[Medicinski fakultet u Rijeci]

Curriculum
2024/2025

[Za kolegij]

Asthma and Allergies in Children

Study program:	**Medical Studies in English (R)** (elective) [Sveučilišni integrirani prijediplomski i diplomski studij]
Department:	**[Katedra za pedijatriju]**
Course coordinator:	**prof. dr. sc. Banac Srđan, dr. med.**
Year of study:	**6**
ECTS:	**1.5**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

The reason for holding this elective course is the fact that the prevalence of allergic diseases shows a disturbing increase in recent decades. The doctors meet allergic patients more and more often at all levels of health care. This mainly applies to the child population. Children suffer quite more often from hypersensitivity reactions than adults. Therefore, this elective course will additionally prepare and train students to know how to correctly approach such patients diagnostically and therapeutically. The content of the course includes presentation of the basics of clinical allergology, appropriate definitions and terminology. Students will learn about the epidemiological aspects of allergic diseases in children. They will learn what allergens are, what their characteristics are and which allergens are the most significant cause of allergic sensitization amongst children. Students will become familiar with the etiopathogenesis of allergic diseases and with the pattern of the so-called "allergic march" in children. Students will get to know and distinguish allergic from pseudoallergic reactions. They will learn the diagnostic approach to childhood asthma, including the differential diagnosis of asthma and asthmatic phenotypes in young children. They will learn the importance of performing and interpreting functional lung tests in children. A therapeutic approach to acute asthmatic attack will be presented practically. They will become familiar with the management of chronic asthmatic inflammation and with the inhalation method of drug administration. Students will learn more about atopic diseases associated to asthma such as allergic rhinitis and atopic dermatitis. They will learn about the importance and assessment of the quality of life of children with chronic atopic diseases. They will learn more about the clinical presentation and therapeutic approach to acute spontaneous urticaria, Quincke's edema and anaphylaxis. They will become familiar with the problem of hypersensitivity reactions to food and drugs. Finally, the importance of implementing measures of primary, secondary and tertiary prevention of allergic diseases will be highlighted.

List of assigned reading:

Nelson Essential of Pediatrics, 9th Edition April 2022.

List of optional reading:

Banac S. et al. Rising trends in the prevalence of asthma and allergic diseases among school children in the north-west coastal part of Croatia. Journal of Asthma. 2013; 50: 810-814.

Curriculum:

[Predavanja] list (with titles and explanation):

L1 Introduction and terminology

To recognize the authenticity of the teaching considering the place where the entire teaching takes place (Veli Lošinj Health Resort). Define and explain basic allergological terms: allergy, atopy, allergic sensitization, atopic disease, allergic reaction, pseudoallergy, intolerance reaction, hypersensitivity reaction. List and explain the four types of allergic reactions according to Coombs and Gell. List atopic diseases and the most common allergic diseases in childhood.

L2 Epidemiology and etiopathogenesis of allergic diseases

To describe the general increasing trend in prevalence of atopic diseases in children. Explain the reasons for starting and the methodology of the International Study of Asthma and Allergic Diseases in Children (ISAAC). List the main results of ISAAC by geographical distribution. Describe epidemiological studies of asthma and allergic diseases conducted in children in Croatia and to extract the results of studies conducted in accordance with the ISAAC methodology. State the hypothetical causes of the general increase in prevalence of atopic diseases in children. Explain the role of genetic predisposition and the influence of environmental factors on the onset and development of allergic diseases. List epigenetic mechanisms as risk factors for allergic diseases. Single out "pro and contra" arguments related to the validity of the "hygiene theory" in the interpretation of the etiopathogenesis of allergic diseases.

L3 Allergens of our environment

To list the main groups of allergens. Name the most common nutritional allergens and the most common inhalant allergens. Describe characteristics and list the biological features of the house dust mite *(Dermatophagoides pteronyssinus*). List the main allergenic groups of pollen and explain their seasonal occurrence according to the pollen calendar. Explain and list individual allergens as the most common causes of allergic sensitization in children, depending on the age of the child and the clinical correlate of allergic sensitization. List the most common allergens from the group of pinworms, medicines and vaccines.

L4 Diagnostic and therapeutic approach to allergic diseases

To point out specific characteristics of the history and physical exam of a child with allergy. List allergological tests "in vivo" and "in vitro". List the types of skin allergy tests and indications for their use. Explain the difference in diagnostic significance between serum concentrations of specific IgE and the so-called component allergen diagnostics. Explain allergen cross-reactivity and define oral allergy syndrome. List the types of provocation tests. To point out four main components of the therapeutic approach to allergic diseases. List the main groups of drugs used in the treatment of allergic diseases in children and explain the indications for which some of them are used.

L5 Childhood asthma and associated atopic diseases

To define childhood asthma as a clinical entity. List the main clinical features of childhood asthma. List the atopic diseases that are often associated with childhood asthma. Explain the so-called "atopic or allergic march" and the age dependence of the onset of certain atopic diseases. List the main clinical features of allergic rhinitis and allergic rhinoconjunctivitis. Describe the clinical features of atopic dermatitis depending on the age of the child. Highlight the main complications of atopic dermatitis. Describe the therapeutic approach to a child with atopic dermatitis.

L6 Hypersensitivity to food, drugs and vaccines

To define food allergy. Explain the differential diagnosis of a whole range of possible food hypersensitivity reactions and food intolerance reactions that are not actually food allergies. Define drug allergy and explain the difference to drug hypersensitivity reactions without a clearly proven underlying immune mechanism of the reaction. Define idiosyncrasy. State and recognize skin manifestations and dermatological clinical entities as a result of an allergic reaction to the drug. Explain the problems in the diagnostic process of proving drug allergy. List the most common causes of hypersensitivity reactions to vaccines. Recognize an absolute contraindication to the use of a vaccine due to an allergy.

L7 Immunotherapy of asthma and allergic diseases

To define allergen-specific immunotherapy and enumerate its types with regard to the method of administration of the allergen. List the indications for conducting allergen-specific immunotherapy in children. Explain the procedure and expected long-term effects of allergen-specific immunotherapy. List the main monoclonal antibodies used in the

treatment of asthma and allergic diseases in children. List the indications for the use of omalizumab (anti-IgE). To isolate the phenotype of asthma and its inflammatory profile, in which the therapeutic use of monoclonal antibodies is indicated.

L8 Prevention of asthma and allergic diseases

To state the reasons for the need to implement prevention measures in solving the problem of childhood asthma and allergic diseases. List and explain each of the three levels (primary, secondary, tertiary) of allergic disease prevention. Explain dietary interventions for infants without or at risk of atopy as part of the primary prevention of allergy and the onset of atopic dermatitis. Indications for the use of partial or extensive milk hydrolyzates in the diet of infants as part of the primary and secondary prevention of allergic diseases. Enumerate measures of secondary and tertiary prevention in a child with allergic asthma.

[Seminari] list (with titles and explanation):

S1 Clinical presentation of childhood asthma

To recognize the symptoms and signs of childhood asthma. Establish a working/clinical diagnosis of childhood asthma. Observe signs of cough and other symptoms of bronchial hyperreactivity in a child with asthma. Distinguish cough which is a part of the clinical picture of childhood asthma from cough as part of allergic rhinitis, which is often associated with asthma. To analyze and compare the respiratory symptoms typical of childhood asthma with the symptoms of other differential diagnostically important underlying serious lung diseases in children.

S2 Acute asthma attack

To recognize symptoms and signs of an acute asthmatic attack in a child. Assess the severity of an acute asthma attack. To analyze the risk factors for the onset of an acute asthmatic attack. Apply general and specific measures for the treatment of an acute asthmatic attack. Adapt the optimal pharmacotherapeutic approach to the child's age. To relate the temporal dynamics of bronchodilator administration with systemic corticosteroid administration. Determine the indication for hospitalization of a child with acute asthmatic symptoms.

S3 Complete asthma control

To assess and classify asthma control according to clinical judgment including application of specific standardized guidelines. Analyze the possible causes of stubborn asthma. Observe the possibility of the absence of complete control of asthma due to the problem of the patient's non-cooperation and due to the patient's exposure to unfavorable environmental factors. To judge the quality of life of a child with asthma. Appreciate the difficulties faced by children with asthma as a chronic disease.

S4 Urticaria and edema Quincke

To describe and recognize the morphological characteristics of urticaria as a pathological skin efflorescence. Distinguish and explain the connection between acute urticaria and edema Quincke. Classify the types of urticaria. Identify the most common causes of urticaria and edema Quincke. To notice the difficulties in discovering the cause of urticaria. Choose the optimal therapeutic approach for a child with urticaria and/or edema Quincke. To compare the pharmacodynamic effects of oral antihistamines of the first and second generation.

S5 Anaphylaxis

To define anaphylaxis and anaphylactic shock. Recognize the symptoms and signs of anaphylaxis in a child. Identify the problem of recognizing the clinical picture of anaphylaxis in infancy and young children. List the causes of anaphylaxis and the most common groups of allergens as allergic causes of anaphylaxis. List the most common foods and medicines that can cause an anaphylactic reaction. Explain the therapeutic approach to a child with anaphylaxis. Identify adrenaline as a key drug in the emergency treatment of a child with anaphylaxis and state its dose and method of administration. State prevention measures in a child prone to anaphylaxis.

[Vježbe] list (with titles and explanation):

P1 Allergological testing

To explain the principles of skin allergy testing. Apply the skin prick test in the child. Interpret the results of skin allergy tests. Explain the clinical significance of a positive skin test. To observe the insufficient sensitivity and specificity of skin tests in cases with allergic reaction to food and drugs.

P2 Lung function tests

To list lung function tests for children. List the indications for the use of lung function tests in children. Interpret the findings of spirometry. Explain the bronchodilator test. Explain home monitoring of peak expiratory flow (PEF) and interpret the resulting pulmonary function curve.

P3 Inhalational drug administration

Enumerate the forms of inhalational drug administration. Prepare the solution for inhalation and start the inhaler (nebulizer). List the types of plastic chambers with a one-way valve for inhaling inhalers and demonstrate the inhalation technique. List the forms of powders for inhalation. Notice the difference in the dose between salbutamol administered via an inhaler or via a nebulizer.

P4 Quality of life of children with asthma and allergic diseases

Describe the questionnaires for examining the quality of life in children with asthma, allergic rhinitis and atopic dermatitis. Interpret and discuss the results of quality of life tests in children with asthma and associated atopic diseases. To see the importance of examining the quality of life of a chronic patient.

Student obligations:

Attendance at lectures, seminars, and practicals is mandatory, and records are kept separately for each student in the INP application of the Faculty of Medicine in Rijeka. All the mentioned forms of teaching start at the exact time indicated according to the given schedule, and lateness will be treated as an absence. Entrances/exits during classes are not taken into account. A student can be excused for missing up to 30% of the hours scheduled separately for practicals, seminars and lectures, solely for health reasons, which is justified by a doctor's excuse. If a student unjustifiably misses more than 30% of classes in a particular form of teaching (2 hours of lectures, 3 hours of seminars, 2 hours of exercises), he cannot continue following the course and loses the opportunity to take the final exam (0 ECTS points, grade F). Students are expected to actively participate in seminars and practicals. These are characterized by active learning methods and demonstration methods. Activity is also expected at the lectures, which are interactive, given that it is a small group of students. Supplementary literature is available to students. It is recommended to be read before the start of classes.

Exam (exam taking, description of the written/oral/practical part of the exam, point distribution, grading criteria):

Students who have 30% or more unexcused absences from classes can not take the final exam. Such a student is gra
multiple choice test - consisting of 30 questions. The duration of writing the test is 45 minutes. The number of correctly a

No. of positive responses	15	15	16	17	18	19	20	21	22	23	
Grade points	0	50	53	56	59	61	64	67	70	73	

The final grade is carried out according to the table:

Total sum of grade points	**Final grade**	
91-100	A	excellent (5)
77-88	B	very good (4)
61-73	C	good (3)
50-59	D	satisfactory (2)
50	F	insufficient (1)

Other notes (related to the course) important for students:

The elective course "Asthma and allergies in children" includes direct contact with students during lectures, seminars and practicals. The lectures will further deepen the knowledge about asthma and allergic diseases in children, the acquisition of which was already started as part of the compulsory course "Paediatrics", which the students took in the 5th year of the Study in medicine. Lectures are followed by seminars and practicals characterized by active methods of problem-oriented learning such as case reports and case-based learning. Demonstration methods are also represented. The whole course is held intensively in the block, for three days consecutively, in an authentic environment - the Veli Lošinj Health Resort - known for treating children with asthma and allergic diseases.

COURSE HOURS 2024/2025

Asthma and Allergies in Children

[Predavanja] (Place and time or group)	**[Vježbe]** (Place and time or group)	**[Seminari]** (Place and time or group)
24.01.2025		

L1 Introduction and terminology:
• [Lječilište Veli Lošinj] (16:00 - 16:45) [370]
  ○ AaAiC
 	
L2 Epidemiology and etiopathogenesis of allergic diseases:
• [Lječilište Veli Lošinj] (17:00 - 17:45) [370]
  ○ AaAiC
 	
L3 Allergens of our environment:
• [Lječilište Veli Lošinj] (18:00 - 18:45) [370]
  ○ AaAiC
 	
L4 Diagnostic and therapeutic approach to allergic diseases:
• [Lječilište Veli Lošinj] (19:00 - 19:45) [370]
  ○ AaAiC
	P1 Allergological testing:
	• [Lječilište Veli Lošinj] (20:00 - 21:30) [370]
	  ○ AaAiC	

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25.01.2025		

L5 Childhood asthma and associated atopic diseases:
• [Lječilište Veli Lošinj] (08:00 - 08:45) [370]
  ○ AaAiC
 	
L6 Hypersensitivity to food, drugs and vaccines:
• [Lječilište Veli Lošinj] (20:30 - 21:15) [370]
  ○ AaAiC
	P2 Lung function tests:
	• [Lječilište Veli Lošinj] (10:45 - 12:15) [370]
	  ○ AaAiC
	
	P3 Inhalational drug administration:
	• [Lječilište Veli Lošinj] (17:00 - 18:30) [370]
	  ○ AaAiC
		S1 Clinical presentation of childhood asthma:
		• [Lječilište Veli Lošinj] (09:00 - 10:30) [370]
		  ○ AaAiC
		
		S2 Acute asthma attack:
		• [Lječilište Veli Lošinj] (12:30 - 14:00) [370]
		  ○ AaAiC
		
		S3 Complete asthma control:
		• [Lječilište Veli Lošinj] (18:45 - 20:15) [370]
		  ○ AaAiC

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26.01.2025		

L7 Immunotherapy of asthma and allergic diseases:
• [Lječilište Veli Lošinj] (11:30 - 12:15) [370]
  ○ AaAiC
 	
L8 Prevention of asthma and allergic diseases:
• [Lječilište Veli Lošinj] (12:30 - 13:15) [370]
  ○ AaAiC
	P4 Quality of life of children with asthma and allergic diseases:
	• [Lječilište Veli Lošinj] (13:30 - 14:15) [370]
	  ○ AaAiC
		S4 Urticaria and edema Quincke:
		• [Lječilište Veli Lošinj] (08:00 - 09:30) [370]
		  ○ AaAiC
		
		S5 Anaphylaxis:
		• [Lječilište Veli Lošinj] (09:45 - 11:15) [370]
		  ○ AaAiC

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List of lectures, seminars and practicals:

[PREDAVANJA] (TOPIC)	**Number of hours**	**Location**

L1 Introduction and terminology	1	[Lječilište Veli Lošinj]
L2 Epidemiology and etiopathogenesis of allergic diseases	1	[Lječilište Veli Lošinj]
L3 Allergens of our environment	1	[Lječilište Veli Lošinj]
L4 Diagnostic and therapeutic approach to allergic diseases	1	[Lječilište Veli Lošinj]
L5 Childhood asthma and associated atopic diseases	1	[Lječilište Veli Lošinj]
L6 Hypersensitivity to food, drugs and vaccines	1	[Lječilište Veli Lošinj]
L7 Immunotherapy of asthma and allergic diseases	1	[Lječilište Veli Lošinj]
L8 Prevention of asthma and allergic diseases	1	[Lječilište Veli Lošinj]

[VJEŽBE] (TOPIC)	Number of hours	Location
P1 Allergological testing	2	[Lječilište Veli Lošinj]
P2 Lung function tests	2	[Lječilište Veli Lošinj]
P3 Inhalational drug administration	2	[Lječilište Veli Lošinj]
P4 Quality of life of children with asthma and allergic diseases	1	[Lječilište Veli Lošinj]

[SEMINARI] (TOPIC)	Number of hours	Location
S1 Clinical presentation of childhood asthma	2	[Lječilište Veli Lošinj]
S2 Acute asthma attack	2	[Lječilište Veli Lošinj]
S3 Complete asthma control	2	[Lječilište Veli Lošinj]
S4 Urticaria and edema Quincke	2	[Lječilište Veli Lošinj]
S5 Anaphylaxis	2	[Lječilište Veli Lošinj]

EXAM DATES (final exam):