

MINISTRY OF HEALTH OF UKRAINE
O.O. BOGOMOLETS NATIONAL MEDICAL UNIVERSITY

“Approved”

at the methodological conference of hygiene
and ecology department

Head of the department

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GUIDELINES
FOR STUDENTS

<i>Subject</i>	Hygiene and ecology
<i>Module № 1</i>	Assessment of the environment and its impact on the population health
<i>Submodule № 2</i>	Municipal hygiene
<i>Topic of the lesson</i>	Modern problems of nosocomial infection and hygienic measures for its prevention.
<i>Course</i>	6
<i>Faculty</i>	medical
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Kiev

1. Learning objective

- 1.1. Strengthen theoretical knowledge about nosocomial infections.
- 1.2. Master method of nosocomial infections determination in hospitals.
- 1.3. Teach the students to make a plan of nosocomial infections prevention.
- 1.4. Master methods of hospital personnel prevention of nosocomial infections.

2. Basics

- 2.1. You should know:
 - 2.1.1. Definition of nosocomial infection.
 - 2.1.2. Modern methods of nosocomial infections determination.
 - 2.1.3. Peculiarities of nosocomial infections appearance.
 - 2.1.4. The main requirements to hospitals for nosocomial infections prevention.
- 2.2. You should have the following skills:
 - 2.2.1. To determine cause and consequences connections of nosocomial infections appearance.
 - 2.2.2. To create a plan of nosocomial infections prevention in different departments of hospitals.
 - 2.2.3. Usage of individual protection things by personnel of hospital.

3. Self-training questions

- 3.1. Definition of nosocomial infections, modern aspects.
- 3.2. Theories and concepts of nosocomial infections.
- 3.3. Factors of transmission of nosocomial infections.
- 3.4. Significance of opportunistic microorganisms in nosocomial infections appearance.
- 3.5. Sanitary-hygienic and epidemiological control of nosocomial infections spreading.
- 3.6. Main principles of nosocomial infections prevention.
- 3.7. Sanitary-hygienic measures of nosocomial infections prevention in special departments.
- 3.8. Quarantine measures in nosocomial infections prevention.
- 3.9. Sanitary and hygienic regimen in permanent establishment (hospitals).
- 3.10. Sanitary-hygienic measures of nosocomial infections prevention among hospital personnel.
- 3.11. Right and duties of hospital personnel for nosocomial infections prevention.

4. Self-training assignments

- 4.1. Make and explain list of measures for localization of nosocomial infection (postoperative purulent complications) in surgical department of multiple-discipline hospital.

5. Structure and content of the lesson (duration of the lesson 160 min + 10 min break)

- 5.1. Preamble – 5-10 min.
- 5.2. Test control for assessment of students’ knowledge datum level – 10-15 min
- 5.3. Theoretical training – 30-40 min.
- 5.4. Typical situational tasks “Krok-2” solution – 30-40 min.
- 5.5. State exams situational tasks solution – 30-40 min.
- 5.6. Test control for assessment of students’ knowledge final level – 10-15 min.

Nosocomial infections – are any clinically apparent germ disease which affect patient under his hospitalization or visiting medical establishment with the purpose of treatment, and also medical personnel in time of doing theirs work irrespectively from manifestations of disease in time being such person at hospital.

Causes of increasing nosocomial infections morbidity:

- ✓ Increase assigned risk contingent (old people, newborns with malformations, premature infants, patients with chronic diseases in compensation and subcompensation stage).
- ✓ Decrease natural immunity and allergization of organism.
- ✓ Forming and diffusion nosocomial germ cultures (highlyresistent to antibiotics, high virulent, resistant to disinfectants).
- ✓ Introduction into a medical practice very complicated treatment and diagnostic methods/
- ✓ Complicate surgical procedures/
- ✓ Using medicines which can reduce immunity.

Nosocomial infection pathogen

Group of m/o	Specimens
Facultative aerobes	Gram-positive coccuses: <ul style="list-style-type: none"> - Staphylococcus aureus, Staphylococcus epidermidis, Staphylococcus saprophiticus; - Streptococcus pyogenes, Streptococcus viridans, Streptococcus pneumoniae <hr/> Gram-negative bacillus: <ul style="list-style-type: none"> - Proteus vulgaris, Proteus mirabilis; - Esherihia coli;

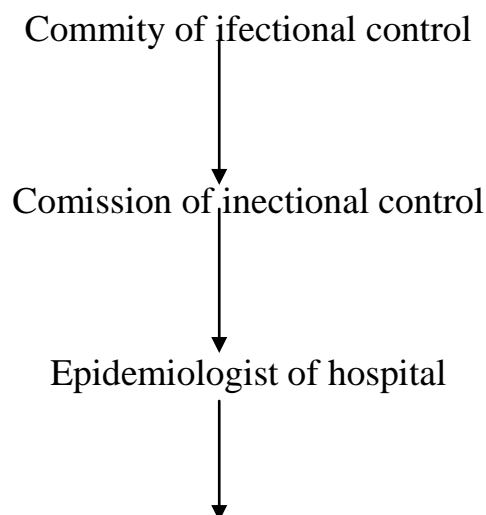
	<ul style="list-style-type: none"> - Salmonella typhimurium, Salmonella enteritidis, Salmonella cholerae suis, Salmonella paratyphi, Salmonella typhi, Salmonella schottmueleri
Obligate aerobes	Gram-negative bacillus: <ul style="list-style-type: none"> - Pseudomonas aeruginosa, Pseudomonas acidovarus
Obligate anaerobes	Gram-negative bacillus: <ul style="list-style-type: none"> - Klebsiella pneumoniae, Klebsiella ozaenae, Klebsiella rhinoscleromatis - Bacteroides fragilis, Bacteroides melaninogenicum - Fusobacterium nucleatum, Fusobacterium mortiferum <hr/> Gram-positive coccuses: <ul style="list-style-type: none"> - Peptostreptococcus putridus, Peptostreptococcus anaerobius <hr/> Gram-positive spore former bacillus: <ul style="list-style-type: none"> - Clostridium perfringens, Clostridium septicum, Clostridium oedemeticus, Clostridium histolyticum
Other bacteriums	Corinebacterium diphteriae, Micobacterium tuberculosis, Bordetella pertussis
Viruses	Hepatitis, Rubella, AIDS, influenza, Herpes simplex, citomegalovirus, rotaviruses, chicken pox, measles
Fungus	Candida, Nocardia, Histoplasma, Coccidioides, Cryptococcus, Pneumocystis
Other m/o	Toxoplasma

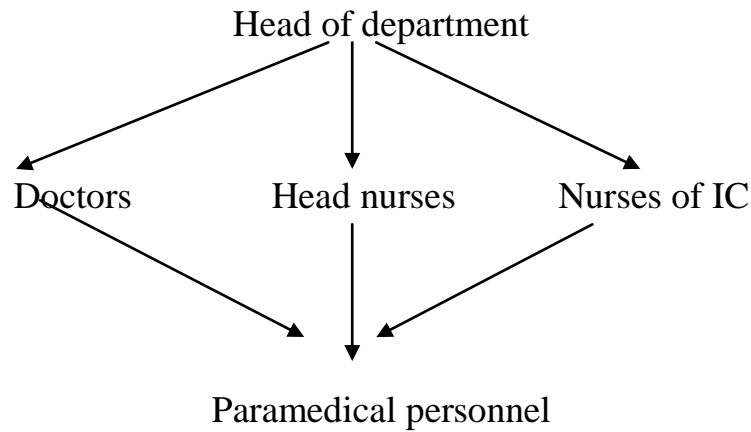
Mechanisms and ways of nosocomial infections transmission

Mechanism of transmission	Ways of transmission		Factors of transmission
	Ukraine	USA	
Fecal-oral	Contact-household Water Food	Contact-household Water Food	<ul style="list-style-type: none"> - hands - household goods - water - food staffs
Respiratory	Respiratory (air-tiny)	Tiny Air	<ul style="list-style-type: none"> - tiny particles of respiratory

	Air-dust		tract secret - dust particles
Transmission	Transmission	Transmission (vectorial)	- arthropoda
Contact	Sex Contact-household	Sex Contact	- hands - household goods - medical instruments - medical materials - drugs
	Artificial ways of trnsmission: Instrumental Hardware Hemotransfusion	Contact (direct or undirect)	- - medical instruments - medical materials - grugs - blood

The main principles of infectious control:





Scheme of sanitary and hygienic inspection of the hospital

1. Name of the hospital, its address, the service district.
2. When was it built? What project was it built according to?
3. General number of beds in the hospital, hospital structure.
4. Location of the hospital in the settlement plan, the hygienic characteristics of the territory, the presence of the noise and air pollution sources. (Draw schematically the situation plan).
5. Hygienic assessment of the hospital site, type of the site development, the list of buildings. (Add the schematic general layout of the site).
6. Order of patient admission. The planning and work regime of the general purpose admission department. Peculiarities of the patient admission to the children's, obstetric and infectious departments. Rules of the patient discharge.
7. Hygienic assessment of the therapeutic department wards section. Use the inspection and questioning method; carry out the objective studies: measure the wards temperature, air relative humidity, carbon dioxide concentration, lighting coefficient, daylight factor, noise level, actual and required air volume, and the ventilation rate (if the devices are available). If the devices are not available, determine only those indices which can be measured and calculated: lightning coefficient, angle of incidence, angle of aperture, artificial illumination by "Watt" method, area, cubic capacity of the wards and others. Add the schematic sketch drawing of the section and one or two wards plans.
8. Hygienic characteristics of the surgical department and the operating block, the intensive care unit, obstetric, infectious, children's departments (they are distributed among the students by teacher; after that the students share the results of their inspection).
9. Hygienic assessment of the organization and quality of the patient nutrition.
10. Sanitary state and the regime of the wards and other hospital premises cleaning. Methods and measures of the nosocomial infection prevention.
11. Personal patient hygiene.
12. Sanitary state and the regime of the hospital territory cleaning. Removal and elimination of the garbage, the obstetric and surgical departments' wastes.
13. Assessment of the in-patient department hygienic conditions by the patients themselves (see Appendix 2).
14. Sanitary facilities of the hospital:

- water supply (central, local, type of the source); the presence of the hot water supply;
 - heating (type, the location of the heating devices, their sufficiency);
 - ventilation: natural (exhaust ducts, window leaves, transoms), artificial (what prevails – inflow, exhaust chamber, their substantiation);
 - sewerage system (central, local, the methods of moving away and destruction of the sewage).
15. Occupational hazards, hygiene and labour protection of medical personnel of different departments and specializations.
 16. General conclusions concerning the positive and negative aspects of the sanitary and hygienic regime in the hospital, substantiated recommendations on their improvement.
 17. Appendices: the graphic materials (situation, general layouts, plan of the ward section, wards), the patient questionnaire forms.

Appendix 4

Patient questionnaire forms concerning the sanitary regime in the department and hospital

1. Your name, family and patronymic name, age, sex.
2. Disease diagnoses. Have you been to the hospital before (once, twice, more), how long are you staying in the hospital?
3. How many beds are there in the ward, the ward area and orientation?
4. What kind of ward do you prefer: for one- two-, three- or more beds, why?
5. Do your ward neighbours bother you and how (noise, lighting, unpleasant smell etc.)?
6. Do the morning manipulations, temperature survey, cleaning disturb your rest and sleep?
7. What other factors connected with the day schedule and hospital regime bother you?
8. Are you satisfied with the microclimate in the ward (temperature, humidity, air movement) and the air quality (unpleasant smells and their spreading from your neighbours or other rooms of the department)?
9. Does the noise, its sources bother you (within the ward, from the corridor and other rooms, out of the building); at what day or night time is it the most intensive?
10. Are you satisfied with the ward planning, beds location, their quality, comfort, the quality of other furniture and equipment?
11. Do you feel any discomfort from the direct ward insolation? What window orientation would you prefer and why?
12. Your remarks and wishes about the ward natural and artificial lighting, wall colour, furniture, equipment, installation of radio, system of urgent personnel call.
13. Are you satisfied with the organization and regime of nutrition? Your wishes about its improvement.

14. Do you smoke during your stay in the hospital? Have you smoked before the admission?
15. Do you use the hospital garden, park and how often? If not, why.
16. Your other remarks and wishes.

6. Literature

6.1. Principal:

- 6.1.1. Гончарук Є.Г., Бардов В.Г., Гаркавий С.І., Яворовський О.П. та ін. Комунальна гігієна/За ред. Є.Г. Гончарука. – К.: Здоров'я, 2003. - С. 615-657.
- 6.1.2. Габович Р.Д., Познанский С.С., Шахбазян Г.Х. Гигиєна.- Київ. 1983.- С.277-304.
- 6.1.3. Даценко І.І., Габович Р.Д. Профілатична медицина. Загальна гігієна з основами екології. Навчальний посібник. К.: Здоров'я, 1999. – С. 608 - 658.
- 6.1.4. Никберг И.И. Гигиєна больниц. – К.: Здоров'я, 2000. – 261с.
- 6.1.5. Загальна гігієна. Посібник до практичних занять/І.І. Даценко, О.Б. Денисюк, С.Л.Долошицький та ін. / За ред. І.І.Даценко.- Львів, 1992.- С. 244 – 252.
- 6.1.6. Пивоваров Ю.П., Гоева О.Э., Величко А,А, Руководство к лабораторным занятиям по гигиене. – М.: Медицина, 1983. – С. 59 – 139.
- 6.1.7. Lecture materials.

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1. Hygiene and ecology: textbook for students of higher medical educational establishments / under the editorship of corresponding member of NAMS of Ukraine, prof. Bardov V.G. – Vinnytsia: Nova Knyha, 2009. – 688 p.
2. Hygiene and ecology / V.A. Korobchanskiy, M.P. Vorontsov, A.A. Musulbas. – Kharkov, 2006. – 207 p.
3. Medicine of emergency situations: textbook for students of higher medical institutions / V.V. Chaplyk, P.V. Oliynyk, S.T. Omelchuk, V.V. Humenyuk. – Vinnytsia: Nova Knyha, 2012. – 344 p.
4. General nutrition: Study guide for the 4th accreditation level Medical School Students / edited by S.T. Omelchuk, O.V. Kuzminska. – Kyiv, 2016. – 146 p.
5. Гигиєна и экология: учебник для студентов высших медицинских учебных заведений. – Винница: НОВА КНИГА, 2008ю – 720 с.

6.2. Additional:

6.2.1. Гігієна праці/За ред. А.М. Шевченко. – К.: “Інфотекс”, 2000. – С. 576 – 592.

6.2.2 Санитарные правила устройства, оборудования и эксплуатации больниц, родильных домов и других лечебных стационаров. (СанПиН 5279-90). – М., 1990.

6.2.3. Кириллов В.Ф. Гигиена труда врачей хирургического профиля. М.: Медицина, 1982. – 187с.

6.2.4. Державні будівельні норми України. Будинки і споруди. Заклади охорони здоров'я. ДБН В.2.2.-10-2001. – Київ: Держбуд України, 2001. – 164 с.