

# Quality Assurance and Benchmarking in Ambulatory Surgery

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## Abstract

**Aim:** To find clinical indicators for benchmarking out of a nationwide quality assurance programme. **Methods:** Data from 153 000 cases of the quality assurance programme AQS1 were electronically analysed for the most frequent procedures in 10 medical specialties.

**Results:** Hospitalisation rate for the most frequent procedures was below 0.6%. The search gave data for the time of inability to work and operating room time for every procedure. The type of anaesthesia in carpal tunnel syndrome had a measurable influence on induction time and time spent in the recovery room.

**Keywords:** Quality assurance; benchmarking; Ambulatory surgery; Clinical indicators.

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**Conclusion:** Combined questionnaires answered by surgeons, anaesthetists and patients and processed electronically give an excellent overview of the quality performance within the surgical unit especially in comparison to the national average. The expenses of 1.49 Euro per case are well compensated by improved quality, shorter time of operating room occupancy, faster recovery, shorter period of disability and higher patient satisfaction.

## Purpose

The outcome and the process of surgical procedures should be judged by doctors (surgeons, anaesthetists) and patients using combined questionnaires. The anonymity of patient questionnaires is very important so that patients can freely express their opinion. These data should be processed at low price by an independent agency. The results of each surgical unit concerning certain benchmarks should be comparable with the collective of all participants.

## History

Germany has a long tradition of quality assurance in ambulatory surgery. The first quality assurance programme in ambulatory surgery was conducted in Lower Saxony and published in 1988 [4]. The Bundesverband für Ambulantes Operieren (BAO), the national association for ambulatory surgery in Germany, initiated a nationwide programme in gynaecology in 1993 [1].

The professional Quality Assurance System, AQS1, has existed since 1999 [5,8] and in its present form since 2005. Results of the incidence of various ambulatory procedures in different disciplines of surgery and the hospitalisation rate after ambulatory surgery have been published [2,9].

## Methods

AQS1 is designed as a combined physician and patient questionnaire to evaluate and analyse the complete process of ambulatory surgery or outpatient operations [5,6]. The part of the paper questionnaire for the physician is characterized by "hard" parameters like the risk factors, the intra-operative complications and an OPS-code (Operationen- und Prozedurenschlüssel [3]) for every procedure. This part is filled out by the surgeon and by the anaesthetist. The other part is answered by the patient to assess the quality of the ambulatory surgery two weeks after his/her surgical procedure and contains

more "soft" parameters to evaluate patient satisfaction and the severity of pain. All questionnaires are collected and electronically processed by medicaltex [7]. The results are provided in a standardised quality report either quarterly or yearly.

## Results

As of January 2007 a total of 450 surgical units are participating in AQS1 in Germany. The number of all procedures processed until that time was 153,613 cases: gynaecology contributed 45,622 cases, surgery 29,646, orthopaedics 25,341, anaesthesiology 12,399, and ear-nose-throat 3,301 cases (Table 1). Altogether 10 medical specialties are participating. By April 2007 the total number of cases exceeded 200,000.

**Table 1** Distribution of cases in different disciplines in the quality assessment system AQS1 (January 2007).

discipline	number of cases
gynaecology	45622
general surgery	29646
orthopaedics	25341
ENT	3136
others	49868
total number of cases	153613

As **clinical indicators** for quality assessment the following five items were selected:

### A. Hospitalisation rate

This rate was chosen as a relatively "hard" parameter for unforeseen complications in ambulatory surgery. For the three most frequent procedures in gynaecology, surgery and ENT the hospitalisation rate was under 0.6% except for hernia repair (Table 2).

**Table 2** Hospitalisation rate (only the three most frequent procedures).

OPS-code	Procedure	Hospitalisation rate
<i>Gynaecology</i>		
	Excision/destruction, uterus, operative	
5-681	hysteroscopy	0.53%
5-690	dilatation and curettage of uterus	0.37%
1-672	diagnostic hysteroscopy (office procedure)	0.17%
<i>Surgery</i>		
5-530	hernia repair	3.83%
5-812	arthroscopy (cartilage, meniscus)	0.60%
5-056	neurolysis hand, carpal tunnel	0.23%
<i>ENT</i>		
5-214	septum repair, nose	0.25%
5-285	adenotomy	0.00%
5-215	repair turbinate, nasal concha	0.00%

### B. Period of disability

The period of disability or inability to work is provided by the patients for every type of procedure. For instance the average disability time is 3.5 days for curettage and 4.6 days for excision/destruction of uterine tissue in operative hysteroscopy. For the three most frequent surgical procedures it is between 12 and 16 days (Table 3).

**Table 3** Period of inability to work (only the three most frequent procedures).

OPS-code	Procedure	Days
<i>Gynaecology</i>		
5-681	excision, destruction of uterine tissue	4.6
5-690	dilatation and curettage of uterus	3.5
1-672	diagnostic hysteroscopy	3.5
<i>Surgery</i>		
5-530	hernia repair	12.2
5-812	arthroscopy, meniscectomy	15.7
5-056	neurolysis hand, carpal tunnel	15.7
<i>ENT</i>		
5-214	septum repair, nose	12.8
5-285	adenotomy	2.6
5-215	repair turbinate	3.3

### C. Operating room (OR) occupancy of single procedures

The time of operating room (OR) occupancy is of importance for OR organisation and economics. With AQS1 it is possible to calculate this important parameter for every procedure of the collective (benchmarking). For instance in surgery average OR occupancy time is 52.9 min for arthroscopy, 37.8 min for neurolysis and 59.5 min for inguinal hernia repair (Table 4).

**Table 4** Operating time (OR occupancy time, cut-suture time).

OPS code	Procedure	Occupancy time min	Cut-suture time min
<i>Gynaecology</i>			
5-681	excision, destruction of uterine tissue	51.1	36.2
5-690	dilatation and curettage of uterus	30.8	18.0
1-672	diagnostic hysteroscopy	38.5	22.6
<i>Surgery</i>			
5-530	hernia repair	59.5	40.3
5-812	arthroscopy, meniscectomy	52.9	30.1
5-056	neurolysis hand, carpal tunnel	37.8	18.7
<i>ENT</i>			
5-214	septum repair, nose	53.4	42.8
5-285	adenotomy	27.3	14.3
5-215	repair turbinate	24.3	16.3

### D. Patient satisfaction

Patient satisfaction is another parameter of clinical importance that can be related to each surgical procedure or to the surgical unit. Overall, patients were very satisfied and would, if necessary, again choose ambulatory surgery (Table 5).

### E. Types of anaesthesia

Various types of anaesthesia are compared e.g. in carpal tunnel syndrome (OPS: 5-056). Cut/suture time was lowest with intravenous anaesthesia (Table 6). Mask anaesthesia was related to higher infection rate and hospitalisation.

When comparing the post-operative time until discharge from the day clinic and adding the time of induction the iv-block anaesthesia resulted in the shortest time until discharge of the patient (Fig. 1). 8 Fig. 1: Time (min) before and after neurolysis (carpal tunnel repair CTS) (blue = induction time, red = post-operative time until discharge) Discussion The professional Quality Assurance System AQS1 has proven to be a useful tool for quality assessment in ambulatory surgery. Therefore, it was expanded from 2006 to inpatient surgery in hospitals under the name of SQS1. One of the most useful assets of this programme is the input of the patients in the form of structured, anonymous questionnaires. Thus the surgeon gets

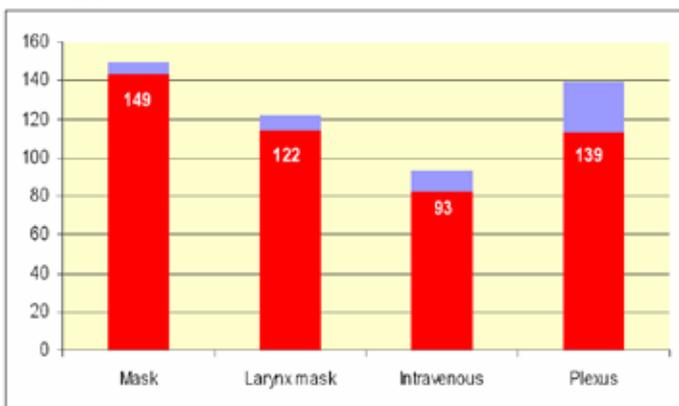
**Table 5** Patient satisfaction (“would you choose ambulatory surgery again?”).

OPS code	Procedure	Yes
<i>Gynaecology</i>		
5-681	excision, destruction of uterine tissue	98.0%
5-690	dilatation and curettage of uterus	98.4%
1-672	diagnostic hysteroscopy	98.9%
<i>Surgery</i>		
5-530	hernia repair	96.1%
5-812	arthroscopy, meniscectomy	96.8%
5-056	neurolysis hand	99.3%
<i>ENT</i>		
5-214	septum repair, nose	94.3%
5-285	adenotomy	98.5%
5-215	repair turbinate	97.6%

**Table 6** Use of various types of anaesthesia in carpal tunnel repair (neurolysis hand, OPS: 5-056).

type of anaesthesia	number of cases	induction time min	induction + recovery-room time
Intubation	188	9	174
Mask	413	6	143
Larynx mask	2581	8	114
Stand By	109	9	59
Intravenous	1452	11	82
Local	402	14	61
Plexus	2496	26	113

**Figure 1** Fig. 1: Time (min) before and after neurolysis (carpal tunnel repair CTS) (blue = induction time, red = post-operative time until discharge).



to know complications, length of disability, hospitalisation and patient satisfaction. These data in comparison to the collective of participating physicians (benchmarking) clearly tells the physicians in what fields management has to be improved. “Medicaltex” calculates the quality reports quarterly for every outpatient facility. These reports should

be made transparent to all members of the team and discussed in team meetings 9 to improve the quality of the performance within the surgical unit. The costs for this quality programme are reasonable - 1.49 Euro base rate per case. The language of the questionnaires is German; translations into other languages are possible. The combination of several benchmarks appears to be a promising method in clinical research. Thus the combination of the procedure for carpal tunnel with various types of anaesthesia gives hints that intravenous anaesthesia may result in the shortest recovery time and thus be advantageous from the viewpoint of economics, patient satisfaction and complication rates

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