



## Report of analysis of education offer in pain medicine at the University of Kragujevac

### A. Graduate Studies – Integrated Academic Studies of Medicine – 360 ESBP

Through analysis of curricula and teaching plans of the 53 subjects taught at Integrated Academic Studies of Medicine, we have established that the pain medicine is studied in the following subjects:

#### 1. **Pharmacology with Toxicology**, at the third year of the study,

Within the didactic unit: Central Nervous System, there are

2 hours of lectures:

- pharmacological pain therapy

3 hours of practical skills teaching:

- The effect of morphine on breathing of rabbit
- Working with pharmacological databases on the Internet

#### 2. **Neurology**, at the fourth year of the study

*Within the didactic unit:* Sleep disorders. Headaches. Vertigo. There are

2 hours of lectures with the aim to introduce following topics to students:

- Definition, classification, clinical picture of headache. Differential diagnosis of headaches.
- Neuralgias of the head and face

3 hours of practical skills teaching with following objectives:

- Students are introduced to Objective examination of the head and neck
- General inspection, palpation and percussion of the head and neck
- Taking a history of the patient, examination of the head and neck by the students
- Plenary session where neurological examination of cranial nerves of the head and neck is demonstrated
- Examination of cranial nerves by students



*Within the didactic unit: Spinal cord diseases and motor neuron diseases there are:*

1 hour of lecture:

- damage to the spinal cord and nerve plexus
- radiculopathies and plexopathies and therapeutic procedures in their treatment

3 hours of clinical skills teaching:

- Independent taking of anamnesis and neurological clinical examination of patients with spinal cord lesions
- Consideration of etiology, differential diagnosis and therapeutic procedures

### **3. Physical medicine and rehabilitation , at the fourth year of study**

Within the didactic unit: Electrotherapy

2 hours of lectures:

- Alternating current
- Low frequency currents (Faradic current).
- Medium-frequency currents (IFS, TENS, sinusoidal modulated currents).
- High-frequency currents
- Indications and contraindications for the application of alternating current
- Use of electrotherapy in painful conditions

2 lessons a practical skills teaching:

- Technique of application of galvanic current, diadynamic currents, interfering currents, TENS therapy.
- Techniques of application of alternating currents on the patient.
- Dosing of alternating currents
- Learn about contraindications for the application of individual AC types
- Precautions for KTD application
- TENS application in painful conditions



Within the didactic unit: Rehabilitation in ortopedics and traumatology

1 hour lesson

- Complex regional pain syndrome: mechanisms of development, clinical picture and physical treatment

1 hour clinical skills teaching

- Preparation of medical rehabilitation plan after soft tissue injuries and after bone fractures.
- To learn the optimal application of physical agents after bone fractures and complications after fracture.

#### 4. Internal medicine 2 , in the fourth year of study

*Within the didactic unit:* Classification of rheumatoid diseases. Rheumatoid arthritis. Spondyloarthritis. Ankylosing spondylitis. Psoriatic arthritis. Enteropathic arthritis.

During 3 hours of theoretical and 3 hours of practical skills teaching in small group, pain therapy in rheumatoid arthritis and spondyloarthropathy is mentioned as a part of therapeutic regimen.

#### 5. Pediatrics, at the fifth year of study

*Within the didactic unit:* Rheumatic diseases in childhood. Rheumatic fever. Poisoning in pediatrics.

During 7 hours of lectures there is a topic relevant to pain medicine:

- Treatment of rheumatic diseases: non-steroidal antirheumatics, methotrexate, glycocorticoids, other drugs, biological drugs

#### 6. Resuscitation 2, at the sixth year of study

Within the didactic unit: Analgesia in trauma

2 hours of lectures

- Analgosedation of the injured patient
- Pathophysiology of pain, unwanted systemic effects of pain
- Assessing pain intensity
- Procedures and techniques for pain therapy

*This project has been funded with support from the European Commission.*

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1 hour of practical skills teaching:

- different ways and techniques of analgesic use, dosing of analgesics

## B. Postgraduate studies

Postgraduate studies are held for 36 specialist areas and for 15 subspecialties. Analyzing curricula and teaching plans for those study programs we found that pain medicine is studied within the following health specialties:

### 1. Thoracic surgery

- Within the study period in the field of pulmonology, there is education on the use of analgesics before and after surgical intervention
- during the study period in the field of Anesthesiology and Reanimation, students are required to learn techniques of regional anesthesia for perioperative pain therapy
- During two-semester lectures:
  - Didactic unit* Anesthesia and analgesia
    - 3 hours of lectures are devoted to the techniques of analgesia in perioperative period for thoracic surgery

### 2. Neurology

During two-semester lectures:

- Didactic unit: Sensory disorders and pain in neurology - 10 hours of lectures
- Didactic unit: Damage of spinal cord and nerve plexuses, Peripheral nervous system diseases - 10 hours of lectures
- Procedures and Skills that the specialist should adopt include techniques for paravertebral blockade

### 3. General medicine

- During two-semester lectures:
  - Lectures in the field of Internal medicine:
    - Didactic unit:* Pain syndrome -1 hour of lecture
    - Didactic unit:* Pain syndrome in cardiology - 1 hour of lecture
  - Lectures in the field of General medicine:
    - Didactic Unit:* Palliative and Supportive Therapy of oncological patients - 1 hour lecture

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- Lectures in the field of Neurology:

*Didactic units:* Headache; Phantom pain; Radiculopathies - each 1 hour of lecture

- Procedures and skills that the specialist should master include techniques of treating pain syndromes and the principles and techniques of local infiltration of analgesics

#### 4. Orthopedic surgery and traumatology

During education in orthopedics following regarding pain is taught:

- Differential diagnosis of pain, the most common chronic pain syndromes of the upper extremities and their treatment;
- Diagnosis and treatment of patellofemoral disorders: lower extremities pain syndromes and balance disorders with dislocation

#### 5. Physical medicine and rehabilitation

Recommended literature to prepare for a specialist exam:

- **Medical rehabilitation of spinal column pain syndrome** Miodrag Veljkovic Kragujevac: Faculty of Medicine, 2008 (Kragujevac: Printel).
- Two-semester lectures include:
  - *Didactic unit:* low frequency alternating electrical current TENS - 2 hours of lectures
  - *Didactic unit:* Acupuncture - 2 hours of lectures
  - *Didactic unit :* Physical pain treatment - 2 hours of lectures
- Procedures and skills that the specialist should master include using low-frequency alternating current, TENS, in the treatment of different painful conditions

#### 6. Anesthesiology, Reanimatology and Intensive Therapy

- Two-semester lectures include:
  - Didactic unit:* Local anesthetics - 3 hours of lectures
  - Didactic unit:* Epidural analgesia, complications of epidural analgesia - 4 hours of lectures
  - Didactic unit:* Epidural analgesia in maternity - 2 hours of lectures
  - Didactic unit:* Adverse effects of epidural analgesia during childbirth - 2 hours of lectures
  - Didactic unit:* Regional blocks of the nerves of the upper extremity-4 hour lecture
  - Didactic unit:* Regional blocks of the nerves of the lower extremity -3 hour lecture
  - Didactic unit:* Sympathetic nerve blockade - 3 hours of lectures
  - Didactic unit:* Therapy of acute postoperative pain
  - Didactic unit:* Chronic pain therapy - 3 hours of lectures
  - Didactic unit:* Analgosedation in ICU- 3 hours of lectures



- Procedures and skills that the specialist should master include:
  - Epidural analgesia
  - Epidural analgesia in maternity
  - Peripheral nerve blocks
  - Use of pain score scales for determining the intensity of pain
  - Patient Controlled Analgesia

## **7. Clinical pharmacology**

- Two-semester lectures include:
  - Didactic unit*: Pain therapy; Opioid analgesics - 3 hours of lectures
  - Didactic unit*: Clinical pharmacology of non-steroidal anti-inflammatory drugs - 3 hours of lectures

## **8. Clinical pharmacy**

- Two-semester lectures include:
  - Didactic unit* : role of a clinical pharmacist in the team for the treatment of pain and migraine - 10 hours of lectures
- Procedures and skills that the specialist should master include:
  - Making of the treatment plan, monitoring of therapeutic response and adverse reactions and monitoring of drug interactions in patients with painful conditions

## **9. Pharmacotherapy**

- Two-semester lectures include:
  - Didactic unit*: Pain therapy - 2 hours of lecture
- Practical work: Case study of patient with neuropathic pain

## **10. Emergency medicine**

- Two-semester lectures include:
  - Didactic unit* : Pain therapy, sedation - 3 hours of lectures



## C. Undergraduate study

We have analyzed curricula of 41 subjects in Undergraduate studies, specialized studies for the title of specialized nurse. We found that the pain is studied in the following subjects:

### 1. Neurology

- *Didactic unit:* Pain and headaches:
  - 1 hour lecture: pain, classification and pain therapy; Neuropathic pain
  - 1 hour of practical skill teaching: recognition of painful syndromes

### 2. Anesthesia with resuscitation

- 3 hours of lectures: pain and pain therapy
- 1 hour of practical skills teaching: Measuring pain. Scales for assessment of pain.

## D. Continuing medical education

Our Faculty organizes continued medical education, at least once a week. Concerning topic of pain, there was only one 6 hour course, held in May, 2016: – *Basics of pathophysiology, evaluation and treatment of chronic pain*