

Applying Outcomes Management to Clinical Practice

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THE PARADIGM SHIFT in health care from case management to cost contained, outcomes management (OM) has vaulted the study and use of valid and reliable outcomes tools. OM, when used appropriately, can measure progress, or the lack thereof, in three critical areas which include pain management, physical capacity (impairment), and disability (activity intolerance). This article describes various outcomes instruments and their respective goals in OM. An extensive literature search as well as conversations with various authors were utilized in this study, which categorizes and classifies OM tools and provides a brief discussion of each. In addition, a time-line recommending a “when to use what” approach is offered.

Key words: Outcomes assessment, Outcomes management, Quality assurance

Outcomes management (OM) is becoming a popular approach utilized in modern managed care to assure quality and contain costs. OM can be defined as the measurement of symptom and/or function of a patient's clinical status. The process of assessing outcomes starts on the initial visit, which is essential in order to establish baselines and to help in goal setting. OM tools (it is important to note) are simple to administer, low in cost, patient-driven rather than doctor driven (i.e., time efficient), and low-tech oriented in that no expensive equipment is required. The critical issue is to establish functional goals, and then to track those goals by documenting patient status and progress over time by utilizing OM.

The promotion of quality without sacrificing cost is a critical component of outcomes management (1). The ratio of quality to cost as described by Frymoyer defines value (2). Quality can be assessed by the demonstration of improved outcomes. Therefore, evidence-based treatments can be assessed for both value and quality by the use of OM (3). The primary goal of care in the acute stage is symptomatic relief of pain, and in the subacute to chronic stage, the goal is prevention of disability. These goals are achieved by focusing on returning function (reducing impairment) which results in activity limitations/intolerance, and the use of OM can help the provider determine when to focus on each of these goals. To clarify, the term *disability* refers to “. . . a decrease in, or the loss or absence of, the capacity of an individual to meet personal, social, or occupational demands, or to meet statutory or regulatory requirements.” (4, p. 317). On the other hand, the term *impairment* refers to “. . . the loss, loss of use, or derangement of any body part, system, or function.” (4, p.315). Therefore, these do not mean the same thing as the same loss of function or impairment may result in a significantly different level of

disability. More specifically, a concert pianist who amputates a digit may be completely disabled from his or her vocation as a performing musician, thus resulting in a high level of disability. However, the same impairment exists in an individual who does not necessitate the use of the amputated digit in their vocation or avocation, and hence may not be disabled whatsoever. Therefore, impairment has to do with dysfunction, while disability has to do with how that dysfunction affects activities of daily living (ADLs).

Case management refers to the care of a patient, taking into consideration all the complexities presented. In some cases, there are few if any complexities that interfere with the resolution of their presenting complaint. A stereotypic example is a young man or woman who sustains a low-level, mechanical back injury for the first time. If past history is noncontributory and the patient complies with treatment recommendations, resolution can be expected without significant complications. However, in some cases, especially those who present with chronic conditions where the etiology is multifactorial, a successful outcome may depend on identifying one or several barriers which may interfere with recovery, thus further reinforcing and perpetuating chronicity. The care one renders to the complicated, multifactorial case may necessitate treatment of a psychosocial issue such as job dissatisfaction, low pain tolerance, depression, an abusive job or ADL task, and so on, more so than their physical impairment (disability is typically significantly greater than impairment). Hence, if the provider is being sought in a primary care setting and proper case management is practiced, it is necessary to obtain a complete current and past history (including medical, family, occupational, social and habits history), perform a complete exam, and review past health care provider records. The health care provider must then weigh the information

TABLE 1. Continuum of Care

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1. Diagnostic Triage (rule out red flags)
 2. Determine End Point of Care
 3. Reassurance/Advice
 4. Provide Symptomatic Relief
 5. Identify Barriers to Recovery
 6. Utilize Outcomes Management
 7. Promote Functional Restoration
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The “continuum of care” is a guide to assure that all aspects of data collection on a patient are gathered. The importance of this becomes obvious when case management involves a chronic case with a multifactorial causation. Failure to consider all of the above points could result in a poor treatment outcome in such a case.

obtained to determine and direct care where it is most needed.

To make this process less cumbersome, a “continuum of care” is offered to achieve quality assurance (see Table 1). By keeping track of these steps, the provider can stay focused on the patient’s specific treatment goals and address important issues as they arise.

In general, outcomes management is designed to establish baselines, document progress, assist in goal setting, and motivate patients. Hence it has something to offer the patient, provider, and payor.

OVERVIEW: CATEGORIES OF OM TOOLS

There are many different outcomes management (OM) tools and determining what tool is most appropriate and when to use that tool is no easy task. To assist the provider in determining when each goal of care is reached, OM includes valid and reliable, quantifiable measurements of patients’ symptoms, impairment/functional limitations, and disability/functional capacity. Other outcomes categories include general health, patient satisfaction, and psychometric information regarding abnormal illness behavior.

The various outcome management tools can be divided into two large categories: those which are patient-driven or subjective and those which are provider-driven or objective. The measurement of pain has classically been a subjective measure, as the provider generally requests a patient to respond verbally to a noxious stimulus. Examples of subjective/patient-driven outcomes assessment (OA) tools include the Visual Analog Scale (measures pain intensity) (5), Pain Drawing (measures location and quality of pain) (6), and McGill Pain Questionnaire (measures sensory, cognitive, and motivational evaluation to pain) (7, 8). However, pain perception can also be objectively assessed by use of *algometry* or use of the Rheumatology Rating Scale (24) (Grade 0-IV) (see Table 4) which follows the American College of Rheumatology recommendations. This and other methods of tracking outcomes based on pain perception are covered in more depth later in this article.

The measurement of physical capacity (isolated function of muscles and/or joints) using inexpensive, low-tech approaches has also been reported (9–11). These tests, in essence, evaluate impairment or dysfunction. For example, Range of Motion, Strength, and Endurance all derive a measure of a specific function and normative data can be utilized to compare to the patient’s performance. This creates the added benefit of determining, on the initial evaluation, specific treatment goals that are quantitative in nature, and hence ideal for assessing outcomes. Alaranta showed that low-tech tests are reliable and valid, and age/gender/occupation-type normative data have also been published regarding these simple and inexpensive squatting, trunk flexion, and trunk extension tests (9).

There are a number of questionnaires available for identifying the patient’s perception of his or her disability or activity intolerance. A partial list includes: Oswestry Low Back Pain Disability Questionnaire (12, 13) (see Fig. 1); Spinal Function Sort and Hand Function Sort (14), Neck Disability Index (15), Roland-Morris Questionnaire (16), and Functional Assessment Screening Questionnaire (FASQ) (17). An example of an instrument representing this category of OM tools is the Oswestry Low Back Disability Questionnaire (Fig. 1) (13). This instrument captures activity intolerance such as personal care, lifting, walking, sitting, standing, sleeping, traveling, and others. Since these describe disability issues, they are an excellent source for tracking outcomes from treatment intervention. These tools are discussed more thoroughly later in this article.

Functional capacity or whole-body movement tests (14, 18) can also be measured, although testing is usually more complicated and time consuming. Examples of functional capacity tests include: lifting, carrying, aerobic capacity, static positional tolerance, balancing, and hand function.

CRITERIA

The benefit of using outcomes management tools is dependent on the ability of the test to enhance sensitivity towards change differentiation and to maintain standard measurements, regardless of who administers the test. Safety and practicality should also be considered. When the OM tool meets these criteria, it is considered worth utilizing. When a test includes normative data, the bonus of being able to compare the baseline or initial assessment of the patient’s results to the normative data can also be utilized in formulating treatment goals. Normative data are especially useful in physical performance test, such as the repetitive sit-up test, as specific exercise or treatment prescription can be derived from comparing the patient’s results to the normative data. Some of the criteria used for judging whether an OM tool is good or not are summarized in Table 2. These criteria will help you determine whether

OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE

PLEASE READ: This questionnaire is designed to enable us to understand how much your low back pain has affected your ability to manage your everyday activities. Please answer each section by circling the ONE CHOICE that most applies to you. We realize that you may feel that more than one statement may relate to you, but PLEASE JUST CIRCLE THE ONE CHOICE WHICH MOST CLOSELY DESCRIBES YOUR PROBLEM RIGHT NOW.

SECTION 1 — Pain Intensity

- A. The pain comes and goes and is very mild.
- B. The pain is mild and does not vary much.
- C. The pain comes and goes and is moderate.
- D. The pain is moderate and does not vary much.
- E. The pain comes and goes and is severe.
- F. The pain is severe and does not vary much.

SECTION 2 — Personal Care

- A. I would not have to change my way of washing or dressing in order to avoid pain.
- B. I do not normally change my way of washing or dressing even though it causes some pain.
- C. Washing and dressing increases the pain, but I manage not to change my way of doing it.
- D. Washing and dressing increases the pain and I find it necessary to change my way of doing it.
- E. Because of the pain, I am unable to do some washing and dressing without help.
- F. Because of the pain, I am unable to do any washing or dressing without help.

SECTION 3 — Lifting

- A. I can lift heavy weights without extra pain.
- B. I can lift heavy weights, but it causes extra pain.
- C. Pain prevents me from lifting heavy weights off the floor.
- D. Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, eg. on a table.
- E. Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.
- F. I can only lift very light weights, at the most.

SECTION 4 — Walking

- A. Pain does not prevent me from walking any distance.
- B. Pain prevents me from walking more than one mile.
- C. Pain prevents me from walking more than 1/2 mile.
- D. Pain prevents me from walking more than 1/4 mile.
- E. I can only walk while using a cane or on crutches.
- F. I am in bed most of the time and have to crawl to the toilet.

SECTION 5 — Sitting

- A. I can sit in any chair as long as I like without pain.
- B. I can only sit in my favorite chair as long as I like.
- C. Pain prevents me from sitting more than one hour.
- D. Pain prevents me from sitting more than 1/2 hour.
- E. Pain prevents me from sitting more than ten minutes.
- F. Pain prevents me from sitting at all.

SECTION 6 — Standing

- A. I can stand as long as I want without pain.
- B. I have some pain while standing, but it does not increase with time.
- C. I cannot stand for longer than one hour without increasing pain.
- D. I cannot stand for longer than 1/2 hour without increasing pain.
- E. I cannot stand for longer than ten minute without increasing pain.
- F. I avoid standing, because it increases the pain straight away.

SECTION 7 — Sleeping

- A. I get no pain in bed.
- B. I get pain in bed, but it does not prevent me from sleeping well.
- C. Because of pain, my normal night's sleep is reduced by less than one than one quarter.
- D. Because of pain, my normal night's sleep is reduced by less than one-half.
- E. Because of pain, my normal night's sleep is reduced by less than three-quarters.
- F. Pain prevents me from sleeping at all.

SECTION 8 — Social Life

- A. My social life is normal and gives me no pain.
- B. My social life is normal, but increases the degree of my pain.
- C. Pain has no significant effect on my social life apart from limiting my more energetic interests, My e.g., dancing, etc.
- D. Pain has restricted my social life and I do not go out very often.
- E. Pain has restricted my social life to my home.
- F. I have hardly any social life because of the pain.

SECTION 9 — Traveling

- A. I get no pain while traveling.
- B. I get some pain while traveling, but none of my usual forms of travel make it any worse.
- C. I get extra pain while traveling, but it does not compel me to seek alternative forms of travel.
- D. I get extra pain while traveling which compels me to seek alternative forms of travel.
- E. Pain restricts all forms of travel.
- F. Pain prevents all forms of travel except that done lying down.

SECTION 10 — Changing Degree of Pain

- A. My pain is rapidly getting better.
- B. My pain fluctuates, but overall is definitely getting better.
- C. My pain seems to be getting better, but improvement is slow at present.
- D. My pain is neither getting better nor worse.
- E. My pain is gradually worsening.
- F. My pain is rapidly worsening.

FIGURE 1. The Oswestry Low Back Pain Disability Questionnaire is an example of a condition-specific questionnaire which captures information regarding disability or activity intolerance. Each category is scored by the patient and is then used for comparison 2 to 4 weeks later to evaluate the treatment outcome.

TABLE 2. Criteria for Outcomes Management Tools

Safety
Reliability
Validity
Normative database
Cost (time, money)

These items represent necessary criteria to be fulfilled when selecting an outcomes assessment or management tool.

a specific tool is worth the financial expense or time spent in your clinic to utilize (19–22).

As stated above, outcomes assessment tools should be time efficient, inexpensive, and valid to be of practical use in your clinic. Validity can be defined in a number of different ways and Table 3 outlines the different types of validity with a brief definition of each (19).

CLASSIFICATION OF OUTCOMES ASSESSMENT TOOLS

A pen-and-paper questionnaire approach is particularly valuable for gathering outcomes information as it is a time-efficient, inexpensive, and simple method for gathering information. These questionnaires provide valid and useful information to assess outcomes, yet are easy to administer and score and do not take up a significant amount of provider or staff time. Tools such as an inclinometer are also invaluable for quantifying objective data of a patient’s functional status and therefore, can determine progress.

Symptoms/Pain

Pain level can be assessed by the use of some type of scale, such as a 0-10 scale. Use of this scale addresses the patient’s perception of pain level. Tracking of pain is important as severe pain intensity is described as one of the four factors which predicts that a patient’s condition may be complicated and outlast the usual natural history (20).

TABLE 3. Validity

Face or content (makes sense)
Construct (the test result follows acceptable theory and is applicable to the case)
Concurrent (correlates with other measures)
Discriminant
sensitivity (high true + rate)
specificity (high true – rate)
Prescriptive
Ability to classify patients into different treatment groups which will optimize outcomes

Validity is one of the most important criteria when determining the utility of a test and can be defined in many different ways. The definition of the different types of validity are described in the parentheses after each term.

Examples of OA instruments belonging in this category include the VAS (Visual Analogue Scale) (5), Numerical Pain Scale (NPS) (21, 22), and the McGill/Melzack Pain Questionnaire (7, 8).

The VAS instrument can be divided into three scores (5) (see Fig. 2):

- pain level right now
- average pain grade
- worst pain grade

When describing the “average pain grade” for the chronic patient (pain and disability present greater than 6 months), request their pain level as it relates to the last 6 months. To reduce the three numbers to one, the *average* of the three ratings is obtained and then multiplied by 10 to yield a 0-100 score. The final score can then be categorized as “Low Intensity” (pain < 50); or “High Intensity” (pain > 50) (5). The VAS, like other measures of a patient’s progress, should be performed every 2 weeks, since a patient’s failure to progress over a 2 week period may indicate a need for a change in the management approach (20).

Another option in the “pain perception” category includes the McGill/Melzack Pain Questionnaire (7). This instrument was designed to measure three items (8):

- Sensory discrimination
- Motivational evaluation
- Cognitive evaluation

The Pain Drawing is a very popular tool used to assess pain in terms of quality (sharp, ache, numb, burning, etc.) and location. Although this method of assessing pain is primarily qualitative, a scoring method has recently been reviewed and found to correlate reliably with the Hy (Hypochondriasis) and Hs (Hysterical) scales of the Minnesota Multiphasic Personality Inventory (MMPI) (23). The reviewers concluded that this could screen out 93% of patients with “poor psychometrics,” and hence, could prompt an appropriate psychological consultation or referral (patient/case specific).

A quantifiable method of assessing tissue tenderness following the American College of Rheumatology recommendations is also available (Table 4) (24). In this approach, the provider rates the patient response to palpatory stimulus *not* by asking the patient to rate the pain level, but rather by observing for facial grimace and signs of withdrawal (ie., pain behavior). By comparing the painful sites to uninvolved body areas, the provider can determine if the response is increased physiologically (appropriate behavior) or exaggerated or nonorganic in character (an exaggerated response to a non-noxious stimulus). By combining this objective pain assessment technique with a

INSTRUCTIONS: Please circle the number which best describes the question being asked.

NOTE: If you have more than one complaint, please answer each question for each individual complaint and indicate which score is for each complaint.

EXAMPLE:

	headache	neck	low back							
0	1	2	3	4	5	6	7	8	9	10

1. What is your pain RIGHT NOW?

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

2. What is your TYPICAL or AVERAGE pain (for chronic patients, refer to last 6 months)?

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

3. What is your pain AT ITS WORST (How close to "0" does your pain get at its worst?)

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

What percentage of your awake hours is your pain at its worst? _____%

CALCULATION: Pain "now" + Average pain + Pain at worst / 3 X 10 = _____ (0-100)

- Low Intensity = pain < 50
- High Intensity = pain > 50

NAME _____ AGE _____ DATE _____ DOA _____

FIGURE 2. Triple Visual Analog Scale. The Triple VAS allows the provider to better understand the pain perception of a patient more accurately than the single VAS which is usually a screen for pain right now only.

TABLE 4. Standardized Palpation of Tenderness

Using 4 kg of pressure (enough to blanch the tip of the thumbnail when pressed on a table).

- Grade 0 = no tenderness
- Grade 1 = tenderness w/ no physical or verbal response
- Grade II = tenderness w/ grimace & /or flinch
- Grade III = tenderness w/ withdrawal (+ jump sign)
- Grade IV = withdrawal to non-noxious stimuli

The rheumatology scale offers the provider an objective means of assessing a patient's pain perception. When used in conjunction with the subjective triple VAS tool, the provider can gain an insight into the patient's pain perception and sincerity.

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subjective numerical pain scale, the provider can determine the patient's perception of their pain tolerance in relation to the observed behavior. By doing so, consistency between the two (or the lack thereof) gives the provider important information regarding patient pain threshold as well as sincerity. Using a 0-10 numerical pain scale, severe pain intensity has been considered by some as pain greater than 6 (usually documented as "6/10," allowing the reader to understand that a 0-10 scale was used) (5).

Physical Capacity (Impairment)

Physical capacity tests measure function such as joint mobility, muscle strength and endurance. Examples include cervical rotation mobility, hip range of motion and trunk

extensor endurance. Excellent reliability and normative databases have been found for spinal and extremity range-of-motion testing (25–38). These tests are inexpensive, time efficient, reliable, valid, and have normative databases. Hence, they serve as objective outcomes data and therefore, can help determine the level of function change before and after treatment or rehabilitation intervention. Since no test is 100% valid or reliable, the provider is encouraged to follow the referenced protocol when performing physical capacity tests to improve accuracy and reduce the changes for error. More specifically, Ekstrand and Gillquist observed an improvement in the CV (coefficient of variation) from 7.5 +/- 2.9 to 1.9 +/- 0.7 after using the tests for 2 months and making subsequent refinements which included (32):

1. Standardized inclinometer placement to ensure the pendulum of the gravity type swings freely
2. Stiffening of the exam table (plywood with Velcro bands)
3. Identify bony anatomical landmarks (mark on skin)
4. Standardizing the exam bench height for each visit

One of the more published physical capacity tests is the Sorenson test, or the “static back extensor endurance test” (9, 38). The Sorenson test has been found to be able to predict first time onset of low back pain (LBP) in healthy individuals, as well as predict recurrence rates in those already suffering a LBP episode (39, 40). The test is performed with the prone patient’s pubic bone at the edge of the table and their upper torso off the table. With the subject’s arms folded across his or her chest, he or she is asked to raise his or her trunk up to horizontal and maintain the position as long as possible. The “normal” is age and gender specific, but averages between 1 and 1.5 minutes, with a maximum of 4 minutes prior to terminating the test) (9) (see Fig. 3). This, as well as other strength and endurance tests, should not be prescribed to a patient who is in an acute stage of their injury. Rather, the Sorensen test is performed when the patient has stabilized sufficiently to allow for strength and endurance forms of rehabilitation, typically 2 to 4 weeks after presenting with uncomplicated low back pain (patient/case specific)

Functional Capacity (Disability)

Condition-specific Questionnaires — Condition-specific questionnaires (disease-specific questionnaires) are available for many regional complaints. Lower back, neck, headache, and upper and lower extremity regions all lend themselves to evaluation by a patient-driven questionnaire regarding functional limitations.

Regarding low back pain, the Oswestry Low Back Pain Disability Questionnaire (12, 13), the Roland-Morris

Disability Questionnaire (16), the Dallas Pain Questionnaire (41), and the Low Back Pain TyPEs (Technology of Patient Experience specification) (42) are examples. In addition, there are many others, of which some have been more recently introduced (43, 44).

The Oswestry Low Back Pain Disability Questionnaire (12) is very popular and often used as a “gold standard” in studies comparing other low back questionnaires (43-45). A “Revised” version measures both impairment (function) and disability (limited ADLs) (13). Erhard et al. reported that a score of 11% was necessary for discharge and return to work readiness (46).

Roland-Morris Disability Questionnaire (16) was originally derived from the sickness illness profile (SIP) (47) but was modified for the low back and is often used with the VAS. There are 24 items to check off to describe their condition as it feels *today*. Scores range from 0 to 24, covering a range from no complaint to extreme disability. Reliability has been established when compared to the SIP and its major subscales (48).

The Low Back Outcome Score was recently introduced by Ruta et al., who utilized a stringent reliability and validity process to screen this instrument (43). The validity and reliability of the instrument was established. This article also contains a good literature review and includes several of the previously mentioned instruments.

Similarly, the Quebec Back Pain Disability Scale was also recently introduced, demonstrating a test-retest reliability of 0.92, and Cronbach’s alpha coefficient of 0.96 (44). This instrument was also compared to the Roland-Morris, Oswestry, and SF-36 scales and found reliable and valid. It was recommended to be used to monitor a patient’s progress in treatment or rehabilitation programs.

Low Back Pain TyPEs (42) was not designed to result in a single score. Rather, each question is sufficiently important to stand alone and serve as a baseline for future comparative assessment (per communication with Deyo). In essence, this instrument serves as an excellent history form specifically designed for LBP patients.

The Neck Disability Index (15) was designed to assess the disability associated with conditions of the cervical spine. This instrument was patterned after the Oswestry Low-Back Pain Disability Questionnaire, is scored similarly, and was validated and found to be reliable.

The Headache Questionnaire (49) consists of 85 questions and was used by Whittingham, et al., in testing the treatment efficacy of manipulation for headaches. No scoring method was received (personal correspondence with the author) and, therefore, this may serve as an excellent history-gathering device, void of a quantitative numerical score. More recently, the Headache Disability Inventory (HDI) was developed and met validity/reliability criteria and is able to be scored (50). In addition, 48 of the possible 100 points represent functional information and 52 of the

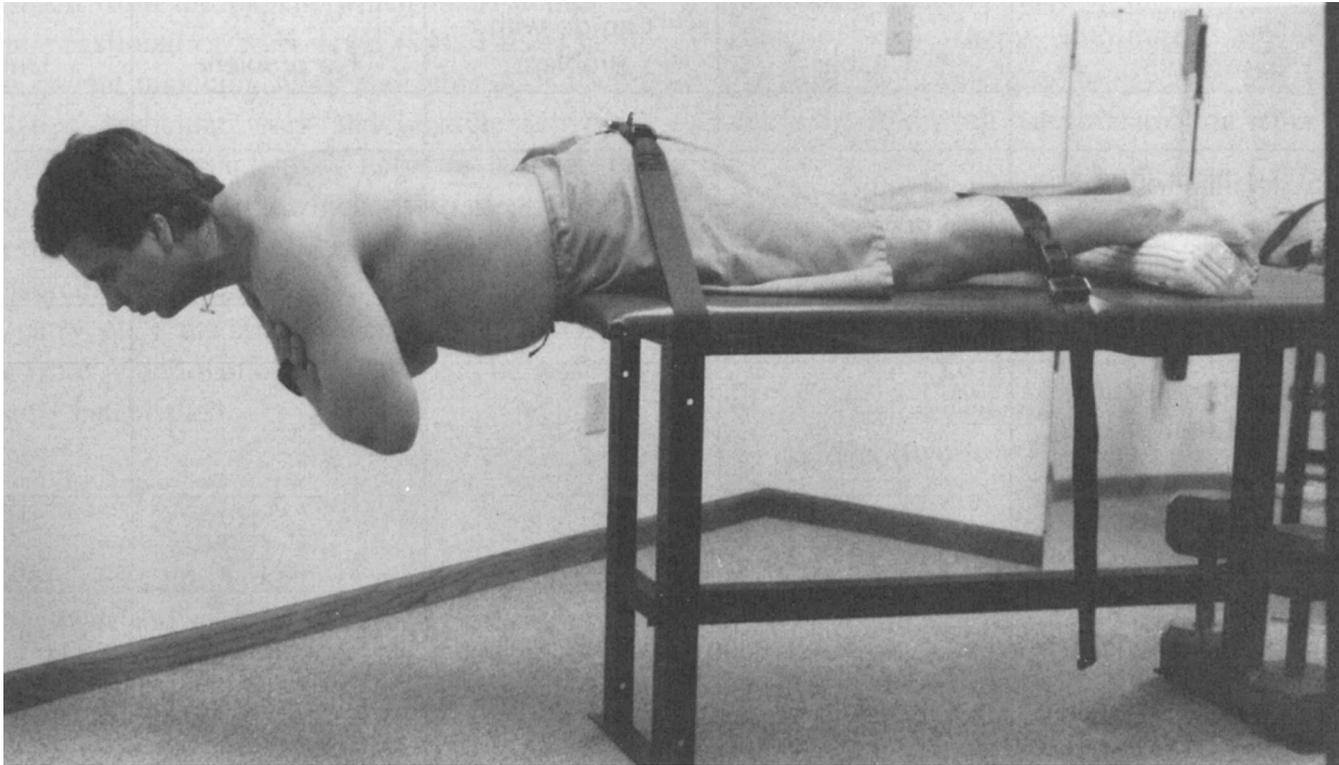


FIGURE 3. Sorenson Test. The static back endurance or the Sorenson test is an important function performance test as it not only can be used to compare the patient to normative data, but it also can help to discriminate present from future low back sufferers. Hence it can facilitate in goal setting as well as in establishing treatment prescription decisions.

100 points represents emotional information. Hence separate scores for two scales, one for function and the other emotion, can be obtained by the HDI.

In addition to the Low Back TyPEs, the Health Outcomes Institute has developed many other condition-specific questionnaires or “TyPEs.” These include OA tools for the following conditions: 1) carpal tunnel syndrome, 2) asthma, 3) chronic obstructive pulmonary disease, 4) depression, 5) hypertension/lipid disorders, 6) osteoarthritis, 7) rheumatoid arthritis, 8) allergic rhinitis, and 9) smoking cessation (51).

There are several instruments that can be used to assess upper extremity (UE) dysfunction. For example, shoulder injuries can be assessed by the use of the Self-assessment of Function Questionnaire (52). This is a 15-item instrument which includes activities of daily living as the main outcomes assessing method. A scoring method is available for quantification. The shoulder can also be assessed by the use of the American Shoulder and Elbow Surgeons Shoulder Evaluation Form (53). This consists of five sections which include pain (5–0 scale), motion (5–0 scale), strength (5–0 scale), stability (5–0 scale), and function (4–0 scale). The latter comprises aspects of a physical exam with the history of the patient. Upper extremity pain can be assessed by the use of the Upper Extremity Pain

Questionnaire (54). This is ideal for elbow, wrist/hand, any upper extremity complaint. This instrument consists of 17 items which represent activities of daily living (ADLs), which are scored on a 0–10 scale, similar to a visual or numerical pain scale.

The knee can be assessed by using the Functional Index Questionnaire (FIQ) (55). This is an 8-item questionnaire regarding ADLs associated with lower extremity function. Each question is responded to by choosing one of four options which include “no problem”, “can do with problem”, “unable,” or “unknown” (Fig. 4). When used in series, this instrument can yield outcome information that can provide the practitioner with information that can help determine a treatment plan or clinical decision.

General Disability Questionnaires — The *disability* category includes questionnaires which can help predict the “difficult to manage” case. One example of such an assessment scale used to attempt to determine who is at risk for becoming permanently disabled from chronic pain is called the *Vermont Questionnaire*. The use of this instrument was compared to the ability of a group of physicians to predict disability based solely on experience (56). This model had a predictive value of 89% and was better in predicting disability than the physician group across all

The following information is to be recorded at approximately the same time each day (preferably at bedtime). Put an "X" in the column that best describes the way you feel. Please complete the following:

"Today did you have any problem or discomfort in your left / right knee at all with the following activities?"

	Unable	Can do with problem	No problem	Unknown
1. Walking as far as 1 mile				
2. Climbing up 2 flights of stairs (16 steps)				
3. Squatting				
4. Kneeling				
5. Sitting for prolonged periods with your knees bent in one position				
6. Climbing up 4 flights of stairs (32 steps)				
7. Running a short distance (100 yards-length of football field)				
8. Walking a short distance (1 block)				

FIGURE 4. Functional Index Questionnaire (FIQ) (Knee). Knee FIQ was designed as a condition-specific tool to assess treatment outcome of patellofemoral knee pain conditions. As with the other OA tools presented, this instrument was found to be valid, reliable, and sensitive to change over time. (Source: Harris E, Quinney H, Magee D, Sheppard MS, NcQuarrie A. Analysis of outcome measures used in the study of patellofemoral pain syndrome. *Physiother Can* 1995; 47:264–272.)

samples. The study indicated two potential uses for this type of predictive model. The first is to stratify patients into those who:

1. are going to return to work (RTW) with certainty, almost regardless of the treatment type received (very low disability scores).
2. will be resistant to treatment and may not RTW "no matter what" (very high scores).
3. are likely to RTW if treated effectively.

The second potential use is to alert health care providers to the critical risk factors associated with difficult LBP cases. There is a short version with a total of 14 questions which requires approximately 3–5 minutes to complete. Both validity and reliability of this instrument has been reported in a recently published article by the Vermont Rehabilitation Engineering Research Center for Low Back Pain (57).

The FASQ (Functional Assessment Screening Questionnaire) is a 15-item checklist designed for a primary care population in evaluating disability associated with chronic pain (17). A third scale, FABQ (Fear Avoidance Beliefs Questionnaire) is also available (58). This instrument may be used when assessing the chronic pain patient where fear avoidance behavior is suspected. This questionnaire is also

useful as a psycho-social screening test as fear of pain associated with activity is common in the chronically painful patient.

Functional Capacity Tests — Functional capacity tests assess whole body movements or functions as opposed to single functions such as straight-leg raise or spinal range of motion (ROM). Since multiple functions are assessed by this method, this type of testing is often utilized when assessing work capacities when returning an injured worker back to the work place or when determining an individual's level of disability. Various tasks are assessed when assessing a patient for returning to work which may include the following:

Lifting and carrying — assessed by the PILE (Progressive Isoinertial Lifting Evaluation) (59) and the Job Demands Questionnaire (14)

Aerobic — assessed by a cycle ergometer, treadmill tests, step tests, or by field tests (60)

Static position tolerance — assessed by position tolerances which include reaching from standing, stooping, crouching, and kneeling positions (14).

Balancing — assessed by a one-leg balance test (61)

Hand function — assessed by Matheson's hand sort where the patient matches activities from charts which correlate with their particular occupation (14).

The Spine and Hand Function Sort are methods of gathering information from the patient which helps define his or her current vocational or work level (14). This is completed by the patient matching work and other ADLs with charts correlating particular work and lifestyle activities. This information is important, as it helps identify the typical physical stressors with which the patient is confronted on a daily basis. In addition, when combined with physical measurements of function (such as ROM, strength, balance, lift/carry, etc.), the spine and/or hand sort is a key piece of data from which work restrictions can be logically and intelligently established.

Other Types

Psychosocial issues are a major complicating factor in patient management and must be identified early in patient management. This outcomes assessment category is described as "Psychometrics." If improvement is not noted, certainly by the end of the initial 6 weeks of care, this issue should be thoroughly investigated. Patients with significant problems in this area may require additional care from a tertiary treatment center or a multidisciplinary team. At minimum, the addition of a clinical psychologist, specializing in chronic pain behavior, is a necessary addition to the management team.

Patients in this category often have one or more of the following (62):

- job dissatisfaction
- previous disability
- high anxiety
- depression
- symptom magnification
- pain avoidance behavior
- catastrophizing and poor coping strategy
- drug or alcohol dependency
- family problems

A partial list of instruments in this category include:

1) HSQ (Health Status Questionnaire, the last 3 questions, #36-38) (51); 2) Waddell Non-Organic LBP Signs* (63); 3) SARS (Somatic Amplification Rating Scale)* (64); 4) Modified Zung Depression Index (65); 5) Modified Somatic Perception Questionnaire (66); 6) SCL-90R (67); 7) DRAM (Distress and Risk Assessment Method) (68); 8) Beck's Depression Scale (69); and 9) Fear Avoidance Beliefs Questionnaire (FABQ) (58).

*Obtained through physical examination procedures, *not* by questionnaires.

Of those listed above, Waddell's Non-organic LBP signs and the SARS are physical examination procedures (63, 64). The former has been well accepted and used as a "gold standard" in many studies. It is made up of eight tests which are placed into five categories. The SARS is a seven-item scale which is made up of many of the eight-test/five-category scale items introduced by Waddell but are "graded" with reference to severity. The Waddell signs include the following categories (63):

1. *Pain* — Superficial and nonanatomical (two tests)
2. *Simulation* — Axial loading and simulated rotation (two tests)
3. *Distraction* — Supine versus sitting straight leg-raise test ("flip sign")
4. *Regional Neurology* — Nonanatomical neurological findings (two tests)
 - a. Motor
 - b. Sensory
5. *Overreaction or Exaggeration* — Noted at any time during the examination

Waddell states that neck pain and nerve root tension may be provoked by the two simulation tests (axial compression and trunk rotation, respectively), and that care must be practiced to avoid a "false positive" Waddell sign if either of these conditions exist.

The SCL-90-R (Symptom Checklist-90, Revised) appears to be an increasingly popular instrument for measurement of maladjustment in a chronic low back pain (CLBP) population (67). It is comprised of nine scales, but only two common important factors are represented (i.e., general psychological discomfort and physical symptoms). Hence two scales were identified as being sufficient to separate the measurement of physical symptoms (somatization scale) from the more reliable composite measure (Global severity index or GSI) which measures psychological discomfort. Therefore, advantages of this instrument include its brevity, ease of administration, face validity to CLBP patients, and superior reliability.

Regardless of the psychometric instrument utilized, it must be remembered that these instruments are only "screens" for psychological distress. If scores are relatively high, a psychological referral will most likely lead to the most appropriate care (patient/case specific).

Patient satisfaction has become an important outcomes issue, especially with managed care companies and with quality assurance certification (70, 71). Instruments measuring patient satisfaction yield important information about the quality of the health care service as perceived by the patient by assessing the following:

1. Acceptance of care
2. Perception of the technical competence of a health care provider

	ALMOST ALWAYS	SOME OF THE TIME	HARDLY EVER
1. I am satisfied that I can turn to a fellow worker for help when something is troubling me.			
2. I am satisfied with the way my fellow workers talk things over with me and share problems with me.			
3. I am satisfied with the way my fellow workers accept and support my new ideas or thoughts.			
4. I am satisfied with the way my fellow workers respond to my emotions, such as anger, sorrow, or laughter.			
5. I am satisfied with the way my fellow workers and I share time together.			
6. I enjoy the tasks involved in my job.			
7. Please check the column that indicates how well you get along with your closest or immediate supervisor.			
COMMENTS: _____ _____ _____ _____ _____			
NAME _____ DATE _____			

FIGURE 5. Modified Work APGAR. The Modified Work APGAR was designed to help identify “Job Dissatisfaction,” a psychosocial barrier to recovery.

3. The setting where care was provided
4. The effectiveness of the health care provider

The Visit-Specific Questionnaire was used in a study comparing medical doctors’ and chiropractors’ patient satisfaction with regard to the “report of findings” given to the patient by the health care provider (72), and with overall patient satisfaction (73). There are several varieties which can be used in a clinical setting. These include:

- Visit-Specific Questionnaire (73, 74)
- Patient Satisfaction Questionnaire (74)
- The Chiropractic Satisfaction Questionnaire (75)

The next category measures *job dissatisfaction*. One method of assessing outcomes is the Modified Work APGAR which resulted from working with 3,020 aircraft employees to identify job dissatisfaction risk factors for

reporting acute back pain at work (76). Factors identified in the MMPI (psychosocial responses) and certain work perceptions resulted in the following observations and these findings prompted the formation of the Modified Work APGAR (Fig. 5):

1. Those who “hardly ever” enjoyed their job tasks were 2.5 times more likely to report a low back injury ($p = 0.0001$) than subjects who “almost always” enjoyed their work.
2. Subjects scoring highest on the Scale-3 (Hy) of the MMPI were 2.0 times more likely to report a low back injury than subjects with the lowest score ($p = 0.0001$).

Some caution should be used when considering the use of the Work APGAR as many patients may be unwilling to fill out this form for fear of employer retribution (per communication with Erhard).

TABLE 5. Outcome Assessment Classification

CATEGORY BASED ON ASSESSMENT GOALS	OUTCOME ASSESSMENT INSTRUMENT
1. PAIN LEVEL	Numerical Pain Scale (NPS) (21, 22) Visual Analogue Scale (VAS) (5) McGill/Melzack pain questionnaire (7, 8)
2. REGION/CONDITION-SPECIFIC DISABILITY Q's LBP	Oswestry Low Back Pain Disability Questionnaire (12, 13) Roland-Morris Low Back Questionnaire (16) Dallas Pain Questionnaire (41) Low Back Pain "TyPE" (42) Neck Disability Index (NDI) (15)
NECK HEADACHE	Headache Disability Questionnaire (HDI) (50)
3. GENERAL HEALTH	Dartmouth COOP charts (77) Health Status Questionnaire 2.0 (51, 77) Short Form (SF) -36 (76, 77)
4. PSYCHOMETRICS	HSQ 2.0 (Mental Health scale and questions 37-39)* (51, 77) SF-36* , (Mental Health scale) (76, 77) Waddell's Non-organic LBP signs (63) ** Modified Zung Questionnaire (65) Modified Somatic Perception Questionnaire (MSPQ) (66) Beck's Depression Scale (69) Fear Avoidance Beliefs Questionnaire (58) SCL-90-R (67)
5. PATIENT SATISFACTION	Patient Satisfaction Questionnaire (74) Visit-Specific Questionnaire (73, 74) Chiropractic Satisfaction Questionnaire (75)
6. JOB DISSATISFACTION	APGAR (76)
7. GENERAL DISABILITY	Vermont Disability Questionnaire (56) Vermont Disability Questionnaire – Brief form (57) Functional Assessment Screening Questionnaire (FASQ) (17) Fear Avoidance Beliefs Questionnaire (FABQ) (58)
8. JOB DEMANDS	Job Demands Questionnaire (JDQ) (14)

Note: This chart is meant to serve as a guide identifying various OM tools with specific methods of capturing the goals listed in the left-hand column. Once an OM tool is chosen for gathering baseline/initial information, the same instrument must be used on follow-up in order to assess the patient's outcome to the previously rendered care. Also, not every tool listed above is necessary (or even appropriate) to utilize on each and every case. The decision to use an instrument should be driven from the clinical evaluation of the patient. Hence, respond to care or present identically.

*Only parts of the questionnaire relate to the categories.

**Represents physical examination tests, not self-administered questionnaires

THE INTEGRATION OF OUTCOMES ASSESSMENT INTO CLINICAL PRACTICE

Once an instrument is selected for use in the clinical setting, deciding when it should be used is another challenge. To assist in answering this question, case management may be broken down into the following stages:

1. Initial/baseline
2. Follow-up/re-examination
3. At times of exacerbation
4. At the conclusion or discharge of the case

There has been a great influx of new instruments reported in many referenced journals claiming to be able to assess various problems or conditions. Many of these outcomes assessment tools are reported to be valid and reliable. Be-

cause of the increasing number of instruments now available, it is practical to categorize these by variety or assessment goal. More specifically, some OA tools yield information regarding general health, while others are condition-specific, such as low back pain questionnaires (77). When instruments from several categories are utilized and grouped together, the interpretation of the valid information obtained will facilitate case management of a patient by identifying the pain and disability issues as well as the impact the condition is having on the patient's general health or lifestyle. By identifying these items, appropriate goals can then be addressed. Many of these groupings or, outcomes management systems, address demographics, diagnosis, lifestyle risk factors, comorbidity issues, prognosis issues, and treatment. Most importantly, **once an instrument is chosen, it should be utilized throughout the remainder of the patient's care, since these**

<p>Acute Pain Patient Initial Visit: Patient Forms: 1) VAS 2) Condition-specific functional questionnaire (i.e. Oswestry, neck disability index) 3) SF-36 (Acute form- General Health) 4) Job Demands Questionnaire if patient is disabled Examination: 5) Range of motion</p> <p>At Follow-up (the options include): Patient Forms: 1) VAS 2) Condition-specific functional questionnaire (i.e. Oswestry, neck disability index) 3) Job Demands Questionnaire if not done initially and job involves significant lifting, carrying or prolonged sitting/standing (>1 hour without a break) 4) Patient Satisfaction Questionnaire 5) SF-36 (Acute form) Examination: 6) Range of motion 7) Strength/endurance tests within patient's intolerance</p> <p>If at 4 weeks patient has made no progress with above OA's, on the next visit patient completes the following: Forms: 1) Matheson's spinal or hand function sort 2) SCL-90 (or, Beck Depression Inventory, Zung Depression Questionnaire, etc.) Examination: 3) Static position tolerance tests 4) Aerobic capacity tests 5) Hand function tests</p>
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FIGURE 6. An example of a time-line approach to utilization of OM tools.

instruments are not interchangeable. Categories may include: 1) Pain perception; 2) Condition-specific functional disability questionnaires; 3) General health; 4) Psychometrics; 5) Patient satisfaction; 6) Job dissatisfaction; and 7) General Disability, and 8) Job Demands (see Table 5).

Although there are many opinions as to which of the many instruments should be utilized at initial visit, re-examination, exacerbation, or discharge, one thing is clear. In order to determine outcomes, one must utilize the same instruments on follow-up that were initially used at baseline. Failure to do so will not allow for an accurate assessment of outcomes as different instruments have different methods of scoring, do not carry the same reliability or validity, and are not interchangeable (See Figure 6).

CONCLUSION: A PRACTICAL APPROACH

With a little training, outcomes management (OM) can contribute greatly to the musculoskeletal practice. Improved goal setting, patient motivation, determining end points of care, and chart documentation are all clear benefits. Most of the resources mentioned in this article are

demonstrated in a practical workbook and videotape (78). Also, there is software available to process and score the outcomes data generated from many of the outcome assessment tools described in this article (79).

OM is here to stay. Instead of relying on unreliable, invalidated assessments of your patients' status which are of little value in a managed care environment, it is now possible to modernize your practice with little expense. OM will continue to become streamlined. Of greatest benefit will be the ability to compare patient data for epidemiological and clinical research purposes.

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