



## The Hong Kong College of Anaesthesiologists

### Curriculum for Diploma in Pain Management

Trainees should be proficient in the following topics:

#### 1. Basic science

- 1.1. Anatomy and physiology of the pain pathways
  - 1.1.1. Peripheral pathways and mechanisms
  - 1.1.2. Central pathways and mechanisms
  - 1.1.3. Higher centres in nociceptive processing
  - 1.1.4. Pain modulation
- 1.2. Pharmacology of agents used in pain management
  - 1.2.1. Opioids
    - 1.2.1.1. Basic opioids pharmacology
      - a) Classification
      - b) Structure of opioids
      - c) Physical properties
      - d) Opioids receptors
      - e) Pharmacokinetic and pharmacodynamic properties for each opioid drugs
      - f) Toxicities and side effects
    - 1.2.1.2. Clinical opioid pharmacology
      - a) Various routes of administration
      - b) Efficacy and potency
      - c) Equianalgesic doses for different opioids
      - d) Different clinical effects among pure agonists, partial agonists and agonists/antagonists
      - e) Tolerance, dependence and addiction
      - f) Recognise specific clinical guidelines for use of opioids in different situations.
      - g) Understand management of side effects and toxicities.
  - 1.2.2. Non-steroid anti-inflammatory drugs (NSAIDs)
    - 1.2.2.1. Pharmacokinetic properties of the drugs
    - 1.2.2.2. Pharmacodynamic properties of the drugs
    - 1.2.2.3. Side effects, interaction and toxicities
    - 1.2.2.4. Indications for use
  - 1.2.3. Antidepressants, Anticonvulsants and Miscellaneous Agents

1.2.3.1. Antidepressants

- a) Pharmacokinetic and pharmacodynamic properties of individual drugs
- b) Indications and specific drugs used
- c) Dosing principles
- d) Common side effects

1.2.3.2. Anticonvulsants

- a) Pharmacokinetic and pharmacodynamic properties of individual drugs
- b) Indications and specific drugs used
- c) Dosing principles
- d) Side effects and toxicities

1.2.3.3. Local anaesthetics and antiarrhythmias

- a) Pharmacokinetic and pharmacodynamic properties of individual drug
- b) Indications
- c) Dosing principles
- d) Side effects and toxicities

1.2.3.4. Neuroleptics

- a) Indications
- b) Side effects and toxicities

1.2.3.5. Antihistamines

1.2.3.6. Analeptic drugs

1.2.3.7. Corticosteroids

1.2.3.8. Central muscle relaxants

1.2.3.9. Sympatholytic drugs

1.2.3.10. Miscellaneous adjuvant drugs

**2. Taxonomy**

- 2.1. Understand and be able to apply the taxonomy of pain syndromes as defined by the IASP (International Association for the Study of Pain)

**3. Assessment of pain and related function**

3.1. Pain measurement

- 3.1.1. Understand role of pain measurement
- 3.1.2. Understand approaches to measuring pain including children
- 3.1.3. Be able to assess factors biasing pain measurement

3.2. Clinical evaluation of pain and function

- 3.2.1. Know the key elements of pain-related history
- 3.2.2. Able to perform an appropriate physical examination and interpret the findings

3.2.3. Know appropriate laboratory, electrophysiological and radiological procedures to evaluate pain

3.2.4. Be able to diagnose and classify pain complaints

3.2.5. Be able to assess physical and psychological disabilities

3.3. Diagnostic testing

3.3.1. Understand the principles of diagnostic testing and how to interpret the results

#### **4. Psychological and social aspects of pain**

4.1. Recognise that pain is experienced in an emotional, cognitive and socio-environmental context

4.2. Recognise individual differences in affective, cognitive and behavioural responses to pain

4.3. Recognise the emotional and psychiatric problems associated with pain

4.4. Recognise the influence of social and family factors on expression of pain

#### **5. Epidemiology of pain**

5.1. Know the epidemiology of various chronic pain conditions

5.2. Know the epidemiology of cancer pain

5.3. Be aware of the magnitude of acute pain problems

#### **6. Principles and techniques of acute pain management**

6.1. Understand the adverse physiological effects of postoperative pain

6.2. Be familiar with pharmacology of opioids, NSAIDs and local anaesthetics

6.3. Be familiar with application of various techniques for optimal postoperative pain management

6.4. Know the non-pharmacological methods of acute pain control

6.5. Understand the organisation of acute pain service and clinical outcomes of acute pain management

#### **7. Principles of cancer pain management**

7.1. Evaluation of patients with cancer

7.1.1. Recognise the importance of comprehensive evaluation in the context of palliative care

7.1.2. Be able to obtain an accurate history, perform physical examination, assess laboratory and radiological investigation and interpret the findings

7.1.3. Be able to recognise oncological emergencies associated pain

7.1.4. Recognise the importance of co-existing symptoms and complaints

7.1.5. Recognise the importance of psychosocial assessment

7.2. Principles of palliative cancer care

7.2.1. Recognise that pain management is a component of broader palliative care

7.2.2. Understand the multidisciplinary model in palliative care

7.2.3. Understand the aims of palliative care

7.3. Pharmacological management of cancer pain

7.3.1. Understand pharmacology of analgesic drugs especially opioids

7.3.2. Understand the "analgesic ladder" approach

7.3.3. Understand the dosing principles, equianalgesic concept and routes of administration

7.3.4. Understand the side effects of pharmacological therapy and the management

7.3.5. Understand the use of adjuvant drugs

7.4. Non-pharmacological approaches in treatment of cancer pain

7.4.1. Understand the use and limitation of nerve blocks

7.4.2. Know the use and limitation of intrathecal therapy

7.4.3. Understand the use and limitations of neuroablative approaches

7.4.4. Recognise the use and limitation of neurostimulatory therapy

7.4.5. Know the indications and limitation of radiotherapy

7.4.6. Be aware of the analgesic effects of some surgical operations

7.4.7. Be aware of psychological and psychiatric approaches to cancer pain management

7.5. Management of dying patients

7.5.1. Recognise the psychological and spiritual needs of a dying patient

7.5.2. Understand the psychological reaction in the family of dying patients

**8. Principles and techniques of management of common chronic pain problems with special emphasis on the followings:**

8.1. Chronic back pain

8.1.1. Know the anatomy of the spine

8.1.2. Know the common pathological changes that are thought to produce pain

8.1.3. Know the common causes of chronic back pain

8.1.4. Understand the principles of standard modalities for treatment of back pain

8.1.5. Know the indications for surgical intervention for back pain

8.1.6. Know the roles of nerve blocks in diagnosis and treatment of back pain

8.1.7. Know the costs/benefits of various treatment for back pain

8.1.8. Recognise the social and economic consequence of back pain

8.2. Myofascial pain

8.2.1. Know the epidemiology of myofascial pain

8.2.2. Understand the concept of trigger points

- 8.2.3. Know the common trigger points responsible for pain
- 8.2.4. Know the treatment modalities for trigger points
- 8.3. Headache
  - 8.3.1. Know the anatomy and physiology of headache
  - 8.3.2. Know the classification of headache
  - 8.3.3. Be able to diagnose and differentiate various headache disorders by history, examination and appropriate investigations.
  - 8.3.4. Understand the treatment modalities for various headache disorders
- 8.4. Neuropathic pain
  - 8.4.1. Know the common clinical characteristics of neuropathic pain
  - 8.4.2. Know the proposed mechanism of neuropathic pain
  - 8.4.3. Know the common neuropathic pain syndromes
    - 8.4.3.1. Nerve compression
    - 8.4.3.2. Nerve inflammation
    - 8.4.3.3. Nerve ischaemia/infarction
    - 8.4.3.4. Neuroma
    - 8.4.3.5. Painful polyneuropathies
    - 8.4.3.6. Complex regional pain syndrome
  - 8.4.4. Know the therapeutic interventions applied in neuropathic pain
    - 8.4.4.1. Know the pharmacological approaches
    - 8.4.4.2. Know the regional anaesthetic approaches
    - 8.4.4.3. Know the neurostimulatory approaches
    - 8.4.4.4. Be aware of the role of surgical approaches
    - 8.4.4.5. Know the role of physical therapy and psychological approaches
- 8.5. Orofacial pain
  - 8.5.1. Anatomy of cranial nerves
  - 8.5.2. Understand the diagnostic features of orofacial pain
  - 8.5.3. Know the treatment of orofacial pain, the indications and contraindications
- 8.6. Rheumatological pain
  - 8.6.1. Know the epidemiology of rheumatological pain
  - 8.6.2. Understand the pathophysiology of musculoskeletal pain
  - 8.6.3. Know the classification of musculoskeletal diseases
  - 8.6.4. Be able to assess disease severity
  - 8.6.5. Know the treatment measures available
  - 8.6.6. Be aware that many rheumatological disease need multidisciplinary approaches
- 8.7. Others

## **9. Principles and practice of interventional pain management**

- 9.1. Nerve blocks
  - 9.1.1. Know the anatomy of the following important peripheral and central nervous system regions
    - 9.1.1.1. Spine
    - 9.1.1.2. Peripheral nerves and plexuses
    - 9.1.1.3. Autonomic nervous system
  - 9.1.2. Be familiar with the pharmacology of the agents used for nerve blocks or injection around the nerves
    - 9.1.2.1. Local anaesthetics
    - 9.1.2.2. Neurolytic agents
    - 9.1.2.3. Corticosteroids
  - 9.1.3. Know how nerve blocks are used for diagnostic or therapeutic purposes, and the risks and problems associated with the blocks
    - 9.1.3.1. Myofascial trigger point injection
    - 9.1.3.2. Common peripheral nerve blocks
    - 9.1.3.3. Sympathetic blocks
    - 9.1.3.4. Epidural steroid injection
    - 9.1.3.5. Visceral plexuses blocks
    - 9.1.3.6. Intrathecal and epidural neurolytic blocks
- 9.2. Intrathecal devices
  - 9.2.1. Know the indications and techniques of implanting intrathecal devices
    - 9.2.1.1. Techniques of catheter placement
    - 9.2.1.2. Techniques of drugs administration
  - 9.2.2. Know the side effects and problems associated with the intrathecal devices
- 9.3. Neuroaugmentation
  - 9.3.1. Understand the postulated mechanism of stimulation-induced analgesia
  - 9.3.2. Understand the general principles and the indications for neurostimulation techniques
  - 9.3.3. Know the techniques and use of dorsal column stimulation
  - 9.3.4. Know the techniques and use of peripheral nerve stimulation
  - 9.3.5. Be aware of the role of deep brain stimulation
- 9.4. Neuroablative procedures
  - 9.4.1. Know how to evaluate patients for the procedures
  - 9.4.2. Know the indications, techniques and outcome of specific procedures
    - 9.4.2.1. Peripheral neurectomy
    - 9.4.2.2. Sympathectomy

- 9.4.2.3. Facet rhizolysis
- 9.4.2.4. Spinal dorsal rhizotomy including ganglionectomy
- 9.4.2.5. Cordotomy
- 9.4.2.6. Dorsal root entry zone lesion
- 9.4.2.7. Commissural myelotomy
- 9.4.2.8. Cranial nerve rhizolysis
- 9.4.2.9. Hypophysectomy

## **10. Principles of physical treatment**

- 10.1. Know the role of physiotherapy and occupational therapy in pain management
  - 10.1.1. Temperature treatment
  - 10.1.2. Manipulation, mobilisation, massage and traction
  - 10.1.3. Exercises
- 10.2. Transcutaneous Electrical Nerve Stimulation (TENS) and acupuncture
  - 10.2.1. Know the principles and the clinical application of following modalities:
    - 10.2.1.1. Conventional TENS
    - 10.2.1.2. Acupuncture-like TENS
    - 10.2.1.3. Vibration
    - 10.2.1.4. Acupuncture by dry needle

## **11. Principles of behavioural, cognitive and supportive psychotherapeutic treatment**

- 11.1. Understand the theoretical rationale and indications of following treatment approaches:
  - 11.1.1. Relaxation techniques
  - 11.1.2. Biofeedback
  - 11.1.3. Cognitive behavioural therapy
  - 11.1.4. Operant therapy
  - 11.1.5. Group therapy
  - 11.1.6. Hypnotic therapy
- 11.2. Recognise the application of various strategies to specific pain syndrome
- 11.3. Understand role of social skill training

## **12. Principles of multidisciplinary approaches to pain management**

- 12.1. Understand the purpose of a multidisciplinary pain clinic
- 12.2. Know the ranges of service a multidisciplinary pain clinic provides
- 12.3. Know the components and administration of a multidisciplinary pain clinic
  - 12.3.1. Personnel
  - 12.3.2. Facilities
  - 12.3.3. Policies and practice
  - 12.3.4. Finance

**13. Principles of management of pain in children**

- 13.1. Understand the developmental psychology of children
- 13.2. Know the multidimensional nature of children's pain experience
- 13.3. Be aware of methods of pain measurement in children
- 13.4. Know the use of pharmacological intervention
- 13.5. Know the application of nonpharmacological methods for children's pain
- 13.6. Know the management of common acute pain problems in children
- 13.7. Know the management of recurrent pain in children
- 13.8. Know the management of specific chronic pain problems in children

**14. Organisation and administration**

- 14.1. Organisation and management of pain management centres
  - 14.1.1. Know the organisation of different levels of pain centres
  - 14.1.2. Know the outcome data of pain centres
  - 14.1.3. Know the specialists involved in pain centres
  - 14.1.4. Be aware of the personnel required for pain centres
  - 14.1.5. Be aware of the facilities required for pain centres
  - 14.1.6. Be aware of the policies and practice of pain centres
  - 14.1.7. Be aware of the finance and cost of pain centres
- 14.2. Continuing quality improvement, utilisation review and evaluation

**15. Research in pain**

- 15.1. Understand the philosophy of ethical considerations in research
- 15.2. Know the international standards in biomedical research
- 15.3. Understand the importance of informed consent
- 15.4. Know the ethical standards in animal research
- 15.5. Understand research design and implementation
- 15.6. Know the application of statistics and interpretation of results.