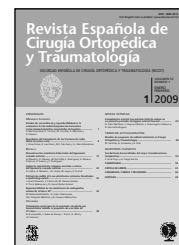




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## REVIEW ARTICLE

# Model for a healthcare quality program in orthopedics

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### KEYWORDS

Healthcare quality program;  
Quality in orthopedic and trauma surgery;  
Quality assessment

### Abstract

Healthcare quality entails the capacity of a team of healthcare professionals to do what needs to be done, to do it well and in a timely manner striving to meet the patients' needs through a judicious use of available resources. Total Healthcare Quality is a dynamic concept whereby everybody in an organization undertakes to work to a methodology aimed at continuous improvement. It is a model characterized by the commitment and involvement of every professional, where communication and information play a crucial role. A methodology that seeks continuous quality improvement comprises 4 essential stages: identifying areas for improvement and how improvement can best be achieved; implement the measures to obtain the improvements; assess the implementation and act on the basis of the results achieved. The quality model must include an information system (IS) that provides the data that may be necessary when it becomes necessary. This IS must be integrated within the IS of the entire organization and must be reliable. The IS will generate the indicators that will make it possible to monitor the achievement of the improvement goals previously set. For the success of this model, it is essential to put together a quality improvement team at the Department of Orthopedic and Trauma Surgery. This team, multidisciplinary in nature, will be headed by a professional with proven Leadership skills and will work to a continuous improvement methodology.  
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**PALABRAS CLAVE**

Programa de calidad asistencial;  
Calidad en cirugía ortopédica y traumatología;  
Evaluación de la calidad

**Modelo de programa de calidad asistencial en Cirugía Ortopédica y Traumatología****Resumen**

Calidad asistencial es la capacidad de un equipo de profesionales de la medicina para hacer las cosas que hay que hacer, hacerlas bien, en el momento que hay que hacerlas, satisfaciendo las necesidades del paciente y utilizando adecuadamente los recursos disponibles. El modelo de calidad asistencial total es un concepto dinámico, en el que todos los profesionales que componen una organización se comprometen a trabajar de acuerdo con la metodología de la mejora continua. Éste es un modelo de compromiso e implicación de todos los profesionales, donde la comunicación y la información tienen un papel esencial. La metodología de la mejora continua de la calidad es un proceso que sigue cuatro pasos esenciales: identificar lo que hay que mejorar y cómo hacerlo; implementar la mejora; evaluar la implementación y actuar con base en el resultado obtenido. El modelo de calidad debe disponer de un sistema de información (SI) que proporcione los datos que se necesitan en el momento adecuado. Este SI debe estar integrado en el SI de la organización y debe ser fiable. De él se extraerán los indicadores que permitirán realizar un seguimiento del cumplimiento de los objetivos de mejora que se hayan establecido a través del cuaderno de calidad. Para el éxito de este modelo es esencial la constitución de un equipo de mejora de la calidad en el servicio de cirugía ortopédica y traumatología, de carácter multidisciplinario, que trabaje siguiendo la metodología de la mejora continua y dirigido por un profesional con reconocida capacidad de liderazgo.

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**Introduction**

Healthcare quality<sup>1-4</sup> entails the capacity of a team of healthcare professionals to do what needs to be done, to do it well and in a timely manner striving to meet the patients' needs through a judicious use of available resources. The concept of healthcare quality encompasses other concepts. The concept of efficacy: to do the things that must be done; for e.g., a patient who presents at the emergency department because of a fortuitous fall on descending stairs complains of wrist pain and a deformity characteristic of a fracture of the distal radial epiphysis, which would warrant the performance of anteroposterior and lateral x-rays. The concept of technical quality: i.e. do things well and in a timely manner; for e.g., the distal radial epiphysis fracture will be resolved by closed reduction and cast immobilization. The concept of perceived quality, i.e. meet the patients' needs; following the previous example this would mean relieve the patient's pain, help them regain their arm's function, inform and reassure their family. The concept of efficiency refers to the appropriate use of resources; following the previous example, if a simple x-ray evaluation with radiographic views of the arm and wrist is enough to confirm the diagnosis, then a CT-scan must not be ordered<sup>5-7</sup>.

All of these concepts are key to understand what healthcare quality is and what we must do to make sure that our work is done in accordance with optimal quality standards. In addition, it should be remembered that working to high quality standards we also guarantee that our work exceeds the performance of other departments of orthopedic and trauma surgery (Top-20 Program by IASIST)<sup>8,9</sup>.

**Total Healthcare Quality Model**

It is a model based on a dynamic concept where all the professionals that make up an organization are committed to working to a continuous improvement methodology<sup>10</sup>. It is a model that requires the commitment and involvement of all professionals, where communication plays a key role and where one learns more from one's mistakes than from one's successes. It is a model where action takes place only once there is a clear definition of what needs to be done, i.e. the planning of the goals to be achieved and of the work needed to achieve them precludes any action. For this purpose it is necessary to:

- Define quality in accordance with the patients' needs. The range of services that includes the list of procedures and diagnostic tests that a Department of Orthopedic and Trauma Surgery offers would be the expression of such needs that must be identified and determined.
- Design the most appropriate services to meet such needs, i.e. define the organizational structure that the Department of Orthopedic and Trauma Surgery requires.
- Assign and organize resources so that these services can be rendered appropriately. This task corresponds to the person responsible for managing the Department of Orthopedic and Trauma Surgery.
- Design such processes as may be capable of generating the resources needed and applying them to the Department's activities. An example of this would be the design and implementation of clinical guidelines<sup>11</sup>.
- Design an evaluation system that permits to monitor the performance of the Department and determine whether

the quality goals established are being fulfilled. This could be called “quality control”, i.e. are we working as we should? are we attaining the appropriate quality standards?<sup>2</sup>.

The healthcare quality model is based on continuous improvement. It defines what needs to be done in order to do things as they should be done, in accordance with what was defined during the planning process.

## Continuous Quality Improvement Methodology

This is the basis for any work on quality (fig. 1). It is a process that comprises 4 essential steps: *a)* identification of what must be improved and how; *b)* implementation of improvements in anything that is not performing as we think it should; *c)* evaluation of the implementation carried out, has it produced the effects or changes that were expected?, and *d)* decision-making based on the result of the evaluation.

### Identifying areas for improvement

These areas are identified by means of:

- Any mismatch observed between the quality goals that were set at the beginning and the state of affairs revealed by the assessment carried out with the quality control methodology (for e.g. we had proposed to reach a rate of nosocomial infection of 3% and we end up with a 4% rate).
- The information furnished by the patients' complaints (for e.g., patients who were supposed to be subjected to emergency surgery complain that their procedure was unduly delayed for several days).
- The information provided by surveys conducted with patients and their relatives (for e.g., patients and their relatives complain that they are not given enough information).
- The opinions of the professionals from the Department of Orthopedic and Trauma Surgery (for e.g., professionals in

a working team by consensus come to the conclusion that one of the problems in the Department is the pre-surgical process: some clinical record or diagnostic tests have gone missing, the patient has not been appropriately prepped, etc.).

- Failure to fulfill any of the quality standards established (for e.g., following the guidelines for total hip arthroplasty, the patient should get out of bed at 24 h, but in actual fact this only happens in 60% of cases)<sup>11,13</sup>.
- The information provided by the comparison of our results with those obtained by other orthopedics departments or specialists (for e.g., our case-adjusted complications rate is one and a half times higher than that of other equivalent departments).

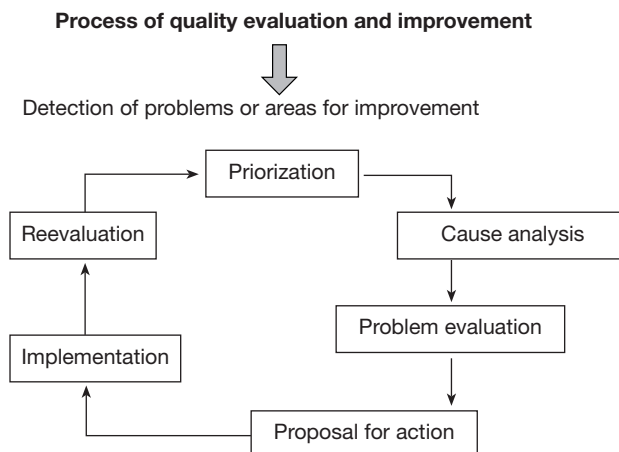
Identifying what we should improve on should not be a problem if 2 requirements are fulfilled: *a)* have an appropriate information system in place, which contains quality goals and indicators, the customer's voice and, if possible, comparisons between our results and those of other departments at our same level<sup>12</sup>, and *b)* have a team in place that constantly works to improve quality<sup>12</sup>. Once the areas for improvement have been identified, we should prioritize the opportunities for improvement.

*Prioritizing opportunities for improvement.* Having a lengthy list of areas for improvement is standard practice in our work. The question is: where should we begin? To answer it, we should use a series of consensus-based prioritization techniques so that the whole team understands why one problem rather than another was chosen as a starting point. As a general rule, the seriousness of the problem the risk it entails for patients, the number of patients involved and its financial cost are variables that must influence the decision of which problem should be tackled first. Once problems have been prioritized, the first one can be addressed, looking for its causes.

*The causes of the problem.* An analysis should be made of the reasons why we are not achieving a certain goal; why we are not reaching the appropriate quality standard or why patients are complaining of lack of information. When analyzing the causes of a problem, one must be unbiased and rigorous and refrain from adopting a defensive attitude. Working on quality requires an open mind, methodological rigor, discipline, patience and perseverance. Only if we are capable of spelling out all the possible causes of an organizational or healthcare-related dysfunction and analyze how they are influencing the current results, can we propose an optimal solution. In the event that these causes are not clear, or if it is difficult or troublesome to identify them, it is advisable to request technical assistance from an expert in quality methodologies, who will have to use specific tools to shed light on a dark matter, for e.g. carrying out an assessment. Once the causes have been defined and the solutions have been found, the next step may be addressed, i.e. the implementation of improvement measures.

### Implementing improvement measures

For each improvement measure proposed, we must define how we will carry out such an implementation, taking into



**Figure 1** Continuous quality improvement scheme.

account the difficulties and the opposition we may encounter along the way, which tend to be a common cause for failure, when we will start with the process, how and when we will measure our success and who will be responsible for the implementation and the evaluation.

## Evaluation

According to the provisions of the plan to implement a solution for a problem, after some time has elapsed it is necessary to determine whether the problem has been solved. It is recommended to carry out 2 (every 6 months) and 4 (every 3 months) annual evaluations in order to monitor the process and be able to reformulate the action undertaken if it is not being as successful as expected. Once the evaluation has been made, the next step is decision making.

## Decision making

The result may be successful (the team got it right the problem was solved) or a failure (the problem persists). If the result was successful, then the usual thing to do is take the next problem on the list and address it following the same methodology. If necessary, the previous problem can still be monitored through the information system by means of the relevant quality indicator. If the result was a failure, the causes for failure need to be analyzed: *a)* the approach was correct but more time is needed to obtain an accurate assessment; *b)* the approach was correct, but the implementation was not carried out correctly and so a revision is needed; *c)* the approach to find a solution was misguided and the whole process needs to be reanalyzed, and *d)* solving the problem is postponed because another problem has emerged which takes priority over it.

## Healthcare quality information system

An information system (IS) should provide the data required when they are required. For that purpose, it must have the following basic characteristics: *a)* it must be integrated within the IS used by the organization to which the Department of Orthopedic and Trauma Surgery belongs as this will make it easier to obtain data about it and make the most of its development, and *b)* it must be a reliable system, i.e. the data it provides must not raise any doubts. To make this possible, the system's structure must have been previously defined, with its inputs and outputs.

The IS must serve the following purposes: *a)* set goals aimed at improving and monitoring healthcare quality, and evaluating whether these goals have been achieved, and *b)* monitor the key variables (indicators) to guarantee optimal quality in the Department of Orthopedic and Trauma Surgery.

## Healthcare quality indicators

An indicator is a measurement that quantitatively expresses the situation something is in. In the realm of quality, an indicator is the quantitative expression of quality. This means that the concept of quality entails a definition –

expressed in numerical terms - of what kind of quality we desire; for e.g., zero complaints caused by inappropriate treatment, zero errors derived from operations on the wrong side or succeeding in keeping the number of discharges against medical advice below 0.1%.

Defining a series of healthcare quality indicators allows us to continuously monitor those processes that we have defined as fundamental<sup>12</sup>. This is so because we cannot use an infinite number of indicators, for several reasons: *a)* difficulty to obtain data about the healthcare process, which complicates measurements; *b)* the IS is limited, which in turn restricts the number of indicators that we can obtain in an easy and rapid manner; *c)* difficulty in defining and specifying a good indicator that can reliably measure what we want to measure; and *d)* limitations of the human mind, which makes it necessary to summarize the relevant information. We cannot handle one thousand indicators; we must select the most important ones in order to guarantee an optimal healthcare quality.

Furthermore, it is advisable to define sentinel indicators, i.e. those that warn us that an event arose that should never have occurred, which requires immediate and effective action by the quality improvement team in order to analyze why the event took place and take the necessary steps to prevent it from arising again, following the mechanism outlined in the continuous improvement scheme.

There are 2 kinds of indicator, those based on technical quality, which monitor the technical aspects of our work, and those based on perceived quality, which monitor the perception that society (patients and their relatives) has of our work.

The IS must contain a definition of the indicators that we will use to monitor healthcare quality. These indicators will be more or less difficult to calculate depending on the power of the general IS of the organization, on how we have constructed the IS of the Department of Orthopedic and Trauma Surgery and on our conception of what quality-related factors must be continuously measured in order to ensure a high quality standard. We will give each indicator a name (for e.g., nosocomial infection rate), we will define what the source of information is (for e.g., the Epine study on the prevalence of nosocomial infection), the formula used to calculate it (for e.g., number of infections occurred while the patient was in hospital divided by the number of patients admitted over a given period, multiplied by one hundred), the frequency at which the calculation is to be made (for e.g., monthly), who will provide the information (for e.g., healthcare quality unit) and to whom (for e.g., Head of the Department of Orthopedic and Trauma Surgery and/ or Quality Coordinator).

Examples of technical quality indicators: rate of infection of the surgical wound; rate of nosocomial infection; rate of infected arthroplasties; hospitalization readmissions rate before 31 days; emergency readmissions rate before 48 hours; overall mortality rate; complexity-adjusted mortality rate; unexpected mortality rate (sentinel indicator); overall complications rate; complexity-adjusted complications rate; rate of infections/colonizations caused by multiresistant microorganisms; rate of falls, rate of pressure ulcers; number of medication errors; number of medication

errors causing harm to the patient, level IV (sentinel indicator); mean length of preoperative hospital stay; mean length of stay; complexity rate; rate of compliance with the clinical documentation.

Examples of perceived quality indicators: number of complaints; activity-adjusted rate of complaints; number of expressions of gratitude; number of suggestions; number of complaints arising from surgical delays; rate of discharges against medical advice; rate of compliance with informed consent documentation; rate of compliance with the anticipated will statement; rate of satisfaction of patients treated in the hospitalization area; rate of satisfaction of patients treated in the outpatient unit; rate of satisfaction of patients treated in the emergency ward.

### The quality scorecard

It is advisable for all the information provided by the IS to be structured in such a way that it reads easily. For this reason, it should take the form of a scorecard (fig. 2), divided into different sections:

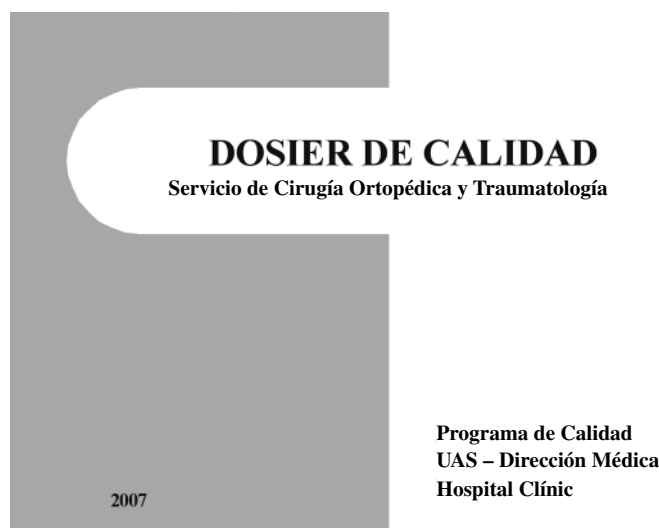
—Section 1: goals (table 1). This section will define the areas for improvement for the current year; for e.g. reducing the rate of pressure ulcers to under 5%. Definitions must always be simple and specific, avoiding mistakes such as stating what one intends to do (e.g. purchasing one hundred air mattresses) as an objective. There must always be a quantification of the goal to be attained as well as a statement of who will be responsible for attaining such a goal, when the degree of achievement will be measured and who will be in charge of such a measurement. It is also important to regularly monitor any progress made and, if possible, state what the situation is at each point in the course of the follow-up process. The current trend is to associate at least part of a physician's variable income with the attainment of

quality improvement goals. In these cases, the evaluation is made by a unit other than the Department of Orthopedic and Trauma Surgery, so that what was said above must be made clear so as to avoid misunderstandings.

- Section 2, technical quality indicators (table 2). This section will discuss the status of the different indicators defined, as compared with the same period the previous year; the trend for the past 3-5 years will also be stated.
- Section 3: perceived quality indicators (table 3). This section will discuss the status of the different indicators defined, as compared with the same period the previous year; the trend for the past 3-5 years will also be stated.
- Section 4: the citizen's voice. This section provides information on what the population we serve thinks of our work. It will furnish details on complaints, suggestions, expressions of gratitude and will make available the results of the surveys conducted in the different units of the Department of Orthopedic and Trauma Surgery.
- Section 5: benchmarking indicators. This is a section aimed at providing information on how the Department of Orthopedic and Trauma Surgery is performing vis-à-vis other orthopedics departments at the same level. To this end, a comparison is made of the results obtained in different key healthcare indicators with those obtained

**Table 1** Quality Scorecard. Goals

Quarterly follow-up
Technical quality goals
Reduce the rate of pressure ulcers to less than 5%
Perceived quality goals
Quantify the degree of satisfaction of hospitalized patients



**Figure 2** Quality Report.

**Table 2** Technical quality indicators

Technical quality indicators. Orthopedic Surgery

Indicator	2007	2006	Difference	Trend
Readmissions <31 days (%)				
Surgical wound infections (%)				

**Table 3** Perceived quality indicators

Perceived quality indicators. Orthopedic Surgery

Indicator	2007	2006	Difference	Trend
Discharges against medical advice (%)				
Rate of complaints (%)				

by other departments, in order to conduct a *benchmarking process*<sup>9,14</sup>. *Benchmarking* is a continuous process for measuring the products, services and activities of an organization as compared with its competitors and/or with companies recognized as market leaders (Kearns DT, Xerox Corporation, 1979). The purpose is to make sure that the company in question can become (or remain) a leader and be recognized as such. This Scorecard should be available to the Department of Orthopedic and Trauma Surgery, through the organization's intranet.

### The quality improvement team

None of the things mentioned above can be achieved successfully if we have not put together a multi-disciplinary quality improvement team that works in order to promote quality, in accordance with a continuous improvement methodology, with the help of the data provided in the Quality Scorecard. Such a team should be led by a professional with recognized Leadership skills.

### Conflict of interests

The authors have declared that they have no conflict of interests.

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