# Infection Control Assessment Tool

## May 2009, 2nd Edition


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## About SPS

The Strengthening Pharmaceutical Systems (SPS) Program strives to build capacity within developing countries to effectively manage all aspects of pharmaceutical systems and services. SPS focuses on improving governance in the pharmaceutical sector, strengthening pharmaceutical management systems and financing mechanisms, containing antimicrobial resistance, and enhancing access to and appropriate use of medicines.

## Recommended Citation



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## Part II: Infection Control Assessment Tool Observation Checklists

## ACKNOWLEDGMENTS

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# Part I: Infection Control Assessment Tool Modules

# *Section A: Modules Administered Once for the Facility as a Whole*

## MODULE 1: HEALTH FACILITY INFORMATION

This module should be completed by the head doctor or administrator of the facility.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

Name of facility: _____

Date: _____

Address: _____

_____

### Person Completing this Questionnaire

Name: _____ Title: _____

Position: _____

### Facility Demographic Information

The following questions provide information about your facility's organization, bed capacity, bed utilization, and adherence to infection control guidelines.

1. How would you describe your facility? (Mark one answer)

   [ ] Public health facility (owned and operated by government and financed from general taxes)
   [ ] Private (for profit) health facility (owned and operated for financial gain)
   [ ] Academic hospital (associated with a university faculty; has a major role in training and receives funding from various sources such as Ministries of Health, Education, Social Affairs, insurance companies, etc.)
   [ ] Charity (missionary health facility funded by charity)

2. Are you familiar with the Ministry of Health guidelines covering infection control? If no, skip question 3.

   [ ] No, not aware of guidelines
   [ ] Yes, aware of guidelines

3. Has your facility adopted the Ministry of Health guidelines governing infection control? (Skip this question if your answer to question 2 is No)

   [ ] No, have not adopted the guidelines
   [ ] Yes, have adopted the guidelines

4. How many beds are in your facility?

   Total beds: _____

   Adult beds: _____

   Newborn beds: _____

   Pediatric beds (excluding newborns): _____

5. What is the average daily number of in-patients in your facility? _____

6. How often does the number of in-patients exceed the number of facility beds? (Mark one answer)

   [ ] Always
   [ ] Usually
   [ ]1 Sometimes
   [ ]1 Never

7. How often do patients have to share a bed? (Mark one answer)

   [ ] Always
   [ ] Usually
   [ ] Sometimes
   [ ]2 Never

8. How often do families stay overnight in patient care areas on adult wards? (Mark one answer)

   [ ] Always
   [ ] Usually
   [ ] Sometimes
   [ ]1 Never

**Assessment section total:** _____ **Possible section total:** 4

## Water Supply

The following questions cover the source and treatment of water entering your facility.

9. What is the source of the facility's general water supply (e.g., water supply for sinks)? (Mark one answer)

[ ] Surface water (e.g., river or lake)
[ ]1 Municipal water
[ ]1 Well water
[ ]1 Rainwater
[ ]1 Water brought in tanker trucks or containers

10. Does the water undergo purification to ensure potability prior to arriving at the facility?

[ ] No
[ ]1 Yes

11. If No, does this water undergo additional treatment at the facility?

[ ] No
[ ]1 Yes

12. Which method is used for additional treatment of water? (Mark the method that is generally used)

[ ]2 Chlorination
[ ]1 Filtration
[ ]2 Boiling

**Assessment section total:** _____ **Possible section total:** 5

## General Characteristics of Facility Wards

The remaining questions in this module provide a profile of your facility's wards.

13. How many separate wards are in the facility? _ _

14. Is there a separate ward for labor and delivery patients?

[ ] No
[ ]1 Yes

15. Is there a separate ward for newborn infants?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 2

## HEALTH FACILITY INFORMATION ANNOTATIONS

### Background

Public and private hospitals should attempt to meet quality standards as described in *Prevention of Hospital-Acquired Infections: A Practical Guide* (WHO 2002, 47) (ISO 9000 and ISO 14000 series). WHO recognizes that older facilities and facilities in developing countries may not be able to achieve these standards, however the underlying principles should be kept in mind when local planning and changes or revisions are made.

### Item Notes

10, 11, 12. The physical, chemical, and bacteriological characteristics of water in health care institutions must meet local regulations. The institution is responsible for the quality of water once it enters the building. For specific uses, water taken from a public network must often be treated by physical or chemical treatment for medical uses (WHO 2002, 50). Water boiled for 1 to 5 minutes is considered safe to drink, while water boiled for 20 minutes is high-level disinfected. Alternatively, water can be disinfected and made safe for drinking by adding a small amount of sodium hypochlorite solution. Chlorination should be done just before storing the water in a container, preferably one with a narrow neck as storage containers often become contaminated if the neck is large enough to permit hands or utensils to enter. (Tietjen et al. 2003, 26-9)

### References (* = Copy on CD)

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources*. Baltimore, MD: JHPIEGO.

* World Health Organization (WHO). 2002. *Prevention of Hospital-Acquired Infections: A Practical Guide*. 2nd ed. WHO/CDS/CSR/EPH/2002/12. Geneva: WHO.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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| **Total for Module** | | | **%** | |

*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 2: INFECTION CONTROL PROGRAM

These questions should be answered by the person in charge of the hospital's infection control program or the person who can best speak for the program.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### Infection Control Regulations and Accreditation

These questions about government regulations and accreditation provide a context for understanding the infection control program in your hospital, and are not scored. The infection control program may not be a formal facility program, but rather a group of activities that relate to investigating, preventing, and controlling health facility-acquired infections and infections acquired by facility personnel in the course of their work.

1. Are there any government regulations that determine infection control practices in your facility?

[ ] No
[ ] Yes

2. Are there accreditation standards related to infection control that apply to your facility? (Mark one answer)

[ ] No
[ ] Yes, accreditation voluntary
[ ] Yes, accreditation mandatory

### Infection Control Program: Responsibilities and Authority

The following questions cover the responsibilities and authority of the individuals in your facility's infection control program.

3. What are the main responsibilities of staff members in charge of the infection control program? (Mark all that apply)

[ ]1 Perform surveillance for nosocomial infection
[ ]1 Generate reports of nosocomial infection rates
[ ]1 Investigate and control clusters of nosocomial infections
[ ]1 Develop policies and procedures for infection control including isolation precautions
[ ]1 Educate hospital personnel regarding infection control
[ ]1 Participate in providing employee health services related to infection control
[ ]1 Participate in monitoring and controlling antibiotic use
[ ]1 Evaluate new products or devices
[ ] None of the above

4. Is there a written policy outlining the responsibilities of those in charge of the infection control program? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

5. Patient care—Do those in charge of the infection control program regularly examine the following services? (Mark all that apply)

[ ]1 Sanitary food preparation
[ ]1 Sanitary preparation of enteral feeds
[ ]1 Sterilization/disinfection of reused equipment, instruments, or other items
[ ] None of the above

6. Environmental services—Do those in charge of the infection control program regularly examine the following? (Mark all that apply)

[ ]1 Facilities maintenance
[ ]1 Quality of drinking water
[ ]1 Disposal of contaminated waste material (i.e., wound dressings)
[ ]1 Handling and disposal of corpses or body parts
[ ]1 Cleaning services
[ ]1 Sewage system
[ ]1 Air quality
[ ] None of the above

7. What actions do those in charge of the infection control program have the authority to undertake? (Mark all that apply)

[ ]1 Review patient records
[ ]1 Examine patients
[ ]1 Order cultures or other laboratory tests (e.g., serologic tests)
[ ]1 Order patient isolation precautions and if possible, put patient with other similarly infected patients
[ ]1 Close a patient room/ward or the operating room if an unusually high risk of infection exists
[ ] None of the above

8. Is there financial support available for infection control activities? (Mark all that apply)

[ ] No financial support is available
[ ]1 Financial support is available for educational programs
[ ]1 Financial support is available for laboratory services or monitoring

**Assessment section total:** _____ **Possible section total:** 27

## Infection Control Committee

The following questions focus on the organization, membership, and functions of your facility's Infection Control Committee, or those who conduct infection control activities.

9. Is there a person or team of people responsible for conducting infection control activities in your facility?

[ ] No
[ ]2 Yes

10. Is there a formal Infection Control Committee in the facility?

[ ] No
[ ]1 Yes

11. Does the committee include at least one physician, one nurse, and one other person with training in infection control?

[ ] No
[ ]1 Yes

12. How many times did the committee meet during the past 12 months? (Mark one answer)

[ ] None
[ ]1 Fewer than three times
[ ]2 Four or more times

13. Which of these general topics are discussed at these meetings? (Mark all that apply)

[ ] Infection rates (surveillance results)
[ ] Specific hospital infection cases
[ ] Outbreaks of hospital infections
[ ] Sterilization/disinfection procedures
[ ] Isolation or barrier precautions
[ ] Employee health/health worker issues
[ ] Education and training programs in infection control

[ ]1 Five of the above seven answers
[ ]2 All seven answers

14. Does the committee discuss antibiotic utilization and control?

[ ] No
[ ]1 Yes

15. Which of the following topics related to antibiotic resistance are discussed? (Mark all that apply)

[ ] No topics related to antibiotic resistance are discussed
[ ]1 Results of microbiology testing
[ ]1 Trends in antibiotic resistance

**Assessment section total:** _____ **Possible section total:** 11

## Key Infection Control Personnel

The next set of questions explores training and the level of effort provided by key infection control personnel. This section should be completed by the head of the infection control program.

16. What is your role in the facility?

[ ] Physician
[ ] Nurse
[ ] Public health specialist
[ ] Medical technician
[ ] Other (specify): _____

17. What specialized training have you completed in infection control? (Mark all that apply)

[ ] None
[ ]1 Less than six months training in infection control
[ ]1 Work experience in infection control (specify duration in years): _ _
[ ]2 Special training in infection control for at least six months

18. Do you spend at least some time each week on infection control activities?

[ ] No
[ ]1 Yes

**This section should be completed by the nurse who performs infection control activities (if this is someone other than the head of the program).**

19. What specialized training have you completed in infection control? (Mark the highest training completed)

[ ] None
[ ]1 Less than six months training in infection control
[ ]1 Work experience in infection control (specify duration in years): _ _
[ ]2 Special training in infection control for at least six months

20. Do you spend the majority of your time on infection control activities?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 5 or 8*

*Possible section score is 8 if all questions are answered, or 5 if questions 19 and 20 are skipped.

## Infection Control Education Programs

The following questions provide an overview of educational programs in infection control throughout your facility.

21. Is there an orientation program with information on infection control for nurses and other staff who provide patient care in this facility?

[ ] No
[ ]1 Yes

22. Are doctors required to attend this orientation program?

[ ] No
[ ]1 Yes

23. Is there a periodic in-service (continuing education) program for nurses and other staff who provide patient care?

[ ] No
[ ]1 Yes

24. Are doctors required to attend this continuing education program?

[ ] No
[ ]1 Yes

25. What topics were discussed during continuing education sessions in the last year? (Mark all that apply)

[ ] No programs were conducted
[ ]1 Hand washing/hand hygiene
[ ]1 Prevention of transmissible/communicable infections
[ ]1 Prevention of intravascular catheter-associated infections
[ ]1 Prevention of catheter-associated urinary tract infections
[ ]1 Postsurgical care to prevent infections
[ ]1 Labor and delivery infection control
[ ]1 Antibiotic use
[ ]1 Antibiotic resistance
[ ]1 Prevention of infections among health care workers

**Assessment section total:** _____ **Possible section total:** 13

## Outbreak Investigation and Nosocomial Infection Surveillance

This final set of questions addresses the investigation and reporting of infection outbreaks, and ongoing methods of nosocomial infection surveillance in the facility.

26. Were any outbreaks investigated by the infection control program in the last 12 months?

[ ] No
[ ]2 Yes

27. Was routine surveillance for nosocomial infections performed in your facility in the last 12 months?

[ ] No
[ ]2 Yes

28. About which infections were data collected in the last 12 months? (Mark all that apply)

[ ]1 Nosocomial bloodstream infection
[ ]1 Nosocomial pneumonia
[ ]1 Nosocomial urinary tract infection
[ ]1 Surgical site/wound infections
[ ]1 Episiotomy infections
[ ]1 Postpartum endometritis
[ ]1 Nosocomial meningitis
[ ]1 Nosocomial skin infections/cellulitis
[ ]1 Nosocomial gastroenteritis
[ ]1 Newborn conjunctivitis
[ ]1 Newborn omphalitis
[ ] None of these infections

29. What type of surveillance was performed for bloodstream infections? (Mark all that apply)

[ ] Discharge diagnosis reporting
[ ] Voluntary notification from physicians or nurses
[ ]1 Ward-based (e.g., chart review, discussion with nurses or physicians, patient exam)
[ ]1 Laboratory-based (e.g., review of blood cultures)
[ ] None of these types of surveillance

30. Were infection rates calculated on the number of discharges or on patient days?

[ ] No
[ ]1 Yes

31. Were rates reported to doctors and nurses caring for these patients?

[ ] No
[ ]1 Twice a year or less
[ ]2 Three or more times a year

32. Which methods were used to collect data on nosocomial pneumonia? (Mark all that apply)

[ ] Discharge diagnosis reporting
[ ] Voluntary notification from physicians or nurses
[ ]1 Ward-based (e.g., chart review, discussion with nurses or physicians, patient exam)
[ ]1 Laboratory-based (e.g., review of blood cultures)
[ ] None of these types or methods

33. Were nosocomial pneumonia infection rates calculated on the number of discharges or on patient days?

[ ] No
[ ]1 Yes

34. Were rates reported to doctors and nurses caring for these patients?

[ ] No
[ ]1 Twice a year or less
[ ]2 Three or more times a year

35. Who collected data on surgical wound infections? (Mark all that apply)

[ ] Ward doctors/nurses or supervisor
[ ]1 Infection control staff

36. Which methods were used to collect data on surgical site infections? (Mark all that apply)

[ ] Discharge diagnosis reporting
[ ] Voluntary notification from doctors or nurses
[ ]1 Ward-based (e.g., chart review, discussion with nurses or doctors, patient exam)
[ ]1 Laboratory-based (e.g., review of blood cultures)

37. Were surgical site infection rates calculated on the number of discharges or on patient days?

[ ] No
[ ]1 Yes

38. Were data on surgical site infection rates stratified? (Mark all that apply)

[ ] Rates not stratified
[ ]1 Stratified by wound class (e.g., clean, clean-contaminated, contaminated, dirty) or some other risk index
[ ]1 Stratified for specific surgical procedures
[ ]1 Stratified for specific surgeons

39. Were surgical site infection rates reported to doctors and nurses caring for these patients?

[ ] No
[ ]1 Twice a year or less
[ ]2 Three or more times a year

40. Is any post-discharge surveillance of surgical site infections performed?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 35

## INFECTION CONTROL PROGRAM ANNOTATIONS

### Background

Preventing nosocomial (hospital-acquired) infections requires a team approach in hospital settings that includes hospital management; direct providers of patient care including clinicians, nurses, and other health care providers; those who hire, supervise, and train health care workers; physical plant managers; pharmacy and laboratory technicians; and providers of materials and products. Infection control programs in a hospital are effective only if they involve all hospital personnel, and include surveillance and prevention activities and effective and ongoing staff training. Ideally, the program receives effective support from national and regional levels (WHO 2002).

### Item Notes

1. At the central level, the ultimate responsibility and authority for ensuring the availability and utilization of infection prevention and control policies and guidelines usually lies with the Ministry of Health (WHO/AFRO et al. 2001, 9).

2. A Regional or Provincial Board of Health should be responsible for monitoring the facilities under its control for utilization and compliance with infection prevention and control. The Board is also responsible for ensuring adequate and appropriate resources are available for support of infection prevention and control within these facilities (WHO/AFRO et al. 2001, 9).

3–6. The responsibilities of the Infection Prevention and Control Committee are to review and approve a yearly program of activity for surveillance and prevention; to review epidemiological surveillance data and identify areas for intervention; to investigate the spread of infection outbreaks in collaboration with medical, nursing, and other staff; to provide a nosocomial infection prevention manual compiling recommended instructions and practices for patient care; to plan and conduct ongoing training programs to ensure that all members of staff are sensitized to measures to prevent the transmission of infections; to develop training programs on infection prevention and control for integration in the preservice curricula of all health care workers; to liaise with all disciplines and sectors to foster team work for infection prevention; to communicate and cooperate with other committees of the hospital with common interests; to review risks associated with new technologies and monitor infectious risks of new devices and products prior to their approval for use; to perform any other duties as and when required (e.g., kitchen inspections, pest control, waste disposal); and to assess on an ongoing basis whether recommended precautions are being adhered to, such as hand washing, decontamination, disinfection, and sterilization (WHO/AFRO et al. 2001, 12–13).

7–10. Facility administration and/or medical management must provide leadership by supporting the infection control program and ensuring that the infection control team has the authority to facilitate appropriate program functions, establish a multidisciplinary Infection Control Committee; and identify appropriate resources for a program to monitor infections and apply the most appropriate methods for preventing infection (WHO 2002, 9–10).

11. The hospital's Infection Control Committee should include a core group that does the real day-to-day work of infection control. Ideally, this core group would include representation from management, doctors, nurses, other health care workers, clinical microbiologists, pharmacists, those in charge of sterilization processes, maintenance, housekeeping, and training services (WHO 2002, 9).

12. It is recommended that the Infection Control Committee should meet at a set time and place monthly or quarterly (Wiblin 1998, 29–32).

13, 14. See 3, 4, and 5.

16 – 18. The duties of the Infection Control and Prevention Officer are primarily associated with infection prevention and control practices. The officer should be a health professional with post-basic education in infection prevention and control, and have responsibility for the day-to-day activities of infection prevention and control (WHO/AFRO et al. 2001, 14).

19. The Infection Control Professional (ICP) generally is a registered nurse, often with a bachelor's degree. Other ICPs are medical technologists, and some may have master's degrees in epidemiology or related fields. ICPs often receive training in infection surveillance and control and in epidemiology through basic courses offered by professional organizations or health care institutions (Scheckler et al. 1998, 119).

21, 22. Developing training programs on infection prevention and control for integration in the preservice curricula of all health care workers, and encouraging participation of all health care facility staff in infection prevention and control by orientation, regular meeting and in-service education are among the responsibilities of the Infection Control and Prevention Committee (WHO/AFRO et al. 2001, 11–12).

23 – 25. The Infection Control and Prevention Committee should plan and conduct ongoing training programs in order to ensure that all members of staff are sensitized to measures to prevent the transmission of infections (WHO/AFRO et al. 2001, 11–12).

26. One of the responsibilities of the Infection Control and Prevention Committee is investigating the spread of infection outbreaks in collaboration with medical, nursing, and other staff. General experience demonstrates that outbreaks of nosocomial infections are extremely common in hospitals with limited resources. If no outbreaks have been detected, review the procedures for surveillance and detection (WHO/AFRO et al. 2001, 12).

27. The nosocomial infection rate is an indicator of quality and safety of care. The development of a surveillance process to monitor this rate is an essential first step to identify local problems and priorities and evaluate the effectiveness of infection control activity (WHO 2002, 16).

28. Where resources are limited, the use of surveillance as an infection monitoring tool generally should be restricted to investigating outbreaks or exposures. When considering initiating other types of surveillance activities, the objectives should be reasonable in terms of the resources and time available, and the projected use for the data should be clearly defined before routine collection of data is established (Tietjen et al. 2003, 28-3).

29, 32, 36. Data collection requires multiple sources of information as no method, by itself, is sensitive enough to ensure data quality. Techniques for case finding include ward activity and observations, laboratory reports, other diagnostic tests and discussion of cases with the clinical staff during periodic ward visits (WHO 2002, 20).

30, 33, 37. Attack rates can be estimated by the calculation of a simplified infection ratio using an estimate of the denominator for the same period of time (i.e., number of admissions or discharges, number of surgical procedures). Incidence rates are encouraged as they take into account the length of exposure or the length of the stay of the patient. This gives a better reflection of risk and facilitates comparisons. Either patient-day rates or device-associated rates can be used (WHO 2002, 20).

31, 34, 39. To be effective, feedback must be prompt, relevant to the target group (i.e., the people directly involved in patient care, and with the potential for maximum influence on infection prevention (i.e., surgeons for surgical site infection, physicians and nurses in intensive care units) (WHO 2002, 23).

35. ICPs should collect surveillance data. Less highly trained individuals are used by some hospitals as surveillance technicians (e.g., licensed practical nurses or medical care associates). With on-the-job training and close supervision by an ICP, such individuals may function effectively in surveillance (Scheckler et al. 1998, p. 119).

38. Infection rates should be stratified by the extent of endogenous bacterial contamination at surgery: clean, clean-contaminated, or dirty. Surgical site infection rates may also be stratified by duration of operation and underlying patient status using indices such as those developed by the CDC's National Nosocomial Infection Surveillance Study (NNIS). Individual surgeons should be provided their own surgical site infection rates in a confidential manner (WHO 2002, 41; Culver et al. 1991).

40. In some instances, almost two-thirds of surgical procedures are performed in the outpatient setting and now that the postoperative length of stay for surgical patients is shorter, it is desirable to include post-discharge surveillance in any surgical site infection surveillance program (Roy 2003, 377–78).

## **References** (* = Copy on CD)

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Roy, M. C. 2003. Modern Approaches to Preventing Surgical Site Infections. In *Prevention and Control of Nosocomial Infections*, 4th ed., edited by R. P. Wenzel, 377–78. Philadelphia, PA: Lippincott, Williams & Wilkins.

Scheckler, W. E., D. Brimhall, A. S. Buck, et al. 1998. Requirements for Infrastructure and Essential Activities of Infection Control and Epidemiology in Hospitals: A Consensus Panel Report. SHEA Position Paper. *Infection Control and Hospital Epidemiology* 19(2):114–24.

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* World Health Organization (WHO). 2002. *Prevention of Hospital-Acquired Infections: A Practical Guide*. 2nd ed. WHO/CDS/CSR/EPH/2002/12. Geneva: WHO.

* WHO/Regional Office for Africa (AFRO), Commonwealth Regional Health Community Secretariat (CRHCS), and East, Central and Southern African College of Nursing (ECSACON). 2001. *Manual of Infection Prevention and Control Policies and Guidelines*. Prepared by U. V. Reid.

Wiblin, R. T., and R. P. Wenzel. 1998. The Infection Control Committee. In *A Practical Handbook for Hospital Epidemiologists*, edited by L. A. Herwaldt and M. Decker. Thorofare, NJ: SLACK Incorporated.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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| **Total for Module** | | | **%** | |

*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 3: ISOLATION AND STANDARD PRECAUTIONS

This module should be completed by the person in charge of the infection control program or the person who can best report on infection control activities in the facility.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### Isolation Policies and Precautions

The following questions focus on your facility's policies and precautions for isolating patients with potential contagious infections to prevent the spread to other patients and to health care workers.

1. Does your facility have a formal written policy for placing patients with potentially contagious infections in isolation or for instituting specific procedures (often called "precautions") to prevent spread to other people?

   [ ] No written policy or procedures
   [ ] Policy/procedures communicated verbally only
   [ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
   [ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

2. Does your facility have a written policy for standard precautions similar to those defined by the U.S. Centers for Disease Control (CDC) or other agencies*?

   [ ] No written policy or procedures
   [ ] Policy/procedures communicated verbally only
   [ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
   [ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

***Answer Yes if the policy is similar to the following CDC recommendation—**
Standard Precautions are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in hospitals. They apply to **all patients** receiving care in hospitals, regardless of their diagnosis or presumed infection status. Standard Precautions should be used when contact with the following body substances or sites is anticipated: 1) blood; 2) all body fluids, secretions, and excretions except sweat, regardless of whether or not they contain visible blood; 3) non-intact skin; and 4) mucous membranes.[1]

[1] Centers for Disease Control and Prevention. 1996. Guideline for Isolation Precautions in Hospitals. Part I. Evolution of Isolation Practices. Hospital Infection Control Practices Advisory Committee. *American Journal of Infection Control* 24(1):24–52.

3. Does your hospital have a written policy regarding cleaning and fumigation of rooms following outbreaks such as cholera, viral hemorrhagic fever (VHF), and plague?

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted in clinical or support areas

4. Does your facility have the following isolation precautions? (Mark all that apply)

[ ] This facility does not use an isolation system based on the route of transmission of pathogens
[ ] Special precautions for immunocompromised patients (including HIV/AIDS)
[ ]1 Airborne precautions (droplet nuclei that travel long distances in the air, as with tuberculosis [TB] and measles)
[ ]1 Droplet precautions (large droplets that travel only several meters in the air, as with meningococcus, pertussis, and Group A streptococcus)
[ ]1 Contact precautions (direct contact with the patient, excretions, or contaminated objects, as with salmonella, formerly known as “enteric precautions”)
[ ]1 Special precautions for multidrug-resistant organisms (bacteria resistant to multiple antibiotics, as with methicillin-resistant staphylococcus)

5. Are there specific isolation precautions for patients infected with the following pathogens? (Mark all that apply)

[ ] This facility does not have an isolation system based on specific types of infection
[ ]1 TB
[ ]1 Measles
[ ]1 Cholera (or other diarrheal diseases; please specify diseases:_____)
[ ]1 VHF
[ ]1 Sudden acute respiratory syndrome
[ ]1 Influenza
[ ]1 Group A streptococcus disease
[ ]1 Staphylococcus aureus
[ ]1 Varicella

6. Do the isolation precaution guidelines include instructions about the following? (Mark all that apply)

[ ] Handling of linen
[ ] Handling of equipment and supplies
[ ] Disposal of waste and corpses
[ ] Cleaning
[ ]1 All of the above
[ ]1 Patient placement in specific rooms according to their disease or mode of transmission
[ ]1 Transport of isolated patients to other locations in facility (X-ray)

7. Who is responsible for placing a patient on isolation precautions? (Mark one answer)

[ ] There is no formal policy for who should place a patient on precautions
[ ]1 Doctor
[ ]1 Nurse

8. Is there a policy for screening and restricting family/visitors with illnesses?

[ ] No
[ ]1 Yes

9. Which of these illnesses are screened for and restricted in family visits? (Mark all that apply)

[ ] None are screened for or restricted in family visits
[ ] Acute respiratory illness
[ ] Gastrointestinal illness
[ ]1 Chronic cough

**Assessment section total:** _____ **Possible section total:** 24

## Supplies for Isolation Precautions

This question seeks information on supplies available for isolation precautions.

10. Which of the following items needed for isolation precautions are usually available in adequate supply? (Mark all that apply)

[ ]1 Standard surgical masks
[ ]1 Special respirator masks (such as N95 or powered air purifying respirators [PAPRs])
[ ]1 Thick utility gloves
[ ]1 Nonsterile gloves (e.g., latex, nitrile)
[ ]1 Protective eye wear
[ ]1 Full face shields
[ ]1 Protective caps
[ ]1 Fluid resistant gowns
[ ]1 Non-fluid resistant gowns
[ ]1 Fluid resistant aprons
[ ]1 Fluid-proof shoes or shoe covers

**Assessment section total:** _____ **Possible section total:** 11

## Precautions for TB (see Tuberculosis Precautions Module)

## Precautions for Other Airborne Diseases

The following questions address practices in your facility for isolating patients with airborne diseases other than TB (for example, measles, varicella).

11. Are patients with other airborne diseases (e.g., measles, varicella) usually placed on special isolation precautions?

[ ] No
[ ]1 Yes

12. Where are patients with other airborne diseases usually isolated? (Mark all that apply)

[ ] Patients with other airborne diseases are not isolated
[ ] In a secluded area of a general ward
[ ]1 In a separate single-bed room
[ ]1 In a separate room in which other patients with the same conditions are cared for

13. How often are the number of isolation rooms and/or the capacity of the airborne diseases ward sufficient for the number of patients requiring isolation? (Mark one answer)

[ ] Patients with other airborne diseases are not isolated
[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]1 Always

**Assessment section total:** _____ **Possible section total:** 4

## Viral Hemorrhagic Fever

If your facility is in an area where VHF occurs, the following questions cover education and policies for dealing with VHF, the type of rooms in which VHF patients are placed, and equipment available to those caring for VHF patients.

**If this facility is in an area where VHF does NOT occur, skip the rest of this module.**

14. Which of the following best describes written policies for managing VHF? (Mark one answer)

[ ] No written policies
[ ]1 Written policies not based on international standards
[ ]2 Written policies based on CDC policies
[ ]2 Written policies based on WHO policies

15. Do the policies cover the following? (Mark all that apply)

[ ] No written policies
[ ]1 Disposing of wastes and contaminated items from VHF patients
[ ]1 Disposing of corpses of patients who have died from VHF

16. Is there an education program for all staff participating in the care of VHF patients?

[ ] No
[ ]1 Yes

17. Are single rooms or a separate ward or building for VHF patients available?

[ ] No
[ ]2 Yes

18. How often is the number of single rooms or the capacity of the VHF ward sufficient for the number of patients requiring isolation? (Mark the number that best applies)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]1 Always

19. Do the rooms used for patients with VHF have an anteroom?

[ ] No
[ ]1 Yes

20. Do the rooms used for patients with VHF have a dedicated toilet or latrine?

[ ] No
[ ]1 Yes

21. How is frequently used equipment (e.g., thermometer, blood pressure cuff, stethoscope) shared among VHF patients? (Mark one answer)

[ ] Equipment for non-VHF patients is not used with VHF patients
[ ]1 Equipment is used for multiple patients, but only patients with VHF
[ ]2 Each VHF patient has dedicated equipment

22. Are fluid-proof boots or shoe covers available?

[ ] No
[ ]1 Yes

23. Is there a device for removing boots without using hands?

[ ] No
[ ]1 Yes

24. Is plastic tape available for securing cuffs and ankles of protective garments?

[ ] No
[ ]1 Yes

25. Are leak-proof containers for infectious waste and patient linens available?

[ ] No
[ ]1 Yes

| |
|---|
| 26. Are leak-proof containers for soiled personal attire available?<br>[ ] No<br>[ ]1 Yes |
| 27. Is a bleach solution available?<br>[ ] No<br>[ ]1 Yes |
| 28. Are bedpans available?<br>[ ] No<br>[ ]1 Yes |

**Assessment section total:** _____ **Possible section total:** 19

## ISOLATION AND STANDARD PRECAUTIONS ANNOTATIONS

### Background

There are two tiers of isolation precautions. The first tier "Standard Precautions" is designed for the care of all patients in hospitals, regardless of their diagnosis or presumed infection status. Implementation of these standard precautions is the primary strategy for successful nosocomial infection control. The second tier "Transmission-Based Precautions," is designed for the care of patients known or suspected to be infected by epidemiologically important pathogens that spread by airborne or droplet transmission, such as TB, or by contact with dry skin or contaminated surfaces (CDC 1996).

### Item Notes

1, 2. Isolation and other barrier precautions should be available to staff in clearly written standardized policies that are adaptable to the infectious agent and the patients. These include standard precautions to be followed for all patients and additional precautions for selected patients (WHO 2002, 44). Standard precautions apply to blood; all body fluids, secretions, and excretions except sweat, regardless of whether or not they contain visible blood; non-intact skin; and mucous membranes. Standard precautions are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in hospitals (CDC 1996).

3. The room, cubicle, and bedside equipment of patients on Transmission-Based Precautions are cleaned using the same procedures used for patients on Standard Precautions, unless the infecting microorganism(s) and the amount of environmental contamination indicate special cleaning. In addition to thorough cleaning, adequate disinfection of bedside equipment and environmental surfaces (e.g., bed rails, bedside tables, carts, commodes, doorknobs, faucet handles) is indicated for certain pathogens, especially enterococci, which can survive in the inanimate environment for prolonged periods of time. Patients admitted to hospital rooms that previously were occupied by patients infected or colonized with such pathogens are at increased risk of infection from contaminated environmental surfaces and bedside equipment if they have not been cleaned and disinfected adequately. The methods, thoroughness, and frequency of cleaning and the products used are determined by hospital policy (CDC 1996).

4, 5. Transmission-Based Precautions are designed for patients documented or suspected to be infected with highly transmissible or epidemiologically important pathogens for which additional precautions beyond Standard Precautions are needed to interrupt transmission in hospitals. There are three types of Transmission-Based Precautions—airborne precautions, droplet precautions, and contact precautions. They may be combined for diseases that have multiple routes of transmission. When used either singularly or in combination, they are to be used in addition to Standard Precautions.

- Airborne precautions are designed to reduce the nosocomial transmission of particles 5 µm or less in size that can remain in the air for several hours and be widely dispersed. Microorganisms spread wholly or partly by the airborne route include TB, chicken pox (varicella virus), and measles (rubeola virus). Airborne precautions are recommended for patients with either known or suspected infections with these

agents. For example, an HIV-infected person with a cough, night sweats, or fever; and clinical or X-ray findings that suggest TB should go on airborne precautions until TB is ruled out.

- Droplet precautions reduce the risks for nosocomial transmission of pathogens spread wholly or partly by droplets larger than 5 µm in size (e.g., H. influenzae and N. meningitides meningitis; M. pneumoniae, flu, mumps and rubella viruses). Other conditions include diphtheria, pertussis  pneumonic plague, and strep pharyngitis (scarlet fever in infants and young children). Droplet precautions are simpler than airborne precautions because the particles remain in the air only for a short time and travel only a few feet; therefore, contact with the source must be close for a susceptible host to become infected.

- Contact precautions reduce the risk of transmission of organisms from an infected or colonized patient through direct or indirect contact. They are indicated for patients infected or colonized with enteric pathogens (hepatitis A or echo viruses), herpes simplex and hemorrhagic fever viruses, and multidrug-resistant bacteria. Interestingly, chicken pox is spread both by the airborne and contact routes at different stages of the illness. Among infants there are a number of viruses transmitted by direct contact. In addition, contact precautions should be implemented for patients with wet or draining infections that may be contagious (e.g., draining abscesses, herpes zoster, impetigo, conjunctivitis, scabies, lice, and wound infections) (Tietjen et al. 2003, 21-3; CDC 1996).

6. Although soiled linen may be contaminated with pathogenic microorganisms, hygienic and common sense storage and processing of clean and soiled linen are recommended. The methods are determined by hospital policy and any applicable regulations (See Tietjen et al. 2003, 8-3, for recommendations on handling, transporting, and laundering soiled linen). Contaminated, reusable critical medical devices or patient-care equipment (i.e., equipment that enters normally sterile tissue or through which blood flows) or semicritical medical devices or patient-care equipment (i.e., equipment that touches mucous membranes) are sterilized or disinfected after use to reduce the risk of transmission of microorganisms to other patients; the type of reprocessing is determined by the article and its intended use, the manufacturer's recommendations, and hospital sterilization policy. Noncritical equipment (i.e., equipment that touches intact skin) contaminated with blood, body fluids, secretions, or excretions is cleaned and disinfected after use. Contaminated disposable (single-use) patient-care equipment is handled and transported in a manner that reduces the risk of transmission of microorganisms and decreases environmental contamination in the hospital; the equipment is disposed of according to hospital sterilization policy. Dishes, glasses, cups, or eating utensils should be cleaned with hot water and detergents.

Patients admitted to hospital rooms previously occupied by patients infected or colonized with nosocomial pathogens are at increased risk of infection from contaminated environmental surfaces and bedside equipment unless the room has been adequately cleaned and disinfected. Limiting the movement and transport of patients infected with virulent or epidemiologically important microorganisms and ensuring that such patients leave their rooms only for essential purposes reduces opportunities for transmission of microorganisms. When patient transport is necessary, appropriate barriers (e.g., masks, impervious dressings) should be worn or used by the patient to reduce the opportunity for transmission of pertinent microorganisms to other patients, personnel, and visitors, and to reduce contamination of the

environment; personnel in the area to which the patient is to be taken should be notified of the impending arrival of the patient and of the precautions to be used. Patients should be informed of ways by which they can assist to preventing the transmission of their infectious microorganisms to others (CDC 1996; Tietjen et al. 2003, 8-3).

7. It is recommended that isolation involves collaborative decision making among nursing personnel and physicians (and takes into account written isolation policies) (WHO/AFRO et al. 2001).

0. Visitors should be restricted to two persons at a time during visiting hours, observe any "STOP" signs, and report to the nurse-in-charge prior to entering an isolation area. Visitors should be requested not to bring items that may harbor potentially harmful microorganisms, and should be informed of precautions to be taken to prevent the spread of infection to family, friends, and community members. If requested, visitors should wear personal protective equipment (WHO/AFRO et al. 2001, 61).

10. Various types of masks, goggles, and face shields are worn alone or in combination to provide barrier protection. A mask that covers both the nose and the mouth, and goggles or a face shield, are worn by hospital personnel during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions to provide protection of the mucous membranes of the eyes, nose, and mouth from contact transmission of pathogens. A surgical mask generally is worn by hospital personnel to provide protection against spread of infectious large particle droplets that are transmitted by close contact and generally travel only short distances (up to about 1 meter from infected patients who are coughing or sneezing. High efficiency masks should be worn by staff entering airborne isolation rooms. Gowns prevent contamination of clothing and protect the skin of personnel from blood and body fluid exposures. Gowns treated to make them impermeable to liquids, leg coverings, boots, or shoe covers provide greater protection to the skin when splashes or large quantities of infective material are present or anticipated. Gowns also are worn during the care of patients infected with epidemiologically important microorganisms to reduce the opportunity for transmission of pathogens from patients or items in their environment to other patients or environments; when gowns are worn for this purpose, they are removed before leaving the patient's environment, and hands are washed (CDC 1996; WHO 2002, 45).

112, 13. Airborne precautions are used for patients known or suspected to be infected with epidemiologically important pathogens that can be transmitted by the airborne route (e.g., TB, chickenpox, measles). The following are ideal—an individual room with adequate ventilation including, where possible, negative pressure; door closed; at least six air exchanges per hour; exhaust to the outside away from intake ducts; staff wearing high efficiency masks in the room; patient stays in the room (WHO 2002, 45). When a private room is not available, place the patient in a room with a patient who has an active infection with the same microorganism but no other infection, unless otherwise recommended, (CDC 1996).

14, 15. For complete infection prevention and control procedures for VHF written policies based on WHO, The U.S. Department of Health and Human Services, and the Centers for Disease Control and Prevention standards should be used. Isolation precautions should include safe disposal of waste and use of safe burial practices (WHO/AFRO et al. 2001, 84).

16. To reduce the risk of VHF transmission in a health care setting, information about the risk of VHF transmission should be provided to health facility staff (WHO/CDC 1998).

17, 18. Ideally an isolation area should be available to patients requiring isolation. If an isolation area is not available and VHF is suspected, immediately identify and set aside a single room with an adjoining toilet or latrine. If a single room is not available, select one of the following in order of preference: a separate building or ward that can be used for VHF patients only; an area in a larger ward that is separate and far away from other patients in the ward; an uncrowded corner of a large room or hall; or any area that can be separated from the rest of the health facility (WHO/CDC 1998).

19. One changing room outside the patient isolation area where health care workers can put on protective clothing is required. After leaving the patient's room, health care workers will reenter the changing room and remove protective clothing (WHO/CDC 1998).

21. When VHF is suspected in the health facility, all medical, nursing, laboratory and cleaning staff should disinfect thermometers, stethoscopes, and other medical instruments after use with each VHF patient (WHO/CDC 1998). Disposable equipment dedicated for use with individual VHF patients is preferred.

22, 23. Boots or overboots must be worn over street shoes. Common rubber boots are recommended. The sides of the boots should be at least 30 cm high and have textured soles. If boots are not available, two layers of plastic bags should be worn. A boot remover should be use to take off the rubber boots. Touching the boots with bare or gloved hands should be avoided (WHO/CDC 1998).

24–26. Supplies for the changing room to be used for VHF patient care should include hooks, nails, or hangers for hanging reusable protective clothing; plastic tape for taping cuffs and trousers of protective clothing; a disinfection station with bleach solution for disinfecting gloved hands; a hand washing station with bucket, soap, soap dish, clean water, and supply of one-use towels; containers with soapy water for collecting discarded gloves and used instruments to be sterilized; containers for collecting reusable protective clothing to be laundered and infectious waste to be burned. All used disposable needles and syringes should be discarded in a puncture-resistant container, then burned with the container in an incinerator or pit for burning (WHO/CDC 1998).

27. Two different solutions of household bleach should be prepared in a central location in the health facility—a 1:10 solution and a 1:100 solution (ordinary household bleach has a 5.0 percent chlorine concentration). The 1:10 bleach solution is a strong solution used to disinfect excreta and bodies. It is also used to prepare the 1:100 bleach solution used to disinfect surfaces, medical equipment, patient bedding, and reusable protective clothing before it is laundered. It is also recommended for rinsing gloves between patient contacts, rinsing aprons and boots before leaving the patient's room, and disinfecting contaminated waste for disposal (WHO/CDC 1998).

28. A bedpan should be available in each patient room (WHO/CDC 1998).

## **References** (* = Copy on CD)

U.S. Centers for Disease Control and Prevention (CDC). 1996. Guideline for Isolation Precautions in Hospitals. Part II. Recommendations for Isolation Precautions in Hospitals. Hospital Infection Control Practices Advisory Committee. *American Journal of Infection Control* 24(1):32–52.

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources.* Baltimore, MD: Jhpiego.

* World Health Organization (WHO). 2002. *Prevention of Hospital-Acquired Infections: A Practical Guide*. 2nd ed. WHO/CDS/CSR/EPH/2002/12. Geneva: WHO.

WHO and CDC. 1998. *Infection Control for Viral Hemorrhagic Fevers in the African Health Care Setting*. Geneva: WHO and CDC. <http://www.cdc.gov/ncidod/dvrd/spb/mnpages/vhfmanual.htm> (accessed July 19, 2006).

* WHO/Regional Office for Africa (AFRO), Commonwealth Regional Health Community Secretariat (CRHCS), and East, Central and Southern African College of Nursing (ECSACON). 2001. *Manual of Infection Prevention and Control Policies and Guidelines.* Prepared by U. V. Reid.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 4: TUBERCULOSIS PRECAUTIONS

This module should be completed by the tuberculosis (TB) coordinator or nurse in charge of the medical/TB ward.

For each item, mark the answer that best describes your current situation by putting a check ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### Work Practice and Administrative Controls

The following questions focus on your facility's policies and practices for isolating TB suspects and patients to reduce risk of exposure to TB.

1. Is a national infection prevention and control policy/procedures for TB available in your facility?

   [ ] No
   [ ]2 Yes

2. Does your facility have a formal written policy for TB infection control?

   [ ] No written policy or procedures
   [ ] Policy/procedures communicated verbally only
   [ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
   [ ]2 Written policy/procedures in a manual but also relevant posters or pamphlets posted on walls in clinical or support areas

3. Is there a written TB infection control plan?

   [ ] No
   [ ]2 Yes

4. What is the turnaround time for TB microscopy (acid-fast bacilli [AFB] smear results)?

   [ ]2 48 hours
   [ ] More than 48 hours

5. Are airborne isolation precautions clearly displayed on walls in clinical or support areas? (Mark one answer)

   [ ]2 Airborne precautions are clearly displayed in all clinical or support areas
   [ ]1 Airborne precautions are clearly displayed in some but not all clinical or support areas
   [ ] Airborne precautions are not clearly displayed in any area

6. Do your facility's airborne precautions/guidelines include clear instructions about the following? (Mark all that apply)

[ ]1 Transporting isolated patients to other locations in facility (e.g., Radiology unit)
[ ]1 Placing patients in private or specific rooms according to their resistance pattern (cohorting)
[ ]1 Always keeping the isolation room doors closed
[ ]1 Use of N95 respirators by all persons entering the isolation area
[ ]1 Limiting movement of infectious patients from isolation area to essential purposes only
[ ]1 Providing surgical masks to infectious patients who are coughing or are required to be transported from isolation to the essential services
[ ]1 Open window policy

**Assessment section total:** _____ **Possible section total:** 16

## Screening and Triaging/Precautions for TB

The following questions cover practices in your facility for ensuring prompt recognition, separation, and isolation of TB cases and suspects; methods for screening patients pre- and post-admission for TB; and the types of TB screening tests used.

7. Which of the following describe your facility's efforts to ensure prompt recognition, separation, and isolation of TB cases and suspects? (Mark all that apply)

[ ] None
[ ]1 Designated personnel (e.g. cough counselors/marshals/officers) operate in areas where queues are more likely (e.g., outpatient department)
[ ]1 Designated personnel (e.g. cough counselors) provide health education on cough hygiene to identified cases and suspects.
[ ]1 Designated personnel (e.g. counselors) provide disposable paper towels and/or surgical masks to suspects
[ ]1 Designated personnel (e.g. counselors) fast-track the patient to required service
[ ]1 Suspects are separated from the rest of the patients as soon as they have been identified
[ ]1 Suspects and cases are directed to wait in well-ventilated areas
[ ]1 Suspects and cases are referred for immediate TB testing

8. Is there a written policy for screening patients for possible TB prior to admission to the facility (e.g., before they are allowed into a waiting room, emergency department, or holding area)? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

9. Is there a written policy for screening patients for possible TB when they are admitted to the facility? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

10. Which methods are used for screening patients for possible TB either prior to or upon admission to the facility? (Mark the highest applicable answer)

[ ] No specific methods used for screening
[ ]1 Symptoms-based screening (specify which symptoms): _____
[ ]2 AFB smears performed in facility less than 12 hours after admission
[ ]1 AFB smears performed in facility more than 12 hours after admission
[ ]1 AFB smears performed outside of facility
[ ]1 Chest radiograph
[ ]1 Polymerase chain reaction or other genomic test

11. Is sputum induction (stimulated coughing) performed in the facility (including outpatient department)?

[ ] No
[ ]1 Yes

**Skip the Next Question if Sputum Induction is Not Performed**

12. Where is the sputum induction procedure usually performed? (Mark one answer)

[ ] No special area designated
[ ] In a secluded area in the outpatient department or ward
[ ] In a room or portable enclosure with no special air handling
[ ]1 In a room or portable enclosure with special air handling
[ ]1 In a room or portable enclosure with an ultraviolet (UV) light barrier at the door
[ ]1 In a room or portable enclosure with mechanical air exhaust to the outside
[ ]1 Outdoors

**Assessment section total:** _____ **Possible section total:** 14*

*Maximum section total is 14 if question 12 is not skipped.

## Isolation Practices

The following questions address practices in your facility for isolating TB suspects and patients.

13. Are TB suspects and patients usually placed on special isolation precautions?

[ ] No
[ ]1 Yes

14. Where are TB suspects and patients usually isolated? (Mark the highest applicable answer)

[ ] TB suspects and patients are not isolated
[ ]1 In a secluded area of a general ward
[ ]2 In a separate single-bed room
[ ]1 In a separate room in which other patients with the same sensitivity profile are cared for
[ ]1 In a separate ward or building reserved for patients with TB

15. How long are TB patients and suspects isolated (Mark one answer)

[ ]1 Until 3 consecutive negative sputum smear results have been obtained on 3 separate days with at least one specimen taken in the morning
[ ]1 Until the patient shows maintained clinical improvement
[ ]1 Until the cough has been resolved
[ ]2 All of the above
[ ] TB patients and suspects are not isolated
[ ] For 24 hours after treatment initiation
[ ] For 48 hours after treatment initiation

16. When TB patients are isolated, which of the following best describes the ventilation in this isolation area? (Mark one answer)

[ ] TB patients are not isolated
[ ] No special ventilation in isolation area
[ ] Room fans that circulate air within the room/ward/building
[ ] Window ventilation that allows fresh (outside) air to enter the room in some seasons only
[ ] Window ventilation that allows fresh (outside) air to enter the room in all seasons
[ ]1 Window or through-wall fan blowing air outdoors
[ ]2 Mechanical ventilation designed to keep the room/ward at negative pressure with respect to the corridor, rest of ward, or building

17. When TB patients are isolated, does the room or ward used for isolation have the following? (Mark all that apply)

[ ] TB patients are not isolated
[ ]1 An anteroom
[ ]1 A dedicated toilet or latrine
[ ]1 UV light barrier in the doorway

18. How often are the number of isolation rooms and/or the capacity of the airborne diseases ward sufficient for the number of patients requiring isolation? (Mark one answer)

[ ] Patients with other airborne diseases are not isolated
[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

19. Who is responsible for placing a patient on isolation precautions? (Mark one answer)

[ ] There is no formal policy on who is responsible for placing a patient on isolation precautions
[ ]1 Only doctors
[ ]1 Only nurses
[ ]1 Both doctors and nurses

20. When TB patients are not isolated, which of the following best describes the ventilation of the ward where they are placed? (Mark one answer)

[ ] No special ventilation
[ ] Window ventilation that allows fresh (outside) air to enter the room only during some seasons of the year
[ ] UV lights without extractor fans
[ ]2 Natural window ventilation that allows fresh (outside) air to enter the room all year round
[ ]1 Negative pressure room fixtures
[ ]1 Room fans that circulate air in the ward
[ ]1 Extractor fans that draw air out of the ward
[ ]1 Ceiling mounted ultraviolet germicidal irradiation lights, shielded from direct eye sight, used in conjunction with extractor fans that encourage circulation of air to the level of the light
[ ]1 Air conditioning with high efficiency particulate air filters

21. Are there up-to-date records of regular monitoring of the environmental controls?

[ ] No
[ ]1 Yes

22. Are there up-to-date records of regular maintenance of the environmental controls?

[ ] No
[ ]1 Yes

23. If pulmonary TB is suspected but not yet confirmed by a diagnostic test, is the patient isolated or placed on special precautions to prevent spread to other patients?

[ ] No
[ ]2 Yes

24. If pulmonary TB is documented by a diagnostic test, is the patient isolated or placed on special precautions to prevent spread to other patients?

[ ] No
[ ]2 Yes

25. When TB patients are isolated, which of the following best describes the ventilation in this isolation area? (Mark one answer)

[ ] TB patients are not isolated
[ ] No special ventilation in isolation area
[ ] Room fans that circulate air within the room/ward/building
[ ] Window ventilation that allows fresh (outside) air to enter the room only during some seasons of the year.
[ ] Window ventilation that allows fresh (outside) air to enter the room in all seasons
[ ]1 Window or through-wall fan blowing air outdoors
[ ]2 Mechanical ventilation designed to keep the room/ward at negative pressure with respect to the corridor, rest of ward, or building

26. When TB patients are isolated, does the room or ward used for isolation have the following? (Mark all that apply)

[ ] TB patients are not isolated
[ ]1 An anteroom
[ ]1 A dedicated toilet or latrine
[ ]1 UV light barrier in the doorway

**Assessment section total:** _____ **Possible section total:** 25

## Health Worker Protection

The following questions focus on measures taken by your facility to protect health workers from TB, MDR-TB, and XDR-TB exposure and infection.

27. Which of the following statements are true for your facility's health worker protection program for TB? (Mark all that apply)

[ ]1 There is a documented disease-monitoring program for protecting health care workers against TB
[ ] There is no specific documented disease-monitoring program for protecting health care workers against TB
[ ]1 Risk assessment for TB has been conducted to identify the categories of risk in all areas
[ ]1 The health care workers in all the sections have been informed about the category of risk they are exposed to
[ ]1 There are records of ongoing education and training on transmission and pathogenesis of TB and the consequences of MDR-TB and XDR-TB
[ ]1 Free HIV voluntary counseling and testing is available on site for health care workers
[ ]1 There are up-to-date quarterly records of weight for health care workers allocated in high-risk areas
[ ]1 There are up-to-date quarterly records of health status assessments (or completed questionnaires) for health care workers allocated in high-risk areas
[ ]1 There are up-to-date annual records of chest x-ray results for health care workers allocated in high-risk areas
[ ]1 Every health care worker has a confidential disease-monitoring file in which screening procedures and all other related information is recorded
[ ]1 Every health care worker has baseline records (including chest X-ray ) of investigations related to occupational diseases
[ ]1 Post-exposure monitoring is conducted for health care workers who have been exposed for two or more hours to aerosolized MDR-TB or XDR-TB infected material (e.g., in bronchoscopy or autopsy rooms)
[ ]1 Health care workers are encouraged to disclose their TB or HIV status for proper placement

**Assessment section total:** _____ **Possible section total:** 12

## Supplies for Isolation Precautions

This question seeks information on supplies available for isolation precautions related to TB.

28. Which of the following items needed for isolation precautions are usually available in adequate supply? (Mark all that apply)

[ ]1 Standard surgical masks
[ ]1 Special respirator masks (such as N95)
[ ]1 Paper towels

**Assessment section total:** _____ **Possible section total:** 3

## TUBERCULOSIS PRECAUTIONS ANNOTATIONS

### Background

Drug-susceptible TB, MDR-TB, and XDR-TB can be spread from person to person through airborne transmission. The high incidence and prevalence of TB fueled by the HIV/AIDS epidemic, and its mode of spread create a significant health hazard, especially in health care settings.

People living with HIV are particularly vulnerable to TB, and they constitute a very significant population of health care users and health care workers. Efforts must be made to prevent contact between HIV positive persons and those with active TB. HIV increases the chance of relapse in previously treated TB patients. Therefore, TB infection prevention and control (IPC) practices are critically important to every health care setting. Early detection, diagnosis, adequate treatment, and prevention of TB must be prioritized.

### Item Notes

1. National TB IPC guidelines should be developed and made widely available as the country's primary guidance document for TB infection control in health care facilities.

2. Each facility must have its own clearly written TB IPC policy/procedures, which should be adapted from national guidelines to suit the local context and needs.

3. National TB IPC guidelines may require each health care facility to have a TB IPC plan that outlines a protocol for prompt recognition and separation of patients with suspected or confirmed TB, initiation of treatment, TB investigation, and patient referral.

4. Reduction in turnaround time for detection and identification of Mycobacterium tuberculosis from pulmonary specimens plays an important role in limiting exposure of health care users and health care workers to TB.

5, 6. Airborne precautions are used for patients known or suspected to be infected with epidemiologically important pathogens that can be transmitted by air (e.g., TB, chickenpox, measles). The following conditions are ideal: an individual room with adequate ventilation, including, where possible, negative pressure, closed door, at least six air exchanges per hour, exhaust to the outside away from intake ducts, staff wearing high efficiency masks in the room, and isolation of patient in the room (WHO 2002). When a private room is not available, place the patient in a room with a patient who has an active infection with the same microorganism but no other infection, unless otherwise recommended (CDC 1996).

7, 8, 9, 10. Health care users must be screened immediately upon arrival to a health care facility to minimize exposure of other health care users and workers to TB. Health care users who have had a cough for more than two weeks, or who report being under investigation or treatment for TB should not be allowed to wait in the line with other users. Health care personnel with responsibility for TB infection control should contribute to the development, implementation, and enforcement of written protocols for the early identification of patients who may have infectious TB. These protocols should be evaluated periodically and revised as

necessary. Review of medical records of patients examined in the facility and diagnosed as having TB may assist in developing or revising these protocols. A diagnosis of TB may be considered for any patient who has a persistent cough (i.e., a cough lasting for three or more weeks) or other signs or symptoms compatible with active TB (e.g., bloody sputum, night sweats, weight loss, anorexia, or fever). However, the index of suspicion for TB will vary in different geographic areas, and will depend on the prevalence of TB and other characteristics of the population served by the facility. The index of suspicion for TB should be very high in geographic areas or among groups of patients in which the prevalence of TB is high. Appropriate diagnostic measures should be conducted and TB precautions implemented for patients in whom active TB is suspected (CDC 1994).

10. Diagnostic measures for identifying TB should be conducted for patients in whom active TB is being considered. These measures include obtaining a medical history and performing a physical examination, PPD skin test, chest radiograph, and microscopic examination and culture of sputum or other appropriate specimens. Other diagnostic procedures (e.g., gastric aspirates, bronchoscopy, or biopsy) may be indicated for some patients. Prompt laboratory results are crucial to the proper treatment of the TB patient and to early initiation of infection control. If a hospital does not have an on-site microbiology laboratory, specimens should be sent to an outside facility (CDC 1994).

11, 12. Sputum collection and sputum induction are high-risk procedures for TB transmission. Cough-inducing procedures should not be performed on patients who may have infectious TB unless the procedures are absolutely necessary and can be performed with appropriate precautions. All cough-inducing procedures performed on patients who may have infectious TB should be performed using local exhaust ventilation devices (e.g., booths or special enclosures) or, if this is not feasible, in a room that meets the ventilation requirements for TB isolation (CDC 1994). Health care workers performing sputum induction must adhere to infection control practices required for airborne transmission.

13–15. Any patient suspected of having or known to have infectious TB should be placed in a TB isolation room that has currently recommended ventilation characteristics. Written policies for initiating isolation should specify (a) the indications for isolation, (b) the person(s) authorized to initiate and discontinue isolation, (c) the isolation practices to follow, (d) the monitoring of isolation, (e) the management of patients who do not adhere to isolation practices, and (f) the criteria for discontinuing isolation. In rare circumstances, placing more than one TB patient together in the same room may be acceptable. This practice is sometimes referred to as “cohorting.” Because of the risk for patients becoming superinfected with drug-resistant organisms, patients with TB should be placed in the same room only if all patients involved (a) have culture-confirmed TB, (b) have drug-susceptibility test results available on a current specimen obtained during the present hospitalization, (c) have identical drug susceptibility patterns on these specimens, and (d) are on effective therapy (CDC 1994).

16. For airborne isolation, the patient should be placed in a private room that has monitored negative air pressure in relation to the surrounding area, 6 to 12 air exchanges per hour, and appropriate discharge of air outdoors or monitored high efficiency filtration of room air before the air is circulated to other areas in the hospital. The room door should be kept closed. If negative pressure is used, it should be tested with a smoke test or air pressure meter to ensure that it is working (CDC 1996). UV light barriers may be used when air handling is not optimal. In some settings window fans blowing air outdoors may create some negative air pressure and reduce risk by increasing air circulation.

17, 18. Although not required, an anteroom may increase the effectiveness of the isolation room by minimizing the potential escape of droplet nuclei into the corridor when the door is opened. To work effectively, the anteroom should have positive air pressure in relation to the isolation room. Except for minimal and low-risk health care facilities, all acute-care inpatient facilities should have at least one TB isolation room. Patients placed in isolation should remain in their isolation rooms with the door closed. If possible, diagnostic and treatment procedures should be performed in the isolation rooms to avoid transporting patients through other areas of the facility (CDC 1994).

19. It is recommended that isolation involves collaborative decision making among nursing personnel and physicians (and takes into account written isolation policies) (WHO/AFRO et al. 2001).

20. If a patient with suspected TB is admitted to the ward, he/she should be placed in a separate, well-lit, well-ventilated room. Windows must stay open even at night in winter (WHO/AFRO et al. 2001, 80).

Natural ventilation is recommended if it is adequate (at least nine air changes per hour). Environmental controls are used to reduce the concentration of droplet nuclei in the air, thereby reducing the possibility of TB transmission. Environmental control measures can not be sufficient on their own for prevention of TB transmission. The environmental controls must always be used in conjunction with administrative controls and personal respiratory protection. The efficiency and maintenance of environmental controls must be monitored regularly.

27. The national TB IPC policy/guidelines must specify, among other things, actions that must be taken to protect health care workers and staff, including increasing staff awareness about TB, HIV/AIDS, and personal respiratory protection.

## **References** (* = Copy on CD)

U.S. Centers for Disease Control and Prevention (CDC). 1994. Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Healthcare Facilities. *MMWR* 1994;43(No. RR-13):1–131.

CDC. 1996. Guideline for Isolation Precautions in Hospitals. Part II. Recommendations for Isolation Precautions in Hospitals. Hospital Infection Control Practices Advisory Committee. *American Journal of Infection Control* 24(1):32–52.

* World Health Organization (WHO). 2002. *Prevention of Hospital-Acquired Infections: A Practical Guide*. 2nd ed. WHO/CDS/CSR/EPH/2002/12. Geneva: WHO.

WHO and CDC. 1998. *Infection Control for Viral Hemorrhagic Fevers in the African Health Care Setting*. Geneva: WHO and CDC. <http://www.cdc.gov/ncidod/dvrd/spb/mnpages/vhfmanual.htm> (accessed July 19, 2006).

* WHO/Regional Office for Africa (AFRO), Commonwealth Regional Health Community Secretariat (CRHCS), and East, Central and Southern African College of Nursing (ECSACON). 2001. *Manual of Infection Prevention and Control Policies and Guidelines*. Prepared by U. V. Reid.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 5: EMPLOYEE HEALTH

These questions should be completed by the person in charge of employee health or another administrator familiar with employee health issues.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### General Information

These questions provide general information about the employee health program in your facility. An employee health program protects both employees and patients from the spread of infection.

1. Does the hospital have a formal employee health program?

   [ ] No
   [ ]1 Yes

2. Are there written policies and procedures for employee health activities?

   [ ] No written policy or procedures
   [ ] Policy/procedures communicated verbally only
   [ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
   [ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

3. Is there a specific person or (team of persons) responsible for managing employee health activities in your hospital?

   [ ] No
   [ ]1 Yes

4. Does the person or team responsible for employee health have special training in employee health issues related to communicable diseases?

   [ ] No specific person or team designated
   [ ] No one has specific training in employee health
   [ ]1 Person responsible has special training in employee health

5. Is the person or team responsible for employee health paid for this work?

   [ ] No specific person or team designated
   [ ] No one is paid for this work
   [ ]1 Yes, the person is paid

**Assessment section total:** _____ **Possible section total:** 6

## Employee Health Activities

The following questions address employee screening, tests, immunizations, and work restrictions.

6. Which of the following employee health activities exist in your facility? (Mark all that apply)

[ ] Medical evaluation (history and physical) of employees
[ ] Tuberculosis (TB) skin testing of employees
[ ] Employees screened for other communicable diseases
[ ] Other laboratory testing of employees, including cultures when clinically indicated
[ ] Employee immunization
[ ] Treatment/prophylaxis of employee hospital-acquired infections
[ ] Education or counseling employees about infection risk in the hospital
[ ] Leave time for employees with communicable diseases or exposure

[ ]1 One to four answers checked
[ ]2 Five to eight answers checked

7. Does the facility provide funding for the above-mentioned employee activities (apart from salary for the manager of the program, if any)?

[ ] No
[ ]1 Yes

8. Which of the following physical examinations are included in the employee medical evaluation? (Mark all that apply)

[ ] No physical examination performed
[ ]1 Skin conditions such as dermatitis
[ ]1 Active skin or soft tissue infections
[ ]1 Gastroenteritis
[ ]1 Chronic cough

9. When are new employees screened for infectious diseases? (Mark one answer)

[ ] No screening takes place
[ ] After hire
[ ]1 Prior to or at time of hire

10. For which of the following diseases are employees screened? (Mark all that apply)

[ ] Hepatitis A (evidence of immunity)
[ ] Hepatitis B infection
[ ] Hepatitis C infection
[ ] HIV infection
[ ] Measles (evidence of immunity)
[ ] Rubella (evidence of immunity)
[ ] TB latent or active
[ ] Varicella (evidence of immunity)

[ ]1 One to four answers checked
[ ]2 Five to eight answers checked

11. What type of TB screening skin test is used? (Mark method usually used)

[ ] No TB skin test is performed
[ ] Tine or other commercial prong test
[ ]1 PPD
[ ]1 Serology

12. How often is employee skin testing performed (if skin test previously negative)? (Mark answer that best applies)

[ ] At hire only
[ ] At intervals greater than one year
[ ]2 Every year

13. Is work restricted for an employee positive for hepatitis B antigen?

[ ] No
[ ]1 Yes

14. Is work restricted for an employee positive for HIV?

[ ] No
[ ]1 Yes

15. Which of the following lab tests/cultures are performed routinely on employees? (Mark all that apply)

[ ] Complete/full blood count
[ ] Urinalysis
[ ] Nose culture for staphylococcus
[ ] Throat culture for streptococcus
[ ] Stool culture for enteric pathogens
[ ]1 None of these lab tests are performed

16. Which immunizations are regularly available for employees? (Mark all that apply)

[ ]1 Varicella zoster live virus if nonimmune
[ ]2 Influenza
[ ]2 Hepatitis B, required if nonimmune
[ ]1 Measles live-virus, optional if nonimmune
[ ]1 Rubella live virus, optional if nonimmune
[ ]1 Measles live virus, required if nonimmune
[ ]1 Rubella live virus, required if nonimmune

17. Which employees' infections are routinely treated with antibiotics? (Mark all that apply)

[ ] No employee antibiotic treatment
[ ]1 Staphylococcal infections
[ ]1 Streptococcal infections
[ ]1 Gastroenteritis
[ ]1 TB
[ ]1 Pertussis

18. Which of the following infections restrict employees from working? (Mark all that apply)

[ ] No employee restriction
[ ]1 Gastroenteritis
[ ]1 Staphylococcal infections
[ ]1 Streptococcal infections
[ ]1 TB
[ ]1 Pertussis

**Assessment section total:** _____ **Possible section total:** 36

## Employee Exposures

This set of questions provides information about your facility's handling of employee exposures to various pathogens and available prophylaxis.

19. For which employee exposures does the facility have written policies and procedures readily available or posted in clinical areas? (Mark all that apply)

[ ] Rabies
[ ] Varicella zoster
[ ] Diphtheria
[ ] Hepatitis A
[ ] Hepatitis B
[ ] Hepatitis C
[ ] HIV
[ ] Meningococcal disease
[ ] Pertussis

[ ]1 One to four answers checked
[ ]2 Five to nine answers checked

20. Is there a designated person to call when an exposure to a blood-borne pathogen occurs?

[ ] No
[ ]1 Yes

21. If a blood-borne exposure occurs, which tests are conducted on the source patient? (Mark all that apply)

[ ] No tests are conducted
[ ]1 Hepatitis B surface antigen
[ ]1 Hepatitis B core antigen
[ ]1 Hepatitis B e antigen
[ ]1 Hepatitis C
[ ]1 HIV, turnaround more than 12 hours
[ ]2 HIV, turnaround less than 12 hours

22. How soon is prophylaxis usually available for persons exposed to hepatitis B (e.g., hepatitis immune globulin and/or hepatitis B vaccine)? (Mark one answer)

[ ] No prophylaxis available
[ ]1 Available, but in more than 24 hours
[ ]2 Available in less 24 hours

23. How soon is prophylaxis usually available for persons exposed to HIV (e.g., zidovudine with or without other antiretroviral agents for at least four weeks)? (Mark one answer)

[ ] Not available
[ ]1 Available, but in more than 24 hours
[ ]2 Available in 6 hours or less

24. Are employees previously negative for TB given a baseline skin test after exposure to pulmonary/laryngeal TB if precautions were not in place?

[ ] No
[ ]1 Yes

25. Are employees previously negative for TB given a follow-up skin test about 6–10 weeks after exposure to pulmonary/laryngeal TB?

[ ] No
[ ]1 Yes

26. Is prophylactic anti-TB treatment given to TB skin test converters following exposure to pulmonary/laryngeal TB?

[ ] No
[ ]1 Yes

27. Are employees with face-to-face contact with meningococcal disease given a prophylactic antibiotic?

[ ] No
[ ]1 Yes

28. Are employees with face-to-face contact with pertussis given a prophylactic antibiotic (e.g., a macrolide)?

[ ] No
[ ]1 Yes

29. Are there written policies/procedures for managing employee exposures for pregnant personnel exposed to infectious agents?

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

30. Which of the following topics are routinely included in employee education programs that cover disease transmission, avoiding exposure, and what to do if exposed? (Mark all that apply)

[ ] TB
[ ] Viral hepatitis
[ ] HIV
[ ] Meningococcal disease
[ ] Pertussis
[ ] Viral hemorrhagic fever

[ ]1 One to three answers checked
[ ]2 Four to six answers checked

**Assessment section total:** _____ **Possible section total:** 23

## Control of Sharp Instruments

These questions focus on policies and procedures for controlling the spread of infection by careful use of needles and other sharp instruments such as scalpels.

31. Are there written policies for reducing the risk of injuries to personnel by needles or other sharps?

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

32. Are containers available for disposable needles and other sharps?

[ ] No
[ ]2 Yes

33. Which types of containers are used? (Mark the answer that best applies)

[ ] No containers used
[ ] Non-puncture-resistant material
[ ]1 Puncture-resistant cardboard
[ ]1 Plastic
[ ]1 Glass

34. How often are these containers available where needles or other sharps are used? (Mark answer that best applies)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

35. Are these containers emptied or disposed of when they are three-quarters full? (Mark answer that best applies)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

36. How are containers handled when they are changed? (Mark answer that best applies)

[ ] Emptied into another container and reused
[ ]1 Sent for disposal and not reused

37. How are the contents of these containers disposed of? (Mark answer that best applies)

[ ] Landfill or dumping
[ ] Regular trash
[ ]1 Burial
[ ]1 Incineration sterilization
[ ]2 Burning sterilization

38. How often are needles recapped after use prior to disposal? (Mark answer that best applies)

[ ]2 Never
[ ]1 Sometimes
[ ] Usually
[ ] Always

39. If needles are recapped, is a one-handed (scoop) technique used when recapping needles?

[ ] Scoop not used
[ ]1 Scoop used

40. How often are needles bent or broken prior to disposal? (Mark answer that best applies)

[ ]1 Never
[ ] Sometimes
[ ] Usually
[ ] Always

41. Are retractable lancets available for obtaining blood? (Mark answer that best applies)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

42. Are capillary tubes used for diagnostic testing (e.g., malaria smears, hematocrits) ever broken or cracked by hand? (Mark answer that best applies)

[ ] Tubes not used
[ ] Tubes sometimes broken or cracked
[ ]1 Tubes never broken

43. Are double gloves worn during surgery in deep body cavities or other procedures in which glove rips or punctures are likely? (Mark answer that best applies)

[ ] Hospital has no surgical areas
[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

44. In the surgical areas, how often do surgeons warn colleagues (“announce”) when they are about to pass a scalpel or other sharp instrument? (Mark answer that best applies)

[ ] Hospital has no surgical areas
[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

45. In the surgical areas, how often are sharps placed in a "neutral zone" (e.g., a basin) when they are passed to colleagues? (Mark answer that best applies)

[ ] Hospital has no surgical areas
[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

46. Are employee punctures and sharp injuries monitored? (Mark one answer)

[ ] Incidents not tracked
[ ]1 Key features such as type of exposure (percutaneous, mucosal, skin, etc.), type of device (solid or hollow needle, etc.), circumstances at time of exposure (surgery, needle disposal), location of exposure, time of day of exposure, or length of hire of exposed staff member are recorded/documented

**Assessment section total:** _____ **Possible section total:** 26

## Employee Health Records

The following questions cover the contents of employee health records.

47. Which of the following items of employee medical history are included in health records? (Mark all that apply)

[ ] Medical evaluation and history
[ ] Hepatitis B status
[ ] Hepatitis C status
[ ] TB history and skin test records
[ ] Immunization records

[ ]1 One to three answers checked
[ ]2 Four to five answers checked

48. Which of the following employee exposures are documented in the medical record? (Mark all that apply)

[ ] Blood-borne disease exposure
[ ] Meningococcus exposures
[ ] Pertussis exposures
[ ] TB exposures
[ ] Diseases acquired from other employees

[ ]1 One to three answers checked
[ ]2 Four to five answers checked

**Assessment section total:** _____ **Possible section total:** 4

## EMPLOYEE HEALTH ANNOTATIONS

### Background

Health care workers are at risk of acquiring infection through occupational exposure. Hospital employees can also transmit infections to patients and other employees. Thus, a program must be in place to prevent and manage infections among hospital staff (WHO 2002, 61).

### Item Notes

1. The infection control objectives for personnel should be an integral part of a health care organization's general program for infection control. These objectives cannot be met without the support of the health care organization's administration, medical staff, and other health care personnel (Bolyard et al. 1998).

2, 3. An active employee (occupational) health system should be established and a written policy should be developed for notifying infection control personnel of infections among personnel that require work restrictions or exclusion from work, clearance for work after an infectious illness that required work restrictions or exclusion, work-related infections and exposures, and, when appropriate, results of epidemiologic investigations. Protocols should be developed to ensure coordination among the employee health program, infection control program, and other relevant departments of the hospital (Bolyard et al. 1998).

4, 5. The organization of a personnel health service may be influenced by the size of the institution, the number of personnel, and the services offered. Personnel with specialized training and qualifications in occupational health can facilitate the provision of effective services (Bolyard et al. 1998).

6–8. Employee health should be reviewed at recruitment, including immunization history and previous exposures to communicable diseases (e.g., tuberculosis) and immune status. Some previous infections (e.g., varicella zoster virus infection) may be assessed by serological tests. Mantoux skin test will document a previous tuberculosis infection and must be obtained as a baseline. Immunizations recommended for staff include hepatitis A and B, measles, mumps, rubella, tetanus, diphtheria, and yearly influenza (WHO 2002, 61). When personnel are exposed to particular infectious agents, they should be informed of the recommended postexposure management that is based on current knowledge about the epidemiology of the infection; the risk of transmitting the infection to patients, other personnel, or other contacts; and methods of preventing transmission of the infection to other persons. Personnel should also be offered necessary prophylactic treatment with medicines, vaccines, or immunoglobulin (Bolyard et al. 1998).

9, 10. New employee evaluation should include routine screening for tuberculosis by using the intradermal PPD test on personnel who have potential for exposure to tuberculosis. Routine serologic screening may be conducted for some vaccine-preventable diseases, such as hepatitis B, measles, mumps, rubella, or varicella, if deemed to be cost-effective to the hospital and beneficial to the health care personnel. Routine cultures on personnel (e.g., cultures of the nose, throat, or stool) should not be conducted as part of the placement

evaluation. Personnel health assessments other than placement evaluations should be performed on an as-needed basis, for example, as required to evaluate work-related illness or exposures to infectious diseases (Bolyard et al. 1998).

11. The Mantoux skin test will document a previous tuberculosis infection and should be obtained as a baseline (WHO 2002, 61).

12. Annual and postexposure tuberculin skin test results should be monitored routinely for individuals who do not already have a positive skin test (Falk 2004, 1766).

13. For personnel with acute or chronic hepatitis B surface antigenemia who do not perform exposure-prone procedures, no restriction is necessary unless epidemiologically linked to transmission of infection. Standard precautions should always be observed. Personnel with acute or chronic hepatitis B e antigenemia who perform exposure-prone procedures should not perform exposure-prone invasive procedures until counsel from an expert review panel has been sought; panel should review and recommend procedures the worker can perform, taking into account specific procedures as well as skill and technique of worker (Bolyard et al. 1998).

14. HIV-positive personnel should not perform exposure-prone invasive procedures until counsel from an expert review panel has been sought; panel should review and recommend procedures the worker can perform, taking into account specific procedure as well as skill and technique of worker. Standard precautions should always be observed (Bolyard et al. 1998).

15. Routine cultures on personnel (e.g., cultures of the nose, throat, or stool) should not be conducted as part of the placement evaluation. Personnel health assessments other than placement evaluations should be performed on an as-needed basis, for example, as required to evaluate work-related illness or exposures to infectious diseases (Bolyard et al. 1998).

16. Immunizations recommended for staff include hepatitis A and B, yearly influenza, measles, mumps, rubella, tetanus, and diphtheria (WHO 2002, 61).

17, 18. Please see table 3 in Bolyard et al. 1998. 407–63

19. Specific postexposure policies must be developed, and compliance ensured for: HIV, hepatitis A virus, hepatitis B virus (HBV), hepatitis C virus (HCV), *Neisseria meningitidis*, *Mycobacterium tuberculosis*, varicella zoster virus, hepatitis E virus, *Corynebacterium diphtheriae*, *Bordetella pertussis*, and rabies (WHO 2002, 61).

20. All health care institutions should have a plan to follow up all occupational exposures to blood-borne pathogens. Health care workers must be educated about the importance of promptly reporting exposures. Ideally, each institution should have a triage system available by phone 24 hours a day. Such a triage service could be provided by the infection control department, by the employee health service, or jointly by both services (Falk 2004, 1767).

21. The person whose blood or body fluid is the source of an occupational exposure should be evaluated for HBV, HCV, and HIV infection (test known sources for HBsAg, anti-HCV, and HIV antibody) (CDC 2001, 19-20).

22. Hepatitis B vaccine and/or hepatitis B immune globulin should be given as soon as possible, preferably within 48 hours and no later than a week after exposure (WHO 2002, 62).

23. Postexposure prophylaxis for HIV should be started within four hours of exposure (WHO 2002, 61).

24, 25. As soon as possible after an exposure to tuberculosis (i.e., exposure to a person with pulmonary or laryngeal TB for whom proper isolation precautions were not implemented), conduct PPD testing on personnel who are known to have negative PPD-test results. If the initial postexposure PPD test result is negative, repeat the PPD test 12 weeks after exposure (Bolyard et al. 1998).

26. Preventive therapy should be offered to the following personnel, regardless of age, who have conversion of their PPD test: (a) recent converters, (b) close contacts of persons with active tuberculosis, (c) those with medical conditions that increase their risk for active tuberculosis, (d) those with HIV infection, and (e) injecting drug users.

27. Intensive close contact (e.g., mouth-to-mouth resuscitation, endotracheal intubation, endotracheal tube management) with a patient with meningococcal disease before administration of antibiotics without the use of proper precautions indicates a need for prophylactic therapy.

28. Antimicrobial prophylaxis should immediately be offered against pertussis to personnel who have had unprotected (i.e., without the use of proper precautions), intensive (i.e., close, face-to-face) contact with a patient who has a clinical syndrome highly suggestive of pertussis and whose cultures are pending (Bolyard et al. 1998). First-line agents are erythromycin or azithromycin.

29. See annotation for question 2.

30. In-service training and education on infection control appropriate and specific for personnel work assignments should be provided annually, and whenever the need arises, so that personnel can maintain accurate and up-to-date knowledge about the essential elements of infection control. Ensure that the following topics are included in the initial training on infection control: (1) hand washing; (2) modes of transmission of infection and importance of complying with standard and transmission based precautions; (3) importance of reporting certain illnesses or conditions (whether work related or acquired outside the hospital), such as generalized rash or skin lesions that are vesicular, pustular, or weeping; jaundice; illnesses that do not resolve within a designated period (e.g., a cough that persists for more than two weeks, gastrointestinal illness, or febrile illness with fever of greater than 103° F lasting more than two days); and hospitalizations resulting from febrile or other contagious diseases; (4) tuberculosis control; (5) complying with standard precautions and reporting exposure to blood and body fluids to prevent transmission of blood-borne pathogens; (6) cooperating with infection control personnel during outbreak investigations; and (7) personnel screening and immunization programs (Bolyard et al. 1998).

31. A plan for the collection, handling, predisposal treatment, and terminal disposal of regulated medical wastes should be developed and proper sharps disposal strategies should be used. Use a sharps container capable of maintaining its impermeability after waste treatment

to avoid subsequent physical injuries during final disposal; place disposable syringes with needles, including sterile sharps that are being discarded, scalpel blades, and other sharp items into puncture-resistant containers located as close as practical to the point of use; do not bend, recap, or break used syringe needles before discarding them into a container (CDC 2003).

32, 33. A sharps-disposal container is a puncture-resistant container used for the local disposal of used needles and other sharps. A sharps container may be made out of a heavy cardboard box, an empty plastic jug, or a metal container. Puncture-resistant sharps-disposal containers should be conveniently located in any area where sharp objects are frequently used (such as injection rooms, treatment rooms, operating theaters, labor and delivery rooms, and laboratories) (EngenderHealth 2004, "Needles and Other Sharps").

35. Sharps containers should be disposed of when they are ¾ full. (Tietien et al. 2003, 7-13)

36, 37. Although burning is the best way to dispose of medical waste, sharps are not destroyed by burning, except in large industrial incinerators. If an industrial incinerator is not available, sharps *can* be rendered harmless by placing needles, plastic syringes, and scalpels in a metal container and then, when the container is three-quarters full, pouring in fuel and igniting and burning it until the fire goes out on its own. When this is done, the plastic syringes will melt and, when cool, become a solid block of plastic, with the sharps embedded within the block. The block can then be buried in the type of burial pit used for solid medical waste. If it is not possible to bury all medical waste on site, sharps should be given priority for burial, since they pose the biggest risk of injury and infections (EngenderHealth 2004, "Waste Disposal").

38. Many accidental needlestick injuries occur when staff are recapping needles. Recapping is a dangerous practice: If at all possible, dispose of needles immediately without recapping them (EngenderHealth 2004, "Needles and Other Sharps")

39. To safely recap needles, the "one-hand" technique should be used—

1. Place the cap on a flat surface, then remove your hand from the cap.

2. With one hand, hold the syringe and use the needle to "scoop up" the cap.

3. When the cap covers the needle, use the other hand to secure the cap on the needle hub. Be careful to handle the cap at the bottom only (near the hub) (EngenderHealth 2004, "Needles and Other Sharps").

40. Hypodermic needles should not be bent, broken or cut before disposal (EngenderHealth 2004, "Needles and Other Sharps").

43. Even the best quality, new latex rubber surgical gloves may leak up to four percent of the time. Moreover, latex gloves, especially when exposed to fat in wounds, gradually become weaker and lose their integrity. Reasonable guidelines for when to double glove: The procedure involves coming in contact with large amounts of blood or other body fluids (e.g., vaginal deliveries and cesarean sections); orthopedic procedures in which sharp bone fragments, wire sutures, and other sharps are likely to be encountered; surgical gloves are

reused (the possibility of unapparent holes or perforations in any type of reprocessed glove is higher than with new gloves) (Tietjen et al. 2003, 7-7).

44, 45. A safe method of passing sharp instruments (scalpels, suture needles, and sharp scissors) during surgery is the "hands-free" technique. This technique for sharps is inexpensive, simple to use, and ensures that the surgeon, assistant, or scrub nurse never touches the same instrument at the same time. Using this technique, the assistant or scrub nurse places a sterile or high-level disinfected kidney basin on the operative field between himself/herself and the surgeon. The container is designated as the neutral or safe zone in which sharps are placed before and immediately after use. For example, the assistant or scrub nurse alerts the surgeon that a sharp instrument has been placed in or on the safe zone, with the handle pointing toward the surgeon, by saying "scalpel" or "sharp" while placing it there. The surgeon then picks up the instrument and returns it to the container after use, this time with the handle pointing away from her/him (Tietjen et al. 2003, 7-5).

46. If an occupational exposure occurs, the circumstances and postexposure management should be recorded in the exposed person's confidential medical record. Recommendations for the contents of the occupational exposure report are as follows: date and time of exposure; details of the procedure being performed, including where and how the exposure occurred; if related to a sharp device, the type and brand of device and how and when in the course of handling the device the exposure occurred; details of the exposure, including the type and amount of fluid or material and the severity of the exposure (e.g., for a percutaneous exposure, depth of injury and whether fluid was injected; for a skin or mucous membrane exposure, the estimated volume of material and the condition of the skin [e.g., chapped, abraded, intact]); details about the exposure source (e.g., whether the source material contained HBV, HCV, or HIV; if the source is HIV-infected, the stage of disease, history of antiretroviral therapy, viral load, and antiretroviral resistance information, if known); details about the exposed person (e.g., hepatitis B vaccination and vaccine-response status); and details about counseling, postexposure management, and follow-up (CDC 2001, 19).

47, 48. An updated record should be kept for all personnel and the confidentiality of their records should be maintained while ensuring that they receive appropriate management for occupational illnesses or exposures. A personnel database should be maintained, preferably computerized, that allows tracking of personnel immunizations, screening tests, and assessment of trends of infections and diseases in personnel (Bolyard et al. 1998).

## **References** (* = Copy on CD)

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## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 6: PHARMACY

This module should be completed by the person in charge of the pharmacy department or the Drug and Therapeutics Committee (DTC) if the hospital has one, or a person familiar with pharmaceutical policies and processes in the facility.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### Key Personnel

These questions provide contextual information about the pharmacy and the functions of the Drug and Therapeutics Committee in your facility.

1. Mark the highest level of training of the person in charge of pharmacy.

[ ] Hospital does not have director of pharmacy
[ ] Special short course or program
[ ] On-the-job training
[ ]1 Diploma/Bachelor in Pharmacy (Dip Pharm, BPharm, BSc Pharm, BSPS)
[ ]1 Masters in Pharmacy (MSc Pharm, MPharm)
[ ]1 Doctor of Pharmacy (PharmD, DPharm, PhD in Pharmacy)

2. Does the facility have a Drug and Therapeutics Committee (DTC)?

[ ] No
[ ]1 Yes

3. Is the head of the pharmacy department a member of the DTC?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 3

### Pharmacy Services

The following questions focus on the functions performed by your pharmacy personnel, and reporting of infection outbreaks.

4. Does the facility have a central pharmacy?

[ ] No
[ ]1 Yes

5. How are medicines usually provided to patients? (Mark all that apply)

[ ] Families purchase medicines outside the facility
[ ]1 From stocks kept on the ward
[ ]1 From the outpatient pharmacy
[ ]2 From the central pharmacy

6. What are the functions of the pharmacy in the facility? (Mark all that apply)

[ ] Procure medicines for the pharmacy
[ ] Distribute prepared medicines from commercial sources directly to patient care areas
[ ]1 Advise and educate medical and nursing staff on appropriate use of medicines
[ ]1 Select medicines for hospital formulary or procurement list
[ ]1 Make clinical pharmacy rounds on wards
[ ]1 Collect data on medicine use

7. What items are prepared or manufactured in the pharmacy? (Mark all that apply)

[ ]1 Admixing or compounding of total parenteral nutrition products
[ ] Preparation of sterile ophthalmic or otic solutions
[ ]1 Preparation or compounding of sterile IV admixtures
[ ] Manufacture of sterile intravenous solutions
[ ] Manufacture of sterile irrigation solutions
[ ]1 Preparation of enteral or oral nutrition solutions

8. Does the pharmacy have written polices and procedures for the following? (Mark all that apply)

[ ] No written policies
[ ]1 Aseptic technique for preparing sterile products (e.g., gloves, gowns, masks, booties)
[ ]1 Expiration dating and labeling of compounded products
[ ]1 Storage conditions for compounded/manufactured sterile products (e.g., room temperature, refrigeration)

9. Are any of the following items available in the pharmacy? (Mark all that apply)

[ ]1 Sink for hand washing
[ ]1 Refrigerator and freezer
[ ]1 Controlled area (limited access area) with nonporous, washable floors
[ ] None of the above are available

10. Are pharmacy personnel certified or trained in compounding sterile products?

[ ] No
[ ]1 Yes

11. How are data on medicine use kept? (Mark the primary method used)

[ ] No routine data on medicine use are kept
[ ]1 Paper records
[ ]1 Computer database

12. How many outbreaks have occurred in the facility in the past 12 months due to contaminated pharmaceuticals?

[ ]1 None
[ ] One to two
[ ] Three or more

13. Did contamination in the pharmacy contribute to the most recent outbreak due to contaminated pharmaceuticals? (Mark one answer)

[ ]1 No outbreaks
[ ]1 No, pharmacy did not contribute
[ ] Yes
[ ] No

**Assessment section total:** _____ **Possible section total:** 22

## Antibiotic Control Program

The following questions focus on your hospital's formulary, antimicrobial drugs, and antibiotic utilization.

14. Is there a medicines formulary in the facility?

[ ] No
[ ]1 Yes

15. Which antimicrobials are usually available in the pharmacy? (Mark all that apply)

[ ] Ticarcillin or piperacillin
[ ] Beta lactam/beta-lactamase combinations (e.g., piperacillin/tazobacam, ticarcillin/clavulate, ampicillin/sulbactam)
[ ] Second generation cephalosporin (e.g., cefuroxime, cefoxitin, cefotetam)
[ ] Third generation cephalosporin (e.g., ceftriaxone, ceftazidime, or cefotaxime)
[ ] Fourth generation cephalosporin (e.g., cefepime)
[ ] Fluoroquinolones (e.g., ciprofloxacin, levofloxacin)
[ ] Imipenem-cilastatin or meropenem
[ ] Vancomycin
[ ]1 Aminoglycosides (e.g., gentamicin/netilmicin, tobramycin, amikacin)
[ ]1 Parenteral first generation cephalosporin (e.g., cefazolin or cephalothin)
[ ]1 Penicillins (penicillin G, ampicillin)
[ ]1 Anti-staph penicillin (methicillin, nafcillin, cloxacillin, or oxacillin)

16. Do you limit the availability of any antimicrobials (e.g., broad spectrum antibiotics or expensive agents) in the facility?

[ ] No
[ ]1 Yes

17. Does the facility have a written policy for antimicrobial use?

[ ] No written policy
[ ] Policy communicated verbally only
[ ]1 Written policy available in an operations manual but not generally available for daily practice
[ ]2 Written policy in a manual but also posted on walls in clinical or support areas

18. Does the facility have written guidelines for antimicrobial use?

[ ] No written guidelines
[ ] Guidelines communicated verbally only
[ ]1 Written guidelines available in an operations manual but not generally available for daily practice
[ ]2 Written guidelines in a manual but also posted on walls in clinical or support areas

19. Does the facility restrict antibiotics on the formulary?

[ ] No
[ ]1 Yes

20. Does the facility rotate antibiotics in and out of the formulary to contain antimicrobial resistance?

[ ] No
[ ]1 Yes

21. Does the facility conduct retrospective or concurrent utilization and review programs for specific antibiotics?

[ ] No
[ ]1 Yes

22. Does the facility use structured antibiotic forms or preprinted order forms for specific conditions, such as sepsis?

[ ] No
[ ]1 Yes

23. Does the facility have a policy for automatic stop orders (e.g., discontinuation of antibiotics after a specific time period)?

[ ] No
[ ]1 Yes

24. Does the facility require approval from a supervising doctor, head prescriber, or pharmacist for the use of certain antimicrobials?

[ ] No
[ ]1 Yes

25. Are there facility guidelines for antibiotic prophylaxis during surgery?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 17

## Antibiotic Utilization Monitoring and Reporting

The following questions deal with antibiotic utilization and utilization reporting.

26. How frequently is antibiotic utilization reported and analyzed for specific antibiotics?

[ ] Do not know
[ ] Utilization not reported frequently
[ ] Occasionally (less than once a year)
[ ]1 One to four times a year
[ ]1 Five or more times a year

27. To whom is antibiotic utilization reported? (Mark all that apply)

[ ] No reporting of antibiotic utilization
[ ] Facility management
[ ] Head of infection control program or chair of infection control committee
[ ] Head(s) of clinical department(s)
[ ] Head of pharmacy department
[ ]1 All of the people mentioned above
[ ]1 All facility doctors

28. Do utilization reports include data on antimicrobial use expressed in the following way? (Mark all that apply)

[ ] No data are reported on antimicrobial use
[ ]1 Number of prescriptions for antimicrobial agents
[ ]1 Number of patients receiving antimicrobial therapy
[ ]1 Number of days of antimicrobial therapy used
[ ]1 Number of defined daily doses (DDD) of antimicrobial therapy used

29. For which groups of patients is antimicrobial use reported? (Mark all that apply)

[ ] None
[ ]1 Patients receiving antimicrobial therapy for peri-operative prophylaxis
[ ]1 Patients receiving antimicrobial therapy for specific diagnoses (e.g., pneumonia, sepsis, meningitis, etc.)

**Assessment section total:** _____ **Possible section total:** 9

## PHARMACY ANNOTATIONS

### Background

The hospital pharmacist and the pharmacy service are essential elements of the health care team, committed to fostering the quality, efficacy, safety, and cost-effectiveness of medicine use. Within this mission, there are four roles relevant to infection control activities: first, to distribute medicines from commercial sources directly to patient care areas and second, to prepare materials for use by repackaging or compounding. These first two roles, however, involve the risk of distributing contaminated materials. The third role is to advise and participate in the control of the hospital's use of medications, leading to an important role in evaluation and education; and the fourth is to be associated with data that may be useful for the investigation, analysis, and ultimately, control of nosocomial infections (Hopkins 2004, 1315).

### Item Notes

1. The pharmacy should be managed by a professionally qualified pharmacist. The head of the pharmacy service should be thoroughly knowledgeable about hospital pharmacy practice and management. An advanced degree is desirable (ASHP 1995).

2. The formulary is a list of medicines (and associated information) that are considered by the professional staff of the facility to be the most useful in patient care. Development, maintenance, and approval of the formulary are the responsibilities of the Pharmacy and Therapeutics (P and T) committee, or its equivalent (ASHP 1992).

3. The pharmacist should be a member of, and actively participate in, committees responsible for establishing medication-related policies and procedures and those responsible for patient care (ASHP 1995).

4, 0. Medication management is the responsibility of the pharmaceutical service and clinical providers. How this responsibility is shared depends on the organization's structure and staffing. When there is no central pharmacy, medications may be managed on each clinical unit. If there is a large central pharmacy, the pharmacy may organize and control medications throughout the organization (JCI 2002, 78).

6. The pharmacist provides patient-specific drug information and accurate and comprehensive information about drugs to other pharmacists, other health professionals, and patients as appropriate (ASHP 1995). The pharmacist also contributes expertise to the formulary system to optimize patient care through rational selection and use of medicines. Pharmacists play a primary role in assessing the relative safety and efficacy of pharmaceuticals nominated for addition to or deletion from the formulary (ASHP 1992).

7, 8. Up-to-date written policies and procedures for compounding sterile products should be available to all personnel involved in these activities. These policies should address personnel education and training requirements, competency evaluation, product acquisition, storage and handling of products and supplies, storage and delivery of final products, use and maintenance of facilities and equipment, appropriate garb and conduct for personnel working

in controlled areas, process validation, preparation technique, labeling, documentation, and quality control (ASHP 2000).

9. For hand washing, a sink with hot and cold running water should be in close proximity to the controlled area. Solutions, drugs, supplies, and equipment used to prepare or administer sterile products should be stored in accordance with manufacturer requirements. Temperatures in refrigerators and freezers used to store ingredients and finished sterile preparations should be monitored and documented daily to ensure that storage conditions and requirements are met. The controlled area should be a limited-access area sufficiently separated from other pharmacy operations to minimize the potential for contamination that could result from the unnecessary flow of materials and personnel into and out of the area (ASHP 2000).

10. Pharmacy personnel preparing or dispensing sterile products should receive suitable training and competency evaluation through demonstration, testing (written or practical), or both (ASHP 2000).

11. Ideally, adequate space, resources, and information-handling and communication technology should be available to facilitate collection and provision of drug information (ASHP 1995).

12, 0. Contamination of sterile products may occur before arrival in the hospital pharmacy, during the course of dispensing, repackaging, compounding in the pharmacy, or after they leave the pharmacy. Therefore, pharmacy personnel should be involved in the analysis and control of any resulting outbreaks (Hopkins 2004, 1035).

14. See annotation 2.

15–17. The appropriate use of antimicrobial agents is usually facilitated through an Antimicrobial Use Committee or Drug and Therapeutics Committee. These committees recommend antibiotics for the formulary and prescribing policies, review and approve practice guidelines, audit antibiotic use, oversee education and interact with pharmaceutical representatives. Each hospital will develop its own antibiotic policy, usually including classification of antimicrobial agents into the following categories: unrestricted (effective, safe and inexpensive, e.g., benzyl penicillin); restricted or reserved (to be used only in special situations by selected practitioners, for severe infection, with particular resistance, etc.); or excluded (preparations without additional benefit to other, less costly alternatives) (WHO 2002, 59). In hospitals where antibiotic resistance is common, effective second or third tier antibiotics should be readily available in addition to the inexpensive first line agents listed in question 15.

18**.** The appropriate use of antimicrobial agents is facilitated through the Antimicrobial Use or Drug and Therapeutics Committee (WHO 2002, 59).

19. Hospitals should have a simple, flexible and regularly updated antibiotic-prescribing policy on a disease-specific basis, relying whenever possible on knowledge of prevailing antibiotic-sensitivity patterns and controlled use of reserve antibiotics. This should incorporate local practice guidelines (WHO 2002).

20. Numerous strategies have been suggested to prevent or reduce microbial resistance to antibiotics, including antibiotic utilization guidelines, feedback of data on antibiotic resistance, removal of antibiotics from the formulary, required approval for use of restricted antibiotics, education (especially by opinion leaders, focused review of use of specific antibiotics, and rotational or cyclic use of antimicrobials (Gerding 2000).

21 Antimicrobial use monitoring is usually performed by the pharmacy department. Specific elements to be monitored include the amount of different antimicrobials used during a given period, and trends in antimicrobial use over time. In addition to monitoring antimicrobial use, intermittent audits should be undertaken to explore the appropriateness of antimicrobial use (WHO 2002, 60).

22, 23. Some institutions use antimicrobial order sheets that incorporate questions about indications for use of antimicrobial agents, suggested dosing regimens, and defined duration of use. These forms can facilitate antimicrobial audits. The pharmacy may also use automatic stop orders for antimicrobials. This technique is most successful for surgical prophylaxis (Duncan 1998, 286).

24. See annotations for 15–17.

25. See annotation for 19.

26. Monitoring the use of antimicrobials is recommended on a monthly basis or at a frequency appropriate to the prescription volume (Shlaes et al. 1997).

27. Antimicrobial use in the facility should be reported in a timely manner to the Antimicrobial Use Committee, Infection Control Committee, and/or medical management and administration (WHO 2002, 60).

28. Elements to be monitored include the amount of different antimicrobials used during a given period and trends in antimicrobial use over time. In addition to monitoring antimicrobial use, intermittent audits should be undertaken to explore the appropriateness of antimicrobial use (WHO 2002).

## **References** (* = Copy on CD)

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## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 7: WASTE MANAGEMENT

These questions should be completed by staff familiar with waste management practices throughout the facility, including surgical areas, wards, patient care areas, laboratories, and support facilities.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### Policies Regarding Contaminated Waste

The following questions provide contextual information on facility policies and guidelines for handling contaminated waste and on staff training.

1. Is there a written facility policy about the handling of contaminated waste? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

2. Which facility staff are trained in the handling/disposal of contaminated waste? (Mark all that apply)

[ ] No training provided
[ ]1 All clinical staff (including doctors, nurses, and laboratory personnel)
[ ]1 All custodial and facilities maintenance staff

**Assessment section total:** _____ **Possible section total:** 4

### Separation of Contaminated Waste

3. Is infectious/contaminated waste stored separately from routine waste?

[ ] No
[ ]1 Yes

4. Are clearly labeled or designated receptacles or containers used to store contaminated waste?

[ ] No
[ ]1 Yes

5. How do contaminated waste containers differ from routine waste containers? (Mark all that apply)

[ ] No separate receptacles or containers are used
[ ] Containers have no special labeling
[ ]1 Contaminated waster containers have clearly different color or label from routine waste, or meet a country's national standards.
[ ]1 Contaminated waste containers meet international World Health Organization (WHO) standards (bright red or orange container and/or standard international biohazard label)

6. How many contaminated waste containers are found in inpatient units? (Mark one answer)

[ ] No contaminated waste containers are used
[ ] Fewer than one container per six inpatient beds (per two patient beds if intensive care unit)
[ ]1 One or more container per six inpatient beds (per two patient beds if intensive care unit)

7. In addition to inpatient units, where are contaminated waste containers found in the facility? (Mark all that apply)

[ ] No contaminated waste containers are used
[ ]1 Easily accessible in outpatient care areas
[ ]1 In all procedure and operating rooms
[ ]1 In all clinical laboratories
[ ]1 In central supply/sterilization facility

**Assessment section total:** _____ **Possible section total:** 9

## Waste Disposal

These questions focus on disposal procedures for non-infectious and contaminated waste.

8. Where is non-infectious waste (e.g., paper, food remains, unsoiled Plaster of Paris) usually disposed of?

[ ] Disposed of on-site (outside the ward or department, but in a designated waste disposal area within the facility premises)
[ ]1 Disposed of off-site (waste is transported to disposal sites outside the facility premises)

9. Where is contaminated solid waste usually disposed of? (Mark one answer)

[ ] Disposed of off-site (see above definition)
[ ]1 Disposed of on-site (see above definition)

10. How is contaminated solid waste (including sharp instruments) usually disposed of? (Mark one answer)

[ ] Community dump or open landfill?
[ ]1 Burial
[ ]1 Incineration
[ ]1 Steam/pressure sterilization (autoclave)

11. Where is contaminated solid waste usually buried? (Mark one answer)

[ ] Waste not buried
[ ] In unprotected pit
[ ]1 In pit protected by a fence or wall

12. Where does incineration of contaminated solid waste usually occur? (Mark one answer)

[ ] Waste not incinerated
[ ]1 Open incinerator
[ ]2 Closed or oil drum incinerator

13. How is contaminated liquid waste usually disposed of? (Mark one answer)

[ ] Poured/drained into sink, toilet, or latrine; pipes lead into hospital grounds or open gutter
[ ]1 Poured/drained into sink, toilet, or latrine; pipes lead into closed sewage system or latrine
[ ]1 Burial
[ ]1 Steam/pressure sterilization (autoclave)

14. Are contaminated materials such as lab specimens, blood clots, or placenta steam/pressure sterilized (autoclaved) before disposal/incineration?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 8

## Postmortem Room and Mortuary

The following questions focus on policies and practices in the postmortem room and mortuary.

15. Are staff working in the postmortem room or mortuary required to wear special protective clothing such as gloves, gowns, plastic aprons, boots, and masks?

[ ] No
[ ]1 Yes

16. Is there a written policy for surface cleaning of these areas? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted in the post mortem room and mortuary

17. Does the policy cover processes for disinfecting instruments and rooms?

[ ] No
[ ]1 Yes

18. Is there a written policy on the use of personal protective equipment in the mortuary? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted in the post-mortem room and mortuary

**Assessment section total:** _____ **Possible section total:** 6

## WASTE MANAGEMENT ANNOTATIONS

### Background

The proper identification and disposal of potentially infectious waste is essential to prevent infection and injury to patients, clinical and custodial staff, and persons in the community.

### Item Notes

1. There should be an explicit protocol that defines what contaminated waste is and how it should be handled, i.e., clearly separated from routine waste as soon as it is generated, handled in a way that prevents further contamination, and disposed of in a manner that will both inactivate microorganisms and prevent environmental contamination.

2. Anyone responsible for generating, handling, or transporting contaminated waste must be trained. Training should occur at the time of employment and be refreshed periodically. The staff who must be trained include the following—

- Clinical staff (e.g. doctors and nurses)
- Laboratory staff (including microbiology, hematology, chemistry, and pathology personnel)
- Facilities staff (including personnel responsible for linens, central sterilization, and custodial staff)

3. Contaminated waste is defined as any disposable material or object that may have been in contact with human pathogens. It includes—

- Waste products, body fluids, and tissue specimens from patients
- Objects that have been in contact with patients, including intravenous catheters, nasogastric and bladder catheters, wound dressings, endotracheal tubes, and gloves that have been in contact with body fluids or tissues
- Sharp instruments, such as scalpels and needles
- Microbiology specimens, including liquid and plated cultures

4. Clearly labeling receptacles of infectious (contaminated) waste will both prevent contamination of routine waste and reduce costs by lowering the overall quantity of material that has to be treated as infectious waste.

5. The optimal labeling process is an internationally accepted standard supported by WHO. According to this standard, containers and bags for infectious waste should be bright orange or red, and/or clearly display the international biohazard symbol. Alternatively, a country's national standards may be applied to waste containers.

6, 7. Containers for contaminated waste should be easily accessible in any area where such waste might be generated. This includes all inpatient and outpatient care areas, including procedure and operating rooms, laboratories where potentially contaminated specimens are handled, and linen and supply areas where reusable items are sterilized. In large wards with multiple patients, clinicians should have immediate access to a receptacle from all patient beds.

8, 9. On-site solid waste disposal (infectious and non-infectious) minimizes the dangers of handling and transport to off-site locations and minimizes the risk of attracting insects, rats, mice, dogs, and vultures, as well as standing pools of water that could breed mosquitoes. If non-infectious waste is transported to an incinerator, the problem is minimized.

10. Sterilizing procedures, such as autoclaving and incineration, are the ideal methods for disposing of contaminated waste.

11. When sterilization is not possible, waste should be deeply buried in a pit. Pits should be surrounded by a fence or wall to prevent animals and people from the community from possible exposure.

12. Burning should occur in a closed incinerator or oil drum rather than an open fire, as open burning might cause airborne dispersal and contamination. It is preferred to dispose of waste on the site of the hospital to minimize handling and transport. In the event that waste must be transported off-site, it should be disposed of by the methods recommended above and never placed in a general dump or body of water.

13. Burial and autoclaving are acceptable methods for disposing of liquid waste. Liquid waste may also be poured down a drain provided that it enters a closed sewage system. It is not acceptable for liquid waste to enter an open drainage system, to be poured on open ground, or to enter any body of water. Liquid specimens from microbiology must be autoclaved before disposal.

14. Because cultures and specimens in microbiology labs have particularly high concentrations of human pathogens, these must be sterilized before disposal. Such specimens should be autoclaved even if they will be subsequently incinerated.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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| **Total for Module** | | | **%** | |

*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

# *Section B: Modules Administered Once for Specific Services (If Present in the Facility)*

## MODULE 8: LABOR AND DELIVERY

This survey should be completed by the head doctor or nurse of the labor and delivery area.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### General Issues, Staff Education, and Labor and Delivery Services Design

This module is designed to provide contextual information on labor and delivery practices in your facility. The first set of questions looks at staff education.

1. In the past year, did you lead or participate in education programs for labor and delivery personnel related to preventing nosocomial infections? If NO, skip question 2.

[ ] No
[ ]1 Yes

2. If yes, which of the following topics were discussed? (Mark all that apply)

[ ] Hand hygiene
[ ] Standard precautions
[ ] Prevention of chorioamnionitis
[ ] Prevention of surgical site infections after cesarean section (C-section) (puerperal sepsis)
[ ] Prevention of infection after vaginal delivery
[ ] Prevention of postpartum endometritis
[ ] Prevention of peripartum infections in the baby
[ ] Prevention of intravenous catheter-associated infections
[ ] Prevention of urinary catheter-associated urinary tract infections
[ ] Care of breast milk pumps, and/or stored breast milk
[ ] Skin and cord care of the baby (neonate)
[ ] Preparation of commercial formulas
[ ] Eye care for the baby (neonate)

[ ]1 At least six items checked
[ ]2 Seven to eleven items checked

3. Are there designated rooms or wards for women in labor? (Mark one answer)

[ ] General hospital ward
[ ]1 Dedicated labor and delivery rooms

**Assessment section total:** _____ **Possible section total:** 4*

*Maximum section total is 4, or total is 2 if question 2 is skipped.

## Cleaning and General Hygiene

The following questions focus on general hygiene practices on the ward.

4. Is there a written policy for general hygiene and cleaning of surfaces such as walls, floors, and toilets on this unit?

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in manual but also posted on walls in clinical or support areas

5. Does the policy cover clothing and equipment?

[ ] No
[ ]1 Yes

6. Do the guidelines cover processes for decontaminating areas contaminated by spillage of blood or body fluids?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 4

## Glove Use for Vaginal Deliveries

7. How frequently are gloves worn for antepartum and postpartum vaginal exams and vaginal deliveries? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

8. How frequently are gloves changed between patients? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

**Assessment section total:** _____ **Possible section total:** 4

## Glove Use for C-Sections

9. How frequently are sterile gloves used when performing C-sections? (Mark one answer)

[ ] C-sections are not performed
[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

**Assessment section total:** _____ **Possible section total:** 2

## Scrub for Vaginal Deliveries

The following questions focus on scrub practices prior to vaginal deliveries.

10. Is the delivering clinician (doctor, nurse, midwife) required to scrub prior to vaginal deliveries?

[ ] No
[ ]1 Yes

11. Is running water usually available for the scrub?

[ ] No
[ ]1 Yes

12. How does the person doing the scrub usually turn the water on and off? (Mark one answer)

[ ] Hand-operated faucet handle
[ ]1 Elbow-operated faucet handles
[ ]1 Foot control or leg/knee lever
[ ]1 Automatic sensor control (electronic)
[ ]1 Someone else turns the water on and off

13. What types of soap or antiseptics are usually used for the scrubs prior to vaginal delivery? (Mark one answer)

[ ] No antiseptic is used
[ ] Plain soap
[ ] Benzalkonium chloride
[ ] Alcohol
[ ] Iodine without alcohol
[ ]1 Tincture of iodine (with alcohol)
[ ]1 Iodophor
[ ]1 Chlorhexidine gluconate without alcohol
[ ]1 Chlorhexidine gluconate solution containing alcohol

14. How are antiseptic dispensers usually cleaned? (Mark one answer)

[ ] Containers not used
[ ] Dispensers are topped off or refilled without cleaning
[ ]1 Dispensers are emptied, washed, and dried before refilling
[ ]1 Dispenser or dispenser insert is disposed of when empty and new one is used

15. How do personnel usually dry their hands after the scrub? (Mark one answer)

[ ] None (air dry)
[ ] Multiple-use cloth towel
[ ]1 Single-use cloth towel
[ ]1 Paper towels
[ ]1 Hot air dryer

**Assessment section total:** _____ **Possible section total:** 6

## Barriers Worn for Vaginal Deliveries

The following questions focus on barriers worn for vaginal deliveries, including the use of gowns and other protective equipment.

16. Does the doctor/nurse/midwife usually wear a cover gown or apron during the delivery? (Mark one answer)

[ ] None
[ ]1 Gown
[ ]1 Apron
[ ]2 Gown and apron

17. How often is a gown or apron available for use? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ] Usually
[ ]1 Always

18. Are gowns or aprons usually changed between patients?

[ ] No
[ ]1 Yes

19. Are gowns fluid proof?

[ ] No
[ ]1 Yes

20. Do the gowns have long sleeves?

[ ] No
[ ]1 Yes

21. Are the following items readily available and routinely worn during vaginal deliveries? (Mark one answer in each row)

| | | |
|---|---|---|
| Protective eye wear (e.g., goggles) | [ ] | No |
| | [ ]1 | Yes |
| Closed toe shoes or shoe covers (e.g., booties) | [ ] | No |
| | [ ]1 | Yes |
| Masks | [ ] | No |
| | [ ]1 | Yes |

**Assessment section total:** _____ **Possible section total:** 9

## Invasive Devices in Labor and Delivery

The following questions examine the use of invasive devices, such as catheters and clamps, during labor and delivery.

**If central venous catheters are used, complete all remaining questions in this module. Then complete the Intravenous Catheters module. If reusable kits or clamps are used, complete the Sterilization and Disinfection modules.**

22. Are peripheral or central venous catheters used in labor and delivery?

[ ] No
[ ] Yes

23. When urinary catheters are used, which type of catheter is usually used?

[ ] No urinary catheters are used
[ ] Indwelling catheters
[ ]1 Straight catheters (in/out)

**If catheters are used, complete all remaining questions in this module. Then complete the Urinary Catheters module.**

24. How often are delivery kits available to birth attendants for vaginal deliveries? (Mark the number that best applies)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]1 Always

25. Are kits intended for single use (disposable) or reusable? (Mark one answer)

[ ] Reusable
[ ]1 Single use

26. Are sterile umbilical clamps/ties routinely used?

[ ] No
[ ]1 Yes

27. Are cord clamps intended for single use (disposable) or reusable? (Mark one answer)

[ ] Reusable
[ ]1 Single use

**Assessment section total:** _____ **Possible section total:** 5*

*Section total is 5 if questions 24-27 are not skipped.

## Labor and Delivery Procedures

The following questions provide an overview of labor and delivery practices in your facility, including examinations, antenatal preparation, postpartum practices including cord care, and antibiotic prophylaxis for C-sections.

**If equipment such as intrauterine pressure catheters, fetal scalp electrodes, and scissors are reprocessed, complete all remaining questions in this module. Then complete the appropriate Sterilization and Disinfection modules.**

28. In a routine, uncomplicated vaginal delivery, how many vaginal exams are usually performed during Stage 1 labor by all personnel caring for mother?

[ ] More than two per hour in first stage of labor
[ ]1 Two or less per hour in first stage of labor

29. In a routine, uncomplicated vaginal delivery, how many vaginal exams are usually performed during Stage 2 labor by all personnel caring for mother?

[ ] More than one per hour in second stage of labor
[ ]1 One or less per hour in second stage of labor

30. How is the perineum usually prepped for delivery? (Mark one answer)

[ ] No cleansing performed routinely
[ ] Tap water
[ ] Distilled water
[ ] Sterile water
[ ] Chlorhexidine gluconate solution without alcohol
[ ] Benzalkonium chloride
[ ] Cetrimide
[ ]1 Betadine*
[ ]1 Chlorhexidine gluconate solution containing alcohol**
[ ]1 Alcohol**

31. What types of suction devices are routinely used for cleaning of nasopharynx or meconium postdelivery? (Mark all that apply)

[ ] No suction devices used
[ ] Mouth-to-tube suctioning
[ ]1 Attaches to wall suction
[ ]1 Bulb suctioṇ

32. What agent is usually used to clean the cord prior to clamping and cutting? (Mark one answer)

[ ] No cleansing performed routinely
[ ] Tap water
[ ] Distilled water
[ ] Benzalkonium chloride
[ ] Cetrimide
[ ]1 Sterile water
[ ]1 Betadine
[ ]1 Chlorhexidine gluconate solution without alcohol
[ ]1 Chlorhexidine gluconate solution containing alcohol
[ ]1 Alcohol

33. Are single use blades used to cut the cord?

[ ] No
[ ]1 Yes

34. What agent is usually used for the cord care? (Mark one answer)

[ ] No agent used
[ ] Tap water
[ ] Distilled wateṛ
[ ] Chlorhexidine gluconate solution without alcohol
[ ] Tetracycline
[ ]1 Sterile water
[ ]1 Betadine
[ ]1 Chlorhexidine gluconate solution containing alcohol
[ ]1 Alcohol
[ ]1 Triple dye
[ ]1 Mupirocin
[ ]1 Bacitracin

35. What is usually used to wash the newborn after delivery? (Mark one answer)*

[ ] Baby not washed
[ ] Distilled wateṛ
[ ] Hexachlorophene, full strength
[ ] Chlorhexidine gluconate solution without alcohol
[ ] Chlorhexidine gluconate solution containing alcohol
[ ]1 Tap water
[ ]1 Sterile saline solution*
[ ]1 Sterile water*
[ ]1 Hexachlorophene, dilute *

36. How are the newborn's eyes treated after birth to prevent gonococcal infection? (Mark one answer)

[ ] No agent used
[ ] Chloramphenicol (topical)
[ ] Ceftriaxone (parenteral)
[ ]1 Silver nitrate (topical)
[ ]1 Erythromycin (topical)

37. Is the newborn received in clean facility linen?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 11

## Prophylactic Antibiotic Use in Labor and Delivery

These questions cover indications and use of prophylactic antibiotic use during labor and delivery, including C-sections.

38. For which procedures are prophylactic antibiotics routinely used? (Mark all that apply)

[ ] None at all
[ ] In labor with spontaneous rupture of membranes four hours or more, no fever or other signs of infection
[ ]1 In labor with rupture of membrane four hours or more, fever or other signs of infection
[ ]1 Elective C-section
[ ]1 Nonscheduled (emergency) C-section
[ ]1 Prolonged labor with rupture of membranes more than 18 hours with no fever or other signs of infection

39. At which point are prophylactic antibiotics usually given in a C-section? (Mark one answer)

[ ] No C-section performed
[ ] Post-C-section
[ ]1 Two hours or less prior to C-section
[ ]1 As soon as cord is clamped

**Assessment section total:** _____ **Possible section total:** 5

## Postpartum Care

The following questions cover postpartum care practices for mother and neonate.

40. Are neonate and mother separated under any of the following conditions? (Mark all that apply)

[ ] Never
[ ] Mother has a postpartum infection
[ ] Mother has eclampsia
[ ] Mother has group A streptococcus infection
[ ] Mother has oral herpes simplex virus
[ ] Mother has genital herpes simplex virus
[ ] Mother has fever
[ ] Mother has HIV
[ ]1 Mother has active tuberculosis

41. How often is "rooming in" practiced for mother and baby? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]1 Always

42. Is there a policy for preventing group B streptococcus infection in the newborn? (Mark one answer)

[ ] No policy
[ ]1 Pregnant women are screened at 35 to 37 weeks and positive cultures treated intrapartum
[ ]1 No screening but intrapartum treatment for high-risk women (i.e., duration of membrane rupture greater than 18 hours, gestation less than 37 weeks, intrapartum fever)

43. What is the average duration of stay for an uncomplicated vaginal delivery?

[ ] More than two days
[ ]1 Less than one day
[ ]1 One to two days

44. What is the average duration of stay for an uncomplicated C-section delivery? (Mark one answer)

[ ] C-sections are not performed in this facility
[ ] More than four days
[ ]1 One to four days

**Assessment section total:** _____ **Possible section total:** 5

## LABOR AND DELIVERY ANNOTATIONS

### Background

In developing countries, postpartum infection remains second only to postpartum hemorrhage as a cause of maternal deaths, and is the leading cause of serious maternal complications of childbirth. This is still the case despite the fact that more than 150 years have elapsed since it was determined not only that childbed fever (puerperal sepsis) was spread from woman to woman on the hands of physicians, but also that outbreaks of this deadly disease could be prevented by hand washing with chlorinated lime before delivery, and boiling all instruments and utensils after use when treating an infected postpartum woman (Tietjen et al. 2003, 25-3).

### Item Notes

4–6. WHO recommends that there be (written) policies specifying the frequency of cleaning and types of cleaning agents used for walls, floors, windows, beds, curtains, screens, fixtures, furniture, baths and toilets, and all reused medical devices. Methods must be appropriate for the likelihood of contamination, including spillage, and necessary levels of asepsis (WHO 2002, 33).

7, 8. To minimize the risk of infection, a clean pair of examination gloves, or high-level disinfected surgical gloves that have been reprocessed should be used for each vaginal examination. Sterilized gloves are not necessary for vaginal examinations (Tietjen et al. 2003, 25-9). Gloves should be changed between care activities and procedures with the same patient (WHO/AFRO et al. 2001, 40).

9. C-sections should be performed using the same standards as for any general surgical procedure (Tietjen et al. 2003, 25-12). Operating staff must wear sterile gloves (WHO 2002, 40). Double gloving is recommended, especially if reprocessed sterile or high-level disinfected surgical gloves are used (Tietjen et al. 2003, 25-12). Prior to delivery, hands should be washed thoroughly, preferably with an antimicrobial soap containing chlorohexidine gluconate or an iodinated compound, especially between the fingers, and forearms up to the elbows with soap and clean water and dried with a clean, dry towel or air dried. If antimicrobial soap is unavailable, an alcohol-based hand rub should be applied to the hands and forearms after hand washing until dry (Tietjen et al. 2003, 25-11).

11. Microorganisms grow and multiply in standing water. Hands should not be scrubbed in a basin that contains standing water, even if an antiseptic solution is added (EngenderHealth, “Surgical Scrub and Surgical Attire”).

12. Optimal hand hygiene requires running water, large washbasins which require little maintenance, and have antisplash devices and hands-free controls (WHO 2002, 31).

14. Soap should not be added to a partially empty soap dispenser. The practice of “topping off” dispensers can lead to bacterial contamination of soap (CDC 2002, 33). Disposable containers are preferred for liquid products. Reusable containers should be thoroughly washed and dried before refilling, and routine maintenance schedules should be documented and followed (WHO/AFRO et al. 2001, 33).

15. After performing the surgical scrub, hands should preferably be dried with a sterile towel (Mangram 1999, 267).

16, 17. Gowns should be worn to protect uncovered skin and to prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions, or excretions. Plastic aprons are recommended where splashes are likely to occur (WHO/AFRO et al. 2001, 42).

18. A soiled gown should be removed as promptly as possible, and hands washed to avoid transfer of microorganisms to other patients or environments (Garner 1996).

19. Surgical gowns made of fluid-resistant materials play a role in keeping blood and other fluids, such as amniotic fluid, off the skin of personnel, particularly in the surgical, delivery, and emergency areas (Tietjen et al. 2003, 5-6).

20. If surgical gowns are worn, sleeves should either taper gently toward the wrists or end with elastic or ties around the wrists (Tietjen et al. 2003, 5-6).

21. Steps that can be taken to decrease the risk of maternal infection during delivery also include wearing a face shield (or a mask and goggles), and shoe covers which are resistant to fluids (Tietjen et al. 2003, 25-11).

23. Steps that can be taken to decrease the risk of maternal infection before and during delivery (if catheters are used) include making sure that the following items are available—high-level disinfected or sterile urinary catheter (straight, rubber or metal) and a clean basin to collect urine (Tietjen et al. 2003, 25-10).

26, 27. High-level disinfected or sterile cord clamp or cloth to tie off the cord should be available for a safe delivery (Tietjen et al. 2003, 25-9).

28, 29. When babies are born in a hospital or health care facility, a factor that increases the risk of maternal infection is vaginal examinations, especially those performed by medical and midwifery students. For example, one study found that the risk of endometritis was 27 percent if seven or fewer vaginal examinations were performed but rose to 71 percent when more than seven were performed (Tietjen et al. 2003, 25-9).

30. Comments obtained from the field on use of the recommended solutions for cleaning the perineum included—

*There appears to be a high incidence of allergic reactions to iodine-containing solutions

**Use of alcohol-based solutions on the perineum may cause the woman in labor, who is already in great discomfort, additional distress.

34. No single method of cord care has proved to be better than others in preventing infection. General suggestions are to keep the cord stump clean and dry; if the cord stump gets soiled or dirty, gently wash it with boiled soapy water, and dry with a clean cloth (Tietjen et al. 2003, 25-15). Avoid water sources that could be contaminated or antiseptics (such as chlorhexidine) without alcohol that could support microbial growth.

35. Minimizing the risk of nosocomial infection in the newborn involves the following—wear gloves and a plastic or rubber apron when handling the infant until blood, meconium, or amniotic fluid has been removed from the infant's skin. Careful removal of blood and other body fluids using a cotton cloth, not gauze, soaked in warm water followed by drying the skin may minimize the risk of infection. In some hospitals, bathing or washing the newborn is delayed until the baby's temperature has stabilized (usually about 6 hours). The buttocks and perineal areas are the most important to keep clean. They should be washed after each diaper change using a cotton cloth soaked in warm soapy water, and then carefully dried (Tietjen et al. 2003, 25-14).

*Practitioners in the field noted that use of some of the recommended solutions may not be feasible in resource-limited settings where some facilities may not even have adequate tap water. The cost of bathing a newborn in sterile water or sterile saline solution, or dilute Hexachlorophene solution may not be justified. Some obstetricians/gynecologists and midwives in these settings maintain that soap and tap water should be adequate to remove vaginal secretions or fecal matter that may have contaminated the baby during birth.

36. Silver nitrate or erythromycin eye drops are recommended to prevent gonococcal eye infections in the neonate (Saiman 2003, 356–57).

37. A clean drape or cloth for wrapping the baby should be available (Tietjen et al. 2003, 25-10).

38, 39. The infusion of the first antimicrobial dose should begin within 60 minutes before surgical incision. In the Unites States, the antimicrobial is usually not administered to patients undergoing C-section until the umbilical cord is clamped. Although there is no evidence to support the delay in administration, it is standard practice and is preferred by neonatologists because of concern of masking septic manifestations in the neonate (Bratzler et al. 2004, 1706).

40. The baby can be with a mother with group A streptococcal infection if the mother has been treated for at least 24 hours. The baby can be with a mother with herpes simplex if the mother can be trained in a rigorous barrier technique to avoid inoculating the infant.

42. Where antenatal services include laboratory testing, most neonatal group B streptococcal infections can be prevented through the use of intrapartum antimicrobial prophylaxis in women at increased risk of transmitting the infection to their newborns. Such women can be identified by having a positive anogenital culture for this pathogen at 35–37 weeks or at least one of the risk factors associated with early infection: group B streptococci bacteriuria during pregnancy; previously delivered infant infected with group B streptococci; preterm birth (less than 37 weeks of gestation); rupture of membranes (more than 18 hours); and clinically evident intra-amniotic infection syndrome with maternal temperature greater than 38 °C, or prior infected child (Tietjen et al. 2003, K-1, K-2). Treatment should be started as close to four hours prior to delivery as possible and include the baby.

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## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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| **Total for Module** | | | **%** | |

*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 9: SURGICAL ANTIBIOTIC USE AND SURGICAL EQUIPMENT PROCEDURES

This module should be completed by the head doctor or nurse of each surgical ward or area.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### Surgical Procedures

These questions give contextual information about surgical procedures performed in this hospital.

1. Which of the following types of surgery are performed in this Surgical Area? (Mark all that apply)

**General Surgery**

[ ] No general surgery is performed
[ ] Cholecystectomy
[ ] Hernia repair
[ ] Breast surgery
[ ] Splenectomy
[ ] Bowel surgery
[ ] Prostate surgery

**Orthopedic Surgery**

[ ] No orthopedic surgery is performed
[ ] Open reduction of fracture
[ ] Amputation

**Obstetrics and Gynecology (Ob-Gyn) Surgery**

[ ] No ob-gyn surgery is performed
[ ] Cesarean-section (C-section)
[ ] Abdominal hysterectomy
[ ] Vaginal hysterectomy
[ ] Abortion (elective or emergency)

## Peri-Operative Antimicrobial Prophylaxis

The following questions focus on peri-operative antibiotic prophylaxis practices including when and where they are administered, which antibiotics are administered, and the storage and availability of antibiotics in your facility.

2. Are there written policies or guidelines for peri-operative antibiotic prophylaxis for all types of surgery performed in your facility? (Mark one answer)

[ ] No written policies or guidelines
[ ] Policies/guidelines communicated verbally only
[ ]1 Written policies/guidelines available in an operations manual but not generally available for daily practice
[ ]2 Written policies/guidelines in a manual but also posted on walls in clinical or support areas

3. Do the guidelines specify when prophylaxis is to be administered?

[ ] No written policy
[ ] No, policy does not cover timing
[ ]1 Yes

4. Do the guidelines specify where in the hospital prophylaxis is to be administered? (Mark one answer)

[ ] No written policy
[ ] No, policy does not cover location
[ ]1 Yes

5. Do the guidelines cover which antibiotic is to be administered?

[ ] No written guidelines
[ ] No, guidelines do not cover which antibiotic should be administered
[ ]1 Yes

6. Do the guidelines cover how many doses of the recommended antibiotic are to be administered? (Mark one answer)

[ ] No written guidelines
[ ] No, guidelines do not cover how many doses should be administered
[ ]1 Yes

7. Do the guidelines specify for which types of surgery prophylaxis is to be administered? (Mark one answer)

[ ] No written guidelines
[ ] No, guidelines do not cover which types of surgery need prophylaxis
[ ]1 Yes

8. Is there a special antibiotic order form or “standing orders” for surgical antibiotic prophylaxis?

[ ] No
[ ]1 Yes

9. Is adherence to the guidelines on antibiotic prophylaxis monitored? (Mark one answer)

[ ] No written guidelines
[ ] No, adherence is not monitored
[ ]1 Yes

10. How frequently are antibiotics needed in surgery out of stock in the hospital? (Mark one answer)

[ ] Always
[ ] Usually
[ ]1 Sometimes
[ ]2 Never

11. How often must antibiotics needed for surgical prophylaxis be purchased outside the hospital by patients or families? (Mark one answer)

[ ] Always
[ ] Usually
[ ] Sometimes
[ ]2 Never

12. Where are antibiotics needed for surgical procedures usually stored? (Mark the most common location)

[ ] In the pharmacy
[ ] On the ward
[ ]1 In the pre-operative holding area
[ ]1 In the Surgical Area

13. Where are antibiotics needed for surgical procedures usually administered? (Mark the most common location)

[ ] On the ward
[ ]1 In the pre-operative holding area
[ ]1 In the surgical area

14. How long is antibiotic prophylaxis administered before or after the start of a surgical procedure (i.e., when the incision is made)? (Mark the most common time)

[ ] More than one hour before the time the surgical incision is made
[ ]2 Within one hour before the beginning of the surgery or two hours for vancomycin or fluoroquinolones
[ ] After the surgical procedure begins

15. Are prophylactic antibiotics repeated during a long procedure (more than 4–6 hours)?

[ ] No
[ ]1 Yes

16. How is bowel decontamination performed? (Mark all that apply)

[ ] Elective colorectal surgery is not performed
[ ] Bowel decontamination not performed
[ ] Enemas
[ ] Cathartics
[ ]1 Oral antibiotics

**Assessment section total:** _____ **Possible section total:** 19

## Surgical Drains

The following questions cover the placement of surgical drains and bowel decontamination.

17. How are drains placed in surgical incisions?

[ ] Directly through the incision
[ ]1 Through a stab wound separate from the incision

18. Are surgical drains attached to a closed suction system?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 2

## Reprocessing of Surgical Instruments

19. Where are surgical instruments decontaminated, cleaned, and sterilized? (Mark all that apply)

**Instruments are decontaminated and cleaned:**

[ ]1 In the surgical area
[ ]1 In a central sterilization area
[ ]1 Other area (i.e., separate area such as sluice room)

**Instruments are sterilized:**

[ ] In the surgical area
[ ]1 In a central sterilization area

**If surgical instruments, needles, or gloves are reprocessed in the surgical area, also complete the appropriate Sterilization and Disinfection modules for this location. The following questions cover procedures for decontaminating and cleaning instruments and equipment.**

20. Are surgeons' personal instruments cleaned and sterilized using standard facility methods?

[ ] No
[ ]1 Yes

21. Are gastrointestinal endoscopes decontaminated and cleaned (including all channels and valves) with a detergent prior to sterilization/disinfection? (Mark one answer)

[ ] Gastrointestinal endoscopes are not available
[ ] No
[ ]1 Yes

22. Are bronchoscopes decontaminated and cleaned (including all channels and valves) with a detergent, prior to sterilization/disinfection? (Mark one answer)

[ ] Bronchoscopes are not available in this hospital
[ ] No
[ ]1 Yes

23. Are the arthroscopes decontaminated and cleaned (including all channels and valves) with a detergent, prior to sterilization/disinfection? (Mark one answer)

[ ] Arthroscopes are not available in this hospital
[ ] No
[ ]1 Yes

24. If a contaminated critical surgical instrument is needed quickly, what is done?

[ ] Not sterilized, disinfected chemically
[ ]1 Flash autoclave sterilization

25. If flash sterilization (autoclave) is used, how much time (in minutes) and what temperature (in °C or °F) are used? _____ minutes _____°C or _____°F

**Assessment section total:** _____ **Possible section total:** 9

**If any of the following equipment is re-used, complete the Sterilization and Disinfection—Equipment and IV Fluids module:**

- Anesthesia breathing circuits and masks
- Endotracheal tubes
- Oxygen masks
- Laryngoscope blades

## SURGICAL ANTIBIOTIC USE AND SURGICAL EQUIPMENT PROCEDURES ANNOTATIONS

### Background

Appropriate, timely use of antibiotic prophylaxis is a critical component of efforts to reduce post-operative infections for many procedures.

### Item Notes

2. Ideally, the appropriate use of antimicrobial agents is facilitated through an Antimicrobial Use Committee (or Infection Control Committee). This committee recommends antibiotics for the formulary, establishes prescribing policies, reviews and approves practice guidelines, audits antibiotic use, oversees education, and interacts with pharmaceutical representatives (WHO 2002, 59).

3. On the basis of published evidence, infusion of the first antimicrobial dose should begin within 60 minutes before incision. However, when a fluoroquinolone or vancomycin is indicated, the infusion should begin within 120 minutes before incision because of their pharmokinetics and need for slower infusions to prevent antibiotic-associated reactions. Although research has demonstrated that administration of the antimicrobial at the time of anesthesia induction is safe and results in adequate serum and tissue drug levels at the time of incision, there is no consensus that the infusion must be completed before incision. When a proximal tourniquet is required, however, the entire antimicrobial dose should be administered before the tourniquet is inflated (Bratzler et al. 2004).

4. For most procedures, scheduling prophylaxis administration at the time anesthesia is induced ensures adequate concentrations during the period of potential contamination. The exceptions are cesarean procedures, in which the antimicrobial should be administered after cross-clamping the umbilical cord, and colonic procedures, in which oral antimicrobials should be administered starting 19 hours before the scheduled time of surgery (ASHP 1999).

5. Ideally, prophylactic drugs should be directed against the most likely infecting organisms, but need not kill or inactivate all pathogens. For most procedures, an inexpensive, first generation cephalosporin such as cefazolin, which has a moderately long half life and is active against staphylococci and streptococci, has been effective when given intravenously up to 30 minutes before surgery. Exceptions are for an appendectomy, where cefoxitin or cefotetan is preferred because they are more active than cefazolin against bowel anaerobic organisms (Tietjen et al. 2003, 23-9).

6. Most studies comparing single-dose prophylaxis with multiple-dose prophylaxis have not shown the benefit of additional doses. Prolonged use of prophylactic antimicrobials is associated with emergence of resistant bacterial strains. For the majority of operations, guidelines recommend that prophylaxis end within 24 hours after the operation. The single possible guideline exception is antimicrobial prophylaxis for cardiothoracic surgery for which the American Thoracic Society recommends up to 48 hours, and continuing prophylaxis for up to 72 hours after the operation (Bratzler et al. 2004).

7. Prophylactic antimicrobials are not indicated for clean surgical procedures. However, prophylaxis is justified for procedures involving prosthetic placement because of the potential for severe complications if postoperative infections involve the prosthesis. Antimicrobial prophylaxis is justified for the following types of surgical procedures: cardiothoracic, GI tract (e.g., colorectal and biliary tract operations), head and neck (except clean procedures), neurosurgical, obstetric or gynecologic, orthopedic (except clean procedures), urologic, and vascular. The use of antimicrobials for dirty and contaminated procedures is not classified as prophylaxis but as treatment for a presumed infection (ASHP 1999).

8. It is helpful to develop preprinted standing orders for antimicrobial prophylaxis for each surgical division for all operations in which prophylaxis is deemed appropriate. The forms should be developed by a joint committee of surgeons, anesthesiologists, and nurses, with participation of the hospital's surgical area, pharmacy and therapeutics and infection control committees, and should include recommendations about the usual drug choices (Dellinger et al. 1994).

9. Compliance with the principles of prophylactic antibiotic administration should be reviewed at least annually by the hospital's infection control or quality assurance committee or by another designated body within the hospital (Dellinger et al. 1994).

13, 14. See annotation 3.

0. Current information indicates that additional intraoperative doses of an antimicrobial agent should be given at intervals of one or two times the half life of the drug so that adequate levels are maintained throughout the operation (Dellinger et al. 1994).

16. Before elective colorectal operations, in addition to intravenous preoperative antibiotic prophylaxis, the colon should be mechanically prepared by use of enemas and cathartic agents. Nonabsorbable oral antimicrobial agents in divided doses should be administered on the day before the operation (Mangram et al. 1999).

17. Drains placed through an operative incision increase incisional SSI (surgical site infection) risk. Many authorities suggest placing drains through a separate incision distant from the operative incision (Mangram et al. 1999).

18. If drainage is necessary, a closed suction drain should be used and it should be placed through a separate incision distant from the operative incision. The drain should be removed as soon as possible (Mangram et al. 1999).

20. All critical items which enter body cavities, tissues, and vascular system should be sterilized (WHO/AFRO et al. 2001, 114).

21. Decontamination and cleaning of equipment including endoscopes is always essential prior to sterilization or disinfection (WHO/AFRO et al. 2001, 113).

24. The Association for the Advancement of Medical Instrumentation states that "During any operation, the need for emergency (flash) sterilization of equipment may arise (e.g., to reprocess an inadvertently dropped instrument). However, flash sterilization is not intended to be used for either reasons of convenience or as an alternative to purchasing additional instrument sets or to save time" (Mangram et al. 1999).

25. Parameters for flash sterilization cycles should be as follows—

- Gravity-Displacement
  - Minimum exposure time and temperature for nonporous items: 3 minutes at 132 ºC (270 ºF)
  - Minimum exposure time and temperature for nonporous and porous items: 10 minutes at 132 ºC (270 ºF)
- Prevacuum
  - Minimum exposure time and temperature for nonporous items: 3 minutes at 132 ºC (270 ºF)
  - Minimum exposure time and temperature for nonporous and porous items: 4 minutes at 132 ºC (270 ºF) (Mangram et al. 1999)

## **References** (* = Copy on CD)

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## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 10: SURGICAL AREA PRACTICES

These questions should be completed by the head doctor or nurse of this surgical area.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

What is the name of this surgical area? _____

### Preoperative Preparation of the Patient

The following questions focus on patient preoperative procedures such as bathing, hair removal, and antiseptic use.

1. Are there written procedures for general preoperative preparation of nonemergency surgical patients in this surgical area? (Mark one answer)

   [ ] No written policy or procedures
   [ ] Policy/procedures communicated verbally only
   [ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
   [ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

2. Is a shower or bath required prior to nonemergency surgery?

   [ ] No
   [ ]1 Yes

3. What type of soap or antiseptic is used during shower or bath? (Mark the most commonly used method)

   [ ] Shower or bath not required
   [ ] Nonantimicrobial soap
   [ ] Iodophor
   [ ]1 Hexachlorophene
   [ ]1 Chlorhexidine gluconate

4. When is the shower or bath performed? (Mark the most common time)

   [ ] Shower or bath not required
   [ ] Morning of surgery
   [ ] Shortly before surgery in the pre-op area
   [ ]1 Night before surgery

5. Is hair removed prior to nonemergency surgery?

   [ ] Yes
   [ ]1 No

6. How is hair removed? (Mark the most commonly used method)

[ ] Hair not removed
[ ] Razor
[ ]1 Depilatory
[ ]1 Clippers
[ ]1 Scissors

7. When is hair removed? (Mark the most common time)

[ ] Hair not removed
[ ] Night before surgery
[ ]1 Morning of surgery
[ ]1 Shortly before surgery in the pre-op area
[ ]1 Immediately before surgery in the OR

8. Is an antiseptic applied to the skin before surgery? If NO, skip questions 9–11.

[ ] No
[ ]1 Yes

9. What antiseptic is used? (Mark the most commonly used method)

[ ] Antiseptic not used
[ ] Chlorhexidine gluconate without alcohol
[ ] Iodine without alcohol
[ ] Alcohol
[ ] Benzalkonium chloride
[ ]1 Chlorhexidine gluconate solution containing alcohol
[ ]1 Alcohol/iodine (tincture of iodine)
[ ]1 Iodophor (povidone iodine)

10. When is the antiseptic applied to the skin? (Mark the most common time)

[ ] Antiseptic not used
[ ] Night before surgery
[ ] Morning of surgery
[ ] Shortly before surgery in the pre-op area
[ ]1 Immediately before surgery in the OR

11. When the antiseptic solution container is empty, what happens? (Mark all that apply)

[ ] Old container cleaned but not disinfected, and refilled
[ ] Old container refilled (topped off) without cleaning or disinfection
[ ]1 Old container cleaned, disinfected, and refilled
[ ]1 New full container provided
[ ]1 Prepacked applicators used and discarded when finished

**Assessment section total:** _____ **Possible section total:** 14

## Preoperative Scrub by Surgical Personnel

These questions cover preoperative preparations by surgical staff including surgical scrub, use of antiseptics, and availability of equipment.

12. If a dip is used instead of a scrub, which agent is generally used? (Mark one answer; if NO dip is used, skip question 13)

[ ]3 No dip used
[ ] Chlorhexidine gluconate without alcohol
[ ] Iodine without alcohol
[ ] Benzalkonium chloride
[ ]1 Alcohol
[ ]1 Chlorhexidine gluconate solution containing alcohol
[ ]1 Tincture of iodine (with alcohol)
[ ]1 Iodophor (povidone iodine)

13. How often is the dip agent changed? (Mark one answer)

[ ] Not daily and less than weekly
[ ] Weekly
[ ]1 Daily
[ ]1 More than once per day

14. Is there a written standard policy for performing a preoperative surgical scrub? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in manual but also posted on walls in clinical or support areas

15. How frequently is there a supply of running water to be used for the surgical scrub? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]1 Always

16. How do personnel turn the water supply on and off? (Mark one answer)

[ ] Hand-operated faucet handle
[ ]1 Elbow-operated faucet handles
[ ]1 Foot control or leg/knee lever
[ ]1 Automatic sensor control (electronic)
[ ]1 Someone else turns water supply on and off

17. How frequently do surgical personnel use an antiseptic for preoperative surgical scrub? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]1 Always

18. Which antiseptics are used? (Mark the most commonly used)

[ ] No antiseptic used
[ ] Chlorhexidine gluconate without alcohol
[ ] Iodine without alcohol
[ ] Benzalkonium chloride
[ ] Alcohol
[ ]1 Chlorhexidine gluconate solution containing alcohol
[ ]1 Tincture of iodine (with alcohol)
[ ]1 Iodophor (povidone iodine)

19. What is the recommended duration of surgical scrub?

[ ] 6–10 minutes with a hard brush
[ ]1 At least 2 minutes with a soft brush or sponge

20. When the antiseptic solution container is empty, what happens? (Mark all that apply)

[ ] Containers not used
[ ] Old container cleaned but not disinfected and refilled
[ ] Old container refilled (topped off) without cleaning or disinfection
[ ]1 Old container cleaned, disinfected, and refilled
[ ]1 New full container provided

21. Are brushes or sponges disposable (single use) or reusable? (Mark all that apply)

[ ] Brushes or sponges not used
[ ] Single use not containing soap or antiseptic
[ ] Reusable used multiple times before sterilization
[ ]1 Single use containing soap or antiseptic
[ ]1 Reusable (sterilized after each use)

22. How do personnel dry their hands after the preoperative surgical scrub? (Mark all that apply)

[ ] Air drying
[ ] No method for drying hands available
[ ] Multiple-use, non-sterile, clean cloth towel
[ ] Single-use cloth towel (non-sterile)
[ ]1 Single-use sterile towel
[ ]1 Paper towels
[ ]1 Hot air dryer

**Assessment section total:** _____ **Possible section total:** 18

## Barrier Precautions Used by Surgical Personnel

The following questions cover protective precautions by surgical personnel, and glove use in surgery.

23. Please indicate the barrier precautions that are usually used by surgical personnel in this surgical area during surgery. (Mark all that apply)

[ ] Shoe covers (e.g., booties)
[ ]1 Sterile gloves
[ ]1 Face shields or eye goggles when blood splashing is possible
[ ]1 Masks
[ ]1 Cloth gowns
[ ]1 Fluid-proof gowns
[ ]1 Caps
[ ]1 Fluid proof shoes when extensive bleeding outside of the operative field is possible

24. Is facial hair allowed on surgical personnel, such as beard or mustache?

[ ] Yes
[ ]1 No

25. Are reprocessed gloves (i.e., gloves that have been used, cleaned, and sterilized) used in surgery?

[ ]1 No
[ ] Yes

26. If gloves are contaminated during surgery (e.g., contamination by ungloved hand when putting on glove, touching a contaminated surface), are gloves routinely changed?

[ ] No
[ ]1 Yes

27. Are double gloves used for any surgeries?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 11

## Cleaning of Surgical Area

These questions provide information on surgical area hygiene.

28. Is there a written policy for general hygiene and cleaning of surfaces, walls, floors, toilets, clothing, and general equipment in this surgical area? (Mark one answer; if NO, skip question 29)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in manual but also posted on walls in clinical or support areas

29. Does the written policy cover processes for decontaminating areas contaminated by spillage?

[ ] No
[ ]1 Yes

30. Is this area ever "fogged" with aerosolized disinfectants?

[ ] Yes
[ ]1 No

31. What procedure is followed for contaminated surgeries (e.g., drainage of an appendiceal abscess)? (Mark the answer that best describes usual practice)

[ ] No special procedures are used
[ ]1 A separate operating room is used
[ ]1 Contaminated surgery is scheduled at the end of the day

32. How often are environmental cultures done in this area? (Mark one answer)

[ ]1 Cultures are never done
[ ] Once a year
[ ] Once a month
[ ] Once a week
[ ] Every day

**Assessment section total:** _____ **Possible section total:** 6

## Surgical Area Ventilation

The following questions on surgical area ventilation provide information on windows, screens, air pressure, and air conditioning.

33. What type of ventilation system is in this surgical area? (Mark one answer).

[ ] No windows in surgical area
[ ] Windows
[ ]1 Windows with screens
[ ]1 Central ventilation

34. Are there screens on the windows? (Mark one answer).

[ ] No windows in the area
[ ] No screens
[ ]1 Yes

35. Is there a central ventilation system in this surgical area? If YES, skip questions 36 and 37.

[ ] No
[ ]1 Yes

36. How does the air enter this area?

[ ] Enters low (near the floor)
[ ]1 Enters high (near the ceiling)

37. How does the air leave this area?

[ ]1 Leaves high (near the ceiling)
[ ] Leaves low (near the floor)

38. How would you characterize the pressure in this area relative to the corridor? (Mark one answer)

[ ] Cannot determine
[ ] Negative pressure
[ ] Neutral pressure
[ ]1 Positive pressure

39. Has the number of air exchanges per hour been verified by direct measurement during the last year?

[ ] No
[ ]1 Yes

40. Are there individual air conditioners in this area? (If NO, skip to question 42. If YES, continue and end at question 41)

[ ] No
[ ] Yes

41. How often are the filters for the individual air conditioners in this area cleaned? (Mark one answer)

[ ] Not cleaned
[ ]1 Once a year or less

42. How often are the filters for the air conditioners replaced? (Mark one answer)

[ ] Not changed
[ ]1 Once a year or less

**Assessment section total:** _____ **Possible section total*:** 8

* The maximum possible total is 8, or 6 if questions 36 and 37 are skipped.

## Surgical Area Traffic

The following questions focus on traffic including personnel and supplies to and from surgical areas.

43. Are there written policies indicating open and restricted areas for traffic (personnel entering and leaving) in this area? (Mark one answer).

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

44. How are supplies transported to this surgical area from outside the area? (Mark one answer)

[ ] Open containers
[ ]1 Usually closed containers
[ ]1 Usually containers on covered carts

45. How are contaminated supplies from this area transported for disposal or reprocessing? (Mark one answer)

[ ] Open containers
[ ]1 Usually closed containers
[ ]1 Usually containers on covered carts

**Assessment section total:** _____ **Possible section total:** 4

## Surgical Area Attire

The following questions ask for information about surgical attire for personnel.

| |
|---|
| 46. Is surgical attire worn outside this area?<br><br>[ ] Yes<br>[ ]1 No |
| 47. Is attire changed before reentering this surgical area?<br><br>[ ] No<br>[ ]1 Yes |
| 48. Are there tacky mats to “decontaminate” shoes on entry to this surgical area?<br><br>[ ] Yes<br>[ ]1 No |
| 49. Are the personnel required to wear special shoes in this area?<br><br>[ ]1 Yes<br>[ ] No |

**Assessment section total:** _____ **Possible section total:** 4

## SURGICAL AREA PRACTICES ANNOTATIONS

### Background

Despite improvements in surgical area practices, instrument sterilization methods, surgical technique and the best efforts of infection prevention practitioners, surgical site infections (SSI) remain a major cause of nosocomial infections, and rates are increasing globally. Moreover, in countries where resources are limited, even basic lifesaving operations such as appendectomies and cesarean sections are associated with high infection rates and mortality. To reduce the risk of nosocomial SSIs in developing countries, a systematic but realistic approach must be applied, with awareness that this risk is influenced by the characteristics of the patient, the operation, the health care staff, and the hospital. In theory, reducing the risk is relatively simple and inexpensive, especially when compared to the cost of the infections themselves, but in practice it requires commitment at all levels of the health care system (Tietjen et al. 2003, 23-1).

### Item Notes

1. A nosocomial infection prevention manual, comprising recommended instructions and practices for patient care, is an important tool. The manual should be developed and updated by the infection control team, with review and approval by the Infection Control Committee. It must be made readily available for patient care staff, and updated in a timely fashion. A systematic program for prevention of SSI includes the practice of optimal surgical technique, a clean surgical area environment with restricted staff entry, appropriate staff attire, sterile equipment, adequate preoperative preparation of the patient, appropriate use of peri-operative antimicrobial prophylaxis, and a surgical wound surveillance program (WHO 2002, 10, 39–40).

2–4. It is recommended that patients shower or bathe with an antiseptic agent the night before surgery. A preoperative antiseptic shower or bath decreases skin microbial colony counts. In a study of more than 700 patients who received two preoperative antiseptic showers, chlorhexidine reduced bacterial colony counts nine-fold, while povidone-iodine or triclocarban-medicated soap reduced colony counts by 1.3- and 1.9-fold, respectively. Other studies corroborate these findings (Mangram 1999).

5–7. Hair should not be removed preoperatively unless the hair at or around the incision site will interfere with the operation. If hair is removed, remove immediately before the operation, preferably with electric clippers (Mangram 1999).

8–10. An appropriate antiseptic agent should be used for skin preparation. Preoperative antiseptic skin preparation should be applied in concentric circles moving toward the periphery. The prepared area must be large enough to extend the incision or create new incisions or drain sites, if necessary. Several antiseptic agents are available for preoperative preparation of skin at the incision site. The iodophors (e.g., povidone-iodine), alcohol-containing products, and chlorhexidine gluconate are the most commonly used agents (Mangram 1999).

11. Disposable containers are preferred for liquid products. Reusable containers should be thoroughly washed and dried before refilling, and routine maintenance schedules should be followed and documented (WHO 2002, 33).

12. Dips are not generally recommended. If they are, cotton or gauze should never be "dipped" into the main antiseptic container—instead pour the amount of antiseptic needed into a small container and dip the cotton or gauze into it. Discard any antiseptic remaining in this container after client preparation. Or pour the antiseptic from the container directly on to the cotton or gauze, making sure not to touch the lip of the container with the cotton or gauze (EngenderHealth, "Introduction to Aseptic Technique" module).

15, 16. Optimal hand hygiene requirements for surgical scrub include running water and large washbasins which require little maintenance, with antisplash device and hands-free controls (WHO 2002, 31).

17–19. The warm, moist conditions inside surgical gloves provide an ideal environment for the rapid growth of microorganisms. Scrubbing with antiseptics before beginning surgical procedures will help prevent this rapid growth of microorganisms for a period of time and will reduce the risk of infections to the client if the gloves develop holes, tears, or nicks during the procedure. Antiseptic agents are used in surgical scrub because they inhibit the growth and development of microorganisms and are safe for use on the skin. A three- to five-minute (at least two minutes) surgical scrub with a soft brush and an antiseptic (such as chlorhexidine or an iodophor) and running water is recommended before a surgical procedure (EngenderHealth, "Surgical Scrub and Surgical Attire" module).

21. If a brush is used, it should be cleaned and either sterilized or high-level disinfected before reuse; sponges, if used, should be discarded (Tietjen et al. 2003, 3-8).

22. Use a separate sterile or clean cloth towel for each hand to wipe from the fingertips to the elbow and then discard the towel. Use a hot air dryer if available (Tietjen et al. 2003, A-3).

23. Operating staff must wear sterile gloves. All persons entering the surgical area must wear surgical attire (scrub suits). All head and facial hair, including sideburns and neckline must be covered (although facial hair is not a recommended practice). Full coverage of the mouth and nose area with a surgical mask is required for everyone entering the operating suite. Sterile gowns must be worn by all personnel participating directly in the operation. Waterproof gowns or aprons should be worn for procedures at high risk of contamination (WHO 2002, 40).

26. If the integrity of a glove is compromised (e.g., punctured), it should be changed as promptly as safety permits (Mangram 1999).

27. Wearing two pairs of gloves (double-gloving) has been shown to reduce hand contact with patients' blood and body fluids when compared to wearing only a single pair. The following are reasonable guidelines for when to double glove: The procedure involves coming in contact with large amounts of blood or other body fluids (e.g., vaginal deliveries and cesarean sections); orthopedic procedures in which sharp bone fragments, wire sutures, and other sharps are likely to be encountered; surgical gloves are reused (the possibility of unnoticeable holes or perforations in any type of reprocessed glove is higher than with new gloves) (Tietjen et al. 2003, 7-7). Double gloving is also recommended when operating on

patients known to be infected with blood-borne pathogens such as HIV, hepatitis B, or hepatitis C. Gloves should be changed immediately after any accidental puncture (WHO 2002, 40).

28. Airborne bacteria must be minimized, and surfaces kept clean. A recommended schedule for cleaning and disinfection of surgical areas is—

- Every morning before any intervention clean all horizontal surfaces
- Between procedures clean and disinfect horizontal surfaces and all surgical items (e.g., tables, buckets)
- At the end of the working day:completely clean the surgical area using a recommended disinfectant cleaner
- Once a week completely clean the operating room area, including all annexes such as dressing rooms, technical rooms, cupboards (WHO 2002, 40).

29. Spills of blood, body fluids and other potentially infectious fluids should be cleaned up immediately. For small spills, wear utility or examination gloves, remove visible material using a cloth soaked in a 0.5 percent chlorine solution, then wipe clean with a disinfectant cleaning solution. For large spills, wear gloves, flood the area with a 0.5 percent chlorine solution, mop up the solution, and then clean as usual with detergent and water (Tietjen et al. 2003, 16-9).

33–39, 43. Ventilation in the surgical area—maintain positive-pressure ventilation in the area with respect to the corridors and adjacent areas. Maintain a minimum of 15 air changes per hour, of which at least 3 should be fresh air. Filter all air, recirculated and fresh, through the appropriate filters; introduce all air at the ceiling, and exhaust near the floor. To prevent SSI, do not use UV radiation in the surgical area. Keep operating room doors closed except as needed for passage of equipment, personnel, and the patient. Consider performing orthopedic implant operations in surgical areas supplied with ultraclean air. Limit the number of personnel entering the operating room to necessary personnel (Mangram 1999).

44, 45. In the context of traffic flow, rather than considering a “clean” and a “dirty” circuit, consider only circuits where the different flows can cross without risk, provided material is properly protected. Both sterile products and waste must be sealed in safe containers, and the outside of those containers must present no risk of biological contamination (WHO 2002, 47–48).

## **References** (* = Copy on CD)

* EngenderHealth. 2004. Infection Prevention Online Course. <http://www.engenderhealth.org/res/onc/index.html#start> (accessed July 17, 2006).

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## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 11: INTENSIVE CARE UNITS

These questions should be completed in consultation with the head doctor or nurse of each intensive care unit (ICU). If policies are similar for all ICUs, complete the form once. If policies differ substantially, fill out a separate form for each ICU.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

What is the name of this ICU? _____

### Staffing

The following questions cover ICU patient populations and staffing patterns.

1. This ICU has

   [ ] Adults only
   [ ] Children only
   [ ] Both adults and children

2. What is the total number of beds in this ICU? _____

3. On weekdays, how many nurses provide care to patients in this ICU during a typical day shift that includes 12 noon? _____

   Calculate the number of beds per nurse: _____

   Then mark the answer that applies

   [ ] More than five beds per nurse
   [ ]1 Three to five beds per nurse
   [ ]2 Two or less beds per nurse

**Assessment section total:** _____ **Possible section total:** 2

## General Practices in the ICU

The next questions cover cleaning of the ICU and staff hand hygiene patterns.

4. How frequently are immediate patient care areas in this ICU thoroughly cleaned? (Mark one answer)

[ ] Less than daily
[ ]1 At least daily
[ ]2 At least daily and between patients

5. Are staff required to wear cover gowns or special shoes to enter the ICU?

[ ]1 No requirement
[ ] Gown required
[ ] Special shoes required

6. Are staff and visitors required to perform thorough hand hygiene prior to entering the ICU?

[ ] No
[ ]1 Yes

7. What method is used for the hand hygiene? (Mark all that apply)

[ ] None required
[ ] Dip in disinfecting agent
[ ] Brushes with soap or antiseptic agent
[ ]1 Sponges or very soft brushes with soap or antiseptic agent
[ ]1 Waterless alcohol hand antiseptic

**Assessment section total:** _____ **Possible section total:** 6

## Mechanical Ventilation

8. The following questions cover mechanical ventilation in the ICU, including the handling of ventilator circuits and humidifiers. What percentage of patients in this unit require mechanical ventilation?

[ ] None
[ ] Less than 25 percent
[ ] 25–50 percent
[ ] More than 50 percent

9. Is the same suction catheter used for more than one episode of endotracheal suctioning in patients receiving positive pressure ventilation?

[ ] Yes
[ ]2 No

10. How often are ventilator circuits changed? (Mark one answer)

[ ] Every day
[ ]1 Every three to six days
[ ]1 Less frequently than once a week
[ ]1 Never when used for an individual patient

11. What type of humidifier is used in the ventilator circuit? (Mark one answer)

[ ] No humidifier used
[ ]1 Mechanical ventilator
[ ]1 Bubbling humidifier
[ ]1 Wick humidifier
[ ]1 Passover humidifier
[ ]1 Cascade humidifier
[ ]1 Hygroscopic condenser or heat-moisture exchange humidifier

12. What type of water is used to fill the humidifier?

[ ]1 Sterilized water
[ ] Distilled water
[ ] Tap water

13. Are in-line bacterial filters used in ventilator circuits?

[ ]1 No
[ ] Yes

**Assessment section total:** _____ **Possible section total:** 6

## Prophylaxis and Monitoring

The next set of questions covers written procedures for ICU procedures, prophylaxis for a number of conditions, and blood glucose monitoring.

14. For which of the following are there written procedures? (Mark all that apply)

[ ]1 Prevention of deep vein thrombosis (DVT)
[ ]1 Prevention of stress ulcers or gastritis
[ ]1 Elevation of the head of bed
[ ]1 Appropriateness of sedation
[ ]1 Assessment of readiness to extubate
[ ]1 Glucose control

15. What proportion of mechanically ventilated patients receive routine DVT prophylaxis?

[ ] Less than 50 percent
[ ]1 50–75 percent
[ ]2 Greater than 75 percent

16. What is the most commonly used procedure for DVT prophylaxis in mechanically ventilated patients? (Mark one answer)

[ ] Not routinely done
[ ]1 Heparin (unfractionated or low molecular weight)
[ ]1 Compression stockings
[ ] Other (Specify) _____

17. What is the typical position of the head of the bed in mechanically ventilated patients? (Mark one answer)

[ ] Flat
[ ] Elevated to between 1 and 29 degrees
[ ]1 Elevated greater than 30 degrees

18. What percentage of patients receive routine prophylaxis for stress ulcers or gastritis? (Mark one answer)

[ ] Less than 50 percent
[ ]1 50–75 percent
[ ]2 More than 75 percent

19. What is used most commonly for the routine prevention of stress gastritis? (Mark one answer)

[ ]1 Proton pump inhibitors (omeprazole, lansoprazole)
[ ]1 H2 blockers
[ ]1 Sucralfate
[ ] Other

20. How is appropriateness of sedation usually monitored? (Mark one answer)

[ ] No monitoring is done
[ ]1 Daily interruption of sedation
[ ] Other

21. How are patients routinely screened for readiness to extubate? (Mark all that apply)

[ ] No screening is done
[ ]1 Daily assessment of lung mechanics
[ ]1 Daily assessment of ventilator parameters
[ ]1 Daily trial of spontaneous respiration
[ ] Other

22. What percentage of mechanically ventilated patients have routine (at least daily) blood glucose monitoring? (Mark one answer)

[ ] Less than 50 percent
[ ]1 50–75 percent
[ ]2 More than 75 percent

23. What is the blood glucose goal in mechanically ventilated patients? (Mark one answer)

[ ] Blood glucose greater than 300 mg/dL (16 mmol/L)
[ ]1 Blood glucose greater than 200 mg/dL (11 mmol/L)
[ ]2 Blood glucose greater than 110 mg/dL (6 mmol/L)
[ ] Other

24. When a ventilated patient has a blood sugar exceeding the above goal, how often is insulin given? (Mark one answer)

[ ] Less then 50 percent of the time
[ ]1 50–75 percent of the time
[ ]2 More than 75 percent of the time

**Assessment section total:** _____ **Possible section total:** 23

## Checklist of Additional Modules to be Completed for This ICU

- ☐ Airway Suctioning
- ☐ Hand Hygiene
- ☐ Intravenous Catheters (if used in ICU)
- ☐ Intravenous Fluids and Medications (if used in ICU)
- ☐ Isolation and Standard Precautions
- ☐ Sterilization and Disinfection (if instruments, equipment, needles, or gloves are disinfected or sterilized in this ICU)
- ☐ Urinary Catheters (if used in ICU)

## INTENSIVE CARE UNIT ANNOTATIONS

### Background

Although only five to ten percent of all hospitalized patients are treated in an intensive care unit (ICU), the incidence of nosocomial infections in ICUs is five to ten times higher than that observed in general hospital wards. Systemic and respiratory infections are far more common in ICUs than in general wards, and most epidemics originate in ICUs (Widmer 1994).

### Item Notes

2. The number of ICU beds in a hospital usually ranges from one to four per 100 total hospital beds. The number depends on the role and the type of ICU. Multidisciplinary ICUs require more beds than single-specialty ICUs, especially if high-dependency beds are not available elsewhere in the hospital. ICUs with fewer than four beds are not considered cost-effective, whereas those with over 20 non-high-dependency beds may be difficult to manage. There are different levels of technology available to ICUs in different settings, and we recognize that not all hospitals are able to provide the ideal ratio of beds to facility (Oh 1997, 3–9).

3. Ideally, all critically ill patients should have one-to-one nursing. Occasionally, very unstable patients requiring complex therapy (e.g., dialytic therapy) require two nurses most of the time. Again, we recognize that not all hospitals are able to provide these levels of care (Oh 1997, 3–9).

4. Patient care areas *(*surgical areas, procedure rooms, laboratories, areas where instruments are cleaned and processed*)* must be cleaned with special care using a disinfectant cleaning solution. In these areas, there is a greater potential for contamination by infectious materials for both clients and clinic staff. These areas should be cleaned as follows—

- Each morning: At the beginning of each day, damp-wipe or mop countertops, tables, trolleys, and floors with water to remove dust and lint that has accumulated overnight.

- Between clients: Clean operating and procedure rooms, examination tables, trolleys or Mayo stands, countertops, lamp handles, and any other potentially contaminated surfaces with a cloth dampened with a disinfectant cleaning solution. Clean spills of blood or other body fluids immediately with a 0.5 percent chlorine solution. Put waste in a leak-proof container. Remove the container from the operating theater or procedure room whenever it is three-quarters full. Clean visibly soiled areas of the floor with a mop soaked in a disinfectant cleaning solution.

- At the end of the clinic session or day: Remove contaminated waste and dispose of it as soon as possible to limit exposure; wipe down all surfaces—including counters, tabletops, sinks, lights, and door handles and plates—with a cloth saturated with a disinfectant cleaning solution. Pay particular attention to procedure/operating tables, making sure to thoroughly clean the sides, base, and legs with a disinfectant cleaning

solution. Clean the floors with a mop dampened with a disinfectant cleaning solution (EngenderHealth 2004, "Housekeeping").

5. There is no demonstrated value to wearing gowns or special shoes in the ICU.

6, 7. Hands should be decontaminated before direct contact with patients. When hands are visibly dirty or contaminated with proteinaceous material, wash them with plain soap and water; when hands are visibly soiled with blood or other body fluids, wash them with an antimicrobial soap and water. If hands are not visibly soiled, an alcohol-based hand rub may be used for routinely decontaminating hands. Alternatively, hands can be washed with an antimicrobial soap and water in all clinical situations (CDC 2002).

14. Several interventions, when routinely applied to mechanically ventilated patients, have been shown to reduce ICU complications, mortality, length of ICU stay, and cost of hospitalization. Deep vein thromboses (DVTs) are common complications in sick, immobilized patients (up to 30 percent of ICU patients), which can lead to pulmonary thromboembolism. Routine use of heparin or compression stockings can reduce the risk of DVT by 50 percent. This corresponds to significantly lower mortality, length of ICU stay, length of total hospitalization, and medical costs (IHI 2006).

17. Routine elevation of the head of the bed to beyond 30 degrees has been shown to reduce the risk of nosocomial pneumonia from 38 to 8 percent. Nosocomial pneumonia increases the likelihood of in-hospital mortality by 40 percent and length of stay by two weeks. Universal elevation of the head of the bed can significantly improve outcomes among ICU patients.

19. The principal risk factors for stress gastritis and consequent upper GI bleeding are mechanical ventilation for more than 48 hours and coagulopathy. Many different physiologic stressors are associated with stress gastritis. Pharmacologic prophylaxis can be effectively accomplished using sucralfate, H2 blockers, or proton pump inhibitors.

20. Monitoring sedation can be easily accomplished with daily interruption or weaning of sedation. This allows earlier identification of patients in whom significant sedation or ventilator weaning is possible. Daily interruption of sedation has been shown to reduce time of mechanical ventilation and ICU stay by more than 30 percent, and to reduce the average length of ICU stay by 2.4 days.

21. Daily assessments should be made of a patient's readiness for extubation. These can be made by reviewing a patient's requirements for ventilatory support, direct measures of lung mechanics (such as compliance and negative inspiratory force), and trials of spontaneous respiration. In a randomized trial looking only at daily spontaneous breathing trials, patients who were assessed daily for readiness to extubate had a mean 1.5 fewer days of mechanical ventilation and a 50 percent reduction in ventilator-associated complications.

23. Intensive control of blood glucose has also been shown to markedly improve both in-hospital and long term mortality in ICU patients. This effect is best demonstrated when aggressive insulin therapy is provided with a goal blood sugar of under 110 mg/dL (6 mmol/L).

In summary, the above interventions can not only improve the outcomes of the individual patient, but if applied universally can dramatically improve the complication rate and medical

expenditures in the intensive care unit. Written policies should exist to implement the above procedures for all patients in whom there is no contraindication (Engender Health 2006, "Implement the Ventilator Bundle").

## **References** (* = Copy on CD)

U.S. Centers for Disease Control and Prevention (CDC). 2002. Guideline for Hand Hygiene in Health-Care Settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. *MMWR* 2002;51(No. RR-16):1–44.

* EngenderHealth. 2004. Infection Prevention Online Course. Module: Housekeeping <http://www.engenderhealth.org/res/onc/index.html#start> (accessed July 17, 2006).

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Oh, T. E. 1997. Design and Organization of Intensive Care Units. In *Intensive Care Manual*, 4th ed., edited by T. E. Oh, 3–9. Boston: Butterworth-Heinemann Medical.

Widmer, A. F. 1994. Infection Control and Prevention Strategies in the ICU. *Journal of Intensive Care Medicine* 20, Suppl. no. 4:S7–S11.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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| **Total for Module** | | | **%** | |

*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 12: MICROBIOLOGY LABORATORY

This survey should be completed by the head of the department or supervisor of the clinical microbiology laboratory.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

Director of the clinical microbiology laboratory: _____

Name: _____ Title: _____

### General Laboratory Issues

The following questions cover general microbiology procedures, contact with infection control personnel, record keeping, and the use of cultures.

1. Please indicate your background education for this position. (Mark highest level of training)

[ ] Special course or program
[ ] On-the-job training
[ ]1 Medical technology degree
[ ]1 BA/BSc or other university degree
[ ]1 MSc
[ ]1 MD, MBChB, or MBBS
[ ]2 PhD or other doctoral degree

2. How frequently do you have formal meetings or discussion with infection control personnel? (Mark one answer)

[ ] Never
[ ] Less frequently than once every three months
[ ]1 Once every three months or more frequently

3. Are microbiology records routinely kept?

[ ] No
[ ]1 Yes

4. How long are these records kept? (Mark one answer)

[ ] No records kept
[ ] Less than one year
[ ]1 One year or longer

5. Does your laboratory routinely perform any of the following cultures for surveillance purposes? (Mark all that apply)

[ ]1 No cultures performed
[ ] Personnel
[ ] Equipment and supplies
[ ] Environment
[ ] Fluids (e.g., IV fluids, irrigation solutions)

6. Does your laboratory routinely perform the following cultures as part of infant care? (Mark all that apply)

[ ] Hospital does not provide care for infants
[ ] No infant nutrition cultures performed
[ ]1 Infant formula made in the hospital (noncommercial)
[ ]1 Breast milk

7. Does your laboratory have the capacity to perform the following cultures as part of outbreak investigations? (Mark all that apply)

[ ] No cultures performed
[ ]1 Personnel
[ ]1 Equipment and supplies
[ ]1 Environment
[ ]1 Fluids (e.g., IV fluids, irrigation solutions)

8. Does this laboratory have high-level containment safety cabinets, such as Class 2, for infectious agents?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 13

## Availability and Use of Tests

The following questions provide an overview of the types of tests performed in your hospital or in outside laboratory facilities.

9. Which of the following microscopy tests are performed in the hospital? (Mark all that apply)

[ ]1 Fungal stains
[ ]1 Acid-fast stain or fluorescent stain for TB
[ ]1 Wright-Giemsa stain
[ ]1 Methylene blue stain
[ ]1 Stool ova and parasites
[ ]2 Gram stain

10. Which of the following cultures or rapid tests are routinely available in a timely way? (Mark one answer in each row)

| Test | Performed in facility | Available from outside laboratory | Not available |
|---|---|---|---|
| Blood culture | [ ]2 | [ ]1 | [ ] |
| CSF culture | [ ]2 | [ ]1 | [ ] |
| Fungal culture | [ ]2 | [ ]1 | [ ] |
| Measles culture or fluorescent antibody test | [ ]2 | [ ]1 | [ ] |
| Mycobacterial culture | [ ]2 | [ ]1 | [ ] |
| Mycobacterial amplified test (e.g., PCR) | [ ]2 | [ ]1 | [ ] |
| Sputum culture | [ ]2 | [ ]1 | [ ] |
| Stool culture for *Campylobacter* spp. | [ ]2 | [ ]1 | [ ] |
| Stool culture for cholera | [ ]2 | [ ]1 | [ ] |
| Stool culture for *E. coli* O:157 | [ ]2 | [ ]1 | [ ] |
| Stool culture for *Shigella* spp. | [ ]2 | [ ]1 | [ ] |
| Urine culture | [ ]2 | [ ]1 | [ ] |
| Wound culture | [ ]2 | [ ]1 | [ ] |

11. Which of the following cultures or rapid tests are routinely available in a timely way? (Mark one answer in each row)

| Test | Performed in facility | Available from outside laboratory | Not performed |
|---|---|---|---|
| Dengue serology | [ ]1 | [ ]1 | [ ] |
| Hepatitis A serology | [ ]1 | [ ]1 | [ ] |
| Hepatitis C serology | [ ]1 | [ ]1 | [ ] |
| Hepatitis B serology | [ ]2 | [ ]1 | [ ] |
| HIV-1 serology | [ ]2 | [ ]1 | [ ] |

12. What tests do you routinely use to identify staphylococci? (Mark all that apply)

[ ] Staphylococci not routinely identified
[ ]1 Gram stain
[ ]1 Colony morphology (pigmentation, hemolysis, etc.)
[ ]1 Coagulase test, thermonuclease test, or latex agglutination test

13. What tests do you routinely use to identify streptococci and enterococci? (Mark all that apply)

[ ] Streptococci not routinely identified
[ ] Catalase test
[ ]1 Colony morphology (hemolysis, etc.)
[ ]1 Gram stain
[ ]1 Bacitracin disc or PYR test
[ ]1 Optochin disc, Quellung test, or bile solubility test
[ ]1 Bile esculin and NaCL 6.5 percent or PYR test
[ ]1 CAMP or hippurate hydrolysis
[ ]1 Serotyping for Lancefield group streptococci

14. What test do you routinely use to identify gram-negative rods? (Mark one answer)

[ ] Gram negative rods not routinely identified
[ ]1 Biochemical tests manufactured in the lab
[ ]1 Commercial diagnostic strips (e.g., API)
[ ]1 Commercial biochemical tests (tube media)

**Assessment section total:** _____ **Possible section total:** 51

## Blood Culture Methods

The following questions cover methods of blood culturing and methods of reporting test results.

15. What method is used for culturing blood? (Mark the usual method)

[ ] Blood cultures not performed
[ ]1 Homemade broth culture
[ ]2 Commercial broth culture

16. Which of the following procedures are performed directly from the blood culture broth? (Mark all that apply)

[ ] No procedures are performed directly from the blood culture broth
[ ]1 Gram stain
[ ]1 Preliminary disk antibiotic susceptibility testing
[ ]1 Preliminary identification of the microorganism

17. What criteria are routinely used for subculturing blood cultures onto solid media? (Mark all that apply)

[ ] Subculturing is not done
[ ]1 Blind subculturing before reporting a final result of negative
[ ]1 When visual inspection suggests that the culture is positive

18. How are doctors notified that a blood culture is positive? (Mark the usual method)

[ ] No notification is sent to doctors
[ ] Paper report sent to the ward or unit
[ ]2 Telephone call or page made directly to the doctors

19. After how many days of incubation is a blood culture reported as officially negative? (Mark the most usual number)

[ ] Less than five days
[ ]1 Five days or more

**Assessment section total:** _____ **Possible section total:** 10

## Antibiotic Resistance Testing

These questions provide contextual information about determining antibiotic resistance in your hospital, as well as the reporting of results.

20. How do you perform antibiotic susceptibility tests for bacterial isolates? (Mark one answer)

[ ] Antibiotic susceptibility tests not performed
[ ] Disc diffusion with homemade discs
[ ]1 Standardized disc diffusion method with commercially purchased discs
[ ]1 MIC testing using broth dilution or microdilution, automated MIC testing, agar dilution, or E-test

21. What criteria are usually used to determine antibiotic susceptibility or resistance? (Mark one answer)

[ ] Antibiotic susceptibility tests not performed
[ ]1 Clinical Laboratory Standards Institute/National Committee for Clinical Laboratory Standards (CLSI/NCCLS)
[ ]1 European system (EUCAST)

22. Under what circumstances is antibiotic susceptibility of bacteria performed?

[ ]1 Only on doctor's request
[ ] Routinely

23. How is *Staphylococcus aureus* resistance to oxacillin (methicillin) determined? (Mark one answer)

[ ] No screening done
[ ]2 ORS (6 ug/ml oxacillin + 4 percent NaCl in Mueller-Hinton agar)
[ ]2 Cefoxitin or oxacillin disc

24. Do you test for extended spectrum beta-lactamase (ESBL) production?

[ ] No
[ ]2 Yes

25. How is the Infection Control Committee or person in charge of infection control usually notified if resistant bacterial strains are isolated? (Mark one answer)

[ ] Not routinely notified
[ ]1 Paper report sent to infection control committee or person in charge of infection control activities
[ ]1 Infection control personnel call or come to the laboratory to make routine checks
[ ]2 Telephone call or page to doctor

26. Do you routinely use reference or quality control organisms to validate the results of sensitivity testing?

[ ] No
[ ]2 Yes

27. Do you prepare summary reports of antibiotic susceptibility patterns for the facility?

[ ] No
[ ]2 Yes

28. Are organism-specific antibiotic resistance patterns reported?

[ ] No
[ ]1 Yes

29. Are the resistance patterns of nosocomial and community-acquired organisms reported separately? (e.g., organisms isolated from patients hospitalized for less than 48 hours versus more than 48 hours)

[ ] No
[ ]1 Yes

30. How frequently are these reports prepared? (Mark one answer)

[ ] No reports prepared
[ ]1 At least once a year or more

31. To whom are resistance patterns reported? (Mark all that apply)

[ ] Not reported
[ ]1 Head of infection control program or chair of infection control committee
[ ]1 Chief(s) of clinical department(s)
[ ]1 Director or person in charge of pharmacy
[ ]1 All hospital doctors

**Assessment section total:** _____ **Possible section total:** 20

## MICROBIOLOGY LABORATORY ANNOTATIONS

### Item Notes

1. Efficient identification of frequently occurring organisms in the health care environment and unusual or fastidious organisms as well as appropriate antibiotic susceptibility testing are complex tasks and require trained staff.

2. Frequent interaction with infection control personnel is needed to discuss changing patterns of antibiotic resistance and changes in the occurrence of suspected nosocomial infections.

3. Microbiology records are needed for good patient care, for tracking local or institutional antibiotic resistance patterns, and for detecting trends in nosocomial infections.

4. A year's worth of data is needed for preparing a summary report (antibiogram) and for high-quality patient care.

5. Routine surveillance cultures are not indicated.

6. Cultures of breast milk or homemade formula are prudent.

7. Personnel, equipment, the environment, and fluids can each be the source of organisms in an outbreak. The decision of what or who to culture should be made in consultation with an infection control specialist, medical microbiologist, or infectious disease doctor. Selective media may be needed to detect a pathogen mixed with environmental or commensal bacteria.

8. The use of safety cabinets and other protective equipment can protect the microbiology staff from laboratory acquired infections. Subculturing of positive blood culture bottles should be performed in a biosafety cabinet, as should methods likely to generate aerosols of pathogens. Manipulation of *Mycobacterium tuberculosis* cultures should be performed in a biosafety cabinet.

9. Direct staining of clinical specimens guides presumptive treatment and occasionally provides a definitive diagnosis (e.g., of intestinal or blood borne parasites). Staining organisms after culture is usually required for definitive identification of bacteria and molds.

10. Each of these tests should be available either within the institutional laboratory, or at a laboratory to which specimens can be quickly transported and from which data can be quickly reported to the institution.

11. Each of these tests should be available either within the institutional laboratory, or at a laboratory to which specimens can be quickly transported and from which data can be quickly reported to the institution.

12. Colony morphology and gram stain can suggest that an organism is a staphylococcus species; however, identification of *S. aureus* requires testing for coagulase, thermos table nuclease, or latex agglutination for *S. aureus* proteins. Latex agglutination assays may give

false-positive results with *S. saprophyticus*, so this assay should not be used on suspected staphylococci from urine specimens.

13. Colony morphology, gram stain, and catalane tests can suggest that an organism is a streptococcus species; however, identification of individual species requires additional testing. Either a positive PYR test or growth in the presence of bile and hydrolysis of esculin (bile esculin media) and growth in 6.5 percent salt demonstrate that a catalane-negative gram-positive cocci in chains is in the enterococcus genus, but species identification requires additional testing. The other tests listed can be used for routine identification of S*treptococcus* if the colony morphology, gram stain, and catalane test are all consistent with the suspected genus.

14. Most gram-negative rods cannot be identified by abbreviated methods and require biochemical panels. Exceptions include Escherichia coli and Pseudomonas aeruginosa, for which rapid identification is possible. Quality control of biochemical assays is always important, but it is particularly important to perform quality control of assays manufactured in the laboratory.

15. Blood culture is one of the most important tests that the clinical microbiology lab can perform. Commercial broth media is generally high quality and more likely than homemade broth to support rapid growth of bacteria.

16. Gram stain and presumptive testing, including antibiotic sensitivity and identification, are important in guiding initial therapy for sepsis. Performed correctly, presumptive antibiotic sensitivity testing directly from the blood culture bottle is reasonably accurate for Staphylococci and Enterobacteriaceae (enteric gram negative rods), but standard testing of pure colonies grown on solid media should also be performed. Gram-positive bacteria in chains should be tested for antibiotic sensitivity directly from the blood culture bottle, but the result should be ignored for Streptococcus pneumonia—this method is not adequate.

17. Visual inspection will not detect all positive blood cultures, so a blind subculture of all apparently negative cultures should be performed. If an automated blood culture system is used, blind subculture is usually not needed.

18. Doctors should be rapidly notified of positive blood cultures so that the patient can receive appropriate therapy.

19. Blood cultures should be cultured a minimum of five days. Although five days is adequate to detect most fastidious bacteria in automated blood culture systems, this has not been demonstrated for homemade broths or manually read cultures, so longer incubation may be needed.

20. Standardized disc diffusion or MIC testing by any of several methods is adequate for determining most antibiotic susceptibility. Commercially available discs are a relatively inexpensive and high-quality way of testing antibiotic susceptibility.

21. Appropriate interpretive criteria for antibiotic susceptibility results should be carefully applied. Use of interpretive criteria intended for one genus or species for a different genus or species is not recommended as the interpretation may be wrong.

22. For most organisms, including *Staphylococcus* species and Enterobacteriaceae (enteric gram negative rods), susceptibility testing should be performed on all clinically significant isolates. Protocols to determine which organisms are "clinically significant" should be determined by the laboratory director or an experienced infectious diseases physician. A few bacteria are predictably susceptible to some antibiotics, and so testing rarely needed. For example, group A and group B streptococci are predictably sensitive to penicillins, and so susceptibility testing is only needed for special circumstances, such as penicillin-allergic patients.

23. Standard procedures must be followed for accurate identification of methicillin-resistant *S. aureus*. Cefoxitin or oxacillin disk diffusion testing, or oxacillin-salt agar can be used to detect methicillin resistant *S. aureus*. Cefoxitin disc diffusion testing is more accurate than oxacillin disc diffusion testing for methicillin-resistant coagulase negative Staphylococcus.

24. Enterobacteriaceae (enteric gram-negative rods) that produce an ESBL may appear sensitive to beta-lactam antibiotics in culture; however, most beta-lactams are clinically ineffective against these organisms. Standard criteria (e.g., Clinical Laboratory Standards Institute/National Committee for Clinical Laboratory Standards) should be used to screen for and confirm the production of an ESBL.

25. Delays in reporting the identification of resistant bacteria to antimicrobials to the clinical staff and infection control officer lead to delay in appropriate infection prevention and control measures in the facility. The laboratory staff, clinicians, and infection control staff should be vigilant and report any suspected outbreaks and ensure that containment procedures are in force as quickly as possible.

26. It is very important that quality control organisms be used to validate the reagents used for antibiotic susceptibility testing. This is true of both commercial and homemade reagents or media.

27. There is great regional and facility variation in antibiotic susceptibility patterns as well as organisms that cause nosocomial infection. Therefore, locally-generated susceptibility data should be used to guide empiric antibiotic therapy.

28. Species within the same genus may differ greatly in their antibiotic susceptibility. In general, organisms should be broken down into species for analysis of antibiotic susceptibility patterns.

29. The breakdown of organisms into community-acquired or nosocomial categories can be useful in determining empiric therapy and tracking the development of antibiotic resistance. The definition of community-acquired or nosocomial can be made in consultation with infection control specialists.

30. Annual reporting of resistance patterns is usually adequate. More frequent analysis might be needed if an outbreak of antibiotic resistant organisms is suspected.

31. Antibiotic resistance patterns should be available to all doctors in the community and are particularly important to the Infection Control Committee and Pharmacy. Significant increases in antibiotic resistance should be brought to the attention of the Infection Control Committee or head of Infection Control.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

# *Section C: Modules Administered Once Where Disinfection or Sterilization Takes Place*

## MODULE 13: STERILIZATION AND DISINFECTION—EQUIPMENT AND IV FLUIDS

These questions should be completed by the person in charge of the central sterilization and disinfection unit or the person in charge of sterilization and disinfection in each location where equipment is sterilized.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

1. Where in the hospital is equipment sterilized and disinfected?

[ ] Central unit
[ ] Labor and delivery support unit
[ ] Surgical area support unit
[ ] Other (specify) _____

2. Please indicate your background education for this position. (Mark all that apply). If no one is formally designated as in charge, skip to question 3.

[ ] No training
[ ] On the job training
[ ]1 Lectures or seminars
[ ]2 Formal training program

**Assessment section total:** _____ **Possible section total:** 3

### Policies and Procedures

These questions provide contextual information about your facility's sterilization and disinfection procedures and practices.

3. Are there written facility policies and procedures for sterilizing materials and equipment?

[ ] No written policies or procedures
[ ] Policies/procedures communicated verbally only
[ ]1 Written policies/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policies/procedures in a manual but also posted on walls in clinical or support areas

4. Do the written policies explicitly identify the items that require sterilization?

[ ] No written policies
[ ] No, items not explicitly identified
[ ]1 Yes

5. What is the required procedure when sterilizer failures are detected? (Mark all that apply)

[ ] No written procedure
[ ]1 Reporting of failure
[ ]1 Recall potentially contaminated items from clinical units

**Assessment section total:** _____ **Possible section total:** 5

## Preparation of Sterile Irrigation and intravenous (IV) Fluids

The following questions identify where and how in the hospital IV fluids are prepared.

6. If irrigation fluids are prepared in a central sterilization unit of the hospital, which sterilization process is used? (Mark the one that best applies)

[ ] No sterile liquids are prepared in the hospital
[ ] Boiling
[ ] Filtration
[ ] Microwave
[ ] Reverse osmosis
[ ]1 Steam sterilization (autoclave)

7. If irrigation fluids are not prepared in a central sterilization unit of the facility, where are irrigation fluids prepared? (Mark one answer)

[ ]1 Fluids are prepared in a central sterilization unit
[ ] Prepared elsewhere in the hospital (Specify where:_____)
[ ] Purchased non-sterile from commercial sources
[ ]2 Purchased sterile from commercial sources

8. If IV fluids are not prepared in a central sterilization unit of the hospital, where are IV fluids prepared? (Mark one answer)

[ ] IV fluids are not prepared in a central sterilization unit of the hospital
[ ] Prepared elsewhere in the hospital (Specify where:_____)
[ ] Purchased non-sterile from commercial sources
[ ]2 Purchased sterile from commercial sources

9. If IV fluids are prepared in a central sterilization unit of the hospital, is there a standard sterilization time required for given volumes of liquid?

[ ] IV fluids are not prepared in a central sterilization unit in the hospital
[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 6

## Decontamination and Cleaning of Instruments and Equipment

The following questions cover policies and practices for decontamination and cleaning of instruments and other equipment.

10. Is there a written hospital policy regarding the decontamination of instruments before cleaning?

[ ] No written policies or procedures
[ ] Policies/procedures communicated verbally only
[ ]1 Written policies/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policies/procedures in a manual but also posted on walls in clinical or support areas

11. How are soiled and clean items separated from each other? (Mark one answer)

[ ] Processed in the same work area
[ ] Same room, separate areas
[ ]1 Separate utility rooms for soiled and clean items

12. Which disinfectant is usually used to decontaminate used items? (Mark the one that is most commonly used)

[ ] Not all used items are decontaminated
[ ]1 Iodophor
[ ]1 Formaldehyde
[ ]1 Ethyl or isopropyl alcohol
[ ]1 Glutaraldehyde
[ ]1 Phenolic
[ ]1 Hydrogen peroxide
[ ]1 Paracetic acid
[ ]2 Sodium hypochlorite or other chlorine compound

13. Does decontamination occur before cleaning or any other handling of used items?

[ ] No
[ ]1 Yes

14. How are soiled instruments usually cleaned? (Mark all that apply)

[ ] Rinsing
[ ]1 Vigorous scrubbing with brush
[ ]1 Mechanical dishwasher
[ ]1 Ultrasonic cleaner

15. Which of the following solutions is used to remove organic material from soiled instruments? (Mark one answer)

[ ] Water
[ ]1 Water with detergent
[ ]1 Protein-dissolving (enzyme) solution

16. What material is usually used to package items for sterilization? (Mark one answer)

[ ] No wrapping
[ ] Canvas
[ ]1 Cotton
[ ]1 Muslin
[ ]1 Paper
[ ]1 Newsprint

17. How many layers are used to wrap items to be sterilized? (Mark one answer)

[ ] One layer
[ ]1 Two layers

**Assessment section total:** _____ **Possible section total:** 12

## Sterilization and Disinfection of Instruments and Equipment

The following questions ask you to identify methods used for disinfection and sterilization, and the specified methods and indicators used for sterilization, packaging, and storage. Answer the questions in section A through E according to the methods used in your area of the hospital.

18. Which methods are used to disinfect and sterilize equipment? (Mark all that apply in each row). Leave blank if equipment not sterilized.

| Equipment | Steam (autoclave) | Dry heat | Chemical sterilization | High-level disinfection | Wet heat /pasteurize | Other method** |
|---|---|---|---|---|---|---|
| Scalpel blades | [ ]1 | [ ]1 | [ ]1 | [ ] | [ ] | [ ] |
| Metal urinary catheters | [ ]1 | [ ]1 | [ ]1 | [ ]1 | [ ]1 | [ ] |
| Plastic urinary catheters | [ ] | [ ] | [ ]1 | [ ]1 | [ ]1 | [ ] |
| IV catheters/tubing | [ ] | [ ] | [ ] | [ ] | [ ] | [ ] |
| Oxygen mask/tube | [ ] | [ ] | [ ] | [ ] | [ ]1 | [ ] |
| Laryngoscope blades | [ ]1 | [ ]1 | [ ]1 | [ ]1 | [ ]1 | [ ] |
| Surgical/obstetric instruments | [ ]1 | [ ]1 | [ ] | [ ] | [ ] | [ ] |
| Endotracheal tubes | [ ] | [ ] | [ ]1 | [ ]1 | [ ]1 | [ ] |
| Fiber-optic endoscopes | [ ] | [ ] | [ ]1 | [ ]1 | [ ] | [ ] |

| | | | | | | |
|---|---|---|---|---|---|---|
| Ambu-bags | [ ] | [ ] | [ ]1 | [ ]1 | [ ]1 | [ ] |
| Respiratory suction catheters | [ ] | [ ] | [ ]1 | [ ]1 | [ ]1 | [ ] |
| Nebulizers | [ ] | [ ] | [ ]1 | [ ]1 | [ ]1 | [ ] |
| Ventilator circuits | [ ] | [ ] | [ ]1 | [ ]1 | [ ]1 | [ ] |

**** If other method is used, describe the procedure used in the space below—**

19. Which methods are used for equipment sterilization? (Mark all that apply)

| | | |
|---|---|---|
| [ ] | Flash steam sterilization (autoclave) | |
| [ ] | Microwave | |
| [ ]1 | Ethylene oxide | |
| [ ]1 | Plasma/gas sterilization | |
| [ ]1 | Low temperature steam formaldehyde sterilization | |
| [ ]1 | Steam/pressure sterilization (autoclave) | ***Complete Section A below*** |
| [ ]1 | Dry heat sterilization (oven) | ***Complete Section B below*** |
| [ ]1 | Chemical sterilization | ***Complete Section C below*** |
| [ ]1 | High-level chemical disinfection | ***Complete Section D below*** |
| [ ]1 | High-level disinfection using pasteurization | ***Complete Section E below*** |

20. Are biological and/or chemical indicators used to monitor the success of sterilization? (Mark one answer)

| | |
|---|---|
| [ ] | Neither is used |
| [ ]1 | Biological indicators only used |
| [ ]1 | Chemical indicators only used |
| [ ]2 | Both indicators are used |

21. How often are monitoring indicators used? (Mark one answer)

| | |
|---|---|
| [ ] | Indicators not used |
| [ ] | Once a week |
| [ ] | Once a month |
| [ ]1 | Every day |
| [ ]2 | Every cycle |

22. How frequently are autoclaves checked by a service or maintenance person? (Mark one answer)

| | |
|---|---|
| [ ] | No autoclaves available in hospital |
| [ ] | Only when serviced as needed for repairs |
| [ ]1 | Only when serviced by maintenance per service contract |
| [ ]1 | Once a month |
| [ ]1 | Several times a year |

23. How are sterile instrument packs stored? (Mark all that apply)

[ ] Directly on shelves or carts
[ ] In cardboard boxes
[ ] In paper bags
[ ]1 In enclosed plastic or metal boxes
[ ]1 In plastic bags
[ ]1 In sterilized acceptor bags

24. Is the date of sterilization written on sterile packs?

[ ] No
[ ]1 Yes

25. In what order are sterile supplies removed from storage for use? (Mark one answer)

[ ] Newest sterile packs are used first
[ ] Randomly or as convenient
[ ]1 Oldest sterile packs are used first

26. Is there a written policy regarding shelf-life after which unprotected items must be re-sterilized? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in manual but also posted on walls in clinical or support areas

**Assessment section total:** _____ **Possible section total:** 56

## A. Steam/Pressure Sterilization (Autoclave)

Complete this section only if steam/pressure sterilization is used.

27. Are written procedures available to personnel performing steam/pressure sterilization? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

28. How often are time, temperature, and pressure monitored during the steam/sterilization process? (Mark one answer)

[ ] Once a week
[ ] Once a month
[ ] Several times a year (not regularly)
[ ] Only when serviced by maintenance per service contract
[ ] Only when serviced by maintenance as needed for repairs
[ ]1 On schedule recommended by manufacturer
[ ]1 Every day
[ ]2 Every cycle

29. How are items dried after removal from the autoclave? (Mark one answer)

[ ] No drying
[ ] Air dried
[ ]1 Dry heat (i.e., oven)
[ ]1 Forced air (i.e., fan)

**Assessment section total:** _____ **Possible section total:** 5

## B. Dry Heat Sterilization

Complete this section only if dry heat sterilization is used.

30. Are written procedures available to personnel performing dry heat sterilization? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

31. How often are time and temperature monitored during dry heat sterilization? (Mark one answer)

[ ] Once a week
[ ] Once a month
[ ] Several times a year (not regularly)
[ ] Only when serviced by maintenance per service contract
[ ] Only when serviced by maintenance as needed for repairs
[ ]1 On schedule recommended by manufacturer
[ ]1 Every day
[ ]2 Every cycle

**Assessment section total:** _____ **Possible section total:** 4

## C. Chemical Sterilization

Complete this section only if chemical sterilization is used.

32. Is there a written policy for monitoring the chemical solution for efficacy? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

33. What agents are used for chemical sterilization? (Mark one answer)

[ ]1 Hydrogen peroxide
[ ] Isopropyl alcohol
[ ] Ethyl alcohol
[ ]1 Paracetic acid
[ ]1 Paracetic acid/hydrogen peroxide
[ ]1 Glutaraldehyde
[ ]1 Glutaraldehyde/phenol
[ ]1 Chlorine
[ ]1 Orthopthaldehyde
[ ]1 Formaldehyde
[ ] Iodophors
[ ]1 Ethylene oxide

34. What is used to rinse items after chemical sterilization? (Mark one answer)

[ ] Tap water alone
[ ] Distilled water alone
[ ]1 Distilled water followed by alcohol rinse
[ ]1 Tap water followed by alcohol rinse
[ ]1 Sterile water

35. How are items dried after chemical sterilization? (Mark all that apply)

[ ] No drying
[ ] Air dried
[ ]1 Dry heat (i.e., oven)
[ ]1 Forced air (i.e., fan)

**Assessment section total:** _____ **Possible section total:** 6

## D. High-Level Chemical Disinfection

Complete this section only if high-level disinfection with chemical agent is used.

36. What items are treated by high-level chemical disinfection? (Mark all that apply)

[ ]1 Scalpel blades
[ ]1 Urinary catheters
[ ]1 Intravenous catheters and tubing
[ ]1 Oxygen masks
[ ]1 Anesthesia breathing circuits
[ ]1 Laryngoscope blades
[ ]1 Surgical and obstetrical instruments
[ ]1 Endotracheal tubes
[ ]1 Endoscopes

37. Is there a written policy for monitoring the chemical disinfection solution for efficacy? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

38. What agent is used most commonly for high-level chemical disinfection? (Mark one answer)

[ ]1 Hydrogen peroxide
[ ] Isopropyl alcohol
[ ] Ethyl alcohol
[ ]1 Paracetic acid
[ ]1 Paracetic acid/hydrogen peroxide
[ ]1 Glutaraldehyde
[ ]1 Glutaraldehyde/phenol
[ ]1 Chlorine
[ ]1 Orthopthaldehyde
[ ]1 Formaldehyde
[ ] Iodophors
[ ]1 Ethylene oxide

39. What is used to rinse items after high-level chemical disinfection? (Mark one answer)

[ ] Tap water alone
[ ] Distilled water alone
[ ]1 Distilled water followed by alcohol rinse
[ ]1 Tap water followed by alcohol rinse
[ ]1 Sterile water

**Assessment section total:** _____ **Possible section total:** 13

## E. High-level Disinfection by Pasteurization

Complete this section only if high-level pasteurization disinfection is used.

40. Are there written procedures for monitoring the pasteurization solution for efficacy? (Mark one answer)

[ ] No written policy or procedures
[ ] Policy/procedures communicated verbally only
[ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
[ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

41. What is used to rinse items after high-level pasteurization disinfection? (Mark one answer)

[ ] Tap water alone
[ ] Distilled water alone
[ ]1 Distilled water followed by alcohol rinse
[ ]1 Tap water followed by alcohol rinse
[ ]1 Sterile water

42. How are items dried after high-level pasteurization disinfection? (Mark all that apply)

[ ] No drying
[ ] Air dried
[ ]1 Dry heat (i.e., oven)
[ ]1 Forced air (i.e., fan)

**Assessment section total:** _____ **Possible section total:** 5

## STERILIZATION AND DISINFECTION—EQUIPMENT AND IV FLUIDS ANNOTATIONS

### Background

This section is devoted to practices used for the preparation of instruments used in patient care. The following terms are used in this section.

1. Decontamination—Immersion of an instrument into a chemical solution to make it safe for handling and processing. Decontamination should inactivate the human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV).

2. Cleaning—Mechanical cleaning of instruments by washing or scrubbing to remove large or visible particles or debris.

3. High-level disinfection (HLD)—Chemical treatment that eliminates nearly all microorganisms. Spore-forming gram positive bacteria are usually spared. This treatment method is appropriate for heat-sensitive instruments that will not contact normally sterile spaces.

4. Pasteurization—HLD by steaming or boiling.

5. Sterilization—Treatment that renders an instrument free of all microorganisms, including gram positive spores. This treatment is required for surgical instruments and vascular devices that will contact normally sterile spaces.

6. Autoclave—A device that sterilizes instruments using pressurized steam.

### Item Notes

1–4. It is best to perform all equipment cleaning, disinfection, packaging, and sterilization in a designated central area. This ensures that all procedures and practices are carried out in a uniform manner that minimizes variability and maximizes experience and comfort among the staff. Formal training and written protocols will help practices conform to recognized standards. To minimize confusion, written protocols should specifically name which items require sterilization.

5. Sterilizer failures can jeopardize the integrity of medical and surgical instruments and fluids, and all materials that may have been incompletely sterilized should be recalled. Furthermore, failure should be reported to supervisory personnel in order to make necessary repairs, log maintenance problems, and if necessary, involve the help of the manufacturer.

6–9. Sterile fluids, such as those used for intravenous administration or irrigation, can only be reliably sterilized in a steam-pressure autoclave (EngenderHealth 2004). Standard times and pressures are published for various volumes of fluid. The quality and sterility of commercially available sterile fluids are more reliable than those prepared on site. Boiling does not reliably kill all microorganisms, particularly gram positive bacterial spores. Therefore, it should not be regarded as true sterilization, but rather HLD. Similarly, dry heat (oven) will simply bring fluids to a boil, whereas the pressure of an autoclave will allow far

more heat to be delivered to fluids before boiling occurs. Fluids that will be administered to sterile sites therefore must be sterilized in an autoclave if one is available.

10–13. Clean and soiled instruments must be separated, ideally into different rooms. This will reduce the risks of contaminating or confusing clean instruments with soiled ones. Decontamination markedly reduces the level of microbial contamination of surgical instruments. If instruments and other items are to be cleaned by hand, decontamination will minimize the risk of infection and reduce microbial contamination. Chlorine solutions made from sodium hypochlorite are the least expensive and the most rapid acting and effective products to use, although 70 percent ethyl or isopropyl alcohol and 0.5–3.0 percent phenolic compounds can also be used (Tietjen et al. 2003).The recommended process for decontaminating soiled surgical instruments, surgical gloves, and other items is to place them in a 0.5 percent chlorine solution for 10 minutes. This step rapidly inactivates HBV, HCV, and HIV, and makes the items safer for those cleaning them to handle. Dilute chlorine solutions can be prepared from liquid bleach for both decontamination and HLD.

14, 15. Neither sterilization nor HLD is effective without prior cleaning. Cleaning effectively reduces up to 80 percent of microorganisms, especially endospores that cause tetanus. The use of soap, preferably liquid, is important for effective cleaning. Thorough washing with soap and clean water physically removes organic material such as blood and body fluids. An enzymatic solution will further degrade organic material. Wearing gloves while cleaning instruments is important so that sterilization staff can avoid contact with blood-borne and other pathogens. Mechanical cleaning can be accomplished by either scrubbing with a soft brush or using a mechanical cleaner (i.e., a dishwasher or ultrasonic cleaner).

16, 17. Cotton, paper, muslin, and newsprint are all acceptable packaging materials as they are durable and yet allow steam to penetrate. Canvas does not allow steam to effectively penetrate and therefore should not be used (EngenderHealth 2004). Two layers of wrapping material are recommended, as there are frequently small tears in individual layers. A second layer will prevent instruments from contamination before use, and two layers are thin enough to allow steam to penetrate and sterilize the item.

18. Ideally, scalpel blades must be procured sterile and should not be reprocessed. However, they may be completely sterilized using either autoclave or dry heat. If these are unavailable, chemical sterilization is acceptable. It must be emphasized, however, that this must be true chemical sterilization and not HLD, which will leave intact some bacterial endospores. Scalpels must be decontaminated and cleaned thoroughly before any packaging and sterilization.

Ideally, plastic urinary catheters must be procured sterile and should not be reprocessed. However, they may be treated using any method that provides at least HLD. Thus, pasteurization and HLD are sufficient. Metal catheters, which are tolerant of heat, may be sterilized using steam or dry heat.

IV catheters should never be reused. It is impossible to guarantee sterilization of the catheter lumen. Furthermore, with repeated use, microscopic defects can arise in catheter tubing, which can lead to contamination of the catheter system and bloodstream infection.

Surgical and obstetrical equipment should be truly sterilized using autoclave or dry heat. Most of these instruments, such as clamps, retractors, or surgical suction devices enter sterile

body sites. Therefore they must not have any viable microbial particles, including bacterial spores. Rare exceptions include obstetrical forceps, which may be treated with HLD.

Respiratory equipment, such as nebulizers, suction catheters, ambu-bags, endotracheal tubes, ventilator circuits, and oxygen masks and tubing should be treated with HLD or pasteurization. Heat stable equipment, such as metal laryngoscope blades, may also be treated with autoclave or dry heat sterilization.

20, 21. Standardized biological and chemical indicators should be used as often as possible to monitor the effectiveness of equipment sterilization. Biological indicators should be used once daily, and chemical indicators (such as indicator tape) should be used with each cycle.

22. In addition to needed repairs, autoclaves should be routinely inspected and maintained by qualified personnel.

23. Sterile items should be kept either in their packaging or in a simultaneously sterilized outer container. Damage or moisture to the packaging can cause instrument contamination, so enclosed plastic or metal boxes will provide the best protection. Clean plastic bags are also acceptable, and will extend the shelf life of sterilized items.

24–26.The shelf life of sterilized items is variable, depending on such factors as handling, packaging, and storage (see Tietjen et al. 2003 for further details). The date of sterilization should be written on sterile packs to ensure that the oldest packs are used first. This should be further documented as a written policy.

0, 29. Items being sterilized by steam/pressure (autoclave) should be sterilized at 121 °C (250 °F) for 30 minutes (wrapped items), 20 minutes for unwrapped items. Wait 20 to 30 minutes (or until the pressure gauge reads zero) before opening the lid or door. Time the process with a clock.

Expeditious drying is important to ensure that the integrity of packing materials is maintained and microbial colonization is minimized. The rapidity of ambient drying is variable. While in very dry climates ambient drying may be sufficient, in more humid environments drying may be slow or in fact never be completely achieved. Thus, dry ovens or fans are encouraged to expedite drying.

30, 31. Dry heat sterilization is performed in a convection oven or simple oven if a thermometer is used to verify the inside temperature. The advantages of dry heat are that the heat reaches all surfaces of the instruments, even those that cannot be disassembled. This method leaves no chemical residue, is protective of sharps or instruments with cutting edges, and eliminates the “wet pack” problems in humid climates. However, plastic and rubber items cannot be sterilized by dry heat and dry heat penetrates materials slowly and unevenly. The recommended temperature and time ratios (once the desired temperature has been reached) vary between 60 minutes at 170 °C (340 °F) to overnight at 121 °C (250 °F). Items can be wrapped in aluminum foil or placed in a metal contained with a tight fitting lid. Sharps should be placed in glass tubes with cotton stoppers, and loose, unwrapped items can be placed in metal containers or on trays in the oven. Biological indicators should be used daily to monitor dry heat sterilization. If possible, chemical indicators should be used with every cycle.

33, 34. There is evidence that biological indicators normally used for steam sterilization, such as spore survival, is also useful to monitor the effectiveness of liquid chemical sterilization (Kralovic 1993). Frequent (i.e., daily) monitoring will ensure that instruments are effectively sterilized.

Chemical sterilization is best reserved for instruments that contain material that may be sensitive to heat or pressure. Complex items, such as endoscopes, are also appropriate for sterilization by this method. See Tietjen et al. 2003 or EngenderHealth for a more comprehensive description of items appropriate for chemical sterilization. Sterilization differs from high level disinfection in that high level disinfection (HLD) does not necessarily kill spore forming gram positive organisms. Be aware that while the same agents are often used for sterilization and HLD, sterilization may require longer immersion times.

There are several chemicals that can be used for chemical sterilization. These include glutaraldehyde (alone or in combination with phenol), paracetic acid (alone or in combination with hydrogen peroxide), hydrogen peroxide, orthopthaldehyde, chlorine, and ethylene oxide.

36, 37. HLD is a treatment process that eliminates all microorganisms with the exception of some gram-positive spores. These include species of *Bacillus* and *Clostridium*. Instruments that may be treated with chemical HLD are those that are heat-sensitive, and thus cannot be sterilized by autoclave or dry-heat sterilization. HLD differs from chemical sterilization, in which chemical treatment will afford true sterilization.

HLD is appropriate for instruments that will not enter a normally sterile space, such as tissue or blood. Flexible fiberoptic endoscopes may be treated with HLD. While laparoscopes and arthroscopes do indeed enter sterile spaces, there remains considerable controversy regarding whether or not HLD is sufficient, or if true chemical sterilization is necessary. Thus, HLD is currently acceptable for all endoscopic devices.

It should be emphasized that removable components of endoscopy equipment, such as biopsy forceps, should be treated by sterilization when possible. Other devices appropriate for HLD include gynecologic equipment (such as forceps, specula) and respiratory equipment (such as endotracheal tubes). HLD can be accomplished by chemical or thermal treatment (see pasteurization, question 40). Thorough cleaning is critical before HLD.

38, 39. Several chemicals are acceptable for HLD: glutaraldehyde (alone or in combination with phenol), paracetic acid (alone or in combination with hydrogen peroxide), hydrogen peroxide, orthopthaldehyde, chlorine, and ethylene oxide.

There are some commonly used chemicals that should not be routinely used for HLD. Alcohol (ethanol or isopropyl) is often used for HLD, but it is not active against bacterial endospores and some viruses (coxsackie viruses, echovirus). Iodophors lack activity against gram positive spores and some fungi, and *Pseudomonas aeruginosa* is known to multiply in iodophor solutions. Formaldehyde is an effective agent for HLD, but it is noxious and potentially carcinogenic; thus it should be used only if other chemicals are unavailable. Equipment should be thoroughly rinsed with sterile water following chemical treatment. If this is not available then it is acceptable to rinse with distilled or tap water followed by an alcohol rinse.

40–42. Pasteurization is HLD achieved by heat exposure. It is accomplished either by complete immersion of equipment in boiling water or exposing it to steam in a closed setting. This procedure is appropriate for equipment that does not require full sterilization, but will be in contact with mucus membranes. Most respiratory equipment, such as endotracheal tubes and oral airways, may be treated in this way. Drying is critical to prevent microorganisms from growing in residual moisture.

## **References** (* = Copy on CD)

EngenderHealth. 2004. Infection Prevention Online Course. <http://www.engenderhealth.org/res/onc/index.html#start> (accessed July 17, 2006).

Kralovic, R. C. 1993. Use of Biological Indicators Designed for Steam or Ethylene Oxide to Monitor a Liquid Chemical Sterilization Process. *Infection Control and Hospital Epidemiology* 14(6):313–19.

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources*. Baltimore, MD: Jhpiego.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 14: STERILIZATION AND DISINFECTION—NEEDLES AND SYRINGES

These questions should be completed by the person in charge of the central sterilization unit or an associated support unit. **Please note that disposable needles and syringes should be used and then safely disposed whenever economically possible. Reprocessing used needles is inappropriate and is responsible for infections. If this is the only option available, it is critical that reprocessing be done as safely as possible, using recommended infection prevention practices. Do not complete this module if needles and/or syringes are not reprocessed in your facility.**

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### Reprocessing of Needles and Syringes

1. Where in the facility are needles used for percutaneous injections or injections into IV catheters or IV infusion systems reprocessed?

   [ ] Needles are not reprocessed
   [ ] Central sterilization unit
   [ ] Operating theater support unit
   [ ] Labor and delivery support unit
   [ ] Other (Specify)_____

**Answer these questions for each location in the facility where needles are reprocessed. The questions focus on methods used in sterilizing used needles. Skip this section if needles are not reprocessed in this facility.**

2. Are needles routinely checked for clogging, bending, and other defects prior to and after reprocessing?

   [ ] No
   [ ]1 Yes

3. Do used needles undergo decontamination prior to reprocessing?

   [ ] No
   [ ]1 Yes

4. Are containers containing water with liquid soap or detergent available where needles are used for holding needles until they can be decontaminated?

   [ ] No
   [ ]1 Yes

5. Which solution is generally used to rinse needles prior to reprocessing? (Mark one answer)

[ ] Needles not rinsed
[ ]1 Sterile water
[ ]1 Clean water

6. Are needles flushed with disinfecting solution as part of decontamination?

[ ] No
[ ]1 Yes

7. How are needles removed from decontaminating solutions? (Mark all that apply)

[ ] By hand, without gloves
[ ] By hand, with thin gloves
[ ] By hand, with thick gloves
[ ]1 With forceps

8. Are needles flushed with sterile or clean water before sterilization?

[ ] No
[ ]1 Yes

9. Which method usually is used to sterilize needles? (Mark answer that best applies)

[ ] Flash steam sterilization (autoclave)
[ ] Dry heat sterilization (oven)
[ ] Microwave
[ ] Formaldehyde
[ ] Low temperature steam formaldehyde sterilization
[ ] High-level disinfection with chemical agent
[ ] High-level disinfection using pasteurization
[ ]1 Steam/pressure sterilization (autoclave)
[ ]1 Ethylene oxide
[ ]1 Chemical sterilization, e.g., with glutaraldehyde, paracetic acid, etc.

**Assessment total:** _____ **Possible total:** 8

## STERILIZATION AND DISINFECTION—NEEDLES AND SYRINGES ANNOTATIONS

### Background

A major concern about reusing needles and syringes is the risk of transmitting HIV, hepatitis B virus, and hepatitis C virus to patients if, after use, they are not reprocessed correctly, or if several injections are given with the same needle and syringe. In recent years this risk has been minimized by widespread use of disposable (single-use) plastic syringes and hypodermic needles, or one of the newer auto-disable syringes that can not be refilled. Whenever economically possible, disposable products should be used and then safely disposed of. Potential options include discarding needles after decontamination and then either recycling the plastic syringe or reprocessing it according to recommended infection prevention practices. Reprocessing used needles represents an inappropriate reuse of disposables and is responsible for infections. If this is the only option available, it is critical that reprocessing be done as safely as possible using recommended infection prevention practices (Tietjen et al. 2003, 14-5–14-7).

### Item Notes

2. Needles and syringes should be examined for bent needle tips or other damage, fit of the needle hub to syringe, and readable syringe markers (lines indicating volume—cc or ml) before and after reprocessing (Tietjen et al. 2003, Appendix E:3-4).

3–9. Steps in safe reprocessing of needles and syringes—

- Do not recap the needle or disassemble the needle and syringe
- Immediately after use, fill the syringe with a 0.5 percent chlorine solution by drawing it into the syringe through the needle
- Decontaminate the assembled needle and syringe by placing it in a 0.5 percent chlorine solution for 10 minutes
- Wearing utility gloves, remove from decontamination solution and push out (flush) solution from assembled needle and syringe
- Use forceps to take needle and syringe apart, then clean with soapy water—be sure to clean hub area of the needle; insert a stylet or needle wire through the hub of the needle to be sure it is not blocked
- Use forceps to put the syringe and needle back together; rinse at least three times by filling with clean water and pushing out (flushing) water into another container so as not to contaminate the rinse water
- Use forceps to detach the needle from the syringe
- Examine the needle and syringe for defects

- Use forceps to handle and dispose of damaged needles in a puncture-resistant sharps container; when container is three-quarters full, burn, encapsulate, or bury it
- Sterilize by autoclaving or high-level disinfect needles and syringes by boiling or steaming
- Store disassembled sterile or high-level disinfected needles and syringes in a sterile or high-level disinfected container with a tight-fitting cover (Tietjen et al. 2003, Appendix E:3-4)

**References** (* = Copy on CD)

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources.* Baltimore, MD: Jhpiego.

## MODULE SCORING SHEET

Name of facility: _____

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*Column Notes*:

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**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 15: STERILIZATION AND DISINFECTION—GLOVES

These questions should be completed by the person in charge of the central sterilization unit or an associated support unit. **Do not complete this module if sterile gloves are not reprocessed in your facility.**

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

### Reprocessing of Sterile Gloves

1. Where are sterile gloves reprocessed in your facility? (Mark all that apply)

[ ]2 Sterile gloves are not reprocessed (disposable gloves used)
[ ]1 Central sterilization unit
[ ]1 Surgical area support unit
[ ]1 Labor and delivery support unit
[ ] Other (Specify)
_____

**Complete these questions for each location in the facility where gloves are reprocessed. The questions focus on methods used in reprocessing sterile gloves. Skip this module if sterile gloves are not reprocessed in the facility.**

2. Where the gloves are removed, are containers containing soapy water or water with detergent available for holding gloves until they can be decontaminated?

[ ] No
[ ]1 Yes

3. Do gloves undergo decontamination prior to final reprocessing?

[ ] No
[ ]1 Yes

4. Are gloves worn by personnel when performing decontamination?

[ ] No
[ ]1 Yes

5. What type of gloves is worn by personnel when performing decontamination?

[ ] Gloves are not decontaminated
[ ] No gloves are worn prior to reprocessing
[ ] Thin gloves (e.g., latex, nitile)
[ ]1 Thick (utility) gloves

6. Which method is used for final reprocessing of sterile gloves? (Mark one answer)

[ ] Dry heat sterilization
[ ] Chemical sterilization
[ ] High-level disinfection
[ ] High-level disinfection with pasteurization
[ ] Cleaning with sterile water and soap or detergent (specify procedure)
[ ] Cleaning with non-sterile water and soap or detergent (specify procedure)
[ ]1 Steam sterilization (autoclave)
[ ]1 Ethylene oxide

7. Which solution is used to rinse gloves after disinfection? (Mark one answer)

[ ] Clean water
[ ]1 Sterile water

8. Which method is used to check gloves for holes or tears prior to reprocessing? (Mark one answer)

[ ] Gloves not checked before reprocessing
[ ] Visual inspection only
[ ] Inflated by blowing into the glove
[ ]1 Inflated with compressed air

9. What material is used to wrap gloves for steaming? (Mark one answer)

[ ] No wrapping
[ ] Canvas
[ ]1 Muslin
[ ]1 Paper
[ ]1 Newsprint
[ ]1 Cotton

10. How many layers of wrapping material are used?

[ ] One layer
[ ]1 Two layers

11. Which rack of the autoclave are gloves put on? (Mark one answer)

[ ] No policy on which rack to use
[ ] Middle racks
[ ] Lower racks
[ ]1 Top rack

12. How are gloves placed in the wrapper? (Mark one answer)

[ ] Lying flat in wrapper
[ ] Balled up in wrapper
[ ]1 Already cuffed

13. What is the usual interval of time between steam sterilization and use of sterilized gloves?

[ ] Less than 24 hours
[ ]1 24–48 hours

14. When are gloves powdered during reprocessing? (Mark one answer)

[ ]2 Gloves are not powdered
[ ]1 Gloves are powdered after decontamination but before cleaning and sterilization
[ ] Gloves are powdered after sterilization

15. Which type of powder is used on reprocessed gloves? (Mark one answer)

[ ] Gloves are not powdered
[ ] Talcum powder
[ ]1 Starch

**Assessment total:** _____ **Possible total:** 20

## STERILIZATION AND DISINFECTION—STERILE GLOVES ANNOTATIONS

### Background

The risk in reprocessing gloves is that reused surgical gloves contain more unnoticeable holes and tears than new ones. In one study, even surgeons wearing new surgical gloves had a 14 percent blood–hand contact. Moreover, in the United States, the regulatory standard "acceptable" leak rate for the best quality latex rubber surgical or examination gloves is up to 4 percent. Wearing new gloves, therefore, does not guarantee that hands will be kept free of contaminating blood or body fluids, even in the absence of accidental breaks or tears. Moreover, double gloving with new gloves is now considered appropriate, given the current risk of exposure to HIV and hepatitis C in many countries. Thus, sterilization or high-level disinfection of previously decontaminated and thoroughly cleaned surgical gloves can produce an acceptable product and, when combined with double gloving, constitutes an appropriate and cost-effective reuse of a disposable item (Tietjen et al. 2003, 14-4).

### Item Notes

2, 3. To decontaminate and clean surgical gloves before sterilization or high-level disinfection—

- Before removing soiled surgical gloves, immerse hands briefly in a container filled with 0.5 percent chlorine solution.
- Remove gloves by turning inside out and soak them in the chlorine solution for 10 minutes—performing steps 1 and 2 insures that both surfaces of the gloves are decontaminated
- Wash gloves in soapy water, cleaning inside and out
- Rinse gloves in clean water until no soap or detergent remains—residual soap or detergent can interfere with sterilization or high-level disinfection
- Test gloves for holes by inflating them by hand and holding them under water (air bubbles will appear if there are holes.)
- Gently air dry gloves inside and out before proceeding with sterilization—gloves which remain wet for long periods of time will absorb water and become tacky

Note: Latex rubber surgical gloves should be discarded after processing three times because the gloves tear more easily with additional processing (Tietjen et al. 2003, C-1).

4, 5. Utility gloves, a mask, and protective eyewear should be worn when cleaning instruments and other items.

6. High temperature and pressure are destructive to gloves. They should be autoclaved at 121 °C for 30 minutes and at a pressure of 106kPa, or ethylene oxide can be used for sterilization (Tietjen et al. 2003, C-1).

9. Wrapping gloves before steam sterilization helps decrease the likelihood that they will become contaminated before use. Paper, newsprint, muslin, or cotton fabric should be used to wrap gloves for steam sterilization. Canvas should not be used because it does not allow steam to penetrate effectively (EngenderHealth, "Instrument Reprocessing" module).

11. Glove packs should be placed loosely in a wire basket or drum, on their edge with the thumbs up, away from the walls of the autoclave, to help ensure that steam reaches all surfaces. If the autoclave has more than one shelf, place the glove packs on the upper shelves. Air inside the autoclave tends to move to the bottom of the unit, and placing gloves on the bottom shelf will speed the rate at which the gloves will deteriorate (EngenderHealth, "Instrument Reprocessing" module).

12. After decontamination, cleaning, and drying, gloves must be packaged prior to sterilizing by autoclaving. Fist the cuffs of the gloves toward the palm so that after sterilization they can easily be put on without contamination (Tietjen et al. 2003, C-1).

13. Gloves should not be used for 24 to 48 hours after sterilization to allow their elasticity to return and to prevent tackiness (stickiness) (Tietjen et al. 2003, C-2).

14, 15. Gloves may be powdered before steam sterilization to prevent them from sticking together and to make them easier to put on. However, powder has been shown to lead to inflammatory reactions in clients (with subsequent granuloma or adhesion formation) and may cause increased development of latex allergies or dermatitis in health care workers. If powder must be used, be sure to use only absorbable powders, such as starch—do not use talcum powder, which is nonabsorbable. Coat all surfaces of the glove with powder. To reduce the risk of inflammatory reactions in clients, staff should rinse gloved hands with sterile water or saline solution after putting on powdered gloves and before handling instruments or performing a clinical procedure (EngenderHealth, "Instrument Reprocessing" module).

## **References** (* = Copy on CD)

* EngenderHealth. 2004. Infection Prevention Online Course. <http://www.engenderhealth.org/res/onc/index.html#start> (accessed July 17, 2006).

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources.* Baltimore, MD: Jhpiego.

## MODULE SCORING SHEET

Name of facility: _____

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*Column Notes*:

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**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

# *Section D: Modules Administered Once for Each Clinical Area (If Relevant)*

## MODULE 16: GENERAL WARD

These questions should be completed in consultation with the head doctor or nurse of each medical or surgical ward included in the assessment.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

What is the name of this ward? _____

| |
|---|
| 1. What is the patient population in this ward? (Mark answer that best describes this ward)<br>[ ] General medical<br>[ ] General surgical<br>[ ] Mixed medical/surgical<br>[ ] Ob-gyn<br>[ ] Newborn |
| 2. This ward has:<br>[ ] Adults only<br>[ ] Children only<br>[ ] Both adults and children |

### Physical Layout and Staffing

The following questions address the number of beds on the ward and the number of physicians and nurses providing patient care.

| | |
|---|---|
| 3. What size are the rooms with regard to number of beds? (Mark all that apply)<br>[ ]1 One-bed or two-bed rooms<br>[ ] Three-bed rooms<br>[ ] Four-bed rooms<br>[ ] Rooms with five or more beds or open ward | |
| 4. What is the total number of beds on this ward? | |
| 5. On weekdays, how many physicians provide care on this ward to patients during the day shift which includes 12 noon?<br>Calculate number of beds per physician: | |
| 6. On weekdays, how many nurses provide care to patients on this ward during a typical day shift which includes 12 noon?<br>Calculate number of beds per nurse: | |

| | |
|---|---|
| 7. On weekdays, how many nurses provide care to patients on this ward during a typical evening/night shift which includes 12 midnight?<br>Calculate number of beds per nurse: | |

**Assessment section total:** _____ **Possible section total:** 1

## General Practices on Ward

The following questions cover your facility's policies and procedures for general hygiene, cleaning and disinfecting instruments, and use of antiseptics.

8. Is there a written policy for general hygiene and cleaning of surfaces, walls, floors, toilets, beds, clothing, and general equipment on this unit?
   - [ ] No written policy or procedures
   - [ ] Policy/procedures communicated verbally only
   - [ ]1 Written policy/procedures available in an operations manual but not generally available for daily practice
   - [ ]2 Written policy/procedures in a manual but also posted on walls in clinical or support areas

9. Does the written policy cover processes for decontaminating areas contaminated by spillage (such as blood or body fluids)?
   - [ ]1 Yes
   - [ ] No

10. Are instruments soaked in antiseptic solution used for multiple patients?
    - [ ] Yes
    - [ ]2 No

11. Are cotton balls stored in antiseptic solution for use in prepping or cleaning the skin?
    - [ ] Yes
    - [ ]1 No

12. Are antiseptics routinely protected from direct sunlight and high heat?
    - [ ]1 Yes
    - [ ] No

**Assessment section total:** _____ **Possible section total:** 7

## Checklist of Additional Modules to be Completed for the General Ward

- ☐ Airway Suctioning
- ☐ Hand Hygiene
- ☐ Injections
- ☐ Intravenous Catheters (if used on ward)
- ☐ Urinary Catheters (if used on ward)
- ☐ Intravenous Fluids and Medications (if used on ward)
- ☐ Isolation and Standard Precautions
- ☐ Sterilization and Disinfection (if equipment, needles, or gloves are disinfected or sterilized on the general ward)

## GENERAL WARD ANNOTATIONS

### Background

The transfer of microorganisms from environmental surfaces (such as walls, floors, beds, and general equipment) to patients is largely via hand contact. Hand hygiene is therefore very important for minimizing the impact of this transfer, but cleaning and disinfecting environmental surfaces are fundamental in reducing their contribution to health care-associated infections (CDC 2003).

### Item Notes

3. One- or two-bed rooms are preferred to avoid the spread of infectious disease, although in many settings this is not feasible.

8. The housekeeping service, in collaboration with the Infection Control Committee, is responsible for classifying the different hospital areas by type of cleaning needed, developing written policies for appropriate cleaning techniques (procedure, frequency, and agents used for each type of room, from highly contaminated to the most clean) and ensuring that these practices are followed (WHO 2002, 13). Housekeeping and cleaning schedules should be planned, written, and closely followed according to the needs of each area (walls, windows, ceilings, doors, tabletops, beds, etc.) (Tietjen et al. 2003, 16-6).

9. Written schedules and procedures for cleaning each specific area (including decontaminating areas contaminated by spillage) should be available and posted prominently (Tietjen et al. 2003, 16-5).

10. Antiseptics should be used to reduce or destroy microorganisms on skin and mucous membranes and they should never be used to disinfect objects. Instruments should never be left soaking in an antiseptic solution (EngenderHealth 2004, “Introduction to Aseptic Technique”).

11. Cotton balls, cotton wool, or gauze sponges should never be left soaking in antiseptic solutions (EngenderHealth 2004, “Introduction to Aseptic Technique”).

12. Disinfectants and antiseptics should always be stored in a cool, dark place. They should never be stored in direct light or near excessive heat (EngenderHealth 2004, “Introduction to Aseptic Technique,” “Steps of Chemical High-Level Disinfection”).

### References (* = Copy on CD)

U.S. Centers for Disease Control and Prevention (CDC). 2003. Guidelines for Environmental Infection Control in Health-Care Facilities: Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. *MMWR* 2003;52(No. RR-10):1–48.

* EngenderHealth. 2004. Infection Prevention Online Course. <http://www.engenderhealth.org/res/onc/index.html#start> (accessed July 17, 2006).

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources.* Baltimore, MD: Jhpiego.

* World Health Organization (WHO). 2002. *Prevention of Hospital-Acquired Infections: A Practical Guide*. 2nd ed. WHO/CDS/CSR/EPH/2002/12. Geneva: WHO.

## MODULE SCORING SHEET

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Date completed: _____

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**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 17: HAND HYGIENE

These questions should be completed by the chief physician or head nurse of each clinical or service area assessed including Medical/Surgical wards, Labor and Delivery, and Surgical Areas.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply.

What is the name of this unit or service area? _____

### Hand Hygiene Equipment and Supplies

The first set of questions focuses on the availability of equipment and supplies recommended for good hand hygiene practices.

1. How many hand washing stations and how many beds are on this unit? Enter numbers for each in the space to the right, then mark one answer below. ____/____

[ ] None
[ ]1 Fewer than one hand washing station per six beds if General Ward (per two beds if Intensive Care Unit)
[ ]2 One or more hand washing station per six beds if General Ward (per two beds if Intensive Care Unit)

2. What is the usual source of water for hand washing? (Mark one answer)

[ ] No water is usually available
[ ] Water is scooped from a basin and poured over hands
[ ]1 Water is usually poured over hands from a basin
[ ]1 Water is usually available from a cistern or container with gravity flow
[ ]2 Running water from sink

3. How frequently is running water available?

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

4. What type of soap is most frequently available for hand washing? (Mark one answer)

[ ] No soap is available
[ ] Plain bar soap stored in a receptacle that does not allow water to drain
[ ]1 Plain bar soap stored in a receptacle that allows water to drain
[ ]1 Plain liquid soap
[ ]1 Soap powder, leaves, or flakes
[ ]1 Soap with antimicrobial agent

5. How frequently is soap available? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

6. What types of dispensers are used on this unit for liquid soaps? (Mark one answer)

[ ] Liquid soaps are not used
[ ] Handheld pour bottle or squeeze dispenser
[ ]1 Hand operated pump dispenser
[ ]1 Foot pump dispenser

7. How are liquid soap dispensers usually cleaned? (Mark one answer)

[ ] Liquid soaps are not used
[ ] Dispensers are topped off or refilled without cleaning
[ ]1 Dispensers are emptied, washed, and dried before refilling
[ ]1 Dispenser or dispenser insert is disposed of when empty and new one is used

8. What method is usually available for drying hands after hand washing? (Mark one answer)

[ ] None (air dry)
[ ] Multiple-use cloth towel
[ ]1 Single-use cloth towel
[ ]1 Paper towels
[ ]1 Hot air dryer

9. Is a waterless alcohol-based hand antiseptic used for hand hygiene? (Mark one answer)

[ ] No
[ ]1 Yes, alcohol-based antiseptic without emollient
[ ]3 Yes, alcohol-based antiseptic with emollient

10. How frequently is there a sufficient supply of waterless alcohol-based hand antiseptic? (Mark one answer)

[ ] Alcohol-based hand antiseptic is not available
[ ] Supply of alcohol-based antiseptic is never sufficient
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

11. How many dispensers of waterless alcohol-based antiseptic are available on the ward? (Mark one answer)

[ ] Alcohol-based hand antiseptic is not available
[ ]1 Fewer than one for every four beds
[ ]2 One or more for every four beds

**Assessment section total:** _____ **Possible section total:** 19

## Hand Hygiene Practices

The following questions address hand hygiene practices in the clinical areas of your facility.

12. In which of the following situations do health care personnel such as doctors and nurses routinely wash their hands with soap and water or a waterless alcohol-based hand antiseptic? (Mark all answers that apply)

[ ]1 Before contact with patients
[ ]1 After contact with individual patients or their immediate environment
[ ]1 Before manipulating medical devices such as intravenous catheters, urinary catheters, or endotracheal tubes, or before handling wound dressing
[ ]1 After touching potentially contaminated objects or surfaces
[ ]1 After removing gloves
[ ]1 After using bathroom, toilet, latrine

13. Is there a policy on covering skin lesions and cuts with waterproof dressings?

[ ] No
[ ]1 Yes

14. Is there a policy on keeping finger nails short and/or not using artificial nails or nail extenders?

[ ] No
[ ]1 Yes

15. Is it usual practice to wear gloves instead of washing hands for contact with patients or potentially contaminated environmental surfaces? (Mark one answer)

[ ]1 No
[ ] Yes

16. Is hand lotion (emollient) usually available for staff to use after hand washing? (Mark one answer)

[ ] No
[ ]1 Yes, hand lotion in disposable containers
[ ]1 Yes, hand lotion in reusable containers

17. When a hand lotion container is empty, what usually happens? (Mark one answer)

[ ] Hand lotion is not usually available
[ ] Container is refilled or topped off without cleaning
[ ]1 Container is emptied, washed, and dried before refilling
[ ]1 Container is disposed of when empty and new container is used

**Assessment section total:** _____ **Possible section total:** 11

# HAND HYGIENE ANNOTATIONS

## Background

Infectious agents frequently contaminate the hands of clinicians and other health care personnel. Effective and frequent hand hygiene procedures can prevent the acquiring and spreading of infectious microorganisms from clinicians and health care personnel to patients and other hospital workers. Good hand hygiene practices are an important—**and one of the simplest**—methods of preventing the spread of nosocomial infections.

### *Hand Hygiene Procedures*

**Introduction: Definition and Purpose of Hand Hygiene**

Hand hygiene is a simple, proven, low-cost, and important practice to prevent infections. Hand washing involves cleaning one's hands by appropriately rubbing them with water and soap. Hand sanitization consists of briefly rubbing hands with an alcohol-based hand rub.

The purpose of hand hygiene is to reduce or eliminate resident and transient microbial flora from the skin covering hands and forearms to prevent infections from being transmitted.

**Types of Hand Hygiene**

There are four types of hand hygiene—

1. Social hand washing
2. Clinical or medical hand washing
3. Hand sanitization
4. Surgical hand washing

The appropriate type of hand washing is determined by the following four criteria—

1. Type of contact with patient, or if there is contact with patient's blood or body fluids
2. Likelihood of microbial transmission
3. Vulnerability to infections
4. Type of procedure to be conducted

**1. Social Hand Washing**

Social hand washing can be performed by any person. It consists of briefly rubbing the surface of the hands with regular soap and then rinsing the hands with water. Social hand washing is intended to remove dirt.

**2. Clinical Hand Washing**

Clinical washing refers to removing dirt and permanent and transient bacterial flora from hands by rubbing the palms and backs of hands, fingers, spaces between fingers, and wrists with antiseptic soap and sufficient running water.

**Purpose**

To reduce the concentration of transient bacterial flora acquired by contact with patients to prevent contamination and infection.

**Technique**

- Remove jewelry and accessories
- Turn on the water faucet to moderate pressure
- Wet your hands
- Apply sufficient liquid and antiseptic soap, and spread it all over the surface covering hands, fingers, and wrists
- Rub your hands—palms and backs of hands
- Using your right hand, rub the fingers of your left hand one by one with circular movements
- Using your left hand, rub the fingers of your right hand one by one with circular movements
- Clean your nails using your thumb nails
- Rub the spaces between fingers of both hands
- Rinse your hands with sufficient water
- Dry your hands by using a disposable paper towel, towel not shared with others, or an electric dryer
- Turn off the faucet without contaminating your hands by using the towel used to dry your hands in the previous step
- Spend no less than 30 seconds washing hands

### 3. Hand Sanitization

Hand sanitization consists of briefly rubbing hands with an alcohol/emollient-based antiseptic solution. Hand sanitization does not replace clinical hand washing; in addition, hands should be clear of organic material before they can be sanitized.

**Purpose**

To destroy microorganisms in transient bacterial flora, and reduce resident flora from hands to prevent their transmission.

**Technique**

- Apply a solution of glycerine and alcohol (95% isopropyl alcohol + 5% glycerine) on one of your hands
- Spread it all over the surface covering your hands, spaces between fingers, and wrists
- Rub gently
- Let air dry

### 4. Surgical Hand Washing

Surgical hand washing refers to a thorough cleansing of hands and forearms prior to conducting any invasive procedure. All staff participating in invasive procedures should conduct surgical hand washing.

**Purpose**

To reduce concentration of bacteria in the resident flora and to completely remove transient flora, which are both acquired by recent contact with patients.

**Technique**

- Use antiseptic soap
- Use a water faucet activated by a pedal or the elbow, or use a photoelectric faucet
- Remove your watch, rings, and other accessories
- Moisten your hands and forearms with antiseptic soap
- Spread soap all over the surface of your hands
- Rub hands together
- Using your left hand, rub the back of your right hand
- Using your right hand, rub the back of your left hand
- Rub the sides of your fingers by interlacing fingers of both hands
- Using your right hand, rub the fingers of your left hand one by one with circular movements, starting with your little finger
- Using your left hand, rub the fingers of your right hand one by one with circular movements, starting with your little finger
- Using your thumb nails or a special toothpick, clean your nails on both hands
- Rub your left wrist and then your right wrist
- Rub your left forearm and then your right forearm
- Rinse with sufficient water, letting the water flow toward your elbows
- Dry your hands with a sterile towel, using one end for each hand
- Avoid splashing
- Turn off the water faucet with your elbow or knee
- Be careful not to touch your hands and forearms while entering the operating room or while putting on gloves
- The first hand washing of the day should last at least five minutes; subsequent hand washings should take at least three minutes if no septic operations have been conducted

(Roosevelt Hospital 2008, San Juan de Dios General Hospital 2008)

## Item Notes

1. Easy access to sinks will allow clinicians and health care workers to clean their hands immediately before and after patient contact. Health care personnel are more likely to use sinks if they are within immediate or easy reach. It is most desirable for a sink to be shared by no more than four patient beds, and ideally there would be one sink per patient bed, especially in critical care areas.

2. Microorganisms can live and multiply in stagnant water. Scooping water, probably with a ladle, can mean that the ladle is likely set down on a surface that may be contaminated between uses, and the ladle inserted in the water for the next use. Pouring is cleaner because nothing has been inserted into the water. Freely flowing water inhibits the growth of microorganisms and will prevent hands from being re-exposed to pathogens. Flowing water

may be delivered by a cistern or container with gravity flow or through pipes from a distant source.

4. The use of soap has been shown to reduce debris and microorganisms from hands. Soap is especially effective when hands are vigorously scrubbed beneath flowing water. Bars of soap that sit in a pool of water in a soap dish can become heavily contaminated, so if bar soap is used, there should be good drainage from the soap dish. Antimicrobial soap has inherent microbicidal activity and is especially preferred in intensive care units.

5. Because soap should be used before and after all patient encounters, an adequate supply should always be available.

6. Because liquid soap is dispensed before hands are clean, soap dispensers may become contaminated by microbes on the user's hands. The use of pump-dispensers can minimize or prevent contact with contaminated hands.

7. Microorganisms can live and grow in liquid soap. Even antimicrobial soaps can harbor bacteria. If containers are refilled without being completely emptied and cleaned first, bacteria in the residual soap may contaminate the entire container. To prevent contamination, soap dispensers should be emptied and thoroughly washed and dried before reuse.

8. Hands should be dried after washing to remove residual bacteria and minimize recolonization of infectious microorganisms. Acceptable methods include single-use paper and cloth towels and hot air driers. Towels should not be reused as they may become contaminated after each use.

9. Alcohol-based hand antiseptics are quick and convenient, and their proper use reduces hand flora more effectively than hand washing with soap. The alcohol content should be 60–90 percent. Unlike hand washing, alcohol-based antiseptics will not remove dirt or debris, so if any visible dirt or debris is present, hands should be washed with soap and dried before using an alcohol-based antiseptic. Emollients such as glycerine, propylene glycol, and sorbitol protect and soften skin and prevent irritation. The use of emollients improves compliance with alcohol-based hand antiseptics.

10. An adequate supply of alcohol-based antiseptics will ensure that proper hand hygiene can always be practiced. Easy availability will facilitate compliance with alcohol-based hand antiseptics. An adequate number of dispensers conveniently placed in a patient care area will facilitate compliance.

12. Hands must be cleaned immediately before and after every patient encounter. Hands must also be cleaned after contact with any potentially contaminated area or object. These include—

- Objects in contact with patients (i.e., dressings, catheters, and linens)
- Surfaces in clinical or laboratory areas
- Bathrooms, toilets, and latrines

Furthermore, gloves do not provide complete protection against the transmission of bacteria and viruses because the hands are easily contaminated in the process of glove removal and hands must be washed immediately after their removal.

15. Bacteria from patients can be recovered from a significant number of health care workers who wear gloves. Some hospital workers have contracted blood-borne pathogens, such as hepatitis B, from patients despite wearing gloves. Gloves may have microscopic defects, particularly if they are cleaned and reused. Thus, glove use *should not alter* hand-hygiene practices (washing and drying) in any way.

16. Skin irritation can occur when hands are frequently washed. The periodic use of hand lotions can prevent dermatitis and inhibit bacterial growth.

17. Bacteria can grow in hand lotion dispensers. The use of small, disposable containers will minimize colonization. Reusable containers should be emptied, thoroughly washed, and dried to eliminate residual bacteria before refilling.

## References

Management Sciences for Health/Strengthening Pharmaceutical Systems. 2008. Hand Hygiene Posters.

Nosocomial Infection Control Committee. 2008. *Prevention and Control Standards for Infectious Diseases Associated with Nosocomial Healthcare.* Roosevelt Hospital, Guatemala City, Guatemala.

Nursing Department. 2008. *Hand Washing Procedure.* San Juan de Dios General Hospital, Guatemala City, Guatemala.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

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**4. Rating**—

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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 18: INJECTIONS

These questions should be completed by the head doctor or nurse of the Medical and Surgical wards, Labor and Delivery area, and/or Surgical areas.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the double brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply.

### Injection Practices

The following questions focus on the use of needles and syringes for injections in your facility, including reprocessing.

1. How often do you use reprocessed needles for injections? (Mark one answer)

   [ ] Sometimes
   [ ] Usually
   [ ] Always
   [ ]2 Never

2. Do you use the same needle in multiple patients without formal reprocessing? (Mark one answer)

   [ ] Sometimes
   [ ] Usually
   [ ] Always
   [ ]3 Never

3. Are auto-disable needles available? (Mark one answer)

   [ ] Never
   [ ] Sometimes
   [ ]2 Usually
   [ ]2 Always

4. When drawing medications or vaccines from vials, do you swab the top of the vial with alcohol or alcohol-containing (e.g., tincture of iodine) disinfectant before puncturing with a needle?

   [ ] No
   [ ]1 Yes

5. Do you leave the needle sticking into multi-dose vials so that the solution can be withdrawn easily for multiple patients?

   [ ] Yes
   [ ]1 No

6. Do you use the same syringes in multiple patients without formal reprocessing? (Mark one answer)

[ ] Sometimes
[ ] Usually
[ ] Always
[ ]1 Never

7. Do you use glass ampoules that must be cracked open by hand?

[ ] Yes
[ ]1 No

8. Are ampoules cracked using sterile gauze to protect the hands and to keep the contents sterile?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 12

## Injection Policies and Education

These questions ask about your hospital's awareness of and adherence to the World Health Organization's (WHO) Safe Injection Global Network (SIGN) guidelines and staff education practices.

9. Do you follow the WHO's SIGN guidelines for safe use of needles?

[ ] No
[ ]2 Yes

10. Do you have routine training sessions to educate staff about safe injection practices?

[ ] No
[ ]1 Yes

**Assessment section total:** _____ **Possible section total:** 3

# INJECTIONS ANNOTATIONS

## Background

The World Health Organization (WHO) estimates that each year unsafe injection practices result in 80,000 to 160,000 new HIV-1 infections, 8 to 16 million hepatitis B virus (HBV) infections, and 2.3 to 4.7 million hepatitis C virus (HCV) infections worldwide. Together, these illnesses account for 1.3 million deaths. Even under the auspices of WHO regional immunization programs, an estimated 30 percent of immunization injections are administered with unclean, commonly reused syringes. And, more than 50 percent of injections of other medications are deemed unsafe, with rates as high as 90 percent in some immunization campaigns (Drucker et al. 2001, 1989)

## Item Notes

1. Needles are difficult to clean and sterilize or high-level disinfect. Reprocessing used needles represents an inappropriate reuse of disposables and can be responsible for infection. Wherever economically possible, disposable products should be used and safely disposed of after decontamination (Tietjen et al. 2003, Ch. 7-9).

2. Contaminated needles are responsible for injuries and the risk of transmitting life-threatening diseases. Several studies have documented that unsafe injection practices, such as using the same needle, syringe, or both for more than one injection, or using improperly processed syringes and needles, are responsible for transmitting HIV, HBV, and HCV (Drucker et al. 2001,1989).

3. Syringes with a reuse prevention feature (auto-disable) offer the highest level of safety for injection recipients. They should be considered for use where local data indicate that unsafe practices are particularly common. There are many types of auto-disable syringes, but the key feature of all of them is that they permit the syringe to be filled and emptied only once. Although they are similar to conventional syringes, most health workers will require training and practice in correctly filling them to avoid wasting medication, syringes, and needles (Tietjen et al. 2003, Ch. 7-11).

4. Before drawing medications or vaccines from vials, the top of the vial should be wiped with a cotton swab soaked in a 60–90 percent alcohol solution or other locally available disinfectant containing alcohol (Tietjen et al. 2003, Ch. 7-11).

5. The needle should not be left inserted in multi-dose vials. This practice provides a direct route for microorganisms to enter the bottle and contaminate the fluid between uses (Tietjen et al. 2003, Ch. 7-11).

6. Best infection control practices for intradermal, subcutaneous, and intramuscular injections recommend the use of a new, single-use injection device for each injection and for the reconstitution of each unit of medication. Syringes with a reuse prevention feature (auto-disable) offer the highest level of safety for injection recipients (Tietjen et al. 2003, Ch. 7). Several studies have documented that unsafe injection practices, such as using the same needle, syringe, or both for more than one injection or using improperly processed syringes

and needles, are responsible for transmitting HIV, HBV, and HCV (Drucker et al. 2001, 1989).

7. Pop-open ampoules should be selected rather than ampoules that require use of a metal file to open (WHO/SIGN 2003).

8. If using ampoules that require a metal file to open, fingers should be protected with a clean barrier (e.g., small gauze pad) when opening the ampoule (WHO/SIGN 2003).

9. When injections are medically indicated, they should be administered safely. A safe injection does not harm the recipient, does not expose the provider to any avoidable risk, and does not result in any waste that is dangerous for other people. Eliminating unnecessary injections is the highest priority for preventing injection-associated infections. These best practices are measures that have been determined through scientific evidence or expert consensus to most effectively protect patients, providers, and communities (WHO/SIGN 2003).

10. The three strategies for the safe and appropriate use of injections are (1) behavior change among patients and healthcare workers to decrease injection overuse and achieve injection safety; (2) availability of necessary equipment and supplies, and (3) management of waste sharps (WHO 2002).

### **References** (* = Copy on CD)

Drucker, E. M., P. G. Alcabes, and P. A. Marx. 2001. The Injection Century: Consequences of Massive Unsterile Injecting for the Emergence of Human Pathogens. *Lancet* 358(9297):1989–92.

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources*. Baltimore, MD: Jhpiego.

* World Health Organization (WHO). 2002. *Prevention of Hospital-Acquired Infections: A Practical Guide*. 2nd ed. WHO/CDS/CSR/EPH/2002/12. Geneva: WHO.

WHO, Safe Injection Global Network (SIGN). 2003. Department of Blood Safety and Clinical Technology Recommendations. *Guiding Principles to Ensure Injection Device Safety*. WHO/BCT/03.12. Geneva: WHO. <http://www.who.int/injection_safety/toolbox/docs/en/Guiding_Principle_Inj.pdf> (accessed Aug. 17, 2006).

## MODULE SCORING SHEET

Name of facility: _____

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| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 19: AIRWAY SUCTIONING

These questions should be completed by the head doctor or nurse for each clinical area where airway suctioning is performed.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply.

The following questions provide information about your facility's respiratory care practices. The questions cover airway suctioning fluids, changing of suction catheters, and general infection control practices to control the spread of nosocomial infections.

1. What type of fluid is instilled for airway suctioning? (Mark one answer)

[ ] Tap water
[ ] Distilled or filtered water
[ ] Sterile water
[ ] Non-sterile saline
[ ]1 Sterile saline

2. How is this fluid dispensed? (Mark one answer)

[ ] Single dose drawn from a multi-dose container
[ ]1 Commercially manufactured single dose vial
[ ]1 Locally made single dose vial
[ ]1 Container made for individual patient use and discarded or reprocessed at least daily

3. How frequently are airway suction catheters changed? (Mark the description that best applies)

[ ] Suction catheters not used
[ ] Approximately every day
[ ]1 Approximately once every shift
[ ]1 More frequently than once per shift

4. Are suction catheters and masks used for more than one patient without reprocessing?

[ ] Yes
[ ]2 No

5. Does the person performing suctioning wear gloves on one or two hands? If gloves are not worn, skip question 6.

[ ] Gloves not worn
[ ] Gloves worn on one hand
[ ]2 Gloves worn on two hands

6. If gloves are worn, are they sterile or not sterile? (Mark one answer)

[ ] Gloves not worn
[ ]1 Sterile reused surgical gloves
[ ]1 Not sterile, but clean (new) examination gloves
[ ]1 Both sterile and non-sterile

7. How frequently is there a sufficient supply of gloves for use during suctioning? (Mark answer that best applies)

[ ] Never
[ ] Sometimes
[ ] Usually
[ ]1 Always

8. How are suction catheters stored between uses? (Mark the answer that best applies)

[ ]1 In-line suctioning is available so no external storage is necessary
[ ] In a bottle containing sterile or distilled water
[ ] In a bottle containing filtered or tap water
[ ]1 In a paper or cloth wrap
[ ]1 Covered in a dry container
[ ] Uncovered container

9. If medication nebulizers are used, how often are they changed or reprocessed for use in the same patient? (Mark one answer)

[ ] Nebulizers not used
[ ]1 After every treatment
[ ]1 Approximately every day
[ ] Only changed for use in another patient

10. What type of cuff is used on endotracheal tubes? (Mark one answer)

[ ]1 Low pressure cuffs
[ ] High volume-low pressure cuffs

**Assessment total:** _____ **Possible total:** 12

## AIRWAY SUCTIONING ANNOTATIONS

### Background

Nosocomial (hospital-acquired) pneumonia is a major cause of infections, with a high mortality rate, and is expensive to treat. Most nosocomial pneumonias occur because of aspiration of bacteria growing in the back of the throat (oropharynx) or stomach. Intubation and mechanical ventilation greatly increase the risk of infection (Tietjen et al. 2003, 27-1).

### Item Notes

1, 2. If possible, only small containers of sterile saline solutions or boiled water, used only once and then replaced, should be used. Use of large containers of saline or other fluids for instillation or rinsing suction catheters should be avoided (Tietjen et al. 2003, 27-3).

4. Airway suction catheters should be decontaminated, cleaned, and high-level disinfected by boiling or steaming between patients (Tietjen et al. 2003, 27-3).

5. Gloves should be worn for handling respiratory secretions or objects contaminated with respiratory secretions of any patient (CDC 2004). The recommended practice is to wear gloves on both hands.

6, 7. Wear clean (new) examination gloves, or reused surgical gloves that have been high-level disinfected, and a protective face shield or mask when suctioning (Tietjen et al. 2003, 27-3).

9. Use only small nebulizer bulbs because nebulizers produce aerosols that can penetrate deep into the lungs. (Contaminated large-volume nebulizers have been associated with gram-negative pneumonia and should not be used.) To prevent small volume nebulizer bulbs from becoming contaminated, clean and dry them between uses, reprocess them daily (decontaminate, clean, and high-level disinfect by steaming or boiling) and use only with sterile fluids or boiled water (Tietjen et al. 2003, 27-3).

10. Adult endotracheal tubes have cuffs. Pediatric tubes generally do not except those used for large children and adolescents. Cuffs help prevent movement of secretions from the upper airway to the lower airway. Low pressure cuffs are less likely to cause ischemia.

### References (* = Copy on CD)

U.S. Centers for Disease Control and Prevention (CDC). 2004. Guidelines for Preventing Health-Care–Associated Pneumonia, 2003: Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. *MMWR* 2004:53(No. RR-3).

Emori, T.G., and R. P. Gaynes. 1993. An Overview of Nosocomial Infections, Including the Role of Microbiology Laboratory. *Clinical Microbiology Reviews* 6(4):428–42.

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources.* Baltimore, MD: Jhpiego.

## MODULE SCORING SHEET

Name of facility: _____

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Date completed: _____

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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

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| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 20: INTRAVENOUS CATHETERS

This module should be completed by the head doctor or nurse for each clinical area in the assessment where intravenous catheters are used.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply.

What is the name of this unit? _____

1. What proportion of patients in this unit receive peripheral intravenous catheters? (Mark one answer)

   [ ] None
   [ ] Some
   [ ] Most
   [ ] All

**If intravenous catheters are never used, skip the rest of this module**

2. What types of catheters are usually used for peripheral intravenous access? (Mark one answer)

   [ ] Short rigid metal catheters (“butterfly”)
   [ ]1 Short flexible polyethylene catheters (needle)

3. What type of skin antiseptic is used for inserting intravenous catheters? (Mark all that apply)

   [ ] None
   [ ] Thiomersal
   [ ] Benzalkonium chloride
   [ ]1 Chlorhexidine
   [ ]1 Iodine
   [ ]1 Iodophor (povidone-iodine)
   [ ]1 Alcohol
   [ ]1 Chlorhexidine + alcohol
   [ ]1 Iodine + alcohol

4. How often is there a sufficient supply of skin antiseptic for use during intravenous catheter insertion procedures? (Mark the answer that best applies)

   [ ] Never
   [ ] Sometimes
   [ ]1 Usually
   [ ]1 Always

5. What proportion of patients in this unit requires central venous catheters?

[ ] None
[ ] Some
[ ] Most

**If NONE, skip the rest of this module**

6. How often are noncommercial intravascular catheters used (e.g., feeding tubes or locally assembled catheters)? (Mark answer that best applies)

[ ]2 Never
[ ] Sometimes
[ ] Usually
[ ] Always

7. Which of the following intravascular catheters are routinely changed? (Mark all that apply)

[ ] No catheters routinely changed
[ ] Umbilical venous catheter
[ ] Umbilical artery catheter
[ ] Catheters inserted peripherally into an arm or leg vein and threaded into central veins (PICCs)
[ ] Percutaneous central venous catheter (e.g., inserted in subclavian, jugular, femoral vein)
[ ]1 Peripheral metal ("butterfly") or short Teflon®, polyethylene, or other plastic catheter changed after 72 hours
[ ]2 Peripheral metal ("butterfly") or short Teflon, polyethylene, or other plastic catheter changed within 72 hours

8. How often are intravenous catheters inserted by cut-down? (Mark number that best applies)

[ ]2 Never
[ ]1 Sometimes
[ ] Usually
[ ] Always

9. What type of dressing is used to cover the catheter insertion site? (Mark the most common)

[ ] None
[ ] No dressing used, covered, or secured with sterile tape
[ ] No dressing used, covered, or secured with non-sterile tape
[ ]1 Sterile gauze
[ ]1 Transparent dressing (specify type): _____
[ ]1 Sterile gauze covered with transparent dressing

10. What type of antimicrobial ointment or cream is applied to the site of insertion of an intravenous catheter? (Mark all that apply)

[ ] Bacitracin
[ ] Neomycin, polymyxin B, and bacitracin (Neosporin®)
[ ] Polysporin
[ ] Mupirocin
[ ] Iodophor
[ ]1 No ointment or cream used

11. Are intravenous catheters reprocessed for use in another patient?

[ ] Yes
[ ]2 No

**If intravenous catheters are used, complete all remaining questions in this module. Then complete the Sterilization and Disinfection: Equipment and Intravenous Fluids module**

12. What types of catheters are used for central venous access? (Mark all that apply)

[ ] Percutaneous, central venous catheter (CVC) (e.g., inserted into subclavian, jugular, or femoral vein)—stiff polyurethane
[ ] Umbilical venous/arterial catheter in newborn—stiff polyurethane

[ ]1 Percutaneous, CVC (e.g., inserted into subclavian, jugular, or femoral vein)—flexible Teflon, polyurethane
[ ]1 Umbilical venous/arterial catheter in newborn—flexible Teflon, polyurethane
[ ]1 Pliable plastic catheters inserted peripherally into an arm or leg vein and threaded into the central veins (PICCs)

13. What barriers are used for central venous catheter insertion? (Mark all that apply)

[ ] Non-sterile gloves
[ ] Mask
[ ] Hair cover (cap)
[ ] Small sterile drape
[ ]1 Sterile gloves
[ ]1 Gown (sterile or non-sterile)
[ ]1 Large sterile drape (such as used in surgery)

14. When the intravascular infusion system is disconnected at the site of a hub connection, is the inside of the connection cleaned with sterile water, sterile saline, or alcohol prior to reconnection?

[ ] No
[ ]1 Yes

15. When an injection is made into a port in the intravascular infusion system, is the port covering (e.g., latex membrane) cleaned with alcohol or an iodinated disinfectant?

[ ] No
[ ]1 Yes

16. When the intravenous infusion system is disconnected, are the ends placed in a sterile fluid?
[ ] No
[ ]1 Yes

**Assessment total:** _____ **Possible total:** 29*

*Possible total is 29 if all questions are answered, or less if some questions are skipped.

# INTRAVENOUS CATHETERS ANNOTATIONS

## Background

The use of intravascular devices, both venous and arterial, to deliver sterile fluids, medications, and nutritional products and for central monitoring of blood pressure and other hemodynamic functions, has increased dramatically during the past decade. The risk of infection associated with the use of intravascular devices can be reduced by following recommended infection prevention practices related to their insertion (e.g., the use of aseptic technique) and by better management of the device once it is in place. In many countries, poor infection prevention practices, such as infrequent hand washing or use of antiseptic hand rub, failure to use gloves, and failure to use maximal barrier precautions when inserting central intravenous catheters, often result in increased rates of local and systemic infections (Tietjen et al. 2003, 24-1).

## Item Notes

2. Teflon® or polyurethane catheters have been associated with fewer infectious complications than catheters made of polyvinyl chloride or polyethylene. Steel needles used as an alternative to catheters for peripheral venous access have the same rate of infectious complications as do Teflon catheters. However, the use of steel needles frequently is complicated by infiltration of intravenous (IV) fluids into the subcutaneous tissues, a potentially serious complication if the infused fluid is a vesicant. The use of steel needles should be avoided for the administration of fluids and medication that might cause tissue necrosis if extravasation occurs (CDC 2002).

3, 4. Clean skin should be disinfected with an appropriate antiseptic before catheter insertion and during dressing changes. Although a two-percent chlorhexidine-based preparation is preferred for central venous catheter insertion, tincture of iodine, an iodophor, or 70 percent alcohol can all be used (CDC 2002). Alcohol is an inexpensive, cost effective, efficacious antiseptic for cleaning skin for peripheral catheter insertion. Chlorhexidine is also highly effective. Iodine and iodophors are effective as well, but they must be allowed to dry before IV access is attempted.

6. Commercial catheters manufactured under strictly controlled antiseptic conditions are ideal for patient use. Locally produced/assembled catheters are more likely to be contaminated and may be more irritating to blood vessels, putting patients at risk of phlebitis and infection. Moreover, connections of locally produced and assembled administration systems may not fit well, allowing contamination of the system.

7. Do not routinely replace central venous or arterial catheters solely for the purposes of reducing the incidence of infection. Replace peripheral venous catheters at least every 72–96 hours in adults to prevent phlebitis. Leave peripheral venous catheters in place in children until IV therapy is completed, unless complications (e.g., phlebitis and infiltration) occur (CDC 2002).

8. Cutdown procedures for venous access put patients at extremely high risk of infection. Intraosseous catheter insertion is possible even in adult patients, and is a preferable route for

emergency intravascular access. If a cutdown or intraosseous procedure is necessary, this line should be replaced by a conventional, aseptically inserted central venous line as soon as possible.

9. Covering the catheter site with a transparent dressing, sterile gauze, or both, forms an effective barrier and allows caretakers to monitor the site for discharge or other evidence of infection.

10. Do not routinely apply prophylactic topical antimicrobial or antiseptic ointment or cream to the insertion site of peripheral venous catheters. Do not use topical antibiotic ointment or creams on insertion sites (except when using dialysis catheters) because of their potential to promote fungal infections and antimicrobial resistance (CDC 2002).

11. Reuse of IV catheters and tubing is dangerous because it puts patients at risk of acquiring blood-borne pathogens, such as HIV or hepatitis B, from a previous patient. Furthermore, defects can arise in catheters and tubing that can cause mechanical dysfunction or bacterial contamination. Thus, IV materials should be discarded after each use.

12. Stiff catheters confer higher risk of venous thrombosis and infection. The risk of these complications is lower with flexible intravascular catheters.

13. Use aseptic technique including the use of a cap, mask, sterile gown, sterile gloves, and a large sterile sheet for the insertion of CVCs (including PICCS) or guidewire exchange (CDC 2002).

14, 15. Clean injection ports with 70 percent alcohol or an iodophor before accessing the system (CDC 2002).

## **References** (* = Copy on CD)

U. S. Centers for Disease Control and Prevention (CDC). 2002. Guidelines for the Prevention of Intravascular Catheter Related Infections. *MMWR* 2002;51(No. RR-10):1–29.

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources.* Baltimore, MD: Jhpiego.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 21: INTRAVENOUS FLUIDS AND MEDICATIONS

This module should be completed by the head doctor or nurse for each unit where intravenous fluids and medications are used.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply.

What is the name of this unit? _____

### Preparation of Intravenous Fluids and Medications

These questions provide contextual information for understanding the use of intravenous (IV) fluids and medications in your hospital, including the preparation of IV fluids, handling and changing infusion tubing, and procedures for using single or multi-dose vials of injectable fluids.

1. Where are standard IV fluids used in this unit admixed (e.g., addition of KCL)? (Mark the description that applies best)

   [ ] Where patient care is performed
   [ ]2 In the pharmacy
   [ ]1 In a designated "clean" area (e.g., within the operating room area, ICU, or in a room specifically designated for this purpose).

2. What is the source of premixed IV fluids available in this unit? (Mark all that apply)

   [ ] None are used
   [ ] Prepared on ward
   [ ]2 Commercial source
   [ ]1 Prepared centrally in facility

3. How frequently is commercial IV infusion tubing available with connections that are compatible with the bottles or bags used in this unit? (Mark one answer)

   [ ] Never
   [ ] Sometimes
   [ ]1 Usually
   [ ]2 Always

4. How frequently is IV infusion tubing changed in this unit for each of the following? (Mark one check box in each column)

| Infusion tubing is changed: | Blood products | Total parenteral nutrition fluids | Dextrose/saline fluids |
|---|---|---|---|
| When infusion is complete | [ ]1 | [ ]1 | [ ] |
| Every 12–24 hours | [ ] | [ ] | [ ] |
| Every 48 hours | [ ] | [ ] | [ ] |
| Every 72 hours | [ ] | [ ]1 | [ ]1 |
| More than 72 hours | [ ] | [ ] | [ ] |
| When IV is discontinued | [ ] | [ ] | [ ] |

5. How frequently are single-dose vials used for injectable fluids/medications? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ]2 Usually
[ ]2 Always

6. When multi-dose vials are used for injectable fluids/medications, how often do they have rubber, silicon, or latex diaphragms? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]2 Always

7. If vials with latex/silicon diaphragms are used, is the diaphragm disinfected with alcohol or iodinated disinfectant prior to access?

[ ] No
[ ]1 Yes

8. Is there a written hospital policy for handling and storage of multi-dose vials? If not, skip question 9.

[ ] No
[ ]2 Yes

9. Does the policy state that opened vials should be marked with the date and time of expiration? (Mark one answer)

[ ] No policy
[ ] No
[ ]1 Yes

10. Are medications manufactured or intended for use in a single patient used for multiple patients?

[ ] Yes
[ ]2 No

**Assessment total:** _____ **Possible total:** 20

## INTRAVENOUS FLUIDS AND MEDICATIONS ANNOTATIONS

### Background

It is estimated that about 50 percent of all patients admitted to hospitals will receive intravenous therapy, creating a large population at risk for local and systemic blood stream infections. Catheters inserted into the venous and arterial bloodstream bypass the normal skin defense mechanism; therefore, these devices provide a way for microorganisms to enter the bloodstream at the time of insertion through several routes—from the device at the time of insertion; from subsequent contamination of the device or attachments (e.g., tubing connected to the blood monitoring apparatus or the fluids being administered); or from pathogens on the skin surrounding the insertion site (Tietjen et al. 2003, 24-1).

### Item Notes

1, 2. All routine parenteral fluids should be admixed in the pharmacy in a laminar-flow hood using aseptic technique (CDC 2002, 15). Where laminar-flow hoods are not available, choose a clean, separate area in the pharmacy; or if there is no pharmacy, admix in a similar area near the point of care.

3. All components of the IV infusion system should be compatible to minimize leaks and breaks in the system (CDC 2002, 15).

4. Infusion tubing used to administer blood, blood products, or lipid emulsions should be replaced within 24 hours. If the solution contains only dextrose and amino acids, the administration set does not need to be replaced more frequently than every 72 hours or when the IV is disconnected. Also, infusion sets should be changed whenever they are damaged (CDC 2002, 11).

5. To prevent contamination of injection equipment and medication, single-dose vials are recommended rather than multi-dose vials (WHO/SIGN 2001).

7. If multi-dose vials are used, the access diaphragm should be cleaned with a 70 percent alcohol solution before inserting a device into the vial. Sterile devices must be used to access a multi-dose vial, avoiding touch contamination of the device before penetrating the access diaphragm. Multiple dose vials should be discarded if sterility is compromised (CDC 2002, 11).

8. Up-to-date policies and procedures for compounding and storage of sterile products should be written and available to all personnel involved in these activities. When policies and procedures are changed they should be updated, as necessary, to reflect current standards of practice and quality (ASHP 2000).

9. All sterile products should bear an appropriate expiration date. The expiration date assigned should be based on currently available drug stability information and sterility considerations (ASHP 2000).

10. Single-use vials are frequently preservative-free and pose a risk for contamination if they are punctured several times. Leftover contents of single-use vials ideally should be discarded, and should not be saved for later use (CDC 2002, 11).

## **References** (* = Copy on CD)

American Society of Hospital Pharmacists (ASHP) Council on Professional Affairs. 2000. ASHP Guidelines on Quality Assurance for Pharmacy-Prepared Sterile Products. *American Journal of Health-System Pharmacy* 57(12):1150–69.

U.S. Centers for Disease Control and Prevention (CDC). 2002. Guidelines for the Prevention of Intravascular Catheter-Related Infections. *MMWR* 2002;51(No. RR-10):1–26.

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources.* Baltimore, MD: Jhpiego.

World Health Organization (WHO), Safe Injection Global Network (SIGN), International Council of Nurses. 2001. *Best Infection Control Practices for Skin-Piercing Intradermal, Subcutaneous, and Intramuscular Needle Injections*. Geneva: WHO.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

## MODULE 22: URINARY CATHETERS

These questions should be completed by the head doctor or nurse for each clinical area in the assessment where urinary catheters are used.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply. Questions that are intended to provide contextual information only are not scored.

What is the name of this unit? _____

### Types of Catheter Used in this Unit

These questions provide contextual information about the use of urinary catheters in your hospital.

1. Are straight (i.e., "in-out," no indwelling) urinary catheters used in this unit?

[ ] No
[ ]1 Yes

2. Are straight urinary catheters reused?

[ ] Straight urinary catheters are never used
[ ] Yes, they are reused
[ ]1 No, they are not reused

3. How frequently are indwelling urinary catheters used in this unit? (Mark one answer)

[ ]2 Never
[ ]1 Only occasionally
[ ] Frequently
[ ] Always

**Assessment section total:** _____ **Possible section total:** 4

## Procedures for Use of Indwelling Urinary Catheters

The following questions examine indicators for use of indwelling urinary catheters, as well as procedures for changing and reuse, and movement of patients.

4. What are the indications for using indwelling urinary catheters? (Mark all that apply)

[ ]1 Urine drainage during surgery and immediate post-operative period
[ ]1 Acute urethral obstruction
[ ]1 Monitor urine output in critically ill patients
[ ] To obtain urine specimens
[ ] Incontinence
[ ] Routine irrigation
[ ]1 Irrigation for bleeding or blood clots
[ ] Prevent/manage bedsores
[ ] Clamped or plugged catheters

5. What types of indwelling urinary catheters are used? (Mark all that apply)

[ ] Feeding tube
[ ]1 Commercially manufactured indwelling urinary catheter impregnated with antimicrobials (e.g., silver)
[ ]1 Commercially manufactured indwelling urinary catheter without antimicrobials

6. Is the supply of indwelling urinary catheters adequate and reliable? (Mark one answer)

[ ] Never
[ ] Sometimes
[ ]1 Usually
[ ]1 Always

7. Is there is a policy to routinely change indwelling urinary catheters?

[ ] Yes
[ ]1 No

8. How frequently are indwelling urinary catheters reused?

[ ]2 Never
[ ]1 Sometimes
[ ] Usually
[ ] Always

9. What are the indications for opening an indwelling catheter system? (Mark all that apply)

[ ] Routine irrigation
[ ] Obtaining urine for analysis or culture
[ ]1 Not draining
[ ]1 Irrigation for bleeding/clots
[ ]1 Never opened

10. If a urine sample must be obtained from a patient with an indwelling urinary catheter for analysis or culture, how is this accomplished? (Mark all that apply)

[ ] Disconnection of catheter from collection tubing
[ ] From collection container
[ ]1 Aspirate through special aspiration port
[ ]1 Aspirate through catheter or collection tubing

**Assessment section total:** _____ **Possible section total:** 15

## Procedures for Insertion and Maintenance of Urinary Catheters

The following questions look at your procedures for insertion and maintenance of urinary catheters.

11. Do personnel usually wear gloves when they insert the urinary catheters? (Mark the answer that best applies)

[ ] No gloves are worn
[ ] Non-sterile gloves
[ ]2 Sterile gloves

12. What type of antiseptic is usually used to prepare the urinary catheter insertion area? (Mark one answer)

[ ] Benzalkonium chloride
[ ] Plain soap and non-sterile water (no antiseptic used)
[ ] Plain soap and sterile water (no antiseptic used)
[ ]1 Chlorhexidine
[ ]1 Iodine
[ ]1 Iodophor (povidone iodine)
[ ]1 Alcohol
[ ]1 Chlorhexidine and alcohol
[ ]1 Iodine and alcohol

13. Is antimicrobial ointment or cream applied to the meatus at the urinary catheter insertion site?

[ ] Yes
[ ]1 No

14. Are antiseptics or antimicrobial agents routinely added to urinary drainage bags?

[ ] Yes
[ ]1 No

15. Where does the bag generally hang during use?

[ ] Same level as patient
[ ]1 Below the bed

16. Is the urinary drainage system a closed or open system?

[ ] Open system (i.e., drains into an open bottle)
[ ]2 Closed system (i.e., drains into a closed container or bag)

17. If the system is closed, are the indwelling catheter and the drainage system compatible (i.e., fit snugly at the connection)?

[ ] No
[ ]1 Yes

18. When patients are moved, what is usually done with the urine collection system? (Mark one answer)

[ ] Disconnected from the urinary catheter
[ ] Kept connected with bag placed on bed/stretcher or wheelchair
[ ]1 Kept connected with bag left hanging below level of patient's bladder

**Assessment section total:** _____ **Possible section total:** 10

# URINARY CATHETERS ANNOTATIONS

## Background

Urinary tract infections (UTIs) are the most common type of nosocomial infections, accounting for 40 percent of all infections in hospitals each year. Several studies have reported that about 80 percent of nosocomial UTIs occur following instrumentation, primarily catheterization. Because nearly 10 percent of all hospitalized patients are catheterized, preventing UTIs is a major factor in decreasing nosocomial infections (Tietjen et al. 2003, 22-1).

## Item Notes

1, 2. Where resources are limited, the reuse of disposable straight and indwelling catheters and drainage tubing is acceptable if the recommended infection control practices are followed for decontamination, cleaning, and disinfection (i.e., by boiling or steaming) and air drying the devices in a high-level disinfected container (Tietjen et al. 2003, 22-2).

3. Urethral catheters should be avoided unless there is a compelling indication (WHO 2002, 38).

4. Generally, urinary catheterization is indicated to relieve urinary tract obstruction, to permit urinary drainage in patients with neurogenic bladder dysfunction and urinary retention, to aid in urologic surgery or other surgery on contiguous structures, and to obtain accurate measurements of urinary output in critically ill patients. Urinary catheterization should be discouraged as a means of obtaining urine for culture or certain diagnostic tests such as urinary electrolytes when the patient can voluntarily void or as a substitute for nursing care in the incontinent patient (Wong 1983). Loss of control (incontinence) or inability to void (retention) may be managed better by straight (in and out) catheterization several times daily rather than by putting in an indwelling catheter. In addition, some patients can be trained to catheterize themselves for long-term care and can clean and high-level disinfect their own catheter by steaming it in a rice cooker or boiling it in a pot (Tietjen et al. 2003, 22-4).

5. Silver is a highly effective antibacterial substance that can be applied to various types of catheters. Silver-coated urinary catheters may be beneficial in preventing UTIs. Using a silver alloy catheter could be considered in patients at high risk for complications of catheter-associated bacteriuria (Saint et al. 1999).

7. Indwelling catheters should not be changed at arbitrary fixed intervals (Wong 1983).

8. See annotations 1 and 2.

9. The catheter and drainage tube should not be disconnected unless the catheter must be irrigated. Irrigation should be avoided unless obstruction is anticipated (e.g., as might occur with bleeding after prostatic or bladder surgery) (Wong 1983).

10. If small volumes of fresh urine are needed for examination, the distal end of the catheter, or preferably the sampling port if present, should be cleansed with a disinfectant, and urine

then aspirated with a sterile needle and syringe. Larger volumes of urine for special analyses should be obtained aseptically from the drainage bag (Wong 1983).

11. Sterile gloves should be worn for insertion of urinary catheters (WHO 2002, 39).

12. Two percent chlorhexidine gluconate with alcohol or 10 percent povidone-iodine solution are preferred (if available) as antiseptic solutions for insertion of urinary catheters (Tietjen et al. 2003, 22-4).

13. Applying topical antibiotics to the perineal area (the urethra for women and the head of penis for men) does not reduce the risk of catheter-associated UTIs (Tietjen et al. 2003, 22-8).

14. Bladder irrigation and antibacterial instillation in the drainage bag have not been clearly shown to prevent bacteriuria and should not be used (Saint et al. 1999).

15. The collection bag should not be raised above the level of the bladder (Tietjen et al. 2003, 39).

16, 17. The catheter collection system should remain closed and should not be opened unless absolutely necessary for diagnostic or therapeutic purposes (Tietjen et al. 2003, 39).

18. Raising the collection bag above the level of the bladder should be avoided. If it becomes necessary to raise the bag above the level of the patient's bladder during transfer of the patient, the tubing should be clamped and all urine should be drained from the tubing into the bag before the patient stands up (Tietjen et al. 2003, 37).

## **References** (* = Copy on CD)

Saint, S., and B. A. Lipsky. 1999. Preventing Catheter-Related Bacteriuria. Should We? Can We? How? *Archives of Internal Medicine* 159(8):800–808.

* Tietjen, L., D. Bossemeyer, and N. McIntosh. 2003. *Infection Prevention: Guidelines for Healthcare Facilities with Limited Resources.* Baltimore, MD: Jhpiego.

Wong, E. S. 1983. CDC Guideline for Prevention of Catheter-Associated Urinary Tract Infections. *American Journal of Infection Control* 11(1):28–36. http://www.cdc.gov/ncidod/dhqp/gl_catheter_assoc.html

* World Health Organization (WHO). 2002. *Prevention of Hospital-Acquired Infections: A Practical Guide*. 2nd ed. WHO/CDS/CSR/EPH/2002/12. Geneva: WHO.

## MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

| Module Section | 1<br>Assessment Total | 2<br>Possible Total | 3<br>Percent Score | 4<br>Rating Based on Percent Score |
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*Column Notes*:

**1. Assessment Total**—Sum of points for all marked responses

**2. Possible Total**—Sum of all possible points for the question

**3. Percent Score**—(Column 1/Column 2) × 100

**4. Rating**—

| | |
|---|---|
| **More than 75%** of possible points: | A—recommended practices are followed consistently and thoroughly |
| **50–75%** of possible points: | B—recommended practices usually followed |
| **Less than 50%** of possible points: | C—training and follow-up needed on recommended practices |

# Part II: Infection Control Assessment Tool Checklists

## CHECKLIST 1: FACILITY CHECKLIST FOR HAND HYGIENE FACILITIES AND SUPPLIES

Facility: _____ Ward/area: _____

Date: _____ Time: _____

For each hand washing station, provide an answer in the space below or mark the answer that best describes the current situation by putting an "X" through the circle in front of the appropriate response(s).

1. How many beds are there in the ward/area? _____

2. How many patients are there in the ward/area? _____

3. How many health care workers are there in the ward/area currently? *(Please include nurses, doctors, nurses' aides, etc.)*
   _____

4. Is there a hand washing station in the ward or area? (If NO, skip questions 5–9)
   - ○ Yes
   - ○ No (stop, go to a different ward or area)

5. If YES, what type of hand washing station is it?
   - ○ Regular bowl, tank, or container with water
   - ○ Sink with running water tap
   - ○ Station with gravity-flow running water

6. Is there running water currently available at the station?
   - ○ Yes
   - ○ No

7. Is there soap available at the station? (if NO, skip question 8)
   - ○ Yes
   - ○ No (go to question 9)

8. If soap is available, what kind of soap is it?
   - ○ Bar without rack
   - ○ Bar with rack
   - ○ Liquid soap in a container (plastic bottle or on the wall)
   - ○ Flake, leaf, powder soap, etc.

9. Are paper towels available to dry hands?
   - ○ Yes
   - ○ No

10. Is there alcohol hand antiseptic currently available in the ward/area? (If NO, skip questions 11 and 12)
    - ○ Yes
    - ○ No (end of survey)

11. If YES, how many full bottles are there? (disregard open or partially used bottles)
    _____

12. Is the antiseptic easily accessible to everyone working in the ward?
    - ○ Yes
    - ○ No

## CHECKLIST 2: FACILITY CHECKLIST FOR HAND HYGIENE PRACTICES

Facility: _____ Ward/area: _____ Date: _____

For **each** observation, choose the answer that best describes the situation by marking the applicable box with an "X" in the appropriate column. **Use the same sheet for the ward for as many observations as possible.** At the end of the sheet, add up the total of each column.

| **Patient Contact Number** | **Type of Health Worker** | | | **Type of Patient Contact** | | **Type of Hand Hygiene before Patient Contact** | | | **Type of Hand Hygiene after Patient Contact** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Doctor | Nurse | Other | Invasive | Non-invasive | Hand washing | Alcohol rub | None | Hand washing | Alcohol rub | None |
| 1 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ |
| 2 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ |
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| 15 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ |
| **Total** | | | | | | | | | | | |
| **% ([Total # of Xs in each column/Total # of Encounters]X100)** | ___% | ___% | ___% | ___% | ___% | ___% | ___% | ___% | ___% | ___% | ___% |

## CHECKLIST 3: FACILITY CHECKLIST FOR HAND WASHING STATION SUPPLIES

**NAME OF FACILITY:** _____ **DATE:**_____

For each observed sink, mark **YES if you agree** with the statement at the top of each column and **NO if you disagree**.

| | **Is the sink in good condition?** | | **Is running water available?** | | **Is liquid soap available?** | | **Was a new soap dispenser used or the old one washed and dried before being refilled?** | | **Are paper towels, individual towels, or an electric hand dryer available?** | | **All Components: Mark YES only if all columns are marked YES, and NO if any column is marked NO.** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **yes** | **no** | **yes** | **no** | **yes** | **no** | **yes** | **no** | **yes** | **no** | **yes** | **no** |
| Sink 1 | | | | | | | | | | | | |
| Sink 2 | | | | | | | | | | | | |
| Sink 3 | | | | | | | | | | | | |
| Sink 4 | | | | | | | | | | | | |
| Sink 5 | | | | | | | | | | | | |
| Sink 6 | | | | | | | | | | | | |
| Sink 7 | | | | | | | | | | | | |
| Sink 8 | | | | | | | | | | | | |
| Sink 9 | | | | | | | | | | | | |
| Sink 10 | | | | | | | | | | | | |
| Sink 11 | | | | | | | | | | | | |
| Sink 12 | | | | | | | | | | | | |
| Sink 13 | | | | | | | | | | | | |
| Sink 14 | | | | | | | | | | | | |
| Sink 15 | | | | | | | | | | | | |
| Sink 16 | | | | | | | | | | | | |
| Sink 17 | | | | | | | | | | | | |
| Sink 18 | | | | | | | | | | | | |
| Sink 19 | | | | | | | | | | | | |
| Sink 20 | | | | | | | | | | | | |
| **% of sinks fulfilling all the criteria** | | | | | | | | | | | | |

## CHECKLIST 4: FACILITY CHECKLIST FOR CORRECT HAND WASHING

For each observation, mark **YES if you agree** with the statement at the top of each column and **NO if you disagree**.

| No | Criteria | | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Obser-vation** | **Category of staff washing hands (D = doctor, N = nurse, O = other)** | | | **Are hands free of jewelry and other accessories?** | | **Are sleeves above the elbow?** | | **Is liquid soap applied?** | | **Does the hand washing process include rubbing hands together and rubbing palms and backs of hands, fingers, spaces between fingers, and wrists?** | | **Are hands rinsed with sufficient running water?** | | **Dry hands with paper towel, individual towel, or electric hand dryer.** | | **Avoid recontam-ination of hands when switching of the tap.** | | **Wash hands for no less than 30 seconds.** | | **All Compon-ents: Mark YES only if all columns are marked YES, and NO if any column is marked NO.** | |
| | D | N | O | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| 1 | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | |
| **% of observations fulfilling all the criteria** | | | | | | | | | | | | | | | | | | | | | |

## CHECKLIST 5: FACILITY CHECKLIST FOR SINKS

For each observed sink, mark **YES if you agree** with the statement at the top of each column and **NO if you disagree**.

| | **The sink is clean.** | | **The taps are not leaking.** | | **The drainage pipes are not leaking.** | | **Running water is available all the time.** | | **All Components: Mark YES only if all columns are marked YES, and NO if any column is marked NO.** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** |
| Sink 1 | | | | | | | | | | |
| Sink 2 | | | | | | | | | | |
| Sink 3 | | | | | | | | | | |
| Sink 4 | | | | | | | | | | |
| Sink 5 | | | | | | | | | | |
| Sink 6 | | | | | | | | | | |
| Sink 7 | | | | | | | | | | |
| Sink 8 | | | | | | | | | | |
| Sink 9 | | | | | | | | | | |
| Sink 10 | | | | | | | | | | |
| Sink 11 | | | | | | | | | | |
| Sink 12 | | | | | | | | | | |
| Sink 13 | | | | | | | | | | |
| Sink 14 | | | | | | | | | | |
| Sink 15 | | | | | | | | | | |
| Sink 16 | | | | | | | | | | |
| Sink 17 | | | | | | | | | | |
| Sink 18 | | | | | | | | | | |
| Sink 19 | | | | | | | | | | |
| Sink 20 | | | | | | | | | | |
| **% of sinks fulfilling all the criteria** | | | | | | | | | | |

## CHECKLIST 6: FACILITY CHECKLIST FOR INJECTION ADMINISTRATION

Facility: _____ Ward/area: _____ Date: _____

Circle the appropriate code (see below) in each column. Tally the number of Y or NA for each column (see below) and calculate the percentage. **Use the same sheet for as many observations as possible.**

| Patient Encounter # | Person Giving Injection | Was Hand Hygiene Practiced before Injection?* | Were Sterile Needle and Syringe Used? | Was the Vial Disinfected with Alcohol? | Was Sterile Cotton or Gauze Used to Break the Ampoule** | Is there Closed Storage of Multidose Vial after Use?† | Were Clean, Single-Use Gloves Used for IV Injection?‡ | Were the Skin and IV Port Disinfected with Alcohol? | Were Sharps Disposed of in a Yellow Sharps Container? | Was Hand Hygiene Practiced after Injection was Administered?* | All Components: If all columns are Y or NA, mark Y; if any column is N, mark N |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 2 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 3 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 4 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 5 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 6 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 7 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 8 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 9 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 10 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 11 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 12 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 13 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 14 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 15 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 16 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 17 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 18 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 19 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 20 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| 21 | D N O | Y N | Y N | Y N NA | Y N NA | Y N NA | Y N NA | Y N | Y N | Y N | Y N |
| | | | | | | | | | | | |
| | % | % | % | % | % | % | % | % | % | % | % |

D = doctor, N = nurse, O = other; * Record Y for hand hygiene if either hand washing with soap and water or use of alcohol hand rub was practiced; ** Record NA if medication used was not from an ampoule (or was from a vial); † Record NA if multidose vial was not used; † and ‡ NA is equivalent to Y when determining the tally and calculating the percentage.

## CHECKLIST 7: FACILITY CHECKLIST FOR WASTE DISPOSAL AFTER DELIVERY

Facility: _____ Ward/area: _____ Date: _____

Circle the appropriate code (see below) in each column. Tally the number of Y responses for each column and calculate the percentage.

| | Was the Placenta Disposed of in a Bucket? | | Were Sharps Disposed of in a Yellow Sharps Container? | | Were Gloves Disposed of in a Red Container for Contaminated Materials? | | Were Swabs and Other Contaminated Materials Disposed of in a Red Container for Contaminated Materials? | | Were Noncontaminated Materials Disposed of in a Container Designated for General Waste? | | If All Columns are Y, Mark Y; If Any Column is N, Mark N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 2 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 3 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 4 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 5 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 6 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 7 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 8 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 9 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 10 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 11 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 12 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 13 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 14 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 15 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 16 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 17 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 18 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 19 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 20 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 21 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 22 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 23 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 24 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| 25 | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| | | | | | | | | | | | | |
| | | % | | % | | % | | % | | % | | % |

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