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Recommendations for designing prescribing audits

- Implementation of this automated antimicrobial stewardship audit-and-feedback intervention in other hospitals should follow a structured approach over approximately 12–18 months.
- A multidisciplinary team (infectious diseases physician, clinical pharmacist, and IT support) should be established and allocated protected time to ensure consistent case review, ideally requiring 0.2–0.5 FTE (thinking about substitutes in case of absence) depending on hospital size and alert volume.
- Adapt your intervention depending on the resources allocated (antibiotics included, frequency of the alerts)
- After a baseline assessment of antibiotic consumption and prescribing patterns, hospitals should develop and integrate automated alerts for selected broad-spectrum antibiotics into the electronic prescribing or pharmacy system, supported by a standardized audit tool and feedback protocol.
- A “long-enough” or “representative” pilot phase in selected wards is recommended before full-scale deployment, allowing workflow optimization and calibration of alert volume.
- During implementation, cases should be reviewed within 24–48 hours, with structured written and/or verbal feedback documented in the electronic health record.
- Continuous monitoring of process and outcome indicators should be ensured throughout the intervention.
- Finally, a structured long-term follow-up phase (or maintenance phase) should be implemented to track prescribing trends after active intervention, provide periodic feedback to clinical units, and sustain improvements in antimicrobial use over time.

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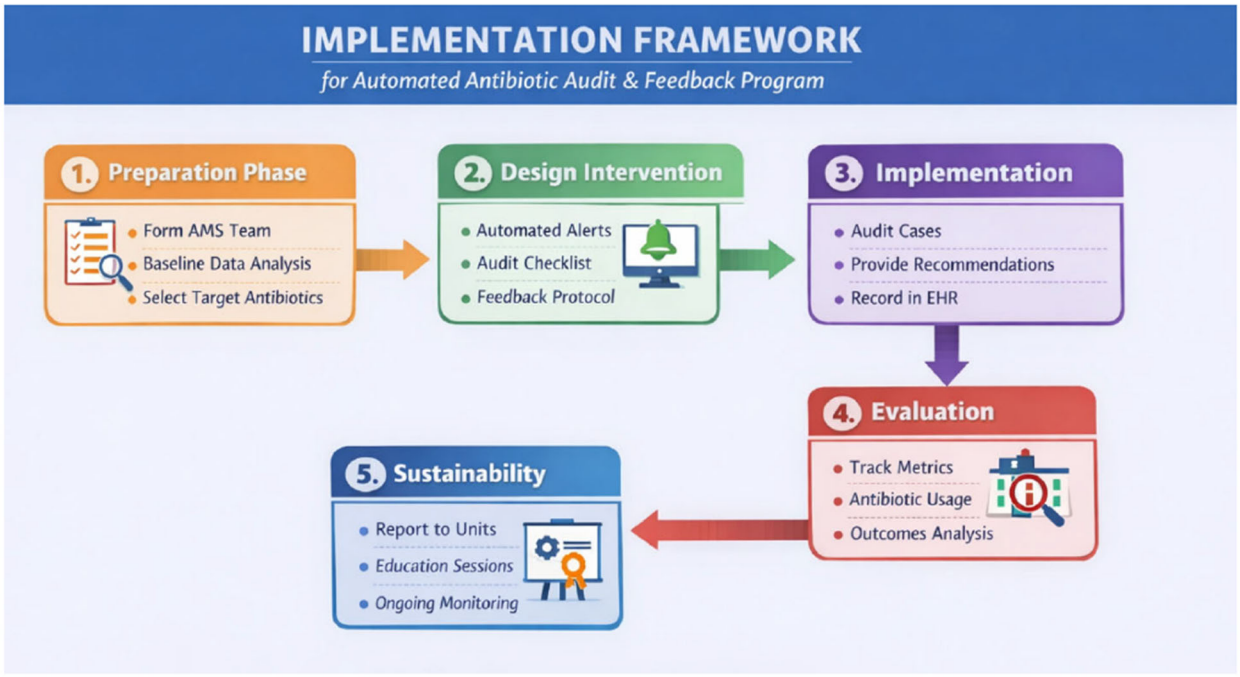
Implementation framework for prescribing audit



Preparation Phase

Governance

Identify project team members	▪ AMS committee (if present in your institution) ▪ Infectious Diseases (ID) physician ▪ Clinical pharmacist ▪ IT/pharmacy software specialist
Secure institutional support	▪ Hospital leadership ▪ Department heads in units where you plan to conduct the intervention (medicine, surgery, geriatrics)
Define objectives	Reduce inappropriate broad-spectrum antibiotic use ▪ Improve prescription quality ▪ Maintain patient safety

Baseline assessment

Antibiotic consumption at baseline	Extract retrospective data (≥12 months), e.g., using ANRESIS data ▪ Antibiotic consumption at unit or department level (if available, prioritize administered antibiotics on patient level): ▪ DDD/admission ▪ DDD/1000 patient-days ▪ For all antibiotics and for broad-spectrum antibiotics

Define target antibiotics	▪ Based on baseline assessment, local epidemiology, other AMS interventions, AMS priorities
	▪ Select broad-spectrum antibiotics, e.g.:
	  ▪ Piperacillin-tazobactam
	  ▪ Cefepime
	  ▪ Carbapenems
	  ▪ Vancomycin
	  ▪ Daptomycin

Design the intervention

Automated alert	▪ Integrate into:
	  ▪ Pharmacy software (e.g., Pharmaclass or equivalent)
	  ▪ OR electronic health record prescribing module
	▪ Define alert rules
	  ▪ New prescription of target antibiotic
	  ▪ Optional: duration threshold (e.g., >48–72h)

Standardized audit tool	Develop a structured checklist for audit, including:
	▪ Diagnostic quality
	  ▪ Infection criteria present?
	  ▪ Appropriate microbiological samples obtained?
	▪ Therapeutic appropriateness
	  ▪ Spectrum justified?
	  ▪ Dose appropriate?
	  ▪ Contraindications/allergies?
	▪ Stewardship opportunities
	  ▪ De-escalation
	  ▪ Escalation (if needed)
	  ▪ Oral switch
	  ▪ Duration / Treatment discontinuation
	Define items for the clinical pharmacist to collect and evaluate

Define intervention workflow	**Alert → Audit → Feedback → Follow up**
	▪ Daily (or less frequent depending on resources available) review of alerts by AMS team
	▪ Feedback modalities:
	  ▪ Written note (mandatory) in EHR
	  ▪ Oral discussion (recommended)

Implementation

Pilot roll-out

- Start with selected units (based on baseline assessment):
  - Internal medicine
  - Geriatrics
  - Surgery
- Expand progressively

Audit&Feedback process

For each alert:

1. Review case within 24–48h
2. Apply structured checklist
3. Propose targeted recommendations
   - Stop antibiotics
   - De-escalate
   - Adjust dose
   - Switch IV → oral
4. Communicate to prescriber

Data collection

Collect for each case:

- Audit performed (yes/no)
- Type of recommendation
- Acceptance within 24h

Evaluation

Process Indicators

- Number of alerts
- % audited cases
- % with recommendations
- % acceptance whithin 24h

Stewardship indicators

- De-escalation rate
- Oral switch rate
- Inappropriate broad-spectrum use
- Duration >72h

Outcome indicators

- Antibiotic consumption ((if available, prioritize administered antibiotics on patient level):
  - DDD/admission
  - DDD/1000 patient-days
  - For all antibiotics / selected broad-spectrum antibiotics

Sustainability

Feedback to teams	Provide unit-level reports: ▪ Consumption trends ▪ Adherence to recommendations ▪ Benchmark across unit
Eucation session	Regular teaching sessions, including data on antibiotic consumption and quality of prescriptions
Long term monitoring	Integrate intervention into routine AMS program