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# Routine outcome monitoring and feedback on physical or mental health status: Evidence and theory

## Abstract

**Objectives:** Routine Outcome Monitoring (ROM) is an important quality tool for measuring outcome of treatment in health care. The objective of this article is to summarize the evidence base that supports the provision of feedback on ROM results to (mental) health care professionals and patients. Also, some relevant theoretical aspects are considered. **Methods:** Literature study (Pubmed, Medline, PsychINFO, Embase Psychiatry, 1975-2009) concerning randomized controlled trials (RTC's) of ROM and feedback on physical or mental health status of patients of all ages. Main search terms were routine outcome monitoring/ measurement, feedback, health status measurement, patient reported outcome measures. **Results:** Included were 52 RCT's concerning ROM and feedback with adult or older patients: of these seven RCT's were exclusively focused on physical health and 45 RCT's (also) on the mental health of the patient, although not always in a mental health care setting or as primary outcome measure. There appears to be a positive impact of ROM on diagnosis and monitoring of treatment, and on communication between patient and therapist. Other results were less clear. There were no published RCT's on this topic with children or adolescents. **Conclusions:** ROM appears especially effective for the monitoring of patients who are not doing well in therapy. Further research into this topic and the clinical-and cost-effectiveness of ROM is recommended, especially in mental health care for both adults and children. Also, more theory-driven research is needed with relevant conceptualizations such as Feedback Intervention Theory, Therapeutic Assessment.

## Keywords

status, health, mental, theory, physical, evidence, feedback, monitoring, routine, outcome

## Disciplines

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# **ROUTINE OUTCOME MONITORING AND FEEDBACK ON PHYSICAL OR MENTAL HEALTH STATUS: EVIDENCE AND THEORY**

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**Keywords:** routine outcome monitoring, feedback, evidence-based assessment, therapeutic assessment, feedback intervention theory, review

**Running title:** Feedback on physical or mental health status

Table: 1

Appendix: 1

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## **Summary**

**Objectives** Routine Outcome monitoring (ROM) is an important quality tool for measuring outcome of treatment in health care. The objective of this article is to summarize the evidence base that supports the provision of feedback on ROM results to (mental) health care professionals and patients. Also, some relevant theoretical aspects are considered.

**Methods** Literature study (Pubmed, Medline, PsychINFO, Embase Psychiatry, 1975-2009) concerning randomized controlled trials (RTC's) of ROM and feedback on physical or mental health status of patients of all ages. Main search terms were routine outcome monitoring / measurement, feedback, health status measurement, patient reported outcome measures.

**Results** Included were 52 RCT's concerning ROM and feedback with adult or older patients: of these 7 RCT's were exclusively focused on physical health and 45 RCT's (also) on the mental health of the patient, although not always in a mental health care setting or as primary outcome measure. There appears to be a positive impact of ROM on diagnosis and monitoring of treatment, and on communication between patient and therapist. Other results were less clear. There were no published RCT's on this topic with children or adolescents.

**Conclusions** ROM appears especially effective for the monitoring of patients who are not doing well in therapy. Further research into this topic and the clinical- and cost-effectiveness of ROM is recommended, especially in mental health care for both adults and children. Also, more theory-driven research is needed with relevant conceptualizations such as Feedback Intervention Theory, Therapeutic assessment.

## **Introduction**

Empirically supported therapies, treatment guidelines, and treatment manuals are methods proposed to enhance treatment outcomes in routine practice [1]. In line with evidence-based medicine and evidence-based assessment, measurement feedback systems like Routine Outcome Monitoring (ROM) are important in clinical practice. For instance when a poorly responding patient is only identified at the end of treatment, it is too late for a shift in treatment that may have resulted in a more favorable outcome [2]. ROM includes the systematic evaluation of a patient's treatment response during the course of treatment and provides health care professionals with information relevant to a patient's progress [3]. Patient-based measures of (mental) health could therefore improve patient outcomes by enabling clinicians to detect and treat functional and psychological problems that previously may have been missed [4]. Furthermore, ROM could facilitate the adherence to clinical directives by therapists [5].

ROM can be placed within the broader research field of "outcomes research", "patient-focused research", "computer-assisted quality management", and "practice-based evidence". Fitzpatrick et al. [6] linked ROM with relevant theories such as Psychometric theory and the related Clinimetrics theory. These theories concern the psychometric properties and clinical utility of measures. Also decision-theory could be interesting from a clinical point of view as well as cost effectiveness [6].

Gilbody et al. [7] describe how the measurement of outcomes has risen in prominence over the past 30 years. First in health care, later also in mental health care. The field of ROM emerged also as a consequence of rapidly escalating costs in health care, and therefore it concerns the enhancement of treatment quality by a continuous outcome management approach that attempts to track outcome in order to improve treatment. Hence, feedback of patient outcomes also constitutes an important instrument of outcome management for stakeholders [8]. Patient-based measures of health could also promote shared decision-making between patient and health care professional, and the systematic feedback about treatment progress itself could be therapeutic to patients. In this context feedback is considered as a cognitive-motivational technique which informs and influences the patient, and contributes to the therapeutic alliance [9].

Beside these advantages there are also disadvantages of ROM (such as time-consuming and expensive) and even doubts concerning the empirical evidence of ROM [10]. In connection then this article summarizes the best evidence regarding the effectiveness of ROM in both healthcare and mental health care.

## **Methods**

A literature search according to guidelines [11] was carried out for the effectiveness of ROM and feedback for the period of 1975 - 2009 using PubMed, Medline, PsychINFO, Embase Psychiatry. Relevant publications were also searched in the Cochrane Database of Systematic Reviews, Cochrane Controlled Trials Register, Database of Abstract of Reviews of Effectiveness.

Inclusion criteria were randomized controlled trials (RCT's) concerning the impact of ROM and feedback in health care and mental health care. Only English written publications were selected, regardless of setting and age of patients (children, adolescents, adults, elderly). Therefore main exclusion criteria were: no randomized controlled trial, no feedback, or trial not intended to evaluate ROM / feedback. A list of excluded publications can be asked at the first author.

Search terms (if possible combined) were: routine outcome monitoring / measurement, feedback, outcome management, health status measurement, routine practice, treatment outcome, outcome assessment, patient reported outcomes (measures), patient-based measures, patient-focused research, psychotherapy outcome research, practice-based evidence, effectiveness, efficacy, cost-effectiveness.

Titles and abstracts of the electronic searches were screened on relevance (IC and DM), whereupon all potentially relevant articles were gone through. Beside relevance and inclusion criteria, possible double publications of the same research were excluded [12]. Additional publications were obtained from references in relevant articles and reviews [1, 4-5, 7-8, 10, 12-17].

## **Results**

In the Appendix [18-32, 9, 33-68], an overview is given of the 52 included RCT's. Considerable empirical studies concerning ROM with adult (> 18 years) or older (> 65 years) patients have been published already. There were no published RCT's of ROM feedback with children or adolescents. ROM could vary in the RCT's from a single questionnaire up to a complete set of questionnaires, sometimes accompanied with an interview. In most trials ROM was followed with written feedback concerning results of ROM to (mental) health care professional and patient. Randomized participants were generally divided between intervention (feedback) - versus control (no feedback) conditions.

### **Impact of ROM on diagnosis and monitoring of treatment**

Most studies concerned the evaluation of the impact of ROM with adult patients on the diagnosis and monitoring of treatment. The majority of these studies found a significantly positive impact of ROM on the behavior of health care professionals with respect to faster and more adequate notes of diagnosis as well as swifter adjustment of treatment. It concerned then especially an impact on the short period (up to some weeks) [1, 4-5, 7-8, 10, 12-17].

Some related aspects in this area were also investigated such as the impact of ROM on communication, satisfaction, cost effectiveness. These aspects were relatively less frequently examined, with not always univocal results (none or positive impact) [1, 4-5, 7-8, 10, 12-17]. Consistently positive results of ROM as an outcome measure were shown on the communication between patient and health care professional, both on the short and longer period. Studies examining the related aspect of impact of ROM on degree of agreement between patient and health care professional, were less consistent. Also some studies found a positive impact of ROM on the satisfaction of the patient with the provided care, while others did not. Finally, the results of studies concerning cost effectiveness as an outcome measure of ROM (for example a shorter treatment or less utilization of care) were not univocal.

### **Impact of ROM on the physical or mental health status of the patient**

Table 1 shows the results for ROM feedback on physical versus mental health status of the patient. Overall can be put that more than half of the studies (63%) found a positive impact of ROM on the physical and/or mental health of the patient, again on the short period. A positive impact of ROM means here that the experimental group had significantly less complaints than the control group.

INSERT TABEL 1 HERE

A minority of the included studies was exclusively focused on physical health (N=7, see table 1), mainly using a general outcome measure. Most of these studies had a positive impact (57%). The studies conducted with elderly patients scored more positive (67%) than those with adults (50%). Studies focusing on pain as main outcome measure were most positive (100%).

The majority of included studies was focused (also) on the mental health of the patient (N=45 trials, in Appendix 1 indicated with \*), although not always in a specific psychiatric or mental health care setting or as primary outcome measure. Table 1 shows that most of these trials (N=24) did a general measuring of the emotional/mental condition of the patient. A small majority of these studies (54%) found thereby a positive impact of ROM. Depression was examined most as second (N=11 trials), where the majority here found a positive impact of ROM (64%). Only ten studies was carried out in a specific mental health setting (mainly outpatient service, not in table 1), where a wide majority found a positive impact of ROM on the mental condition (78%). At the partitioning of studies according to age, appears that most were carried out with adult patients (N=37) with a leading positive impact of ROM on mental health status (70%). The studies conducted with elderly patients (N=8) scored less positive (38%). To sum up, it appears that the majority of studies (65%) becomes clear positive scores with regard to impact of ROM on the mental condition of the patient. In this context, can also be mentioned, that several ROM-feedback studies showed that feedback appears particularly effective with patients where treatment is complicated [1, 2, 5, 9, 17, 35, 64, 69].

## **Discussion**

In general, our literature review shows evidence for providing feedback on routine outcome measures to (mental) health care professionals and their patients. Which is in conformity with other relevant reviews such as a recent meta-analysis of Knaup et al. [8] who also included non randomized trails.

Our search was limited to published English articles. At the time of our search there were no published RCTS's into the effectiveness of ROM feedback with children or adolescents, which was also noticed by other recent authors [70]. The majority of included trials had been aimed at the impact of ROM on diagnosis and monitoring of treatment, therefore on the behavior of the health care professional. Studies concerning the impact of ROM on the behavior and (physical or mental) health status of the patient are scarcer, with inconsistent results. Some studies found none or little impact of ROM on (mental) health status, which could have several explanations. For instance feedback was possibly insufficiently intensive and used by health care professionals. Or feedback was sometimes given only to health care professionals and not to patients. Also, in some trials the research group was possibly not large enough to show clinically meaningful differences between experimental and control groups. Finally, many included trials were carried out in a general practitioner setting, which meant that patients had frequently only light (mental) health complaints that spontaneously could improve [66].

Another comment relates to the scarcity of theory-driven research within the literature evaluating the effectiveness of feeding back ROM results. A theory-driven approach involves combining knowledge of whether and how an intervention works. Most reviews and RCT's assessing the efficacy of ROM feedback have focused almost exclusively on determining whether this intervention works, without adequate consideration of how it might give rise to the expected outcomes [71]. For this reason, we will now focus on some relevant theoretical aspects. Afterwards follow some suggestions for clinical practice and further research.

### **Theoretical considerations**

At least two conceptualizations can be considered in which links between processes and outcomes of ROM feedback are theorized: Feedback Intervention Theory and Therapeutic Assessment.

The Feedback Intervention Theory (FIT) is a framework from industrial/organizational psychology [72]. According to FIT, feedback interventions work by providing new information that redirect recipients' attention either toward or away from the task (in health care for instance prescribing appropriate medication). Frequent, individualized, and non punitive feedback has been shown to be effective in helping health care providers adhere to clinical practice guidelines [5]. Written and graphic performance results increased the effects of feedback in psychotherapy, whereas verbally delivered feedback reduced the effects [2]. **Riemer et al.** [73] have developed a clinical model to explain how feedback is interpreted and used, which is known as Contextual Feedback Intervention Theory (CFIT), proposing that clinicians are self-determined in their learning. So the provision of accurate feedback is a critical factor in the enhancement of this self-regulation process. The source, content, sign, and format all affect the amount of attention a clinician will pay to the feedback and how he or she will be to accept it as accurate [69].

Therapeutic Assessment (TA) [74] is focused on the therapeutic effects of providing test feedback to patients. It is linked to treatment validity, clinical utility, and more or less also to incremental validity of assessment procedures in therapy. The emergence of therapeutic models of assessment, such as TA, provides a conceptual framework and research methodology for studying this issue directly. Discussing test-derived inferences with patients as part of a therapeutic strategy rather than a diagnostic strategy was first reported in 1949 by Bellak et al. [75]. However, for many years the guiding principle concerning feedback was the cautionary note sounded by Klopfer et al. [76], who recommend careful titration of limited information [92]. Poston & Hanson [17] describe several names used by more recent authors for therapeutic models of assessment: besides TA also Collaborative/individualized assessment, Collaborative consultation to psychotherapy, Brief personalized assessment feedback, Treatment utility of assessment feedback, Psychological assessment as a therapeutic intervention, Psychological assessment feedback. All therapeutic models of assessment have as main unifying commonalities: (a) working collaboratively with clients to define individualized assessment goals ("diagnostic partnership"), and (b) sharing and exploring assessment results with clients on several occasions [17]. The most prevalent contemporary model, TA, is a brief, highly structured, theoretically and empirically based approach to assessment and testing. It was

developed by Stephen Finn and his colleagues, and influenced by humanistic and self psychology. TA usually involves three sessions, and if done in the aforementioned way, it is a minitreatment in its own right. It functions as a means of patient self-verification, self-enhancement, and self-efficacy or self-discovery [17, 74, 77].

### **Suggestions for clinical practice**

An effective use of ROM requires “concurrent outcome management” [45]: several measurements before, during, and after treatment, and follow-up. Secondly a multidimensional assessment is recommended: besides psychopathology, functioning, quality of life, also satisfaction, care needs, utilization of care, and if possible also indices of the treatment progress and process. In this context, Kelley and Bickman [70] refer to the concept of “multidimensional monitoring”, which is part of a measurement feedback system (MFS). MFS is defined as a battery of comprehensive measures that are administered frequently concurrent with treatment, and provide timely and clinically useful feedback [17]. At third is important that both health care professional and patient get written feedback concerning the ROM results repeatedly and rapidly [9, 59]. Especially when this feedback goes paired with an interactive discussion between patient and health care professional. If possible, feedback on ROM-results could be formulated as “guideline-driven care recommendations”, which can be used during treatment [48, 69]. Finally, regular training of therapists how to use ROM-feedback during therapy is thereby vital [13].

### **Suggestions for research**

The vision stands here that ROM is primarily meant for supporting patient care, where ROM-data additionally could be used for scientific research to further improve patient care. On the basis of our literature search the main research recommendation is a RCT concerning the clinical- and cost effectiveness of ROM, especially in mental health care, with adults and children. Four relevant points of interest can be mentioned thereby. First, a cluster randomized controlled design is recommended, with randomization by health care professional or setting instead of by patient [13]. Secondly, a focus is suggested on so-called signal-alarm patients who are not doing well in therapy [2, 64, 69]. It is

appropriate then to measure the therapeutic relationship and the willingness to change of the patient [9]. Thirdly could be taken into account a possible differential effectiveness of ROM. For example depending on associated type of psychiatric disorder [8] or cognitive skills [56]. Finally, although the importance of feedback is generally accepted nowadays, little empirical work has been done to clarify what it is that makes feedback work [17]. Which is in line with our aforementioned theoretical considerations. Research is needed regarding what is the most effective ROM feedback protocol, as well as how it can be used during therapy by both therapist and patient.

### **Conclusions**

The evidence base for providing ROM feedback to (mental) health care professionals and their patients is promising. Feedback on ROM-results appears effective with respect to the diagnosis (faster and completer screening) as well as monitoring of the treatment (more swiftly adjustment of it). Also a significant impact of ROM was found on the communication between health care professional and patient: more often and effectively talking with each other. This is in connection with the finding that the quality of the patient-doctor communication is determinative for a positive impact of the treatment [45].

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**Table 1** Impact of feedback on physical or mental health status (N = 52 trials)

Physical health (N=7)	N	Positive effect N (%) <sup>*</sup>
<b>Age</b>		
Adults (> 18 years)	4	2 (50%)
Elderly (> 65 years)	3	2 (67%)
<b>Outcome measure</b>		
General health status	3	2 (67%)
Pain	2	2 (100%)
Arthritis	1	0 (0%)
Asthma	1	0 (0%)
Total Physical health trials	7	4 (57%)
<b>Mental health (N=45)</b>		
<b>Age</b>		
Adults (> 18 years)	37	26 (70%)
Elderly (> 65 years)	8	3 (38%)
<b>Outcome measure</b>		
Global psychological status <sup>**</sup>	24	13 (54%)
Anxiety	1	1 (100%)
Depression	11	7 (64%)
Depression & anxiety	4	3 (75%)
Bulimia	1	1 (100%)
Psychotic disorder	1	1 (100%)
Addiction	3	3 (100%)
Total Mental health trials	45	29 (65%)
<b>TOTAL OF TRIALS</b>	<b>52</b>	<b>33 (63%)</b>

\* Results were considered as positive, if there was a statistic significant ( $p < 0.05$ ) difference in the expected direction between the intervention- and control groups

\*\* Global psychological status: overall measuring of the emotional/mental condition such as general psychopathology, psychosocial functioning, quality of life, stress coping, well-being, care needs

## Appendix

Summary of included RCT's concerning effectiveness of routine outcome monitoring and feedback (N= 52 trials)

<i>Trial</i>	<i>Country</i>	<i>Setting</i>	<i>Main outcome measure</i>
Anker et al. (2009)	USA	Mental health setting	Psychosocial functioning*
Ashaye et al. (2003)	UK	Mental health setting (elderly, daycare)	Psychosocial functioning/care needs*
Boyes et al. (2006)	Australia	Oncology	Anxiety/depression/care needs/health*
Brodey et al. (2005)	USA	Mental health setting	Anxiety/depression*
Brody et al. (1990)	USA	Hospital/Medical clinic	Psychosocial functioning/stress coping*
Buchsbaum et al. (1993)	USA	Hospital/Medical clinic	Alcohol problems*
Calkins et al. (1994)	USA	Hospital/Medical clinic	Mental and physical functioning*
Callahan et al. (1996)	USA	Primary care (elderly)	Depression*
Dailey et al. (2002)	UK	Dentist practice	Anxiety*
Detmar et al. (2002)	The Netherlands	Oncology	Psychosocial functioning/quality of life/satisfaction*
Dowrick & Buchan (1995)	UK	Primary care	Depression*
Gagnon et al. (1999)	Canada	Hospital/Medical clinic (elderly)	Psychosocial functioning/satisfaction/health*
Gater et al. (1998)	UK	Hospital/Medical clinic	Psychosocial functioning/satisfaction/costs *
Gold & Baraff (1989)	USA	Emergency department	Psychosocial functioning*
Goldsmith & Brodwick (1989)	USA	Primary care (elderly)	Health
Hawkins et al. (2004)	USA	Mental health setting	Psychosocial functioning*
Hoeper et al. (1984)	USA	Primary care	Psychosocial functioning/depression*
Kazis et al. (1990)	USA	Hospital/Medical clinic	Health/satisfaction
Lambert et al. (2001)	USA	Mental health setting	Psychosocial functioning*
Lewis et al. (1996)	UK	Primary care	Psychosocial functioning/depression/health*
Linn & Yager (1980)	USA	Hospital/Medical clinic	Depression*
Magruder-Habib et al. (1990)	USA	Primary care	Depression*
Marshall et al. (2004)	UK	Mental health setting	Psychopathology/psychosocial functioning/satisfaction*
Mazonson et al. (1996)	USA	Primary care	Anxiety/depression/psychosocial functioning/care utilization*
McCusker et al. (2001)	Canada	Emergency department (elderly)	Depression/satisfaction/functioning/health*
McLachlan et al. (2001)	Australia	Oncology	Depression/care needs/satisfaction/functioning*
Moore et al. (1978)	USA	Primary care	Depression*
Ockene et al. (1999)	USA	Primary care	Alcohol abuse*
Priebe et al. (2007)	UK	Mental health setting	Psychosis/quality of life/care needs/satisfaction*
Rand et al. (1988)	USA	Primary care	Psychosocial functioning*
Ravaud et al. (2004)	France	Hospital/Medical clinic	Pain perception
Rosenbloom et al. (2007)	USA	Oncology	Psychosocial functioning/quality of life/health*
Rubenstein et al. (1989)	USA	Primary care (elderly)	Psychosocial functioning/health*
Rubenstein et al. (1995)	USA	Primary care	Psychosocial functioning/health*
Runciman et al. (1996)	Scotland	Emergency department (elderly)	Mental and physical functioning*
Saitz et al. (2003)	USA	Primary care	Alcohol abuse*
Schmidt et al. (2006)	UK	Mental health setting	Bulimia/psychosocial functioning*
Schriger et al. (2001)	USA	Emergency department	Psychopathology/health*
Shapiro et al. (1987)	USA	Primary care	Psychosocial functioning*
Slade et al. (2006)	UK	Mental health setting	Psychopathology/quality of life/ therapeutic alliance/care needs and utilization*
Smith (1998)	Scotland	Primary care	Psychosocial functioning*
Trowbridge et al. (1997)	USA	Oncology (elderly)	Pain perception
Velikova et al. (2004)	UK	Oncology	Anxiety/depression/quality of life*
Wagner et al. (1997)	USA	Neurology	Quality of life/psychosocial functioning/satisfaction*
Wasson et al. (1992)	USA	Primary care	Health
Wasson et al. (1999)	USA	Primary care (elderly)	Health
Weatherall (2000)	New Zealand	Hospital/Medical clinic (elderly)	Depression*
Whipple et al. (2003)	USA	Mental health setting	Psychosocial functioning/therapeutic relationship/motivation to change/social support*
White et al. (1995)	UK	Primary care	Health
Whooley et al. (2000)	USA	Primary care (elderly)	Depression*
Williams et al. (1999)	USA	Primary care	Depression/satisfaction*
Zung et al. (1983)	USA	Primary care	Depression*

\* ROM concerning mental health status (general or specific, N= 45 trials)