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Chapter 6

PREOPERATIVE ASSESSMENT IN SURGERY
IN HUNGARIAN HOSPITALS, 1992-1997

Abstract

The way the value of diagnostic regimens in medical care is measured is one of the central questions of preoperative assessment in surgery, the main aim of which is to reduce the risk associated with surgical procedures. There is evidence from the literature that the numbers of diagnostic tests performed in hospitals could be reduced without affecting outcomes to patients, and with significant concomitant reduction in cost. Even more, outcome could be improved through performing smaller numbers of diagnostic tests. This is an area where one can demonstrate that ‘too much is poor quality’. Needless tests cause anxiety, unnecessary surgery costs lives, repeated exams create inconveniences for patients, routine tests create confounding data and lead to unnecessary further examinations and treatment of ‘false positives’ and excess hospital stays create hospital infection risk. Our questionnaire surveys conducted in 1992/93, 1995 and 1997 indicated that practice in Hungary concerning routine preoperative assessment was different compared to a group of hospitals located in the countries of Western Europe and varied significantly from hospital to hospital. There was little, if any, control of test requests in Hungary in 1992/93 when preoperative assessment was first evaluated in 17 hospitals. Laboratory tests were clearly overused. There were various reasons for which tests were requested, not closely related to preoperative assessment, such as: for screening, diagnosis, treatment, documentation, practice of defensive medicine, risk assessment and income generation purposes. The first study in 1992/93 showed that the hospitals’ underdeveloped quality systems and inappropriate, often implicit and verbal, anecdotal ‘guidelines’ and old habits of the physician and surgeons were the factors underlying over-utilisation of the tests of preoperative assessment. Various tests ordering reasons were singled out, suggestions were created and agreed upon through various consensus conferences. As the result of these quality assurance efforts, the second study in 1995 and the third study in 1997 showed dramatic decrease of the number of preoperative tests used in the participating 20 hospitals.

The author is grateful to Professor James Kahan (RAND-Europe, Leiden) for his helpful comments of this chapter and the author would like to express his special thanks to Professor Niek S. Klazinga, leader of COMAC/HSR/QA and BIOMED/PECO programme, for his contribution and support of this study in Hungary. The author thank Professor Egon Jonsson (SBU, Stockholm) for his comments and suggestions. This study was performed under the aegis of the Hungarian Society for Quality Assurance in Health Care by the author of the thesis. This research was part of the COMAC/HSR/QA and BIOMED/PECO Programme of the European Union, DG XII., funded by the European Union, DG XII. and the Dutch Ministry of Health, Welfare and Sports.
6.1 Why was preoperative assessment in surgery selected as one of the very first quality assurance topics in Hungary?

Preoperative assessment aims to reduce the risk connected with surgery and anaesthesia or other forms of pain relief, and to promote rehabilitation after surgery. Routine assessment often include chest radiography, electrocardiography and laboratory testing of such as urine albumin, urine glucose, urine sedimentation, urine reduction, blood ESR/viscosity, blood haemoglobin, blood haematocrit, blood white cell count, creatinine, sodium, potassium, sGPT, gGT, thrombocyte account, blood glucose, APTT, PTT, clinical clotting time. In Hungary, preoperative investigation is initiated by the surgeon in co-operation with the attending anaesthetist sometimes in consultation with other specialists. Preoperative assessment may lead to preventive actions, while the planning of operative and postoperative care may also be influenced by the findings. High quality and cost-effective practice demands that the preoperative assessment must be effective and complete, which however does not mean that it should be equally comprehensive for all patients. Increased safety may be achieved by a more limited and focused investigation of patients who are otherwise healthy such as patients falling in the ASA 1 category.

There is a substantial body of literature to show evidence that much of the routine preoperative X-rays, ECG and laboratory testing performed in different countries is unnecessary, and the cost of these examinations could be reduced without harming patients (*) There is also evidence that unnecessary tests harming patients through further examination and treatment of ‘false positives’, cause inconveniences for the patients and, delays in the clinical process, and result in longer lengths of stay which can cause higher risk for nosocomial infection and increased cost. (SBU, 1989) According to the ‘Statement on routine preoperative laboratory and diagnostic screening’ of the American Society of Anaesthesiologists (1987): “Individual anaesthesiologists should order test(s) when, in their judgement, the result may influence decisions regarding risks and management of the anaesthesia and surgery.” The author of this thesis had very different experience on preoperative assessment in surgery in Hungary. Working as hospital internist during the 80s he experienced that surgeons referred every surgical patient to the medical department for preoperative examination purposes. Internal diseases specialists made a physical examination and ECG in each of the cases. Blood was taken from all patents for laboratory examination (SMA 12) purposes and according to the requirement (anecdotal or implicit guideline) every patients had to have a chest X-ray. Senior physicians controlled this process and it was called a ‘medical error’ if one of these examinations was missing. All examinations had been done and documented in the patient’s record before an anaesthesiologist even saw the patients. Preoperative routine was evaluated in three phases in Hungarian hospitals. The first study

was conducted in 1992/93 in 17 Hungarian hospitals, as part of the 1st Concerted Action Programme on Quality Assurance in European Hospitals (COMAC/HSR/QA).

The second evaluation of the preoperative routine was done in 20 hospitals in 1995 as part of the 2nd Concerted Action Programme on Quality Assurance in European Hospitals (BIOMED/PECO). The third study was conducted in 1997 in 9 hospitals, in order to detect the changes as result of the Concerted Action Programmes between 1992 and 1997. In order to examine change over time, the same questions were used in all the three studies.

6.1.1 The main aim and methodology

The substantial body of literature on the evaluation of preoperative assessment shows that this is a popular topic and "success story" for quality assurance. There is an established opinion shared by many authors that the number of preoperative X-rays, ECG and laboratory tests can be decreased while the quality of care remains unchanged or even improves. This is a well researched area with a high level of agreement among professionals and there is a significant difference between scientific evidence and daily practice.

The research aim of the (COMAC/QA/HSR and BIOMED/PECO) project was to study different quality assurance strategies and their effect on the improvement of care with respect to four clinical topics: 1) keeping of patients records; 2) prophylactic antibiotic use in surgery; 3) preoperative assessment in surgery; and 4) prevention and therapy of pressure ulcers. (Klazinga, 1994) The 'Preoperative assessment in surgery' was among the most popular and developed quality assurance activities among the key topics, both in Hungary as well as in other countries participated in the programme.

In Hungary the main aim of the programme on preoperative assessment in surgery was:
- to establish a baseline on preoperative assessment in surgery,
- to design and introduce guidelines in the form of quality assurance activities and to set and disseminate process recommendations for preoperative assessment in surgery,
- to eliminate a significant percentage of the unnecessary preoperative X-rays, ECG and laboratory tests which were performed in the participating hospitals in 1992.

6.1.2 Study design

The study was conducted in three interrelated phases. (Table 6.1)
Phase 1: In 1992/1993 the actual practice was registered in the 17 participating hospitals. The evaluation was limited to the ASA1 category of patients. (American Society of Anaesthesiologists Physical Measure (ASA) Class 1: There is no physiologic, biochemical or psychiatric disturbance. The pathological process for which operation is to be performed is localised and not conducive to systemic disturbance.) These are 'healthy patients', and 40-50% of the operations can be grouped to ASA1 class. (Robbins and Mushlin, 1979) Then an analysis was conducted to identify the reasons for which these selected preoperative assessments procedures were performed in the participating hospitals. The question of 'Doing good things wrong versus doing wrong' by the hospitals had to be answered. In other
words, efforts were made to learn if the daily practice in the hospital differs from the otherwise appropriate recommendations, guidelines or expectations or the written or non-written guidelines or expectations are inappropriate. There were two follow-up activities subsequently in 1995/96 in 20 hospitals (Phase 2) and in 1997 in 9 hospitals (Phase 3) to detect the changes of the preoperative routine.

Table 6.1 Study design

<table>
<thead>
<tr>
<th>Phases</th>
<th>Activities</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Dissemination of the questionnaires to 124 Hungarian hospitals. (1)</td>
<td>17 hospitals, 14% overall response rate</td>
</tr>
<tr>
<td>1992</td>
<td>According to the survey protocol hospitals were asked to participate in the programme to complete the questionnaire and to improve quality in the chosen fields.</td>
<td>Good representation of the county/medium care hospitals: 10 county hospitals (53%), Fair representation of the total number of hospital beds (22%)</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Dissemination of the same questionnaires to 123 Hungarian hospitals.</td>
<td>20 hospitals, 16% overall response rate</td>
</tr>
<tr>
<td>1995</td>
<td>According to the survey protocol hospitals were asked to complete the questionnaire again and to continue working in the programme or newly join to the programme to improve quality in the chosen fields.</td>
<td>Good representation of the medium care hospitals: 9 county hospitals (47%), 8 participating county hospitals were the same as in the previous round Fair representation of the total number of hospital beds (25%)</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Dissemination of the same questionnaires/data collection forms to the 20 participating hospitals.</td>
<td>9 hospitals, 45% overall response rate</td>
</tr>
<tr>
<td>1997</td>
<td>According to the survey protocol hospitals were asked to evaluate their quality improvement activity results of the programme.</td>
<td>Fair representation of the medium care hospitals: 7 county hospitals (37%), 78% response rate in county hospitals (all 7 county hospitals were the same as in the previous two rounds) Poor representation of the total number of hospital beds (12%)</td>
</tr>
</tbody>
</table>

(1) The 124 hospitals include 123 county and municipality hospital and 1 university hospital. In Hungary, there are 167 hospitals in total, but the 4 University Clinics, 18 National Institutions, 8 hospitals of the Hungarian Rail, 3 Church hospitals, 7 hospitals of the Ministry of Defence, 1 hospital of the Ministry of Internal Affairs, 2 hospitals of the Ministry of Justice. All together 43 hospitals were not on the mailing list of the Hungarian Society for Quality Assurance in Health Care, which conducted the survey, because these hospitals were not accessible due to various reasons. (Gulácsi, and Kovács, 1997)

The same questionnaire was used for the evaluation of the baseline and for the two follow-ups. Hospitals, mainly large county public settings with around 1,500 – 2,000 beds and municipal hospitals with around 200 – 600 bed, participated on voluntary basis. The same questionnaires were distributed to medical directors of 124 Hungarian hospitals in 1993 and in 1995 and distributed to 20 hospitals in 1997. Completed questioners were returned by 17 hospitals (14%) in 1993 by 20 hospitals (16%) in 1995 and 9 hospitals (45% response rate represents 5.3% of the total number of hospitals) completed the questionnaire in 1997. The representation of the hospitals of different size and function was varied. In 1993, of the 17 participating hospitals 10 were large county hospitals with 1,500-2,200 beds, repre-
senting 53% of the total number of 19 county hospitals, and five were municipal hospitals with 200-600 beds each. In 1995, 9 out of the 20 hospitals were large county hospitals (47% of the total number of county hospitals) and in 1997, 7 out of the 9 hospitals were county hospitals. Altogether 7 large county hospitals (C7) participating through the whole duration of the programme. The response rate from Phase 2 to Phase 3 shows that county hospitals might be more receptive. Using Fisher Yates correction (Siegel, 1956), Chi-squared value is 4.90, p<0.05. (Table 6.2)

Table 6.2 Response rate of the hospitals from Phase 2 to Phase 3

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>County hospitals</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Other hospitals (*)</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>

(* Other hospitals: municipal and university hospitals)

In the first study round (1993), hospitals were invited to choose at least one from the four listed quality assurance topics, complete the questionnaire and to set a baseline in the chosen field. In addition, hospitals were requested to create and implement quality assurance programmes in the given field(s), to set up a committee in the hospital and nominate professional(s) to manage the programme and to keep contact with the leader of the programme on national level (the writer of the thesis). Materials and continuous assistance were provided to the hospitals. Quarterly meetings were held during the programmes for the leaders of the programme on hospital level, and site visits were provided on request by the Hungarian leader of the programme (the author of this thesis).

In the second study round (1995) participating hospitals were asked to continue and other hospitals were invited to join and start quality assurance activities on the chosen topics. Twenty hospitals responded, 12 hospitals from the first phase and 8 newly joined hospitals. Five hospitals gave up who were participated in the first phase, including 1 county hospital, 1 university hospital and 3 municipal hospitals. All new participants were municipal hospitals. In this way in the second phase there were 9 large county hospitals - 8 of them participated in the previous study round as well and 11 municipal hospitals, 3 from them participated in the first phase and 8 new ones. Almost all county hospitals had a quality assurance deputy director, or at least part time employed quality assurance leader that time, this programme was under their leadership. Only 4 municipal hospitals remained to stay in the programme from the first round, and new ones joined to the programme. Only two of them completed the final evaluation questionnaire (in 1997), no data is available about the development of quality of care achieved. Partly this is the reason why county hospitals are in the focus of the programme.

In the third study round the same questionnaires were distributed to all 20 hospitals which were completed the questionnaire in the second round and participated in the programme. Nine of them completed the programme evaluation questionnaire, which was the last step of the 5-year quality assurance programme. The response rate was 45%. Seven out of the
9 institutions were county hospitals have been participated in the programme from the beginning. Quality assurance was given a high priority in these hospitals by the management, which is demonstrated by the fact that in 1997 full time quality assurance directors were working in all 7 county hospitals.

6.1.3 Sample and data validity

In Hungary medium level health care services are mainly provided by the 19 large, 1,500-2,000 bed county hospitals. These hospitals have 12-15 different departments, offering a wide range of health services, except top level care. There are many exceptions of this rule, as some of them do offer top level care, for instance open heart surgery, or high technology radiology services. Municipal hospitals have in general 200-600 beds and 4-5 departments responding the needs of the local population as first referral hospital. In this study there was a good representation (between 37% and 53%) of medium level care provided by large county hospitals. These hospitals were recruited from all parts of Hungary. Therefore, it seems to be fair enough to state that the study findings represent the quality assurance activities in the field of ‘preoperative assessment in surgery’ in the county hospitals. Due to this condition further analysis is mainly restricted to county hospitals.

6.2 The first evaluation of preoperative routine in 17 hospitals in 1992-1994

The first study on preoperative routine was conducted in 1992/93 in 17 Hungarian hospitals, as part of the 1st Concerted Action Programme on Quality Assurance in Hospitals (COMAC/HSR/QA). The 100-question long COMAC/HSR/QA questionnaire was translated in Hungarian and was mailed to the medical directors of 124 Hungarian hospitals. In 1992/1993 data and information required by the questionnaire was not easily available in the Hungarian hospitals. At first questionnaires were subdivided into chapters, the sub-chapter of the evaluation of the preoperative assessment was one among them. Questionnaire sub-chapters were distributed among hospital departments to be answered and then the medical directors collected these sub-chapters and mailed to the programme management team. The questionnaire was completed by 17 hospitals (14%). The low rate can be explained by the fact that in 1992/93 quality assurance was a very new concept in Hungary, this programme was the first quality assurance activity in Hungary and the 100-questionnaire was very difficult to complete due to the unavailability of the data. As shown by Table 6.3/a in 1992/93 there was no guideline on preoperative routine or available data in the hospitals which could have been used for quality assurance purposes. Preoperative routine was not recognised as an important topic for assessment and improvement. In none of the hospitals had this issue been addressed during the four years preceding the study.
Table 6.3/a Preoperative assessment in surgery in 1992-1997; general characteristics

<table>
<thead>
<tr>
<th>Quality assurance of preoperative assessment</th>
<th>General characteristics</th>
<th>A 17 Hungarian Hospitals COMAC/ HSR</th>
<th>A 267 (P) COMAC/ HSR hospitals E 123 COMAC/ HSR hospitals</th>
<th>A 20 Hungarian Hospitals (PECO)</th>
<th>A 198(s) BIOMET/ PECO Hospitals E 198(**) BIOMET/ PECO Hospitals</th>
<th>E 9 Hungarian Hospitals (PECO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative assessment tests usually performed before admission of in-patients.</td>
<td>A 0% E 97%</td>
<td>A 0% E 97%</td>
<td>A 5% E 76%</td>
<td>A 0% E 97%</td>
<td>A 5% E 76%</td>
<td>A 0% E 97%</td>
</tr>
<tr>
<td>Routine data on pre-operative assessment available at hospital and can used for evaluation</td>
<td>A 0% E 65%</td>
<td>A 0% E 65%</td>
<td>A 0% E 65%</td>
<td>A 0% E 65%</td>
<td>A 0% E 65%</td>
<td>A 0% E 65%</td>
</tr>
<tr>
<td>Medical pre-operative assessment a topic for (medical audit) evaluation in the last 4 year</td>
<td>A 0% E 43%</td>
<td>A 0% E 43%</td>
<td>A 0% E 43%</td>
<td>A 0% E 43%</td>
<td>A 0% E 43%</td>
<td>A 0% E 43%</td>
</tr>
</tbody>
</table>

A - Assessment phase of the programme; E - Evaluation phase of the programme

(2) Participating countries and number of hospitals (COMAC/HSR/QA): Austria 14; Belgium 42; Denmark 30; France 11; Germany 11; Greece 8; Ireland 5; Israel 17; Italy 14; The Netherlands 15; Portugal 11; Russia 11; Spain 82; United Kingdom 7; Hungary 17; and Poland 40 hospitals,

(a) Participating countries and number of hospitals (BIOMET/PECO): Denmark 4; France 5; Germany 15; Greece 1; Hungary 20; Italy 11; Ireland 21; Israel 7; The Netherlands 6; Poland 27; Portugal 8; Russia 14; Slovak Republic 2; Spain 50; Switzerland 4; and United Kingdom 3 hospitals. (CBO, 1992 and 1993)

As can be seen in the 2nd column in Table 6.3/a, 17 Hungarian hospitals conducted a baseline study on pre-operative assessment in 1992/1993. The baseline situation - i.e. no quality assurance activities and no data available in this field - made it clearly necessary to create, introduce and implement a quality assurance programme on preoperative assessment. (*) The 3rd column of Table 6.3/a shows significant improvement in this field among the 'COMAC/HSR' hospitals between 1991 and 1993. The 4th and the 6th column of Table 6.3/a present the development of quality assurance on preoperative assessment during the BIOMET/PECO programme among the participating Hungarian hospitals. As shown by the 4th and 6th columns, a total of 86% (in 1995) and 100% (in 1997) of the county hospitals - participating through the whole duration of the programme - reported that they had

(*) Due to a limited time this activity was not finished till the end of the COMAC/HSR programme, which was completed in 1994 in the participating countries.
guidelines on the tests to be performed for pre-operative assessment. (*) This is a tremendous difference if these rates are compared to the 0% rate of 1992/1993.

Routine data on pre-operative assessment testing that could be used for evaluation were available in 71% (in 1995) and 100% (in 1997) of the hospitals, yielding visible development if compared to the 0% rate of 1992/93. Preoperative assessment was a topic for medical audit in the preceding 4 years of the survey in 57% (in 1995) - 100% (in 1997) of the hospitals. A breakthrough can be detected in this field, too, as compared to 1993/92, when even, the term, theory and practice of 'medical audit' was unknown in the Hungarian hospitals. In the 5th columns the results of the BIOMED programme can be seen from the hospitals of the developed countries. The base line setting (Assessment Phase, A) in 1995 was not followed by a detailed evaluation of the results of the programme (Evaluation Phase, E), therefore no data are shown from this side. Table 6.3/b shows significant changes in the field of quality assurance of preoperative assessment in surgery between 1992-1997 in the 7 large county hospitals (C7) - participating through the whole duration of the programme.

Table 6.3/b Preoperative assessment in surgery in 1992-1997; the 7 large county hospitals (C7) - participating through the whole duration of the programme

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guidelines on tests to be performed for preoperative assessment</td>
<td>0%</td>
<td>86%</td>
<td>100%</td>
</tr>
<tr>
<td>Pre-operative assessment tests usually performed before admission of in-patients</td>
<td>0%</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Routine data on pre-operative assessment available at hospital and can used for evaluation</td>
<td>0%</td>
<td>71%</td>
<td>100%</td>
</tr>
<tr>
<td>Medical pre-operative assessment a topic for (medical audit) evaluation in the last 4 year</td>
<td>0%</td>
<td>57%</td>
<td>100%</td>
</tr>
</tbody>
</table>

As shown by Table 6.4/a, there was a significant incongruence between the Hungarian routine and the generally shared opinion, as in the literature, and there was a significant difference between the group of Hungarian hospitals and the group of hospitals in the developed countries that took part in the European Concerted Action Programmes. As Klazinga and Helslot (1989) concluded, a preoperative chest X-ray and ECG in ASA I. patients do not provide useful information. Laboratory tests are a subject of discussion, but the number of preoperative laboratory tests are very high by the European average. In 1992-1994, ASA score was neither implemented nor proposed for consideration in Hungary. After the first study on the necessity of pre-operative tests, the Hungarian Society for Quality Assurance in Health Care, highlighted the importance of the implementation of the ASA score in various publications and consensus conferences and suggested to the College of Surgeons to implement ASA score in the daily practice. The professional

(*)Twenty hospitals were involved in the Phase 2 in 1995 (Assessment Phase, A) and 9 hospitals evaluated the developments that were achieved till 1997 (Evaluation phase, E). As shown by the 4th and 6th columns, a total of 70% (1995) - 80% (1997) of the hospitals reported that they had guidelines on the tests to be performed for pre-operative assessment.
College of Surgeons (Hungary) published its guideline on preoperative assessment and in this guideline they suggested to the surgeons to use ASA in 1995. (Guideline, 1995) As can be seen in the Table 6.4/a, the frequency of using pre-operative tests dropped dramatically both in the hospitals in the developed countries and in Hungary. In Hungary financial limitations became very heavy during the time of the programme. However, as a significant decrease was experienced in the hospitals in the developed countries as well, it is fair to assume that the decrease in the number of the pre-operative tests performed was caused largely by the programme.

Table 6.4/a Routine preoperative tests for ASA1(&) patients, elective surgery: 1992-1997

<table>
<thead>
<tr>
<th>Preoperative tests</th>
<th>Hungarian Hospitals</th>
<th>Hungarian Hospitals</th>
<th>Hungarian Hospitals</th>
<th>Hungarian Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COMAC/QA/HSR</td>
<td>COMAC/QA/HSR</td>
<td>COMAC/QA/HSR</td>
<td>COMAC/QA/HSR</td>
</tr>
<tr>
<td></td>
<td>E -</td>
<td>E -</td>
<td>E -</td>
<td>E -</td>
</tr>
<tr>
<td>Chest X-ray</td>
<td>A 83%</td>
<td>A 52%</td>
<td>A 20%</td>
<td>A 28%</td>
</tr>
<tr>
<td></td>
<td>E 19%</td>
<td>E 19%</td>
<td>E 28%</td>
<td>E 34%</td>
</tr>
<tr>
<td>ECG</td>
<td>A 88%</td>
<td>A 50%</td>
<td>A 20%</td>
<td>A 28%</td>
</tr>
<tr>
<td></td>
<td>E 29%</td>
<td>E 29%</td>
<td>E 34%</td>
<td>E 34%</td>
</tr>
<tr>
<td>Urine albumin</td>
<td>A 94%</td>
<td>A 57%</td>
<td>A 65%</td>
<td>A 31%</td>
</tr>
<tr>
<td></td>
<td>E 33%</td>
<td>E 33%</td>
<td>E 34%</td>
<td>E 34%</td>
</tr>
<tr>
<td>Urine glucose</td>
<td>A 94%</td>
<td>A 57%</td>
<td>A 65%</td>
<td>A 31%</td>
</tr>
<tr>
<td></td>
<td>E 35%</td>
<td>E 35%</td>
<td>E 34%</td>
<td>E 34%</td>
</tr>
<tr>
<td>Urine sedimentation</td>
<td>A 94%</td>
<td>A 46%</td>
<td>A 39%</td>
<td>A 31%</td>
</tr>
<tr>
<td></td>
<td>E 38%</td>
<td>E 38%</td>
<td>E 34%</td>
<td>E 34%</td>
</tr>
<tr>
<td>Urine reduction</td>
<td>A 94%</td>
<td>A 30%</td>
<td>A 45%</td>
<td>A 24%</td>
</tr>
<tr>
<td></td>
<td>E 29%</td>
<td>E 29%</td>
<td>E 34%</td>
<td>E 34%</td>
</tr>
<tr>
<td>Blood ESR/viscosity</td>
<td>A 0%</td>
<td>A 13%</td>
<td>A 5%</td>
<td>A 19%</td>
</tr>
<tr>
<td></td>
<td>E 33%</td>
<td>E 33%</td>
<td>E 34%</td>
<td>E 34%</td>
</tr>
<tr>
<td>Blood haemoglobin</td>
<td>A 88%</td>
<td>A 80%</td>
<td>A 75%</td>
<td>A 58%</td>
</tr>
<tr>
<td></td>
<td>E 71%</td>
<td>E 71%</td>
<td>E 75%</td>
<td>E 75%</td>
</tr>
<tr>
<td>Blood haematocrit</td>
<td>A 88%</td>
<td>A 72%</td>
<td>A 75%</td>
<td>A 55%</td>
</tr>
<tr>
<td></td>
<td>E 24%</td>
<td>E 24%</td>
<td>E 75%</td>
<td>E 75%</td>
</tr>
<tr>
<td>White blood cell count</td>
<td>A 89%</td>
<td>A 70%</td>
<td>A 65%</td>
<td>A 53%</td>
</tr>
<tr>
<td></td>
<td>E 52%</td>
<td>E 52%</td>
<td>E 65%</td>
<td>E 53%</td>
</tr>
<tr>
<td>Creatinine</td>
<td>A 81%</td>
<td>A 55%</td>
<td>A 35%</td>
<td>A 34%</td>
</tr>
<tr>
<td></td>
<td>E 57%</td>
<td>E 57%</td>
<td>E 35%</td>
<td>E 34%</td>
</tr>
<tr>
<td>Sodium</td>
<td>A 94%</td>
<td>A 51%</td>
<td>A 55%</td>
<td>A 36%</td>
</tr>
<tr>
<td></td>
<td>E 29%</td>
<td>E 29%</td>
<td>E 55%</td>
<td>E 36%</td>
</tr>
<tr>
<td>Potassium</td>
<td>A 94%</td>
<td>A 51%</td>
<td>A 55%</td>
<td>A 36%</td>
</tr>
<tr>
<td></td>
<td>E 33%</td>
<td>E 33%</td>
<td>E 55%</td>
<td>E 36%</td>
</tr>
<tr>
<td>SGPT</td>
<td>A 57%</td>
<td>A 35%</td>
<td>A 35%</td>
<td>A 21%</td>
</tr>
</tbody>
</table>
Preoperative tests | A 17 Hungarian Hospitals COMAC/QA/HSR | A 267 (H) COMAC/QA/HSR E 123/34(@) COMAC/QA/HSR | A 20 Hungarian Hospitals (PECO) | A 198(e) BIOMED/PECO Hospitals | E 9 Hungarian Hospitals (PECO)
--- | --- | --- | --- | ---

GGT | A 45% | A 28% E 19% | A 25% | A 18% | E 22%

Thrombocyte count | A 65% | A 57% E 43% | A 40% | A 39% | E 33%

Blood glucose | A 94% | A 62% E 76% | A 55% | A 43% | E 66%

APTT | A 65% | A 43% E 38% | A 5% | A 24% | E 0%

PTT | A 65% | A 48% E 48% | A 15% | A 28% | E 0%

Clinical clotting time | A 50% | A 39% E 14% | A 30% | A 26% | E 11%

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**A** - Assessment phase of the programme; **E** - Evaluation phase of the programme

(@) ASA1 - The American Society of Anaesthesiologists Physical Status Measure (ASA); Class 1.: There is no physiologic, biochemical or psychiatric disturbance. The pathological process for which operation is to be performed is localised and not conductive to systemic disturbance.

(@) Participating countries and number of hospitals (COMAC/HASR/QA): Austria 14; Belgium 42; Denmark 30; France 11; Germany 11; Greece 8; Ireland 5; Israel 17; Italy 14; The Netherlands 15; Portugal 11; Russia 11; Spain 82; United Kingdom 7; Hungary 17; and Poland 40 hospitals.

(a) Participating countries and number of hospitals (BIOMED/PECO): Denmark 4; France 5; Germany 15; Greece 1; Hungary 20; Italy 11; Ireland 21; Israel 7; The Netherlands 6; Poland 27; Portugal 8; Russia 14; Slovak Republic 2; Spain 50; Switzerland 4; and United Kingdom 3 hospitals. (CBO, 1992 and 1993)

Table 6.4(b) shows significant changes of professional behaviour in the field of routine preoperative tests for ASA1(&) patients, elective surgery: 1992-1997 in the 7 large county hospitals (C7) - participating through the whole duration of the programme.

Table 6.4(b) Routine preoperative tests for ASA1(&) patients, elective surgery: 1992-1997; the 7 large county hospitals (C7) - participating through the whole duration of the programme

<table>
<thead>
<tr>
<th>Preoperative tests</th>
<th>1995</th>
<th>1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest X-ray</td>
<td>15%</td>
<td>11%</td>
</tr>
<tr>
<td>ECG</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>Urine albumin</td>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>Urine glucose</td>
<td>55%</td>
<td>55%</td>
</tr>
<tr>
<td>Urine sedimentation</td>
<td>55%</td>
<td>55%</td>
</tr>
<tr>
<td>Urine reduction</td>
<td>45%</td>
<td>44%</td>
</tr>
<tr>
<td>Blood ESR/viscosity</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Blood haemoglobin</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Blood haematocrit</td>
<td>80%</td>
<td>80%</td>
</tr>
</tbody>
</table>
6.2.1 Interpretation of the result of the first study on preoperative routine and further quality assurance activities

As Tables 6.3/a-b and 6.4/a-b show, there was a big difference in the field of preoperative routine in the group of Hungarian hospitals compared to a group of 267 European hospitals that participated in the first Concerted Action Programme on Quality Assurance in Hospitals. (Data from the 17 Hungarian hospitals are not included in the data of the 267 European hospitals.) After these findings had been obtained, a literature review on preoperative routine was conducted and published in medical journals in Hungary, and the results were presented in various consensus conferences. ASA score was recommended to use to the Hungarian College of Surgeons. Methodology and results of the evaluation of preoperative routines became part of the quality assurance training programmes, which were started in Hungary at that time. The lesson learned from the first study as compared with those from the 267 European hospitals was the first ‘local’ example to show that there is a difference in quality among hospitals which can be eliminated without major additional resource investment. As seen in Table 6.4/a-b, substantial preoperative routine was performed on the patients. Six main reasons were identified through the answers for the open questions of the questionnaire from the surgeons and physicians, site visits and various meetings that gave an explanation to this practice:

- ASA score was not used in Hungary in 1992/93 (subsequently, it was recommended by the Hungarian Society of Surgeons later in 1995),
- the concept of risk assessment and adjustment and the patients categorisation based on this was unknown at that time,
- there was an implicit, anecdotal but very strong requirements in the hospitals that every patients had to have chest X-ray, ECG and laboratory tests (SMA 12) prior to surgery. According to the underlying health policy of the time, all hospital physicians and surgeons were responsible for and had to perform general physical check up, all screenings what were possible in the given hospital, health promotion and health education. Preoperative routine was automatic. At many of the departments and services, nurses automatically filled in the X-ray, ECG and laboratory tests request forms and sent patients to preoperative routine. In most surgical departments all preopera-
tive routine had been ready before the surgeon or anaesthesiologists first saw the patient.

- there were no budget limitations at the time, hospitals were financed by global budgets,
- no evaluation had been conducted previously on the quality of preoperative routine,
- and the importance of preoperative routine had never been questioned before,
- results of international research published in international professional literature were unknown, journals in quality of care, technology assessment, clinical epidemiology, health economics, audit etc. were not available in Hungary, and this kind of research had never been used and implemented; furthermore, no systematic reviews in this field were ever published.

Based on the findings shown in Tables 6.3/a-b and 6.4/a-b, a ‘Preoperative Assessment Working Party’, hereinafter referred to as ‘Working Party’ was formed. Members were delegated by the participating hospitals (mainly medical directors), the Hungarian Hospital Association (Secretary General), Health Insurance Fund Administration county directorates (medical directors) and the Hungarian Society for Quality Assurance in Health Care (Secretary General - the author). They created and educational package based on the literature on preoperative assessment. The various reasons of justifying the performance of preoperative routine (diagnostic function: complete the medical history, and medical examination; baseline function: assess potential further disturbances; screening function: detect unsuspected illness; risk assessment function: predict individual risk; monitoring function: help management of patient care) and their sensitivity and specificity (Charpak, 1986; CBO, 1994, Klazinga and Helsloot, 1989) were discussed in details. Fortunately, this educational package was incorporated into the curriculum of health care management education that was launched just at that time in Hungary. This was mainly due to the fact that this program was part of the first European concerted quality assurance programme, this was the first multi-hospital quality assurance program in Hungary and the materials of this program formed the only quality assurance literature in Hungarian language. This course conferred manager diplomas to hospital medical directors. The preoperative assessment education package was used to demonstrate quality assurance in hospitals as well as the specificity and sensitivity of various examinations. Members of the ‘Working Party’, such us medical directors of major hospitals, the Secretary General of the Hungarian Hospital Association etc. were at that time trainees at that manager course. Many of them prepared their diploma thesis on this topic. These fortunate coincidences greatly contributed to the success of the program. The ‘Working Party’ set up and disseminated suggestions on preoperative routine based on the literature. These suggestions were:

- the investigation request form (X-ray, ECG, lab. tests) should be filled in by an MD, preferably a surgeon or anaesthesiologist,
- ASA score should be implemented in the daily practice, and all patients should be categorised according to ASA,
- it is a general guideline not to perform preoperative X-ray and ECG for ASA1 patient, unless a doctor specifically requests some of them for some reason,
- there should be policies about preoperative laboratory test request developed by the individual departments or services within the hospital, based on the case mix and profile of the department,
current practice needs to be reviewed annually with the involvement of the Working Party.

As a general recommendation, the Working Party suggested to establish a Quality Assurance Committee in the hospitals (in 1992, no Hungarian hospital had quality assurance professionals or a quality assurance committee in place).

6.2.1.1 Response rate and the receptivity of hospitals, Phase 1

The response rate of Phase 1 shows that large county hospitals might be more receptive to participating in quality improvement programmes than other hospitals with different size and function. (Using Fisher Yates correction, Chi-squared value is 28.3 p<0.05). (Table 6.5)

Table 6.5 Response rate of the hospitals Phase 1

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>County hospitals</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Other hospitals (*)</td>
<td>9</td>
<td>98</td>
</tr>
</tbody>
</table>

(*) Other hospitals: municipal and university hospitals

6.3 Second evaluation of the preoperative routine in 20 hospitals, 1995/96

During the Phase 2 of the study the same methodology was used; the translated questionnaire was distributed among 124 hospitals and was completed by 20 of them (16%). A comparison of the 1995/96 stage of quality assurance with that in 1992/93 (Table 6.1) shows significant changes in Hungarian hospitals in relation to quality assurance activities on preoperative routine. Quality assurance on preoperative assessment in surgery was among the first four quality assurance activities implemented in Hungarian hospitals. The methodology and literature review, were available in Hungarian and experts in this field visited Hungary (Klazinga and colleagues) and provided technical assistance quite frequently. Because additional resources were not needed, the programme was supported by the Ministry of Welfare and the management of the participating hospitals. Quality assurance on preoperative routine was an ideal topic to start quality assurance activity in Hungary. Table 6.3/a-b shows a dramatic decrease in the number of preoperative tests performed in the responding Hungarian hospitals.

6.3.1 Interpretation of the result of the second study on preoperative routine and further quality assurance activities

As shown by Tables 6.3/a-b and 6.4/a-b, a considerable step forward was made in the field of quality assurance in general and in the field of preoperative assessment in particular. Especially the 7 large county hospitals (C7) - participating through the whole duration of the programme - showed significant changes between 1992/1993 and 1995 in utilisation of preoperative tests. It seems fair to conclude that the decrease in the preoperative investigations was partly due to the quality assurance activities and partly the significant dete-
rioration of the hospitals' financial situation. None of the hospitals reported any negative effects as a consequence that decreased number of preoperative investigations were performed. The Working Party maintained their previous suggestions (Paragraph 6.2.1) and proposed to continue their implementation without any change. The previous recommendations that were considered to be good were then published, disseminated countrywide to all hospitals and presented at consensus conferences. These recommendations were widely accepted and agreed among the professionals in Hungary in the participating 7 county hospitals.

6.4 The third evaluation of the preoperative routine in 9 hospitals in 1997

During the third survey (Phase 3), the questionnaire used during the two previous studies was administered for final evaluation purposes. At that time, 9 completed questionnaires (45% response rate) were returned out of the participating 20 hospitals as shown by Tables 6.1, 6.3/a-b and 6.4/a-b. Seven hospitals out of the 9 were large 1,500-2,000 bed county hospitals participating in the programme since the beginning (1992). The 7 county hospitals represented 37% of the county hospitals, which provide a massive amount of medium level care on county level in Hungary. These 7 county hospitals participating throughout in the programme reached most of the goals of the programme between 1992/1993 and 1997. Only the rate of ‘pre-operative assessment tests usually performed before admission of in-patients’ (Table 6.3/a-b) remained practically unchanged. Due to the current hospital financing mechanism hospitals have a strong financial incentive to admit patients instead of performing preoperative assessment before admission. Hospital management are fully aware that pre-operative tests performed before admission would be better for the patients and resources could be saved, but clear financial loss as a consequence of quality assurance activity is unacceptable to them.

6.4.1 Interpretation of the result of the third study on preoperative routine and further quality assurance activities

The third survey is only of an informative nature, from national perspective due to the relatively low number of participating hospitals. But this finding seems to be relevant to the medium care settings provided by large county hospitals (C7 in tables 6.3/a-b and 6.4/a-b). This is interesting to notice that mostly these hospitals employed quality staff and implemented quality assurance programmes really actively in Hungary. Top care institutions, included national institutes and university clinics were and are rather reluctant to set up quality policy, involved quality assurance programmes and employ staff paid for doing quality assurance.

In the other side of the health care palette, the basic care providers, the municipal hospitals were argued that they capacity to be involved in quality assurance programmes were limited due to the ‘small’ hospital size (200-600 beds) and limited staff and budget. There were no budget dedicated to employ full time or part time quality - or even hospital epidemiology - staff. Many times there were (and are) different legal requirements for these ‘small hospitals’, for instance, full time hospital epidemiologists were and still not manda-
tory to employ. It had special impact on quality assurance due to the fact that hospital epidemiologists took the leading role of the quality assurance in the county hospitals in the beginning of quality assurance development and later they often became quality assurance directors or were and still working closely together with quality assurance directors.

In hospitals in which quality assurance had been instituted as a continuous activity and incorporated among the hospital’s routines, X-ray, ECG and laboratory test utilisation became a continuous concern of the Quality Assurance Committee. In 1997, in the 4th - 5th year of the programme, results out of the programme were used in many hospitals, guidelines were created and implemented in lots of hospitals, the concept and methodology became widely accepted. Quality assurance in pre-operative assessment became part of the daily routine, professionals did not see this as research programme any more, and the Quality Assurance Committees are fully able to manage this in their own hospitals, further assistance was not needed from ‘outside’ in this field.

6.5 Discussion; results

From the early 80s researchers have provided a massive amount of scientific evidence about the serious overuse of preoperative assessment tests, including laboratory tests, ECG and chest X-ray. This overuse is costly and may cause harm to the patients due to the large amount of false positives and further diagnosing and treating these false positive patients. Tests used for preoperative assessment purposes are typical low-cost diagnostic technologies (LCDT). According to Lewis (1997) the distinguishing characteristics of the LCDTs are: they are minimally regulated, widely available and by definition inexpensive; there are rarely formal policies or protocols governing the nature and amount of use, they are widely diffused across the health care system; the fixed cost and marginal cost are relatively low and the marginal revenues from each procedures can be very high. (Lewis, 1997)

The inappropriateness of preoperative assessment in surgery became an issue in Hungary in the early 90s, and there was a rising awareness among professionals that preoperative assessment should be performed according to the scientific insights. Guidelines were required and implemented in order to change the behaviour of the professionals and improve the quality of care system. Managers were also impressed by the fact that this type of quality assurance activity works, can save resources and improve quality of care.

The first questionnaire survey in 1992/93 showed that hospital departments in Hungary were performing pre-operative tests of almost all kind for ASA 1 category patients in elective surgery, in 80-90% of the cases. According to the literature the value of pre-operative tests has not been established for ‘healthy patients’ with no previous medical history, in whom physical examination does not indicate a need for further investigation has not been established. In case of inappropriately, unnecessarily offered pre-operative tests the predicted rate of false positives might be very high, testing and subsequent treatment might be harmful, costly and time-consuming (e.g. surgical procedures might be unnecessarily delayed). The assessment, development and evaluation of the preoperative routine were successfully finished in 1997. In 1995 and 1997, those hospitals that had incorporated
quality assurance as a continuous exercise among the hospital activities and in which X-ray, ECG and laboratory test utilisation review was part of the standing duties of the Quality Assurance Committee, ceased to consider this area as one of priority importance to be studied. The initial recommendations of the Working Party were subsequently included in the guidelines of the various professional associations (Society of Anaesthesiology and Intensive Therapy, Professional Colleges of Surgery). The amount and evaluation of necessary preoperative routines became a topic at professional conferences of surgeons and of their publications. Whereas in 1992 and earlier, the prevailing attitude had been one of 'the more investigations, the better the quality of care', by 1997 the aim in most of the hospitals became 'to carry out few and only the necessary investigations. Also, the professional advisory board in the given speciality and the medical speciality itself became owners of the field, which is seen as a real success of the programme.

As a second step, the reasons for carrying out preoperative assessment were examined, and then recommendations based on literature and the results from the large group of European hospitals (COMAC/HSR/QA and BIOMED/PECO), were created and disseminated.

6.5.1 Process versus outcome measures of the preoperative assessment

Outcome measurement was not part of the programme. Partly because poor outcome may not occur each time something is done incorrectly, outcome can require very large samples and often take too long to measure a statistically significant effect. In the case of preoperative assessment, based upon the massive international literature, process measures (what is done to a patient) seems to be a sensitive measure of quality of care. However, professionals in the participating hospitals (with particular emphasis on county hospitals) become interested in learning more about the actual outcome of the services they performed. The above explanation was acceptable but not satisfying to them. They wanted to further analyse risks, antibiotic delivery and nosocomial infections such as surgical site infections (SSI) of their patients. As a consequence of the professionals' interest this research went further in a different but related topic the 'Risk-adjusted surgical site infection surveillance in Hungarian hospitals', the results of this study are discussed in Chapter 7.

6.5.2 County hospitals as change agents of quality improvement

One of the most interesting results of the study showed that county hospitals are more receptive than other healthcare settings such as university hospitals (top care) and municipal hospitals (basic care). Quality assurance activities started in large county hospitals in Hungary, this impression is strengthened by chapter 5-9 as well. County hospitals seem to be the change agents in the transition period of the Hungarian health care system, in terms of quality improvement. This result is in accordance with the literature. Keeler, Rubenstein, Kahn et al. (1992) argued that teaching, larger and more urban hospitals have better quality in general than non-teaching, small and rural hospitals. Although further research is needed to fix and describe the characteristic feature of the change agent(s) in quality improvement, there might be some possible explanations to be listed:
County hospitals are big and complex enough, having large number of staff with different qualification, to break the 'critical mass'.

These hospitals have stronger, more 'general management oriented' management compared to the municipal or university hospitals.

County hospitals belong to the municipalities, they are close to the 'customers', the feed-back is more direct and immediate.

Patients are usually 'filtered' before admission to county hospitals, as they are usually referred to county hospitals by out-patient clinics or municipal hospitals. In contrast, municipal hospitals and university hospitals have a so-called 'municipal hospital function or basic care function' which means that patients usually come with GPs' referral as well (or are self-referrals).

These hospitals have trained full time management, both in terms of general, medical, nursing and economic management, which was not available in the municipal and university hospitals. Full time hospital epidemiologists were and are (in 2000) employed only in county (and university) hospitals and not in municipal hospitals. From 1993, first part time, than after 1995/1996 full time quality assurance directors (with fully employed staff) were employed in almost all county hospitals. There were no full time quality assurance staff employed in municipal and university hospitals, and this situation has not changed.

6.5.3 Validity of the findings

Important question is the validity of the findings. Results might be well extrapolated to the medium care institutions, to the county hospitals. These hospitals are the 'backbone' of the health care system and provide the highest level health care services in a county basis. These hospitals are also the centre of the county level CME and these are teaching hospitals affiliated to medical universities. Significant changes could be witnessed in the field of preoperative assessment in particular and in quality assurance activities in general between 1992-1997 in the Hungarian county hospitals. Direct evidence were obtained in relation to 7 county hospitals out of the study. Results might be extrapolated with caution to national institutes, university hospitals and municipal hospitals.

Did quality assurance efforts facilitated or caused the change, which we believe was improvement?

In analysing the introduction of the quality assurance in hospitals, it may be difficult to identify the cause and effect of such tool perfectly. Between 1992 and 1997 there were many changes in the health care system, including financial mechanisms of the reimbursement, managerial changes in the hospitals, as well as legal frameworks.

Some of the changes in the procedure of the preoperative assessment are direct results of the programme such as setting up quality policy in the hospitals related to preoperative assessment, creating and using guidelines, establishing committees, collecting and analysing data and continuously making corrective actions. One might say that the decrease of the use of these preoperative assessment tests were influenced by the limited resources available for the hospitals. This might contribute to the final result to some extent.
6.6 Recommendations

Based on the findings of the study the following recommendations can be made:

a) This study provided direct evidence that quality assurance in the field of preoperative assessment can work in a group of 7 Hungarian county hospitals. In Hungary there are 19 county hospitals in total plus a couple of hospitals in Budapest (10 hospitals) of the same size and function, with altogether 50%-55% of the total hospital capacity in terms of hospital beds falling in this category. Quality improvement activities in this field should be promoted and broadly disseminated to these hospitals.

b) Smaller hospitals (municipal hospitals) 'below the critical mass' might also be able to participate in the quality improvement of preoperative assessment in surgery through various management assistance, such as twinning hospitals, more extensive networking, sharing experience, time of quality assurance professionals and quality management with county hospitals. The most appropriate technique should be identified, piloted, implemented and maintained in the near future, assisted by regulation or legislation, for instance, within the accreditation scheme which is currently being established.

c) More comprehensive data collection is needed as a routine in all kinds of hospitals.

d) Our results show that systems (hospitals) might absorb innovations/changes without them changing. One working quality assurance programme does not necessarily mean that the whole system changed and the concept of quality is implemented. In order to improve and maintain quality of care in the field of preoperative assessment the quality concept has to be further implemented in the Hungarian hospitals.

Without these further steps health care settings in Hungary are not ready to institute guidelines imported from other countries.
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