



# INAHTA

## *Synthesis Report*

# *Preoperative Evaluation in Elective Surgery*

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Basque Office for Health Technology Assessment - Osteba

December 1999

**Synthesis of INAHTA Agencies Reports**

**PREOPERATIVE  
EVALUATION IN ELECTIVE  
SURGERY**

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December 1999

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Published in name of the International Network of Agencies for Health  
Technology Assessment (INAHTA) by:

Basque Office for Health Technology Assessment, Osteba.  
Dpt. of Health Basque Government.  
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Legal Deposit: VI-160/2000

This document is also available in Spanish, translated by the Basque  
Office for Health Technology Assessment, Osteba.  
Dpt. of Health Basque Government.  
The English version is available in the INAHTA web: [www.inahta.org](http://www.inahta.org)

This report should be referenced as follows.

López-Argumedo M., Asua J. *Preoperative Evaluation in Elective Surgery*.  
(INAHTA Synthesis Report). Vitoria-Gasteiz. Dpt. of Health Basque  
Government. Basque Office for Health Technology Assessment, Osteba.  
1999

## LIST OF ABBREVIATIONS

**ANDEM:** *Agence Nationale pour l'Évaluation Médicale.* France.

**ANDEM 92:** “*Indication of preoperative tests*” published by *Agence Nationale pour le Développement de l'Évaluation Médicale* in June 1992

**ASA:** American Society of Anesthesiology

**BMI:** Body Mass Index = Weight/(Height)<sup>2</sup>

**BUN:** blood urea nitrogen

**CAHTA:** Catalan Agency for Health Technology Assessment. Spain.

**CAHTA 99:** “*Survey of preoperative routines in Catalonia (Spain)*” published by Catalan Agency for Health Technology Assessment in April 1999. Preliminary report.

**cc:** cubic centimeters

**cig.:** cigarettes

**CNFME:** Specialists Doctors Training National Commission (Spain)

**EKG:** electrocardiogram

**GR:** *Gezondheidsraad.* The Netherlands.

**GR 97:** “*Preoperative Evaluation*” published by the Health Council of the Netherlands in February 1997

**INAHTA:** International Network of Agencies for Health Technology Assessment

**NCCHTA:** The National Coordinating Center for Health Technology Assessment. United Kingdom.

**NCCHTA 97:** “*Routine preoperative testing: a systematic review of the evidence*” published by NCCHTA in December 1997.

**OSTEBA:** Basque Office for Health Technology Assessment. Spain.

**OSTEBA 94:** “*Healthy/Asymptomatic Patient Preoperative Evaluation*” published by The Basque Office for HTA, OSTEBA, in June 1994

**Rx:** radiography

**SBU:** Swedish Council on Technology Assessment in Health Care

**SBU 89:** “*Preoperative routines*” published by the Swedish Council on Technology Assessment in Health Care in May 1989

## **ACKNOWLEDGEMENTS**

We should acknowledge the Synthesis Report Editorial Committee for many helpful comments and suggestions and also Gloria Oliva from CAHTA and Mike Boss from GR who provided us useful information about their reports.

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## INTRODUCTION

The routine ordering of a range of tests preoperatively, whether or not indicated by an individual patient's clinical features, has been a part of clinical practice for many years.

The purposes of such testing may include:

- The identification of an unsuspected condition which may require treatment preoperatively or a change in anaesthetic or surgical management preoperatively.
- The prediction of postoperative complications.
- The establishment of a “baseline” measurement for later reference.
- Opportunistic screening, unrelated to the surgical procedure.

Routine investigations often include chest X-ray, electrocardiogram (EKG), and laboratory testing, such as hemoglobin, electrolytes, and blood glucose. These preoperative investigations involve several different specialties, including anesthesiology, surgery, clinical physiology, clinical chemistry, and radiology.

The need for a preoperative investigation is obvious in cases where such an investigation is indicated by the patient's previous medical history and present status, or by the surgery itself. However, the value of routine investigation is questionable in healthy patients without previous medical history and where physical examination does not indicate a need for further investigation – particularly since false positive findings, and subsequent fruitless, time consuming, costly, and sometimes harmful testing and subsequent treatment, might result from routine investigation.

Since 1989, when an assessment report was published in Sweden on “Preoperative Routines” (SBU 89), five more documents have been written on this subject by other agencies in INAHTA (ANDEM 92, OSTEBA 94, NCCHTA 97, GR 97, CAHTA 99).

This document has been conceived as a pilot project to allow an appraisal to be made of the feasibility of drawing up summary documents on subjects that have been assessed repeatedly by different agencies in INAHTA.

## **OBJECTIVES**

### ◆ **MAIN OBJECTIVE:**

To carry out a report synthesizing the evaluation papers published to date by INAHTA agencies on “Preoperative Evaluation in Elective Surgery”.

### ◆ **SPECIFIC OBJECTIVES:**

- To sum up the state of scientific knowledge about “Preoperative Evaluation in Elective Surgery” in the published reports.
- To describe habitual attitudes and practices among surgeons and anesthesiologists based on the surveys published in the assessment reports.
- To summarize the economic and legal implications analyzed in the reports.



## METHOD

### COLLECTING THE INFORMATION:

An appraisal was made of the information contained in the aforementioned papers that comply with the following **inclusion criteria**:

1. The main subject of the document is “Preoperative Evaluation in Elective Surgery”.
2. The report has been published by an INAHTA member agency.

No **exclusion criteria** have been considered.

In accordance with these criteria, the following reports have been included in this paper:

- “*Preoperative routines*” published by the Swedish Council on Technology Assessment in Health Care in May 1989 (SBU 89).
- “*Indication of preoperative tests*” published by the *Agence Nationale pour le Developpement de l’Evaluation Medicale* in June 1992 (ANDEM 92).
- “*Healthy/ Asymptomatic Patient Preoperative Evaluation*” published by the Basque Office for HTA, OSTEBA, in June 1994 (OSTEBA 94).
- “*Preoperative Evaluation*” published by the Health Council of the Netherlands in February 1997 (GR 97).
- “*Routine preoperative testing: a systematic review of the evidence*” published by NCCHTA in December 1997 (NCCHTA 97).
- “*Survey of preoperative routines in Catalonia (Spain)*” made by Catalan Agency for Health Technology Assessment in April 1999 (CAHTA 99). Preliminary report.

## **SUMMARY AND COMPARISON OF THE REPORTS**

The information from each of the evaluations has been summarized in accordance with the following parameters:

### **1. - OBJECTIVES**

### **2. - RESULTS**

#### **2.1. INDICATIONS IN PREOPERATIVE EVALUATION.**

This chapter describes the following aspects:

- Reports which included information about this question
- Study population
- Method used in the reports
- Results:

The results have been divided into two sections:

- a) those that refer to patients without symptoms of concomitant pathology leading to surgical treatment (asymptomatic surgery patients or ASA I)
- b) those that show symptoms of a concomitant pathology leading to surgical treatment (symptomatic patients or ASA different from I).

In the chapter on results, each of the following tests are considered:

- Chest X-rays
- Electrocardiogram
- Hemogram
- Tests for appraising haemostasis
- Other analytical tests

#### **2.2. HABITUAL ATTITUDES AND PRACTICES AMONG SURGEONS AND ANESTHETISTS**

This chapter includes the following aspects:

- Reports which included information about this question
- Method used in the reports
- Results

The results have been divided into two sections:

- a) Habitual practices
- b) Attitudes

### 2.3. ECONOMIC CONSIDERATIONS

This part includes the following aspects:

- Reports which included information about this question
- Method used in the reports
- Results

### 2.4. LEGAL IMPLICATIONS

The chapter was divided in three parts:

- Reports which included information about this question
- Method used in the reports
- Results

After collecting the information it is being summarized into tables to be able to compare the concordances and differences between the reports, but global conclusions are not drawn.

In the chapters about habitual attitudes and practices among physicians and economic and legal considerations, only the common aspects between the different reports and the main ideas contained in each report about these questions were taken into account.

# RESULTS

## 1. REPORT'S OBJECTIVES

Table 1: Report's **objectives**

<b>SBU 89</b>	<ul style="list-style-type: none"> <li>• To examine the scientific literature concerning the value of different preoperative investigations</li> <li>• To describe, based on a survey, the current practice in Sweden for routine investigations and the general attitude of attending physicians concerning the value of preoperative routines.</li> <li>• To realize an economic analysis and presentation of potential saving from restructuring preoperative routines.</li> </ul>
<b>ANDEM 92</b>	<ul style="list-style-type: none"> <li>• To perform a bibliographical search to document the interest of some preoperative investigations.</li> <li>• To describe, based on a survey, the current practices in France for routine investigations and the general attitude of anesthetists concerning the prescription of preoperative routines.</li> <li>• To analyze the medical legal repercussions of the requests for preoperative investigations.</li> </ul>
<b>OSTEBA 94</b>	<ul style="list-style-type: none"> <li>• To design a document which would scientifically support decision making and build a protocol of recommendations to undergo elective/programmed surgery in healthy/asymptomatic patients.</li> <li>• To publish a report concerning the legal medical repercussions of the implementation of the recommended protocol.</li> <li>• To make a cost/benefit calculation of the implementation of the recommended protocol according to the various application hypotheses.</li> </ul>
<b>GR 97</b>	<p>To answer to the following questions:</p> <ul style="list-style-type: none"> <li>- What is the purpose of preoperative evaluation?</li> <li>- Which specific tests are relevant, especially in “healthy” patients (ASA I)?</li> <li>- Which responsibilities should be assigned to the surgeon and the anesthetist respectively?</li> <li>- How should preoperative evaluation be organized in practice?</li> </ul>
<b>NCCHTA 97</b>	<ul style="list-style-type: none"> <li>• To review the available evidence on the value of routine preoperative testing in healthy or asymptomatic adults.</li> <li>• To assess the completeness of existing reviews of preoperative testing and how applicable their conclusions are to the UK.</li> <li>• To identify areas for further research.</li> </ul>
<b>CAHTA 99</b>	<ul style="list-style-type: none"> <li>• To describe the preoperative practice for elective surgery in surgical centers in Catalonia.</li> <li>• To document the opinion and attitude of professionals about evidence which support this practice.</li> </ul>

As can be observed in Table 1, all documents assessed, except the one of Catalonia (CAHTA 99), aim to know the purpose of preoperative evaluation and the value of different preoperative investigations reviewing the available evidence.

One of the declared goals of the reports published in Sweden, France and Catalonia is to describe customary practice when evaluating surgical patients in each of these countries, as well as the attitudes of surgeons and anesthetists on the scientific evidence that supports this practice and the need for its modification.

The Dutch agency aims to determine how to organize preoperative evaluations in practice.

NCCHTA tries to identify new areas for future research, as well as evaluating the reports published up to 1997 in order to assess the adaptation of its conclusions within the United Kingdom.

## **2. INDICATIONS IN PREOPERATIVE EVALUATION**

### **2.1. REPORTS WHICH INCLUDED INFORMATION ABOUT THIS QUESTION**

All the published reports excepting Catalonian's, included information about indications in preoperative evaluation.

### **2.2. STUDY POPULATION**

- ◆ The report published in Sweden is the only document that limits itself to evaluating surgery in adults. The others include all age groups.
- ◆ Almost all the reports exclude some types of surgery:

The Swedish report excludes chest surgery, neurology, pediatrics, ocular and hand surgery.

The Basque Country report only considers programmed surgery that meets the following criteria: low surgical complexity (under 1 or 2 level in CNFME classification), blood loss under 500 cc and operations lasting under two hours.

The British report excludes obstetric and cardiothoracic surgery.

The Catalonia report excludes pediatric, obstetric and plastic surgery.

### 2.3. METHOD USED IN THE REPORTS

Table 2: **Methods** used in the reports

<b>SBU 89</b>	Bibliographical review Mail questionnaire Economic assessment
<b>ANDEM 92</b>	Bibliographical review Telephone survey Legal analysis
<b>OSTEBA 94</b>	Bibliographical review Panel of experts Legal analysis Economic evaluation
<b>GR 97</b>	Bibliographical review Committee of experts
<b>NCCHTA 97</b>	Bibliographical review Review of existing reports
<b>CAHTA 99</b>	Mail questionnaire

All the agencies (except for the Catalonia agency) have carried out a bibliographical review of the literature.

OSTEBA and NCCHTA describe the databases consulted and the search period considered in these, as the search strategy used.

In addition to, in the Basque Country a Panel of Experts with Scientific Societies representatives was used as a method of consensus, meeting on three occasions to discuss preoperative evaluation in asymptomatic patients and to draw up a series of conclusions in those cases without a evidence base.

In the Netherlands, a committee of experts was brought together to decide on the value/use of the tests used in the preoperative evaluation, but in this case with a bibliographical basis.

## 2.4. RESULTS

Whenever possible, we have divided the results of the reports into two parts:

- A. Asymptomatic patients or ASA I
- B. Symptomatic patients or with a pathology (ASA different from I)

This classification of patients requires a preliminary assessment of the clinical state of the patient by the surgeon or anesthetist by means of the clinical history and an examination.

### 2.4.1. – Chest radiography

#### A) *Asymptomatic patients*

Table 3: Recommendations on the suitability of pre-surgery **chest X-rays** in **asymptomatic** patients

SBU 89	- Immigrants from developing countries without chest X-ray during the previous 12 months.
ANDEM 92	- Immigrants from developing countries who have not had a chest X-ray over the previous 12 months.
OSTEBA 94	- Persons of over 60 years of age - Obese persons with BMI over 30 - Smokers of more than 20 cigarettes a day
GR 97	- Immigrants from developing countries who have not had a chest X-ray over the previous 12 months. - Long-term smokers.
NCCHTA 97	- Not indicated

As can be observed in Table 3, several reports (SBU 89, ANDEM 92, GR 97) consider that it is suitable to order chest X-rays in immigrants from developing countries who have not had a chest X-ray over the last 12 months, due to the risk of tuberculosis.

Other reports consider it correct to order a X-ray examination in smokers of more than 20 cigarettes a day (OSTEBA 94) or long-term smokers (GR 97).

The report of the Basque Country considered that a X-ray examination should be ordered in patients over 60 years of age.



The most recent report published (NCCHTA 97) that includes results about this question, argues that “there is no evidence to support chest X-rays in all patients, and that there is no evidence to show that the absence of x-ray examination may lead to their health being affected, due to the fact that only 2% of the X-rays made involve a change in the handling of patients, thereby suggesting high costs and disadvantages with a very limited potential benefit.”

A) *Symptomatic patients:*

Table 4: Recommendations on the suitability of pre-surgery **chest X-rays** in **symptomatic** patients

SBU 89	<ul style="list-style-type: none"> <li>- Symptoms of acute respiratory pathology</li> <li>- Cardiopulmonary pathology</li> <li>- Risk of metastasis</li> </ul>
ANDEM 92	<ul style="list-style-type: none"> <li>- Symptoms of acute respiratory pathology</li> <li>- Cardiopulmonary pathology</li> <li>- Risk of metastasis</li> </ul>
GR 97	<ul style="list-style-type: none"> <li>- Respiratory pathology</li> <li>- Cardiovascular pathology</li> <li>- Developed neoplasias</li> <li>- Cardiac and high chest surgery</li> </ul>

\* The reports published by OSTEBA and NCCHTA only include asymptomatic patients

As can be seen in Table 4, there is agreement that a routine chest X-ray should be order in patients with respiratory or cardiovascular pathology and with an underlying risk of metastasis.

## 2.4.2. - **Electrocardiogram**

### A) *Asymptomatic patients:*

Table 5: Recommendations on the suitability of **EKGs in asymptomatic** patients

SBU 89	<ul style="list-style-type: none"><li>- Men of over 50 – 60 years of age</li><li>- Women of over 60 – 70 years of age</li></ul>
ANDEM 92	<ul style="list-style-type: none"><li>- Men of over 40 – 45 years of age</li><li>- Women of over 55 years of age</li></ul>
OSTEBA 94	<ul style="list-style-type: none"><li>- Men and women of over 60 years of age</li><li>- Patients of over 40 years of age not having done a previous EKG</li></ul>
GR 97	<ul style="list-style-type: none"><li>- Men and women of over 60 years of age</li></ul>
NCCHTA 97	<ul style="list-style-type: none"><li>- Not indicated</li></ul>

It has been demonstrated in these reports that the increase in age is associated with the appearance of more electrocardiographic findings, with a greater percentage of true positives. Accordingly, age has been the criterion used in most evaluation reports to recommend an electrocardiogram preoperative. Sixty years of age was the most frequently used age limit.

NCCHTA argues that “the evidence does not support a policy of routine preoperative electrocardiogram in all patients, and conversely provides no evidence that such policy would be harmful. Given that benefits would probably only occur in those 2% of patients in whom management is altered, a policy of routine EKG recording is unlikely to yield important benefits for patients.”

*B) Symptomatic patients:*

Table 6: Recommendations on the suitability of **EKGs in symptomatic** patients

SBU 89	- Cardiopaths
ANDEM 92	<ul style="list-style-type: none"> <li>- Personal histories or signs of cardiac pathology (including arrhythmia)</li> <li>- Cardiac surgery</li> <li>- Systematic illnesses associated with cardiac problems (high blood pressure, peripheral vascular disease, infectious diseases, neoplasias, collagenosis)</li> <li>- Treatment with cardiotoxic drugs (phenothiazines, tricyclic antidepressants, doxorubicin)</li> <li>- Important electrolytic disturbances</li> </ul>
GR 97	<ul style="list-style-type: none"> <li>- Cardiac pathology</li> <li>- High blood pressure</li> <li>- Treatment with digitalis in persons of over 45 years of age</li> <li>- Pulmonary pathology</li> <li>- Radiotherapy</li> <li>- Insulin-dependent diabetes</li> </ul>

\* The reports published by OSTEBA and NCCHTA only include asymptomatic patients

Reports that include symptomatic patients in their evaluation recommend that it is advisable to perform a preoperative EKG in patients with personal histories or signs of cardiac pathology.

The reports carried out in France (ANDEM 92) and in the Netherlands (GR 97) also recommend its use in diseases associated with cardiac pathology, such as high blood pressure, diabetes mellitus and treatment with cardiotoxic drugs.

### 2.4.3. - **Hemogram:**

#### A) *Asymptomatic patients:*

Table 7: Recommendations on the suitability of pre-surgery **hemograms in asymptomatic** patients

SBU 89	- When the need to make transfusions is envisioned.
ANDEM 92	- Minor surgery: Do not carry out on a routine basis in the case of patients of less than 1 year of age, the elderly, pregnant women and immigrants from developing countries. - Potentially hemorrhagic surgery.
OSTEBA 94	- Not recommended on a routine basis except in the new-born, persons of over 60 years of age and fertile women. - Potentially hemorrhagic surgery (more than 500 cc.)
GR 97	- Not recommended on a routine basis except in children of less than one year of age and patients of non-Caucasian origin. - Surgery in which the need to make transfusions is expected.
NCCHTA 97	- Not indicated.

NCCHTA argues that there is no evidence to support hemoglobin and routine blood counts in all patient because this rarely results in changed clinical management.

The rest of the reports recommended hemograms in asymptomatic patients in those cases in which the surgery to which the patient is to be subjected is potentially hemorrhagic or in which the need to have a transfusion is envisaged.

If the surgery isn't potentially hemorrhagic, two reports (ANDEM 92, OSTEBA 94) recommend these tests in patients of less than one year or over 60 year.

*B) Symptomatic patients:*

Table 8: Recommendations on the suitability of pre-surgery **hemograms in symptomatic** patients

SBU 89	Recommends selective use in accordance with the basic pathology
ANDEM 92	<p>If there are signs or symptoms of:</p> <ul style="list-style-type: none"> <li>- anemia</li> <li>- abnormal bleeding</li> <li>- polyglobulia</li> <li>- hematological disorders in general</li> <li>- diseases associated with anemia (cancer, kidney failure)</li> </ul>
GR 97	<ul style="list-style-type: none"> <li>- Neoplasias</li> <li>- Kidney disease</li> <li>- High blood pressure</li> <li>- Anti-coagulation treatment</li> <li>- Chronic obstructive pulmonary disease</li> </ul>

\* The reports published by OSTEBA and NCCHTA only include asymptomatic patients

As can be observed in Table 8, pre-surgery hemogram is recommended if diseases related to blood cells or coagulation disorders are present.

#### 2.4.4.- **Haemostasis:**

##### A) *Asymptomatic patients:*

Table 9: Recommendations on the suitability of pre-surgical tests to evaluate **haemostasis in asymptomatic** patients

SBU 89	- Not recommended
ANDEM 92	- If the past history suggests the risk of hemorrhage - If it isn't possible to know the past history (children of less than one year of age or patients who cannot respond to questions on this matter) - Special therapies
OSTEBA 94	- If the anamnesis suggests coagulation problems - Difficult surgical haemostasis - Drinkers of more than 500 cc of wine or its equivalent
GR 97	- If the past history suggests hemorrhagic disorders
NCCHTA 97	- If the anamnesis suggests haemostasis disorders

SBU argues that there is no evidence to support tests related to the risk for bleeding in all patient because the prevalence of clinically important conditions is extremely low among asymptomatic patients, there are hundred of false positive per detected case and it is estimated that the cost per identified case of asymptomatic bleeding was 1.1 million U.S. dollars in 1979.

The rest of the reports recommended that an haemostasis test should be conducted when the past history suggest any possible haemostasis problems.

##### B) *Symptomatic patients:*

Only the Dutch report (GR 94) makes reference to carrying out haemostasis tests in symptomatic patients, recommending their performance in patients with developed neoplasias, demonstrated cases of haemostasis disorders, hepatic diseases or treatment with oral anticoagulants.

2.4.5. - **Other analyses**

A) *Asymptomatic patients*

• **Blood biochemistry.**

Table 10: Recommendations on the suitability of **biochemical blood tests in asymptomatic** patients

SBU 89	- Not indicated
ANDEM 92	- The cost efficiency of this examination increases with age although the limit as from which it must be carried out is not clear.
OSTEBA 94	- BUN or creatinine and glycemia for persons of over 40 years of age
GR 97	- Creatinine for persons of over 60 years of age
NCCHTA 97	- Not indicated

As can be observed in Table 10, NCCHTA and SBU reports don't consider it justified to request biochemical blood tests in asymptomatic patients, but three other reports recommend that these should be carried out at specific ages.

B) *Symptomatic patients*

Table 11: Recommendations on the suitability of **biochemical blood tests in symptomatic** patients

GR 1997	<ul style="list-style-type: none"> <li>• Patients under treatment with:             <ul style="list-style-type: none"> <li>- diuretics (creatinine, potassium)</li> <li>- digoxin (creatinine, potassium)</li> <li>- corticosteroids (glucose, potassium)</li> </ul> </li> <li>• Diabetic patients</li> <li>• Kidney patients</li> <li>• Severe high blood pressure</li> </ul>
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\* The reports published by OSTEBA and NCCHTA only include asymptomatic patients

- **Immunohaematological tests**

The reports published in France and the Netherlands recommend this test be carried out if the need to have a blood transfusion is envisaged.

The rest of the reports don't analyze this question.

- **Urinalysis**

In the Basque Country (OSTEBA 94) this test is recommended when the urinary tracts are manipulated in order to rule out an asymptomatic pyuria.

In the United Kingdom (NCCHTA 97), this test is not justified in healthy individuals except in a selected population (for example, elderly women) with dipstick testing for features suggestive of infection, followed by laboratory microscopy and cultures for those which are positive.

Other reports don't included considerations about this test.



### **3. HABITUAL ATTITUDES AND PRACTICES CONCERNING PREOPERATIVE EVALUATION IN PROGRAMMED SURGERY**

#### **3.1. REPORTS WHICH INCLUDED INFORMATION ABOUT THIS QUESTION**

Currently, three agencies belonging to the INAHTA network have made an appraisal of these subjects: SBU in Sweden, ANDEM in France and CAHTA in Catalonia.

Although the work done in Catalonia is still unpublished, the authors have provided a preliminary document and have authorized the inclusion of the results in this chapter.

#### **3.2. METHOD USED IN THE REPORTS**

To obtain information about habitual practices and attitudes, a survey has been applied in the three reports (SBU 89, ANDEM 92, CAHTA 99).

The characteristics of the surveys are as follows:

Table 12: Characteristics of the surveys

SBU 1989	<ul style="list-style-type: none"><li>- Mail questionnaire.</li><li>- Surgeons and anesthetists.</li><li>- n= 244</li><li>- Response rate 93%</li><li>- Period: March 1989</li></ul>
ANDEM 1992	<ul style="list-style-type: none"><li>- Telephone survey</li><li>- Anesthetists (Representative sample)</li><li>- n = 204</li><li>- Replacement by repeated absence of the anesthetist phoned</li><li>- Response rate 100%</li><li>- Period: 5-20 September 1991</li></ul>
CAHTA 1999	<ul style="list-style-type: none"><li>- Mail questionnaire repeated two months later if there was no answer</li><li>- Surgeons and anesthetists</li><li>- n = 227</li><li>- Response rate 61%</li><li>- Period: September 1997- February 1998</li></ul>

### 3.3. RESULTS:

#### A) *HABITUAL PRACTICES*

- ◆ In **Sweden**, in 1989, most surgeons (61%) and anesthesiologists (70%) ordered chest X-rays in the preoperative stage only in the case of special indications. On the other hand, in the case of electrocardiograms, the most commonly used criteria was age (78% in the case of surgeons and 76% in the case of anesthesiologists).

Spirometry was performed mainly for special indications (69% of surgeons and 76% of anesthesiologists).

Both groups of doctors requested the performance of analytical tests such as potassium (66% of the anesthesiologists and 73% of surgeons), sodium (64% and 69% respectively), creatinine (54% and 65%), albumin and a leukocyte counts (48% and 45%) mainly in patients to be submitted to programmed surgery.

- ◆ In **Catalonia**, a fifth of those surveyed performed a preoperative evaluation of programmed patients, mainly on the same day the patient is admitted to hospital or on the day of surgery.

Centers usually had a protocol in place for requesting additional tests, although only half established some of these application criteria in accordance with the state of health of the patient, age, the anaesthetic-surgical risk and the type of operation.

29% of the surgeons and 49% of the anesthesiologists requested chest X-rays "above determined age". The remaining doctors requested it "always or almost always". EKG was requested in 25% of surgeons and 43% of anesthesiologists "always above a certain age" and 70% and 55% respectively demanded it "always or almost always".

Most of those surveyed declared that they requested hemoglobin and/or hematocrit "always or almost always" (95%), coagulation tests (94%) and glycemia (89%).

54% of surgeons and 40% of anesthesiologists use current chest X-ray to identify asymptomatic diseases and in case of EKG, 67% of surgeons and 55% of anesthesiologists.

- ◆ In **France**, in 1992, 29% of the centers had a protocol to request pre-surgical tests. These protocols established the priority to demand tests in function of the type of disorders (45%), of the age of the patients (41%), of the urgency (8%) and of the type of surgery (6%).

## B) ATTITUDES

- ◆ According to the survey carried out in **Sweden** in 1989, 83% of the surgeons and 93% of the anesthetists surveyed questioned or rejected the statement that there was support in scientific literature for preoperative chest X-rays.

There was widespread doubt about the existence of a valid scientific base for recommending an EKG (59%) or a chest X-ray (62%) at the preoperative stage.

Concerning the motives for performing a preoperative chest X-ray, 35% of the surgery and anesthesia departments considered that the main reason is to identify asymptomatic illnesses. In the case of EKGs, 59% of surgeons and 67% of anesthetists considered that these were performed to identify asymptomatic diseases and 59% and 72%, respectively, considered that these were carried out to detect medical complications.

- ◆ In **France** in 1992, 66% of anesthetists declared themselves to be satisfied with the type of practice used, while 44% declared that too many preoperative examinations were performed. 37% reported a lack of organization at the preoperative stage and 19% a lack of standardization in practices. 81% favoured the change in the preoperative study and 9% were not in favour.

Five types of obstacles were reported for modifying preoperative evaluations: 62% refer to problems of a legal nature, 54% organizational problems, 26% relating to relations with colleagues, 24% relating to patients' demands and 20% to cost effectiveness problems .

- ◆ In **Catalonia** in 1997, 70% of the surgeons and 88% of the anesthetists surveyed questioned or rejected the statement that there was support in scientific literature for preoperative chest X-ray. In the case of EKG, 60% of surgeons and 75% of the anesthetists.

According to 74% of surgeons and 87% of anesthetists surveyed, "some of the preoperative tests are necessary, but others are requested only for legal protection". Nevertheless, 31% of surgeons and 49% of the anesthetists were "in agreement" with the fact that "all routine preoperative tests in asymptomatic patients were requested for legal coverage.

In Catalonia, most doctors (91% of anesthetists and 87% of surgeons) considered that it is absolutely necessary to establish a selective protocol for preoperative tests by means of consensus among the different specialties involved and based on existing scientific knowledge.

#### 4. **ECONOMIC CONSIDERATIONS**

##### 4.1. REPORTS WHICH INCLUDED INFORMATION ABOUT THIS QUESTION

An economic assessment was made of “Preoperative Evaluation” in the reports published in Sweden (SBU 89) and the Basque Country (OSTEBA 94).

##### 4.2. METHODS USED IN THE REPORTS

In the papers published in the Basque Country and Sweden a “cost-benefits” analysis was made to estimate the profitability that would be obtained in the case that the protocol recommended would be implemented.

##### 4.3. RESULTS

Both reports (SBU 92, OSTEBA 94) considered that the indications for preoperative investigation might have a large economic impact on health care. Making the indications for preoperative investigation more stringent in accordance with the best evidence available, may result in the following cost effects:

- Short-term saving in variable costs.
  - Fewer tests will free resources for other purposes.
  - Savings resulting from fewer false positive test results which, for example, might otherwise be reason to postpone operations.
  - Higher costs resulting from complications –during or after surgery– which would have been possible to prevent if routine tests had provided a warning.
- ◆ In the Swedish report it was estimated that the cost per findings which results in actions costs 5,000 – 11,000 SEK (equivalent cost: 958 - 2116.9 U.S. dollars in 1998), which is 10 to 20 times greater than the original cost per preoperative investigation. In Sweden, annual costs generated by preoperative evaluation were estimated at 281 million Swedish Crowns in 1989 (equivalent cost: 54.10 million U.S. dollars in 1998).

Considering that fact that at that time only 7% of surgical patients were not admitted to hospital during the preoperative stage, an analysis was made of the resources that would be freed should this percentage increase from 15 to 75%.

This analysis concluded that if the percentage of patients not admitted to hospital during the preoperative stage were for example 30%, 153.5 million Swedish Crowns would be freed every year (equivalent cost: 29.56 million U.S. dollars in 1998).

- ◆ In the Basque Country, an estimate was made of the annual cost reduction of preoperative tests according to different hypotheses of application of the recommended protocol. For example, should the recommended protocol be applied in the public health system to 100% of the 29.25% of healthy patients requiring elective surgery, the economic repercussion would be very considerable, as it would mean the freeing of resources estimated at 275 million pesetas in 1992 (equivalent cost: 2.86 million U.S. dollars in 1998).

## **5. LEGAL IMPLICATIONS**

### 5.1. REPORTS WHICH INCLUDED INFORMATION ABOUT THIS QUESTION

The Basque and the French reports have considered the legal implications of the application of recommendations in preoperative assessment by the physicians.

### 5.2. METHODS USED IN THE REPORTS

In both reports, experts in Civil Law considered the implications of the request of preoperative investigations and of the implementation of the recommended protocols.

### 5.3. RESULTS

There is concordance in both reports describing the judicial process by its specificity, i.e. each legal problem is different and it is necessary to consider all the aspects related to it.

The French document mentions that anesthetists justify the requirement for a set of systematic examinations due to the fact that there are no regulations that indicate with precision which examinations should be carried out. However, they comment that it should not be forgotten that the aim of making the recommendations is to ensure the maximum safety for patients and not to reassure doctors with guarantees in the case of eventual legal proceedings.

The document published in the Basque Country certifies that “for doctors, the hypothetical introduction of a protocol would have the significant legal value of a kind of coded *lex artis*, and would offer them the advantage of its protection as proof of the good practice of their profession, should they be taken to court. For this reason, it might be said that this imaginary protocol would attenuate or soften, so to speak, the responsibility of doctors, provided that in all other aspects they have followed the dictates of the *lex artis*”.

## DISCUSSION

This document entitled “Preoperative Evaluation in Elective Surgery” has been conceived as a pilot project to allow an appraisal to be made of the feasibility of drawing up summary documents on subjects that have been assessed repeatedly by different agencies in INAHTA.

The subject selected in order to carry out this pilot project has been studied by six assessment agencies, members of INAHTA, over the last ten years: SBU in 1989, ANDEM in 1992, OSTEBA in 1994, NCCHTA in 1997 and CAHTA in 1999.

In some cases, the reports have different approaches and assessment methods, but they also have common features.

Firstly, the aims of all the reports, except the one published in Catalonia, include an analysis of the scientific evidence available at the time of publication, in order to assess the suitability of indicating a number of **diagnostic tests in the preoperative evaluation**. This has been done by means of systematic reviews of the literature on the subject and by consensus methods such as the Dutch document and the Basque report.

On many occasions, the conclusions obtained in these reports are similar or slightly differ in aspects such as the age limits as of which the tests are recommended. Nevertheless, in other cases, more important differences are shown, especially in reports in which consensus methods have been used.

On the other hand, we should point out that the most recently published assessment report, made by the University of Sheffield (NCCHTA 97), based in available evidence and not in experts’ opinion, makes recommendations on the tests indicated in the preoperative stage for asymptomatic patients which are more restrictive than previous reports.

Secondly, another aim included in several of the reports considered in this document has been to collect the **opinions, attitudes and customary practices** of professionals during the preoperative stage in elective surgery. This question has been analyzed through a survey carried out among the health service professionals involved, i.e., anesthetists and surgeons, by the Swedish, French and Catalonian agencies.

Among the **attitudes** of doctors covered in the survey both in Sweden, France and Catalonia, it is interesting to note that most of these doctors express serious doubts about the existence of a valid scientific base for recommending an EKG or chest X-ray during the preoperative stage.

This contrasts with the fact that in Catalonia, as a daily practice, 49% of anesthetists and 68% of surgeons request chest X-rays and that 55% and 70% respectively request an EKG to be carried out in patients to be submitted to elective surgery.

According to the information gathered in Sweden in 1989, both anesthetists and surgeons requested the performance of analytical tests such as potassium (66% and 73% respectively), sodium (64% and 69%), creatinine (54% and 65%), albumin (30% and 41%) and white cell count (48% and 45%) “mainly in all those patients to be submitted to programmed surgery”.

In 1998 in Catalonia, most of those surveyed declared that they request “always or almost always” glucose (87% anesthetists, 93% surgeons), platelet count (94% and 84% respectively), leukocyte counts (72% and 86% respectively), urea and creatinine (72% and 73%).

There is a lack of concordance between the recommendations extracted from the assessment reports and customary practice of doctors, both in Sweden and in Catalonia 10 years later.

It may prove interesting to discuss the **causes** that lead to this **discrepancy** between the **information** provided by scientific publications and customary medical practice.

The French and Catalonian agencies asked the professionals surveyed about the obstacles to making changes in customary practice they consider relevant. The conclusion is in that most health services professionals point to problems of a legal nature (in France 62% of anesthetists and in Catalonia 87% of anesthetists and 74% of surgeons). 57% of French anesthetists also indicate difficulties of an organizational nature.

In Catalonia, most doctors (91% of anesthetists and 87% of surgeons) consider that it is absolutely necessary to establish a selective protocol for preoperative tests by means of consensus among the different specialties involved and based on existing scientific knowledge.

Thirdly, in relation with the **economic considerations**, it has been demonstrated in the reports published in Sweden and Basque Country, that in the case of following the general clinical practice recommendations, an important amount of resources could be liberated, in order to be devoted to improve other practices or cover other medical needs.

Finally, as **Civil law aspects** stated in the French and Basque reports, following evidence recommendations, that could be considered as a kind of coded *lex artis*, would not liberate the responsibility of the physicians but will certainly attenuate or soften their responsibilities in case of legal procedures.

On the other hand, it should not be forgotten that an appraisal of individual risk for each patient is needed in any case.



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