Infection prevention and control in patient care

Based on the 2017 recommendation from the American Academy of Pediatrics.

CONTENTS

I. EDITORIAL

The protocol, issued of Semmelweis University, is intended to adapt to the local clinical practice the patient infection prevention and control guidelines published periodically by the American Academy of Pediatrics in 2017.

The purpose of the guidelines is to reduce the transmission capacity of infectious agents and to prevent outbreaks of infections within outpatient care by using the methods detailed.

II. SCOPE OF EFFECT

Patients concerned by the internal guidelines are patients and their companions who seek outpatient care, regardless of their age and gender; and health professionals working in outpatient / inpatient care.

The target **user-groups of the guidelines are health care professionals and patients within the institutional outpatient care and outpatient / inpatient and emergency care.**

III. INTRODUCTION

For the first time in 2007, the American Academy of Pediatrics published its biennial infection prevention and control policy guidelines for patient care.

Hospital treatment recommendations from the Centers for Disease Control and Prevention can also be applied to patient specialist care.

The guidelines emphasize the use of hand hygiene, quarantine, cough hygiene, the use of personal protective equipment (gloves, hats, masks, goggles) and, in certain cases, the use of dispensable gloves, and the use of appropriate sterilization, disinfection and antisepsis.

This update emphasizes the importance of **vaccination** and optimization of **isolation**.

Ways to transmit infections

Direct transmission

Infection transmitted by direct physical contact between patient and health care professional (eg handshake, physical examinations, bathing, body exudation, etc.). Such transmission include, for example, infections caused by *Staphylococcus aureus*, Gram negative bacterial strains, HAV, HBV and HIV.

Indirect transmission

Infections (eg *Acinetobacter spp*., *Stenotrophomonas maltophilia*, *Salmonella spp., Pseudomonas spp*.) can be transmitted passively by an intermediary surface (eg stethoscope and other medical devices, door-handle, waiting room equipment).

Droplet Infections

Within a distance of 1-1.5 meters between a patient and a health care professional; infections are transmitted by large droplets (> 5 μm) during coughing, sneezing, talking and respiratory tract suction (eg: *Staphylococcus auerus, Neisseria meningitidis*, Influenza and Adenoviruses).

Respiratory transmission

Long-range infections travelling in air by droplets smaller than 5 μm. These include *Mycobacterium tuberculosis*, SARS-coronavirus and VZV infections.

IV. PROFESSIONAL DETAILS OF RECOMMENDATIONS

Hand Hygiene

The simplest, most easily accessible and feasible, and the most effective way to prevent the spread of infections. **According to the recommendation of the World Health Organization, there are 5 aspects of hand hygiene:** hand hygiene before touching a patient, before aseptic intervention, after exposure to secretions, after touching the patient and after touching the patient's environment. (***Appendix 3***)

It is important to **regularly and thoroughly clean the hand hygiene areas**.

Hand washing

Hand washing and hand disinfection are recommended before starting work.

If the hand gets contaminated by visible dirt, spore infection (eg *Clostridium difficile*) or if the chance of getting in **contact with certain viruses** (eg Norovirus) arises, or after using the toilet, the recommendation is to **wash hands with a liquid soap**. (***Appendix 4***) In other cases, **hand disinfection with an alcohol-based disinfectant** is also appropriate to **maintain good hand hygiene**.

Alcohol-based hand disinfectants

A quick, convenient, easy-to-reach hand hygiene method. It has a high microbial inactivation effect if the appropriate amount, exposure time and technique is used. Compared to regular hand washing with soap, its repeated use dries skin less. (***Appendix 5***)

Before invasive interventions

Before invasive procedures, it is recommended to use alcohol-based surgical detergent or antimicrobial soap (two-phase hand sanitizer) for 2-6 minutes after washing the hands with soap. It is recommended to cut the nails and use nail cleansing sticks.

The use of protective equipment

Gloves

Its use protects healthcare workers from direct contact infections and can reduce the germ load on the hands of the care personnel. Its use is necessary before invasive interventions and when there is a possibility of contamination by infectious agents.

However, it is important to note that **the use of gloves is not a substitute for hand disinfection**, since gloves, depending on their material, are permeable and do not prevent the transmission of pathogens.

The use of protective gloves is not required when changing a healthy child's diapers, wiping the nose or eyes of a healthy child, or when administering vaccines.

The importance of **conscious use of gloves** cannot be overemphasized: at the end of the intervention, used gloves should be placed in the appropriate disposal container immediately.

Mask

It can be used to protect health care staff and patients (eg in case of transplant patients, staff illness). It is recommended when there is a possibility of Influenza virus or *Bordatella pertussis* infection. Using masks the right way is often a financial problem and it is less effective for young children.

Hat, goggles

Recommended for invasive procedures to protect health care personnel from contamination.

Preventing needlestick injuries

Proper education of health professionals is a key to preventing needlestick accidents. Avoid risky operations (refitting the cap, bending, breaking, etc.) and the use of safety products and disposables specifically for the purpose of blood sampling is recommended. It is important that the disposal containers are handled appropriately.

Illness of the care staff

Respiratory illnesses of health workers alone do not indicate exclusion, but the **use of a mask and improved hand hygiene** are recommended. **It is not recommended to work in the case of a constantly runny nose, sniffing or coughing attacks**. Active laryngeal and / or pulmonary TBC justifies exclusion from health care work until a negative return-to-work test. (***Appendix 6***)

Immunisation – vaccinations (*Appendix 7*)

Vaccination against hepatitis B

Healthcare workers should have adequate protection against HBV.

Vaccination against Influenza

Voluntary vaccinations are available free of charge in order to secure the individuals against the risk of disease and this option is especially recommended for health care professionals due to the possible transmission of the infection to high-risk groups.

Vaccination against diphtheria

Employees of microbiological laboratories and employees who work at the infectious wards or who handle or process any test materials of human origin are required to be vaccinated against diphtheria if the person who received the mandatory diphtheria vaccine was vaccinated more than 10 years ago. There are combined vaccines available for immunization that contain diphtheria toxoid.

Vaccination against meningococcal disease

The risk of exposure of health care workers to infection is not higher than that of the general population. However, vaccination is recommended for those who participate in the regular treatment of patients with Meningococcal meningitis (e.g.: employees of an intensive care unit).

Varicella

Employers should provide the VZV vaccination to those employees who are susceptible to the disease, such as employees who take care of newborns and infants.

In relation to the vaccinations the 2016 Methodological Letter of the National Center for Epidemiology on Vaccines is applicable in addition to the recommendations of the protocol.

V. SUGGESTIONS FOR USE OF RECOMMENDATIONS

In addition to the above, the following recommendations for outpatient care should be kept:

Waiting rooms

We recommend that the waiting rooms should have smaller boxes that are designed to separate patients at least 1 meter from each other, according to the peculiar conditions of the room. The number of companions / relatives of patients should be limited.

Patients who are suspected to be infected should be escorted directly to the examination room and **the formation of crowds should be avoided by reducing the waiting time.**

Visual and written guides such as how people should cough in a public place (***Annex 8.)*** are an important part of education.

(Annex I) and proper respiratory hygiene can reduce respiratory diseases. The **regular and proper cleaning and disinfection** - especially of the toys - is important.

Examination room

Proper hand hygiene is an essential part of infection prevention. However, this also requires providing the appropriate conditions: **disinfectant soap, alcohol-based hand disinfectant, disposable paper towels**. **Replace empty soap bottles** instead of refilling them. It is not recommended to use an aerator

/ perlator at the tap outlet, as it increases the possibility of Pseudomonas infections. After regular disinfection of the examination table, it is recommended that the disposable paper sheet be used before patient examination.

After physical or instrumental examination, it is recommended that medical devices be disinfected (e.g. stethoscopes, thermometers, blood pressure cuffs, etc.) or disposable devices should be used; and infectious waste should be properly managed.

not forget to regularly disinfect **objects frequently used in the examination room (e.g. pens, fever sheet holders, computer mouse and keyboards, mobile phones**, etc.).

"Air-ways"

In order to prevent airborne infections (e.g. VZV, influenza, measles, TBC), it is important **to ventilate the room 6 times an hour** (of which **2 times should be done with outside air**) in addition to the general hygiene guidelines.

In case of a suspected respiratory infection, a rapid detection is important - bring the patient to the examining room as soon as possible. If possible, patients should arrive for an appointment at the end of the waiting period. The examination should be performed with a limited door opening.

Rational antibiotic therapy

In order to prevent the dissemination of multidrug-resistant pathogens, it is essential to use effective and rational antibiotic therapy and the amount of the drug should be as little as possible.

Efforts should be made **to properly diagnose the disease** as well as to use a **targeted antibiotic treatment**.

VI. LITERATURE

Mobeen H. Rathore, MD, FAAP,[a] Mary Anne Jackson, MD, FAAP,[b] COMMITTEE ON INFECTIOUS DISEASES: Infection Prevention and Control in Pediatric Ambulatory Settings. Pediatrics. 2017;140(5):e20172857.

The CLIV. Health Act of Hungary of the year1997.

(X. 20.) ESzCsM Decree on minimum professional conditions for the provision of health services of 60/2003.

NM Decree nn epidemiological measures necessary for the prevention of communicable diseases and epidemics 18/1998 (VI. 3.)

Health Science Glossary of the ÁEEK

VII. CLAUSE

The directive is intended for internal clinical use only and the recommendations should be adapted to local conditions.

VIII. APPENDIX

Appendix 1: Definitions

Patient: A person receiving a healthcare service or participating in healthcare.

Physician: The physician or physicians responsible for treating the patient and determining the intervention and treatment plan for the patient's disease or medical condition.

Examination: An activity designed to assess the health of a patient, to identify any disease or risk, to determine the specific disease (s), to determine their prognosis, to change their course, to determine the effectiveness of treatment, and to determine the time and cause of death. There are two types of examinations: screening examinations and diagnostic examinations.

Health care: the total sum of health activities related to a given patient's health.

Out-patient care: a single or occasional medical care provided by a specialist on the basis of a referral by or on the basis of a patient's referral to a doctor, and, in the case of a chronic illness not requiring in-patient care. Synonym: ambulant care.

Specialized ambulant care: a form of outpatient care where the care is provided by the assistance of in-patient care background (and by other statutory personal and material conditions), i.e. a special outpatient care.

Emergency care: A service that is unforeseeable, unscheduled, which means that the risk of a health condition (deterioration, permanent damage to health, or intolerable pain) is caused by the lack of care, or the lack of scheduled delivery.

Emergency Care Unit (ECU): A health care provider licensed to admit and receive an inpatient due to acute symptoms or an illness requiring urgent care, with or without prior medical examination or delivery.

a) an emergency department should be established on the basis of the minimum conditions laid down in the Regulation,

b) a service provider who does not have these conditions shall also establish a place for receiving patients under the conditions laid down in this Regulation.

Epidemic: The incidence of a particular infectious disease is significantly higher than expected or exceeds a certain threshold in a given area or community, over a specified period of time, or at least two interrelated cases that can be supported by epidemiological evidence.

Infectious disease: A disease caused by specific infectious agents or their toxic products, caused directly or indirectly by the introduction of a specific pathogen or product from an infected person, animal or reservoir into a susceptible host.

Prevention: Medical and non-medical health practices, lifestyles, and motivators that aim to prevent, detect, and prevent complications.

Prevention of infectious diseases:

- vaccinations and other preventive treatments,
- screenings for epidemiological reasons,
- performance of general epidemiological tasks,
- the application of personal protective equipment
- it is based on the development of a health culture.

Immunization: protection against infectious diseases - by vaccination.

Immunization may include:

- ***Active Immunization***: By using attenuated or killed pathogens, the natural infection process is imitated, thereby the body's natural defences are stimulated (by antibody production) to prevent infections and to create immunization.

- ***Passive immunization***: when immunity is developed by introducing specific antibodies (by a ready-made antibody) against a specific pathogen. The characteristic of passive immunization is that such protection lasts only a few days or weeks until the inoculated antibodies are cleared from the body.

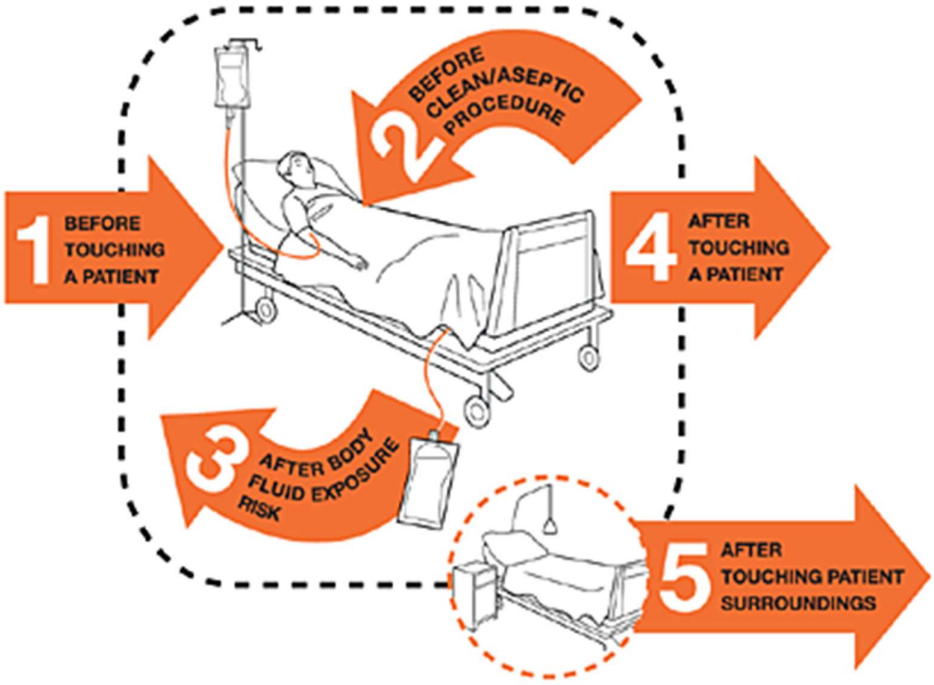
The prevention of infectious diseases is an important goal everywhere in the world, as different countries develop their compulsory vaccination regimes (vaccination schedules, vaccination calendars), as well as other regulations and recommendations that are related to compulsory and recommended vaccines.

Vaccination: A health activity in which a vaccine is administered to the body for active or passive immunization, which is used to develop and enhance specific protection against a particular disease.

Appendix. 2: Abbreviations

AAP	American Academy of Pediatrics
CDC	Centers for Disease Control and Prevention
HAV	Hepatitis A vírus
HBV	Hepatitis B vírus
HCP	Health Care Personnel
HIV	Humán Immundeficiencia vírus
MMR	Morbilli-Mumpsz-Rubeola
OSHA	Occupational Safety and Health Administration
SARS	Severe Acute Respirator Syndrome
TBC	Tuberculosis
VZV	Varicella-Zoster vírus
WHO	World Health Organization

Appendix 3: 5 moments for hand hygiene



Appendix 4: How to Handwash

Duration of the entire procedure: 40-60 seconds

Appendix 5: How to Handrub?

Appendix 6. Occupational restrictions on sick health workers

TABLE 4 Work Restriction Policies for Employees

Infection	Restriction	Length of Restriction
Conjunctivitis	Restrict from direct patient care	Until discharge resolves
Gastroenteritis	Restrict from direct patient care and food preparation	Until symptoms resolve or person is deemed noncontagious
Hepatitis A	Restrict from direct patient care	Until 1 wk after onset of jaundice
Hepatitis B	None[a]	—
Hepatitis C	None[a]	—
Herpes simplex		
Orofacial	None (cover lesion if feasible)	—
Whitlow	Restrict from direct care of newborn infants	Until lesions are crusted
HIV	None[a]	—
Measles	Exclude from ambulatory facility	Until 4 d after onset of rash
Mumps	Exclude from ambulatory facility	Until 5 d after onset of parotitis
Pertussis	Exclude from ambulatory facility	Until treated for 5 d with appropriate antimicrobial therapy
Rubella	Exclude from ambulatory facility	Until 5 d after onset of rash
Staphylococcal skin infection	Restrict from direct patient care	Until treated for 24 h with an agent active against of the isolate
Streptococcal group A pharyngitis	Restrict from direct patient care	Until treated for 24 h
TB, active	Exclude from ambulatory facility	Until proven noninfectious
Varicella	Exclude from ambulatory facility	Until lesions crusted (usually 6 d after the onset of rash)
Zoster	If lesions covered, may have contact with patients (other than immunocompromised patients and newborn infants); if lesions cannot be covered, restrict from patient care	Until lesions crusted

—, not applicable.
[a] HCP with these infections should avoid performing procedures considered to be at risk for transmission of blood from HCP to patient.

Appendix 7: Vaccines recommended for healthcare workers

TABLE 5 Immunizations for Ambulatory Care Staff

All staff members should receive the following immunizations:

- Meningococcal vaccines
  Generally not indicated for HCP.
  Standard recommendation for all who are asplenic (functional or anatomic) or have complement deficiency.
- MMR vaccine
  All HCP born after 1956 should have documentation of 2 doses of an MMR vaccine. Because birth before 1957 is only presumptive evidence of immunity to measles, mumps, and rubella, 1 dose of MMR vaccine for unimmunized workers born before 1957 who do not have laboratory evidence of immunity to these viruses is recommended. Some experts recommend serologic screening for all employees to ensure immunity to measles, mumps, and rubella.
- Hepatitis B vaccine
  Hepatitis B vaccine should be strongly recommended for any employee who may come in contact with blood. OSHA requires that a hepatitis B vaccine must be offered to all employees who may be at risk for bloodborne exposures on the basis of the job categories determined by the organization's bloodborne pathogen exposure control plan. If the employee refuses immunization, this should be documented in the employee's file; the OSHA declination form is useful for this purpose.
- Varicella vaccine
  Proof of varicella immunity is recommended. This may include either verified history of varicella or herpes zoster, laboratory confirmation of immunity, or documentation of 2 doses of varicella vaccine.
  If the employee has a medical contraindication to varicella vaccine or refuses immunization, this information should be placed in the employee's file.
- Influenza vaccine
  Vaccine use should be mandated and offered free of charge yearly to all employees.
- Adolescent-adult Tdap
  This vaccine is recommended by the CDC to be given once to all HCP with direct patient contact.

Adapted from American Academy of Pediatrics Committee on Infectious Diseases. Prevention of pertussis among adolescents: recommendations for use of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap) vaccine. *Pediatrics.* 2006;117(3):965–978; Centers for Disease Control and Prevention. Updated recommendations for use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap) vaccine from the Advisory Committee on Immunization Practices, 2010. *MMWR Morb Mortal Wkly Rep.* 2011;60(1):13–15; American Academy of Pediatrics, Committee on Infectious Diseases. Influenza immunization for all health care personnel: keep it mandatory. *Pediatrics.* 2015;136(4):809–819; Infectious Diseases Society of America; Society for Healthcare Epidemiology of America; Pediatric Infectious Diseases Society. Joint policy statement on mandatory immunization of health care personnel according to the ACIP-recommended vaccine schedule. 2013. Available at: https://www.idsociety.org/uploadedFiles/IDSA/Policy_and_Advocacy/Current_Topics_and_Issues/Immunizations_and_Vaccines/Health_Care_Worker_Immunization/Statements/IDSA_SHEA_PIDS%20Policy%20on%20Mandatory%20Immunization%20of%20HCP.pdf. Accessed March 6, 2017; and Dheda K, Udwadia ZF, Huggett JF, Johnson MA, Rook GA. Utility of the antigen-specific interferon-gamma assay for the management of tuberculosis. *Curr Opin Pulm Med.* 2005;11(3):195–202. MMR, measles-mumps-rubella; Tdap, tetanus, diphtheria toxoid, and acellular pertussis vaccine.

Appendix 8: Cough etiquette