

## THE QUALITY IMPROVEMENT SYSTEM IN THE HOSPITALS OF PADUA (ITALY)

Carlo Favaretti and Aldo Mariotto

Medical Directorate Hospital  
and  
University Medical Center of Padua  
Italy

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*A quality improvement system has been established in 1989 in the hospital network of Padua and its organization is described. Three selected experiences are reported. (1) Appropriateness of the use of human albumin. After the assessment of the clinical policy, new guidelines were experimentally introduced and an evaluation after 3 months has shown a decrease of the total number of prescriptions (25%) and of inappropriate indications (9% vs 40.1%). (2) Urinary Tract Infections (UTI) and indwelling catheterization. The study showed 49% of conditions related to UTI and some corrigible inadequacies in the process of care: 37.2% of indications were probably not justified; 40% of patients who did not undergo urine culture had indications and 13% who underwent urine culture had no indications to the test. Guidelines for appropriate indications and a continuing education programme have been introduced. (3) Falls by hospitalized patients. The patient fall rate was 0.31/1000. As the reporting system showed inaccuracies (for example, the severity of injury was not collected in 34% of cases), a new notification form was introduced in 1991.*

**Key words:** Quality of care, quality assurance, quality assurance through system design, quality improvement, performance monitoring, feedback and behaviour change.

### INTRODUCTION

In recent years the movement to improve quality in health systems has been growing.

According to the 31st target of the WHO strategy "Health for all by the year 2000" [1], the Italian Government and Parliament enacted several laws—i.e. regulations on hospital personnel standards, collective agreement for the personnel of the National Health Service (NHS) and general practitioners who are independent contractors—in which measures for improving quality of care have been introduced.

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Reprint requests should be sent to: Dr Carlo Favaretti, Direttore Sanitario Complesso Ospedale-Università, Via Giustiniani 2, 35128 Padova, Italy.

The health care system in Italy is dominated by the NHS, which was established in 1978, even if in recent years the private sector has become more assertive.

The NHS is organized on three levels: national, regional and local.

The national and regional levels are responsible for health planning and financial support while the Local Health Units (LHU) are responsible for the provision of health services. Primary care services, hospitals and some social services are run by the same administration.

The mandate of the NHS is broad, encompassing activities of disease prevention, treatment, rehabilitation, environmental and occupational health, and health promotion.

Due to the high degree of regional autonomy in health care, the implementation of the health care plan varies across regions, resulting in some important inequalities (i.e. between North and South) in the provision of health care in the country.

The Veneto Region (north eastern part of Italy)—total population of 4.5 million inhabitants—is one of the most advanced from the social and economic perspective: it has a broad network of health services, including hospitals.

The Padua LHU (total population of 380,000) is one of the largest in Italy: it includes three hospitals (a total of 3,500 acute beds) and one large university medical center (of 2,500 beds).

### SYSTEM DESIGN

The hospital network of the Padua LHU has been the first in Italy to enforce the new regulations on quality assessment and assurance.

The Executive Board of the LHU, with the resolution No. 797 of 19 April 1989, established a quality improvement system (QIS) with the aim of facilitating initiatives of quality assessment and producing change through quality improvement actions.

The resolution of the Executive Board was preceded by several changes: (1) the enlargement of the Medical Directorate operating structure; (2) an increased interest of the Medical Directorate for planning and control functions; (3) the creation of a hospital Department of Epidemiology; (4) the appointment of several advisory medical committees and (5) the granting of special funds from the Regional Government.

The QIS is structured on two levels (Fig. 1): the first one is formed by a Technical Committee (TC) chaired by the General Medical Director (GMD) of the Hospitals; at the second level, several Working Groups are established to achieve specific objectives, defined by the TC. The TC is composed of representatives of the staff in order to ensure a broadly based consensus with respect to goals, but a representative of consumers is also included and it has been appointed by a non-profit Association on Patient's rights.

Its main function is monitoring of problems, identification of priorities for intervention and evaluation of changes and improvements. When a problem is identified, a specific Working Group of experienced professionals (5–10) is established. The assessment phase is performed on the basis of a critical appraisal of the literature and a consensus development process. Clinicians, epidemiologists and nurses usually take part in the Working Groups.

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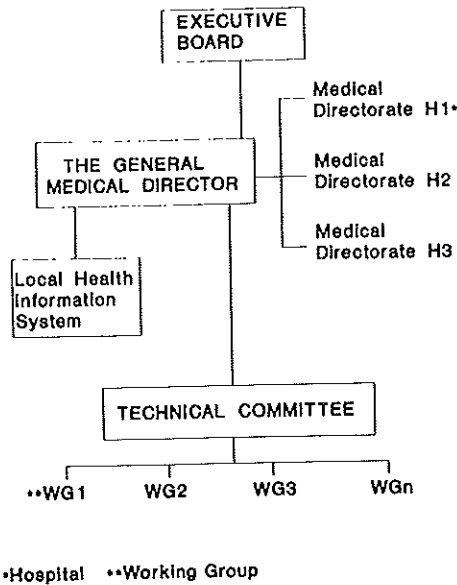


FIGURE 1. Organization of the Quality Improvement System in the hospitals of Padua.

The results of the assessment and the proposals for improvement (including the monitoring system for the re-evaluation) are discussed by the Working Groups and referred to the TC for their validation.

The GMD plays a very important role in the implementation of change. He is the chairman of the TC but has managerial responsibilities also and takes part as a consultant to the Executive Board, which is a political body, elected by the City Councils of the LHU and responsible for the administration of the hospital network.

Therefore, the GMD should enable the linkage between assessment and improvement of quality of care.

The aim of this paper is to describe an empiric process and report a selection of programs started up in the hospitals of Padua.

They are at different levels of progress: in some cases only the assessment phase has been carried out, in others some changes have been already implemented.

### SELECTED EXPERIENCES

#### *Appropriateness of the Use of Human Albumin*

In recent years the use of human albumin has been increasing, with several problems from the clinical and epidemiological perspective as far as the appropriateness of its use is concerned. The economical aspects have also been considered because of the raising costs.

The TC has selected the program on the appropriateness of the use of human albumin for economical and organizational reasons (in 1988 the cost was about \$0.85

million out of a total costs for drugs of \$6.8 million) and because the TC evaluated that it could be a suitable example to start with a QIS focused on appropriate care in the hospitals of Padua.

After a descriptive analysis of the prescriptions based on administrative data, a retrospective investigation was carried out to assess the clinical policy.

A sample of 299 human albumin prescriptions during a four month period in 1989 was examined and the therapeutic indications were compared with international criteria and standards [2,3].

According to the international parameters an appropriate use has been found for 7.7% of the prescriptions; an occasionally appropriate use for 42.5%; an inappropriate use for 40.1% and for 9.7% the classification of appropriateness was impossible, due to the lack of suitable data.

Using a consensus development technique, based on the critical appraisal of evidence and on a review of the literature, new and up-dated criteria of appropriate use were defined: conditions of appropriate, occasionally appropriate and generally inappropriate use were pointed out [4].

The medical staff was then informed with written guidelines about these criteria and a new monitoring system was created in order to evaluate the compliance with the new policy. The guidelines were experimentally introduced on 1 October 1990. A short term evaluation of the program at the end of 1990 has shown a decrease of the total number of prescriptions (25%), a reduction of costs, a good compliance with the new policy and an improvement of appropriate use (only 9% of the prescriptions were classified in the category "generally inappropriate use").

In order to check the quality of the new monitoring system, data reported on prescription forms were also compared with those in medical records. Several discrepancies were found particularly when serum albumin determinations were taken into account.

Then, the Working Group decided to introduce more strict regulations: a serum albumin level not higher than  $3 + 0.5$  g/dl has been selected as one of the most important indicators of appropriateness.

The monitoring system has also been slightly modified in order to assess more efficiently the compliance of practice with the criteria and the concordance between data reported in the prescription forms and in the medical records.

Another short term evaluation is now in progress and will be completed in the next few months.

On the basis of these evaluations the TC could validate criteria and guidelines, referring to the GMD and the Executive Board for their implementation as official hospital policy.

#### *Urinary Tract Infections and Indwelling Catheterization*

Indwelling urinary catheters are responsible for a large amount of hospital infections, but a number of them could be prevented by improving the quality of managing catheterized patients and reducing the catheterization length. In addition, the type of catheter, the draining system and the antimicrobial therapy play an important role in the epidemiology of urinary infections [5,6].

In the time span December 1989 to February 1990 the Hospital Infections Unit carried out a survey on 15 wards (7 medical and 8 surgical): 4,505 patients were

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admitted to these wards during the period, 658 were catheterized and 647 were suitable for the analysis [7].

The period prevalence of the catheterization was 14.6%.

A large proportion (49%) of the catheterized patients showed conditions related to Urinary Tract Infection (UTI): in 10.7% of cases an infection was diagnosed by microbiological tests ( $\geq 1000$  CFU/ml) [8] and in the other cases a diagnosis has been made following clinical or the laboratory findings.

The assessment of managing criteria of catheterized patients showed some corrigible inadequacies [9]: in 37.2% of cases the catheterization was decided to facilitate the nursing care in incontinent and immobilized patients or for monitoring purposes; in 54.7% of cases during the catheterization no examination of urine was done in order to detect mild UTI; anyhow, in 80% of patients an antimicrobial treatment was prescribed even if it was not always related to UTI; 40% of the catheterized patients who did not undergo urine culture had clinical indications to the test and 13% who underwent urine culture had no clinical indications to the test.

The results of the investigation have been disseminated to the staff.

The TC asked the Working Group to develop written guidelines with more strict indications for the catheterization, infections surveillance and compliance with hospital antibiotics policy.

The guidelines have been recently submitted to the TC and are now under scrutiny.

In addition, the Working Group has planned a specific programme of continuing education on urinary catheterization for the nursing staff, in order to improve knowledge, skills and attitudes on the subject. This programme has been funded by the Executive Board, implemented on April and will end in October 1991.

#### Falls by Hospitalized Patients

Falls by inpatients are an important cause of hospital morbidity and mortality. They occur particularly in the elderly and, due to the aging of the population, will become a major problem in the near future in the absence of specific actions.

In the hospitals of Padua the staff has to report to the Medical Directorate the accidents befalling the patients either for epidemiological or administrative (insurance) purposes.

To assess the epidemiological pattern of the falls by inpatients, a retrospective analysis of the notifications in the period September 1989 to August 1990 has been carried out by the Nursing Department, taking into considerations the following variables: sex; age; ward; admission date and diagnosis; site, date, day of the week and hour of the accident; characteristics of the injury; mortality; diagnostic procedures and treatment; staff involved in the care.

According to Cumming *et al.* [10], the analysis has been focused on falls rather than on patients who have fallen. In addition, the classification system of the degree of injury and the methods of calculation of fall rates proposed by Morse and Morse [11] have been used.

The total number of falls by 191 inpatients was 200. Falls were by 100 (50%) males and 100 (50%) females (Table 1 shows some selected figures).

In addition, the average number of falls per day was  $28.6 \pm 4.7$  (1 SD). On Friday the average number was 37, on Sunday 22.

The peak values of falls occurred in the following hours: 3 to 4 a.m. (10.1%), 5 to 6 a.m. (10.1%) and 11 to 12 p.m. (9.4%), while the fall average per hour was  $6.6 \pm 4.5$  (1 SD).

The accident site was registered in 84% of cases. The falls have occurred more frequently in patient room (57.7%), in the bathroom (22.6%) and in the corridor (11.9%).

The degree of injuries (known in only 66% of cases) was: no injury (53.8%), minor (19.7%), moderate (12.9%), major (13.6%).

The injuries were distributed between head (53.5%), trunk (21.2%), legs (15.9%), arms (9.4%).

Moreover, three patients died within 24 hours after the fall, although we do not have reliable information on a causal association.

The retrospective analysis has shown some inaccuracies in the reporting system which could bias the results. In particular, the severity of the injury was not reported in 34% of cases and the notification of the results of diagnostic and therapeutic procedures was sporadic.

Inpatient falls could be a major health problem in the hospitals of Padua, as far as quality of care is concerned: the phenomenon is probably underestimated, particularly for less severe outcomes, because of the inaccuracy of the notification system.

For these reasons, the improvement of the reporting system has been considered essential by the TC and the Executive Board, in order to have more reliable epidemiological information to support changes.

A new structured notification form has been developed, focusing on the most important health related parameters. This form was introduced on 1 January 1991 and it will allow a prospective survey.

In the meantime, the results of the retrospective study have been disseminated to the staff and some critical analyses of the organization of work during the hours with an excess of accidents have been carried out.

At the end of June 1991 a six months assessment will be carried out in order to complete the epidemiological analysis of the phenomenon and to develop further initiatives to improve the quality of care.

TABLE 1. Falls by hospitalized patients: annual rates

$$\text{Patient fall rates} = \frac{\text{No. of patient falls}}{\text{No. of patient bed days}} \times 1000 = 0.3$$

$$\text{Patients at risk} = \frac{\text{No. of patient falls}}{\text{No. of patients at risk}} \times 1000 = 2.8$$

$$\text{No. of falls per bed} = \frac{\text{No. of patient falls}}{\text{No. of beds}} = 0.078$$

$$\text{Probability of falling} = \frac{\text{Fall rate}}{1000} = 1:3334^*$$

$$\text{Injury rate} = \frac{\text{No. of patient injuries}}{\text{No. of patient falls}} \times 100 = 70$$

\*Chance of a patient falling for any one day.

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Other programmes we are carrying out are dealing with:

- the quality of epidemiological data on discharge charts and ambulatory care records;
- the quality of nursing records;
- the quality of services provided by clerical workers who are in contact with the public;
- the integrations between technology assessment and QA through a pilot study on Coronary Angiography, PTCA and CABG in the defined population.

### CONCLUSION

The QIS established in Padua is a first operational attempt to implement the national regulations, which consider the quality of care an essential objective of the NHS.

The system has been designed to allow the involvement and participation of the staff in the policy of quality improvement, but also to assure a strong guidance of the GMD and the Executive Board in the implementation of change.

The system tries to link institutional to professional responsibilities in quality assurance [12].

Some resistance has been found because, in general, it is difficult to introduce evaluation in a very large and complex hospital system where, in particular, academic departments aim toward being quite independent.

However, the interest of some prominent clinicians and the participation of several members of their staff in the programmes defined by the TC (three of them have been described in this paper) are encouraging and strengthen the determination to accept the challenge to develop the system further.

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