SwissASP – framework conditions

Recommendations from the Swissnoso SwissASP working group

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Background

Antibiotics can be highly effective and life-saving drugs when used appropriately. Widespread intensive use of antibiotics, however, has contributed to the emergence of antibiotic resistance as a global threat to health. Injudicious or inappropriate use of antibiotics contributes considerably to the selection and spread of antibiotic resistance. As a result, many countries and international bodies, including the World Health Organization, are making efforts to improve stewardship of antibiotics.

Several countries with highly centralized healthcare systems and gatekeeping systems for accessing specialist or hospital care, including Australia, the Netherlands, several Scandinavian countries and the United Kingdom, are currently implementing coordinated national antimicrobial stewardship activities. These often focus on specific targets for reductions in antibiotic use overall or reductions in inappropriate antibiotic use and include multiple, sometimes mandatory components.

In Switzerland, the Swiss Antibiotic Resistance Strategy StAR was adopted by the Federal Council in November 2015. It describes how Switzerland will address the development and emergence of antimicrobial resistance. As part of the field of activity “general conditions” the introduction of comprehensive targeted programmes for the appropriate use of antibiotics will be considered, in particular in primary and secondary healthcare settings.

While most antibiotics are consumed in the community, antibiotics of last resort, including antibiotics thought to have a greater potential towards selecting resistant bacteria, are often prescribed in hospital. Furthermore, medical training in Switzerland includes hospital-based training for virtually all specialties, including for physicians aiming to move into general practice. This provides a nearly universal opportunity to introduce physicians in training to the concepts of best practices in antibiotic prescribing. Such best practices in the inpatient setting are therefore an important pillar of national efforts to conserve currently available antibiotics and ensure newly licensed antibiotics are used responsibly from the time point of market introduction.

Antimicrobial stewardship has been defined as a “coherent set of actions which promote using antimicrobial responsibly”. While there is no agreed international consensus on administrative, infrastructural and resource requirements to implement antimicrobial stewardship, it is clear that dedicated human resources and infrastructure are needed. These could be accessed by allocating stewardship tasks to existing personnel with adequate training or by generating new positions.

Objective

Based on the Swiss hospital landscape and healthcare system, this document outlines the framework conditions considered essential to ensure sustainable stewardship efforts in hospitals in Switzerland. Specifically, this document outlines the governance, infrastructure and resources required to address activities in the core areas of hospital antimicrobial stewardship (Table 1).

Table 1: Core areas of hospital antimicrobial stewardship based on the Checklist for Hospital Antimicrobial Stewardship Programming (CHASP)

Expertise and technology	Identification, training and continuous professional development of staff with relevant expertise is critical to sustainable hospital antimicrobial stewardship. Experts may come from a range of different professional backgrounds with important contributions expected from infectious diseases specialists, clinical microbiologists, infection prevention and control specialists and clinical pharmacists. Availability of appropriate information technology can considerably facilitate activities.
Monitoring and surveillance	Local on-going tracking of antibiotic utilization, resistance patterns and *Clostridioides difficile* infections is necessary to identify opportunities for antibiotic stewardship interventions and activities as well as to assess the impact of such efforts. National surveillance of antibiotic use and antimicrobial resistance is provided by anresis (www.anresis.ch). However, additional targeted monitoring is likely to be required at hospital level to inform the selection of activities and determine their success.
Reporting and communication	Information on antibiotic use and antimicrobial resistance needs to be available to hospital staff at different levels, including the hospital leadership as well as staff in charge of quality management, and infection prevention and control, but also all healthcare providers prescribing antibiotics to patients. Information requirements will vary with the target audience
Education and training	Education on antibiotic resistance and training on optimal antibiotic prescribing needs to be available to all staff prescribing antibiotics. In addition, information needs to be provided to patients and families.
Interventions aimed at optimal antimicrobial use	Hospitals will need to select among the interventions those which target a specific area with potential for improvement. These will be defined by local needs. The impact of interventions will need to be monitored.

Details of possible activities in the core areas of hospital antibiotic stewardship are provided in the document “SwissASP portfolio 2019”.

Executive sponsorship

Antibiotic stewardship programs can only be successful if they are clearly supported by the hospital management. Such executive sponsorship ultimately requires the allocation of resources to AS activities, particularly human resources and IT support. Importantly, hospital management must officially identify antimicrobial stewardship a priority objective and integrate it in its key performance indicators.

AS will typically reduce antibiotic exposure including duration of treatment and associated direct (drug) and indirect (days in hospital) expenses, will result in shorter length of stay and fewer readmissions, and will improve the hospital's performance for a number of patient safety and quality management standards.

Executive sponsorship may be demonstrated by

Strategic support

Incorporating antibiotic stewardship as a goal in the patient safety, quality management or infection prevention and control strategy of the hospital.

Issuing a formal written statement in support of efforts to improve antimicrobial use.

Placing antibiotic stewardship in a robust clinical governance or quality improvement framework as part of strategic planning.

Executive accountability and reporting

Delegating an executive sponsor to participate in the antibiotic stewardship program development and internal oversight.

Scheduling regular progress report meetings with regular feedback to the executive board.

Supporting the antibiotic stewardship team in implementing accountability in antibiotic prescribing across the hospital.

Mandating education on antibiotic stewardship competencies at a minimum for staff involved in antibiotic prescribing, and ideally also for those dispensing, administration and monitoring antibiotics.

Provision of resources

Ensuring adequate staffing for the antimicrobial stewardship team or unit.

Allocating budgeted additional resources, such as access to IT facilities and expertise.

Providing access to relevant training for members of the antibiotic stewardship team/unit or other core staff involved in antibiotic stewardship.

Integration into healthcare delivery

Incorporating appropriate information on antibiotic stewardship activities in the hospital into induction for new patient-contact employees.

Ensuring that antibiotic stewardship is included in ongoing education and training of all antibiotic prescribers, and that updates on antibiotic stewardship activities are accessible throughout the hospital.

Facilitating proactively informing patients regarding antibiotic stewardship activities at the hospital.

Supporting face-to-face interaction of the antibiotic stewardship team with prescribers as a way of implementing education in real time.

Supporting the core team in coopting additional members depending on the setting and the AS issue being considered.

Governance and accountability

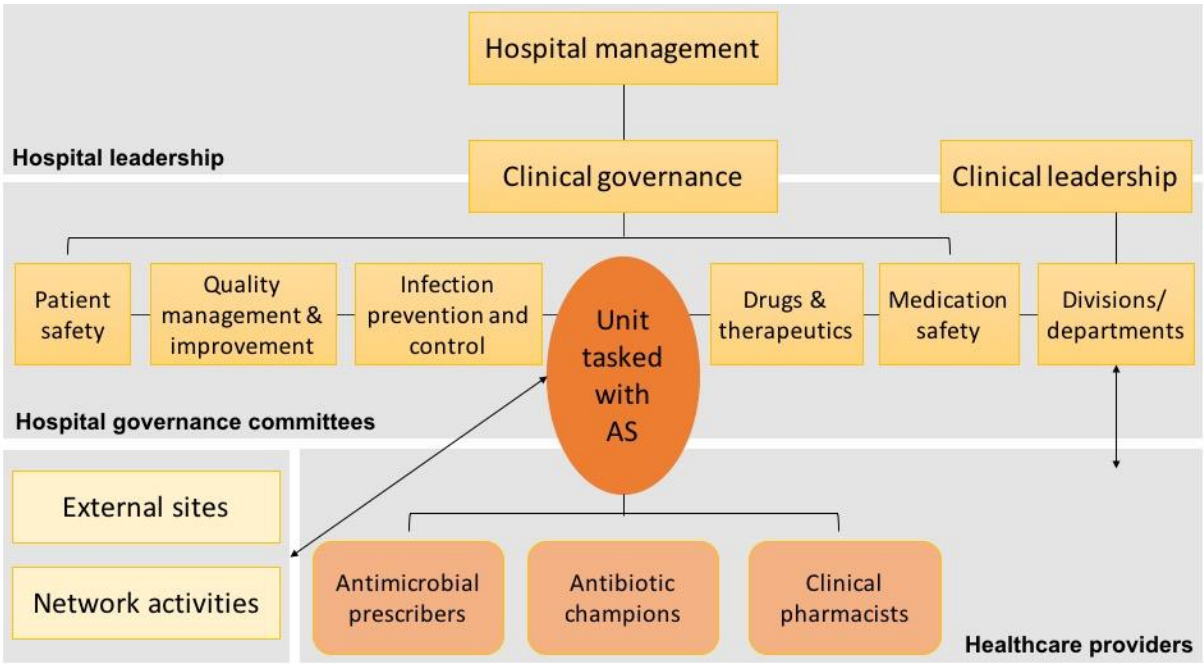
Antimicrobial stewardship activities should be linked to other on-going patient safety and quality management activities. The planned way of interacting with any of the following committees or hospital-level groups should be documented: patient safety, quality management, medication safety, IPC. (see Figure X). If a hospital is part of a network and already receives IPC support from another institution, the exchange of materials, staff and other resources should be network-wide.

All formal organizational units tasked with developing and implementing antimicrobial stewardship should be included within the clinical governance framework. This may, for example, be an antimicrobial stewardship team, but may also consist of an internal working group of antibiotic champions that are active at a ward level.

The method of oversight by hospital management, including reporting requirements and independent authority to issue directives, should be defined in writing for all staff members and units tasked with antimicrobial stewardship. Responsibility for implementation at hospital level should be devolved to a senior staff member or leadership team with appropriate expertise.

Antimicrobial stewardship related duties should form part of the job descriptions of any contributing clinical staff, but in particular for members of formal antimicrobial stewardship units. Within the job description the time allocated to these duties must be specified. Specific objectives from the five core areas should be defined, recorded and reviewed as part of regular performance assessments.

Figure 1: Possible governance structure for hospital antimicrobial stewardship units/teams



Adapted from "Antimicrobial Stewardship in Australian Health Care", p 42.

Clinical leadership

Clinical leadership in antimicrobial stewardship is two-fold: Senior staff members facilitating activities at the divisional or department level and staff who are responsible for implementing antimicrobial stewardship activities across the five core areas in a hospital.

Buy-in of the senior clinical staff is a key factor for successful implementation of hospital AS. Clinical leadership may be demonstrated by acting as or identifying a departmental antibiotic champion who is dedicated to AS activities and provides education and training relevant to his/her specific clinical area. In collaboration with staff members tasked with hospital-wide implementation of antimicrobial stewardship, these champions should ensure incorporation of AS in processes of care, as appropriate, as well as integration of key clinical leads within their area of practice.

Ultimately, AS activities should be coordinated by a unit, team or lead, as appropriate. The composition of the organizational unit responsible for delivering hospital-wide antimicrobial stewardship can vary according to local availability of expertise. The following staff groups should be considered for leadership of formal multidisciplinary antimicrobial stewardship units or teams:

1) A board-accredited specialist in infectious diseases and hospital epidemiology is well-placed to lead AS activities. Physicians with infectious diseases board accreditation but

working in general medicine or other medical specialties may be considered equivalent. They may, however, benefit from the support of an external designated infectious diseases and/or infection prevention and control service.

2) A clinical microbiologist may also have the relevant expertise to lead antimicrobial stewardship, especially if already routinely involved in patient care.
3) In some institutions, a clinical pharmacist with a special interest in antibiotics may take the lead on AS activities, especially if no infectious diseases or clinical microbiology expertise is available at the hospital. He or she may also benefit from the support of an external designated infectious diseases and/or infection prevention and control service.

In circumstances when these experts are not available, any senior physician or surgeon can be supported to lead and manage AS activities. Equally with appropriate support the lead may be with a non-physician IPC practitioner.

Required resources

Based on a review of international guidance on human resources required for inpatient antimicrobial stewardship (Table 2), the following is considered necessary in the context of the Swiss healthcare system for acute care hospitals:

- 1.2 FTE (200 or fewer beds)
- 1.8 FTE (>200-500 beds)
- 2.4 FTE (>500 beds)

Where it is not possible to support at least 1.2 FTE, strong consideration should be given to engaging external support from an experienced larger team through cooperation agreements. A transition period of several months for putting in place AS staff or units will be necessary in sites without dedicated resources.

Table 2: Human resource recommendations (country level) for inpatient antibiotic stewardship teams

Country	Approach	AS Team FTEs recommended (established)	Clinician	Pharmacist	Microbiologist	IT/data analyst	Other	Reference
Australia	Policy document "Antimicrobial Stewardship in Australian Health Care 2018"	At least 2.0-3.0 FTE (principal referral hospital)	1.0 FTE (prinicipal referral hospital)	1.0 FTE (principal referral hospital	✓	-	Clinical Nurse Consultant with training in IPC or quality improvement, FTE not specified	Antimicrobial Stewardship in Australian Health Care 2018
Austria	See Germany							
Canada	Literature review and consensus-based decision-making process of the Association of Medical microbiology and Infectious Diseases Canada Working Group	Total of 4.9 FTE/1000 acute beds	1.0 FTE	3.0 FTE	-	0.4 FTE	0.5 FTE programme administration and coordination	Morris, 2018
ECDC	Commission notice – EU Guidelines for the prudent use of antimicrobials in human health	FTE not specified	✓	✓	✓	-	-	C/2017/4326
France	Cross-sectional national survey distributed through the	Total of 6.7 FTE/1000 acute beds	3.6 FTE	2.5 FTE	0.6 FTE	-	-	Le Coz, 2016

	French Infectious Diseases Society							
Germany	Structured literature review as the basis for development of AWMF guidance	2.0 FTE/1000beds	✓	✓	✓	-	IPC physician	de With, 2016
Netherlands	Electronic survey distributed to 21 stewardship teams and consensus meeting	1.25 FTE (<300 beds) 2.14 FTE (300-750 beds) 3.0 FTE (>750 beds)	-	-	-	-	Not specified, but highest representation on existing teams: ID physician, microbiologist, pharmacist	ten Oever, 2018
New Zealand	Policy document "Antimicrobial Stewardship: Systems and processes for effective antimicrobial medicine use within human health and healthcare in New Zealand"	Not specified, based on NICE guideline NG15 (see UK below), aimed at District Health Board level	✓	✓	✓	-	Primary care representative	Bpac[nz] guideline, 2017
United Kingdom	Baseline assessment tool for Antimicrobial stewardship (NICE medicines	Not specified	-	✓	✓	-	-	Audit tool NICE, 2015

	practice guideline NG15)							
United States	Electronic survey to members of IDSA, SHEA or PIDS to inform a consensus recommendation	1.4 FTE (100-300 beds) 1.6 FTE (301-500 beds) 2.6 FTE (501-1000 beds) 4.0 FTE (>1000 beds)	0.4 (100-500 beds) 0.6 (501-1000 beds) 1.0 (>1000 beds)	1.0 (100-300 beds) 1.2 (301-500 beds) 2.0 (501-1000 beds) 2.0 (> 1000 beds)	-	-	-	Doernberg, 2018

In addition to specific staffing requirements, access to relevant IT expertise and administrative support is critical for delivery of hospital-wide antimicrobial stewardship.

Examples of such support include

- Programming of relevant queries, integration of algorithms or regular provision of data extracts from the hospital electronic patient record or e-prescribing systems.
- Financial support for participation in national or international AS courses/workshops or training in quality improvement for AS team members.
- Administrative support, for example for coordination and minuting of AS activities, report writing and development of patient-facing materials.

Hospitals should define and document in writing which posts will contribute IT expertise or administrative support as locally relevant.

Antimicrobial stewardship unit or team

If possible, it is advisable to devolve responsibility for hospital-wide antimicrobial stewardship to a formal multidisciplinary unit or team. The professional groups traditionally involved in leading antimicrobial stewardship (infectious diseases, microbiology, pharmacy, infection prevention and control) should whenever possible contribute to such a team. In addition, contributions may be sought from quality management, risk management and patient safety officers. The team may be enlarged to include senior clinicians from key departments as well as nursing and midwifery staff. The contribution to day to day activities of representatives from different groups may vary by site. In general, expected contributions (frequency and type of input) should be defined in a local charter or similar document. The antimicrobial stewardship unit may also need to recruit other workforce members, for example for data collection or guideline review. Relevant contributors should be identified through local governance structures.

In hospitals without access to infectious diseases/IPC services on site, the antimicrobial stewardship team may be led by any senior clinician, preferably with relevant training. Clinical microbiology or pharmacy input may be obtained externally within a network or between independent organizations. Such collaborations should be formalized in writing, including addressing how they will be financed.

The antimicrobial stewardship team has the dual role of interacting with relevant governance bodies in the hospital as well as providing the antimicrobial stewardship service within the hospital. Individual tasks may be assigned within the antimicrobial stewardship team.

Designated time should also be allocated for relevant professional development, for example in quality management/improvement or patient safety.

Tasks undertaken by an antimicrobial stewardship unit or team will centre on activities from the core areas and may include:

- Providing input on antimicrobial use, for example as part of guideline development and review.
- Evaluating guideline implementation including audit and feedback.
- Contributing to the hospital formulary, e.g. advising on restricted antimicrobials.
- Designing and implementing antimicrobial approval systems, including input into electronic prescribing and reviewing patients on restricted antimicrobials.
- Monitoring relevant aspects (e.g. volume, distribution and appropriateness) of antimicrobial prescribing at the hospital, division or ward level.
- Engaging in education and training for prescribers and non-prescribers who administer antibiotics.
- Providing input on the design and implementation of IT systems, e.g. electronic prescribing, clinical decision support systems, electronic patient records.
- Proposing and supporting the implementation of specific quality improvement interventions based on opportunities identified as part of antimicrobial stewardship.

Proposal for implementation of SwissASP framework conditions

This document has been reviewed by the StAR steering committee and representatives of the Swiss Society for Infectious Diseases, the Swiss Society for Microbiology and the Swiss Association of Public Health Administration and Hospital Pharmacists. In the next project phase, implementation of SwissASP framework conditions will be discussed with the key stakeholders, most importantly H+ and the GDK/CDS, as well as representatives from other relevant professional bodies and associations.

The following could be considered evidence for implementation of SwissASP framework requirements at hospitals:

- Any formal written statement or documentation indicating inclusion of antimicrobial stewardship as part of the hospital's strategic plan and key performance indicators.
- Documentation outlining the interaction of the structure, unit or team tasked with antimicrobial stewardship with other relevant governance bodies and executive leadership in the hospital, e.g. an organigram.
- An antimicrobial stewardship charter or equivalent document detailing the composition and tasks of the antimicrobial stewardship unit or team as well as the roles and responsibilities of its members.
- Evidence of sufficient personnel resources to deliver AS, e.g. staffing plan and job descriptions, including for the local antimicrobial stewardship lead.
- Any network contracts or agreements enabling access to relevant resources for antimicrobial stewardship implementation in cases where these are not available on site.

To optimally position Swiss hospitals for implementation of antimicrobial stewardship, it will be recommended that fulfilment of the framework requirements should eventually be defined as a necessary criterion for commissioning hospital healthcare. This is modelled on the approach taken in many cantons for infection prevention and control and aligns the StAR and NOSO strategies. Pragmatically, a two-year transition period for hospitals not yet able to demonstrate fulfillment of framework requirements is proposed, starting from their first inclusion in any commissioning agreements.

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Appendix 1

Checklist for hospital antimicrobial stewardship readiness assessment – executive sponsorship, governance and accountability (based on CHASP)

1. Executive sponsorship

1.1. Has hospital management formally identified antimicrobial stewardship as a priority objective for the institution and included it in its key performance indicators?

1.2. Are there dedicated and sustainable budgeted resources for antimicrobial stewardship activities?

1.3. Does your hospital follow recommended staffing standards for antimicrobial stewardship activities?

2. Governance and accountability

2.1. Does your hospital have a formal written antimicrobial stewardship strategy detailing the approach towards ensuring appropriate antimicrobial use?

2.2. Does your hospital have a formal committee, structural unit or team responsible for antimicrobial stewardship?

2.3. Is there an identified clinical leader for antimicrobial stewardship who is responsible for identifying and implementing locally relevant antimicrobial stewardship activities?

2.4. Is there documentation clearly defining the roles and responsibility and procedures of collaboration of staff members who are part of the formal antimicrobial stewardship unit or team?

2.5. Is there documentation clearly defining the procedures of collaboration between the antimicrobial stewardship unit or team and other relevant committees and teams, such as patient safety, quality improvement and infection prevention and control?