WORLD HEALTH ORGANIZATION

EUROPE

PATH

PATH

Performance Assessment Tool
for Quality Improvement in Hospitals

Indicador descriptions (core set)

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Abstract

This brochure provides an overview on the indicator set used in the WHO Performance Assessment Tool for Quality Improvement in Hospitals (PATH) and includes descriptive sheets for all core indicators. It should be read in conjunction with the PATH information brochure on the main orientations of the project.

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Indicators in the Performance Assessment Tool for Quality Improvement in Hospitals (PATH)

The Performance Assessment Tool for Quality Improvement in Hospitals (PATH) was developed by the WHO Regional Office for Europe to support hospitals in collecting data on their performance, identifying how they are doing in comparison to their peer group and initiating quality improvement activities. PATH is designed for internal use and on voluntary basis only - it is not meant to be used for external reporting, accreditation or restructuring purposes. The general framework for the project and indicator selection is built on strong theoretical background and empirical material. It was elaborated by a group of international experts, based on extensive reviews of the literature and surveys on data availability and assessments of indicators. The framework for performance assessment encompasses six dimensions: four domains (clinical effectiveness, efficiency, staff orientation and responsive governance) and two transversal perspectives (safety, patient centeredness).

PATH indicators are grouped into two sets (Figure 1):

- A **core set** includes indicators that are relevant to all contexts and represent a low burden of data collection. This set includes 17 core indicators (after considering all tracers these amounts to 48 indicators). Hospitals participating in PATH should intend to gather all the indicators of the core set.

- A **tailored set** includes indicators that either are relevant to a limited number of contexts, or, because of their higher burden of data collection, are suggested if congruent with the organization or country's priorities. This set includes 24 indicators (after considering all tracers these amounts to 47 indicators). It is up to the hospital to decide which of the tailored indicators are collected additionally.
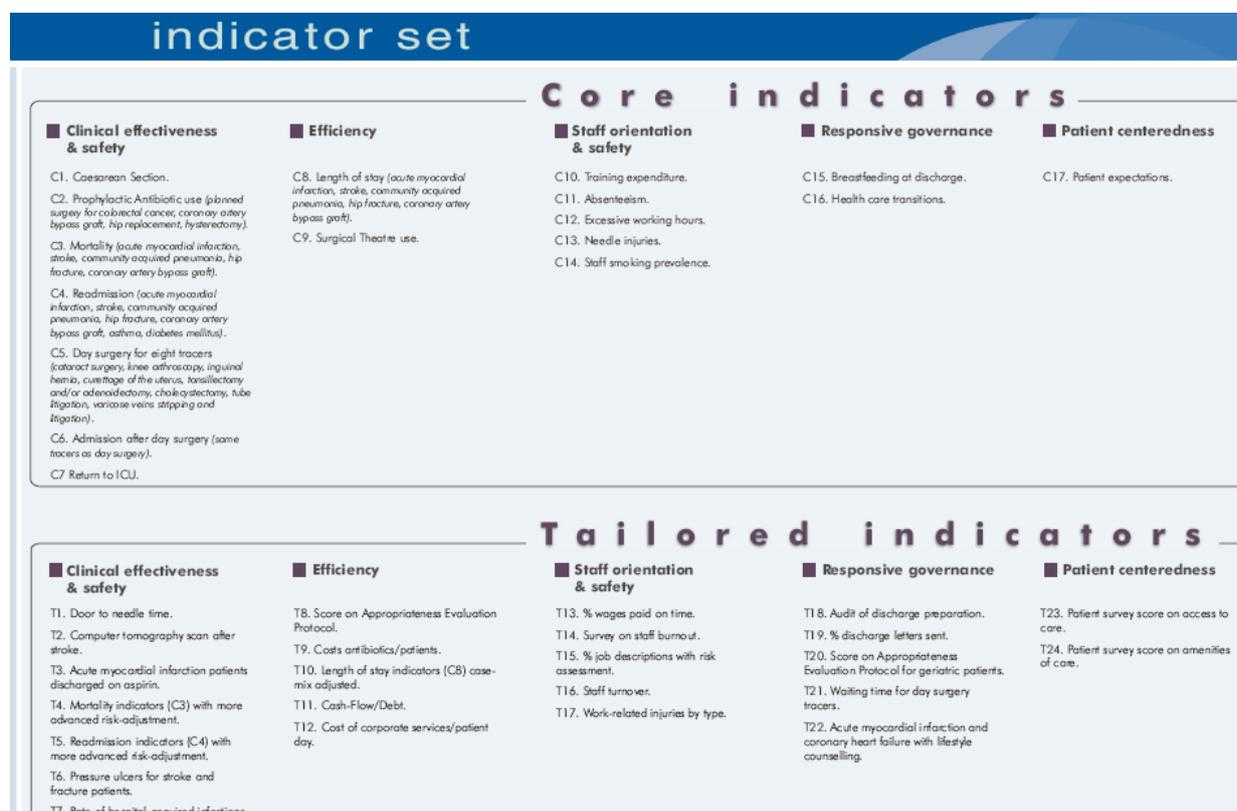
Structure of the indicator descriptive sheets

A descriptive sheet was drawn for each proposed indicator. The descriptive sheets contain an operational definition, the rationale and justification for use (burden, importance, prevalence, potential for improvement), strengths and limitations, hints for interpreting the direction and potential target of the indicator, data collection issues and further information. The objective of the descriptive sheets is to share a common language. Operational definitions are provided to support uniform data collection across hospitals and countries. If indicators are to be used for comparisons, operational definitions (and the underlying data) need to be standardised rather than left for local determination within national contexts. Though standardisation between countries should be aimed at, it will be gradual. A commitment to start to schedule for convergence is preferred to the unrealistic aim to seek immediate conformity. International comparisons are a secondary objective, aimed for at a later stage of the project.

The descriptive sheets will not answer all questions regarding the definition and data collection issues. In some cases references are provided to retrieve the lists of exclusion criteria, in other cases the indicator can not be standardized at international level and further work will be required at national/regional and hospital level to reach a solid definition for actual data collection in hospitals. We propose that the indicator descriptions are the starting point to review definitions and accustom the team in the hospital with the indicator. These descriptions should be reviewed in conjunction with the data collection sheets provided in Excel format. Additional modifications or specific data collection issues within the hospital should then by documented in the data element source and collection matrix, in which the PATH working group in the hospital can record their revisions of each indicator and collect further information on data collection, storing, responsibilities and deadlines (for more information on this matrix see the annex to this document). The process of adapting the PATH indicators to the local hospital settings is illustrated in Figure 2:

Figure 2: PATH descriptives sheets, data collection forms and data element source matrix

Mapping PATH definitions and ICD codes

In order to assess potential overlaps with other indicator iniatives, we carried out a mapping exercise comparing the PATH indicators to those included in the AHRQ and ORYX datasets and assessed the conversion of ICD codes between different data sets.Out of the 17 core indicators in PATH only four similar indicators were found in ORYX and/or AHRQ, all of which refer to indicators in the clinical effectiveness & safety domain. Of the four, only two had similar definitions to those of the PATH indicators. Where possible, we tried to adjust the PATH definitions to reflect at operational level those definitions supported by both AHRQ and the ORYX initiative.

A challenge for international comparisons is the limitations of The International Classification of Diseases (ICD), published by WHO. The purpose of using the ICD codes is to standardize data collection (in particular, case inclusion) and compare results internationally; however, different versions of the ICD exist, which are not fully up- or downward compatible.

The most commonly used versions of ICD are ICD-9, ICD-9-CM and ICD-10. The ICD-9 was published in 1977, and this version is still being used in several countries. The current version is the ICD-10 which came into use in 1994. ICD-9-CM is the clinical modification of the ICD-9 codes developed by the National Center for Health Statistics (NCHS) and the Centers for Medicare and Medicaid Services in the United States. WHO has developed a program to translate codes from ICD-9 to ICD-10, but there is no official program to translate codes from ICD-9CM to either ICD-9 or ICD-10. Since different countries use different versions of the ICD, it is important to ensure consistency in the use of codes and appropriateness in the code conversion; however, there are several differences in the coding between ICD-9, ICD-9-CM, and ICD-10.

- ICD-9 has 6,969 codes while there are 12,420 codes in ICD-10 (14,199 with the fourth-character place of occurrence codes in Chapter XX (External Causes of Morbidity and Mortality).
- ICD-9-CM also includes codes for procedures, which are not included in either ICD-9 or ICD-10.
- Some countries have created their own extensions to ICD-10: For example, Australia introduced their first edition of "ICD-10-AM" in 1998, and Canada introduced "ICD-10-CA" in 2000.

Because of the difference in the structure of the codes and different adaptations in different countries, ICD codes can not easily be converted from one ICD version to another. In addition, clinical procedures can only be expressed in the 9CM version of the ICD and thus hospitals in collaboration with country coordinators, should agree on the appropriate codes in their country.

References

World Health Organization, International Classification of Diseases and Health Related Problems, 10th Revision, Version for 2007 http://www.who.int/classifications/apps/icd/icd10online/
World Health Organization, ICD-9 to ICD-10 Translator. Health Situation Analysis and Projection Unit (HST/HSP). WHO, Geneva, 1997
Inpatient Quality Indicators Overview. AHRQ Quality Indicators. February 2006. Agency for Healthcare Research and Quality, Rockville, MD. http://www.qualityindicators.ahrq.gov/iqi_overview.htm
Performance Measurement Initiatives. The Joint Commission. ORYX indicators
http://www.jointcommission.org/PerformanceMeasurement/PerformanceMeasurement/

Descriptive sheets

C1   **Caesarean section**
C2   **Prophylactic antibiotic use**
C3   **Mortality**
C4   **Readmission**
C5   **Day surgery**
C6   **Admission after day surgery**
C7   **Return to Intensive Care Unit (ICU)**
C8   **Length of stay**
C9   **Surgical theatre use**
C10   **Training expenditure**
C11   **Absenteeism**
C12   **Excessive working hours**
C13   **Needle injuries**
C14   **Staff smoking prevalence**
C15   **Breastfeeding at discharge**
C16   **Health care transitions**
C17   **Patient expectations**

Indicator name	C1. Caesarean section
Rationale (including justification, strengths and limits)	Ceasarean section is an indicator of clinical effectiveness and, in case it is not indicated, may reflect a safety concern by exposing mothers to uncessary surgery. Ceasarean sections are associated with higher morbidity and mortality, including deep vain thrombosis, pulmonary embolism, post-thrombotic syndrome, endometrisis and wound infections.
	WHO targets a Ceasarean section rate of 10-15%. In the Nordic countries, the rate remains stable around this target, while it steadily increased in US, Canada and UK.
	Strengths: Ceasarean section is the most common operative procedure in US. There is evidence of major variations and of over-use for this procedure. The indicator may address large potentials for quality improvement in a number of settings.
	Limits: The indicator is difficult to interpret due to its bi-directionality. Selection bias can be expected and there is a need to identify high-risk patients (such as HIV positive mothers). Patients for which Ceasarean section is indicated can only to a limited extent by identified from administrative databases and non-clinical (cultural and socio-demographic) factors and patients' preferences are difficult to account for.
Domain	Clinical Effectiveness / Safety
Definition	Percentage of Ceasarean sections of total deliveries
Type of indicator	Process measure
Numerator	Number of Ceasarean section sections - **ICD9: 669.7** - **ICD9CM: 740, 741, 742, 744, 749.9** - **ICD10: O82**
Denominator	All deliveries - **ICD9: 640-676,** - **AHRQ Delivery DRGs: 370, 373, 371, 374, 372, 375** - **ICD10: O1, O2, O4, O6-O8, O30-37, O90-O92, O 95, O98, O99 with sixth digit 1 or 2, or Z·/**
Optional	a) Number of primary Ceasarean section over number of primary deliveries b) Vaginal delivers over all deliveries with a previous Ceasarean section
Inclusion	Delivery with > 37 weeks pregnancy
Exclusion	Abnormal presentation, fetal death, multiple gestation, breech procedure
Interpretation	There is evidence of overuse of Cesarean delivery, therefore lower rates are preferred. However, the indicator is bidirectional, i.e. too low rates may reflect underuse. Rates that are approximately below 15% and above 25% may indiciate inappropriate care.
Data source	Birth register, theatre register, delivery suite register, maternity case notes, patient records, administrative database, discharge abstract, national specific register
Observation time	Observation time depends on case-load in individual facilities and data can be collected retrospectively or prospectively: If done retrospectively, all cases in 2006 should be included. If done prospectively, observation time should be between one to three months.
Further information	This indicator is based on the definition as proposed by the Agency for Health Care Research and Quality (AHRQ). Additional information on the evidence and technical specifications can be found under the following link: AHRQ Inpatient Quality Indicators: http://www.qualityindicators.ahrq.gov/downloads/iqi/iqi_guide_v31.pdf (page 60ff) and http://www.qualityindicators.ahrq.gov/downloads/iqi/iqi_technical_specs_v31.pdf (p21ff)

Indicator name	C2. Prophylactic antibiotic over and under use
Rationale (including justification, strengths and limits)	Antimicrobial use is the major determinant in the development of resistance. Careful antibiotics prescribing can curtail the emergence and reduce the prevalence of resistance. According to the Institute for Health Care Improvement, an estimated 40–60 percent of Surgical Site Infections are preventable with appropriate use of prophylactic antibiotics. Overuse, under use, improper timing, and misuse of antibiotics occurs in 25–50 percent of operations (http://www.ihi.org/IHI/Topics/PatientSafety/SurgicalSiteInfections/). Strength: Appropriate antibiotics prescription is a crucial public health issue and should be covered by at least one indicator for content validity of the set of indicators as a whole. Limits: Burden of tool development and data collection.
Domain	Clinical Effectiveness, Safety
Definition	Percentage of patients who received prophylactic antibiotic according to guidelines in the specific country
Type of indicator	Process measure
Numerator	Patients with a) appropriate use, b) over-use (too long or too strong), c) under-use (too short or too low) and d) other inadequate use (too long with too low dose or too short with too strong dose).
Denominator	Patients that should have received antibiotics.
Optional indicators	Indicators on: - Type of antibiotic (by group) - Surgical patients who received prophylactic antibiotics within 1 hour prior to surgical incision - Surgical patients whose prophylactic antibiotics were discontinued within 24 hours after surgery end time
Tracer conditions	Planned surgery for colorectal cancer: **ICD-9: 153, 154, ICD10: C18. C19, C20, C21.0, C21.1, C21.2, C21.8)** Coronary artery bypass graft: **ICD-9-CM: 36.10 through 36.19** Hip replacement: **ICD-9CM: 81.51 and 81.53** Hysterectomy: **ICD-9CM: 68.3 through 68.7**
Inclusion	All tracer patients that should have received antibiotics
Exclusion	Evidence of pre-operative infection
Interpretation	Higher rate of appropriateness is preferred. Some limitations in international comparisons due to different methods and data sources.
Data source	National data base (e.g. in Denmark) or audit for tracer condition. Audit should consider the following issues: choice of antibiotic, assessment for penicillin allerg, timing of administration, duration of prophylaxis, route of administration, dose selection, blood loss, fluid replacement and antibiotic prophylaxis.
Observation time	Retrospective data collection based on audit of 30 to 60 randomly collected clinical records compared to national guidelines for tracers.
Further information	If no national guidelines are available, audit should be made against international guidelines, e.g.: Scottish Intercollegiate Guidelines Network (SIGN): Antibiotic prophylaxis in surgery Guideline. SIGN Publications No 45, 2000. http://www.sign.ac.uk/guidelines/fulltext/45/section5.html

Indicator name	C3. Mortality
Rationale (including justification, strengths and limits)	Mortality rates are widely used as indicator of quality and were the first hospital-specific outcome measure to be made publicly available by the Health care Financing Administration (HCFA) in 1986. They may be useful to identify major variations from standards and less useful for fine-tuning of care processes, especially since results may be confounded by many different factors, such as coding, local culture/practices and patient-characteristics. The tracers reflect common causes of morbidity and functional decline particularly in the elderly and are associated with a significant increase in the subsequent risk of mortality. Complications during procedures for these conditions and other comorbidiies lead to higher mortality rates and evidence suggests that some of these complications are preventable. High mortality rates over time warrant investigation into the quality of care provided.
	Strengths: Strong rationale, death is an outcome that needs to be avoided. Literature demonstrates relationships between process measures and mortality for some conditions and thus this indicator can to some extent be useful to identify quality improvement actions. Information is easily available.
	Limits: Rating is strongly affected by risk adjustment procedure, time frame and whether or not deaths after discharge are included. Overall the reliability is low (concerns with quality of coding).
Domain	Clinical Effectiveness, Safety
Definition	Percent of in-hospital mortality by tracer condition
Type of indicator	Outcome measure
Numerator	In hospital deaths
Denominator	Total number of patients admitted for tracer condition or procedures
Tracer conditions	Acute myocardial infarction: **ICD-9: 410 and ICD-10: I21, I22** Stroke: **ICD-9 and ICD-9CM: 431, 433, 434, 436 and ICD-10: I61, I62, I63, I64, I65, I66**) (includes ischaemic and hemorrhagic stroke) Community acquired pneumonia: **ICD-9 and ICD-9CM: 485, 486, ICD-10: J13, J14, J15, J18, A48.1** Hip fracture: **ICD-9 and ICD-9CM: 820 and ICD-10: S72.0, S72.1** Coronary artery bypass graft: **ICD-9-CM: 36.10 through 36.19**
Inclusion	All patients admitted for tracer
Exclusion	Exclusion: Patient transferred to/from other hospitals
Risk adjustment/stratification	Risk adjusted by age and sex
Interpretation	Lower rate is preferred, although very low rates may indicate early discharges or transfers rather than high quality of care.
Data source	Administrative databases
Observation time	12 months time period: 1st January to 31st December 2006 (unless this is not available, in which case the most recent data covering a six month-period should be used).
Further information	Guide to inpatient quality indicators: quality of care in hospitals -- volume, mortality, and utilization [version 3.0]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 99 p. Schneider EC. Measuring mortality outcomes to improve health care – rational use of rating and rankings. Medical Care 2002;40(1):1-3. Hofer TP, Hayward RA. Identifying poor quality hospitals: can hospital mortality rates detect quality problems for medical diagnosis? Medical Care 1996;34(8):737-753.

Indicator name	C4. Readmission (All tracers)
Rationale (including justification, strengths and limits)	The percentage of readmitted patients is an important balancing measure to indicate if changes to patient flow through the system are negatively affecting care. While some readmissions are part of the planned care and are desirable, others may be indications of a quality issue related to shortened length of stay and premature discharge. Disease specific readmission rates are currently being used in the NHS, ACHS, QIP and the Ontario hospitals report.
	Strengths: high consensus, points at important quality issues.
	Limits: Difficult to distinguish preventable readmission from readmission due to the natural progress of the history. Furthermore it is difficult to distinguish between readmissions in and from different hospitals.
Domain	Clinical Effectiveness, Safety
Definition	Percentage of unplanned readmissions for selected tracer conditions or procedures.
Type of indicator	Process measure
Numerator	Total number of unplanned admissions within a fixed follow up period from the same hospital and with a readmission diagnosis relevant to the initial care.
Denominator	Total number of patients admitted for selected tracer condition.
Tracer conditions	Follow up period: 30 days after discharge
	Acute myocardial infarction: **ICD-9: 410 and ICD-10: I21, I22**
	Stroke (**ICD-9: 431, 433, 434, 436 and ICD-10: I61, I63, I64, I65, I66**)
	Community acquired pneumonia: **ICD-9: 485, 486, ICD-10: J13, J14, J15, J18, A48.1**
	Hip fracture: **ICD-9: 820**, **ICD-10: S72.0, S72.1, S72.2**
	Coronary artery bypass graft: **ICD-9-CM (36.10 through 36.19)**
	Asthma **ICD-9: 493 and ICD-10: J45, J46**
	Diabetes **ICD-9: 250 and ICD-10: E10- E14**
	Additional follow up period for asthma and diabetes: within 24 hours, 24 to 72 hours
Inclusion	Patients admitted for tracer condition.
Exclusion	Exclusion: Patient who died during the index hospitalization or who were discharged to another acute care hospital.
Risk adjustment/stratification	Risk adjusted by age and sex
Interpretation	Lower rate is preferred; however, very low rates may reflect that patients are re-admitted to other hospitals. Useful to monitor over time.
Data source	Administrative databases.
Observation time	12 months time period: 1st January to 31st December 2006 (unless not available, in which case the most recent data covering a six month-period should be used).
Further information	Benbassat J, Taragin M. Hospital readmissions as a measure of quality of health care. Archives of Internal Medicine 2000;160:1074-1081.
	Ashton C, Del Junco D, Souchek J, Wray N, Mansyur CL. The association between the quality of inpatient care and early readmission: a meta-analysis of the evidence. Medical Care 1997;35(10):1044-1059.

Indicator name	C5. Day surgery
Rationale (including justification, strengths and limits)	Day surgery is the admission of carefully selected patients to hospital for a planned surgical procedure, returning home on the same day. Day surgery rates reflect cost-efficiency, innovativeness and diffusion of technologies and impacts on outcomes and patients satisfaction. Patients undergoing day surgery have often shorter waiting times, spend less time in the hospital and receive care that is better suited to their needs. Hospital costs are lower and day surgery does not compromise outcomes.
	Strength: Benefits of day surgery for patients and hospital efficiency.
	Limits: No standard definition or measurement of day surgery across countries available. It is difficult to interpret because it is multi-faced and reflects the impacts on several dimension of performance.
Domain	Clinical effectiveness and Safety
Definition	Percentage of patients undergoing day surgery for selected tracer procedures.
Type of indicator	Process measure
Numerator	Number of patients undergoing a tracer procedure within one day
Denominator	Total number of patients undergoing a tracer procedure
Tracer conditions	Cataract surgery: **ICD9-CM: 13.71**
	Knee arthroscopy: **ICD9-CM: 81.26**
	Inguinal hernia: **ICD9-CM: 53.0, 53.1, 53.21**
	Curettage of the uterus: **ICD9-CM: 69.0-69.9**
	Tonsillectomy and/or adenoidectomy: **ICD9-CM: 28.2 and 28.3**
	Cholecystectomy: **ICD9-CM: 51.22 and 51.23**
	Tube ligation: **ICD9: 66.2, 66.3**
	Varicose veins – stripping and ligation: **ICD9-CM: 38.59**
Inclusion	Number of patients undergoing a tracer procedure within one day
Exclusion	Emergency procedures and patients who died under surgery.
Risk adjustment/stratification	Stratification by age groups
Interpretation	A higher day surgery rate is better, as long as safety is not compromised.
Data source	Administrative data
Observation time	12 months time period: 1st January to 31st December 2006 (unless this is not available, in which case the most recent data covering a six month-period should be used).
Further information	Shnaider I, Chung F.Outcomes in day surgery. Curr Opin Anaesthesiol. 2006 Dec;19(6):622-9.
	Theus R.J. Go P.M.N.Y.H.;van Wijmen F. Quality assessment in a day surgery unit. Ambulatory Surgery, Volume 3, Number 4, December 1995, pp. 195-198(4)

Indicator name	C6. Admission after day surgery
Rationale (including justification, strengths and limits)	Early admission reflects low technical quality of surgery, poor patient selection for day surgery or disturbed patient flow (last procedures too late). Late admission (after being discharge) reflects poor patient education and continuity of care. Admission following day-surgery negatively impacts on patient's experience. Strengths: Most admissions after day surgery are thought to be preventable, thus monitoring admission rates produces useful information for quality improvement and hospital efficient. Limits: Admission after day surgery has a low prevalence rate thus it is more difficult to collect this data. Monitoring admission after day surgery makes more sense when related to ambulatory surgery rate.
Domain	Clinical effectiveness, Safety
Definition	Identification of day-surgery patient is left for local determination. In some countries, day-surgery patients are attributed a specific code on admission and hence can easily be identified from database
Type of indicator	Process measure
Numerator	Admitted after day surgery within 72 hours
Denominator	Number of patients undergoing tracer procedure within one day
Tracer conditions	Cataract surgery: **ICD9-CM: 13.71** Knee arthroscopy: **ICD9-CM: 81.26** Inguinal hernia: **ICD9-CM: 53.0, 53.1, 53.21** Curettage of the uterus: **ICD9-CM: 69.0-69.9** Tonsillectomy and/or adenoidectomy: **ICD9-CM: 28.2 and 28.3** Cholecystectomy: **ICD9-CM: 51.22 and 51.23** Tube ligation: **ICD9: 66.2, 66.3** Varicose veins – stripping and ligation: **ICD9-CM: 38.59**
Inclusion	Inclusion: Only admissions to the hospital where the day-surgery took place.
Exclusion	None.
Risk adjustment/stratification	Stratification by main causes for admission (such as complication, too late surgery, pain after return home) is not possible in a retrospective study based on a administrative databases. Thus this is optional for those that collect this data prospectively.
Interpretation	Admission rates should be very low, as the intervention intended to avoid admission.
Data source	Administrative data.
Observation time	12 months time period: 1st January to 31st December 2006 (unless this is not available, in which case the most recent data covering a six month-period should be used).
Further information	Lermitte J, Chung F. Patient selection in ambulatory surgery. Curr Opin Anaesthesiol. 2005 Dec;18(6):598-602. Aldwinckle RJ, Montgomery JE.Unplanned admission rates and postdischarge complications in patients over the age of 70 following day case surgery. Anaesthesia. 2004 Jan;59(1):57-9.

Indicator name	**C7. Return to intensive care unit (ICU)**
Rationale (including justification, strengths and limits)	The indicator is generally accepted and a widely used indicator of quality in ICU. It technical quality in the ICU and appropriateness of discharge timing. Readmitted patients have a longer duration of ICU stay and a higher mortality rate than thise who are not readmitted. ICU readmission within 48 hours were ranked by the Society of Critical Care Medicine' s Quality Indicator Committee (1995) as the top indicator for judging ICU quality.
	Strengths: Widely accepted and used measure with strong face validity, limited burden of data collection.
	Limits: It is difficult to distinguish between planned re-operations and or natural evolution of the disease and readmission due to complications or premature discharge. It is further difficult to adjust for clinical levels of availability of ICU beds and intermediate care beds. Furthermore difficult to interpret because of bi-directionality of the indicator. Has low prevalence and hence is difficult to identify statistically significant results.
Domain	Clinical effectiveness, Safety
Definition	Percentage of unplanned readmission into an intensive care unit within (and including) 48 hours post discharge from the intensive care unit.
Type of indicator	Process measure
Numerator	Number of patients returned to ICU < 48 hours
Denominator	All patients discharged from the intensive care unit.
Inclusion	Same as denominator
Exclusion	Readmissions for further planned operations should be eliminated from the numerator. This variable will be collected during data collection sheet and excluded post-data collection (see Excel table for data collection).
Risk adjustment/stratification	Age and sex.
Interpretation	Lower rates are better. However, an extremely low rate may indicate systematic failure to discharge patients in a timely fashion resulting in prolonged ICU stays or failure to readmit patients with deteriorating health status. The readmission rate is affected by case-mix of the ICU.
Data source	Administrative/clinical databases (however, databases may not allow to identify exclusion criteria).
Observation time	Observation time to be determined by hospitals, based on frequency of phenomena (e.g one month). Can be done prospectively.
Further information	Rosenberg AL, Watts C. Patients readmitted to ICU's: A systematic review of risk factors and outcomes. Chest 2000;118(2):492-502.
	Nishi GK, Suh RH, Wilson MT, Cunneen SA, Margulies DR, Shabot MM: Analysis of the causes and prevention of early readmission to surgical intensive care. American Surgeon 2003;69(10):913-917.
	Cooper GS, Sirio CA, Rotondi AJ et al. Are readmissions to the intensive care unit a useful measure of hospital performance? Medical Care 1999;37:399-408.

Indicator name	C8. Length of stay
Rationale (including justification, strengths and limits)	In many countries, policy makers are debating surrounding the over- or under-bedding. In EU countries, a trend towards shorter stays can be observed; however, without reaching US levels. Routine data showed that there are variations in length of stay between countries, regions and hospitals. The trends in length of stay showed a decrease over time in all regions. Research fails to show an adverse effect on health outcomes of reducing length of stay, but there may nevertheless be an ethical or moral minimum length of stay. However, numerous studies on appropriateness of hospital days indicate a great frequency of inappropriate days (see here-under). Length of stay is a direct measure of efficiency and reflects appropriateness.
	Strengths: Low burden of data collection and very strong rationale, such as improving efficiency (maximizing the use of limited resources), improving integration and coordination of care (patients requiring alternative services should receive at the most appropriate place, e.g.nursing home, home care), improving internal processes and improving clinical effectiveness (reducing patients' exposure to hospital hazards).
	Limits: Difficult to interpret because it may reflects and impact on many different sub-dimensions of performance. Furthermore difficulties to adjust for different in case-mix.
Domain	Efficiency
Definition	Median number of days of hospitalization (admission and discharge date count for one day) for selected tracer conditions and procedures
Type of indicator	Outcome measure
Tracer conditions	Acute myocardial infarction: **ICD-9: 410 and ICD-10: I21, I22** Stroke: **ICD-9: 431, 433, 434, 436 and ICD-10: I63, I64, I65, I66** Community acquired pneumonia: **ICD-9: 485, 486, ICD-10: J13, J14, J15, J18, A48.1** Hip fracture: **ICD-9: 820 and ICD-10: S72.0, S72.1, S72.2** Coronary Artery bypass graft: **ICD-9-CM (36.10 through 36.19)**
Inclusion	All patients with tracer condition specified.
Exclusion	Exclusion: Patient transferred to/from other hospitals
Risk adjustment/stratification	Age and sex
Interpretation	From the point of view of indicator of efficiency, shorter is better, but very low median days may pose patients at risk.
Data source	Administrative data
Observation time	6 months time period: 1st July to 31st December 2006 (unless this is not available, in which case the most recent data covering a six month-period should be used).
Further information	Clarke A, Rosen R. Length of stay. How short should hospital care be? Eur J Public Health. 2001 Jun;11(2):166-70.
	Collins TC, Daley J, Henderson WH, Khuri SF. Risk factors for prolonged length of stay after major elective surgery. Annals of Surgery 1999;230(2):251-259.
	Leyland AH. Examining the relationship between length of stay and readmission rates for selected diagnoses in Scottish hospitals. IMA Journal of Mathematics Applied in Medicine and Biology 1995;12(3-4):175-184.

Indicator name	C9. Surgical theatre use
Rationale (including justification, strengths and limits)	The operating room is a high cost department within hospitals. Considerable resources are wasted if operating room is not used effectively. Effective management of operating room is paramount when operating room is a "bottleneck". By increasing use of operating room, patient flow improves and waiting list can be reduced.
	Direct measure of optimal use of the capacity. Increasing surgical theatre use may be achieved by better work organization, such as better preparation by the team of anaesthetic, theatre and surgical staff, however, may also require higher staffing levels.
	Strengths: Analyzing the operating room utilization trends allows rescheduling of elective operating sessions to that all units achieve optimal utilization.
	Limits: higher burden of data collection (for optional indicator)
Domain	Efficiency
Definition	Surgical theatre use
Type of indicator	Qualitative measurement
Qualitative measure	Do you monitor your operation theatre capacity use? [yes, no] How do you measure? [Free text] Please provide value? [value for own performance report]
Optional	
Definition	Surgical theatre use (adaptation from Belgian PATH project)
Type of indicator	Process measure (utilization indicator)
Numerator	Sum (exit time – entrance time)
Inclusion criteria for numerator	Elective and emergency surgery
Denominator 1	Number of operating rooms * 24 hours * 30 days
Denominator 2	Number of operating rooms * x (normal operating) hours * 30 days
Inclusion criteria for denominator	Centrally managed operating rooms
Exclusion criteria for denominator	Surgery theatre on obstetric ward, non-centrally managed operating rooms, "close" facilities (due to lack of staff etc).
Data source	
Observation time	Prospective data collection in June 2007
Further references	Donham, RT, Mazzei, WJ, Jones, RL: Glossary of terms used for scheduling and monitoring of diagnostic and therapeutic procedures. Am J Anesth 1996, 23: 5-9
	Haiart DC, Paul AB, Griffiths JM. An audit of the usage of operating theatre time in a peripheral teaching surgical unit. Pograd Med J. 1990 Aug;66(778):612-5.

Indicator name	C10. Training expenditure
Rationale (including justification, strengths and limits)	To measure the training expenditure is an indirect measure on the staff's knowledge on updated medical technology and reflects organizational priorities for staff development. Evidence suggests associations between staff training, staff motivation and technical care.
	Strengths: Uses data from routine information/management system. Limitations: Difficult to interpret and compare even at regional level. Medical training expenditure may not be convered depending on the contracting and salary of medical services.
Domain	Staff orientation and safety
Definition	Training expenditure on staff
Type of indicator	Structural measure
Numerator	Amount of training resources planned in the budget for the present fiscal year (as an explicit post or series of posts in the formal budget)
Denominator	Total budget
Inclusion	All medical and nursing staff on the hospitals' payroll.
Exclusion	Staff contracted through external agencies.
Risk adjustment/stratification	Stratified by medical (all categories) and nursing (categories) staff.
Interpretation	
Data source	Budgets and financial reports from hospitals.
Observation time	One year
Further information	European Union. Directive on Working Time, 93/104. Brussels: European Union Publications Office, 1993 Olson LG, Ambrogetti A. Working harder -- working dangerously. Fatigue and performance in hospitals. Med J Aust 1998; 168: 614-616.

Indicator name	C11. Absenteeism
Rationale (including justification, strengths and limits)	Absenteeism reflects motivation and job involvement and has a high burden on hospital functioning in terms of cost to compensate for loss of working hours, increased workload for the remaining staff, lost productivity, lower quality if highly skilled personnel providing essential services cannot be replaced. Short-term absence is most disturbing because of its unpredictable nature and it allows less time to adjust schedule, to take steps to replace absent worker.
	Strengths: Evidence suggests a high burden of absenteeism in hospitals with negative implications on work organization and patient care. There is strong theoretical support and a demonstrated relationship with practice environment, job satisfaction, morale, job involvement. Limits: Variability of definitions and low reliability of data in some countries. It is more relevant to countries where job security is guaranteed
Domain	Staff orientation, Safety
Definition	Absenteeism is referred herein as failure of employees to report for work when they are scheduled to work
Type of indicator	Qualitative indicator
Qualitative measure	Do you monitor absenteeism? [yes, no] Please describe how your monitor it: [free text] If available, please provide value [for inclusion in own performance report]:
Optional	
Definition	Nursing staff calendar days realized as planned
Numerator	Total number of nursing staff calendar days realized as planned
Denominator	Total number of nursing staff (nurses and nurse assistants) planned calendar days in April 2007
Inclusion	Only nursing staff
Exclusion	Maternity leave.
Interpretation	The reference value for the optional indicator should be high to reflect conformity between planned and realized days (and thus impiying low absenteeism). Further, reporting periods (ideally) would be monthly, but annual roll ups would be a minimum requirement. In Europe, the absenteeism rate (including temporary and permanent work incapacity) ranges from 3.5% in Denmark to 8% in Portugal. Breaking down data by professional group (and unit) would enhance the data's usefulness in identifying an organization's strengths and weaknesses in quality of work life issues.
Data source	Human resources databases
Observation time	One month
Further information	WHO Human Resources for Health Tools and guidelines: http://www.who.int/hrh/tools/situation_analysis/en/index.html Martimo, KP. Reducing sickness absenteeism at the workplace--what to do and how? Scand J Work Environ Health. 2006 Aug;32(4):253-5 Sounan, C. Gagnon, S. Relationships among work climate, absenteeism, and salary insurance in teaching hospitals. Healthc Manage Forum. 2005 Autumn;18(3):35-8.

Indicator name	C12. Excessive working hours
Rationale (including justification, strengths and limits)	Excessive working hours have an impact on staff health and satisfaction. They reflect overload, job strain and poor human resource planning. But they also have an impact on patient safety as evidence suggest that professionals that are tired make more errors. The EU's working directive has direct implications for the health sector.
	Strengths: strong face validity and some construct validity Limitations: not applicable to all staff categories, only partly under hospital influence.
Domain	Staff orientation, Safety
Definition	Number of hours worked exceeding normal working hours. According to the EU directive on working times, "member states shall take measures to ensure that workers enjoy an average of weekly working period of not more than 48 hours, including the overtime for each seven-day period."
Type of indicator	Qualitative measurement
Qualitative measurement	Do you monitor excessive working hours? [yes, no] How do you monitor? [Text] Please provide value: [for hospitals' own performance report, by department, if available]
Optional	
Definition	The percent of weeks worked more than 48 hours during a specified period.
Numerator	Weeks worked more than 48 hours.
Denominator	All work weeks.
Inclusion	Limit to nurses and nurse assistants. Include only hospital employees
Exclusion	Exclude working hours contracted through external temporary work agency.
Risk adjustment/stratification	Stratified by department and hospital staff.
Interpretation	Low rate of excessive hours worked are better.
Data source	Human resource data
Observation time	Retrospective study of the percent of weeks worked more than 48 hours during the period 1st January to 31st March 2007. If hospitals collect this information manually they might choose a shorter time period for data collection.
Further information	The EU Working Time Directive: http://www.europa.eu/scadplus/leg/en/cha/c10405.htm Institute of Medicine, Committee on the Work Environment for Nurses and Patient Safety. Keeping the Patient Safe. Eds: Page A. 2003. The National Academic Press, Washington DC Vidyarthi AR, Auerbach AD, Wachter RM, Katz PP. The impact of duty hours on resident self reports of errors. J Gen Intern Med. 2007 Feb;22(2):205-9.

Indicator name	C13. Needle injuries
Rationale (including justification, strengths and limits)	Needlestick injuries are wounds caused by needles or other sharp objects that accidentally puncture the skin and may result in exposure to blood or other body fluids. Needlestick injuries are a hazard for people who work with hypodermic syringes and other needle equipment. These injuries can occur at any time when people use, disassemble, or dispose of needles. When not disposed of properly, needles can become concealed in linen or garbage and injure other workers who encounter them unexpectedly. Needlestick injuries transmit infectious diseases, especially blood-borne viruses. This indicator reflects safe working conditions. It should be taken into consideration that there is a possibility of bias, because of an under estimation the injuries or lack of reporting.
	Strengths: high burden, strong hospital impact, sends a crucial message to monitor the issue Limits: low incidence, very low reliability.
Domain	Staff orientation, Safety
Definition	Needle stick injuries over the last calendar year.
Type of indicator	
Numerator	Number of needle stick injuries over the past calendar year.
Denominator	Number of FTE staff
Inclusion	All hospital staff
Exclusion	
Risk adjustment/stratification	Stratified by type of personnel: nurses, physician, technicians, students and housekeeping.
Interpretation	Many types of needles and other sharp devices are used in health care. However, only a few needles and other sharp devices are associated with the majority of injuries. Of nearly 5,000 percutaneous injuries reported by hospitals in the US (between June 1995 and July 1999), 62% were associated with hollow-bore needles, primarily hyperdermic needles attached to disposable syringes (29%) and winged-steel (butterfly-type) needles (13%).
Data source	Point prevalence survey among hospital staff.
Observation time	Needle-stick injuries reported in 2006.
Further information	US National Institute for Occupational Safety and Health: Preventing Needle-stick injuries in health care settings. http://www.cdc.gov/niosh/2000-108.html Hanrahan A, Reutter L [1997]. A critical review of the literature on sharps injuries: epidemiology, management of exposures and prevention. J Adv Nurs 25:144—154. Porta C, Handelman E, McGovern P [1999]. Needlestick injuries among health care workers: a literature review. Am Assoc Occup Health Nur J 47(6):237—244. Trinkoff AM, Le R, Geiger-Brown J, Lipscomb J. Work schedule, needle use, and needlestick injuries among registered nurses. Infect Control Hosp Epidemiol. 2007 Feb;28(2):156-64

Indicator name	C14. Staff smoking
Rationale (including justification, strengths and limits)	Despite the well-known effects on health, a large number of health professionals is still smoking. Staff smoking behaviour is related to patients' compliance with lifestyle counselling: patients, who when admitted to the hospital with a condition related to their smoking habits are more responsive to lifestyle counseling when this advice is provided by a professional not smoking. According to the, EC supported Network of Smoke Free Hospitals, hospitals have important obligations in the struggle to reduce the use of tobacco and its deleterious health effects. These obligations include not only a smoke-free environment to protect non-smokers but also the provision of active support for smokers in their quitting process. This concerns patients as well as all categories of personnel.
	Strengths: Clear effect of smoking on health. Staff smoking behaviour relates to patients' compliance with lifestyle counseling. Limitations: Burden of data collection and resistance among staff
Domain	Staff orientation, safety
Definition	Staff smoking prevalence
Type of indicator	Survey
Numerator	Number of staff smoking
Denominator	All staff
Inclusion	All staff on the hospital payroll
Exclusion	
Risk adjustment/ stratification	Adjusted by age and sex and stratified by occupational group.
Interpretation	In most European countries the smoking rate among hospital workers is over 25%, which is just a little below the rate for the general population.
Data source	The European Network of Smoke-free hospitals developed a survey measure including 13 standard questions to be able to compare differences between hospitals in various European countries. The first questions of the survery will be sufficient to gather information on staff smoking prevalence; the additional questions in the survey are optional for hospitals to fill in. Alternatively, if the information on staff smoking prevalence is already available from other sources (such as periodic staff health survey), these can be used.
Observation time	Point prevalence study among hospital staff in one month during the data collection period. The questionnaire could be distributed with in-house mail or salary slips and has to be returned confidentially.
Further information	European Network of Smoke-free hospitals http://ensh.aphp.fr/index.php?id_rubrique=9&langue=2 Fichtenberg CM, GLantz SA. Effect of smoke-free workplaces on smoking behaviour: systematic review. British Medical Journal, 2002, 325: 188 Larsson US, Saljo R, Aronsson K. Patient-doctor communication on smoking and drinking: lifestyle in medical consultations. Soc Sci Med. 1987;25(10):1129-37. Mullins R, Borland R. Doctors' advice to their patients about smoking. Aust Fam Physician 1993;22:1146-55

Questionnaire on smoking status - European Network of Smoke-free hospitals

No	Item	Response categories
1	Country	To be filled in by PATH coordination
2	Hospital code	To be filled in by PATH coordination
	This questionnaire is strictly confidential and anonymous.	
3	Age	[years old]
4	Sex	[female, male]
5	Job	[doctor, nurse, student, other health-professionals, administrative, other non-health professional]
6	You are:	[non-smoker, ex-smoker, daily smoker, occasional smoker]
	If you have never smoked, the questionnaire is finished, thank you for your participation	
	OPTIONAL	
	If you are a daily smoker	
7	How long after waking up do you smoke?	[< 5 minutes, 6-30 minutes, 31-60 minutes, > 60 minutes]
8	On average, how many cigarettes, cigars or pipes do you smoke per day?	[xxx cigarettes/day, xxx cigars/day, xxx pipes/day]
9	Are you planning to quit?	[no, in the next month, in the next 3-6 months, in the next 6-24 months, somday]
	If you are an ex-smoker	
10	At what age did you stope smoking	[XXX years old]
	If you are a smoker or ex-smoker	
11	How old were you when you started smoking?	[xxx years old]
12	Have you received smoking cessation help from your organization?	[yes, not existing, not desired, not easily available]
13	How many times did you seriously attempt to quit?	[0, 1, 2-5, more than 5 times]
	Optional questions	
14	Do you work at night	[never, sometimes, always]
15	Do you smoke during working hours	[no, yes]

Indicator name	C15. Breastfeeding at discharge
Rationale (including justification, strengths and limits)	Exclusive breastfeeding, that is the use of mother's milk as the child's sole source of nourishment, excluding even consumption of water or teas, is regarded and internationally promoted as the ideal method of feeding infants during the first six months of an infant's life. Breastfeeding aids in digestion and provides all the micronutrients and water a baby needs. Breastmilk alone contains all the nutrients, antibodies, hormones and antioxidants an infant needs to thrive. It protects babies from diarrhoea and acute respiratory infections, stimulates their immune systems and response to vaccination, and, according to some studies, confers cognitive benefits as well._x000D_Exclusive breastfeeding: the infant receives breast milk (including expressed milk) and is allowed to receive drops or syrups (vitamins, minerals, and medicines)._x000D_Predominant breastfeeding: the infant receives breast milk (including expressed milk) and is allowed non-nutritive liquids (water and water based drinks, fruit juice, oral rehydration salt, ritual fluids), and drops or syrups (vitamins, minerals and medicines). The infant is not allowed to receive anything else (in particular, non-human milk, food-based fluids)._x000D_Complementatary/replacement feeding: the infact receives breast milk and is allowed any food or liquid, including non-human milk._x000D_Strength: Very strong rationale, major public health impact_x000D_Limits: Limited hospital influence and covers only partially the area of health promotion in the hospital
Domain	Responsive governance, patient centeredness
Definition	The percent of women with exclusive breastfeeding at discharge
Type of indicator	Outcome
Numerator	Total number of mother included in the denominator breastfeeding at discharge
Denominator	Total number of delivery fulfilling criteria for inclusion
Inclusion	Infant born at greater or equal to 37 weeks gestation
Exclusion	Neither mother nor infant has a medical condition for which breastfeeding is contraindicated.
Risk adjustment/stratification	-
Interpretation	Higher rate is better. The WHO/UNICEF Baby-Friendly Hospital Initiative requires reaching 75% exclusive breastfeeding to obtain the label.
Data source	Maybe be extracted from the kitchen information
Observation time	Study period to be determined by hospital (one month to three depending on number of deliveries)
Further information	Labbok, M. What is the definition of breastfeeding? Breastfeeding Abs: 19 (3), 19-21, 2000_x000D_WHO, World Health Organization. Indicators for assessing breastfeeding practices: report from an informal meeting, 11-12 June 1991, Geneva, 1991_x000D_The breastfeeding Committee for Canada. The National Authority for the WHO/UNICEF Baby-Friendly Hospital Initiative in Canada. Breastfeeding Definitions and Data Collection Periods. January 2006. www.breastfeedingcanada.ca (through documents)

Indicator name	C16. Health Care Transition Measure
Rationale (including justification, strengths and limits)	Many chronic patients leave the hospital without fully understanding their disease, symptoms or how to take their medications and evidence suggests that both quality and patient safety are jeopardized for patients undergoing transitions across care. Performance measurement using the health care transition measure is one potential strategy for improving the quality of transitional care.
	Strengths: Psychometric testing of the CTM © has been completed, demonstrating high internal consistency and reliability and applicability for assessment across multiple sites of care (i.e., hospital to home, hospital to skilled nursing facility, skilled nursing facility to home, etc.). The measure also demonstrated the power to discriminate between: 1) patients discharged from the hospital who did/did not experience a subsequent emergency visit or rehospitalization for their index condition, and 2) health care facilities with differing levels of commitment to care coordination. It relates very closely to other core indicators such as length of stay and readmission. Limitations: Requires survey measure for data collection, resource intensive.
Domain	Responsive governance, Patient centeredness
Definition	The term "care transitions" refers to the movement patients make between health care practitioners and settings as their condition and care needs change during the course of a chronic or acute illness.
Type of indicator	Process
Score	Score according to instructions included in the measure description
Tracer conditions	Acute myocardial infarction **ICD-10: I21, I22 and ICD-9: 410.x1** Stroke (**ICD-9: 431, 433, 434, 436 and ICD-10: I63, I64, I65, I66**) Hip fracture **ICD-9: 820 and ICD-10: S72.0, S72.1, S72.2** Community acquired pneumonia: **ICD-9: 485, 486, ICD-10: J13, J14, J15, J18, A48.1** Asthma **ICD-9: 493 and ICD-10: J45, J46** Diabetes **ICD-9: 250 and ICD-10: E10- E14**
Inclusion	Patients admitted with tracer condition
Exclusion	Pediatric patients (relevant exclusion criteria for asthma and diabetes or pneumonia), patients who have not stayed overnight, demented patients.
Risk adjustment/stratification	Adjusted for age and sex, stratified by department
Interpretation	**Overall Quality of Care Transition Score:** This score reflects the overall quality of the care transition, with lower scores indicating a poorer quality transition, and higher scores indicating a better transition.
Data source	Survey
Observation time	Depends on frequency of discharges for tracers (usually one to three months). During a maximum of three months, for each tracer at least 60 patients should complete the survey.
Further information	Coleman EA et al. The care transitions intervention: results of a randomized controlled trial. Arch Intern Med. 2006 Sep 25;166(17):1822-8. Coleman EA, Smith JD, Frank JC, Eilertsen TB, Thiare JN, Kramer AM.Development and testing of a measure designed to assess the quality of care transitions. Int J Integr Care. 2002;2:e02. Epub 2002 Jun 1 The Care Transitions Project: http://www.caretransitions.org/

Items of the Care Transition Measure (CTM-3)

Case number: _____
Date: _____

Tracer: _____
Age: _____
Sex: _____

Filled in by the patient

1. The hospital staff took my preferences and those of my family or caregiver into account in deciding what my health care needs would be [when I left the hospital].

Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know/ Don't Remember/ Not Applicable
1	2	3	4	9

2. [When I left the hospital], I had a good understanding of the things I was responsible for in managing my health.

Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know/ Don't Remember/ Not Applicable
1	2	3	4	9

3. [When I left the hospital], I clearly understood the purpose for taking each of my medications.

Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know/ Don't Remember/ Not Applicable
1	2	3	4	9

Indicator name	C17. Patient expectations
Rationale (including justification, strengths and limits)	This indicator measures what patients think, overall, about their hospital stay based on the most recent patient survey data. Three general types of measures can be distinguished: 1. Factual measures – Patient experience with care received (e.g. Picker Institute) – Scoring – Frequency of occurrence of an event (typically answers: "often" to "never"), 2. Affective measures – Patient satisfaction or patient judgement (Press Ganey/Parckside, Patient Judgement on Hospital Quality) – Rating – Degree of satisfaction (typical answers: "very poor" to "excellent") and 3. Gap between explicit expectations and realties of the service receive (Servqual) **PATH does not endorse one specific instrument** but supports the use of standardized instruments that allow for comparisons and cover the following **sub-dimensions of patient-centeredness**: - Respect for patients' preferences and expressed needs - Coordination of care and integration of services - Information and education - Physical comfort and pain relief - Emotional support and alleviation of fears and anxieties - Involvement of family and friends - Transition to home and continuity of care
	Strength: Patients are the ultimate judge of patient centeredness and their perception impacts on compliance (and ultimately outcomes), loyalty and recommendations to friends. Patients' assessments can guide quality improvement efforts, can be used to monitor impact of quality improvement initiatives and also constitute an accountability tool. Limitation: ceiling effect in many patient surveys. Results don't always prompt concrete quality improvement actions.
Domain	Patient centeredness
Definition	If the hospital is not using a standardized instrument, report only variations in hospital's score (how much did he improve or depreciate over the last year? or the last three years?) and match the instrument's sub-dimensions to the framework and provide specific ratings (index scores) for each sub-dimension indicated above. If the hospital is using a standardized questionnaire, include in the report the comparative rating to the hospital itself in the past and provide ratings comparative to hospitals using the same instrument (name the "peer group", specify the number of hospitals on which it was compared, and provide in the appendix further information if useful).
Type of indicator	Survey
Score	Mean score for each sub-dimension.
Risk adjustment/stratification	By age and department
Interpretation	In order to facilitate reporting and interpretation, answers to the contextual application need to be provided, such as: - Was a standardized instrument used (Yes/No)? Which one? - How was it administered? - What was the sample size? - What categories of patients were asked concerned?
Data source	Survey measure (patient experience measure in the hospital questionnaire).
Observation time	Month of April 2007
Further information	van Campen C, Sixma H, Friele RD, Kerssens JJ, Peters L.Quality of care and patient satisfaction: a review of measuring instruments. Med Care Res Rev. 1995 Mar;52(1):109-33. Review.

Additional information

General exclusion criteria

The following exclusion criteria should be applied to all clinical indicators:

Condition	ICD9	ICD9-CM	ICD-10
Cancer	140-172, 174-208, 230-239, V58.0	(140-172, 174-208, 230-239, V58.0, V58.1)	C00-C43, C45 C50-85 C90-95 Z51.0
HIV-AIDS	042-044, V08	(042-044, V08)	B20-B24 Z21
Violent trauma	(800-848, 881-884.1, 884.9, 886.0, 890-899, 900, 910, 913-926, 928, 950-968, 970-976, 990-998)	(800-848, 881-884.1, 884.9, 886.0, 890-899, 900, 910, 913-926, 928, 950-968, 970-976, 990-998)	

Age stratification

To simplify data collection, we propose the same age categories for all diagnostic and procedures. Age class will be grouped together if considered adequate for specific tracers.

Age strata	Code
0 – 14	1
15 – 24	2
25 – 44	3
45 – 65	4
65 – 79	5
80 – 89	6
90 and above	7

Data Element Source and Collection Matrix

The indicator descriptions may not in all cases include sufficient information to guide data collection in the hospitals. The reason is that hospital information systems differ quite substantially within and between countries and thus the indicator definitions can not specify details such as specific data sources and data storage. We therefore suggest that the PATH working group in the hospital reviews each indicator and fills the table below with the hospital specific details on data collection and storing. The table will also be helpful as a planning tool to identify resources, responsibilities and timeframes.

Indicator	Potential data source	Actual data collection	Data reporting	Responsibility	Deadlines
C1: Ceasarean section	Medical records, nursing log in neonatal care unit, hospital discharge forms	Electronic data collection from medical records (based on the hospital information system (HIS))	Electronically m, in Excel sheet according to PATH template	[Name, Function]	[Date]
C2:					
C3:					
[…]					