



Original article

Scand J Work Environ Health [2011;37\(6\):494-501](#)

doi:10.5271/sjweh.3165

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Refers to the following texts of the Journal: [2002;28\(3\):197-204](#)
[2007;33\(5\):368-378](#) [2009;35\(6\):461-465](#)

The following article refers to this text: [\[online first; 27 May 2019\]](#)

Key terms: [disability evaluation](#); [EBM](#); [evidence](#); [evidence-based medicine](#); [ICF](#); [insurance medicine](#); [insurance physician](#); [occupational health](#); [occupational health](#); [social insurance](#); [work capacity](#); [work disability](#); [work participation](#)

This article in PubMed: www.ncbi.nlm.nih.gov/pubmed/21523317



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Integrating evidence in disability evaluation by social insurance physicians

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Kok R, Hoving JL, Verbeek J, Schaafsma FG, van Dijk FJH. Integrating evidence in disability evaluation by social insurance physicians. *Scand J Work Environ Health*. 2011;37(6):494–501. doi:10.5271/sjweh.3165

Objective The aim of this study was to explore applying the method of evidence-based medicine (EBM) to resolve common questions in the field of disability evaluation.

Methods We used three clinical questions corresponding to problems encountered by insurance physicians in daily practice to explore opportunities for and barriers to the application of EBM. The questions fell under two topics: the prognosis of work ability and the effectiveness of interventions to enhance work participation. We used the four-step EBM strategy: (i) formulation of a clinical question, (ii) searching the literature, (iii) appraisal of the evidence, and (iv) implementation of the findings into clinical practice. We restricted the searches to PubMed (Medline).

Results For rheumatoid arthritis, we found evidence on the prognosis of work disability over a long-term period. For remaining sciatica after lumbar discectomy, we found evidence for the stability of the limitations at this stage. For depression with co-morbid alcoholism, we found evidence that treatment of both conditions would enhance work participation. The searches were effective and efficient. The interpretation of the findings was hampered by a lack of consensus in the literature about outcomes such as the concept of a poor prognosis of work ability.

Conclusions The EBM strategy and methods can be used by social insurance physicians to find and apply evidence for common questions in disability evaluation. The World Health Organization's International Classification of Functioning, Disability, and Health (ICF) model is instrumental in this, although more consensus on central outcome measures is needed. Further research is needed on the translation of evidence into practice. Development of valid specific search strategies for physicians in disability evaluation would improve the implementation of EBM.

Key terms EBM; evidence-based medicine; ICF; insurance medicine; occupational health; work capacity; work disability; work participation.

Restricted participation in social roles is generally considered an adverse consequence of disease. In many cases, restricted work participation results in a loss of economic independence and is a heavy burden for both workers, families, companies, and society. In most industrialized countries, financial consequences are at least partly counterbalanced by disability benefits based on social security legislation. Assessment of entitlement to a disability benefit usually includes a medical examination to evaluate the nature and extent of disability (1–2). The literature suggests that these work ability evaluations or assessments are usually based on expert judgments of a specified physician and administrative

rules of the social security organization. Most assessments are not or only limitedly supported by scientific evidence (3–5).

Evidence-based medicine (EBM) is a widely adopted method in clinical medicine of systematically finding, appraising, and using up-to-date research findings as a basis for clinical decisions. It has been shown to be instrumental in clinical specialties, occupational medicine, and general practice (6–8). The method urges practitioners to find the best evidence for clinical questions by searching literature databases such as Medline, Embase, and PsycInfo, using validated search methods to find appropriate original studies, systematic reviews,

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and guidelines (9). However, disability evaluations carried out by insurance physicians differ from clinical evaluations in that the former mainly address the social consequences of a disease. The main task of insurance physicians is to evaluate health-related work disability. Given this focus, it is still unclear if and how the method of EBM can be applied in this field.

Disability evaluations by insurance physicians typically involve the following four tasks: (i) evaluating the social and medical history of the client (ie, making an analysis of the stagnation of recovery and return to work), which is the basis for the next three tasks; (ii) assessing the actual activity limitations that arise as a consequence of structural and functional aspects of physical or mental impairments and assess how and to what extent these limitations restrict a patient's work participation; (iii) assessing the prognosis of the impairments and the limitations in activities and work participation; and (iv) evaluating ongoing medical treatment, rehabilitation, and guidance given for returning to work, and initiating appropriate interventions if indicated (10). Physicians worldwide are involved in similar assessments even though national practices can vary considerably in accordance with country-specific social insurance schemes and workers' compensation legislation (1). The logical coherence between physical and mental impairments, activity limitations, and restrictions in work participation is a key concept in this assessment, which is in accordance with the World Health Organization's International Classification of Functioning, Disability and Health (ICF) (11) (see also figure 1).

The ICF visualizes various components and the interaction between them in the development of problems in functioning and disability as a consequence of disease. The added value of the ICF model is that it provides a description of situations with regard to human functioning and disability that can serve as a scheme to organize information and decision-making. In this schematic functioning, we think the ICF model can be instrumental in applying the EBM method: defining the answerable questions and selecting which terms to use in searching especially. Work disability is considered to be a part of the core concept in ICF called "participation". Participation including work disability is seen as the result of complex interactions between various components. A central component is the "health condition", the disorder or disease. A second is the resulting consequence of a disease at the level of "body functions and structures" such as limited blood flow in the heart muscle after a myocardial infarction. A third component is described as (limitations) in activities (eg, limited ability to walk caused by impaired blood flow to the legs). External environmental factors such as healthcare and social support, and personal factors such as motivation and all kinds of skills and capacities can have a

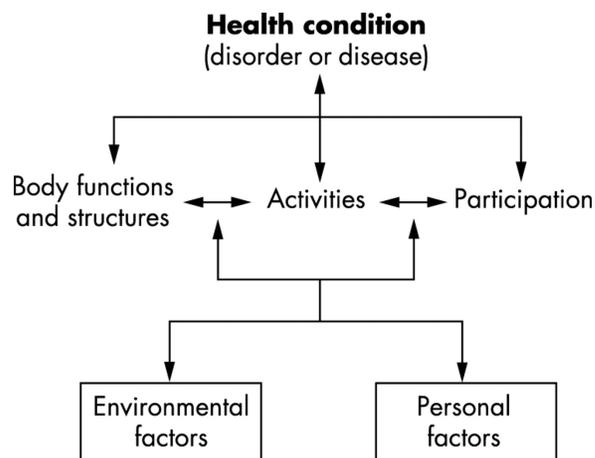


Figure 1. World Health Organization: International Classification of Functioning, Disability and Health (ICF, 2001).

great impact on all other components and therefore on work disability.

The objective of this study was to explore whether the method of EBM can be applied to the resolution of common questions in the field of disability evaluation and, further, to explore if the ICF model can be instrumental in this process.

Methods

Clinical problems and formulating answerable questions

We selected three common case studies and subsequent clinical decision-making that are considered to be representative of the core tasks of social insurance physicians. These case studies are a summary of the most relevant findings according to the physician. On the basis of these problems, questions were formulated using the Patient-Intervention-Control-Outcome (PICO) method (12), an often-used EBM search tool for intervention and prognostic questions. The use of this PICO method has two distinct advantages: first, it is helpful in formulating a question more precisely and, second, it facilitates the identification of good search terms that can lead to useful scientific articles (13).

The case studies fell under two topics: (i) prognosis of work disability and (ii) effectiveness of interventions to enhance work participation.

Prognosis of work disability. Case study A. Four years ago, a 53-year-old male nurse working on an orthopedic ward was diagnosed by his rheumatologist as suffering from rheumatoid arthritis. Notwithstanding early and

adequate intensive therapy, the functioning of his hands deteriorated slowly but steadily, which restricted him seriously in manual work such as injecting patients and lifting patients to and from bed. At the time of evaluation, he had been on sick leave for 20 months. The insurance physician had to decide whether the nurse's work disability would be permanent for the coming years, could subside, or even eventually improve. We searched recent literature for prognostic or predictive factors for work disability among rheumatoid arthritis patients. The clinical question formulated was: "In a 53-year-old male nurse, what is the probability of being at work five years after diagnosis of rheumatoid arthritis?"

Prognosis of work disability. Case study B. Two years ago, a male (40-year-old) laboratory assistant in a high school underwent a discectomy because of a lumbar disc herniation. Despite his wish to resume all his tasks at work, he was still unable to do so because the sciatica restricted him from lifting objects, an important part of his job. The insurance physician had to evaluate whether it is realistic to expect substantial beneficial change with respect to the patient's limitations in the forthcoming years. We searched the literature for scientific evidence that reflects on the course of sciatica and the various prognostic factors involved. The clinical question formulated was: "In a 40-year-old laboratory assistant, what is the probability of being at work five years after lumbar discectomy?"

Effectiveness of interventions to enhance work participation. Case study C. A 43-year-old woman who worked as a school nurse recently developed a mild depression in combination with a history of alcohol abuse for more than 15 years. Functioning well in her job had proven difficult the last three years, even for limited tasks, mainly because of absenteeism due to excessive drinking. Attempts aimed at alcohol abstinence in the past had failed. To be able to judge her permanent work disability, the insurance physician needed to know if there is an effective therapy for depression in combination with alcohol abuse as a co-morbidity. The clinical question formulated was: "In a 43-year-old nurse, is treatment of both alcoholism and depression more effective than treatment of depression alone or than no treatment, regarding return to work or retaining a job?"

General outline of the search strategy, critical appraisal and applied evidence

Search strategy. In this study, we confined our searches to Medline, using PubMed, as this database is relevant for most medical questions and provides easy internet access. Moreover, Medline also includes abstracts of systematic reviews from the Cochrane library, an important resource for evidence on treatment effectiveness.

Furthermore, as has been recommended by Verbeek et al (13) for occupational physicians, it is important for all practitioners in the field of disability evaluation to first become acquainted with the Medline database before using other literature databases. Searching Medline only can also be more cost-effective than previously thought, as was shown by Rollin et al (14) for finding intervention studies with return to work as the outcome measure. We searched for high quality reviews and original studies, respectively. Although in the future, other sources such as evidence-based practice guidelines developed for social insurance medicine could be searched, at this moment such guidelines are not available or are mostly based on consensus and not on evidence, as was recently shown by de Boer et al (15).

For the disease term (*patient* in PICO), we used the standard MeSH term in PubMed whenever available. For work participation (*outcome* in PICO), we used a search strategy that has proven useful for identifying articles in Medline on chronic diseases (eg, rheumatoid arthritis) and work participation. Haafkens et al (16) recommended the following string: "work capacity OR work disability OR vocational rehabilitation OR occupational health OR sick leave OR absenteeism OR return to work OR retirement OR employment status OR work status". These terms cover many essential aspects of work participation. We combined this string with the broad clinical queries filters in PubMed for prognosis and intervention effectiveness, respectively. If the search resulted in 10–50 articles, we considered this search sufficient (17). If we had >50 hits, we limited the search to articles that had been published in the last 5 years. We selected articles based on relevant titles or abstracts. Fulltext article(s) were read before using the information for clinical decision-making. If no appropriate review article could be found for our purpose, we looked for original articles in the same search.

Critical appraisal. We performed critical appraisal using the common quality criteria specific to each type of research (12). For prognostic and etiologic studies, this means especially verifying whether the patients in the research form a well-defined inception cohort, if follow-up was long enough, and if objective outcome criteria were applied in a "blind" fashion. For a systematic review, this means verifying whether the main question addressed was clearly stated, inclusion criteria for studies were clearly defined, the major bibliographic databases were searched, the quality of each study was independently assessed (by at least two reviewers), and the criteria for assessment were clearly described.

Applying the evidence, guidelines for decision-making. Regarding insurance physicians' prognosis of work ability, we could not find definitions in the literature of

what constitutes a poor prognosis, either conceptually or in operational terms. Therefore, we defined what an insurance physician might call a “poor prognosis for work ability”. For the purposes of this study, we agreed a poor prognosis would be similar to permanent work disability and defined it as <25% chance of recovery from the disease and the resulting work limitations after 5 years follow-up starting from the time of diagnosis. Moreover, for this study we decided that a risk is increased if the relative risk (or odds ratio) was ≥ 2 , meaning that the risk factor would at least double the chance to become work disabled for the “exposed” versus “non-exposed” group. Considering the importance of the baseline risk in evaluating the consequences for an individual patient, this was taken into consideration in the interpretation of the research results where applicable.

Regarding therapy, methodologically, the randomized controlled trial (RCT) is the study design for intervention studies that is least susceptible to bias. Therefore, we wanted the evidence to consist of one or more RCT or a systematic review of RCT.

In order to derive meaningful differences in means, Cohen worked out a dimensionless scale of effect sizes, analogous to his work on correlations (18). Typically these are used in a systematic meta-analysis. He introduced thresholds for small-, moderate-, and large-effect sizes, which are 0.20, 0.50 and 0.80, respectively. This can be helpful as a rule of thumb for insurance physicians in interpreting the presented differences in means. A corresponding relative risk would be (i) 1.0–0.75=small, (ii) 0.75–0.50=moderate, and (iii) 0.5–0.25=large risk reductions (19). The insurance physicians would decide that an intervention would be effective if there is any significant effect on the outcome symptoms or related work disability.

Results

Table 1 summarizes the results of formulating answerable questions within the PICO format. For each question chosen, we present a description of the search process, the critical appraisal of the results, and finally, the use of the results to answer the clinical question.

Prognosis of restrictions for manual work with rheumatoid arthritis

Literature search. We searched for articles about prognostic or predictive factors for work disability among rheumatoid arthritis patients. Therefore, we started with the MeSH term for rheumatoid arthritis in combination with terms for work participation as validated by Haafkens (16), which yielded 856 articles (Medline

4 August 2010). Using the broad prognostic clinical queries filter in PubMed yielded 254 articles, and 20 systematic reviews. We selected four review articles by reading the titles, after which we proceeded to read their abstracts. We selected the article by Burton et al (20) as the most relevant for our clinical question.

Critical appraisal. The study of Burton et al (20) is a recent systematic review published in 2006 addressing a focused question: the relationship between rheumatoid arthritis and work productivity. Two authors performed the search for and selection of the articles. They searched in major databases, including Medline and CINAHL. Cohort and cross-sectional studies were included if they were primary studies reporting productivity loss measures such as work limitation, work loss, and work disability. The review dealt with adults diagnosed using strictly defined criteria for rheumatoid arthritis. The search for studies was well described. Individual studies were assessed for validity. The results of included studies were presented in summary tables. They only used simple summary statistics, no statistical pooling was attempted. We found the quality and relevance of this systematic review sufficient to be used as support for the clinical decision.

Clinical decision. Burton et al’s review (20) described the impact of rheumatoid arthritis on productivity loss – work limitation, work loss, and work disability – and was therefore relevant. Patients in the studies were identified via a physician diagnosis of rheumatoid arthritis, comparable to our patient. The article depicts a survival analysis which showed that the period between the onset of rheumatoid arthritis to the point with 50% probability of being work disabled varied between 4.5–22 years. It was stated that the largest increase in work disability occurred in the first year after diagnosis. For reasons of generalization to our Dutch patient, we also read the study by Albers et al (21) performed in the Netherlands, published in 1999, which was referred to in Burton et al’s review. Albers et al found that after five years, <30% of the patients were still working. As we determined our cut-off percentage to be 25%, we could not conclude that the course of the work ability in this patient is poor although the difference is small. However, the systematic review indicated that in cohort studies the baseline variables that were consistently predictive of subsequent work disability were: (i) a physically demanding work type; (ii) greater severity of rheumatoid arthritis [expressed as score measured by the Health Assessment Questionnaire (HAQ) which measures functional disability in the activities of daily living]; (iii) a high number of affected joints count;

Table 1. Answerable questions formulated for three clinical problems encountered in disability evaluation by insurance physicians.

Problem	Patient or worker	Intervention or exposure	Comparison	Outcome
Prognostic factors for impact of rheumatoid arthritis on work disability	53-year old male nurse with rheumatoid arthritis	Exposure to prognostic or predictive factors	No exposure	Work disability
Prognostic factors for impact of sciatica after discectomy on work disability	40-year old male laboratory assistant with sciatica	Exposure to prognostic or predictive factors	No exposure	Work disability
Appropriate therapy for alcohol abuse accompanied by depressive disorder, related to work disability	43-year old female teacher with a mild depression and alcohol abuse	Therapeutic intervention	No or other intervention	Work disability

and (iv) older age. Applying these findings to our patient who performed physically demanding work and was of older age, we assumed these factors to cause another 5–10% elevation in risk, which would make the chance for recovery <25% within a period of five years. So we decided that our patient had a poor prognosis for future work ability within a period of five years. We concluded that a re-evaluation in the future to judge if his work ability has improved would not be necessary and that the disability for his own work was considered to be permanent.

Prognosis of sciatica after surgical management of lumbar disc herniation

Literature search. When searching for MeSH terms for “lumbar disc herniation” in the PubMed MeSH database, no relevant MeSH terms were found (search 4 September 2010). Limiting the search to “disc herniation,” the suggestion of “herniated disc” was offered, which leads to the MeSH term “intervertebral disk displacement”. On the page of the last term, the suggestion of “sciatica” was given as a related MeSH term. The combination of both seemed most appropriate for our purpose as we were interested in the course of the symptom sciatica after surgery for lumbar disc herniation. Combining both MeSH terms with the terms from Haafkens et al (16) for “work disability” yielded 46 articles. Reading the titles of the original articles, we found 12 potentially relevant articles, of which 1 was in the Norwegian language and 1 was >10 years old. After reading the abstracts of the remaining articles, we chose the publication of Atlas et al (22), a prospective cohort study of 507 patients in the USA who underwent open surgery or received conservative treatment after lumbar disc herniation and were followed for 10 years.

Critical appraisal. Atlas et al (22) used clear criteria for their inception cohort; all patients had symptoms for <6 months. There were 217 surgical patients and 183 non-surgically treated patients with available 10-year outcomes, a mean response rate of 84%. We considered a 10-year follow-up of 217 surgical patients sufficient. Thirty patients died during the follow-up period. Further

exploration into the response rate would have enhanced the quality of the article. The outcomes were based on patients’ self-reports on questionnaires concerning leg and back pain, functional status, satisfaction, and work and disability compensation status. The impact of prognostic factors predicting symptoms and functional status was adjusted for baseline values using a logistic regression analysis. We concluded that the quality of the study was sufficient to be of use in our clinical decision.

Clinical decision. The study of Atlas et al (22) showed that after two years post-discectomy, no further significant improvement in the Roland Morris disability questionnaire (a widely used measure for the consequences of low-back pain) could be observed. Our patient was referred by his general practitioner to a neurosurgeon and was of comparable age to the study population in the USA. We had no reason to believe that the effect of a lumbar herniation procedure would be different for a Dutch patient than an American one. Therefore, we concluded that two years after surgery, further beneficial change in the physical limitations of our patient was not to be expected. At this stage, efforts to promote return to work could better be directed at other objectives such as the realization of workplace accommodations supporting the lifting of objects as was also suggested in the discussion of the American study.

Depression and alcoholism: where to start?

Literature search. We searched for articles about treatment of patients with mild depression in combination with alcohol abuse, preferably including work-related outcomes. First we used the term “alcohol abuse” in the MeSH database of PubMed, which brought us the term “alcoholism” that best covered our concept of “alcohol abuse” (search 4 August 2010). Using the term “depression” in the MeSH database led us to the MeSH term “depressive disorder” that is more in accordance with the health status of our patient than the broader term “depression”. Combining “depressive disorder” with “alcoholism” resulted in 1762 articles. The combination with the terms from Haafkens et al (16) for “work

participation” yielded 14 articles, unfortunately none of these were relevant to our question. In a new search, entering both MeSH terms in the clinical query function “systematic reviews” in PubMed, 19 articles were found. After reading the titles, we were left with four articles. Of these, one was about bipolar disorder, one appeared to be a narrative review, and the other two were systematic reviews. We chose the systematic review of Nunes & Levin (23) on the treatment of depression among patients with alcohol or other drug dependence because it had the most up-to-date search (completed in December 2003) and included a meta-analysis. Although this review was oriented toward disease-related outcomes and not explicitly work participation, the content was most relevant to the prognostic and therapeutic questions and fitted well with the concept of ICF (11).

Critical appraisal. This systematic review and meta-analysis of placebo-controlled RCT addressed two focused questions: first, whether depression responds to anti-depressant medication treatment among substance-dependent patients and, second, what the impact is of such treatment on concurrent substance abuse. Two authors independently performed the search for and selection of the articles. They searched in Medline and Cochrane databases, which was regarded as sufficient for our purpose. RCT were included if they met well-defined criteria. Most importantly, patients had to meet the standard diagnostic criteria set forth in the Diagnostic and Statistic Manual of Mental Disorders for both a current drug or alcohol-use disorder and a current unipolar depressive disorder. Individual studies were independently and rigorously assessed for validity and reliability. Eight trials recruited alcohol-dependent patients. The review critically tested for heterogeneity of the studies included in the meta-analysis. The results were clearly presented in tables. We regarded the information on quality and relevance as sufficient to consider this a good systematic review.

Clinical decision. Applying Cohen’s thresholds (18) in the meta-analysis, we found there was a small-to-modest effect of anti-depressant medication on depressive symptoms among patients with alcohol or drug dependence, as measured by the Hamilton depression scale (the overall pooled effect size was 0.38 [95% confidence interval (95% CI) 0.18–0.58]. For those cases where the depression effect size was >0.50 , there was also a small positive pooled effect on diminishing alcohol or drug intake of 0.25 (95% CI 0.08–0.42). There was no reason why our patient would be different from those in this review such that results could not apply. Therefore the decision was that treatment of the depression with anti-depressant medication was recommended, but we agreed with Nunes & Levin (23) that another recommendation

should be treatment of the alcohol abuse as the effect of the anti-depressant on substance abuse outcomes was only small at best. Although the results of this review do not explicitly pertain to work participation, the information on improvement of disease-related symptoms could indeed help the insurance physician in deciding what treatment should be recommended.

Discussion

In this study, we showed that EBM method is applicable to common questions in the field of disability evaluation. As an overall guiding principle in defining which answerable questions can be formulated and selecting which terms to select for searching, the ICF model was helpful. For finding studies on (work) participation, an existing occupational health search tool – developed to support searches on the topic of chronic diseases and work participation (16) – proved to be instrumental in providing clinically relevant answers in two out of three cases. We also suggest that social insurance institutions and other decision-makers should adopt a policy that would allow for more scientific evidence to be incorporated in “evidence-based/informed decision-making”, in addition to the development of professional guidelines and continuing medical education.

The case study on prognosis and rheumatoid arthritis illustrates that many work-related articles can be found that are relevant to social insurance physicians. The case clarified the need to develop new “rules” in order to facilitate the transfer of knowledge to practice: we had to specify what an insurance physician would consider a poor prognosis for work ability. The search on rheumatoid arthritis demonstrated that specific information in the articles found can contribute to the knowledge of the disease and therapy.

The case study of sciatica after surgical management of lumbar disc herniation illustrates that searching requires some skills, like exploring the tree structure of a MeSH term in the MeSH database. The evidence found strengthens the decision not to refer this patient for any further treatment. Instead alternatives (eg, workplace accommodations) were suggested that can be helpful in clinical decision-making during disability evaluation. In addition, the case study shows that reading articles allows one to learn about measurement tools such as the Roland Morris disability questionnaire, which can be used in insurance practice as well.

In the case study of depression and alcohol, contrary to longstanding therapeutic beliefs, the start of concurrent anti-depressant therapy and treatment of addiction can be worthwhile. Although the review especially discussed evidence at the level of disease, it was judged

nonetheless to be useful in our decision-making regarding the enhancement of work participation.

In this study, we confined ourselves to questions about prognosis and effectiveness of therapies. As outlined in the ICF framework we used, disability assessment includes more topics such as the assessment of the severity of the disorder and how this influences the ensuing disability. However in our experience, these aspects of disability assessment raise less questions in the practice of social insurance physicians. Nonetheless evidence pertaining to all major components in the ICF model can be used in the assessment of work ability. Slebus et al (24) also explicated both analytical and integrative function of the ICF model. They showed that when insurance physicians have to determine work ability, they predominantly consider aspects relating to the “body functions and structures” and “participation” components of the ICF model to be important. However, based on the work of Krause (25), the authors commented that “environmental” and “personal” factors should more often be considered in the assessment because of their impact on the duration of disability. The comment implies that all aspects that can be categorized in the various components of the ICF model and their inter-relationships can be or even have to be utilized in the assessment of work ability. Finally, the professional has to integrate all the components and the interactions in the final determination of the work ability of a patient. So we believe it is ill-advised to restrict the search to evidence that directly relates a specific disease to work participation issues such as work ability, work functioning, and sickness absence alone. And like in all decision-making in medicine, some subjective interpretation is unavoidable especially when applying results from research to an individual case.

The strength of our study is that we showed how evidence can be incorporated in the decision-making process of disability evaluation. As such it is an additional method to improve the quality of decision-making during disability evaluations. We like to emphasize that the decision itself is always an integration of all the relevant information including the evidence at hand. Moreover the EBM method does not free social insurance physicians from the painstaking work of getting familiar with and integrating all the relevant data that is available. One can argue that using this EBM method would take a practitioner too much time or effort. And while it is true that a certain amount of training in applying the method of EBM in disability evaluation is needed, we believe that questions could be answered within a reasonable time period. So, while this might not be feasible for every question in practice, the method is certainly worthwhile to consider when one is in serious doubt or when cases are used as exemplary models for other practitioners.

Further research on search tools and strategies and

further operationalization of the decision-making process of social insurance physicians could encourage the use of EBM. Insurance physicians would ideally incorporate evidence if available in their assessments. Especially when practice guidelines become more evidence based for insurance physicians, the evidence included can be applied with the distinct advantage that this would take a practitioner substantially less time and effort. Asking insurance physicians to be explicit in their reports about the use of evidence in their decision-making might add to the implementation of new practices.

In showing how decision-making in disability evaluation can be underpinned by using scientific evidence, we hope to encourage practitioners in the field of disability evaluation to make more and better use of the available evidence.

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Received for publication: 21 October 2010