

Infectology - Plan and programme of the course

Basic information

ISVU Code: 195679

ECTS points: 3.0

Faculty unit: Chair of Infectology

Web address: <https://www.sfzg.unizg.hr/en/course/121>

Head of Chair: Dragan Lepur, MD, PhD, Assistant Professor

Course hours

Lectures: 8 hours (allowed absence: max. 3 hours)

E-learning course: 7 hours

Clinical practicals: 25 hours (allowed absence: max. 6 hours)

Total hours: 40

Absence of more than 50% classes regardless of reason won't be possible to compensate!

Lecturers:

Dragan Lepur, MD, PhD, Assistant Professor

Specialist in Infectious Diseases, Intensive Care Medicine subspecialist
Scientific Advisor

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Tomislava Skuhala, MD, PhD, Assistant Professor

Specialist in Infectious Diseases
Scientific Assistant

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Lorna Stemberger Marić, MD, PhD, Senior Assistant

Specialist in Pediatric Infectious Diseases
Scientific Assistant

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Administrative Assistant:

Ms. Paula Halar

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Description and course aims

Students will be introduced to the contemporary Infectology. Special focus will be placed to the oral manifestation of infectious diseases (ID) as well as the head and neck infections. Furthermore, they will learn about current issues in this part of clinical medicine and potential themes for scientific research will be suggested. The principles and rational use of antimicrobial drugs will be particularly emphasized. In addition, they will learn about possibilities and principles of prophylaxis of infectious diseases/infections.

After the course, students will be trained in rational approach to the patient with orofacial infections and recognizing oral manifestation of infectious diseases. Also, they will be able to properly make differential diagnosis and to resolve practical problems associated with diagnostics, prophylaxis and treatment.

Competences and learning outcomes

1. Differentiate general symptoms from the special symptoms of ID based on anamnesis, physical examination and basic laboratory findings
2. Enumerate and explain the major pathogenetic mechanisms of the ID
3. Enumerate the most important laboratory tests used in ID diagnostics (ESR=erythrocyte sedimentation rate; CRP= C-reactive protein, CBC=complete blood count; Blood, urine and cerebrospinal fluid cultures; Stool cultures; Throat swabs culture; Cytological and biochemical cerebrospinal fluid findings) and describe the proper collection of samples for microbiological diagnostics.
4. Enumerate the major classes of antibiotics, describe their mechanisms of action and the most frequent adverse reactions
5. Enumerate viruses causing viral hepatitis, routes of transmission, prophylactic possibilities and interpret specific laboratory tests (IgM and IgG anti-HBs, HBsAg, anti-HCV, etc.)
6. Explain principles of antimicrobial prophylaxis in dental medicine and criteria for optimal antibiotic choice (pharmacokinetic and pharmacodynamic features of drugs, patient's characteristics)
7. Enumerate common features of deep neck space infections and the most important entities (Ludwig's angina, peritonsillar abscess, parapharyngeal abscess, etc.)
8. Enumerate local and disseminated complications of odontogenic infections (infective endocarditis, brain abscess, sepsis, carotid artery erosion, Lemierre's syndrome, osteomyelitis etc.), describe pathogenesis and principles of treatment
9. Enumerate the most frequent respiratory infections (common cold, acute respiratory syndrome, flu, bronchitis, bronchiolitis, acute middle ear infection, etc.) and make comparison between bacterial and atypical pneumonias
10. Explain the difference between active and passive immunoprophylaxis

11. Enumerate and describe symptoms of systemic ID in oral cavity (EBV mononucleosis, syphilis, HIV infection, measles)
12. Describe main differences between viral and bacterial meningitis (clinical findings, cytological and biochemical cerebrospinal fluid findings)
13. Enumerate the most frequent gastrointestinal infections (salmonellosis, campylobacteriosis, shigellosis, rotavirus and adenovirus infection, norovirus infection, traveller's diarrhea, *C.difficile* colitis) and food poisoning (*S.aures*, *B.cereus*, *C.perfringens* toxins) and describe the main principles of treatment

Examples of checks and evaluation

Example of check for the Outcome 1st

Oral and written exam. („Are headache/fever/vomiting/cough/dysuria and consciousness disturbance general or special symptoms (or both) of ID?“ „What is febrile proteinuria?“ „When a headache is considered as special symptom?“).

Example of check for the Outcome 2nd

Oral and written exam („Explain pathogenetic model of cyclic ID on example of varicella“. „What are toxoinfectious diseases and give at least two examples“. „Explain difference between colonization and infection“. „What is the incubation period?“).

Example of check for the Outcome 3rd

Oral and written exam. („Describe the procedure of blood taking for culture“. „Which sample of urine is appropriate for culture?“ „When does throat swab should take?“ „Enumerate laboratory findings associated with bacterial infection“. „Which ID are suspected if there is leukocytosis with neutrophilia?“).

Example of check for the Outcome 4th

Oral and written exam. („Which is the largest and the most used class of antibiotics?“ „Describe mechanism of action of the aminoglycosides“, „What does drug fever mean?“ „How can we classify adverse reaction of antimicrobial drugs“, „Which antibiotics were the most often prescribed in dental medicine and why?“).

Example of check for the Outcome 5th

Oral and written exam. („What is the main transmission route of hepatitis B in developed countries?“ „For which viral hepatitis exists efficient prophylaxis?“ „What is the protective level of IgG anti-HBs?“ „Hepatitis B postexposure prophylaxis“, „What is the fulminant viral hepatitis?“ „Preventive possibilities in hepatitis B vaccine non-responders?“ „Which serologic markers indicate acute HBV infection?“

Example of check for the Outcome 6th

Oral and written exam. („What is antimicrobial prophylaxis?“ „What requirements should antibiotic fulfilled to be appropriate for prophylactic purpose?“ „What is the best choice for infective endocarditis (IE) prophylaxis?“ „What time does the antibiotic should take for prophylaxis of IE?“

„When does the antibiotic should apply in immunocompromised patients?“

Example of check for the Outcome 7th

Oral and written exam. („Enumerate common clinical features of deep neck space infections“, „Which anatomical structures are potential source of deep neck space infections?“, „Which bacteria are the most common cause of deep neck space infections?“, „What are the symptoms of masticatory space infection?“, „What is the difference between parotid space infection and buccal space infection?“).

Example of check for the Outcome 8th

Oral and written exam. („Enumerate some complications of oral cavity infections“, „What are the possible routes of spread of the oral infections?“, „Principles of the IE treatment“, „What is Lemierre's syndrome?“, „When should suspect to septic cavernous sinus thrombosis?“).

Example of check for the Outcome 9th

Oral and written exam. („What are the most common causes of sore throat?“, „What is the best practical classification of pneumonias?“, „What is Legionnaires' disease?“, „How should we treat atypical pneumonias?“, „What are the main differences between bacterial and atypical pneumonias?“, „Why beta-lactams are uneffecient in atypical pneumonias treatment?“).

Example of check for the Outcome 10th

Oral and written exam. („Explain the difference between active and passive immunoprophylaxis“, „Which antibiotics can be used in postexposure prophylaxis of invasive meningococcal disease?“, „Which vaccines are included in Croatian mandatory vaccination programme?“, „What are the advantages and disadvantages of passive immunoprophylaxis?“).

Example of check for the Outcome 11th

Oral and written exam. („What are the oral manifestations of syphilis?“, „What disease is associated with Koplik's spots?“, „What is oral hairy leukoplakia“).

Example of check for the Outcome 12th

Oral and written exam. („Biphasic course is a feature of: a) bacterial meningitis, b) tick-borne encephalitis, c) neuroborreliosis“, „In cerebrospinal fluid of patient with aseptic meningitis we can always find: a) neutrophilic pleocytosis, b) mononuclear pleocytosis, c) decreased level of glucose, d) normal level of glucose, e) heavy proteinorachia, f) mild proteinorachia“, „The most common causes of aseptic meningitis are: a) *Mycobacterium tuberculosis*, b) *Borrelia burgdorferi*, c) parasites, d) viruses, e) *Treponema pallidum*“, „The most severe and ultimately fatal viral encephalitis is caused by: a) *Herpes simplex virus* type 1, b) *Herpes simplex virus* type 2, c) tick-borne encephalitis virus, d) rabies virus, e) Varicella-zoster virus, f) influenza virus“)

Example of check for the Outcome 13.

Oral and written exam. („Which bacteria are the most common cause of infectious diarrhea?“, „When to use antibiotics in patients with acute diarrhea?“, „What are the common causes of the viral gastroenteritis?“, „Which bacteria produce exotoxins responsible for food poisoning?“, „What can be used for oral rehydration?“)

Methods of monitoring the quality, successfulness and appropriateness of the course

Evaluation during the course, keeping record of the tuition and acquired skills. Anonymous questionnaire to assess the course quality, and lecturers' and associates' work.

Plan of the course and course schedule

Course structure

Lectures, clinical practicals (analysis of selected cases from daily practice, video presentations) and e-learning course.

Lectures: 8 hours

E-learning course (7 lessons): 7 hours

Clinical practicals: 25 hours

1. Lectures (8 hours)

Time of lectures:

Lectures always start at 11.00 a.m. and finish at 11.45 a.m. on Wednesday according to schedule (see Table 1).

Place: Main lecture hall "Josip Fališevac" - University Hospital for Infectious Diseases (UHID) "Dr.Fran Mihaljević", Mirogojska 8, Zagreb

Table 1. Lectures schedule

	Topics	Date	Lecturer
1	Introduction to Infectology	2 October, 2019	Assist.Prof. Dragan Lepur
2	Respiratory infections	9 October, 2019	Assist.Prof. Tomislava Skuhala
3	Gastrointestinal infections	16 October, 2019	Assist.Prof. Tomislava Skuhala
4	Urinary tract infections	23 October, 2019	Assist.Prof. Tomislava Skuhala
5	Sexually transmitted diseases	30 October, 2019	Assist.Prof. Tomislava Skuhala
6	Recreational infections	6 November, 2019	Assist.Prof. Tomislava Skuhala
7	Viral hepatitis	13 November, 2019	Assist.Prof. Dragan Lepur
8	Exanthematous diseases	20 November, 2019	Assist.Prof. Dragan Lepur

2. E-learning course (7 hours)

URL: <https://moodle.srce.hr/2019-2020/course/view.php?id=46264>

Login: use your AAI identity

E-collegium consists of 7 lessons (see Table 2) and is mandatory for completion of the course. Students have to successfully resolve tests at the end of each lesson to take next lesson. Completion of the e-collegium, as well as documented other lectures and clinical practicals (presence), are required for taking the final exam and testing of the semester.

Students who fulfilled required criteria will get badges that are visible in e-collegium.

Students who have got all three badges can apply for the final exam.

E-collegium will be available from 30 September 2019 to 24 January 2020.

Table 2. E-learning course – topics

Lesson	Topic	hours	Lecturer
1	Introduction to Infectology	1	Assist.Prof. Dragan Lepur
2	Medical history and clinical examination in Infectology	1	Assist.Prof. Dragan Lepur
3	Odontogenic infections of the oral cavity - Part 1	1	Assist.Prof. Dragan Lepur
4	Odontogenic infections of the oral cavity - Part 2	1	Assist.Prof. Dragan Lepur
5	Non-odontogenic infections of the oral cavity - Part 1	1	Assist.Prof. Dragan Lepur
6	Non-odontogenic infections of the oral cavity - Part 2	1	Assist.Prof. Dragan Lepur
7	Central nervous system infections	1	Assist.Prof. Dragan Lepur

3. Clinical practicals (25 hours)

Place: Clinical Departments of the UHID “Dr. Fran Mihaljević”, Mirogojska 8, Zagreb

Clinical practicals will be hold during 13 working weeks starting from 2 October, 2019.

Final schedule will be available on the website of the Chair (address:

<https://www.sfzg.unizg.hr/predmet/121483>) and on the **Notice board** of the e-collegium (students will be also informed by e-mail) a few days before next month.

Topics of the practicals are shown in Table 3 and schedule is shown in Table 4.

Students should warn the teachers to any important health problem/condition before contact with patients with infectious diseases. It means that teacher should know if students are pregnant, immunocompromised or susceptible to particular disease (e.g. chickenpox).

In addition, we suggest to students to miss practicals when they are sick or they are feeling unwell.

Table 3. Clinical practicals – topics

Week	Topic	hours
1.	Physical examination and medical history	2
2.	Streptococcal infections	2
3.	Infections of the CNS	2
4.	Urinary tract infections	2
5.	Gastrointestinal infections	2
6.	Exanthematous diseases	2
7.	Viral hepatitis	2
8.	Respiratory infections	2
9.	Sepsis and infective endocarditis	2
10.	Antimicrobial therapy	2
11.	Odontogenic infections	2
12.	Skin and soft tissue infections	2
13.	Hospital infections	1

Table 4. Time schedule of clinical practicals

1.-13. week (2 Oct 2019 - 8 Jan 2020) *

There won't be practicals between 23 December 2019 and 3 January 2020.

Day		Time	Location*†	Lecturer*
Wednesday	2 Oct 2019 - 18 Dec 2019	11.45-13.15	A B C	T. Skuhala D. Lepur L. Stemberger Marić
Wednesday	8 Jan 2020	11.45-12.30	A B C	T. Skuhala D. Lepur L. Stemberger Marić

*** Changes are possible because of lecturers' rota – students should mandatory check the location with Ms. Paula Halar in Chair office just before practicals begin (immediately after lecture)**

Legend:

† A= Department of Urinary Tract Infections

B = Department of Intensive Care Medicine

C= Department of Pediatric Infectious Diseases

Index signing

Students who have finished the course can get the signed indexes in Chair office between 22 Jan and 24 Jan, 2020.

Assessment method

Completion of the e-learning course, as well as documented other lectures and clinical practicals, are required for taking the final exam (written and oral part) and testing of the semester.

Students who fulfilled required criteria will get three badges which are visible in e-collegium. Students who have all required badges can apply for the final exam.

Final exam consists of a written test (60 multiple choice questions) followed with an oral exam. Students have 60 minutes available to solve the test. **Test will be held and available online in the same way as lessons in e-learning course.**

The schedule for the written exam as well as the results of test will be available online (**Notice board**) on the same address. Also, students will be immediately informed about test schedule by e-mail.

Immediately after closing of the written exam (when 60 minutes elapsed) students will get the results (grades) of their exam.

Students who pass the written exam will take the oral exam in the next several days according to the schedule. If student doesn't approach to the oral exam or if he isn't satisfied with the grade he achieved, than he must take written test again.

Schedules for oral exams will be available on Notice board.

Score table for written exam

Points	Grade	%
54-60	A (5; excellent)	90-100
48-53	B (4; very good)	80-89
42-47	C (3; good)	70-79
36-41	D (2; weak)	60-69
0-35	F (1; fail)	0-59

Exams – time table

REGULAR EXAMS	
WINTER	28 January 2020 at 13.00 18 February 2020 at 13.00
SUMMER	16 June 2020 at 13.00
AUTUMN	8 September 2020 at 13.00
ADDITIONAL EXAMS	
17 March 2020 at 13.00	
14 April 2020 at 13.00	

Literature

Mandatory:

D. Lepur, et al. Textbook of Infectious Diseases. Naklada Slap, Zagreb, 2019. – in press
<http://www.nakladaslap.com/knjige/pregled/>

Additional literature:

Articles and presentations from the E-learning course.

Test material (selected topics)

D. Lepur. Textbook of Infectious Disease. Naklada Slap, Zagreb, 2019.

Chapter I. INTRODUCTION

1. The importance of infectious diseases
 - 1.1. Emerging and reemerging infectious diseases
 - 1.2. Infectious causes of chronic and malignant diseases
 - 1.3. Systemic diseases caused by infections of the oral cavity
2. Epidemiology of infectious diseases
 - 2.1. Basic epidemiological terms
3. Basic terms and definitions

Chapter II. MICROBIOLOGICAL DIAGNOSTICS

1. Introduction
2. Specificity of oral cavity infections
3. Samples for microbiological diagnosis
4. Microbial etiology of oral infections

5. Diagnostic methods in clinical microbiology – **introduction only**

Chapter III. MEDICAL HISTORY AND PHYSICAL EXAM

Chapter IV. HEAD, NECK AND ORAL CAVITY INFECTIONS

A. ORAL CAVITY INFECTIONS

1. ODONTOGENIC INFECTIONS OF THE ORAL CAVITY

2. NONODONTOGENIC INFECTIONS OF THE ORAL CAVITY

- 2.1. Stomatitis and other infectious diseases of the oral cavity
- 2.2. Tonsillopharyngitis
- 2.3. Infections of the salivary glands

B. LYMPHADENOPATHY

1. Introduction
2. Infectious mononucleosis
3. Cat-scratch disease
4. Toxoplasmosis

C. INFECTIONS OF THE EYE

3. Conjunctivitis

- 3.1. Neonatal conjunctivitis (*Ophthalmia neonatorum*)
- 3.2. Chlamydial conjunctivitis (Trachoma)
- 3.3. Diagnostics of infective conjunctivitis
- 3.4. Treatment of conjunctivitis

4. Infectious keratitis

- 4.1. Herpes simplex viral keratitis
- 4.2. Herpes zoster ophthalmicus

E. INFECTIONS OF EAR, MASTOID AND SINUSES

Chapter V. RESPIRATORY TRACT INFECTIONS

1. Introduction
2. The common cold
3. Acute respiratory syndrome
4. Influenza
5. Acute laryngitis
6. Acute laryngotracheobronchitis (croup)
7. Epiglottitis
8. Acute bronchitis
9. Bronchiolitis
10. Acute exacerbation of chronic obstructive pulmonary disease
11. Pneumonia
15. Pertussis (Whooping cough)

Chapter VI. GASTROINTESTINAL INFECTIONS AND FOOD POISONING

1. Introduction
2. Epidemiology
4. Protective mechanisms
5. Clinical presentation and complications of acute gastroenterocolitis
6. Diagnosis
7. Treatment
8. Prevention of gastrointestinal infections
9. Etiology of gastroenteritis
10. *Helicobacter pylori*
11. Campylobacteriosis

12. Salmonellosis (**without typhoid fever**)
17. Antibiotic-associated diarrhea (pseudomembranous colitis)
18. Viral gastroenteritis
 - 18.1. Norovirus
 - 18.2. Rotavirus
 - 18.3. Adenovirus
20. Food poisoning
 - 20.1. Staphylococcal food poisoning
 - 20.4. Scombroid syndrome

Chapter VII. SKIN AND SOFT TISSUE INFECTIONS

1. Impetigo and ecthyma
2. Folliculitis
3. Erysipelas, cellulitis and skin abscess
4. Herpes virus - associated skin infections

Chapter VIII. INFECTIOUS DISEASES WITH RASH

INTRODUCTION

1. Bacterial diseases with rash

- 1.2. Staphylococcal toxic shock syndrome
- 1.3. Streptococcal toxic shock syndrome
- 1.4. Staphylococcal sepsis and infectious endocarditis
- 1.5. Meningococcal sepsis
- 1.8. Lyme disease (borreliosis)

2. Classic viral exanthems

- 2.1. Varicella (Chickenpox)
- 2.2. Herpes zoster (Shingles)
- 2.3. Measles (Morbilli)
- 2.4. Exanthema subitum
- 2.5. Infectious erythema
- 2.6. Rubella (German measles)

3. Other viral exanthematous diseases

- 3.2. Enteroviral infections

4. Rickettsial infections

5. Anaplasmosis and Ehrlichiosis

6. Other infectious diseases with rash

- 6.1. Infectious mononucleosis
- 6.2. Hepatitis B

Chapter IX. URINARY TRACT INFECTIONS

1. Introduction
2. The classification and definitions
3. Epidemiology and etiology
4. Pathoanatomic considerations
5. Pathogenesis
6. Diagnostics

Chapter X. HEPATOBILIARY INFECTIONS

1. Introduction
2. Viral hepatitis
 - 2.1. Hepatitis A
 - 2.2. Hepatitis E

- 2.3. Hepatitis B
- 2.4. Hepatitis D
- 2.5. Hepatitis C

Chapter XI. SEXUALLY TRANSMITTED DISEASES

- 1. Introduction**
- 2. Genital herpes**
 - 2.1.1. Genital herpes in pregnant women
- 3. Nongonococcal urethritis and mucopurulent cervicitis**
- 4. Vaginal discharge syndrome**
 - 4.1.1. Bacterial vaginosis
 - 4.1.2. Trichomoniasis
 - 4.1.3. Vulvovaginal candidiasis
- 5. Chlamydial infections**
 - 5.1. Infections caused by *Chlamydia trachomatis*
 - 5.1.1. Infections of the female reproductive system
 - 5.1.2. Infections of the male reproductive system

Chapter XII. INFECTIONS IN THE IMMUNOCOMPROMISED PATIENTS

1 - INTRODUCTION

- 2. Specific (acquired) immunodeficiencies**
 - 2.1. Infections in cellular immunodeficiency
 - 2.1.1. *Pneumocystis jirovecii* pneumonia
 - 2.1.2. Cryptococcal infections
 - 2.1.3. Atypical mycobacterial infections
 - 2.1.4. Cytomegalovirus infections
 - 2.2. Infections in patients with humoral immunodeficiency
 - 2.3. Infections in neutropenic patients
 - 2.3.1. Bacterial infections
 - 2.3.2. Fungal infections
 - 2.7. Infections in patients with diabetes mellitus
 - 2.8. Infections in asplenic patients
 - 2.9. Infections in HIV patients

Chapter XIII. PERIPARTAL AND INTRAUTERINE INFECTIONS

- 1. Introduction**
- 2. Viral infections**
 - 2.1. Cytomegalovirus
 - 2.3. Hepatitis B virus
 - 2.4. Hepatitis C virus
 - 2.5. HIV infection
 - 2.6. Rubella
 - 2.7. Varicella
 - 2.8. Genital HSV infections
- 3. Parasites**
 - 3.2. Toxoplasmosis
- 4. Bacterial infections**
 - 4.2. Gonococcal infections
 - 4.3. *Chlamydia trachomatis*

Chapter XIV. SEPSIS

Chapter XV. INFECTIVE ENDOCARDITIS

Chapter XVI. INFECTIONS OF THE CENTRAL NERVOUS SYSTEM (CNS)

1. Introduction
2. Anatomy and pathophysiology
3. Pathogenesis of infectious diseases of CNS
4. Complications of CNS infections
5. The most common clinical syndromes
 - 5.1. Meningitis
 - 5.1.1. Acute aseptic meningitides
 - 5.1.2. Acute bacterial meningitis
 - 5.2. Meningoencephalitis
 - 5.2.1. Herpes simplex virus encephalitis
 - 5.2.2. Varicella-zoster virus meningoencephalitis
 - 5.2.3. Tick-borne meningoencephalitis
 - 5.4. Brain abscess
6. Diseases caused by bacterial neurotoxins
 - 6.1. Tetanus
 - 6.2. Botulism

Chapter XVII. RECREATIONAL INFECTIONS

1. Introduction
2. Travel associated infections
 - 2.1. Infections acquired during travelling
 - 2.2. Infections acquired at destination
 - 2.1.1. Traveller's diarrhea
 - 2.1.2. Diseases transmitted by arthropods
Malaria
3. Contact with animals
 - 3.1. Diseases related to cats
 - 3.2. Diseases related to dogs
4. Outdoor activities
 - 4.1. Climbing and camping
 - 4.2. Exposure to insects' bites
 - 4.3. Skin exposure to sand and soil
5. Exposure to water