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Recent advance

Outcome measurements in hand and upper limb surgery

Évaluation des résultats en chirurgie de la main et du membre supérieur

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Abstract

Of marginal importance only 20 years ago, outcome measurement has become one of the most widely published topics in medical literature. The concept of global health is described by the International Classification of Function, Disability and Health. Today, the surgeon's perspective is no longer sufficient to evaluate global health condition of a patient. The patient cannot be reduced to an organ. Outcome measurement must take into consideration body structures and function (symptoms, organ function) as reviewed by a professional, the individual's functional health status in terms of activity and evaluated by the patient himself, and his participation in his social environment. These principles are now being applied to our specialty and it is essential to know them to be able to collect, analyze and publish valid results. This review article defines the rules for using clinical outcome tools, provides the most widely used clinical and self-evaluation forms for our specialty as well as instructions for their use. Global outcome is usually obtained by arithmetic addition of scores; which is a simple but questionable method. The sieving and radar charts can be used for a more comprehensible representation showing areas of relative strength and relative weakness on a graph, as well as depicting general overall performance. The reliability of data is also affected by declaration of conflicts of interest, negligence or fraud. The level of evidence is questionable as long as a data verification system is not implemented.

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Keywords: Evaluation; Outcome; Results; Scores; Self-evaluation; Upper extremity; Hand; Wrist

Résumé

Encore marginale il y a 20 ans, l'évaluation des résultats est devenue un des sujets les plus publiés dans la littérature médicale. Le concept d'état de santé global est bien précisé par la classification internationale du fonctionnement, du handicap et de la santé. Actuellement, le point de vue du chirurgien ou d'un de ses collaborateurs ne suffit plus. Si l'on veut apprécier l'état de santé global, le patient ne peut pas être réduit à un organe. L'évaluation des résultats doit prendre en compte l'état de santé organique (symptômes, fonctions organiques) examiné par un professionnel, l'état de santé fonctionnel de l'individu en tant que tel (activités) par le patient lui-même, et les aptitudes dans son environnement social (participation). L'application de ces principes dans notre spécialité est en cours, et il est indispensable de les connaître pour savoir collecter, analyser et publier des résultats crédibles. Cette mise au point précise les conditions d'utilisation des outils cliniques, présente les fiches d'évaluation (cliniques et autoévaluation) les plus utilisées dans notre spécialité avec leur mode d'utilisation. À partir de toutes ces données, la représentation du résultat est habituellement réalisée par addition arithmétique des scores ; cette méthode est simple, mais très critiquable. Le tamisage et le graphique multifactoriel sont des propositions pour une présentation plus compréhensible. Enfin, la fiabilité des données dépend aussi de la déclaration des conflits d'intérêt, de la négligence ou de la fraude. Le degré de preuve restera limité en l'absence de vérification des données.

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Mots clés : Évaluation ; Résultats ; Bilans ; Autoévaluation ; Membre supérieur ; Main ; Poignet

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1. Introduction

Outcome measurement is necessary to know if our treatment methods are effective. The stakes are high as it is this result that will justify risks, difficulty, disadvantages and cost of treatment. So which criteria are used to evaluate results of our procedures? What clinical tools are available for measurement? How can we classify them? How can we avoid bias in measurements? How to obtain a global assessment of these results in order to compare them? Many questions arise in clinical practice as well as in clinical research that has launched great interest in our community over the past 20 years or so.

In hand surgery, the results are not judged based on simple criteria such as life duration/longevity. Our procedures target functional outcomes and better quality of personal and social life.

Outcome measurement is mandatory to make progress on our techniques as well as to inform our patients and justify our practice to payers. We have made great progress in recent years; however, critical analysis of literature in our specialty still shows great shortcomings in our evaluation procedures [1–4]. We lack insight and rigor in the choice of evaluation criteria and in taking measurements. We do not take into account patient perspective even though they are the ones most affected by their own functional and relational capacity.

This paper aims to explain the decisive progress that should lead to the improvement of evaluation. It is important that our specialty does not remain at the margins of this global movement; our credibility to our patients, peers, administrations and partners is at stake.

This review is dedicated solely to outcome measurement of treatments; other related fields such as the evaluation of the quality of surgical act, surgeon expertise, and methodology of clinical trials are not considered.

2. Historical stages of evaluation

In 20 years, outcome measurement has become one of the most important topics in our specialty [5]. Among the 20 most cited and most influential articles in hand surgery over the past 20 years, five reported on outcome measurements [5].

2.1. Standardization of clinical measurement tools

As for all scientific or technical activities, qualitative and quantitative measurements must be distinguished. Quantitative measurements describe physical or behavioral characteristics with precision, while quantifying allows comparison of results and their communication. Most variables measured in our specialty are not visible and a tool is necessary to quantify them. Such are physical variables as force which needs a dynamometer to be measured or sensibility. The reliability of measurement tools depends on the quality of their calibration as well as how they are used. Certain values such as force are measured on proportional scales, meaning that the interval between values is regular. Other values such as pain or satisfaction cannot be measured on proportional scales. The

intervals between values are not regular and do not allow arithmetic comparisons or statistical analysis. We use a tool to test sensibility but we cannot say if a patient has lost or gained 50% of his sensibility. This calculation has no meaning unless the scale is proportional.

In any case, the result is reproducible only if the conditions of measurement are standardized. However sophisticated, these instruments record false values if their use is not standardized, and lack of standardization is a great source of bias. Bias is a step or procedure that engenders errors in the results of a study; such as ‘bias of measurement’, ‘bias of auto compliance’, ‘bias of estimation’ and especially bias related to conflict of interest. When comparing preoperative and postoperative status of health, the evaluation is meaningful only if the same instruments are used with the same procedures.

Efforts towards standardization are a great progress and are mandatory. However, bias exists despite our efforts, and certain bias is difficult to avoid such as encouraging patients to make the effort during measurement recording.

Thus, quantitative clinical measurements are wrongly called ‘objective’ measurements; these measurements are influenced by the subjectivity of the examiner and the examinee. Factors of bias include empathy of the examiner, encouragement, patient/examiner relationship, context of work-related accident and compensation for invalidity; these play a clear and essential role.

Pretending clinical measurements are objective just because they are recorded by a professional is an old completely obsolete concept. All clinical measurements can be biased by the subjectivity of the patient and/or the examiner.

2.2. Global evaluation (outcome movement)

This movement originated in the USA in 1994 and modified the approach to outcome measurement directing it towards global evaluation of the patient as a whole as opposed to focusing on a limb or organ [6–10]. Contrary to purely clinical evaluation used up until then, this global evaluation includes outcome measurement by the patient himself, based on the principle that no one is better placed than the patient to know his own needs and criteria for results. Patient self-evaluation is especially adapted to certain aspects of health such as daily activities, satisfaction, social well being, pain and quality of life. What now seems obvious to us was a great revolution as tools were then reserved for clinical measurements. It had to be shown that quantitative measurement tools for ‘subjective’ measurements could be precise and equally useful as measurement of force or sensation. Since 1994, the development of self-questionnaires evolved as a result of much hard work on the part of the whole scientific community [11]. The quality of the self-questionnaires has improved and their validity is evaluated using criteria of validity and reliability, reproducibility and sensitivity similar to clinical measurement tools. A consensus on a checklist for a study of the value of evaluation forms has been published recently [12].

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