

DRIVE-AB WP1A
QUALITY INDICATORS & QUANTITY METRICS OF ANTIBIOTIC USE

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DRIVE-AB WP1A definitions:

- A **quality indicator** reflects the degree in which antibiotic is correct or appropriate.
→ outcome has value on its own
- A **quantity metric** reflects the volume or the costs of antibiotic use.
→ outcome only gains value in its comparison

More information on the methodology:

http://drive-ab.eu/wp-content/uploads/2015/06/ECCMID_2016_Quality-indicators-in-inpatient-setting.pdf

<http://drive-ab.eu/wp-content/uploads/2015/06/Outpatient-quality-indicators-Poster-ECCMID-29.03.16.pdf>

http://drive-ab.eu/wp-content/uploads/2015/06/Quantity-metrics-assessing-antibiotic-use-in-the-outpatient-setting_a-global-consensus-procedure_poster-ECCMID-2016.pdf

http://drive-ab.eu/wp-content/uploads/2015/06/WP1A-Poster_Metrics-for-quantifying-antimicrobial-use-in-a-hospital-setting-poster_ECCMID-2016.pdf

Abbreviations:

IQI: Inpatient Quality Indicator

OQI: Outpatient Quality Indicator

IQM: Inpatient Quantity Metric

OQM: Outpatient Quantity Metric

Antibiotic Prescribing

- IQI-1 Antibiotics should be prescribed according to local practice guidelines.
- IQI-2 Antibiotics should be prescribed according to national guidelines when no local guidelines are available.
- IQI-3 Antibiotic prescriptions that deviate from guidelines should be justified.

Antibiotic Stewardship

- IQI-4 Surveillance of antibiotic use and resistance should be performed at least once per year at the health care facility.
- IQI-5 An antibiotic formulary should be available and updated continuously at the health care facility.
- IQI-6 An approval system should be in place for prescriptions of restricted antibiotics at the health care facility.
- IQI-7 An antibiotic stewardship programme (antibiotic prescribing control programme and/or antibiotic prescribing policy) should be in place at the health care facility.
- IQI-8 Antibiotic prescribing should be compliant with recommendations from infectious disease and/or microbiology specialist(s).
- IQI-9 Audits of antibiotic use by the antibiotic stewardship team should be performed regularly at the health care facility.
- IQI-10 A multidisciplinary antibiotic stewardship team appointed by the health care facility management should have meetings at least twice a year and make a report with objectives and selected performance indicators.

Availability

- IQI-11 Antibiotics from the antibiotic formulary should not be out of stock at the health care facility.

Diagnostics

- IQI-12 Two sets of blood culture should be taken before antibiotic administration when bacteremia is suspected.
- IQI-13 Specimens for culture from suspected sites of infection should be collected before antibiotic administration.
- IQI-14 Microbiological investigations should be performed according to guidelines.

Documentation

- IQI-15 An antibiotic plan should be documented in the medical record at the start of the antibiotic treatment.
Antibiotic plan includes: indication, name, doses, duration, route, and interval of administration.
- IQI-16 Clinical and laboratory sepsis parameters should be documented in the medical records when prescribing antibiotics.
- IQI-17 The results of bacteriological sensitivities should be documented in the medical records.

Dosing

- IQI-18 Dosing and dosing interval of antibiotics should be prescribed according to guidelines.

- IQI-19 Dosing and dosing interval of renally eliminated antibiotics should be adapted to the patient's renal function.
- IQI-20 The dosage regimen of antibiotics with an increased risk of toxicity (such as vancomycin or gentamicin) should be managed according to guidelines.

Duration-Discontinuation

- IQI-21 Duration of antibiotic therapy should be compliant with guidelines.
- IQI-22 Antibiotic therapy should be discontinued based on the lack of clinical evidence of infection.
- IQI-23 Antibiotic therapy should be discontinued on completion of the documented antibiotic course.

Education

- IQI-24 Educational sessions about practical guidelines should be organized for medical staff and should have a predetermined attendance target.

Guidelines

- IQI-25 A local antibiotic guideline should be present at the health care facility.
- IQI-26 An evaluation whether an update should be considered for the local antibiotic guideline should be done once a year.
- IQI-27 The local guidelines should correspond to the national guideline but should be adapted based on local resistance patterns.

Outcome

- IQI-28 Clinical outcomes of patients receiving antibiotics should be monitored at the health care facility.
- IQI-29 Rates of nosocomial *Clostridium difficile* should be monitored at the health care facility.

Prescribing-Administration

- IQI-30 Prescribed antibiotics should actually be administered to the patients.

Route

- IQI-31 The route of administration of antibiotics should be compliant with guidelines.
- IQI-32 Antibiotic therapy in adult patients with sepsis should be started intravenously.
- IQI-33 Switching from intravenous to oral antibiotic(s) should be performed according to guidelines.
- IQI-34 Switching from intravenous to oral antibiotic(s) should be done within 48–72 hours based on the clinical condition and when oral treatment is adequate.

Safety/General

- IQI-35 Contraindications should be taken into account when prescribing antibiotics.

Safety/Allergy

- IQI-36 Allergy status should be taken into account when antibiotics are prescribed.
- IQI-37 Allergy status (including nature and severity) of the patient should be documented in the medical records when antibiotics are prescribed.
- IQI-38 Patients with a history of anaphylaxis after penicillin therapy should be prescribed an alternative drug class.

IQI-39 Medical staff should be educated regarding cross-allergy with cephalosporins in patients with penicillin allergy.

Safety/Interaction

IQI-40 Identified interactions between antibiotic regimen and concurrent medications should be documented in the medical record with a recommended management plan to deal with the interaction.

Safety/Toxicity

IQI-41 Duration of administration of intravenous antibiotics should be compliant with guidelines.

Selective Reporting

IQI-42 The microbiological laboratory should report individual selective susceptibility reports* (or antibiograms) adapted to local guidelines.

A selective susceptibility report (or antibiogram) is a report of a selection of antibiotic sensitivities, based on bacteriological activity, broadness of spectrum or toxicity.

Spectrum

IQI-43 The prescribed antibiotic should be active against all the likely causative pathogens.

Streamlining/De-escalation

IQI-44 Broad-spectrum empirical antibiotic therapy should be changed to pathogen-directed therapy as soon as culture results become available.

IQI-45 The choice of antibiotic treatment should be reviewed and modified based on clinical response.

IQI-46 Antibiotics for empirical therapy should be reviewed within the third day of treatment or when microbiological results become available.

Surgical Prophylaxis

IQI-47 Prophylactic antibiotics should be added to a preoperative checklist.

Therapeutic Drug Monitoring

IQI-48 Therapeutic Drug Monitoring should be performed for antibiotics with a narrow therapeutic spectrum and an increased risk of toxicity according to guidelines.

IQI-49 If antibiotic Therapeutic Drug Monitoring levels are not in the reference range, doses should be adjusted appropriately after the results become available.

IQI-50 Therapeutic Drug Monitoring levels of antibiotics should be documented in the medical records.

Timing

IQI-51 Timeliness of administration of antibiotic therapy and prophylaxis should be compliant with guidelines.

Final set of Quality Indicators for the Outpatient Setting

- OQI-1 Antibiotics should be prescribed for (most) bacterial infections (e.g. acute pneumonia, urinary tract infections).
- OQI-2 Antibiotics should not be prescribed for (most) viral infections or self-limiting bacterial infections (e.g. acute bronchitis, influenza, acute otitis media > 2 years old).
- OQI-3 Outpatients should receive antibiotic therapy compliant with guidelines; this includes, but is not limited to indication, choice of the antibiotic, duration, dose and timing.
- OQI-4 Some antibiotics should be rarely prescribed.
- OQI-5 Acute upper respiratory infections and bronchitis should not be treated with antibiotics within the first three days, unless there is documented indication for treatment
- OQI-6 Outpatients with acute tonsillitis/pharyngitis should undergo a group A streptococcal diagnostic test to decide whether or not they should receive antibiotics.
- OQI-7 Outpatients with an acute tonsillitis/pharyngitis and positive group A streptococcal diagnostic test should be treated with antibiotics.
- OQI-8 Antibiotics for an acute tonsillitis/pharyngitis should be withheld, discontinued or not prescribed if an outpatient presents a diagnostic test (rapid antigen test or throat culture) negative for group A streptococci.
- OQI-9 Prescribed antibiotics should be chosen from an essential list/formulary.
- OQI-10 Possible contraindications should be taken into account when antibiotics are prescribed.
- OQI-11 Antibiotics from the list of essential antibiotics should be available in health facilities that dispense antibiotics.
- OQI-12 Key antibiotics should not be out of stock in health facilities that dispense antibiotics.
- OQI-13 Antibiotics in stock should not be beyond the expiry date.
- OQI-14 Antibiotics that are dispensed to outpatients should be adequately labelled (patient name, antibiotic's name, when antibiotics should be taken).
- OQI-15 Antibiotics should be adequately conserved and handled in health facilities.
- OQI-16 Health facilities should keep adequate records of dispensed key antibiotics.
- OQI-17 A copy of the essential antibiotics list should be available in health facilities.
- OQI-18 Standard antibiotic treatment guidelines should be available in health facilities.
- OQI-19 Health facilities should have access to the SPC (Summary of Product Characteristics) of prescribed antibiotics, written in a local language.
- OQI-20 Antibiotics should not be sold without prescription.
- OQI-21 Outpatients and OPAT (Outpatient Antibiotic Parenteral Treatment) patients with an antibiotic prescription should be educated on how to take it, on the dosage, on expected side effects, and on the natural history of the disease.

- OQI-22 The treatment plan should be agreed between the OPAT (Outpatient Antibiotic Parenteral Treatment) team and the referring clinician before start of treatment.
- OQI-23 All OPAT (Outpatient Antibiotic Parenteral Treatment) plans should include dose, frequency of administration and duration of therapy.
- OQI-24 OPAT (Outpatient Antibiotic Parenteral Treatment) antibiotics should be correctly stored, prepared, reconstituted, dispensed and administered.
- OQI-25 Administered doses of OPAT (Outpatient Antibiotic Parenteral Treatment) intravenous therapy should be documented on a medication card.
- OQI-26 The first dose of a new antibiotic in an OPAT (Outpatient Antibiotic Parenteral Treatment) should be administered in a supervised setting.
- OQI-27 OPAT (Outpatient Antibiotic Parenteral Treatment) antibiotics should be regularly reviewed to optimize speed of intravenous to oral switch.
- OQI-28 Each OPAT (Outpatient Antibiotic Parenteral Treatment) centre should monitor quality indicators on OPAT antibiotics.
- OQI-29 An expert in OPAT (physician, nurse, pharmacist) should work in each OPAT (Outpatient Antibiotic Parenteral Treatment) centre.
- OQI-30 The OPAT (Outpatient Antibiotic Parenteral Treatment) plan should be communicated to the general practitioner (GP) at discharge.
- OQI-31 The OPAT (Outpatient Antibiotic Parenteral Treatment) program should be accredited or certified.
- OQI-32 In an OPAT (Outpatient Antibiotic Parenteral Treatment) program, clinical and/or microbiological outcomes including treatment failure and adverse events (including Clostridium difficile infections) should be recorded.

Final set of Quantity Metrics for the Inpatient Setting

- IQM-1 Defined Daily Dose (DDD) per 100(0) Patient Days/ Bed Days/ Occupied Bed Days
- IQM-2 Defined Daily Dose (DDD) per Admissions
- IQM-3 Defined Daily Dose (DDD) per 100 Bed Days per Case Mix Index
- IQM-4 Prescribed Daily Dose (PDD) per 100 Patient Days
- IQM-5 Days of Therapy (DOT) per Patient Days
- IQM-6 Days of Therapy (DOT) per Patients
- IQM-7 Days of Therapy (DOT) per Admissions
- IQM-8 Length of Therapy (LOT) per Admissions
- IQM-9 Length of Therapy (LOT) per Patients
- IQM-10 Patients exposed to antibiotics per all Patients
- IQM-11 Patients exposed to antibiotics per Admissions
- IQM-12 Antibiotic use should be preferably expressed in at least two metrics simultaneously

Final set of Quantity Metrics for the Outpatient Setting

OQM-1 Defined Daily Doses (DDD) per defined population

OQM-2 Treatments/courses per defined population

OQM-3 Treatments/courses per physician contact

OQM-4 Prescriptions/defined population

OQM-5 Prescriptions/physician contact

OQM-6 Seasonal variation of total antibiotic use