhuisomgeving. |
| **Item:** | De gebouwde ziekenhuisomgeving is van belang om desoriëntatie van de klinische patiënt te voorkomen en mobilisatie te stimuleren. |
| **Teller:** | Er is gebruik gemaakt van oriënterende middelen, zoals looproutes en/of routewijzers, ter ondersteuning van de oriëntatie van klinische patiënten. |
| *Indicator 52* | **De klinische patiënt wordt gestimuleerd om te bewegen door de inrichting van de afdeling.** |
| **Thema:** | Omgeving. |
| **Item:** | Aanwezigheid van foto's, kunst en/of ander beeldmateriaal om patiënten te stimuleren om te bewegen. |
| **Teller:** | Is er gebruik gemaakt van foto's, kunst en/of ander beeldmateriaal op de wandelgangen van de afdeling? |
| *Indicator 53* | **De klinische patiënt heeft een beweegruimte op de afdeling.** |
| **Thema:** | Omgeving. |
| **Item:** | Aanwezigheid van een beweegruimte. |
| **Teller:** | Is er een beweegruimte aanwezig op de afdeling? |
| *Indicator 54* | **De klinische patiënt heeft zonlicht op de patiëntenkamer.** |
| **Thema:** | Omgeving. |
| **Item:** | Aanwezigheid van zonlicht op de patiëntenkamer. |
| **Teller:** | Is er zonlicht op de patiëntenkamer? |

*Supplementary Table A4. Overview of ratings in the consensus rounds with the corresponding decision: selection, discussion, or no selection.*

| | First round | | Second round | | Third round | |
|---|---|---|---|---|---|---|
| **Theme: Exercise program and physical activity plan** | Median (%HT) | Decision | Median (%HT) | Decision | Median (%HT) | Decision |
| 1. Patients without the need for support during mobilization should have a physical activity plan. | 7 (79%) | D | 8 (100%) | S | | |
| 2. Patients should receive support for mobilization. | 8 (79%) | S | | | | |
| 3. Patients in need for support during mobilization should have a physical activity plan | 8 (93%) | S | 8 (60%) | D | 8 (100%) | S |
| 4. Patients should perform physical activities as described in their physical activity plan. | 8 (86%) | S | 8 (100%) | S | | |
| 6. Patients should be physically active within 48 hours after hospital admission. | 8 (64%) | D | 8 (100%) | S | | |
| 8. Patients with a physical disability should have an exercise program. | 7 (71%) | D | 6 (40%) | NS | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 9. Patients who are dependent in activities of daily living should have an exercise program. | 7 (64%) | NS | | | | |
| **Theme: Assistance during mobilization** | | | | | | |
| 5. Patients should walk with a physical therapist. | 8 (64%) | D | 4 (20%) | NS | | |
| 10. Patients should be independent in activities of daily living at discharge. | 7 (64%) | NS | | | | |
| 42. Patients should walk with volunteers. | 7 (64%) | NS | | | | |
| 43. Patients should walk with close-relatives. | 8 (86%) | S | 7 (100%) | D | 7 (60%) | NS |
| **Theme: Mobilizing** | | | | | | |
| 7. Patients should be physically active within 48 hours after hospital admission. | 8 (86%) | S | 8 (80%) | S | | |
| 11. Patients should mobilize independently at discharge. | 7 (64%) | NS | | | | |
| 50. The number of steps of a patient during hospital stay per day. | 6 (43%) | NS | | | | |
| ***Theme: Attitude*** | | | | | | |

| | | | | |
|---|---|---|---|---|
| 12. Physicians should stimulate independent functioning in daily activities of patients. | 6 (50%) | NS | | |
| 13. Nurses should stimulate independent functioning in daily activities of patients. | 8 (86%) | S | 8 (80%) | S |
| 14. Physical therapists should stimulate independent functioning in daily activities of patients. | 6 (50%) | NS | | |
| 15. Physicians should be aware of their own attitude related to stimulation of physical activity in patients during hospital stay. | 6 (43%) | NS | | |
| 16. Nurses should be aware of their own attitude related to stimulation of physical activity in patients during hospital stay. | 7 (57%) | NS | | |
| 17. Physical therapists should be aware of their own attitude related to stimulation of physical activity in patients during hospital stay. | 6 (43%) | NS | | |
| 39. Physicians should stimulate physical activity of patients. | 7 (71%) | D | 8 (80%) | S |

| | | | | | | |
|---|---|---|---|---|---|---|
| 40. Nurses should stimulate physical activity of patients. | 8 (86%) | S | 8 (80%) | S | | |
| 41. Physical therapists should stimulate physical activity of patients. | 7 (72%) | D | 6 (40%) | NS | | |
| **Theme: Use of restraints** | | | | | | |
| 18. The number of patients with mobility limiting equipment. | 7 (71%) | D | 6 (40%) | NS | | |
| 44. Nurses should evaluate freedom limiting equipment. | 8 (71%) | S | 8 (100%) | S | | |
| 46. Nurses should evaluate mobility limiting equipment. | 8 (79%) | S | | | | |
| 47. The hospital (ward) should have a policy to minimize the use of mobility limiting equipment in patients at risk for falling. | 8 (79%) | S | 8 (60%) | D | 7 (80%) | D |
| 48. Patients should have an acceptable degree of pain. | 8 (79%) | S | 8 (60%) | D | 8 (80%) | S |
| **Theme: Fall incident** | | | | | | |
| 19. Patients should be evaluated after a fall incident. | 8 (71%) | S | | | | |
| 20. The number of documented fall incidents. | 8 (57%) | D | 5 (0%) | NS | | |

| | | | | |
|---|---|---|---|---|
| **Theme: Documentation** | | | | |
| 21. Nurses or physical therapists should evaluate the preadmission physical ability. | 8 (93%) | S | 8 (100%) | S |
| 22. Nurses or physical therapists should evaluate the mobility. | 8 (79%) | S | 8 (100%) | S |
| **Theme: Providing information** | | | | |
| 23. Close-relatives of patients should be informed about the importance of physical activity. | 7 (79%) | D | 8 (80%) | S |
| 24. Patients should be informed about the importance of physical activity. | 8 (71%) | S | | |
| **Theme: Bed rest** | | | | |
| 25. Physicians should consider bed rest as an abnormal medical procedure. | 6 (50%) | NS | | |
| 26. Nurses should consider bed rest as an abnormal procedure. | 6 (50%) | NS | | |
| 27. Physical therapists should consider bed rest as an abnormal procedure. | 6 (29%) | NS | | |

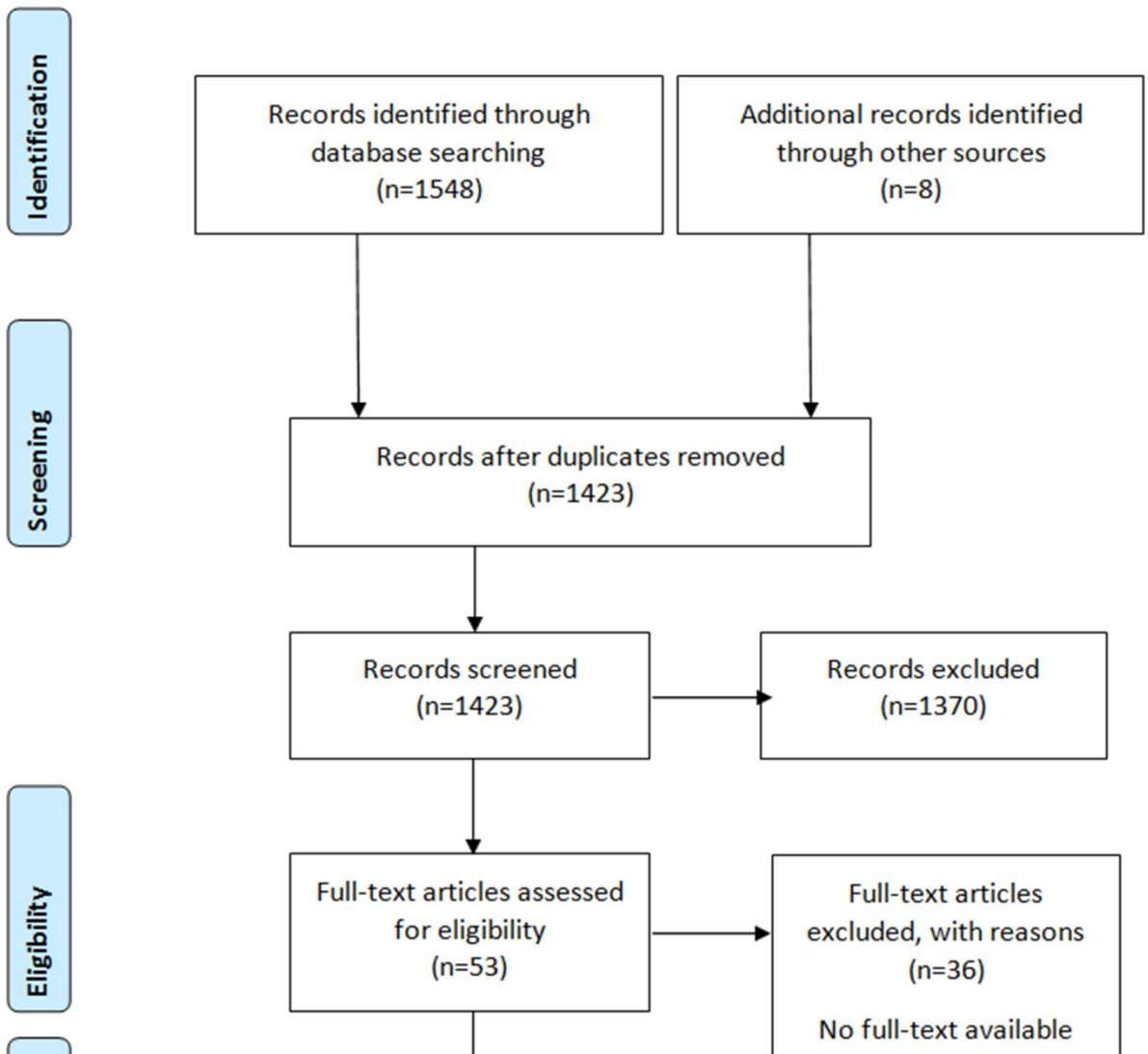
| | | | | | | |
|---|---|---|---|---|---|---|
| 28. The number of patients with bed rest without medical urgency. | 6 (50%) | NS | 7 (60%) | NS | | |
| **Theme: Education** | | | | | | |
| 29. The number of lower educated healthcare providers. | 2 (0%) | NS | | | | |
| 36. Physicians should have followed education related to physical activity of patients. | 7 (71%) | D | 7 (60%) | NS | | |
| 37. Nurses should have followed education related to physical activity of patients. | 7 (86%) | D | 8 (80%) | S | | |
| 38. Physical therapists should have followed education related to physical activity of patients. | 7 (64%) | NS | | | | |
| **Theme: Work pressure** | | | | | | |
| 30. Nurses should be aware of work pressure being a limiting factor for physical activity in patients. | 8 (79%) | S | 7 (100%) | D | 7 (100%) | D |
| 31. The number of patients who experience to be discharged too early. | 5 (29%) | NS | | | | |
| **Theme: Environment** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 32. Hospital rooms should be equipped with adequate furniture to improve physical activity. | 7 (71%) | D | 7 (80%) | D | 7 (80%) | D |
| 51. The hospital (ward) has orientation promoting resources. | 7 (57%) | NS | 7 (100%) | D | 8 (100%) | S |
| 52. The hospital (ward) provides adequate resources to stimulate physical activity. | 8 (86%) | S | 8 (100%) | S | | |
| 53. Patients should have access to a movement room. | 8 (79%) | S | 7 (60%) | NS | | |
| 54. Patients should have sunlight in their hospital room. | 7 (64%) | NS | | | | |
| **Theme: Aids for mobilization** | | | | | | |
| 33. Patients should have adequate walking aids. | 8 (86%) | S | | | | |
| 34. Patients should have comfortable chairs. | 8 (79%) | S | 6 (40%) | NS | | |
| 35. Patients should have access to ergometers. | 4 (28%) | NS | | | | |
| **Theme: Culture** | | | | | | |
| 45. The hospital (ward) should have a policy to improve physical activity of | 8 (86%) | S | 8 (100%) | S | | |

| | | | | |
|---|---|---|---|---|
| patients. | | | | |
| 49. The hospital (ward) should have a policy to inform close-relatives about physical activity. | 8 (79%) | S | 8 (80%) | S |

*Abbreviations: %HT, percentage in highest tertile; D, discussion; NS, no selection; S, selection*

*Supplementary Figure A1. Flow diagram of study selection.*



BMJ Open

# Development of a longlist with healthcare quality indicators for physical activity of patients during hospital stay: a modified RAND Delphi study

| | |
|---|---|
| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2019-032208.R1 |
| Article Type: | Original research |
| Date Submitted by the Author: | 08-Aug-2019 |
| Complete List of Authors: | Koenders, Niek; Radboudumc, Radboud Institute for Health Sciences, Department of Rehabilitation - Physical Therapy<br>van den Heuvel, Stein; Radboudumc, Radboud Institute for Health Sciences, Department of Rehabilitation - Physical Therapy<br>Bloemen, Shanna; Radboudumc, Radboud Institute for Health Sciences, Department of Rehabilitation - Physical Therapy<br>Van der Wees, Philip; Radboud university medical center, Radboud Institute for Health Sciences, IQ healthcare<br>Hoogeboom, Thomas J; Radboud university medical center, Radboud Institute for Health Sciences, IQ healthcare |
| Primary Subject Heading: | Rehabilitation medicine |
| Secondary Subject Heading: | Health services research |
| Keywords: | Healthcare quality indicator, Performance indicator, Quality measure, Physical activity |
| | |

**TITLE**

# Development of a longlist with healthcare quality indicators for physical activity of patients during hospital stay: a modified RAND Delphi study

**AUTHOR NAMES AND AFFILIATIONS**

Niek Koenders[a], MSc.; Stein van den Heuvel[a], MSc.; Shanna Bloemen[a]; prof. dr. Philip J van der Wees[b]; dr. Thomas J Hoogeboom[b]

[a] Department of Rehabilitation – Physical Therapy, Radboud Institute for Health Sciences, Radboud university medical center, Nijmegen, the Netherlands.

[b] IQ healthcare, Radboud Institute for Health Sciences, Radboud university medical center, Nijmegen, the Netherlands.

**CORRESPONDING AUTHOR**

Niek Koenders

Department of Orthopaedics – Physical Therapy

Radboud university medical center, Nijmegen, the Netherlands

Radboud Institute for Health Sciences

Full postal address: Geert Grooteplein Zuid 10, 6525 GA NIJMEGEN, the Netherlands

Email: niek.koenders@radboudumc.nl

Telephone number: 0031-024 36 13812

**RUNNING TITLE**

Indicators for inpatient physical activity

**KEYWORDS**

Healthcare quality indicator, performance indicator, quality measure, physical activity

**WORD, REFERENCE AND GRAPHICS COUNT**

Abstract: 298

Main text: 2932

References: 52

Tables: 2

Figures: 1

**BRIEF SUMMARY**

A longlist with 23 quality indicators was constructed to grade, monitor, and improve care for hospitalized adults of all ages with (or at risk of) low physical activity during hospital stay.

## ABSTRACT

### Objective

To develop a longlist with healthcare quality indicators for the care of hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay.

### Design

A modified RAND/UCLA Appropriateness Method Delphi study.

### Setting and Participants

Participants were physical therapists, nurses, and managers working in Dutch university medical centers.

### Methods

The current study consisted of three phases. Phase 1 was a systematic literature search for quality indicators and relevant topics. Phase 2 was a survey amongst healthcare professionals to collect additional data. Phase 3 consisted of three consensus rounds. In round one, experts rated the relevance of the potential indicators online (Delphi). The second round was a face-to-face expert panel meeting managed by an experienced moderator. The second round was a face-to-face expert panel meeting. Acceptability, feasibility, and validity of the quality indicators were discussed by the panel members. Disagreements were solved online (Delphi) in the third round.

### Results

The search retrieved 1,556 studies of which 53 studies were assessed full-text. Data from seventeen studies were included in a first draft longlist with indicators. Eighteen nurses and

one physical therapist responded to the survey and added data for a second draft of the longlist. Experts constructed the final longlist with 23 indicators in three consensus rounds. Eight domains were identified: “Aim”, “Patient-tailored physical activity plan”, “Evaluation of physical activity”, “Information on physical activity”, “Equipment to stimulate physical activity”, “Policy regarding physical activity”, “Attitude related to physical activity”, and “Other”.

**Conclusion and Implications**

The healthcare quality indicators developed in this study could help to grade, monitor, and improve healthcare for hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay. Future research will focus on the psychometric quality of the indicators and selection of key performance indicators.

**Strengths and limitations of this study**

- The current study consists of a systematic review with duplicate study selection, an extra survey in healthcare professionals, and three consensus rounds with a panel meeting.
- The panel meeting has been moderated by an internationally experienced moderator
- The longlist with healthcare quality indicators was developed by a multidisciplinary group of healthcare professionals including nurses, physical therapists, and managers.
- Extending the list to patients, other healthcare professionals, and healthcare insurers is recommended.

## INTRODUCTION

Low physical activity of patients during the hospital stay has been extensively reported,[1 2] especially in older patients.[3-5] Low physical activity is a global healthcare issue with known adverse effects such as decreased strength, functional decline, a prolonged hospital stay, and institutionalization.[6-9] Common barriers to physical activity during the hospital stay include: symptoms (i.e. fatigue and pain), lack of motivation, medical devices, and the hospital environment.[10-13] Several quality improvement initiatives have been developed to improve physical activity of patients during the hospital stay.[14-18] Nevertheless, quality indicators to measure the results of such quality improvement strategies are scarce.[19-21]

Healthcare quality indicators, also known as performance indicators or quality measures, are used all over the world to quantify, grade, monitor, and improve the quality of healthcare.[22-24] Recently, qualitative indicators have also been introduced to express matters that are hard to capture quantitatively such as having confidence in being safe in a community.[25] Quality indicators are used in hospital care to provide information for quality improvement initiatives to, for example, decrease hospital mortality and complications.[26 27] Regarding the management of (low) physical activity of patients during the hospital stay, quality indicators could be helpful to capture persisting barriers in an attempt to improve the physical activity of all patients.[28] As a first step, a longlist with relevant quality indicators is needed to serve as a database for healthcare professionals, clinical teams, and organizations to measure performance for quality improvement purposes.[21] Therefore, the aim of this study is to develop a longlist with quality indicators for the healthcare in hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay.

## METHODS

### Design and setting

A modified RAND/UCLA Appropriateness Method Delphi study[29] was used to develop a longlist with quality indicators which meets the requirements of the Appraisal of Guidelines for Research and Evaluation (AGREE) II Healthcare Quality Indicator tool.[30] The AGREE II tool was used as a guiding checklist for study development (Supplementary Table A1). The reporting of this study followed guidelines of the Standards for QUality Improvement Reporting Excellence (SQUIRE 2.0).[31] The study was conducted as a quality improvement initiative of the Radboud university medical center and followed the principles of the Declaration of Helsinki[32] and Good Clinical Practice Guideline[33]. Full ethical consideration was waived by the Ethics Committee of the Radboud university medical center in accordance with the Dutch Medical Research with Human Subjects Law.

All phases from the RAND/UCLA method were followed (Figure 1). Phase 1 was a systematic literature search to identify indicators and relevant topics for potential indicators. Phase 2 was an extra survey amongst healthcare professionals to provide additional relevant topics. This extra survey was a modification to the original RAND/UCLA method to obtain as many relevant indicators and topics as possible. Phase 3 consisted of three consensus rounds in which potential indicators were rated for their relevance by experts.

### Literature search

The literature search was conducted to develop the first draft of a longlist with quality indicators for physical activity of hospitalized adults of all ages. CINAHL, MEDLINE, and EMBASE were systematically searched for studies up to 24 January 2018 using a pre-defined search strategy (Supplementary Table A2). The search strategy was compiled with the help

of an experienced librarian (OYC). The study selection and data extraction were independently performed by two researchers (NK, SH).[34] An indicator was considered relevant if a definition, numerator, and denominator were described in the literature and related to physical activity of patients during the hospital stay. A topic was considered relevant when information in the text of articles commented on the physical activity of patients during the hospital stay.

**Extra survey**

All indicators and topics were then translated into the Dutch language and presented to a convenience sample of healthcare professionals and managers of one Dutch academic hospital using an online questionnaire in LimeSurvey.[35] The participants were requested to suggest additional topics related to physical activity of hospitalized adults of all ages. Furthermore, problems as a result of unclear translation or unclear formulation were solved with the help of the participants. The second draft was constructed by two researchers (NK, SH) with quality indicators from both the literature review and additional input from healthcare professionals and managers. Each topic was converted into an indicator by formulating a definition, numerator, and denominator. All converted topics were checked for loss of information due to the translation by a third researcher (TH).

**Consensus rounds**

The second draft of the longlist with quality indicators was presented for relevance rating in the three consensus rounds with experts.[36] To include a group of multidisciplinary experts in the consensus rounds, we purposefully sampled national experts.[37] The multidisciplinary expert panel consisted of 28 experts (12 physical therapists, 11 nurses, 5 managers). All experts worked in a university medical center (secondary care); participated in care,

research, and innovation of physical activity in patients during the hospital stay; and were representatives of an acknowledged national workgroup called *Moving Hospitals* (in Dutch: *Beweegziekenhuizen*). The experts were approached by email and telephone for participation in this study.

In the first consensus round (Delphi method), the experts received the longlist with quality indicators online in LimeSurvey. All indicators were rated on relevance by the experts for the first consensus label: *selection*, *discussion* or *no selection*. In the second round, all quality indicators were discussed in a panel meeting with experts (panel members) moderated by an experienced moderator (PW). First, the panel members discussed the acceptability to healthcare professionals and managers, the feasibility of use, and the validity in terms of providing more appropriate care and optimizing patient outcomes.[29] Finally, all panel members voted (yes or no) for final consensus on *selection*, *discussion*, or *no selection* of the quality indicators. A methodologist (TH) observed the panel meeting from the side-line and intervened if methodological errors occurred. In the third consensus round (Delphi method), all panel members only received the modified quality indicators and the quality indicators which were still under discussion online in LimeSurvey for final consensus.

**Data analysis**

The experts were instructed to rate the quality indicators only on relevance, not on e.g. feasibility or reliability. The relevance was scored using a 9-point Likert scale ranging from 1 *not relevant* to 9 *very relevant*. Consensus outcomes from the relevance ratings were calculated using the *IQ healthcare consensus tool.*[38] The consensus outcomes were based on the median score and the highest tertile, which resulted in labels: *selection*, *discussion*, or *no selection* (Table 1).[38] Quality indicators were labeled *selection* when the median score was ≥8

on the 9-point Likert scale and ≥70% of the responses were in the highest tertile. The label *discussion* was given as a result of three possible outcomes, 1) the median score was ≥8 though less than 70% of the responses were in the highest tertile, 2) the median score was <8 though more than 70% of the responses were in the highest tertile, or 3) 30% of the responses were in the lowest and highest tertile. An indicator was labeled *no selection* when the median was ≤7 and less than 70% of the responses were in the highest tertile.

*Table 1. Labels corresponding to the consensus outcomes following different quantitative relevance ratings of experts in the consensus rounds using the IQ healthcare consensus tool.*

| | **≥70% in the highest tertile** | **≥30% in the lowest tertile, and ≥30% in the highest tertile** | **<70% in the highest tertile** |
|---|---|---|---|
| **Median ≤ 3** | Discussion | Discussion | No selection |
| **Median 4 ≤ 7** | Discussion | Discussion | No selection |
| **Median ≥ 8** | Selection | Discussion | Discussion |

In the second consensus round (panel meeting), the panel members received information on all first-round outcomes with corresponding labels per quality indicator. The panel members voted yes or no for final *selection*, *discussion*, or *no selection* and consensus meant that at least 75% of the members voted for one final outcome. Where needed, the quality indicators were modified to improve the concise formulation. If modification(s) were suggested, the quality indicators were reformulated and rated (online and anonymous) for a second time by the panel members. The quality indicators needing further discussion were modified and rated by the panel members in the third online consensus round. After the third consensus round, only quality indicators which were labeled *selection* were included in the longlist with quality indicators. Ultimately, all selected quality indicators were charted by

domain and translated into the English language with a standardized forward-backward by the Language Centre of the HAN university of applied sciences, Nijmegen, the Netherlands.

**Patient and public involvement**

No patients or public were involved in the design and conceptualization of this study.

## RESULTS

### Literature search

The systematic literature search retrieved a total of 1,556 studies, including 8 studies through searching the grey literature (Supplementary Table A2, Supplementary Figure A1). Full-text articles of 53 studies were assessed for eligibility, ultimately resulting in the inclusion of 17 articles.[1-3 6 19-21 39-48] Data extraction resulted in the identification of 29 unique indicators and 5 topics related to hospitalized adults of all ages with (or at risk of) low physical activity during hospital stay for a first draft longlist with quality indicators.

### Extra survey

The 29 indicators and 5 topics were translated into the Dutch language and surveyed amongst 296 healthcare professionals. Eighteen nurses and 1 physical therapist responded and they suggested 20 additional topics. Twenty-five topics were reformulated and converted into indicators, ultimately resulting in 54 unique indicators in the second draft longlist with quality indicators (Supplementary Table A3).

### Consensus rounds

Consensus round 1 – Twenty-eight experts were invited to participate in the first online Delphi round. Ultimately, 14 experts responded: 8 physical therapists, 4 nurses and 2 managers. A total of 22 indicators were labeled *selection*, 12 indicators *discussion*, and 20 indicators *no selection* as a result of the first round. A detailed overview of ratings and selections is provided in Supplementary Table A4.

Consensus round 2 – The panel meeting lasted three hours with a total of 5 panel members: 4 physical therapists and 1 nurse. At the start, the moderator asked to discuss two key issues

which were identified in the first Delphi round. First, the concept of physical activity during hospital stay was discussed and defined for the panel meeting as *"an active transfer of a body(part) by a hospitalized patient*". This did not include exercises or a transfer of a body(part) using a machine or object such as a standing aid or hospital bed. Second, the physical activity plan was defined as *"an object in which physical activity should be reported, tailored at individual patients' needs, with a specific structure stating personal goals, frequency, intensity, time, and type of physical activity. Besides, the amount of support needed for mobilization should be described, for example, the need for a walking aid*". Of all 22 indicators with the label *selection*, the panel members voted consensus for *selection* of 15 indicators, *discussion* of 5 indicators, and *no selection* of 2 indicators. Of all 12 indicators with the label *discussion*, the panel members voted consensus for *selection* of 5 indicators, *discussion* of 1 indicator, and *no selection* of 6 indicators. Of all 20 indicators with the label *no selection*, the panel members voted consensus for *discussion* of 1 indicator and *no* selection of 19 indicators. As a result of the second consensus round, 20 indicators were *selected*, 7 indicators remained under *discussion* and were included in round 3, and 27 indicators were *not selected* (Supplementary Table A4).

Consensus round 3 (Delphi) – In the third round, the same 5 panel members performed the final rating of 7 remaining indicators resulting in the *selection* of 3 indicators, *discussion* of 3 indicators, and *no selection* of 1 indicator. The discussion remained for three indicators (numbers 30, 32, 47) resulting in *no selection* due to a lack of consensus (Supplementary Table A4). A flow diagram of the quality indicators selection is presented in Figure 1.

Please insert Figure 1 'Flow diagram showing the selection of healthcare quality indicators in all phases of the study' about here.

**Final longlist indicators**

The final longlist with quality indicators includes 23 indicators and are categorized into eight domains (Table 2). The first domain, "*Aim"*, consists of one indicator that describes the intention of achieving physical activity of patients within 48 hours after hospital admission. The second domain, "*Patient-tailored physical activity plan"*, describes quality indicators related to the use and follow-up of a patient-tailored physical activity plan that "*should be reported, tailored at individual patients' needs, with a specific structure stating personal goals, frequency, intensity, time, and type of physical activity".* The third domain, "*Evaluation of physical activity"* includes quality indicators on timely documentation and assessment of physical activity of patients by a healthcare professional. The fourth domain, *"Information on physical activity"*, describes two quality indicators related to the provision of educational information to both patients and close-relatives. The fifth domain includes quality indicators on *"Equipment to stimulate physical activity"*. Within this domain, specific attention is given to limited use of freedom and mobility limiting equipment such as a five-point fixation, intravenous lines, and urinary catheters. The sixth domain describes two quality indicators in the domain "*Policy regarding physical activity"* to evaluate institutional characteristics of the hospital (ward) in which healthcare professionals work. The seventh domain describes three qualitative quality indicators in which the "*Attitude related to physical activity"* of physicians and nurses should be assessed. Finally, three quality indicators were labeled in domain eight as "*Other"*.

*Table 2. The final longlist with healthcare quality indicators for the care of patients with (or at risk of) low physical activity during the hospital stay.*

| Domain | | Healthcare quality indicators |
|---|---|---|
| **1. Aim** | ***Title:*** | **1. Patients should be physically active within 48 hours after hospital admission (Outcome indicator)** |
| | *Numerator:* | The number of patients who were physically active within 48 hours after hospital admission. |
| | *Denominator:* | The number of patients. |
| | | *Adapted from Arora et al.*[20] |
| **2. Patient-tailored physical activity plan** | ***Title:*** | **2. Patients should have a physical activity plan (Process indicator)** |
| | *Numerator:* | The number of patients who had a physical activity plan within 48 hours after hospital admission. |
| | *Denominator:* | The number of patients. |
| | | *Adapted from Growdon et al.*[43] *and Lafont et al* [41] |
| | ***Title:*** | **3. Patients in need for support during mobilization should have a physical activity plan (Process indicator)** |
| | *Numerator:* | The number of patients, who needed the support of (at least) one person for mobilization, with a physical activity plan. |
| | *Denominator:* | The number of patients who needed the support of at (least) one person for mobilization. |
| | | *Adapted from Growdon et al.*[43] *and Lafont et al.*[41] |
| | ***Title:*** | **4. Patients without need for support during mobilization should have a physical activity plan (Process indicator)** |
| | *Numerator:* | The number of patients, who did not need the support of a person for mobilization, with a physical activity plan. Patients who only use (a) walking aid(s) are considered independent. |
| | *Denominator:* | The number of patients who did not need the support of a person for mobilization. |
| | | *Adapted from Growdon et al.*[43] *and Lafont et al.*[41] |
| | ***Title:*** | **5. Patients should perform physical activities as described in their physical activity plan (Outcome indicator)** |
| | *Numerator:* | The number of patients who performed physical activities as described in their physical activity plan. |
| | *Denominator:* | The number of patients with a physical activity plan. |
| | | *Adapted from Growdon et al.*[43] *and Lafont et al.*[41] |
| **3. Evaluation of physical activity** | ***Title:*** | **6. Nurses or physical therapists should evaluate the preadmission physical ability (Process indicator)** |

| | | |
|---|---|---|
| | *Numerator:* | The number of patients in which the preadmission physical functioning was evaluated within 24 hours after hospital admission. |
| | *Denominator:* | The number of patients.<br>*Adapted from Brown et al.[3], Pedersen et al.[1], Lafont et al.[41], Zisberg et al.[6], Covinsky et al.[39], Bail et al.[19], Arora et al.[42], Tropea et al.[21], and Counsell et al.[47]* |
| | ***Title:*** | **7. Nurses or physical therapists should evaluate the mobility (Process indicator)** |
| | *Numerator:* | The number of patients in which the mobility was evaluated within 24 hours after hospital admission. |
| | *Denominator:* | The number of patients.<br>*Adapted from Covinsky et al.[39]* |
| | ***Title:*** | **8. Patients should be evaluated after a fall incident (Process indicator)** |
| | *Numerator:* | The number of patients in which a fall incident was evaluated within 24 hours after the fall. |
| | *Denominator:* | The number of patients with a fall incident.<br>*Adapted from Arora et al.[20] and Tropea et al.[21]* |
| **4. Information on physical activity** | ***Title:*** | **9. Patients should be informed about the importance of physical activity (Process indicator)** |
| | *Numerator:* | The number of patients who were informed about the importance of physical activity during the hospital stay. |
| | *Denominator:* | The number of patients.<br>*Adapted from Bail et al.[19]* |
| | *Title:* | **10. Close-relatives of patients should be informed about the importance of physical activity (Process indicator)** |
| | *Numerator:* | The number of close-relatives of patients who were informed about the importance of physical activity during the hospital stay. |
| | *Denominator:* | The number of patients with close-relatives.<br>*Adapted from Bail et al.[19]* |
| **5. Equipment to stimulate physical activity** | ***Title:*** | **11. Patients should have adequate walking aids (Structure indicator)** |
| | *Numerator:* | The number of patients who were advised to use (a) walking aid(s), with (an) adequate walking aid(s) available. |
| | *Denominator:* | The number of patients who were advised to use (a) walking aid(s).<br>*Expert opinion* |
| | ***Title:*** | **12. Nurses should evaluate freedom limiting equipment (Process indicator)** |
| | *Numerator:* | The nurses performed a daily assessment of the use of freedom-limiting equipment. Examples are five-point fixation, wheelchair tables, and wheelchair brakes. |

| | | |
|---|---|---|
| | *Answer:* | The number of nurses.<br>*Adapted from Inouye et al.[44] and Sourdet et al.[40]* |
| | ***Title:*** | **13. Nurses should evaluate mobility limiting equipment (Process indicator)** |
| | *Numerator:* | The nurses performed a daily assessment of the use of mobility-limiting equipment in patients. Examples are intravenous lines, urinary catheters, and oxygen tubes. |
| | *Answer:* | The number of nurses.<br>*Adapted from Inouye et al.[44] and Sourdet et al.[40]* |
| | ***Title:*** | **14. The hospital (ward) should provide adequate resources to stimulate physical activity (Structure indicator)** |
| | *Numerator:* | The hospital (ward) provided physical activity stimulating resources. Examples are walking routes, treadmills, ergometers. |
| | *Answer:* | The number of hospital(s) ward(s).<br>*Adapted from Bail et al.[19] and Covinsky et al.[39]* |
| | ***Title:*** | **15. The hospital (ward) should have orientation promoting resources (Structure indicator)** |
| | *Numerator:* | The hospital (ward) provided orientation stimulating resources. Examples are maps, direction signs, banners with route information |
| | *Answer:* | The number of hospital(s) ward(s).<br>*Adapted from Bail et al.[19] and Covinsky et al.[39]* |
| **6. Policy regarding physical activity** | ***Title:*** | **16. The hospital (ward) should have the policy to improve the physical activity of patients (Structure indicator)** |
| | *Numerator:* | The hospital (ward) policy was to inform patients to be physically active during the hospital stay. |
| | *Answer* | The number of hospital(s) ward(s).<br>*Expert opinion* |
| | ***Title:*** | **17. The hospital (ward) should have the policy to inform close-relatives about physical activity (Structure indicator)** |
| | *Numerator:* | The hospital (ward) policy was to inform close-relatives of patients about the importance of physical activity during the hospital stay. |
| | *Answer:* | The number of hospital(s) ward(s).<br>*Expert opinion* |
| **7. Attitude related to physical activity** | ***Title:*** | **18. Physicians should stimulate the physical activity of patients (Qualitative indicator)** |
| | *Numerator:* | The number of physicians who had a stimulating attitude towards the physical activity of patients during the hospital stay |
| | *Denominator:* | The number of physicians. |

| | | |
|---|---|---|
| | | *Adapted from Inouye et al.[44] and Sourdet et al.[40]* |
| | ***Title:*** | **19. Nurses should stimulate the physical activity of patients (Qualitative indicator)** |
| | *Numerator:* | The number of nurses who had a stimulating attitude towards the physical activity of patients during the hospital stay. |
| | *Denominator:* | The number of nurses. |
| | | *Adapted from Inouye et al.[44] and Sourdet et al.[40]* |
| | ***Title:*** | **20. Nurses should stimulate independent functioning in daily activities of patients (Qualitative indicator)** |
| | *Numerator:* | The number of nurses who had a stimulating attitude towards independent physical functioning in daily activities of patients during the hospital stay. |
| | *Denominator:* | The number of nurses. |
| | | *Adapted from Sourdet et al.[40], Pedersen et al.[1], and Brown et al.[3]* |
| **8. Other** | ***Title:*** | **21. Patients should receive support for mobilization (Process indicator)** |
| | *Numerator:* | The number of patients who received the support of (at least) one person for mobilization. |
| | *Denominator:* | The number of patients who needed the support of (at least) one person for mobilization. |
| | | *Adapted from Growdon et al.[43] and Lafont et al.[41]* |
| | ***Title:*** | **22. Patients should have an acceptable degree of pain (Outcome indicator)** |
| | *Numerator:* | The number of patients who scored *pain at rest* and *pain during physical activities* with a Numeric Pain Rating Scale ≤4. |
| | *Denominator:* | The number of patients. |
| | | *Adapted from Sourdet et al.[40], Covinsky et al.[39], and Arora et al.[42]* |
| | ***Title:*** | **23. Nurses should have followed education related to physical activity of patients (Structure indicator)** |
| | *Numerator:* | The number of nurses who followed education concerning the importance of physical activity of patients during the hospital stay. |
| | *Denominator:* | The number of patients. |
| | | *Adapted from Bail et al.[19]* |

255

## DISCUSSION

The current study presents the development of a longlist with quantitative and qualitative healthcare quality indicators for the healthcare of hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay. A multidisciplinary expert panel agreed on a list of 23 quality indicators with important domains such as an aim, patient-tailored physical activity plan, evaluation of physical activity, information on physical activity, equipment to stimulate physical activity, policy regarding physical activity, and attitude related to physical activity. The quality indicators involve several stakeholders such as patients, close-relatives, and healthcare professionals (i.e. physical therapists, nurses, and physicians), which is consistent with the multi-factorial nature of low physical activity of patients during the hospital stay.[39]

Reviewing current literature related to indicator development in secondary healthcare, shows several studies reporting on physical activity of the elderly.[19-21] In contrast to our study, none of these aimed to evaluate physical activity in hospitalized adults of all ages during the hospital stay. Bail et al.[19] performed a literature review and constructed a theoretical framework called 'Failure to maintain'. This study suggested quality indicators on physical environment factors and process factors (treatment and regimes that may affect the patient) to increase physical activity in complex older patients and ultimately decrease the incidence of urinary tract infections, pneumonia, delirium, and pressure injuries. Arora et al.[20] also performed a literature review for the general medical care of hospitalized vulnerable elderly. Out of thirty reported quality indicators, only two related to physical activity of patients during the hospital stay: mobilization and inpatient fall evaluation. These two domains are likely to be important, although only two quality indicators do not completely address the complex issue of low physical activity in patients during the hospital

stay.[10] Tropea et al.[21] performed a Delphi study with anonymous voting rounds and a panel meeting similar to the current study, ultimately resulting in a set of quality indicators for healthcare in older hospitalized patients. The set exists of three quality indicator domains related to physical activity in patients during the hospital stay with five relevant quality indicators: inpatient fall evaluation, fall-related injuries including fractures, pressure ulcer risk assessment, discharge assessment, and assessment of physical function.

Interestingly, the current study found two quality indicators with a focus on hospital (ward) policy. In line with the Medical Research Council recommendations, quality improvement studies which aim to improve physical activity in hospitalized adults of all ages should include the perspective of local hospital policy in their study development and process evaluation.[49] Furthermore, qualitative quality indicators were described to evaluate the attitudes of healthcare professionals related to physical activity. Attitudes are often hard to measure and therefore underexposed in other studies,[25] despite the knowledge that attitudes of different stakeholders play an important role in healthcare quality improvement.[50] With low physical activity during hospital stay being a multi-factorial issue in hospitalized adults of all ages, the current study provides crucial knowledge to evaluate healthcare for hospitalized adults of all ages (with or) at risk of low physical activity during the hospital stay.

**Strengths and limitations**

The current study has several strengths. First, all methods as suggested by the modified RAND/UCLA are followed in detail. The use of a thorough systematic review with duplicate study selection, an extra survey in healthcare professionals, and consensus rounds with a panel meeting is considered as a very rigorous quality indicators development procedure.[51]

Second, the panel meeting has been moderated by an internationally experienced moderator (PW) which contributed to an efficient and systematic discussion of all quality indicators.

There are some limitations to the current study that need to be discussed. First, only five panel members participated in the panel meeting which is lower than the preferred seven to fifteen members within the RAND/UCLA method.[29] Despite the reduced diversity of representation, the smaller group size was found to stimulate the involvement of every panel member in the group discussion. Second, two items of the AGREE II were not met.[30] The quality indicators were not submitted to external review, and stakeholders such as patients, managers, and healthcare insurers were insufficiently included in the process of quality indicators development. However, the limited external review and stakeholder involvement could be adequately addressed in future research.

**Recommendations for future research**

As the next step of our quality improvement initiative, a multicenter study will be performed to assess the acceptability, feasibility and reliability of the longlist with quality indicators for the healthcare in hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay. The longlist with quality indicators will be applied in practice to further assess the acceptability to patients, healthcare professionals, and managers, as well as its feasibility and reliability.[52] Future research will include a validation study following the Delphi technique of Hasson et al.[51] in a team of national and international experts. This would provide crucial information on the appropriateness of care and optimization of patient outcomes. To improve feasibility in daily practice, it would be useful to select approximately three or four key performance quality indicators from the current longlist.

Ultimately, a quality improvement study should use the key performance quality indicators in daily healthcare and assess their effect on patient outcomes such as strength and functional decline.

**Conclusions and Implications**

The healthcare quality indicators developed within the current study form a rigorous basis to evaluate healthcare for hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay. Improvements in healthcare related to low physical activity of patients during the hospital stay are urgently needed, as the epidemic of low physical activity already exists for decades with known, well-reported adverse effects. Quality improvement projects to increase the physical activity of patients during the hospital stay using currently developed healthcare quality indicators are promising, relevant, and will improve outcomes in hospitalized adults of all ages.

**ACKNOWLEDGEMENTS**

We would like to thank librarian On Ying Chan (OYC) for her help in the systematic literature search. Inge Janssen and Rebecca Cooke of the Language Centre (HAN university of applied sciences, Nijmegen, the Netherlands) are thanked for their forward-backward translation of the longlist with healthcare quality indicators. We would also like to thank Amy Awad-Sman for her language corrections. All members of the Dutch expert group *Beweegziekenhuizen* are thanked for their help in study conceptualization and data collection.

**COMPETING INTERESTS**

All authors declare that they have no competing interests.

## FUNDING

This research did not receive and funding from agencies in the public, commercial or not-for-profit sectors.

## AUTHORS' CONTRIBUTIONS

All listed authors meet the ICMJE criteria for authorship. NK, SH, and TH contributed to study conceptualization. Data collection and analysis was handled by NK, SH, PW, and TH. SB provided resources and contributed to project administration. PW and TH supervised all research activities. All authors reviewed concept drafts of the manuscript and approved submission of the final draft.

## DATA AVAILABILITY

No additional data are available. All data is provided in detail in the online Supplementary File.

## REFERENCES


1. Pedersen MM, Bodilsen AC, Petersen J, et al. Twenty-four-hour mobility during acute hospitalization in older medical patients. *J Gerontol A Biol Sci Med Sci* 2013;68(3):331-7. doi: 10.1093/gerona/gls165
2. Mudge AM, McRae P, McHugh K, et al. Poor mobility in hospitalized adults of all ages. *Journal of hospital medicine* 2016 doi: 10.1002/jhm.2536 [published Online First: 2016/01/23]
3. Brown CJ, Redden DT, Flood KL, et al. The underrecognized epidemic of low mobility during hospitalization of older adults. *Journal of the American Geriatrics Society* 2009;57(9):1660-5. doi: 10.1111/j.1532-5415.2009.02393.x [published Online First: 2009/08/18]
4. Warshaw GA, Moore JT, Friedman SW, et al. Functional disability in the hospitalized elderly. *Jama* 1982;248(7):847-50. [published Online First: 1982/08/20]
5. Lazarus BA, Murphy JB, Coletta EM, et al. The provision of physical activity to hospitalized elderly patients. *Archives of internal medicine* 1991;151(12):2452-6. [published Online First: 1991/12/01]
6. Zisberg A, Shadmi E, Sinoff G, et al. Low mobility during hospitalization and functional decline in older adults. *Journal of the American Geriatrics Society* 2011;59(2):266-73. doi: 10.1111/j.1532-5415.2010.03276.x [published Online First: 2011/02/15]
7. Boyd CM, Landefeld CS, Counsell SR, et al. Recovery of activities of daily living in older adults after hospitalization for acute medical illness. *Journal of the American Geriatrics Society* 2008;56(12):2171-79.
8. Baztan JJ, Suarez-Garcia FM, Lopez-Arrieta J, et al. Effectiveness of acute geriatric units on functional decline, living at home, and case fatality among older patients admitted to hospital for acute medical disorders: meta-analysis. *BMJ (Clinical research ed)* 2009;338:b50. doi: 10.1136/bmj.b50 [published Online First: 2009/01/24]
9. Van Ancum JM, Scheerman K, Jonkman NH, et al. Change in muscle strength and muscle mass in older hospitalized patients: A systematic review and meta-analysis. *Experimental gerontology* 2017;92:34-41. doi: 10.1016/j.exger.2017.03.006 [published Online First: 2017/03/14]
10. Koenders N, van Oorsouw R, Seeger JPH, et al. "I'm not going to walk, just for the sake of walking...": a qualitative, phenomenological study on physical activity during hospital stay. *Disability and rehabilitation* 2018:1-8. doi: 10.1080/09638288.2018.1492636 [published Online First: 2018/08/11]
11. Chan DE, Hong MLI, Tan MYG, et al. Older patients' participation in physical activity during hospitalization: A qualitative study of ward nurses' perceptions in an Asian context. *Geriatric nursing (New York, NY)* 2019;40(1):91-98. doi: 10.1016/j.gerinurse.2018.07.002 [published Online First: 2018/08/11]
12. Lam KK, Ho Cheung William L, Ho KY, et al. Factors contributing to the low physical activity level for Hong Kong Chinese children hospitalised with cancer: an exploratory study. *Journal of clinical nursing* 2017;26(1-2):190-201. doi: 10.1111/jocn.13495 [published Online First: 2016/08/04]
13. Kneafsey R, Clifford C, Greenfield S. What is the nursing team involvement in maintaining and promoting the mobility of older adults in hospital? A grounded theory study. *International journal of nursing studies* 2013;50(12):1617-29. doi: 10.1016/j.ijnurstu.2013.04.007 [published Online First: 2013/05/25]
14. Liu B, Moore JE, Almaawiy U, et al. Outcomes of Mobilisation of Vulnerable Elders in Ontario (MOVE ON): a multisite interrupted time series evaluation of an implementation intervention to increase patient mobilisation. *Age and ageing* 2018;47(1):112-19. doi: 10.1093/ageing/afx128 [published Online First: 2017/10/07]
15. Oliver D. David Oliver: Fighting pyjama paralysis in hospital wards. *BMJ (Clinical research ed)* 2017;357:j2096. doi: 10.1136/bmj.j2096 [published Online First: 2017/05/04]
16. Booth KA, Simmons EE, Viles AF, et al. Improving Geriatric Care Processes on Two Medical-Surgical Acute Care Units: A Pilot Study. *Journal for healthcare quality : official publication of*

*the National Association for Healthcare Quality* 2018 doi: 10.1097/jhq.0000000000000140 [published Online First: 2018/05/26]
17. Teodoro CR, Breault K, Garvey C, et al. STEP-UP: Study of the Effectiveness of a Patient Ambulation Protocol. *Medsurg nursing : official journal of the Academy of Medical-Surgical Nurses* 2016;25(2):111-6. [published Online First: 2016/06/22]
18. Brown CJ, Foley KT, Lowman JD, et al. Comparison of posthospitalization function and community mobility in hospital mobility program and usual care patients: a randomized clinical trial. *JAMA internal medicine* 2016;176(7):921-27.
19. Bail K, Grealish L. 'Failure to Maintain': A theoretical proposition for a new quality indicator of nurse care rationing for complex older people in hospital. *International journal of nursing studies* 2016;63:146-61. doi: 10.1016/j.ijnurstu.2016.08.001 [published Online First: 2016/09/23]
20. Arora VM, McGory ML, Fung CH. Quality indicators for hospitalization and surgery in vulnerable elders. *Journal of the American Geriatrics Society* 2007;55 Suppl 2:S347-58. doi: 10.1111/j.1532-5415.2007.01342.x [published Online First: 2007/10/04]
21. Tropea J, Amatya B, Brand CA. Use of consensus methods to select clinical indicators to assess activities to minimise functional decline among older hospitalised patients. *Australian health review : a publication of the Australian Hospital Association* 2011;35(4):404-11. doi: 10.1071/ah09790 [published Online First: 2011/12/01]
22. Petersson IF, Strömbeck B, Andersen L, et al. Development of healthcare quality indicators for rheumatoid arthritis in Europe: the eumusc. net project. *Annals of the rheumatic diseases* 2013:annrheumdis-2013-203765.
23. Steinke S, Beikert FC, Langenbruch A, et al. Measurement of healthcare quality in atopic dermatitis - development and application of a set of quality indicators. *Journal of the European Academy of Dermatology and Venereology : JEADV* 2018 doi: 10.1111/jdv.15074 [published Online First: 2018/05/16]
24. Bellmunt S, Roque M, Osorio D, et al. Healthcare quality indicators of peripheral artery disease based on systematic reviews. *European journal of vascular and endovascular surgery : the official journal of the European Society for Vascular Surgery* 2014;48(1):60-9. doi: 10.1016/j.ejvs.2014.02.001 [published Online First: 2014/03/22]
25. Church C, Rogers MM. Designing for results: Integrating monitoring and evaluation in conflict transformation programs: Search for Common Ground 2006.
26. Wright J, Dugdale B, Hammond I, et al. Learning from death: a hospital mortality reduction programme. *Journal of the Royal Society of Medicine* 2006;99(6):303-08.
27. Haynes AB, Weiser TG, Berry WR, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *New England Journal of Medicine* 2009;360(5):491-99.
28. Hoyer EH, Friedman M, Lavezza A, et al. Promoting mobility and reducing length of stay in hospitalized general medicine patients: A quality-improvement project. *Journal of hospital medicine* 2016;11(5):341-7. doi: 10.1002/jhm.2546 [published Online First: 2016/02/06]
29. Fitch K, Bernstein SJ, Aguilar MD, et al. The RAND/UCLA appropriateness method user's manual: RAND CORP SANTA MONICA CA, 2001.
30. Abrahamyan L, Boom N, Donovan LR, et al. An international environmental scan of quality indicators for cardiovascular care. *The Canadian journal of cardiology* 2012;28(1):110-8. doi: 10.1016/j.cjca.2011.09.019 [published Online First: 2011/12/14]
31. Ogrinc G, Davies L, Goodman D, et al. SQUIRE 2.0 (Standards for QUality Improvement Reporting Excellence): revised publication guidelines from a detailed consensus process. *BMJ quality & safety* 2016;25(12):986-92. doi: 10.1136/bmjqs-2015-004411 [published Online First: 2015/09/16]
32. Association WM. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *Jama* 2013;310(20):2191.
33. Grimes DA, Hubacher D, Nanda K, et al. The Good Clinical Practice guideline: a bronze standard for clinical research. *The Lancet* 2005;366(9480):172-74.

34. Higgins JP, Green S. Cochrane handbook for systematic reviews of interventions: John Wiley & Sons 2011.
35. Schmitz N, Wang J, Malla A, et al. The impact of psychological distress on functional disability in asthma: Results from The Canadian Community Health Survey. *Psychosomatics* 2009;50(1):42-49.
36. Boulkedid R, Abdoul H, Loustau M, et al. Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. *PloS one* 2011;6(6):e20476.
37. Portney LG, Watkins M. Foundations of clinical research: applications to pratice: FA Davis Company/Publishers 2015.
38. Stienen J, Ouwens M, Pols M, et al. Hoe kom je tot de kern van de zaak? *Tijdschrift voor gezondheidswetenschappen* 2011;89(8):405-08.
39. Covinsky KE, Pierluissi E, Johnston CB. Hospitalization-associated disability:"She was probably able to ambulate, but I'm not sure". *Jama* 2011;306(16):1782-93.
40. Sourdet S, Lafont C, Rolland Y, et al. Preventable Iatrogenic Disability in Elderly Patients During Hospitalization. *Journal of the American Medical Directors Association* 2015;16(8):674-81. doi: 10.1016/j.jamda.2015.03.011 [published Online First: 2015/04/30]
41. Lafont C, Gerard S, Voisin T, et al. Reducing "iatrogenic disability" in the hospitalized frail elderly. *The journal of nutrition, health & aging* 2011;15(8):645-60. [published Online First: 2011/10/05]
42. Arora VM, Plein C, Chen S, et al. Relationship between quality of care and functional decline in hospitalized vulnerable elders. *Medical care* 2009;47(8):895-901. doi: 10.1097/MLR.0b013e3181a7e3ec [published Online First: 2009/07/15]
43. Growdon ME, Shorr RI, Inouye SK. The Tension Between Promoting Mobility and Preventing Falls in the Hospital. *JAMA internal medicine* 2017;177(6):759-60. doi: 10.1001/jamainternmed.2017.0840
44. Inouye SK, Brown CJ, Tinetti ME. Medicare nonpayment, hospital falls, and unintended consequences. *The New England journal of medicine* 2009;360(23):2390-3. doi: 10.1056/NEJMp0900963 [published Online First: 2009/06/06]
45. Grube MM, Dohle C, Djouchadar D, et al. Evidence-based quality indicators for stroke rehabilitation. *Stroke* 2012;43(1):142-6. doi: 10.1161/strokeaha.111.627679 [published Online First: 2011/10/25]
46. Le H, Khankhanian P, Joshi N, et al. Patients recovering from abdominal surgery who walked with volunteers had improved postoperative recovery profiles during their hospitalization. *World journal of surgery* 2014;38(8):1961-5. doi: 10.1007/s00268-014-2491-5 [published Online First: 2014/03/13]
47. Counsell SR, Holder CM, Liebenauer LL, et al. Effects of a multicomponent intervention on functional outcomes and process of care in hospitalized older patients: a randomized controlled trial of Acute Care for Elders (ACE) in a community hospital. *Journal of the American Geriatrics Society* 2000;48(12):1572-81. [published Online First: 2000/12/29]
48. Fisher SR, Kuo YF, Sharma G, et al. Mobility after hospital discharge as a marker for 30-day readmission. *The journals of gerontology Series A, Biological sciences and medical sciences* 2013;68(7):805-10. doi: 10.1093/gerona/gls252 [published Online First: 2012/12/21]
49. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ (Clinical research ed)* 2008;337:a1655-a55. doi: 10.1136/bmj.a1655
50. Wensing MJP, Grol RPTM. Implementatie: Effectieve verbetering van de patiëntenzorg: Bohn Stafleu van Loghum 2017.
51. Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. *Journal of advanced nursing* 2000;32(4):1008-15. [published Online First: 2000/11/30]
52. Campbell SM, Braspenning J, Hutchinson A, et al. Research methods used in developing and applying quality indicators in primary care. *Quality & safety in health care* 2002;11(4):358-64. doi: 10.1136/qhc.11.4.358 [published Online First: 2002/12/07]

513

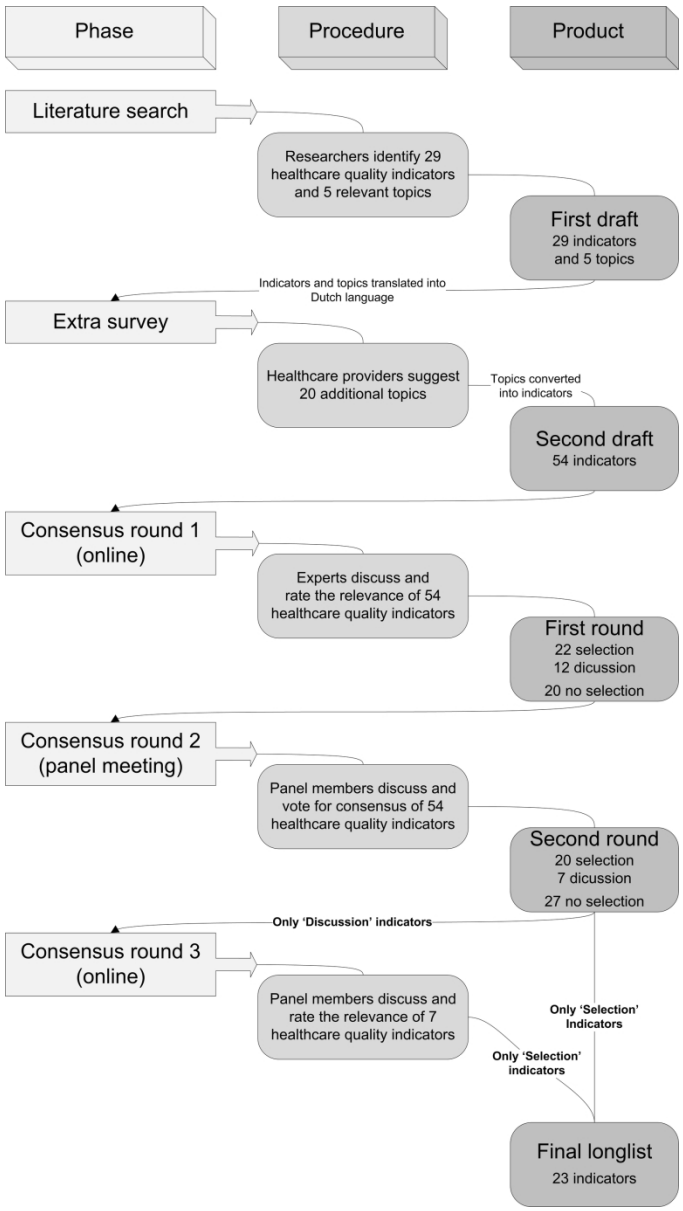



Figure 1. Flow diagram showing the selection of healthcare quality indicators in all phases of the study

160x284mm (300 x 300 DPI)

*Supplementary Table A1. Agree II quality indicator tool: Quality items and followed procedures for the development of healthcare quality indicators for the care of patients with (or at risk of) low physical activity during hospital stay. Adapted from Peter et al.[55]*

| | |
|---|---|
| **Domain 1. Scope and purpose** | |
| The overall objectives of the quality indicator development initiative are specifically described. | The purpose of this quality indicators development was to assess the quality of care for patients with (or at risk of) low physical activity during hospital stay. |
| The population to whom the indicators are meant to apply is specifically described. | Adult hospitalized adults of all ages during hospital stay, with specific attention for patients with (or at risk of) low physical activity. |
| **Domain 2. Stakeholder involvement** | |
| The indicator development group includes individuals from relevant professional groups in line with the overall objective. | First, an acknowledged group of experts in physical activity of patients during hospital stay was contacted. From this group with healthcare providers, researchers, innovators, and implementation experts, a multidisciplinary expert panel was formed. |
| The target users of the indicators are clearly defined. | The target users of the quality indicators are physical therapists and nurses working in hospital care, treating patients with low physical activity during hospital stay. |
| **Domain 3. Rigour development** | |
| Systematic methods were used to search for evidence. | Evidence was based on a systematic literature search conducted in CINAHL, MEDLINE, and EMBASE. Details are provided in Supplementary Table A2 and Supplementary Figure A1. |
| The criteria for selecting the indicators are clearly described. | A RAND/UCLA-modified Delphi method was used for the selection of quality indicators. The *IQ healthcare consensus tool* was used to calculate consensus and provide information on selection, discussion or no selection according to pre-defined cut-off values. |
| The methods for formulating the indicators are clearly described. | Formulation of the quality indicators was done by the researchers (NK, SH) and checked by a third researcher (TH). The formulation was subsequently discussed by all healthcare providers and experts participating in this study before the second draft of the longlist with quality indicators. The expert panel commented on the formulation of all quality indicators before discussing indicator selection and the final draft of the longlist with quality indicators. |
| There was a predefined quantitative process for | A numeric rating scale from 1 (completely irrelevant) to 9 (extremely relevant) was |

| | |
|---|---|
| indicator selection. | used for scoring by the expert panel. Details for quantitative quality indicators selection are provided in Supplementary Table 2. |
| An explicit link between the indicators and supporting evidence is provided. | For each quality indicator, relevant studies were provided in summary and full-text. If no relevant evidence was available, it was stated that the quality indicator was based on expert opinion. |
| The indicators have been externally reviewed by experts/end-users prior to publication. | An external review was not conducted. A subsequent study will be conducted to test the feasibility, validity, and implementation of the quality indicators suggested in the final draft longlist with quality indicators. |
| A procedure for updating the indicators is provided and/or the indicator set has been updated. | The quality indicators will be updated every five years in collaboration with the national professional association for hospital physical therapy. |
| **Domain 4. Clarity of presentation** | |
| The indicators are specific and unambiguous. | For each quality indicator, a numerator and denominator were formulated to quantify the indicator, so that they are suitable for assessing the quality of care. |
| **Domain 5. Applicability** | |
| The indicators are supported with tools for use | Tools suggested for usage were electronic medical records, direct observations using behavioral mapping, and interviews. |
| The potential organizational barriers to applying the indicators have been discussed. | Potential organizational barriers were suggested such as the need to include more stakeholders (i.e. patients, health insurers), and the degree in which all quality indicators could be measured validly. Those barriers will be handled within the subsequent feasibility, validity, and implementation study. |
| The indicator development initiative is editorially independent from the funding body. | This research was conducted without any funding. |
| Comparing interests of indicator development group members have been recorded and addressed. | All authors declared that there were no conflicts of interest. |
| **Domain 6. 'Rate the overall quality of this initiative'** | Not applicable to quality indicators development. |

*AGREE, Appraisal of Guidelines for Research and Evaluation; RAND/UCLA, Research and Development/University of California, Los Angeles*

*Supplementary Table A2. Literature search details.*

| *PubMed:* |
| --- |
| **Domain:**<br><br>(Inpatients[MeSH] OR Hospitalization[MeSH] OR "Adolescent, Hospitalized"[MeSH] OR "Child, Hospitalized"[MeSH] OR inpatient*[tiab] OR hospitalized[tiab] OR hospitalization*[tiab] OR hospitalised OR hospitalisation*[tiab] OR hospital[tiab])<br><br>**Determinant:**<br><br>Early Ambulation[MeSH] OR Exercise[MeSH] OR Iatrogenic Disease[MeSH] OR Locomotion[MeSH] OR Motor Activity[MeSH] OR Muscle Fatigue[MeSH] OR Muscle Strength[MeSH] OR Physical Endurance[MeSH] OR Physical Exertion[MeSH] OR Physical Fitness[MeSH] OR Physical Therapy Modalities[MeSH] OR Posture[MeSH] OR Sedentary lifestyle[MeSH] OR Self Care[MeSH] OR "Mobility Limitation"[MeSH]OR Ambulation[tiab] OR Exercis*[tiab] OR Fitness[tiab] OR Hospital Acquired Condition*[tiab] OR Iatrogenic disabilit*[tiab] OR Iatrogenic Disease*[tiab] OR Iatrogenic disorder*[tiab] OR Immobil*[tiab] OR Locomot*[tiab] OR mobil*[tiab] OR motor activity[tiab] OR Muscle Fatigue[tiab] OR Muscle Strength[tiab] OR Muscular Fatigue[tiab] OR Physical activ*[tiab] OR Physical Effort*[tiab] OR Physical Endurance*[tiab] OR Physical Exertion*[tiab] OR Physical inactivity[tiab] OR Physical therap*[tiab] OR Physiotherap*[tiab] OR Posture*[tiab] OR Seated Position*[tiab] OR Sedentary behavior[tiab] OR Sedentary behaviour[tiab] OR Sedentary lifestyle[tiab] OR Self Care[tiab] OR Self Management[tiab] OR Sitting Position*[tiab] OR Standing Position*[tiab] OR stepping[tiab] OR hospital associated disorder*[tiab]<br><br>**Outcome:**<br><br>"Quality indicators, Health Care"[MeSH] OR Healthcare Quality indicator*[tiab] OR Health care Quality indicator*[tiab] OR Healthcare Global Trigger Tool*[tiab] OR Health care Global Trigger Tool*[tiab] OR structure indicator*[tiab] OR process indicator*[tiab] OR performance |

| |
|---|
| indicator*[tiab] OR Health indicator*[tiab] OR health status indicator*[tiab] OR qualitative indicator*[tiab] OR quantitative indicator*[tiab] |
| *EMBASE:*<br><br>**Domain**<br><br>'hospital patient'/exp OR 'hospitalization'/exp OR (inpatient* OR hospitalized OR hospitalization* OR hospitalised OR hospitalisation* OR hospital):ti,ab,kw<br><br>**Determinant**<br><br>'mobilization'/exp OR 'exercise'/exp OR 'endurance'/exp OR 'physical activity'/exp OR 'physical capacity'/exp OR 'physical inactivity'/exp OR 'iatrogenic disease'/exp OR 'patient mobility'/exp OR 'physical mobility'/exp OR 'locomotion'/exp OR 'muscle strength'/exp OR 'muscle fatigue'/exp OR 'fitness'/exp OR 'sedentary behavior'/exp OR 'sedentary lifestyle'/exp OR 'cardiorespiratory fitness'/exp OR 'physiotherapy'/exp OR 'body position'/exp OR 'self care'/exp OR 'walking difficulty'/exp OR 'stepping'/exp OR 'immobility'/exp OR Ambulation:ti,ab,kw OR Exercis*:ti,ab,kw OR Fitness:ti,ab,kw OR ('Hospital Acquired' NEXT/1 Condition*):ti,ab,kw OR (Iatrogenic NEXT/1 disabilit*):ti,ab,kw OR (Iatrogenic NEXT/1 Disease*):ti,ab,kw OR (Iatrogenic NEXT/1 disorder*):ti,ab,kw OR Immobil*:ti,ab,kw OR Locomot*:ti,ab,kw OR mobil*:ti,ab,kw OR 'motor activity':ti,ab,kw OR 'Muscle Fatigue':ti,ab,kw OR 'Muscle Strength':ti,ab,kw OR 'Muscular Fatigue':ti,ab,kw OR (Physical NEXT/1 activ*):ti,ab,kw OR (Physical NEXT/1 Effort*):ti,ab,kw OR (Physical NEXT/1 Endurance*):ti,ab,kw OR (Physical NEXT/1 Exertion*):ti,ab,kw OR 'Physical inactivity':ti,ab,kw OR (Physical NEXT/1 therap*):ti,ab,kw OR Physiotherap*:ti,ab,kw OR Posture*:ti,ab,kw OR (Seated NEXT/1 Position*):ti,ab,kw OR 'Sedentary behavior':ti,ab,kw OR 'Sedentary behaviour':ti,ab,kw OR 'Sedentary lifestyle':ti,ab,kw OR 'Self Care':ti,ab,kw OR 'Self Management':ti,ab,kw OR (Sitting NEXT/1 Position*):ti,ab,kw OR (Standing NEXT/1 Position*):ti,ab,kw OR stepping:ti,ab,kw OR 'hospital associated disorder':ti,ab,kw |

| |
|---|
| **Outcome**<br><br>'health status indicator'/exp OR 'clinical indicator'/exp OR 'performance measurement system'/exp OR 'public health systems research'/exp OR ('Healthcare Quality' NEXT/1 Indicator*):ti,ab,kw OR ('Health care Quality' NEXT/1 Indicator*):ti,ab,kw OR ('Healthcare Global Trigger' NEXT/1 Tool*):ti,ab,kw OR ('Health care Global Trigger' NEXT/1 Tool*):ti,ab,kw OR (structure NEXT/1 indicator*):ti,ab,kw OR (process NEXT/1 indicator*):ti,ab,kw OR (performance NEXT/1 indicator*):ti,ab,kw OR (Health NEXT/1 indicator*):ti,ab,kw OR ('health status' NEXT/1 indicator*):ti,ab,kw OR (qualitative NEXT/1 indicator*):ti,ab,kw OR (quantitative NEXT/1 indicator*):ti,ab,kw' |
| *CINAHL* |
| **Domain**<br><br>(MH "Inpatients+") OR (MH "Hospitalization+") ) OR TI inpatient* OR AB inpatient* OR TI hospitalized OR AB hospitalized OR TI hospitalization* OR AB hospitalization* OR TI hospitalised OR AB hospitalised OR TI hospitalisation* OR AB hospitalisation* OR TI hospital OR AB hospital<br><br>**Determinant**<br><br>(MH "Early Ambulation") OR (MH "Exercise+") OR (MH "Physical Therapy+") OR (MH "Iatrogenic Disease") OR (MH "Physical Endurance+") OR (MH "Physical Fitness+") OR (MH "Body positions+") OR (MH "Locomotion+") OR (MH "Muscle Fatigue") OR(MH "Muscle strength+") OR (MH "Life Style, Sedentary") OR (MH "Self Care+") OR (MH "Physical Mobility") OR (MH "Physical Mobility Impairment (Saba CCC)") OR (MH "Impaired Physical Mobility (NANDA)") OR (MH "Immobility") OR (MH "Immobility Management (Iowa NIC)") OR(MH "physical activity") OR TI(Ambulation OR Exercis* OR Fitness OR "Hospital Acquired Condition*" OR "Iatrogenic disabilit*" OR "Iatrogenic Disease*" OR "Iatrogenic disorder*" OR Immobil* OR Locomot* OR mobil* OR "motor activity" OR |

"Muscle Fatigue" OR "Muscle Strength" OR "Muscular Fatigue" OR "Physical activ*" OR "Physical Effort*" OR "Physical Endurance*" OR "Physical Exertion*" OR "Physical inactivity" OR "Physical therap*" OR Physiotherap* OR Posture* OR "Seated Position*" OR "Sedentary behavior" OR "Sedentary behavior" OR "Sedentary lifestyle" OR "Self Care" OR "Self Management" OR "Sitting Position*" OR "Standing Position*" OR stepping) OR AB (Ambulation OR Exercis* OR Fitness OR "Hospital Acquired Condition*" OR "Iatrogenic disabilit*" OR "Iatrogenic Disease*" OR "Iatrogenic disorder*" OR Immobil* OR Locomot* OR mobil* OR "motor activity" OR "Muscle Fatigue" OR "Muscle Strength" OR "Muscular Fatigue" OR "Physical activ*" OR "Physical Effort*" OR "Physical Endurance*" OR "Physical Exertion*" OR "Physical inactivity" OR "Physical therap*" OR Physiotherap* OR Posture* OR "Seated Position*" OR "Sedentary behavior" OR "Sedentary behavior" OR "Sedentary lifestyle" OR "Self Care" OR "Self Management" OR "Sitting Position*" OR "Standing Position*" OR stepping OR 'hospital associated disorder')

**Outcome**

(MH "Health Status Indicators") OR (MH "Quality of Health Care") OR (MH "Performance Measurement Systems") OR TI("Healthcare Quality indicator*" OR "Health care Quality indicator*" OR "Healthcare Global Trigger Tool*" OR "Health care Global Trigger Tool*" OR "structure indicator*" OR "process indicator*" OR "performance indicator*" OR "Health indicator*" OR "health status indicator*") OR AB("Healthcare Quality indicator*" OR "Health care Quality indicator*" OR "Healthcare Global Trigger Tool*" OR "Health care Global Trigger Tool*" OR "structure indicator*" OR "process indicator*" OR "performance indicator*" OR "Health indicator*" OR "health status indicator*" OR "qualitative NEXT/1 indicator*" OR "quantitative NEXT/1 indicator*")

*Supplementary Table A3. The second draft with 54 healthcare quality indicators for the care of patients with (or at risk of) low physical activity during the hospital stay: Dutch version.*

| | |
|---|---|
| *Indicator 1:* | **Klinische patiënten die zelfstandig kunnen lopen, met een beschreven activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Er is een activiteitenplan beschreven, waarin dagelijkse loopmomenten worden beschreven voor patiënten die zelfstandig lopen. |
| **Teller:** | Het aantal opgenomen klinische patiënten, dat in staat is om zelfstandig te lopen, waarbij een activiteitenplan is beschreven. |
| **Noemer:** | Het aantal opgenomen klinische patiënten, dat in staat is om zelfstandig te lopen. |
| *Indicator 2:* | **Dagelijkse loopmomenten van klinische patiënten die zelfstandig kunnen lopen, zoals beschreven in het activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Patiënten lopen dagelijks zelfstandig, zoals beschreven in het activiteitenplan. |
| **Teller:** | Het aantal opgenomen klinische patiënten dat dagelijks zelfstandig loopt, zoals beschreven in het activiteitenplan. |
| **Noemer:** | Het aantal opgenomen klinische patiënten met een activiteitenplan, dat in staat is om zelfstandig te lopen. |
| *Indicator 3:* | **Klinische patiënten die ondersteuning nodig hebben met lopen van één of meerdere personen, met een beschreven activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Er is een activiteitenplan beschreven, waarin dagelijkse loopmomenten worden beschreven voor patiënten die ondersteuning nodig hebben met lopen. |
| **Teller:** | Het aantal opgenomen klinische patiënten die ondersteuning nodig hebben bij het lopen van een persoon, bij wie een activiteitenplan is beschreven. |
| **Noemer:** | Het aantal opgenomen klinische patiënten met een activiteitenplan die lopen met ondersteuning van een persoon. |
| *Indicator 4:* | **Dagelijkse loopmomenten van klinische patiënten die ondersteuning nodig hebben met lopen van een persoon, zoals beschreven in het activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Er is een activiteitenplan beschreven, waarin dagelijkse loopmomenten worden beschreven voor klinische patiënten die ondersteuning nodig hebben met lopen. |
| **Teller:** | Het aantal opgenomen klinische patiënten die dagelijks lopen met ondersteuning van een persoon, zoals beschreven in het activiteitenplan. |
| **Noemer:** | Het aantal opgenomen klinische patiënten met een activiteitenplan, die lopen met ondersteuning van een persoon. |
| *Indicator 5:* | **Klinische patiënten met fysiotherapeutische begeleiding.** |
| **Thema:** | Standaard consult fysiotherapie. |
| **Item:** | De klinische patiënt ontvangt fysiotherapie begeleiding. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling met fysiotherapie begeleiding. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling. |
| *Indicator 6:* | **Percentage klinische patiënten met een activiteitenplan binnen 48 uur na opname.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Patiënten hebben binnen 48 uur na opname een activiteitenplan. |

| | |
|---|---|
| **Teller:** | Het aantal klinische patiënten per afdeling met een activiteitenplan binnen 48 uur na opname. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 7:* | **Klinische patiënten, die voor opname mobiel waren, die worden gemobiliseerd binnen 48 uur post operatief.** |
| **Thema:** | Mobiliseren. |
| **Item:** | Tijdig mobiliseren. |
| **Teller:** | Het aantal klinische patiënten per afdeling die binnen 48 uur postoperatief mobiliseren. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling na een operatie. |
| *Indicator 8:* | **Klinische patiënten met lichamelijke beperking, met een oefenprogramma.** |
| **Thema:** | Een passend oefenprogramma. |
| **Item:** | Als een klinisch opgenomen patiënt moeite heeft met het looppatroon, kracht (MRC 4 of ondersteuning van de armleuningen om op te staan vanuit de stoel), of uithoudingsvermogen (bijv. dyspneu bij lichte vermoeidheid), dan moet er een oefenprogramma worden aangeboden. |
| **Teller:** | Het aantal opgenomen klinische patiënten met een beperking in lichamelijk functioneren per afdeling, met een oefenprogramma. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling met een beperking in lichamelijk functioneren. |
| *Indicator 9:* | **Klinische patiënten met een beperking in dagelijkse activiteiten, met een oefenprogramma.** |
| **Thema:** | Een passend oefenprogramma. |
| **Item:** | Als een klinisch opgenomen patiënt moeite heeft met het looppatroon, kracht (MRC 4 of ondersteuning van de armleuningen om op te staan vanuit de stoel), of uithoudingsvermogen (bijv. dyspneu bij lichte vermoeidheid), dan moet er een oefenprogramma worden aangeboden. |
| **Teller:** | Het aantal opgenomen klinische patiënten met een beperking in dagelijkse activiteiten per afdeling, met een oefenprogramma. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling met een beperking in dagelijkse activiteiten. |
| *Indicator 10:* | **Klinische patiënten dat in staat is zonder hulp te bewegen, bij ontslag.** |
| **Thema:** | Verandering in mobiliteit. |
| **Item:** | Percentage van patiënten die bij ontslag in staat zijn om zelfstandig te verplaatsen, eventueel met behulp van een rolstoel, van de patiënten die immobiel of afhankelijk van een rolstoel waren bij opname. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren, en bij ontslag zelfstandig te verplaatsen, eventueel met behulp van een rolstoel. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren. |
| *Indicator 11:* | **Klinische patiënten dat in staat is zonder hulp te lopen, bij ontslag.** |
| **Thema:** | Patiëntenmobiliteit. |
| **Item:** | Het inzichtelijk krijgen van het percentage van klinische patiënten die in staat zijn zelfstandig te lopen bij ontslag, eventueel met loophulpmiddel, van de patiënten die immobiel waren of afhankelijk van een rolstoel bij opname. |

| | |
|---|---|
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren, en bij ontslag zelfstandig lopen, eventueel met behulp van een loophulpmiddel. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren. |
| *Indicator 12:* | **Artsen die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen.** |
| **Thema:** | Stimuleren zelfstandig ADL. |
| **Item:** | De artsen stimuleren klinische patiënten om hun algemeen dagelijkse levensverrichtingen zelfstandig uit te voeren. |
| **Teller:** | Het aantal artsen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen. |
| **Noemer:** | Het aantal artsen per afdeling. |
| *Indicator 13:* | **Verpleegkundigen die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen.** |
| **Thema:** | Stimuleren zelfstandig ADL. |
| **Item:** | De verpleegkundigen stimuleren klinische patiënten om hun algemeen dagelijkse levensverrichtingen zelfstandig uit te voeren. |
| **Teller:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling. |
| *Indicator 14:* | **Fysiotherapeuten die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen.** |
| **Thema:** | Stimuleren zelfstandig ADL. |
| **Item:** | De fysiotherapeuten stimuleren klinische patiënten om hun algemeen dagelijkse levensverrichtingen zelfstandig uit te voeren. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling. |
| *Indicator 15:* | **Artsen die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen.** |
| **Thema:** | Stimuleren lopen. |
| **Item:** | De artsen stimuleren klinische patiënten om zelfstandig te lopen van het bed naar de stoel. |
| **Teller:** | Het aantal artsen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| **Noemer:** | Het aantal artsen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| *Indicator 16:* | **Verpleegkundigen die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen.** |
| **Thema:** | Stimuleren lopen. |
| **Item:** | De verpleegkundigen stimuleren klinische patiënten om zelfstandig te lopen van het bed naar de stoel. |
| **Teller:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze klinische patiënten |

| | |
|---|---|
| | stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| *Indicator 17:* | **Fysiotherapeuten die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen.** |
| **Thema:** | Stimuleren lopen. |
| **Item:** | De fysiotherapeuten stimuleren klinische patiënten om zelfstandig te lopen van het bed naar de stoel. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| *Indicator 18:* | **Klinische patiënten met vrijheidsbeperkende middelen.** |
| **Thema:** | Immobilisatie. |
| **Item:** | Inventariseren van gebruik van vrijheidsbeperkende middelen voor het voorkomen van vallen. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling waarbij vrijheidsbeperkende middelen zijn ingezet. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling. |
| *Indicator 19:* | **Klinische patiënten met een valincident, waarbij het valincident binnen 24 uur wordt geëvalueerd.** |
| **Thema:** | Evaluatie vallen. |
| **Item:** | Er vindt een evaluatie plaats van een valincident binnen 24 uur. De evaluatie bestaat uit ten minste medicijngebruik en aan- of afwezigheid van (voortekenen van) ziekte. |
| **Teller:** | Het aantal klinische patiënten per afdeling met een valincident, waarbij dit geëvalueerd is binnen 24 uur. |
| **Noemer:** | Het aantal klinische patiënten per afdeling met een valincident. |
| *Indicator 20:* | **Klinische patiënten met documentatie van een valincident.** |
| **Thema:** | Documentatie vallen. |
| **Item:** | Er vindt documentatie plaats van een valincident, waarbij de potentiële oorzaken zijn beschreven. |
| **Teller:** | Het aantal klinische patiënten per afdeling met een documentatie van een valincident. |
| **Noemer:** | Het aantal klinische patiënten per afdeling met een valincident. |
| *Indicator 21:* | **Klinische patiënten met documentatie van preopname functioneren.** |
| **Thema:** | Preopname functioneren. |
| **Item:** | Er vindt documentatie plaats van het preopname functioneren. De documentatie betreft beschrijven van het valrisico, gebruik van rollator of stok en de onafhankelijkheid in het uitvoeren van algemeen dagelijkse levensverrichtingen voor opname. |
| **Teller:** | Het aantal klinische patiënten per afdeling, waarbij het preopname functioneren is gedocumenteerd. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 22:* | **Klinische patiënten, bij wie tijdens opname een evaluatie van de mobiliteit plaatsvindt.** |
| **Thema:** | Evaluatie mobiliteit. |
| **Item:** | Bij opname in het ziekenhuis worden de volgende transfers geëvalueerd: van lig naar zit transfereren zonder hulp; uit bed komen en tot stand komen vanuit bed; een aantal passen lopen, en het gebruik maken van een stok of een rollator zo nodig. |

| | |
|---|---|
| **Teller:** | Het aantal klinische patiënten per afdeling waar bij opname een evaluatie van mobiliteit plaatsvindt. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 23:* | **Klinische patiënten met geïnformeerde familie.** |
| **Thema:** | Informeren familie. |
| **Item:** | De klinische patiënten en familie zijn geïnformeerd over het belang van bewegen. |
| **Teller:** | Het aantal klinische patiënten met familie per afdeling, die zijn geïnformeerd over het belang van bewegen. |
| **Noemer:** | Het aantal klinische patiënten met familie per afdeling. |
| *Indicator 24:* | **Klinische patiënten dat is geïnformeerd over hun zorgtraject.** |
| **Thema:** | Informeren patiënt. |
| **Item:** | Het zorgtraject met betrekking tot bewegen wordt samen met de klinische patiënt besproken. Een zorgtraject met betrekking tot bewegen bestaat onder andere uit het bespreken van het benodigde niveau van fysiek functioneren voor ontslag. |
| **Teller:** | Het aantal klinische patiënten per afdeling, waar bij het zorgtraject met betrekking tot bewegen is besproken. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 25:* | **Artsen die bedrust beschouwen als de dagelijkse gang van zaken.** |
| **Thema:** | Mindset. |
| **Item:** | De mindset van artsen draagt bij aan bedrust bij klinische opgenomen patiënten als een dagelijkse gang van zaken. |
| **Teller:** | Het aantal artsen per afdeling die geloven dat bedrust behoort tot de dagelijkse gang van zaken. |
| **Noemer:** | Het aantal artsen per afdeling. |
| *Indicator 26:* | **Verpleegkundigen die bedrust beschouwen als de dagelijkse gang van zaken.** |
| **Thema:** | Mindset. |
| **Item:** | De mindset van verpleegkundigen draagt bij aan bedrust bij klinische opgenomen patiënten als een dagelijkse gang van zaken. |
| **Teller:** | Het aantal verpleegkundigen per afdeling die geloven dat bedrust behoort tot de dagelijkse gang van zaken. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling. |
| *Indicator 27:* | **Fysiotherapeuten die bedrust beschouwen als de dagelijkse gang van zaken.** |
| **Thema:** | Mindset. |
| **Item:** | De mindset van fysiotherapeuten draagt bij aan bedrust bij klinische opgenomen patiënten als een dagelijkse gang van zaken. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling die geloven dat bedrust behoort tot de dagelijkse gang van zaken. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling. |
| *Indicator 28:* | **Klinische patiënten met bedrust zonder medische noodzaak.** |
| **Thema:** | Bedrust. |
| **Item:** | Bedrust zonder medische noodzaak is van belang bij de hoeveelheid bewegen voor de klinisch opgenomen patiënt. |
| **Teller:** | Het aantal klinische patiënten per afdeling dat bedrust heeft voorgeschreven gekregen, zonder medische noodzaak. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |

| | |
|---|---|
| *Indicator 29:* | **Lager opgeleide zorgverleners op de afdeling.** |
| **Thema:** | Niveau van opleiding. |
| **Item:** | Lager opgeleide zorgmedewerkers geven een lagere prioriteit aan het mobiliseren van patiënten dan hoger opgeleide zorg medewerkers. |
| **Teller:** | Het aantal lager opgeleide zorgverleners op de afdeling. |
| **Noemer:** | Het aantal zorgverleners op de afdeling. |
| *Indicator 30:* | **Zorgverleners die aangeven dat werkdruk een beperkende factor is voor het mobiliserende van klinische patiënten.** |
| **Thema:** | Werkdruk. |
| **Item:** | Werkdruk heeft een negatief effect op het structureel bewegen van patiënten. |
| **Teller:** | Het aantal zorgverleners op de afdeling, die aangeeft dat de eigen werkdruk een beperkende factor is voor de optimale hoeveelheid beweging van patiënten. |
| **Noemer:** | Het aantal zorgverleners op de afdeling. |
| *Indicator 31:* | **Klinische patiënten die ervaren te vroeg ontslagen te zijn.** |
| **Thema:** | Triagesysteem. |
| **Item:** | Met de invoering van het triagesysteem ligt er druk op het ontslaan van patiënten minder op zelfstandig kunnen bewegen. |
| **Teller:** | Het aantal klinische patiënten dat wordt ontslagen, en ervaart dat ze te vroeg ontslagen worden. |
| **Noemer:** | Het aantal klinische patiënten dat wordt ontslagen. |
| *Indicator 32:* | **Klinische patiënten die worden beperkt in het uitvoeren van transfers door meubilair.** |
| **Thema:** | Meubels. |
| **Item:** | Het gebruik van hoge bedden met bedrekken en stoelen die moeilijk bereikbaar zijn is van invloed op het bewegen van klinische patiënten. |
| **Teller:** | Het aantal opgenomen klinische patiënten, die beperkt worden in het zelfstandig uitvoeren van transfers door hoge bedden, hoge stoelen, of het gebruik van bijvoorbeeld bedrekken. |
| **Noemer:** | Het aantal opgenomen klinische patiënten. |
| *Indicator 33:* | **Klinische patiënten die de beschikking hebben over een geadviseerd loophulpmiddel.** |
| **Thema:** | Hulpmiddelen. |
| **Item:** | Er moeten voldoende loophulpmiddelen beschikbaar zijn om het bewegen van patiënten mogelijk te maken. |
| **Teller:** | Het aantal klinische patiënten per afdeling die beschikking hebben over een geadviseerd loophulpmiddel. |
| **Noemer:** | Het aantal klinische patiënten per afdeling, dat geadviseerd wordt te lopen met een loophulpmiddel. |
| *Indicator 34:* | **Klinische patiënten die beschikking hebben over een relax stoel.** |
| **Thema:** | Hulpmiddelen. |
| **Item:** | Er moeten voldoende relaxstoelen beschikbaar zijn om het bewegen van patiënten mogelijk te maken. |
| **Teller:** | Het aantal klinisch patiënten per afdeling die beschikking hebben over een relaxstoel. |
| **Noemer:** | Het aantal klinisch patiënten per afdeling. |
| *Indicator 35:* | **Klinische patiënten die beschikking hebben over een bedfiets.** |
| **Thema:** | Hulpmiddelen. |
| **Item:** | Er moeten voldoende bedfietsen beschikbaar zijn om het bewegen van patiënten |

| | |
|---|---|
| | mogelijk te maken. |
| **Teller:** | Het aantal klinisch patiënten per afdeling met het advies gebruik te maken van de bedfiets, die beschikking hebben over een bedfiets. |
| **Noemer:** | Het aantal klinisch patiënten per afdeling, dat geadviseerd wordt gebruik te maken van een bedfiets. |
| *Indicator 36:* | **Artsen die geschoold zijn in het aanbieden van beweegzorg bij klinische patiënten.** |
| **Thema:** | Scholing. |
| **Item:** | Er wordt scholing aangeboden met betrekking tot het aanbieden van beweegzorg bij patiënten voor alle artsen medewerkers/zorgverleners die werkzaam zijn op de afdeling. |
| **Teller:** | Het aantal artsen dat scholing heeft gevolgd met betrekking tot het aanbieden van beweegzorg bij klinische patiënten. |
| **Noemer:** | Het aantal artsen dat op de afdeling werkt. |
| *Indicator 37:* | **Verpleegkundigen die geschoold zijn het aanbieden van beweegzorg bij klinische patiënten.** |
| **Thema:** | Scholing. |
| **Item:** | Er wordt scholing aangeboden met betrekking tot het aanbieden van beweegzorg bij patiënten voor alle verpleegkundigen die werkzaam zijn op de afdeling. |
| **Teller:** | Het aantal verpleegkundigen dat scholing heeft gevolgd met betrekking tot het aanbieden van beweegzorg bij patiënten. |
| **Noemer:** | Het aantal verpleegkundigen dat op de afdeling werkt. |
| *Indicator 38:* | **Fysiotherapeuten die geschoold zijn in het aanbieden van beweegzorg bij klinische patiënten.** |
| **Thema:** | Scholing. |
| **Item:** | Er wordt scholing aangeboden met betrekking tot het aanbieden van beweegzorg bij patiënten voor alle fysiotherapeuten die werkzaam zijn op de afdeling. |
| **Teller:** | Het aantal fysiotherapeuten dat scholing heeft gevolgd met betrekking tot het aanbieden van beweegzorg bij patiënten. |
| **Noemer:** | Het aantal fysiotherapeuten dat op de afdeling werkt. |
| *Indicator 39:* | **Artsen die geloven beweeggedrag te stimuleren bij patiënten.** |
| **Thema:** | Mindset artsen. |
| **Item:** | De mindset van artsen draagt bij aan het motiveren, stimuleren en initiëren van beweeggedrag bij patiënten. |
| **Teller:** | Het aantal artsen per afdeling, die geloven dat ze beweeggedrag stimuleren bij patiënten. |
| **Noemer:** | Het aantal artsen per afdeling. |
| *Indicator 40:* | **Verpleegkundigen die geloven beweeggedrag te stimuleren bij patiënten.** |
| **Thema:** | Mindset verpleegkundigen. |
| **Item:** | De mindset van verpleegkundigen draagt bij aan het motiveren, stimuleren en initiëren van beweeggedrag bij patiënten. |
| **Teller:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze beweeggedrag stimuleren bij patiënten. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling. |
| *Indicator 41:* | **Fysiotherapeuten die geloven beweeggedrag te stimuleren bij patiënten.** |
| **Thema:** | Mindset fysiotherapeuten. |
| **Item:** | De mindset van fysiotherapeuten draagt bij aan het motiveren, stimuleren en initiëren |

| | |
|---|---|
| | van beweeggedrag bij patiënten. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze beweeggedrag stimuleren bij patiënten. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling. |
| *Indicator 42* | **Klinische patiënten die lopen met een vrijwilliger** |
| **Thema:** | Vrijwilligers. |
| **Item:** | Klinische patiënten lopen zoveel mogelijk als zijn of haar conditie toelaat met een vrijwilliger in het ziekenhuis. |
| **Teller:** | Er is/zijn vrijwilliger(s) aanwezig op de afdeling die ondersteunen bij lopen. |
| *Indicator 43* | **Klinische patiënten die lopen met familie.** |
| **Thema:** | Familie. |
| **Item:** | Klinische patiënten lopen zoveel mogelijk als zijn of haar conditie toelaat met familie in het ziekenhuis. |
| **Teller:** | Er zijn familieleden aanwezig op de afdeling die ondersteunen bij lopen. |
| *Indicator 44* | **Mobiliteit beperkende middelen worden dagelijks geëvalueerd.** |
| **Thema:** | Evaluatie immobilisatie. |
| **Item:** | Regelmatige evaluatie van de inzet van mobiliteit beperkende middelen bij klinische patiënten, zoals zuurstofslangen, blaas katheters en intraveneuze katheters. |
| **Teller:** | Er vindt dagelijks per afdeling een evaluatie plaats over de inzet van mobiliteit beperkende middelen bij klinische patiënten. |
| *Indicator 45* | **Patiëntenmobiliteit is opgenomen in de normen van het ziekenhuis.** |
| **Thema:** | Cultuur. |
| **Item:** | De norm in het ziekenhuis is dat patiënten regelmatig lopen, als ze dat kunnen. |
| **Teller:** | In de normen van het ziekenhuis staat beschreven dat er verwacht wordt dat patiënten regelmatig lopen als ze dat kunnen. |
| *Indicator 46* | **Vrijheidsbeperkende middelen worden dagelijks geëvalueerd.** |
| **Thema:** | Evaluatie immobilisatie. |
| **Item:** | Er vindt regelmatig evaluatie plaats van de inzet van vrijheidsbeperkende middelen bij klinische patiënten, zoals buikband, vijfpunt fixatie, rolstoelblad, rem van de rolstoel. |
| **Teller:** | Er vindt dagelijks per afdeling een evaluatie plaats over de inzet van vrijheidsbeperkende middelen bij klinische patiënten. |
| *Indicator 47* | **Het ziekenhuis heeft een kritische houding ten aanzien van het inzetten van immobiliserende middelen bij valgevaarlijke patiënten.** |
| **Thema:** | Cultuur. |
| **Item:** | De norm van het ziekenhuis is een kritische houding te hebben ten aan zien van de inzet van immobiliserende middelen bij valgevaarlijke klinische patiënten. |
| **Teller:** | In de normen van het ziekenhuis staat beschreven dat de inzet van immobiliserende middelen bij valgevaarlijke klinische patiënten kritisch wordt bekeken. |
| *Indicator 48* | **De inzet van pijnstillende middelen wordt dagelijks geëvalueerd ten behoeve van het pijn vrij mobiliseren van de klinische patiënt.** |
| **Thema:** | Evaluatie pijnmedicatie. |
| **Item:** | Er vindt regelmatige evaluatie plaats van pijnmedicatie bij de klinische patiënt, ten behoeve van het bewegen. |
| **Teller:** | Er vindt dagelijks per afdeling een evaluatie plaats van de inzet van pijnstillende middelen bij klinische patiënten, ten behoeve van het bewegen. |

| | |
|---|---|
| *Indicator 49* | **Het informeren van de familie van de klinische patiënt ten aanzien van het belang van bewegen is een norm van het ziekenhuis.** |
| **Thema:** | Cultuur. |
| **Item:** | De norm van het ziekenhuis is het informeren van de familie van de klinische patiënt ten aanzien van het belang van bewegen. |
| **Teller:** | In de normen van het ziekenhuis staat beschreven dat de familie van de klinische patiënt geïnformeerd wordt over het belang van bewegen. |
| *Indicator 50* | **Het aantal stappen dat een klinische patiënt loopt.** |
| **Thema:** | Bewegen. |
| **Item:** | De totale hoeveelheid stappen die een klinische patiënt per dag loopt. |
| **Teller:** | Het aantal stappen dat een klinisch opgenomen patiënt loopt per dag. |
| *Indicator 51* | **De klinische patiënt kan zich goed oriënteren in het ziekenhuis.** |
| **Thema:** | Ziekenhuisomgeving. |
| **Item:** | De gebouwde ziekenhuisomgeving is van belang om desoriëntatie van de klinische patiënt te voorkomen en mobilisatie te stimuleren. |
| **Teller:** | Er is gebruik gemaakt van oriënterende middelen, zoals looproutes en/of routewijzers, ter ondersteuning van de oriëntatie van klinische patiënten. |
| *Indicator 52* | **De klinische patiënt wordt gestimuleerd om te bewegen door de inrichting van de afdeling.** |
| **Thema:** | Omgeving. |
| **Item:** | Aanwezigheid van foto's, kunst en/of ander beeldmateriaal om patiënten te stimuleren om te bewegen. |
| **Teller:** | Is er gebruik gemaakt van foto's, kunst en/of ander beeldmateriaal op de wandelgangen van de afdeling? |
| *Indicator 53* | **De klinische patiënt heeft een beweegruimte op de afdeling.** |
| **Thema:** | Omgeving. |
| **Item:** | Aanwezigheid van een beweegruimte. |
| **Teller:** | Is er een beweegruimte aanwezig op de afdeling? |
| *Indicator 54* | **De klinische patiënt heeft zonlicht op de patiëntenkamer.** |
| **Thema:** | Omgeving. |
| **Item:** | Aanwezigheid van zonlicht op de patiëntenkamer. |
| **Teller:** | Is er zonlicht op de patiëntenkamer? |

*Supplementary Table A4. Overview of ratings in the consensus rounds with the corresponding decision: selection, discussion, or no selection.*

| | First round | | Second round | | Third round | |
|---|---|---|---|---|---|---|
| **Theme: Exercise program and physical activity plan** | Median (%HT) | Decision | Median (%HT) | Decision | Median (%HT) | Decision |
| 1. Patients without the need for support during mobilization should have a physical activity plan. | 7 (79%) | D | 8 (100%) | S | | |
| 2. Patients should receive support for mobilization. | 8 (79%) | S | | | | |
| 3. Patients in need for support during mobilization should have a physical activity plan | 8 (93%) | S | 8 (60%) | D | 8 (100%) | S |
| 4. Patients should perform physical activities as described in their physical activity plan. | 8 (86%) | S | 8 (100%) | S | | |
| 6. Patients should be physically active within 48 hours after hospital admission. | 8 (64%) | D | 8 (100%) | S | | |
| 8. Patients with a physical disability should have an exercise program. | 7 (71%) | D | 6 (40%) | NS | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 9. Patients who are dependent in activities of daily living should have an exercise program. | 7 (64%) | NS | | | | |
| **Theme: Assistance during mobilization** | | | | | | |
| 5. Patients should walk with a physical therapist. | 8 (64%) | D | 4 (20%) | NS | | |
| 10. Patients should be independent in activities of daily living at discharge. | 7 (64%) | NS | | | | |
| 42. Patients should walk with volunteers. | 7 (64%) | NS | | | | |
| 43. Patients should walk with close-relatives. | 8 (86%) | S | 7 (100%) | D | 7 (60%) | NS |
| **Theme: Mobilizing** | | | | | | |
| 7. Patients should be physically active within 48 hours after hospital admission. | 8 (86%) | S | 8 (80%) | S | | |
| 11. Patients should mobilize independently at discharge. | 7 (64%) | NS | | | | |
| 50. The number of steps of a patient during hospital stay per day. | 6 (43%) | NS | | | | |
| ***Theme: Attitude*** | | | | | | |

| | | | | |
|---|---|---|---|---|
| 12. Physicians should stimulate independent functioning in daily activities of patients. | 6 (50%) | NS | | |
| 13. Nurses should stimulate independent functioning in daily activities of patients. | 8 (86%) | S | 8 (80%) | S |
| 14. Physical therapists should stimulate independent functioning in daily activities of patients. | 6 (50%) | NS | | |
| 15. Physicians should be aware of their own attitude related to stimulation of physical activity in patients during hospital stay. | 6 (43%) | NS | | |
| 16. Nurses should be aware of their own attitude related to stimulation of physical activity in patients during hospital stay. | 7 (57%) | NS | | |
| 17. Physical therapists should be aware of their own attitude related to stimulation of physical activity in patients during hospital stay. | 6 (43%) | NS | | |
| 39. Physicians should stimulate physical activity of patients. | 7 (71%) | D | 8 (80%) | S |

| | | | | | | |
|---|---|---|---|---|---|---|
| 40. Nurses should stimulate physical activity of patients. | 8 (86%) | S | 8 (80%) | S | | |
| 41. Physical therapists should stimulate physical activity of patients. | 7 (72%) | D | 6 (40%) | NS | | |
| **Theme: Use of restraints** | | | | | | |
| 18. The number of patients with mobility limiting equipment. | 7 (71%) | D | 6 (40%) | NS | | |
| 44. Nurses should evaluate freedom limiting equipment. | 8 (71%) | S | 8 (100%) | S | | |
| 46. Nurses should evaluate mobility limiting equipment. | 8 (79%) | S | | | | |
| 47. The hospital (ward) should have a policy to minimize the use of mobility limiting equipment in patients at risk of falling. | 8 (79%) | S | 8 (60%) | D | 7 (80%) | D |
| 48. Patients should have an acceptable degree of pain. | 8 (79%) | S | 8 (60%) | D | 8 (80%) | S |
| **Theme: Fall incident** | | | | | | |
| 19. Patients should be evaluated after a fall incident. | 8 (71%) | S | | | | |
| 20. The number of documented fall incidents. | 8 (57%) | D | 5 (0%) | NS | | |

| | | | | |
|---|---|---|---|---|
| **Theme: Documentation** | | | | |
| 21. Nurses or physical therapists should evaluate the preadmission physical ability. | 8 (93%) | S | 8 (100%) | S |
| 22. Nurses or physical therapists should evaluate the mobility. | 8 (79%) | S | 8 (100%) | S |
| **Theme: Providing information** | | | | |
| 23. Close-relatives of patients should be informed about the importance of physical activity. | 7 (79%) | D | 8 (80%) | S |
| 24. Patients should be informed about the importance of physical activity. | 8 (71%) | S | | |
| **Theme: Bed rest** | | | | |
| 25. Physicians should consider bed rest as an abnormal medical procedure. | 6 (50%) | NS | | |
| 26. Nurses should consider bed rest as an abnormal procedure. | 6 (50%) | NS | | |
| 27. Physical therapists should consider bed rest as an abnormal procedure. | 6 (29%) | NS | | |

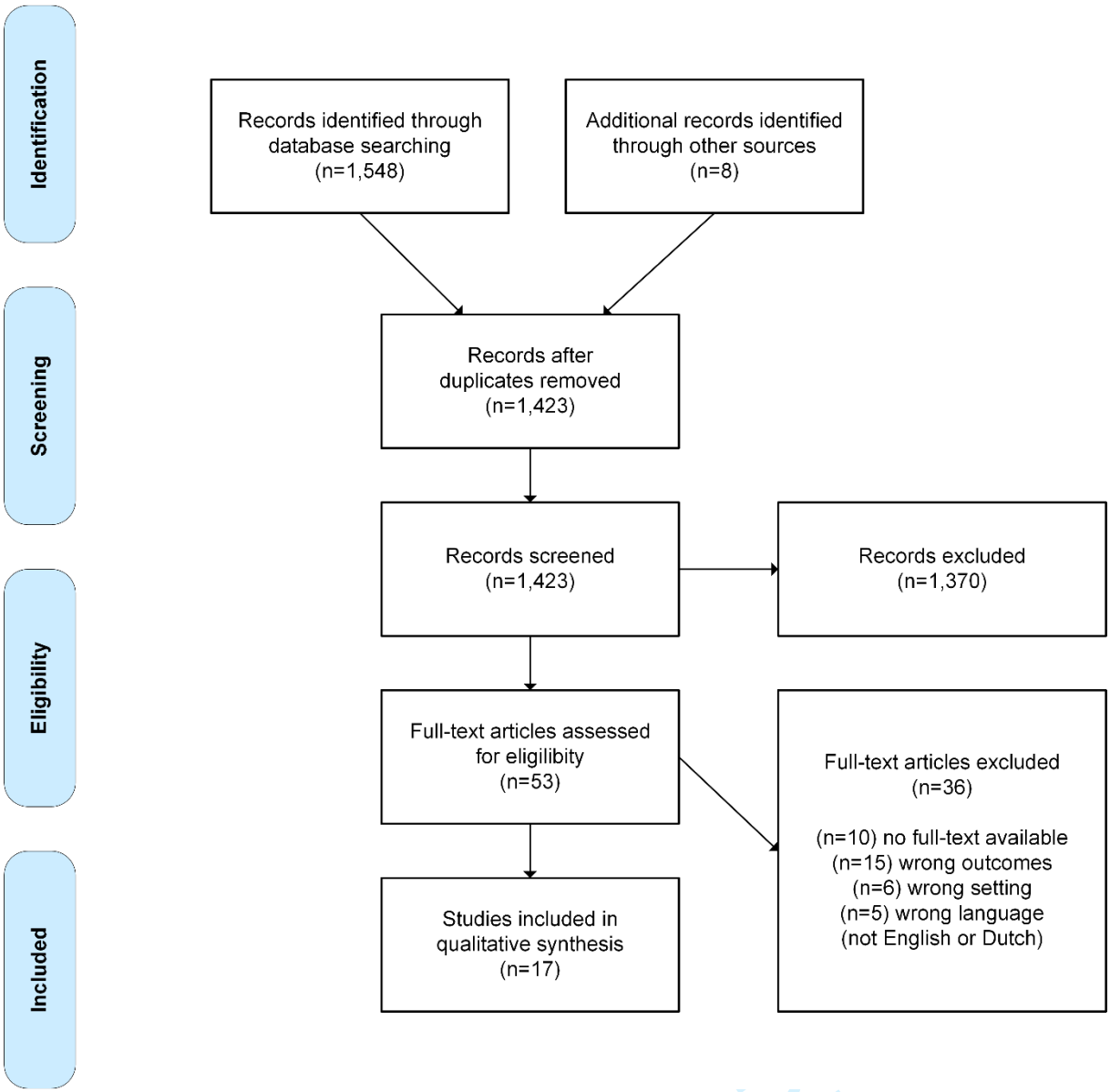
| | | | | | | |
|---|---|---|---|---|---|---|
| 28. The number of patients with bed rest without medical urgency. | 6 (50%) | NS | 7 (60%) | NS | | |
| **Theme: Education** | | | | | | |
| 29. The number of lower educated healthcare providers. | 2 (0%) | NS | | | | |
| 36. Physicians should have followed education related to physical activity of patients. | 7 (71%) | D | 7 (60%) | NS | | |
| 37. Nurses should have followed education related to physical activity of patients. | 7 (86%) | D | 8 (80%) | S | | |
| 38. Physical therapists should have followed education related to physical activity of patients. | 7 (64%) | NS | | | | |
| **Theme: Work pressure** | | | | | | |
| 30. Nurses should be aware of work pressure being a limiting factor for physical activity in patients. | 8 (79%) | S | 7 (100%) | D | 7 (100%) | D |
| 31. The number of patients who experience to be discharged too early. | 5 (29%) | NS | | | | |
| **Theme: Environment** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 32. Hospital rooms should be equipped with adequate furniture to improve physical activity. | 7 (71%) | D | 7 (80%) | D | 7 (80%) | D |
| 51. The hospital (ward) has orientation promoting resources. | 7 (57%) | NS | 7 (100%) | D | 8 (100%) | S |
| 52. The hospital (ward) provides adequate resources to stimulate physical activity. | 8 (86%) | S | 8 (100%) | S | | |
| 53. Patients should have access to a movement room. | 8 (79%) | S | 7 (60%) | NS | | |
| 54. Patients should have sunlight in their hospital room. | 7 (64%) | NS | | | | |
| **Theme: Aids for mobilization** | | | | | | |
| 33. Patients should have adequate walking aids. | 8 (86%) | S | | | | |
| 34. Patients should have comfortable chairs. | 8 (79%) | S | 6 (40%) | NS | | |
| 35. Patients should have access to ergometers. | 4 (28%) | NS | | | | |
| **Theme: Culture** | | | | | | |
| 45. The hospital (ward) should have a policy to improve physical activity of | 8 (86%) | S | 8 (100%) | S | | |

| | | | | |
|---|---|---|---|---|
| patients. | | | | |
| 49. The hospital (ward) should have a policy to inform close-relatives about physical activity. | 8 (79%) | S | 8 (80%) | S |

*Abbreviations: %HT, percentage in highest tertile; D, discussion; NS, no selection; S, selection*

*Supplementary Figure A1. Flow diagram of study selection.*



BMJ Open

# Development of a longlist of healthcare quality indicators for physical activity of patients during hospital stay: a modified RAND Delphi study

| | |
|---|---|
| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2019-032208.R2 |
| Article Type: | Original research |
| Date Submitted by the Author: | 25-Sep-2019 |
| Complete List of Authors: | Koenders, Niek; Radboudumc, Radboud Institute for Health Sciences, Department of Rehabilitation - Physical Therapy<br>van den Heuvel, Stein; Radboudumc, Radboud Institute for Health Sciences, Department of Rehabilitation - Physical Therapy<br>Bloemen, Shanna; Radboudumc, Radboud Institute for Health Sciences, Department of Rehabilitation - Physical Therapy<br>Van der Wees, Philip; Radboud university medical center, Radboud Institute for Health Sciences, IQ healthcare<br>Hoogeboom, Thomas J; Radboud university medical center, Radboud Institute for Health Sciences, IQ healthcare |
| Primary Subject Heading: | Rehabilitation medicine |
| Secondary Subject Heading: | Health services research, Rehabilitation medicine |
| Keywords: | Healthcare quality indicator, Performance indicator, Quality measure, Physical activity |
| | |

## TITLE

Development of a longlist of healthcare quality indicators for physical activity of patients during hospital stay: a modified RAND Delphi study


## AUTHOR NAMES AND AFFILIATIONS

Niek Koenders[a], MSc.; Stein van den Heuvel[a], MSc.; Shanna Bloemen[a]; prof. dr. Philip J van der Wees[b]; dr. Thomas J Hoogeboom[b]

[a] Department of Rehabilitation – Physical Therapy, Radboud Institute for Health Sciences, Radboud university medical center, Nijmegen, the Netherlands.

[b] IQ healthcare, Radboud Institute for Health Sciences, Radboud university medical center, Nijmegen, the Netherlands.

## CORRESPONDING AUTHOR

Niek Koenders

Department of Orthopaedics – Physical Therapy

Radboud university medical center, Nijmegen, the Netherlands

Radboud Institute for Health Sciences

Full postal address: Geert Grooteplein Zuid 10, 6525 GA NIJMEGEN, the Netherlands

Email: niek.koenders@radboudumc.nl

Telephone number: 0031-024 36 13812


## RUNNING TITLE

Indicators for inpatient physical activity

**KEYWORDS**

Healthcare quality indicator, performance indicator, quality measure, physical activity

**WORD, REFERENCE AND GRAPHICS COUNT**

Abstract: 285

Main text: 2875

References: 52

Tables: 2

Figures: 1

**BRIEF SUMMARY**

A longlist of 23 quality indicators was constructed to grade, monitor, and improve care for hospitalized adults of all ages with (or at risk of) low physical activity during hospital stay.

## ABSTRACT

### Objective

To develop a longlist of healthcare quality indicators for the care of hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay.

### Design

A modified RAND/UCLA Appropriateness Method Delphi study.

### Setting and Participants

Participants were physical therapists, nurses, and managers working in Dutch university medical centers.

### Methods

The current study consisted of three phases. Phase 1 was a systematic literature search for quality indicators and relevant domains. Phase 2 was a survey amongst healthcare professionals to collect additional data. Phase 3 consisted of three consensus rounds. In round one, experts rated the relevance of the potential indicators online (Delphi). The second round was a face-to-face expert panel meeting managed by an experienced moderator. Acceptability, feasibility, and validity of the quality indicators were discussed by the panel members. In round three, the panel members rated the relevance of the potential indicators that were still under discussion.

### Results

The search retrieved 1,556 studies of which 53 studies were assessed full-text. Data from seventeen studies were included in a first draft longlist of indicators. Eighteen nurses and

one physical therapist responded to the survey and added data for a second draft of the longlist. Experts constructed the final longlist of 23 indicators in three consensus rounds. Seven domains were identified: “Policy”, “Attitude and education”, “Equipment and support”, “Evaluation”, “Information”, “Patient-tailored physical activity plan”, and “Outcome measure”.

**Conclusion and Implications**

The healthcare quality indicators developed in this study could help to grade, monitor, and improve healthcare for hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay. Future research will focus on the psychometric quality of the indicators and selection of key performance indicators.

**Strengths of this study**

- The current study consists of a systematic review with duplicate study selection, an extra survey in healthcare professionals, and three consensus rounds with a panel meeting.
- The panel meeting has been moderated by an internationally experienced moderator
- The longlist of healthcare quality indicators was developed by a multidisciplinary group of healthcare professionals including nurses, physical therapists, and managers.

**Limitations of this study**

- Only five panel members participated in the second and third consensus rounds.
- There were no patients and public involved in the coproduction of this study.

## INTRODUCTION

Low physical activity of patients during the hospital stay has been extensively reported,[1 2] especially in older patients.[3-5] Low physical activity is a global healthcare issue with known adverse effects such as decreased strength, functional decline, a prolonged hospital stay, and institutionalization.[6-9] Common barriers to physical activity during the hospital stay include: symptoms (i.e. fatigue and pain), lack of motivation, medical devices, and the hospital environment.[10-13] Several quality improvement initiatives have been developed to improve physical activity of patients during the hospital stay.[14-18] Nevertheless, quality indicators to measure the results of such quality improvement strategies are scarce.[19-21]

Healthcare quality indicators, also known as performance indicators or quality measures, are used all over the world to quantify, grade, monitor, and improve the quality of healthcare.[22-24] Recently, qualitative indicators have also been introduced to express matters that are hard to capture quantitatively such as having confidence in being safe in a community.[25] Quality indicators are used in hospital care to provide information for quality improvement initiatives to, for example, decrease hospital mortality and complications.[26 27] Regarding the management of (low) physical activity of patients during the hospital stay, quality indicators could be helpful to capture persisting barriers in an attempt to improve the physical activity of all patients.[28] As a first step, a longlist of relevant quality indicators is needed to serve as a database for healthcare professionals, clinical teams, and organizations to measure performance for quality improvement purposes.[21] Therefore, the aim of this study is to develop a longlist of quality indicators for the healthcare in hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay.

## METHODS

### Design and setting

A modified RAND/UCLA Appropriateness Method Delphi study[29] was used to develop a longlist of quality indicators which meets the requirements of the Appraisal of Guidelines for Research and Evaluation (AGREE) II Healthcare Quality Indicator tool.[30] The AGREE II tool was used as a guiding checklist for study development (Supplementary Table A1). The reporting of this study followed guidelines of the Standards for QUality Improvement Reporting Excellence (SQUIRE 2.0).[31] The study was conducted as a quality improvement initiative of the Radboud university medical center and followed the principles of the Declaration of Helsinki[32] and Good Clinical Practice Guideline[33]. Full ethical consideration was waived by the Ethics Committee of the Radboud university medical center in accordance with the Dutch Medical Research with Human Subjects Law.

All phases from the RAND/UCLA method were followed (Figure 1). Phase 1 was a systematic literature search to identify indicators and relevant topics for potential indicators. Phase 2 was an extra survey amongst healthcare professionals to provide additional relevant topics. This extra survey was a modification to the original RAND/UCLA method to obtain as many relevant indicators and topics as possible. Phase 3 consisted of three consensus rounds in which potential indicators were rated for their relevance by experts.

### Literature search

The literature search was conducted to develop the first draft of a longlist of quality indicators for physical activity of hospitalized adults of all ages. CINAHL, MEDLINE, and EMBASE were systematically searched for studies up to 24 January 2018 using a pre-defined search strategy (Supplementary Table A2). The search strategy was compiled with the help

of an experienced librarian (OYC). The study selection and data extraction were independently performed by two researchers (NK, SH).[34] An indicator was considered relevant if a definition, numerator, and denominator were described in the literature and related to physical activity of patients during the hospital stay. A topic was considered relevant when information in the text of articles commented on the physical activity of patients during the hospital stay.

**Extra survey**

All indicators and topics were then translated into the Dutch language and presented to a convenience sample of healthcare professionals and managers of one Dutch academic hospital using an online questionnaire in LimeSurvey.[35] The participants were requested to suggest additional topics related to physical activity of hospitalized adults of all ages. Furthermore, problems as a result of unclear translation or unclear formulation were solved with the help of the participants. The second draft was constructed by two researchers (NK, SH) with quality indicators from both the literature review and additional input from healthcare professionals and managers. Each topic was converted into an indicator by formulating a definition, numerator, and denominator. All converted topics were checked for loss of information due to the translation by a third researcher (TH).

**Consensus rounds**

The second draft of the longlist of quality indicators was presented for relevance rating in the three consensus rounds with experts.[36] To include a group of multidisciplinary experts in the consensus rounds, we purposefully sampled national experts.[37] The multidisciplinary expert panel consisted of 28 experts (12 physical therapists, 11 nurses, 5 managers). All experts worked in a university medical center (secondary care); participated in care,

research, and innovation of physical activity in patients during the hospital stay; and were representatives of an acknowledged national workgroup called *Moving Hospitals* (in Dutch: *Beweegziekenhuizen*). The experts were approached by email and telephone for participation in this study.

In the first consensus round (Delphi method), the experts received the longlist of quality indicators online in LimeSurvey. All indicators were rated on relevance by fourteen experts for the first consensus label: *selection*, *discussion* or *no selection*. In the second round, all quality indicators were discussed in a panel meeting with five experts (panel members) moderated by an experienced moderator (PW). First, the panel members discussed the acceptability to healthcare professionals and managers, the feasibility of use, and the validity in terms of providing more appropriate care and optimizing patient outcomes.[29] Finally, all panel members voted (yes or no) for final consensus on *selection*, *discussion*, or *no selection* of the quality indicators. A methodologist (TH) observed the panel meeting from the side-line and intervened if methodological errors occurred. In the third consensus round (Delphi method), all five panel members received the modified quality indicators and the quality indicators which were still under discussion online in LimeSurvey for final consensus.

**Data analysis**

The experts were instructed to rate the quality indicators only on relevance, not on, for example, feasibility or reliability. The relevance was scored using a 9-point Likert scale ranging from 1 *not relevant* to 9 *very relevant*. Consensus outcomes from the relevance ratings were calculated using the *IQ healthcare consensus tool.*[38] The consensus outcomes were based on the median score and the highest tertile, which resulted in labels: *selection*, *discussion*, or *no selection* (Table 1).[38] Quality indicators were labeled *selection* when the

median score was ≥8 on the 9-point Likert scale and ≥70% of the responses were in the highest tertile. The label *discussion* was given as a result of three possible outcomes, 1) the median score was ≥8 though less than 70% of the responses were in the highest tertile, 2) the median score was <8 though more than 70% of the responses were in the highest tertile, or 3) 30% of the responses were in the lowest and highest tertile. An indicator was labeled *no selection* when the median was ≤7 and less than 70% of the responses were in the highest tertile.

*Table 1. Labels corresponding to the consensus outcomes following different quantitative relevance ratings of experts in the consensus rounds using the IQ healthcare consensus tool.*

| | **≥70% in the highest tertile** | **≥30% in the lowest tertile, and ≥30% in the highest tertile** | **<70% in the highest tertile** |
|---|---|---|---|
| **Median ≤ 3** | Discussion | Discussion | No selection |
| **Median 4 ≤ 7** | Discussion | Discussion | No selection |
| **Median ≥ 8** | Selection | Discussion | Discussion |

In the second consensus round (panel meeting), five panel members received information on all first-round outcomes with corresponding labels per quality indicator. The panel members voted yes or no for final *selection*, *discussion*, or *no selection* and consensus meant that at least 75% of the members voted for one outcome. Where needed, the quality indicators were modified to improve the concise formulation. If modification(s) were suggested, the quality indicators were reformulated and rated (online and anonymous) for a second time by the panel members. The quality indicators needing further discussion were modified and rated by the same five panel members in the third online consensus round. After the third consensus round, quality indicators which were labeled *selection* were

included in the longlist of quality indicators. All selected quality indicators were charted by domain and translated into the English language with a standardized forward-backward method by the Language Centre of the HAN university of applied sciences, Nijmegen, the Netherlands.

**Patient and public involvement**

No patients or public were involved in the design and conceptualization of this study.

## RESULTS

### Literature search

The systematic literature search retrieved a total of 1,556 studies, including 8 studies through searching the grey literature (Supplementary Table A2, Supplementary Figure A1). Full-text articles of 53 studies were assessed for eligibility, resulting in the inclusion of 17 articles.[1-3 6 19-21 39-48] Data extraction resulted in the identification of 29 unique indicators and 5 domains related to hospitalized adults of all ages with (or at risk of) low physical activity during hospital stay for a first draft longlist of quality indicators.

### Extra survey

The 29 indicators and 5 domains were translated into the Dutch language and surveyed amongst 296 healthcare professionals. Eighteen nurses and 1 physical therapist responded, and they suggested 20 additional domains. Twenty-five domains were reformulated and converted into indicators, resulting in 54 unique indicators in the second draft longlist of quality indicators (Supplementary Table A3).

### Consensus rounds

Consensus round 1 – Twenty-eight experts were invited to participate in the first online Delphi round. Fourteen experts responded: 8 physical therapists, 4 nurses and 2 managers. A total of 22 indicators were labeled *selection*, 12 indicators *discussion*, and 20 indicators *no selection* as a result of the first round. A detailed overview of ratings and selections is provided in Supplementary Table A4.

Consensus round 2 – The panel meeting lasted three hours with a total of 5 panel members: 4 physical therapists and 1 nurse. At the start, the moderator asked to discuss two key issues

which were identified in the first Delphi round. First, the concept of physical activity during hospital stay was discussed and defined for the panel meeting as *"an active transfer of a body(part) by a hospitalized patient*". This did not include exercises or a transfer of a body(part) using a machine or object such as a standing aid or hospital bed. Second, the physical activity plan was defined as *"an object in which physical activity should be reported, tailored at individual patients' needs, with a specific structure stating personal goals, frequency, intensity, time, and type of physical activity. Besides, the amount of support needed for mobilization should be described, for example, the need for a walking aid*". Of all 22 indicators with the label *selection*, the panel members voted consensus for *selection* of 15 indicators, *discussion* of 5 indicators, and *no selection* of 2 indicators. Of all 12 indicators with the label *discussion*, the panel members voted consensus for *selection* of 5 indicators, *discussion* of 1 indicator, and *no selection* of 6 indicators. Of all 20 indicators with the label *no selection*, the panel members voted consensus for *discussion* of 1 indicator and *no* selection of 19 indicators. As a result of the second consensus round, 20 indicators were *selected*, 7 indicators remained under *discussion* and were included in round 3, and 27 indicators were *not selected* (Supplementary Table A4).

Consensus round 3 (Delphi) – In the third round, the same 5 panel members performed the final rating of 7 remaining indicators resulting in the *selection* of 3 indicators, *discussion* of 3 indicators, and *no selection* of 1 indicator. The discussion remained for three indicators (numbers 30, 32, 47) resulting in *no selection* due to a lack of consensus (Supplementary Table A4). A flow diagram of the quality indicators selection is presented in Figure 1.

Please insert Figure 1 'Flow diagram showing the selection of healthcare quality indicators in all phases of the study' about here.

**Final longlist indicators**

The final longlist of quality indicators includes 23 indicators within seven domains (Table 2). The first domain, "*Policy"*, includes two structure indicators to evaluate institutional characteristics of the hospital ward. The second domain, "*Attitude and education*", describes four structure indicators to assess the attitude and education of physicians and nurses related to physical activity stimulation. The third domain consists of three structure indicators and one process indicator on "*Equipment and support*" to assess, for example, the availability of walking aids and ergometers. The fourth domain, "*Evaluation*" includes five process indicators on the evaluation of freedom and mobility limiting equipment (such as: five-point fixation, intravenous lines, and urinary catheters), physical functioning of patients, and timely documentation of falls by a healthcare professional. The fifth domain, *"Information on physical activity"*, consists of two process indicators related to the provision of educational information to both patients and close-relatives. The sixth domain, "*Patient-tailored physical activity plan"*, includes three process indicators to assess the use and follow-up of a patient-tailored physical activity plan that "*should be reported, tailored at individual patients' needs, with a specific structure stating personal goals, frequency, intensity, time, and type of physical activity".* The seventh domain, "*Outcome measure"*, consists of three outcome indicators to measure if patients are physically active within 48 hours after hospital admission, if patients perform physical activities as described in a physical activity plan, and whether patients have an acceptable degree of pain.

*Table 2. The final longlist of healthcare quality indicators for the care of patients with (or at risk of) low physical activity during the hospital stay.*

| Domain | | Healthcare quality indicators |
|---|---|---|
| **1. Policy** | ***Title:*** | **1. The hospital ward should have the policy to improve the physical activity of patients (Structure indicator)** |
| | *Numerator:* | The hospital ward policy was to inform patients to be physically active during the hospital stay. |
| | *Denominator:* | The hospital ward. |
| | | *Expert opinion* |
| | ***Title:*** | **2. The hospital ward should have the policy to inform close-relatives about physical activity (Structure indicator)** |
| | *Numerator:* | The hospital ward policy was to inform close-relatives of patients about the importance of physical activity during the hospital stay. |
| | *Denominator:* | The hospital ward. |
| | | *Expert opinion* |
| **2. Attitude and education** | ***Title:*** | **3. Physicians should stimulate the physical activity of patients (Structure, qualitative indicator)** |
| | *Numerator:* | The number of physicians who had a stimulating attitude towards the physical activity of patients during the hospital stay |
| | *Denominator:* | The number of physicians at the hospital ward. |
| | | *Adapted from Inouye et al.[44] and Sourdet et al.[40]* |
| | ***Title:*** | **4. Nurses should stimulate the physical activity of patients (Structure, qualitative indicator)** |
| | *Numerator:* | The number of nurses who had a stimulating attitude towards the physical activity of patients during the hospital stay. |
| | *Denominator:* | The number of nurses at the hospital ward. |
| | | *Adapted from Inouye et al.[44] and Sourdet et al.[40]* |
| | ***Title:*** | **5. Nurses should stimulate independent functioning in daily activities of patients (Structure, qualitative indicator)** |
| | *Numerator:* | The number of nurses who had a stimulating attitude towards independent physical functioning in daily activities of patients during the hospital stay. |
| | *Denominator:* | The number of nurses at the hospital ward. |
| | | *Adapted from Sourdet et al.[40], Pedersen et al.[1], and Brown et al.[3]* |
| | ***Title:*** | **6. Nurses should have followed education related to physical activity of patients (Structure indicator)** |
| | *Numerator:* | The number of nurses who followed education concerning the importance of physical activity of patients during the hospital stay. |
| | *Denominator:* | The number of patients at the hospital ward. |
| | | *Adapted from Bail et al.[19]* |

| | | |
|---|---|---|
| **3. Equipment and support** | ***Title:*** | **7. Patients should have adequate walking aids (Structure indicator)** |
| | *Numerator:* | The number of patients who were advised to use (a) walking aid(s), with (an) adequate walking aid(s) available. |
| | *Denominator:* | The number of patients at the hospital ward who were advised to use (a) walking aid(s). |
| | | *Expert opinion* |
| | ***Title:*** | **8. The hospital ward should provide adequate resources to stimulate physical activity (Structure indicator)** |
| | *Numerator:* | The hospital ward provided physical activity stimulating resources. Examples are walking routes, treadmills, ergometers. |
| | *Denominator:* | The hospital ward. |
| | | *Adapted from Bail et al.[19] and Covinsky et al.[39]* |
| | ***Title:*** | **9. The hospital ward should have orientation promoting resources (Structure indicator)** |
| | *Numerator:* | The hospital ward provided orientation stimulating resources. Examples are maps, direction signs, banners with route information |
| | *Denominator:* | The hospital ward ward. |
| | | *Adapted from Bail et al.[19] and Covinsky et al.[39]* |
| | ***Title:*** | **10. Patients should receive support for mobilization (Process indicator)** |
| | *Numerator:* | The number of patients who received the support of (at least) one person for mobilization. |
| | *Denominator:* | The number of patients at the hospital ward who needed the support of (at least) one person for mobilization. |
| | | *Adapted from Growdon et al.[43] and Lafont et al.[41]* |
| **4. Evaluation** | ***Title:*** | **11. Nurses should evaluate freedom limiting equipment (Process indicator)** |
| | *Numerator:* | The nurses performed a daily assessment of the use of freedom-limiting equipment. Examples are five-point fixation, wheelchair tables, and wheelchair brakes. |
| | *Denominator:* | The number of nurses at the hospital ward. |
| | | *Adapted from Inouye et al.[44] and Sourdet et al.[40]* |
| | ***Title:*** | **12. Nurses should evaluate mobility limiting equipment (Process indicator)** |
| | *Numerator:* | The nurses performed a daily assessment of the use of mobility-limiting equipment in patients. Examples are intravenous lines, urinary catheters, and oxygen tubes. |
| | *Denominator:* | The number of nurses at the hospital ward. |
| | | *Adapted from Inouye et al.[44] and Sourdet et al.[40]* |
| | ***Title:*** | **13. Nurses or physical therapists should evaluate the preadmission physical ability (Process indicator)** |
| | *Numerator:* | The number of patients in which the preadmission physical |

| | | |
|---|---|---|
| | | functioning was evaluated within 24 hours after hospital admission. |
| | *Denominator:* | The number of patients at the hospital ward. *Adapted from Brown et al.[3], Pedersen et al.[1], Lafont et al.[41], Zisberg et al.[6], Covinsky et al.[39], Bail et al.[19], Arora et al.[42], Tropea et al.[21], and Counsell et al.[47]* |
| | ***Title:*** | **14. Nurses or physical therapists should evaluate the mobility (Process indicator)** |
| | *Numerator:* | The number of patients in which the mobility was evaluated within 24 hours after hospital admission. |
| | *Denominator:* | The number of patients at the hospital ward. *Adapted from Covinsky et al.[39]* |
| | ***Title:*** | **15. Patients should be evaluated after a fall incident (Process indicator)** |
| | *Numerator:* | The number of patients in which a fall incident was evaluated within 24 hours after the fall. |
| | *Denominator:* | The number of patients at the hospital ward with a fall incident. *Adapted from Arora et al.[20] and Tropea et al.[21]* |
| **5. Information** | ***Title:*** | **16. Patients should be informed about the importance of physical activity (Process indicator)** |
| | *Numerator:* | The number of patients who were informed about the importance of physical activity during the hospital stay. |
| | *Denominator:* | The number of patients at the hospital ward. *Adapted from Bail et al.[19]* |
| | *Title:* | **17. Close-relatives of patients should be informed about the importance of physical activity (Process indicator)** |
| | *Numerator:* | The number of close-relatives of patients who were informed about the importance of physical activity during the hospital stay. |
| | *Denominator:* | The number of patients at the hospital ward with close-relatives. *Adapted from Bail et al.[19]* |
| **6. Patient-tailored physical activity plan** | ***Title:*** | **18. Patients should have a physical activity plan (Process indicator)** |
| | *Numerator:* | The number of patients who had a physical activity plan within 48 hours after hospital admission. |
| | *Denominator:* | The number of patients at the hospital ward. *Adapted from Growdon et al.[43] and Lafont et al [41]* |
| | ***Title:*** | **19. Patients in need for support during mobilization should have a physical activity plan (Process indicator)** |
| | *Numerator:* | The number of patients, who needed the support of (at least) one person for mobilization, with a physical activity plan. |
| | *Denominator:* | The number of patients at the hospital ward who needed the support of at (least) one person for mobilization. |

| | | |
|---|---|---|
| | | *Adapted from Growdon et al.[43] and Lafont et al.[41]* |
| | ***Title:*** | **20. Patients without need for support during mobilization should have a physical activity plan (Process indicator)** |
| | *Numerator:* | The number of patients, who did not need the support of a person for mobilization, with a physical activity plan. Patients who only use (a) walking aid(s) are considered independent. |
| | *Denominator:* | The number of patients at the hospital ward who did not need the support of a person for mobilization. *Adapted from Growdon et al.[43] and Lafont et al.[41]* |
| **7. Outcome measure** | ***Title:*** | **21. Patients should be physically active within 48 hours after hospital admission (Outcome indicator)** |
| | *Numerator:* | The number of patients who were physically active within 48 hours after hospital admission. |
| | *Denominator:* | The number of patients at the hospital ward. *Adapted from Arora et al.[20]* |
| | ***Title:*** | **22. Patients should perform physical activities as described in their physical activity plan (Outcome indicator)** |
| | *Numerator:* | The number of patients who performed physical activities as described in their physical activity plan. |
| | *Denominator:* | The number of patients at the hospital ward with a physical activity plan. *Adapted from Growdon et al.[43] and Lafont et al.[41]* |
| | ***Title:*** | **23. Patients should have an acceptable degree of pain (Outcome indicator)** |
| | *Numerator:* | The number of patients who scored *pain at rest* and *pain during physical activities* with a Numeric Pain Rating Scale ≤4. |
| | *Denominator:* | The number of patients at the hospital ward. *Adapted from Sourdet et al.[40], Covinsky et al.[39], and Arora et al.[42]* |

257

## DISCUSSION

The current study presents the development of a longlist of quantitative and qualitative healthcare quality indicators for the healthcare of hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay. A multidisciplinary expert panel agreed on a list of 23 quality indicators with important domains such as an aim, patient-tailored physical activity plan, evaluation of physical activity, information on physical activity, equipment to stimulate physical activity, policy regarding physical activity, and attitude related to physical activity. The quality indicators involve several stakeholders such as patients, close-relatives, and healthcare professionals (i.e. physical therapists, nurses, and physicians), which is consistent with the multi-factorial nature of low physical activity of patients during the hospital stay.[39]

Reviewing current literature related to indicator development in secondary healthcare, shows several studies reporting on physical activity of the elderly people.[19-21] In contrast to our study, none of these aimed to evaluate physical activity in hospitalized adults of all ages during the hospital stay. Bail et al.[19] performed a literature review and constructed a theoretical framework called 'Failure to maintain'. This study suggested quality indicators on physical environment factors and process factors (treatment and regimes that may affect the patient) to increase physical activity in complex older patients and ultimately decrease the incidence of urinary tract infections, pneumonia, delirium, and pressure injuries. Arora et al.[20] also performed a literature review for the general medical care of hospitalized vulnerable elderly people. Out of thirty reported quality indicators, only two related to physical activity of patients during the hospital stay: mobilization and inpatient fall evaluation. These two domains are likely to be important, although two quality indicators do not completely address the complex issue of low physical activity in patients during the

hospital stay.[10] Tropea et al.[21] performed a Delphi study with anonymous voting rounds and a panel meeting similar to the current study, resulting in a set of quality indicators for healthcare in older hospitalized patients. The set exists of three quality indicator domains related to physical activity in patients during the hospital stay with five relevant quality indicators: inpatient fall evaluation, fall-related injuries including fractures, pressure ulcer risk assessment, discharge assessment, and assessment of physical function.

Interestingly, the current study found two quality indicators with a focus on hospital ward policy. In line with the Medical Research Council recommendations, quality improvement studies which aim to improve physical activity in hospitalized adults of all ages should include the perspective of local hospital policy in their study development and process evaluation.[49] Furthermore, qualitative quality indicators were described to evaluate the attitudes of healthcare professionals related to physical activity. Attitudes are often hard to measure and therefore underexposed in other studies,[25] despite the knowledge that attitudes of different stakeholders play an important role in healthcare quality improvement.[50] With low physical activity during hospital stay being a multi-factorial issue in hospitalized adults of all ages, the current study provides crucial knowledge to evaluate healthcare for hospitalized adults of all ages (with or) at risk of low physical activity during the hospital stay.

**Strengths and limitations**

The current study has several strengths. First, all methods as suggested by the modified RAND/UCLA are followed in detail. The use of a thorough systematic review with duplicate study selection, an extra survey in healthcare professionals, and consensus rounds with a panel meeting is considered as a very rigorous quality indicators development procedure.[51]

Second, the panel meeting has been moderated by an internationally experienced moderator (PW) which contributed to an efficient and systematic discussion of all quality indicators.

There are some limitations to the current study that need to be discussed. First, only five panel members participated in the panel meeting and the third consensus round which is lower than the preferred seven to fifteen members within the RAND/UCLA method.[29] Despite the reduced diversity of representation, the smaller group size was found to stimulate the involvement of every panel member in the group discussion. Second, two items of the AGREE II were not met.[30] The quality indicators were not submitted to external review, and stakeholders such as patients, managers, and healthcare insurers were insufficiently included in the process of quality indicators development. However, the limited external review and stakeholder involvement could be adequately addressed in future research.

**Recommendations for future research**

As the next step of our quality improvement initiative, a multicenter study will be performed to assess the acceptability, feasibility and reliability of the longlist of quality indicators for the healthcare in hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay. The longlist of quality indicators will be applied in practice to further assess the acceptability to patients, healthcare professionals, and managers, as well as its feasibility and reliability.[52] Future research will include a validation study following the Delphi technique of Hasson et al.[51] in a team of national and international experts. This would provide crucial information on the appropriateness of care and optimization of patient outcomes. To improve feasibility in daily practice, it would be useful to select approximately

three or four key performance quality indicators from the current longlist. Ultimately, a quality improvement study should use the key performance quality indicators in daily healthcare and assess their effect on patient outcomes such as strength and functional decline.

**Conclusions and Implications**

The healthcare quality indicators developed within the current study form a rigorous basis to evaluate healthcare for hospitalized adults of all ages with (or at risk of) low physical activity during the hospital stay. Improvements in healthcare related to low physical activity of patients during the hospital stay are urgently needed, as the epidemic of low physical activity has already existed for decades with known, well-reported adverse effects. Quality improvement projects to increase the physical activity of patients during the hospital stay using currently developed healthcare quality indicators are promising, relevant, and will improve outcomes in hospitalized adults of all ages.

**ACKNOWLEDGEMENTS**

We would like to thank librarian On Ying Chan (OYC) for her help in the systematic literature search. Inge Janssen and Rebecca Cooke of the Language Centre (HAN university of applied sciences, Nijmegen, the Netherlands) are thanked for their forward-backward translation of the longlist of healthcare quality indicators. We would also like to thank Amy Awad-Sman for her language corrections. All members of the Dutch expert group *Beweegziekenhuizen* are thanked for their help in study conceptualization and data collection.

**COMPETING INTERESTS**

All authors declare that they have no competing interests.

## FUNDING

This research did not receive and funding from agencies in the public, commercial or not-for-profit sectors.

## AUTHORS' CONTRIBUTIONS

All listed authors meet the ICMJE criteria for authorship. NK, SH, and TH contributed to study conceptualization. Data collection and analysis was handled by NK, SH, PW, and TH. SB provided resources and contributed to project administration. PW and TH supervised all research activities. All authors reviewed concept drafts of the manuscript and approved submission of the final draft.

## DATA AVAILABILITY

No additional data are available. All data is provided in detail in the online Supplementary File.

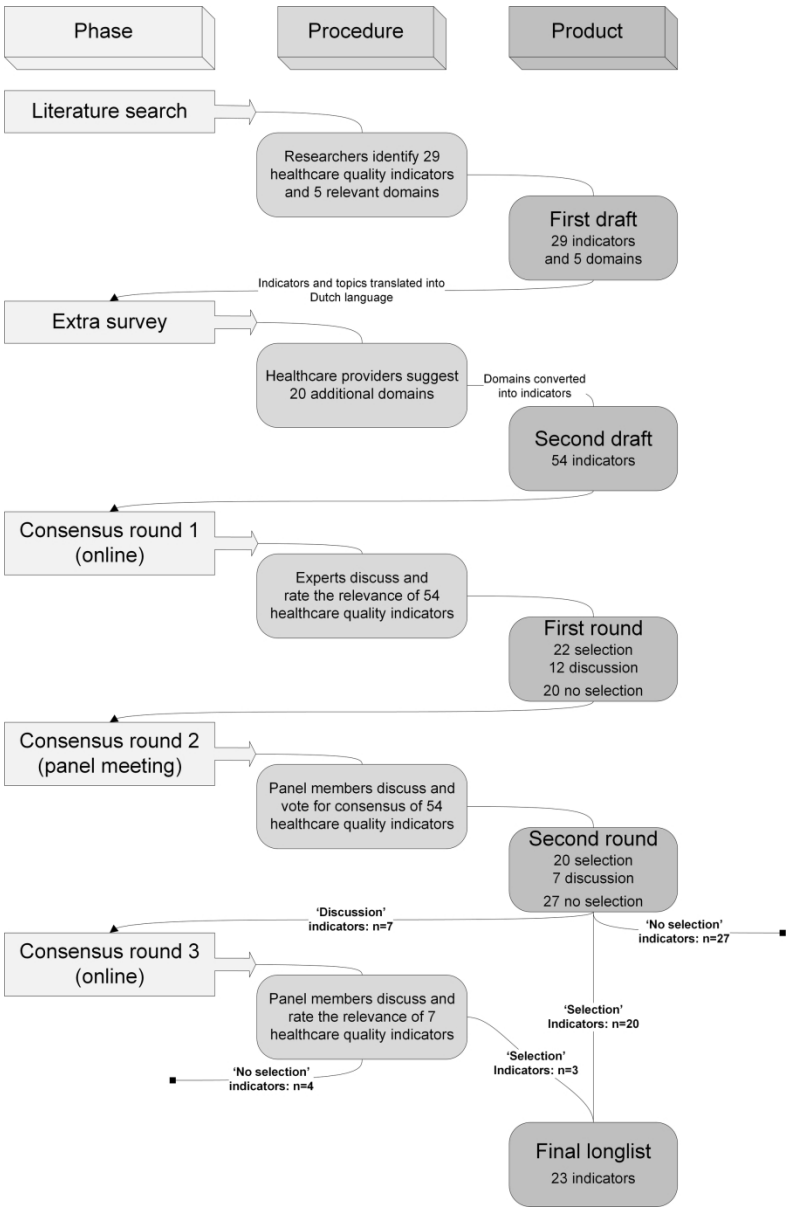
## REFERENCES


1. Pedersen MM, Bodilsen AC, Petersen J, et al. Twenty-four-hour mobility during acute hospitalization in older medical patients. *The journals of gerontology Series A, Biological sciences and medical sciences* 2013;68(3):331-7. doi: 10.1093/gerona/gls165 [published Online First: 2012/09/14]
2. Mudge AM, McRae P, McHugh K, et al. Poor mobility in hospitalized adults of all ages. *Journal of hospital medicine* 2016 doi: 10.1002/jhm.2536 [published Online First: 2016/01/23]
3. Brown CJ, Redden DT, Flood KL, et al. The underrecognized epidemic of low mobility during hospitalization of older adults. *Journal of the American Geriatrics Society* 2009;57(9):1660-5. doi: 10.1111/j.1532-5415.2009.02393.x [published Online First: 2009/08/18]
4. Warshaw GA, Moore JT, Friedman SW, et al. Functional disability in the hospitalized elderly. *Jama* 1982;248(7):847-50. [published Online First: 1982/08/20]
5. Lazarus BA, Murphy JB, Coletta EM, et al. The provision of physical activity to hospitalized elderly patients. *Archives of internal medicine* 1991;151(12):2452-6. [published Online First: 1991/12/01]
6. Zisberg A, Shadmi E, Sinoff G, et al. Low mobility during hospitalization and functional decline in older adults. *Journal of the American Geriatrics Society* 2011;59(2):266-73. doi: 10.1111/j.1532-5415.2010.03276.x [published Online First: 2011/02/15]
7. Boyd CM, Landefeld CS, Counsell SR, et al. Recovery of activities of daily living in older adults after hospitalization for acute medical illness. *Journal of the American Geriatrics Society* 2008;56(12):2171-79.
8. Baztan JJ, Suarez-Garcia FM, Lopez-Arrieta J, et al. Effectiveness of acute geriatric units on functional decline, living at home, and case fatality among older patients admitted to hospital for acute medical disorders: meta-analysis. *BMJ (Clinical research ed)* 2009;338:b50. doi: 10.1136/bmj.b50 [published Online First: 2009/01/24]
9. Van Ancum JM, Scheerman K, Jonkman NH, et al. Change in muscle strength and muscle mass in older hospitalized patients: A systematic review and meta-analysis. *Experimental gerontology* 2017;92:34-41. doi: 10.1016/j.exger.2017.03.006 [published Online First: 2017/03/14]
10. Koenders N, van Oorsouw R, Seeger JPH, et al. "I'm not going to walk, just for the sake of walking...": a qualitative, phenomenological study on physical activity during hospital stay. *Disability and rehabilitation* 2018:1-8. doi: 10.1080/09638288.2018.1492636 [published Online First: 2018/08/11]
11. Chan DE, Hong MLI, Tan MYG, et al. Older patients' participation in physical activity during hospitalization: A qualitative study of ward nurses' perceptions in an Asian context. *Geriatric nursing (New York, NY)* 2019;40(1):91-98. doi: 10.1016/j.gerinurse.2018.07.002 [published Online First: 2018/08/11]
12. Lam KK, Ho Cheung William L, Ho KY, et al. Factors contributing to the low physical activity level for Hong Kong Chinese children hospitalised with cancer: an exploratory study. *Journal of clinical nursing* 2017;26(1-2):190-201. doi: 10.1111/jocn.13495 [published Online First: 2016/08/04]
13. Kneafsey R, Clifford C, Greenfield S. What is the nursing team involvement in maintaining and promoting the mobility of older adults in hospital? A grounded theory study. *International journal of nursing studies* 2013;50(12):1617-29. doi: 10.1016/j.ijnurstu.2013.04.007 [published Online First: 2013/05/25]
14. Liu B, Moore JE, Almaawiy U, et al. Outcomes of Mobilisation of Vulnerable Elders in Ontario (MOVE ON): a multisite interrupted time series evaluation of an implementation intervention to increase patient mobilisation. *Age and ageing* 2018;47(1):112-19. doi: 10.1093/ageing/afx128 [published Online First: 2017/10/07]
15. Oliver D. David Oliver: Fighting pyjama paralysis in hospital wards. *BMJ (Clinical research ed)* 2017;357:j2096. doi: 10.1136/bmj.j2096 [published Online First: 2017/05/04]

16. Booth KA, Simmons EE, Viles AF, et al. Improving Geriatric Care Processes on Two Medical-Surgical Acute Care Units: A Pilot Study. *Journal for healthcare quality : official publication of the National Association for Healthcare Quality* 2018 doi: 10.1097/jhq.0000000000000140 [published Online First: 2018/05/26]
17. Teodoro CR, Breault K, Garvey C, et al. STEP-UP: Study of the Effectiveness of a Patient Ambulation Protocol. *Medsurg nursing : official journal of the Academy of Medical-Surgical Nurses* 2016;25(2):111-6. [published Online First: 2016/06/22]
18. Brown CJ, Foley KT, Lowman JD, et al. Comparison of posthospitalization function and community mobility in hospital mobility program and usual care patients: a randomized clinical trial. *JAMA internal medicine* 2016;176(7):921-27.
19. Bail K, Grealish L. 'Failure to Maintain': A theoretical proposition for a new quality indicator of nurse care rationing for complex older people in hospital. *International journal of nursing studies* 2016;63:146-61. doi: 10.1016/j.ijnurstu.2016.08.001 [published Online First: 2016/09/23]
20. Arora VM, McGory ML, Fung CH. Quality indicators for hospitalization and surgery in vulnerable elders. *Journal of the American Geriatrics Society* 2007;55 Suppl 2:S347-58. doi: 10.1111/j.1532-5415.2007.01342.x [published Online First: 2007/10/04]
21. Tropea J, Amatya B, Brand CA. Use of consensus methods to select clinical indicators to assess activities to minimise functional decline among older hospitalised patients. *Australian health review : a publication of the Australian Hospital Association* 2011;35(4):404-11. doi: 10.1071/ah09790 [published Online First: 2011/12/01]
22. Petersson IF, Strömbeck B, Andersen L, et al. Development of healthcare quality indicators for rheumatoid arthritis in Europe: the eumusc. net project. *Annals of the rheumatic diseases* 2013:annrheumdis-2013-203765.
23. Steinke S, Beikert FC, Langenbruch A, et al. Measurement of healthcare quality in atopic dermatitis - development and application of a set of quality indicators. *Journal of the European Academy of Dermatology and Venereology : JEADV* 2018 doi: 10.1111/jdv.15074 [published Online First: 2018/05/16]
24. Bellmunt S, Roque M, Osorio D, et al. Healthcare quality indicators of peripheral artery disease based on systematic reviews. *European journal of vascular and endovascular surgery : the official journal of the European Society for Vascular Surgery* 2014;48(1):60-9. doi: 10.1016/j.ejvs.2014.02.001 [published Online First: 2014/03/22]
25. Church C, Rogers MM. Designing for results: Integrating monitoring and evaluation in conflict transformation programs: Search for Common Ground 2006.
26. Wright J, Dugdale B, Hammond I, et al. Learning from death: a hospital mortality reduction programme. *Journal of the Royal Society of Medicine* 2006;99(6):303-08.
27. Haynes AB, Weiser TG, Berry WR, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *New England Journal of Medicine* 2009;360(5):491-99.
28. Hoyer EH, Friedman M, Lavezza A, et al. Promoting mobility and reducing length of stay in hospitalized general medicine patients: A quality-improvement project. *Journal of hospital medicine* 2016;11(5):341-7. doi: 10.1002/jhm.2546 [published Online First: 2016/02/06]
29. Fitch K, Bernstein SJ, Aguilar MD, et al. The RAND/UCLA appropriateness method user's manual: RAND CORP SANTA MONICA CA, 2001.
30. Abrahamyan L, Boom N, Donovan LR, et al. An international environmental scan of quality indicators for cardiovascular care. *The Canadian journal of cardiology* 2012;28(1):110-8. doi: 10.1016/j.cjca.2011.09.019 [published Online First: 2011/12/14]
31. Ogrinc G, Davies L, Goodman D, et al. SQUIRE 2.0 (Standards for QUality Improvement Reporting Excellence): revised publication guidelines from a detailed consensus process. *BMJ quality & safety* 2016;25(12):986-92. doi: 10.1136/bmjqs-2015-004411 [published Online First: 2015/09/16]
32. Association WM. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *Jama* 2013;310(20):2191.

33. Grimes DA, Hubacher D, Nanda K, et al. The Good Clinical Practice guideline: a bronze standard for clinical research. *The Lancet* 2005;366(9480):172-74.
34. Higgins JP, Green S. Cochrane handbook for systematic reviews of interventions: John Wiley & Sons 2011.
35. Schmitz N, Wang J, Malla A, et al. The impact of psychological distress on functional disability in asthma: Results from The Canadian Community Health Survey. *Psychosomatics* 2009;50(1):42-49.
36. Boulkedid R, Abdoul H, Loustau M, et al. Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. *PloS one* 2011;6(6):e20476.
37. Portney LG, Watkins M. Foundations of clinical research: applications to pratice: FA Davis Company/Publishers 2015.
38. Stienen J, Ouwens M, Pols M, et al. Hoe kom je tot de kern van de zaak? *Tijdschrift voor gezondheidswetenschappen* 2011;89(8):405-08.
39. Covinsky KE, Pierluissi E, Johnston CB. Hospitalization-associated disability:"She was probably able to ambulate, but I'm not sure". *Jama* 2011;306(16):1782-93.
40. Sourdet S, Lafont C, Rolland Y, et al. Preventable Iatrogenic Disability in Elderly Patients During Hospitalization. *Journal of the American Medical Directors Association* 2015;16(8):674-81. doi: 10.1016/j.jamda.2015.03.011 [published Online First: 2015/04/30]
41. Lafont C, Gerard S, Voisin T, et al. Reducing "iatrogenic disability" in the hospitalized frail elderly. *The journal of nutrition, health & aging* 2011;15(8):645-60. [published Online First: 2011/10/05]
42. Arora VM, Plein C, Chen S, et al. Relationship between quality of care and functional decline in hospitalized vulnerable elders. *Medical care* 2009;47(8):895-901. doi: 10.1097/MLR.0b013e3181a7e3ec [published Online First: 2009/07/15]
43. Growdon ME, Shorr RI, Inouye SK. The Tension Between Promoting Mobility and Preventing Falls in the Hospital. *JAMA internal medicine* 2017;177(6):759-60. doi: 10.1001/jamainternmed.2017.0840
44. Inouye SK, Brown CJ, Tinetti ME. Medicare nonpayment, hospital falls, and unintended consequences. *The New England journal of medicine* 2009;360(23):2390-3. doi: 10.1056/NEJMp0900963 [published Online First: 2009/06/06]
45. Grube MM, Dohle C, Djouchadar D, et al. Evidence-based quality indicators for stroke rehabilitation. *Stroke* 2012;43(1):142-6. doi: 10.1161/strokeaha.111.627679 [published Online First: 2011/10/25]
46. Le H, Khankhanian P, Joshi N, et al. Patients recovering from abdominal surgery who walked with volunteers had improved postoperative recovery profiles during their hospitalization. *World journal of surgery* 2014;38(8):1961-5. doi: 10.1007/s00268-014-2491-5 [published Online First: 2014/03/13]
47. Counsell SR, Holder CM, Liebenauer LL, et al. Effects of a multicomponent intervention on functional outcomes and process of care in hospitalized older patients: a randomized controlled trial of Acute Care for Elders (ACE) in a community hospital. *Journal of the American Geriatrics Society* 2000;48(12):1572-81. [published Online First: 2000/12/29]
48. Fisher SR, Kuo YF, Sharma G, et al. Mobility after hospital discharge as a marker for 30-day readmission. *The journals of gerontology Series A, Biological sciences and medical sciences* 2013;68(7):805-10. doi: 10.1093/gerona/gls252 [published Online First: 2012/12/21]
49. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ (Clinical research ed)* 2008;337:a1655-a55. doi: 10.1136/bmj.a1655
50. Wensing MJP, Grol RPTM. Implementatie: Effectieve verbetering van de patiëntenzorg: Bohn Stafleu van Loghum 2017.
51. Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. *Journal of advanced nursing* 2000;32(4):1008-15. [published Online First: 2000/11/30]

52. Campbell SM, Braspenning J, Hutchinson A, et al. Research methods used in developing and applying quality indicators in primary care. *Quality & safety in health care* 2002;11(4):358-64. doi: 10.1136/qhc.11.4.358 [published Online First: 2002/12/07]




Flow diagram showing the selection of healthcare quality indicators in all phases of the study

185x284mm (300 x 300 DPI)

*Supplementary Table A1. Agree II quality indicator tool: Quality items and followed procedures for the development of healthcare quality indicators for the care of patients with (or at risk of) low physical activity during hospital stay. Adapted from Peter et al.[55]*

| | |
|---|---|
| **Domain 1. Scope and purpose** | |
| The overall objectives of the quality indicator development initiative are specifically described. | The purpose of this quality indicators development was to assess the quality of care for patients with (or at risk of) low physical activity during hospital stay. |
| The population to whom the indicators are meant to apply is specifically described. | Adult hospitalized adults of all ages during hospital stay, with specific attention for patients with (or at risk of) low physical activity. |
| **Domain 2. Stakeholder involvement** | |
| The indicator development group includes individuals from relevant professional groups in line with the overall objective. | First, an acknowledged group of experts in physical activity of patients during hospital stay was contacted. From this group with healthcare providers, researchers, innovators, and implementation experts, a multidisciplinary expert panel was formed. |
| The target users of the indicators are clearly defined. | The target users of the quality indicators are physical therapists and nurses working in hospital care, treating patients with low physical activity during hospital stay. |
| **Domain 3. Rigour development** | |
| Systematic methods were used to search for evidence. | Evidence was based on a systematic literature search conducted in CINAHL, MEDLINE, and EMBASE. Details are provided in Supplementary Table A2 and Supplementary Figure A1. |
| The criteria for selecting the indicators are clearly described. | A RAND/UCLA-modified Delphi method was used for the selection of quality indicators. The *IQ healthcare consensus tool* was used to calculate consensus and provide information on selection, discussion or no selection according to pre-defined cut-off values. |
| The methods for formulating the indicators are clearly described. | Formulation of the quality indicators was done by the researchers (NK, SH) and checked by a third researcher (TH). The formulation was subsequently discussed by all healthcare providers and experts participating in this study before the second draft of the longlist of quality indicators. The expert panel commented on the formulation of all quality indicators before discussing indicator selection and the final draft of the longlist of quality indicators. |
| There was a predefined quantitative process for | A numeric rating scale from 1 (completely irrelevant) to 9 (extremely relevant) was |

| | |
|---|---|
| indicator selection. | used for scoring by the expert panel. Details for quantitative quality indicators selection are provided in Supplementary Table 2. |
| An explicit link between the indicators and supporting evidence is provided. | For each quality indicator, relevant studies were provided in summary and full-text. If no relevant evidence was available, it was stated that the quality indicator was based on expert opinion. |
| The indicators have been externally reviewed by experts/end-users prior to publication. | An external review was not conducted. A subsequent study will be conducted to test the feasibility, validity, and implementation of the quality indicators suggested in the final draft longlist of quality indicators. |
| A procedure for updating the indicators is provided and/or the indicator set has been updated. | The quality indicators will be updated every five years in collaboration with the national professional association for hospital physical therapy. |
| **Domain 4. Clarity of presentation** | |
| The indicators are specific and unambiguous. | For each quality indicator, a numerator and denominator were formulated to quantify the indicator, so that they are suitable for assessing the quality of care. |
| **Domain 5. Applicability** | |
| The indicators are supported with tools for use | Tools suggested for usage were electronic medical records, direct observations using behavioral mapping, and interviews. |
| The potential organizational barriers to applying the indicators have been discussed. | Potential organizational barriers were suggested such as the need to include more stakeholders (i.e. patients, health insurers), and the degree in which all quality indicators could be measured validly. Those barriers will be handled within the subsequent feasibility, validity, and implementation study. |
| The indicator development initiative is editorially independent from the funding body. | This research was conducted without any funding. |
| Comparing interests of indicator development group members have been recorded and addressed. | All authors declared that there were no conflicts of interest. |
| **Domain 6. 'Rate the overall quality of this initiative'** | Not applicable to quality indicators development. |

*AGREE, Appraisal of Guidelines for Research and Evaluation; RAND/UCLA, Research and Development/University of California, Los Angeles*

*Supplementary Table A2. Literature search details.*

| *PubMed:* |
| --- |
| **Domain:**<br><br>(Inpatients[MeSH] OR Hospitalization[MeSH] OR "Adolescent, Hospitalized"[MeSH] OR "Child, Hospitalized"[MeSH] OR inpatient*[tiab] OR hospitalized[tiab] OR hospitalization*[tiab] OR hospitalised OR hospitalisation*[tiab] OR hospital[tiab])<br><br>**Determinant:**<br><br>Early Ambulation[MeSH] OR Exercise[MeSH] OR Iatrogenic Disease[MeSH] OR Locomotion[MeSH] OR Motor Activity[MeSH] OR Muscle Fatigue[MeSH] OR Muscle Strength[MeSH] OR Physical Endurance[MeSH] OR Physical Exertion[MeSH] OR Physical Fitness[MeSH] OR Physical Therapy Modalities[MeSH] OR Posture[MeSH] OR Sedentary lifestyle[MeSH] OR Self Care[MeSH] OR "Mobility Limitation"[MeSH]OR Ambulation[tiab] OR Exercis*[tiab] OR Fitness[tiab] OR Hospital Acquired Condition*[tiab] OR Iatrogenic disabilit*[tiab] OR Iatrogenic Disease*[tiab] OR Iatrogenic disorder*[tiab] OR Immobil*[tiab] OR Locomot*[tiab] OR mobil*[tiab] OR motor activity[tiab] OR Muscle Fatigue[tiab] OR Muscle Strength[tiab] OR Muscular Fatigue[tiab] OR Physical activ*[tiab] OR Physical Effort*[tiab] OR Physical Endurance*[tiab] OR Physical Exertion*[tiab] OR Physical inactivity[tiab] OR Physical therap*[tiab] OR Physiotherap*[tiab] OR Posture*[tiab] OR Seated Position*[tiab] OR Sedentary behavior[tiab] OR Sedentary behaviour[tiab] OR Sedentary lifestyle[tiab] OR Self Care[tiab] OR Self Management[tiab] OR Sitting Position*[tiab] OR Standing Position*[tiab] OR stepping[tiab] OR hospital associated disorder*[tiab]<br><br>**Outcome:**<br><br>"Quality indicators, Health Care"[MeSH] OR Healthcare Quality indicator*[tiab] OR Health care Quality indicator*[tiab] OR Healthcare Global Trigger Tool*[tiab] OR Health care Global Trigger Tool*[tiab] OR structure indicator*[tiab] OR process indicator*[tiab] OR performance |

| |
|---|
| indicator*[tiab] OR Health indicator*[tiab] OR health status indicator*[tiab] OR qualitative indicator*[tiab] OR quantitative indicator*[tiab] |
| *EMBASE:*<br><br>**Domain**<br><br>'hospital patient'/exp OR 'hospitalization'/exp OR (inpatient* OR hospitalized OR hospitalization* OR hospitalised OR hospitalisation* OR hospital):ti,ab,kw<br><br>**Determinant**<br><br>'mobilization'/exp OR 'exercise'/exp OR 'endurance'/exp OR 'physical activity'/exp OR 'physical capacity'/exp OR 'physical inactivity'/exp OR 'iatrogenic disease'/exp OR 'patient mobility'/exp OR 'physical mobility'/exp OR 'locomotion'/exp OR 'muscle strength'/exp OR 'muscle fatigue'/exp OR 'fitness'/exp OR 'sedentary behavior'/exp OR 'sedentary lifestyle'/exp OR 'cardiorespiratory fitness'/exp OR 'physiotherapy'/exp OR 'body position'/exp OR 'self care'/exp OR 'walking difficulty'/exp OR 'stepping'/exp OR 'immobility'/exp OR Ambulation:ti,ab,kw OR Exercis*:ti,ab,kw OR Fitness:ti,ab,kw OR ('Hospital Acquired' NEXT/1 Condition*):ti,ab,kw OR (Iatrogenic NEXT/1 disabilit*):ti,ab,kw OR (Iatrogenic NEXT/1 Disease*):ti,ab,kw OR (Iatrogenic NEXT/1 disorder*):ti,ab,kw OR Immobil*:ti,ab,kw OR Locomot*:ti,ab,kw OR mobil*:ti,ab,kw OR 'motor activity':ti,ab,kw OR 'Muscle Fatigue':ti,ab,kw OR 'Muscle Strength':ti,ab,kw OR 'Muscular Fatigue':ti,ab,kw OR (Physical NEXT/1 activ*):ti,ab,kw OR (Physical NEXT/1 Effort*):ti,ab,kw OR (Physical NEXT/1 Endurance*):ti,ab,kw OR (Physical NEXT/1 Exertion*):ti,ab,kw OR 'Physical inactivity':ti,ab,kw OR (Physical NEXT/1 therap*):ti,ab,kw OR Physiotherap*:ti,ab,kw OR Posture*:ti,ab,kw OR (Seated NEXT/1 Position*):ti,ab,kw OR 'Sedentary behavior':ti,ab,kw OR 'Sedentary behaviour':ti,ab,kw OR 'Sedentary lifestyle':ti,ab,kw OR 'Self Care':ti,ab,kw OR 'Self Management':ti,ab,kw OR (Sitting NEXT/1 Position*):ti,ab,kw OR (Standing NEXT/1 Position*):ti,ab,kw OR stepping:ti,ab,kw OR 'hospital associated disorder':ti,ab,kw |

| |
|---|
| **Outcome**<br><br>'health status indicator'/exp OR 'clinical indicator'/exp OR 'performance measurement system'/exp OR 'public health systems research'/exp OR ('Healthcare Quality' NEXT/1 Indicator*):ti,ab,kw OR ('Health care Quality' NEXT/1 Indicator*):ti,ab,kw OR ('Healthcare Global Trigger' NEXT/1 Tool*):ti,ab,kw OR ('Health care Global Trigger' NEXT/1 Tool*):ti,ab,kw OR (structure NEXT/1 indicator*):ti,ab,kw OR (process NEXT/1 indicator*):ti,ab,kw OR (performance NEXT/1 indicator*):ti,ab,kw OR (Health NEXT/1 indicator*):ti,ab,kw OR ('health status' NEXT/1 indicator*):ti,ab,kw OR (qualitative NEXT/1 indicator*):ti,ab,kw OR (quantitative NEXT/1 indicator*):ti,ab,kw' |
| *CINAHL* |
| **Domain**<br><br>(MH "Inpatients+") OR (MH "Hospitalization+") ) OR TI inpatient* OR AB inpatient* OR TI hospitalized OR AB hospitalized OR TI hospitalization* OR AB hospitalization* OR TI hospitalised OR AB hospitalised OR TI hospitalisation* OR AB hospitalisation* OR TI hospital OR AB hospital<br><br>**Determinant**<br><br>(MH "Early Ambulation") OR (MH "Exercise+") OR (MH "Physical Therapy+") OR (MH "Iatrogenic Disease") OR (MH "Physical Endurance+") OR (MH "Physical Fitness+") OR (MH "Body positions+") OR (MH "Locomotion+") OR (MH "Muscle Fatigue") OR(MH "Muscle strength+") OR (MH "Life Style, Sedentary") OR (MH "Self Care+") OR (MH "Physical Mobility") OR (MH "Physical Mobility Impairment (Saba CCC)") OR (MH "Impaired Physical Mobility (NANDA)") OR (MH "Immobility") OR (MH "Immobility Management (Iowa NIC)") OR(MH "physical activity") OR TI(Ambulation OR Exercis* OR Fitness OR "Hospital Acquired Condition*" OR "Iatrogenic disabilit*" OR "Iatrogenic Disease*" OR "Iatrogenic disorder*" OR Immobil* OR Locomot* OR mobil* OR "motor activity" OR |

"Muscle Fatigue" OR "Muscle Strength" OR "Muscular Fatigue" OR "Physical activ*" OR "Physical Effort*" OR "Physical Endurance*" OR "Physical Exertion*" OR "Physical inactivity" OR "Physical therap*" OR Physiotherap* OR Posture* OR "Seated Position*" OR "Sedentary behavior" OR "Sedentary behavior" OR "Sedentary lifestyle" OR "Self Care" OR "Self Management" OR "Sitting Position*" OR "Standing Position*" OR stepping) OR AB (Ambulation OR Exercis* OR Fitness OR "Hospital Acquired Condition*" OR "Iatrogenic disabilit*" OR "Iatrogenic Disease*" OR "Iatrogenic disorder*" OR Immobil* OR Locomot* OR mobil* OR "motor activity" OR "Muscle Fatigue" OR "Muscle Strength" OR "Muscular Fatigue" OR "Physical activ*" OR "Physical Effort*" OR "Physical Endurance*" OR "Physical Exertion*" OR "Physical inactivity" OR "Physical therap*" OR Physiotherap* OR Posture* OR "Seated Position*" OR "Sedentary behavior" OR "Sedentary behavior" OR "Sedentary lifestyle" OR "Self Care" OR "Self Management" OR "Sitting Position*" OR "Standing Position*" OR stepping OR 'hospital associated disorder')

**Outcome**

(MH "Health Status Indicators") OR (MH "Quality of Health Care") OR (MH "Performance Measurement Systems") OR TI("Healthcare Quality indicator*" OR "Health care Quality indicator*" OR "Healthcare Global Trigger Tool*" OR "Health care Global Trigger Tool*" OR "structure indicator*" OR "process indicator*" OR "performance indicator*" OR "Health indicator*" OR "health status indicator*") OR AB("Healthcare Quality indicator*" OR "Health care Quality indicator*" OR "Healthcare Global Trigger Tool*" OR "Health care Global Trigger Tool*" OR "structure indicator*" OR "process indicator*" OR "performance indicator*" OR "Health indicator*" OR "health status indicator*" OR "qualitative NEXT/1 indicator*" OR "quantitative NEXT/1 indicator*")

*Supplementary Table A3. The second draft with 54 healthcare quality indicators for the care of patients with (or at risk of) low physical activity during the hospital stay: Dutch version.*

| | |
|---|---|
| *Indicator 1:* | **Klinische patiënten die zelfstandig kunnen lopen, met een beschreven activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Er is een activiteitenplan beschreven, waarin dagelijkse loopmomenten worden beschreven voor patiënten die zelfstandig lopen. |
| **Teller:** | Het aantal opgenomen klinische patiënten, dat in staat is om zelfstandig te lopen, waarbij een activiteitenplan is beschreven. |
| **Noemer:** | Het aantal opgenomen klinische patiënten, dat in staat is om zelfstandig te lopen. |
| *Indicator 2:* | **Dagelijkse loopmomenten van klinische patiënten die zelfstandig kunnen lopen, zoals beschreven in het activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Patiënten lopen dagelijks zelfstandig, zoals beschreven in het activiteitenplan. |
| **Teller:** | Het aantal opgenomen klinische patiënten dat dagelijks zelfstandig loopt, zoals beschreven in het activiteitenplan. |
| **Noemer:** | Het aantal opgenomen klinische patiënten met een activiteitenplan, dat in staat is om zelfstandig te lopen. |
| *Indicator 3:* | **Klinische patiënten die ondersteuning nodig hebben met lopen van één of meerdere personen, met een beschreven activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Er is een activiteitenplan beschreven, waarin dagelijkse loopmomenten worden beschreven voor patiënten die ondersteuning nodig hebben met lopen. |
| **Teller:** | Het aantal opgenomen klinische patiënten die ondersteuning nodig hebben bij het lopen van een persoon, bij wie een activiteitenplan is beschreven. |
| **Noemer:** | Het aantal opgenomen klinische patiënten met een activiteitenplan die lopen met ondersteuning van een persoon. |
| *Indicator 4:* | **Dagelijkse loopmomenten van klinische patiënten die ondersteuning nodig hebben met lopen van een persoon, zoals beschreven in het activiteitenplan.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Er is een activiteitenplan beschreven, waarin dagelijkse loopmomenten worden beschreven voor klinische patiënten die ondersteuning nodig hebben met lopen. |
| **Teller:** | Het aantal opgenomen klinische patiënten die dagelijks lopen met ondersteuning van een persoon, zoals beschreven in het activiteitenplan. |
| **Noemer:** | Het aantal opgenomen klinische patiënten met een activiteitenplan, die lopen met ondersteuning van een persoon. |
| *Indicator 5:* | **Klinische patiënten met fysiotherapeutische begeleiding.** |
| **Thema:** | Standaard consult fysiotherapie. |
| **Item:** | De klinische patiënt ontvangt fysiotherapie begeleiding. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling met fysiotherapie begeleiding. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling. |
| *Indicator 6:* | **Percentage klinische patiënten met een activiteitenplan binnen 48 uur na opname.** |
| **Thema:** | Een gestructureerd activiteitenplan. |
| **Item:** | Patiënten hebben binnen 48 uur na opname een activiteitenplan. |

| | |
|---|---|
| **Teller:** | Het aantal klinische patiënten per afdeling met een activiteitenplan binnen 48 uur na opname. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 7:* | **Klinische patiënten, die voor opname mobiel waren, die worden gemobiliseerd binnen 48 uur post operatief.** |
| **Thema:** | Mobiliseren. |
| **Item:** | Tijdig mobiliseren. |
| **Teller:** | Het aantal klinische patiënten per afdeling die binnen 48 uur postoperatief mobiliseren. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling na een operatie. |
| *Indicator 8:* | **Klinische patiënten met lichamelijke beperking, met een oefenprogramma.** |
| **Thema:** | Een passend oefenprogramma. |
| **Item:** | Als een klinisch opgenomen patiënt moeite heeft met het looppatroon, kracht (MRC 4 of ondersteuning van de armleuningen om op te staan vanuit de stoel), of uithoudingsvermogen (bijv. dyspneu bij lichte vermoeidheid), dan moet er een oefenprogramma worden aangeboden. |
| **Teller:** | Het aantal opgenomen klinische patiënten met een beperking in lichamelijk functioneren per afdeling, met een oefenprogramma. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling met een beperking in lichamelijk functioneren. |
| *Indicator 9:* | **Klinische patiënten met een beperking in dagelijkse activiteiten, met een oefenprogramma.** |
| **Thema:** | Een passend oefenprogramma. |
| **Item:** | Als een klinisch opgenomen patiënt moeite heeft met het looppatroon, kracht (MRC 4 of ondersteuning van de armleuningen om op te staan vanuit de stoel), of uithoudingsvermogen (bijv. dyspneu bij lichte vermoeidheid), dan moet er een oefenprogramma worden aangeboden. |
| **Teller:** | Het aantal opgenomen klinische patiënten met een beperking in dagelijkse activiteiten per afdeling, met een oefenprogramma. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling met een beperking in dagelijkse activiteiten. |
| *Indicator 10:* | **Klinische patiënten dat in staat is zonder hulp te bewegen, bij ontslag.** |
| **Thema:** | Verandering in mobiliteit. |
| **Item:** | Percentage van patiënten die bij ontslag in staat zijn om zelfstandig te verplaatsen, eventueel met behulp van een rolstoel, van de patiënten die immobiel of afhankelijk van een rolstoel waren bij opname. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren, en bij ontslag zelfstandig te verplaatsen, eventueel met behulp van een rolstoel. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren. |
| *Indicator 11:* | **Klinische patiënten dat in staat is zonder hulp te lopen, bij ontslag.** |
| **Thema:** | Patiëntenmobiliteit. |
| **Item:** | Het inzichtelijk krijgen van het percentage van klinische patiënten die in staat zijn zelfstandig te lopen bij ontslag, eventueel met loophulpmiddel, van de patiënten die immobiel waren of afhankelijk van een rolstoel bij opname. |

| | |
|---|---|
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren, en bij ontslag zelfstandig lopen, eventueel met behulp van een loophulpmiddel. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling die bij opname immobiel of afhankelijk van rolstoel waren. |
| *Indicator 12:* | **Artsen die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen.** |
| **Thema:** | Stimuleren zelfstandig ADL. |
| **Item:** | De artsen stimuleren klinische patiënten om hun algemeen dagelijkse levensverrichtingen zelfstandig uit te voeren. |
| **Teller:** | Het aantal artsen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen. |
| **Noemer:** | Het aantal artsen per afdeling. |
| *Indicator 13:* | **Verpleegkundigen die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen.** |
| **Thema:** | Stimuleren zelfstandig ADL. |
| **Item:** | De verpleegkundigen stimuleren klinische patiënten om hun algemeen dagelijkse levensverrichtingen zelfstandig uit te voeren. |
| **Teller:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling. |
| *Indicator 14:* | **Fysiotherapeuten die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen.** |
| **Thema:** | Stimuleren zelfstandig ADL. |
| **Item:** | De fysiotherapeuten stimuleren klinische patiënten om hun algemeen dagelijkse levensverrichtingen zelfstandig uit te voeren. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig uitvoeren van dagelijkse levensverrichtingen. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling. |
| *Indicator 15:* | **Artsen die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen.** |
| **Thema:** | Stimuleren lopen. |
| **Item:** | De artsen stimuleren klinische patiënten om zelfstandig te lopen van het bed naar de stoel. |
| **Teller:** | Het aantal artsen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| **Noemer:** | Het aantal artsen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| *Indicator 16:* | **Verpleegkundigen die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen.** |
| **Thema:** | Stimuleren lopen. |
| **Item:** | De verpleegkundigen stimuleren klinische patiënten om zelfstandig te lopen van het bed naar de stoel. |
| **Teller:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze klinische patiënten |

| | |
|---|---|
| | stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| *Indicator 17:* | **Fysiotherapeuten die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen.** |
| **Thema:** | Stimuleren lopen. |
| **Item:** | De fysiotherapeuten stimuleren klinische patiënten om zelfstandig te lopen van het bed naar de stoel. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze klinische patiënten stimuleren in het zelfstandig lopen van het bed naar de stoel. |
| *Indicator 18:* | **Klinische patiënten met vrijheidsbeperkende middelen.** |
| **Thema:** | Immobilisatie. |
| **Item:** | Inventariseren van gebruik van vrijheidsbeperkende middelen voor het voorkomen van vallen. |
| **Teller:** | Het aantal opgenomen klinische patiënten per afdeling waarbij vrijheidsbeperkende middelen zijn ingezet. |
| **Noemer:** | Het aantal opgenomen klinische patiënten per afdeling. |
| *Indicator 19:* | **Klinische patiënten met een valincident, waarbij het valincident binnen 24 uur wordt geëvalueerd.** |
| **Thema:** | Evaluatie vallen. |
| **Item:** | Er vindt een evaluatie plaats van een valincident binnen 24 uur. De evaluatie bestaat uit ten minste medicijngebruik en aan- of afwezigheid van (voortekenen van) ziekte. |
| **Teller:** | Het aantal klinische patiënten per afdeling met een valincident, waarbij dit geëvalueerd is binnen 24 uur. |
| **Noemer:** | Het aantal klinische patiënten per afdeling met een valincident. |
| *Indicator 20:* | **Klinische patiënten met documentatie van een valincident.** |
| **Thema:** | Documentatie vallen. |
| **Item:** | Er vindt documentatie plaats van een valincident, waarbij de potentiële oorzaken zijn beschreven. |
| **Teller:** | Het aantal klinische patiënten per afdeling met een documentatie van een valincident. |
| **Noemer:** | Het aantal klinische patiënten per afdeling met een valincident. |
| *Indicator 21:* | **Klinische patiënten met documentatie van preopname functioneren.** |
| **Thema:** | Preopname functioneren. |
| **Item:** | Er vindt documentatie plaats van het preopname functioneren. De documentatie betreft beschrijven van het valrisico, gebruik van rollator of stok en de onafhankelijkheid in het uitvoeren van algemeen dagelijkse levensverrichtingen voor opname. |
| **Teller:** | Het aantal klinische patiënten per afdeling, waarbij het preopname functioneren is gedocumenteerd. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 22:* | **Klinische patiënten, bij wie tijdens opname een evaluatie van de mobiliteit plaatsvindt.** |
| **Thema:** | Evaluatie mobiliteit. |
| **Item:** | Bij opname in het ziekenhuis worden de volgende transfers geëvalueerd: van lig naar zit transfereren zonder hulp; uit bed komen en tot stand komen vanuit bed; een aantal passen lopen, en het gebruik maken van een stok of een rollator zo nodig. |

| | |
|---|---|
| **Teller:** | Het aantal klinische patiënten per afdeling waar bij opname een evaluatie van mobiliteit plaatsvindt. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 23:* | **Klinische patiënten met geïnformeerde familie.** |
| **Thema:** | Informeren familie. |
| **Item:** | De klinische patiënten en familie zijn geïnformeerd over het belang van bewegen. |
| **Teller:** | Het aantal klinische patiënten met familie per afdeling, die zijn geïnformeerd over het belang van bewegen. |
| **Noemer:** | Het aantal klinische patiënten met familie per afdeling. |
| *Indicator 24:* | **Klinische patiënten dat is geïnformeerd over hun zorgtraject.** |
| **Thema:** | Informeren patiënt. |
| **Item:** | Het zorgtraject met betrekking tot bewegen wordt samen met de klinische patiënt besproken. Een zorgtraject met betrekking tot bewegen bestaat onder andere uit het bespreken van het benodigde niveau van fysiek functioneren voor ontslag. |
| **Teller:** | Het aantal klinische patiënten per afdeling, waar bij het zorgtraject met betrekking tot bewegen is besproken. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |
| *Indicator 25:* | **Artsen die bedrust beschouwen als de dagelijkse gang van zaken.** |
| **Thema:** | Mindset. |
| **Item:** | De mindset van artsen draagt bij aan bedrust bij klinische opgenomen patiënten als een dagelijkse gang van zaken. |
| **Teller:** | Het aantal artsen per afdeling die geloven dat bedrust behoort tot de dagelijkse gang van zaken. |
| **Noemer:** | Het aantal artsen per afdeling. |
| *Indicator 26:* | **Verpleegkundigen die bedrust beschouwen als de dagelijkse gang van zaken.** |
| **Thema:** | Mindset. |
| **Item:** | De mindset van verpleegkundigen draagt bij aan bedrust bij klinische opgenomen patiënten als een dagelijkse gang van zaken. |
| **Teller:** | Het aantal verpleegkundigen per afdeling die geloven dat bedrust behoort tot de dagelijkse gang van zaken. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling. |
| *Indicator 27:* | **Fysiotherapeuten die bedrust beschouwen als de dagelijkse gang van zaken.** |
| **Thema:** | Mindset. |
| **Item:** | De mindset van fysiotherapeuten draagt bij aan bedrust bij klinische opgenomen patiënten als een dagelijkse gang van zaken. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling die geloven dat bedrust behoort tot de dagelijkse gang van zaken. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling. |
| *Indicator 28:* | **Klinische patiënten met bedrust zonder medische noodzaak.** |
| **Thema:** | Bedrust. |
| **Item:** | Bedrust zonder medische noodzaak is van belang bij de hoeveelheid bewegen voor de klinisch opgenomen patiënt. |
| **Teller:** | Het aantal klinische patiënten per afdeling dat bedrust heeft voorgeschreven gekregen, zonder medische noodzaak. |
| **Noemer:** | Het aantal klinische patiënten per afdeling. |

| | |
|---|---|
| *Indicator 29:* | **Lager opgeleide zorgverleners op de afdeling.** |
| **Thema:** | Niveau van opleiding. |
| **Item:** | Lager opgeleide zorgmedewerkers geven een lagere prioriteit aan het mobiliseren van patiënten dan hoger opgeleide zorg medewerkers. |
| **Teller:** | Het aantal lager opgeleide zorgverleners op de afdeling. |
| **Noemer:** | Het aantal zorgverleners op de afdeling. |
| *Indicator 30:* | **Zorgverleners die aangeven dat werkdruk een beperkende factor is voor het mobiliserende van klinische patiënten.** |
| **Thema:** | Werkdruk. |
| **Item:** | Werkdruk heeft een negatief effect op het structureel bewegen van patiënten. |
| **Teller:** | Het aantal zorgverleners op de afdeling, die aangeeft dat de eigen werkdruk een beperkende factor is voor de optimale hoeveelheid beweging van patiënten. |
| **Noemer:** | Het aantal zorgverleners op de afdeling. |
| *Indicator 31:* | **Klinische patiënten die ervaren te vroeg ontslagen te zijn.** |
| **Thema:** | Triagesysteem. |
| **Item:** | Met de invoering van het triagesysteem ligt er druk op het ontslaan van patiënten minder op zelfstandig kunnen bewegen. |
| **Teller:** | Het aantal klinische patiënten dat wordt ontslagen, en ervaart dat ze te vroeg ontslagen worden. |
| **Noemer:** | Het aantal klinische patiënten dat wordt ontslagen. |
| *Indicator 32:* | **Klinische patiënten die worden beperkt in het uitvoeren van transfers door meubilair.** |
| **Thema:** | Meubels. |
| **Item:** | Het gebruik van hoge bedden met bedrekken en stoelen die moeilijk bereikbaar zijn is van invloed op het bewegen van klinische patiënten. |
| **Teller:** | Het aantal opgenomen klinische patiënten, die beperkt worden in het zelfstandig uitvoeren van transfers door hoge bedden, hoge stoelen, of het gebruik van bijvoorbeeld bedrekken. |
| **Noemer:** | Het aantal opgenomen klinische patiënten. |
| *Indicator 33:* | **Klinische patiënten die de beschikking hebben over een geadviseerd loophulpmiddel.** |
| **Thema:** | Hulpmiddelen. |
| **Item:** | Er moeten voldoende loophulpmiddelen beschikbaar zijn om het bewegen van patiënten mogelijk te maken. |
| **Teller:** | Het aantal klinische patiënten per afdeling die beschikking hebben over een geadviseerd loophulpmiddel. |
| **Noemer:** | Het aantal klinische patiënten per afdeling, dat geadviseerd wordt te lopen met een loophulpmiddel. |
| *Indicator 34:* | **Klinische patiënten die beschikking hebben over een relax stoel.** |
| **Thema:** | Hulpmiddelen. |
| **Item:** | Er moeten voldoende relaxstoelen beschikbaar zijn om het bewegen van patiënten mogelijk te maken. |
| **Teller:** | Het aantal klinisch patiënten per afdeling die beschikking hebben over een relaxstoel. |
| **Noemer:** | Het aantal klinisch patiënten per afdeling. |
| *Indicator 35:* | **Klinische patiënten die beschikking hebben over een bedfiets.** |
| **Thema:** | Hulpmiddelen. |
| **Item:** | Er moeten voldoende bedfietsen beschikbaar zijn om het bewegen van patiënten |

| | |
|---|---|
| | mogelijk te maken. |
| **Teller:** | Het aantal klinisch patiënten per afdeling met het advies gebruik te maken van de bedfiets, die beschikking hebben over een bedfiets. |
| **Noemer:** | Het aantal klinisch patiënten per afdeling, dat geadviseerd wordt gebruik te maken van een bedfiets. |
| *Indicator 36:* | **Artsen die geschoold zijn in het aanbieden van beweegzorg bij klinische patiënten.** |
| **Thema:** | Scholing. |
| **Item:** | Er wordt scholing aangeboden met betrekking tot het aanbieden van beweegzorg bij patiënten voor alle artsen medewerkers/zorgverleners die werkzaam zijn op de afdeling. |
| **Teller:** | Het aantal artsen dat scholing heeft gevolgd met betrekking tot het aanbieden van beweegzorg bij klinische patiënten. |
| **Noemer:** | Het aantal artsen dat op de afdeling werkt. |
| *Indicator 37:* | **Verpleegkundigen die geschoold zijn het aanbieden van beweegzorg bij klinische patiënten.** |
| **Thema:** | Scholing. |
| **Item:** | Er wordt scholing aangeboden met betrekking tot het aanbieden van beweegzorg bij patiënten voor alle verpleegkundigen die werkzaam zijn op de afdeling. |
| **Teller:** | Het aantal verpleegkundigen dat scholing heeft gevolgd met betrekking tot het aanbieden van beweegzorg bij patiënten. |
| **Noemer:** | Het aantal verpleegkundigen dat op de afdeling werkt. |
| *Indicator 38:* | **Fysiotherapeuten die geschoold zijn in het aanbieden van beweegzorg bij klinische patiënten.** |
| **Thema:** | Scholing. |
| **Item:** | Er wordt scholing aangeboden met betrekking tot het aanbieden van beweegzorg bij patiënten voor alle fysiotherapeuten die werkzaam zijn op de afdeling. |
| **Teller:** | Het aantal fysiotherapeuten dat scholing heeft gevolgd met betrekking tot het aanbieden van beweegzorg bij patiënten. |
| **Noemer:** | Het aantal fysiotherapeuten dat op de afdeling werkt. |
| *Indicator 39:* | **Artsen die geloven beweeggedrag te stimuleren bij patiënten.** |
| **Thema:** | Mindset artsen. |
| **Item:** | De mindset van artsen draagt bij aan het motiveren, stimuleren en initiëren van beweeggedrag bij patiënten. |
| **Teller:** | Het aantal artsen per afdeling, die geloven dat ze beweeggedrag stimuleren bij patiënten. |
| **Noemer:** | Het aantal artsen per afdeling. |
| *Indicator 40:* | **Verpleegkundigen die geloven beweeggedrag te stimuleren bij patiënten.** |
| **Thema:** | Mindset verpleegkundigen. |
| **Item:** | De mindset van verpleegkundigen draagt bij aan het motiveren, stimuleren en initiëren van beweeggedrag bij patiënten. |
| **Teller:** | Het aantal verpleegkundigen per afdeling, die geloven dat ze beweeggedrag stimuleren bij patiënten. |
| **Noemer:** | Het aantal verpleegkundigen per afdeling. |
| *Indicator 41:* | **Fysiotherapeuten die geloven beweeggedrag te stimuleren bij patiënten.** |
| **Thema:** | Mindset fysiotherapeuten. |
| **Item:** | De mindset van fysiotherapeuten draagt bij aan het motiveren, stimuleren en initiëren |

| | |
|---|---|
| | van beweeggedrag bij patiënten. |
| **Teller:** | Het aantal fysiotherapeuten per afdeling, die geloven dat ze beweeggedrag stimuleren bij patiënten. |
| **Noemer:** | Het aantal fysiotherapeuten per afdeling. |
| *Indicator 42* | **Klinische patiënten die lopen met een vrijwilliger** |
| **Thema:** | Vrijwilligers. |
| **Item:** | Klinische patiënten lopen zoveel mogelijk als zijn of haar conditie toelaat met een vrijwilliger in het ziekenhuis. |
| **Teller:** | Er is/zijn vrijwilliger(s) aanwezig op de afdeling die ondersteunen bij lopen. |
| *Indicator 43* | **Klinische patiënten die lopen met familie.** |
| **Thema:** | Familie. |
| **Item:** | Klinische patiënten lopen zoveel mogelijk als zijn of haar conditie toelaat met familie in het ziekenhuis. |
| **Teller:** | Er zijn familieleden aanwezig op de afdeling die ondersteunen bij lopen. |
| *Indicator 44* | **Mobiliteit beperkende middelen worden dagelijks geëvalueerd.** |
| **Thema:** | Evaluatie immobilisatie. |
| **Item:** | Regelmatige evaluatie van de inzet van mobiliteit beperkende middelen bij klinische patiënten, zoals zuurstofslangen, blaas katheters en intraveneuze katheters. |
| **Teller:** | Er vindt dagelijks per afdeling een evaluatie plaats over de inzet van mobiliteit beperkende middelen bij klinische patiënten. |
| *Indicator 45* | **Patiëntenmobiliteit is opgenomen in de normen van het ziekenhuis.** |
| **Thema:** | Cultuur. |
| **Item:** | De norm in het ziekenhuis is dat patiënten regelmatig lopen, als ze dat kunnen. |
| **Teller:** | In de normen van het ziekenhuis staat beschreven dat er verwacht wordt dat patiënten regelmatig lopen als ze dat kunnen. |
| *Indicator 46* | **Vrijheidsbeperkende middelen worden dagelijks geëvalueerd.** |
| **Thema:** | Evaluatie immobilisatie. |
| **Item:** | Er vindt regelmatig evaluatie plaats van de inzet van vrijheidsbeperkende middelen bij klinische patiënten, zoals buikband, vijfpunt fixatie, rolstoelblad, rem van de rolstoel. |
| **Teller:** | Er vindt dagelijks per afdeling een evaluatie plaats over de inzet van vrijheidsbeperkende middelen bij klinische patiënten. |
| *Indicator 47* | **Het ziekenhuis heeft een kritische houding ten aanzien van het inzetten van immobiliserende middelen bij valgevaarlijke patiënten.** |
| **Thema:** | Cultuur. |
| **Item:** | De norm van het ziekenhuis is een kritische houding te hebben ten aan zien van de inzet van immobiliserende middelen bij valgevaarlijke klinische patiënten. |
| **Teller:** | In de normen van het ziekenhuis staat beschreven dat de inzet van immobiliserende middelen bij valgevaarlijke klinische patiënten kritisch wordt bekeken. |
| *Indicator 48* | **De inzet van pijnstillende middelen wordt dagelijks geëvalueerd ten behoeve van het pijn vrij mobiliseren van de klinische patiënt.** |
| **Thema:** | Evaluatie pijnmedicatie. |
| **Item:** | Er vindt regelmatige evaluatie plaats van pijnmedicatie bij de klinische patiënt, ten behoeve van het bewegen. |
| **Teller:** | Er vindt dagelijks per afdeling een evaluatie plaats van de inzet van pijnstillende middelen bij klinische patiënten, ten behoeve van het bewegen. |

| | |
|---|---|
| *Indicator 49* | **Het informeren van de familie van de klinische patiënt ten aanzien van het belang van bewegen is een norm van het ziekenhuis.** |
| **Thema:** | Cultuur. |
| **Item:** | De norm van het ziekenhuis is het informeren van de familie van de klinische patiënt ten aanzien van het belang van bewegen. |
| **Teller:** | In de normen van het ziekenhuis staat beschreven dat de familie van de klinische patiënt geïnformeerd wordt over het belang van bewegen. |
| *Indicator 50* | **Het aantal stappen dat een klinische patiënt loopt.** |
| **Thema:** | Bewegen. |
| **Item:** | De totale hoeveelheid stappen die een klinische patiënt per dag loopt. |
| **Teller:** | Het aantal stappen dat een klinisch opgenomen patiënt loopt per dag. |
| *Indicator 51* | **De klinische patiënt kan zich goed oriënteren in het ziekenhuis.** |
| **Thema:** | Ziekenhuisomgeving. |
| **Item:** | De gebouwde ziekenhuisomgeving is van belang om desoriëntatie van de klinische patiënt te voorkomen en mobilisatie te stimuleren. |
| **Teller:** | Er is gebruik gemaakt van oriënterende middelen, zoals looproutes en/of routewijzers, ter ondersteuning van de oriëntatie van klinische patiënten. |
| *Indicator 52* | **De klinische patiënt wordt gestimuleerd om te bewegen door de inrichting van de afdeling.** |
| **Thema:** | Omgeving. |
| **Item:** | Aanwezigheid van foto's, kunst en/of ander beeldmateriaal om patiënten te stimuleren om te bewegen. |
| **Teller:** | Is er gebruik gemaakt van foto's, kunst en/of ander beeldmateriaal op de wandelgangen van de afdeling? |
| *Indicator 53* | **De klinische patiënt heeft een beweegruimte op de afdeling.** |
| **Thema:** | Omgeving. |
| **Item:** | Aanwezigheid van een beweegruimte. |
| **Teller:** | Is er een beweegruimte aanwezig op de afdeling? |
| *Indicator 54* | **De klinische patiënt heeft zonlicht op de patiëntenkamer.** |
| **Thema:** | Omgeving. |
| **Item:** | Aanwezigheid van zonlicht op de patiëntenkamer. |
| **Teller:** | Is er zonlicht op de patiëntenkamer? |

*Supplementary Table A4. Overview of ratings in the consensus rounds with the corresponding decision: selection, discussion, or no selection.*

| | First round | | Second round | | Third round | |
|---|---|---|---|---|---|---|
| **Theme: Exercise program and physical activity plan** | Median (%HT) | Decision | Median (%HT) | Decision | Median (%HT) | Decision |
| 1. Patients without the need for support during mobilization should have a physical activity plan. | 7 (79%) | D | 8 (100%) | S | | |
| 2. Patients should receive support for mobilization. | 8 (79%) | S | | | | |
| 3. Patients in need for support during mobilization should have a physical activity plan | 8 (93%) | S | 8 (60%) | D | 8 (100%) | S |
| 4. Patients should perform physical activities as described in their physical activity plan. | 8 (86%) | S | 8 (100%) | S | | |
| 6. Patients should be physically active within 48 hours after hospital admission. | 8 (64%) | D | 8 (100%) | S | | |
| 8. Patients with a physical disability should have an exercise program. | 7 (71%) | D | 6 (40%) | NS | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 9. Patients who are dependent in activities of daily living should have an exercise program. | 7 (64%) | NS | | | | |
| **Theme: Assistance during mobilization** | | | | | | |
| 5. Patients should walk with a physical therapist. | 8 (64%) | D | 4 (20%) | NS | | |
| 10. Patients should be independent in activities of daily living at discharge. | 7 (64%) | NS | | | | |
| 42. Patients should walk with volunteers. | 7 (64%) | NS | | | | |
| 43. Patients should walk with close-relatives. | 8 (86%) | S | 7 (100%) | D | 7 (60%) | NS |
| **Theme: Mobilizing** | | | | | | |
| 7. Patients should be physically active within 48 hours after hospital admission. | 8 (86%) | S | 8 (80%) | S | | |
| 11. Patients should mobilize independently at discharge. | 7 (64%) | NS | | | | |
| 50. The number of steps of a patient during hospital stay per day. | 6 (43%) | NS | | | | |
| ***Theme: Attitude*** | | | | | | |

| | | | | |
|---|---|---|---|---|
| 12. Physicians should stimulate independent functioning in daily activities of patients. | 6 (50%) | NS | | |
| 13. Nurses should stimulate independent functioning in daily activities of patients. | 8 (86%) | S | 8 (80%) | S |
| 14. Physical therapists should stimulate independent functioning in daily activities of patients. | 6 (50%) | NS | | |
| 15. Physicians should be aware of their own attitude related to stimulation of physical activity in patients during hospital stay. | 6 (43%) | NS | | |
| 16. Nurses should be aware of their own attitude related to stimulation of physical activity in patients during hospital stay. | 7 (57%) | NS | | |
| 17. Physical therapists should be aware of their own attitude related to stimulation of physical activity in patients during hospital stay. | 6 (43%) | NS | | |
| 39. Physicians should stimulate physical activity of patients. | 7 (71%) | D | 8 (80%) | S |

| | | | | | | |
|---|---|---|---|---|---|---|
| 40. Nurses should stimulate physical activity of patients. | 8 (86%) | S | 8 (80%) | S | | |
| 41. Physical therapists should stimulate physical activity of patients. | 7 (72%) | D | 6 (40%) | NS | | |
| **Theme: Use of restraints** | | | | | | |
| 18. The number of patients with mobility limiting equipment. | 7 (71%) | D | 6 (40%) | NS | | |
| 44. Nurses should evaluate freedom limiting equipment. | 8 (71%) | S | 8 (100%) | S | | |
| 46. Nurses should evaluate mobility limiting equipment. | 8 (79%) | S | | | | |
| 47. The hospital (ward) should have a policy to minimize the use of mobility limiting equipment in patients at risk of falling. | 8 (79%) | S | 8 (60%) | D | 7 (80%) | D |
| 48. Patients should have an acceptable degree of pain. | 8 (79%) | S | 8 (60%) | D | 8 (80%) | S |
| **Theme: Fall incident** | | | | | | |
| 19. Patients should be evaluated after a fall incident. | 8 (71%) | S | | | | |
| 20. The number of documented fall incidents. | 8 (57%) | D | 5 (0%) | NS | | |

| | | | | |
|---|---|---|---|---|
| **Theme: Documentation** | | | | |
| 21. Nurses or physical therapists should evaluate the preadmission physical ability. | 8 (93%) | S | 8 (100%) | S |
| 22. Nurses or physical therapists should evaluate the mobility. | 8 (79%) | S | 8 (100%) | S |
| **Theme: Providing information** | | | | |
| 23. Close-relatives of patients should be informed about the importance of physical activity. | 7 (79%) | D | 8 (80%) | S |
| 24. Patients should be informed about the importance of physical activity. | 8 (71%) | S | | |
| **Theme: Bed rest** | | | | |
| 25. Physicians should consider bed rest as an abnormal medical procedure. | 6 (50%) | NS | | |
| 26. Nurses should consider bed rest as an abnormal procedure. | 6 (50%) | NS | | |
| 27. Physical therapists should consider bed rest as an abnormal procedure. | 6 (29%) | NS | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 28. The number of patients with bed rest without medical urgency. | 6 (50%) | NS | 7 (60%) | NS | | |
| **Theme: Education** | | | | | | |
| 29. The number of lower educated healthcare providers. | 2 (0%) | NS | | | | |
| 36. Physicians should have followed education related to physical activity of patients. | 7 (71%) | D | 7 (60%) | NS | | |
| 37. Nurses should have followed education related to physical activity of patients. | 7 (86%) | D | 8 (80%) | S | | |
| 38. Physical therapists should have followed education related to physical activity of patients. | 7 (64%) | NS | | | | |
| **Theme: Work pressure** | | | | | | |
| 30. Nurses should be aware of work pressure being a limiting factor for physical activity in patients. | 8 (79%) | S | 7 (100%) | D | 7 (100%) | D |
| 31. The number of patients who experience to be discharged too early. | 5 (29%) | NS | | | | |
| **Theme: Environment** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 32. Hospital rooms should be equipped with adequate furniture to improve physical activity. | 7 (71%) | D | 7 (80%) | D | 7 (80%) | D |
| 51. The hospital (ward) has orientation promoting resources. | 7 (57%) | NS | 7 (100%) | D | 8 (100%) | S |
| 52. The hospital (ward) provides adequate resources to stimulate physical activity. | 8 (86%) | S | 8 (100%) | S | | |
| 53. Patients should have access to a movement room. | 8 (79%) | S | 7 (60%) | NS | | |
| 54. Patients should have sunlight in their hospital room. | 7 (64%) | NS | | | | |
| **Theme: Aids for mobilization** | | | | | | |
| 33. Patients should have adequate walking aids. | 8 (86%) | S | | | | |
| 34. Patients should have comfortable chairs. | 8 (79%) | S | 6 (40%) | NS | | |
| 35. Patients should have access to ergometers. | 4 (28%) | NS | | | | |
| **Theme: Culture** | | | | | | |
| 45. The hospital (ward) should have a policy to improve physical activity of | 8 (86%) | S | 8 (100%) | S | | |

| | | | | |
|---|---|---|---|---|
| patients. | | | | |
| 49. The hospital (ward) should have a policy to inform close-relatives about physical activity. | 8 (79%) | S | 8 (80%) | S |

*Abbreviations: %HT, percentage in highest tertile; D, discussion; NS, no selection; S, selection*

*Supplementary Figure A1. Flow diagram of study selection.*