NEW ZEALAND ASSOCIATION OF MUSCULOSKELETAL MEDICINE

CURRICULUM

(20 February 2019)

Contents

OPENING STATEMENT

This NZAMM curriculum document describes the attributes expected to be obtained in the trainee's journey towards Fellowship of the AFMM and subsequent awarding of the Certificate of Attainment in Musculoskeletal Medicine (CAMM). The certificate is the recognised vocational qualification to practise as a musculoskeletal physician in New Zealand.

The document, along with the referenced supporting documents, provides the expected trainee outcome for each of the domains of competency, how these are assessed, what the expected standard of achievement is, the resources to be utilised, and the key academic references underlying each domain.

1. INTRODUCTION

1.1 What is Musculoskeletal Medicine?

Musculoskeletal medicine is a branch of medical science concerned with the functions and disorders of the musculoskeletal system, including the muscles, aponeuroses, joints, and bones of the axial and appendicular skeletons, and those parts of the nervous system associated with them.

Various medical and allied health professionals, such as general practitioners, musculoskeletal physicians, orthopaedic surgeons, rheumatologists, physiotherapists, osteopaths, chiropractors, and acupuncturists care for patients with musculoskeletal problems. Musculoskeletal physicians, however, combine a core knowledge of musculoskeletal science with a practical ability to integrate this knowledge with particular clinical skills, to orchestrate a comprehensive approach to the diagnosis and treatment of patients with disorders of the musculoskeletal system. These skills include appropriate investigations, treatment with manual therapy, medication, interventional pain procedures, rehabilitation, and biopsychosocial management approaches. Musculoskeletal medicine is a community-based specialist service that provides for clinical presentations of conditions that may range from acute to chronic, and that may have failed to respond to other forms of treatment.

1.2 The Educational Objectives of the Training Programme

The training programme will produce fellows with the ability to

- determine and describe the mechanisms and causes of painful disorders of the musculoskeletal system and their associated symptoms and signs
- explain to patients, in understandable terms, the mechanisms and causes of painful disorders of the musculoskeletal system
- explain to their colleagues, of all ranks and disciplines, the mechanisms and causes of painful disorders of the musculoskeletal system
- comprehensively assess patients with acute and chronic painful disorders of the musculoskeletal system, using techniques and procedures that are reliable and valid, according to the best available scientific evidence
- formulate a plan of management for patients with acute or chronic painful disorders of the musculoskeletal system, using interventions known to be safe, effective, and cost-effective, according to the best available scientific evidence
- provide all or part of this management themselves, according to their training, aptitude, and resources available to them, or secure and provide by referral and collaboration such appropriate management as they themselves may not be able to immediately offer
- critically evaluate the available literature pertaining to painful disorders of the musculoskeletal system
- advise patients, medical colleagues, insurers, ACC, and workers' compensation authorities on the nature and merits of various options available for the management of patients with painful disorders of the musculoskeletal system
- distinguish between those management options that are conjectural and those that are evidence-based, and distinguish those that are reliable, valid, and effective from those that are not
- teach consumers, students, and colleagues any and all aspects of the basic and clinical sciences pertinent to the optimal management of painful disorders of the musculoskeletal system

- have an ongoing dedication to the evolution of the discipline by undertaking literature reviews and participating in research projects.

Because of their training and experience, musculoskeletal specialists are able to provide, for general practitioners and other members of the profession, a specialist resource that can secure for patients a comprehensive and valid assessment of their problems, and the most appropriate form of management that is safe, effective, and cost-effective. Musculoskeletal specialists have strong relationships with general practitioners and other primary health care providers, helping to secure optimal outcomes for patients with musculoskeletal pain problems.

Specialists in musculoskeletal medicine have trained and been examined in

- the anatomy, physiology, and histology of the bones, muscles, joints, and nerves of the body
- the biochemistry of fibrous connective tissues and their common disorders
- the normal biomechanics of the musculoskeletal system
- the physiology of nociception, pain processing, and the behavioural dimensions of pain
- the pathophysiology of painful disorders of the musculoskeletal system, including an understanding of valid and conjectural models
- the principles of biostatistics and epidemiology as they pertain to evidence concerning the diagnosis and management of painful disorders of the musculoskeletal system, and the application of these principles to actual clinical practice
- obtaining a detailed and comprehensive history from patients
- performing a physical examination of the musculoskeletal system, using accepted techniques, but with awareness of the reliability and validity of each technique
- techniques available for the investigation of painful disorders of the musculoskeletal system, with awareness of their reliability and validity
- the management of pain and of patients with musculoskeletal pain, using explanation, education, encouragement, and reassurance, advice about activity and exercises, manual therapy, drug therapy, injections, appliances, and other devices, according to the best available evidence of safety, efficacy, and cost-effectiveness.

The particulars of these knowledge sets and skills, and the literature upon which they are based, are recorded in detail in the syllabus of the faculty.

Musculoskeletal specialists are trained and examined in

- knowledge explicitly pertinent to the pain and associated features suffered by patients with musculoskeletal disorders, some of which are not associated with demonstrable pathology
- knowledge and techniques pertaining to disorders suffered by patients that are not explicitly or formally embraced by the curricula of other specialists, or examined by members of those respective colleges or faculties
- knowledge firmly based on contemporary evidence of reliability, validity, safety, efficacy, and cost-effectiveness, as opposed to traditional wisdom and past conventional practice
- practices that have been subjected to independent scrutiny and evaluation, and which have been shown to be safe, effective, and cost-effective, and appreciated and valued by consumers
- practices that are based on sound ethical principles, meaning trainees develop respect for patients and for the profession.

1.3 Vocational Training

The purpose of training in musculoskeletal medicine is to produce doctors with competence and skills in managing musculoskeletal pain problems.

Trainees are required to complete a specified programme of training and examination in order to be eligible for admission to fellowship of AFMM under Articles 49, 50, 51, and 52 of the Articles of Association of AFMM. Trainees will be eligible for admission as members of AFMM, in accordance with the Articles of Association, after attaining the Diploma of Musculoskeletal Medicine. To obtain a CAMM (the Certificate of Attainment in Musculoskeletal Medicine is the recognised specialist qualification in New Zealand) a trainee must firstly be successful in the final fellowship examinations.

2. PURPOSE OF THE CURRICULUM

1. The curriculum is designed to be a practical resource, which clearly outlines the learning requirements for those undertaking the musculoskeletal medicine vocational training pathway.
2. The curriculum represents a comprehensive statement on the unique body of knowledge required for musculoskeletal medicine practice. Through the development of this resource we have gained a clear view of what, where, and how musculoskeletal medicine trainees and CAMM holders need to learn in order to undertake safe and independent practice across a range of communities in New Zealand.
3. The curriculum provides a framework from which to plan specific educational, assessment, and professional development processes. The development of the curriculum promotes transparency, consistency, and academic rigour in these educational processes. It also represents a fundamental resource for musculoskeletal medicine trainees, supervisors, and teachers, providing clear information on what is to be expected from vocational education and lifelong professional development.

3. BACKGROUND TO THE CURRICULUM

1. Musculoskeletal medicine is an acknowledgement of
    - the emergence of musculoskeletal medicine as a distinct discipline
    - a deficit in the appropriate management of musculoskeletal medicine conditions in traditional medical practice
    - the need for well-designed vocational preparation and continuing medical education for musculoskeletal medicine doctors.
2. Musculoskeletal medicine is a separate community-based specialty with a unique range of clinical skills and evidence-based management approaches. These are distinct from those required in general, hospital, rheumatological, and orthopaedic practice.
3. While the required knowledge and skills may be drawn from other disciplines, it is the unique combination of knowledge and skills practised within a defined set of professional values that distinguishes musculoskeletal medicine practice.

4. PROGRESS THROUGH THE CURRICULUM

TIMELINE OF CURRICULUM/TRAINING PROGRAMME

PART A

|<----------→|

DipMuscMed

|←-----→|

DipMuscMed

-MSME701

-MSME711

PART B

|<----------|----------|----------|----------→|

Year 1 Year 2 Year 3 Year 4

|←----------→|

10 core training modules (750 hours)

|←----------→|

5 elective training attachments (150 hours)

|←----------→|

Diploma/Masters Pain Medicine

←----------→|

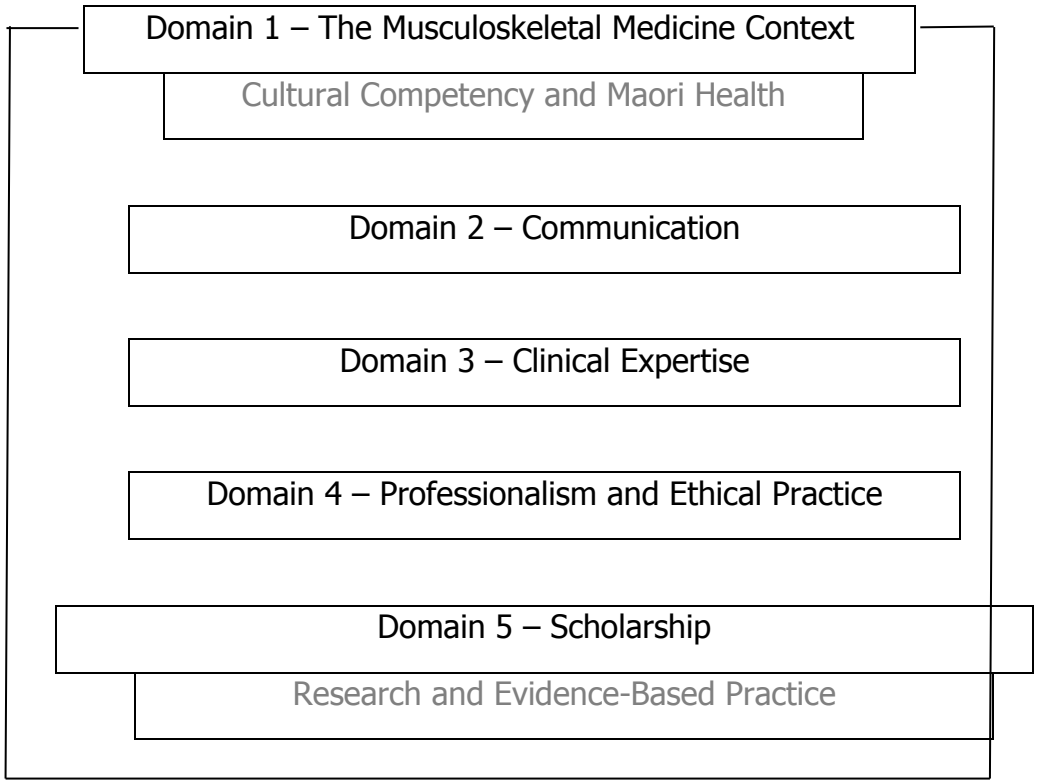
Part 2 Examination

(For details, see section on "Vocational Training in Musculoskeletal Medicine" on page 15, NZAMM Training Manual, Revised 13/1/18)

5. DOMAINS OF THE CURRICULUM

The musculoskeletal medicine training curriculum has been organised into five domains, which encompass the trainee attributes expected to be obtained during the training period. *Domain One* provides the "milieu" in which the other domains are practised. Cultural aspects are covered in this domain because they too impact across all the other domains.

Domain Two "overarches" the clinical elements covered in *Domain Three*, which in turn are underpinned by *Domains Four* and *Five*.



5.1 The New Zealand Musculoskeletal Medicine Context Cultural Competency and Maori Health

Refer: NZAMM Policy Statements: *Cultural Competency*
Maori Health

5.2 Communication

CAMM holders and trainees in musculoskeletal medicine are able to

- communicate in ways that facilitate optimal patient care and patient satisfaction
- establish patient-centred relationships with patients and their family/whanau, respecting the needs, concerns, beliefs, and expectations of the patient and their family/whanau
- relate effectively to patients of different life stages, cultural backgrounds, gender, socio-economic status, and beliefs

- communicate effectively with other health professionals to ensure best possible outcomes for patients
- develop shared-care arrangements with other health providers, based on clear communication and clarity about each practitioner's role and responsibilities
- effectively and appropriately use IT for communication, including viewing imaging online
- provide patients with relevant information, seek informed consent, and negotiate management plans where appropriate
- effectively manage challenging situations, including conveying bad news, aggressive patients, grief or anger, confusion, or misunderstandings.

5.3 Clinical Expertise

CAMM holders and trainees in musculoskeletal medicine have the clinical expertise to provide a specialist resource to general practitioners and other members of the medical and allied health profession, comprising a comprehensive and valid assessment of their patients' musculoskeletal pain problems and the most appropriate form of management that is safe, effective, and cost-effective.

5.3.1 Scope of Clinical Practice

Musculoskeletal medicine physicians are trained and examined in

- knowledge explicitly pertinent to the pain and associated features suffered by patients with musculoskeletal disorders in which overt or diagnosable pathology is not usually clearly demonstrable
- knowledge and techniques pertaining to disorders suffered by patients that are not explicitly or formally embraced by the curricula of other specialists, or examined by those respective colleges or faculties
- knowledge firmly based on contemporary evidence of reliability, validity, safety, efficacy, and cost-effectiveness, as opposed to traditional wisdom and past conventional practice
- practices that have been subjected to independent scrutiny and evaluation, and which have been shown to be safe, effective, and cost-effective, and not only appreciated but valued by consumers
- practices that are based on sound ethical principles, meaning trainees develop respect for patients and the profession.

Musculoskeletal medicine physicians are able to

- recognise their own skills and knowledge in the assessment and management of musculoskeletal pain patients, and respond appropriately within the limits of their knowledge and skills
- take a relevant history, conduct a competent physical examination with a musculoskeletal focus, and undertake appropriate manual therapies and interventional procedures in the management of these musculoskeletal conditions
- use clinical reasoning to develop a working diagnosis, and refine this diagnosis through the use of appropriate investigations
- diagnose, investigate, and manage common conditions in musculoskeletal medicine, and demonstrate competence in identifying orthopaedic, rheumatological, neurological, general medical, and "red"' and "yellow" flag conditions
- develop skills in managing complex cases within the limitations of the available resources

- use evidence-based medicine to guide clinical decision-making
- have an understanding of how cultural factors can affect clinical presentation and management.

5.3.2 Core Clinical Knowledge

CAMM holders in Musculoskeletal Medicine have trained and been examined in

- the anatomy and histology of the bones, muscles, joints, and nerves of the body
- the biochemistry of fibrous connective tissues and their common disorders
- the normal biomechanics of the musculoskeletal system
- the physiology of nociception, and the behavioural dimensions of pain
- the pathology of painful disorders of the musculoskeletal system, including valid and conjectural models
- the principles of biostatistics and epidemiology as they pertain to evidence concerning the diagnosis and management of painful disorders of the musculoskeletal system
- the application of these principles to actual clinical practice
- obtaining a thorough pain and systematic history from patients
- performing a physical examination of the musculoskeletal system, using any and all traditional techniques but with a consummate awareness of the reliability and validity of every technique
- the techniques available for the investigation of painful disorders of the musculoskeletal system, with consummate awareness of their reliability and validity
- the management of pain and of patients with musculoskeletal pain, using explanation, education, encouragement and reassurance, activity, exercises, manual therapy, drug therapy, injections, appliances and other devices, according to the best available evidence of safety, efficacy, and cost-effectiveness.

The particulars of these knowledge sets and skills, and the literature upon which they are based, are recorded in detail in the syllabus of the faculty.

5.3.3 Introduction to the Syllabus of the Association

NZAMM has produced a refreshed, comprehensive, and referenced syllabus pertaining to musculoskeletal medicine.

The objective of NZAMM's syllabus is to outline the body of knowledge necessary for musculoskeletal physicians and other medical practitioners to achieve expertise in the management of musculoskeletal disorders.

Trainees are examined in all aspects of the syllabus, to the level required by the Board of Censors.

The specific objectives of the syllabus are each complemented by references to the available literature. These references constitute the key scientific publications that make up the evidence base for this subject. However, in some instances, references are provided to prominent or influential publications, in order to expose trainees to the broad diversity of views that obtain in some areas of musculoskeletal medicine. NZAMM considers that trainees and CAMM holders should be conversant with this literature, especially when it competes with an evidence-based approach to the issue covered by the specific objective.

5.4 Professionalism and Ethical Practice

NZAMM expects its trainees and CAMM holders to conduct themselves in accordance with the standards set by the profession, and as espoused by the Medical Council of NZ.

In addition to the Medical Council website, trainees and CAMM holders are expected to be familiar with both "Good Medical Practice" and "Coles Medical Practice in New Zealand" (v6), which are available as PDF downloads from the Medical Council website.

Professionalism also encompasses good practice management.

The key attributes are:

- Honesty
- Moral reasoning
- Integrity
- Respect for patients
- Respect for colleagues
- Ethical practice
- Probity

5.5 Scholarship

NZAMM expects its trainees and CAMM holders to actively engage in teaching, presentations, and research. Trainees and CAMM holders are expected to be conversant with the evidence base upon which they practice their specialty.

6. EXPANDED SYLLABUS REFLECTING TRAINEE OUTCOMES

6.1 Tools and Guides for Assessing Competency in Musculoskeletal Medicine Vocational Training

The following documents constitute a suite of tools, standards, and guides for assessing competency in assessing trainees through the training programme. These complement the trainee outcome document.

1. NZAMM Training Manual 20 Jan 2018
2. NZAMM Guide to Assessing Competency for Vocational Training 20 Jan 18
3. Notes to Accompany Assessing Competency for Vocational Training 23 Feb 18
4. NZAMM Standards

6.2 Expanded Syllabus

Musculoskeletal Medicine Training Programme Syllabus

A. BASIC SCIENCES

A.1 CRITICAL REASONING AND BIOSTATISTICS				
To demonstrate an ability to undertake critical evaluation of published literature and practical procedures with respect to their reliability, validity, utility, and effectiveness in clinical practice.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
A.1.1.1	Demonstrates competence in the application and interpretation, with reference to musculoskeletal health care, of the following descriptive elements of biostatistics: • mean • standard deviation • standard error of the mean • median • interquartile range • confidence interval of a mean • confidence interval of a proportion • coefficient of variation.	Scholar	MSME 707 (1) Refs: 1, 2, 3	Diploma exam; Final exam part A and part B
A.1.1.2	Demonstrates competence in the application and interpretation, with reference to musculoskeletal health care, of the following inferential elements of biostatistics: • tests of difference -t-test -rank tests -analysis of variance -power analysis -survival analysis. • tests of association -chi-squared test -Fisher's exact test. • tests of correlation -regression -Spearman's coefficient -Pearson's coefficient. • tests of agreement -kappa.	Scholar	MSME 707 (1) Refs: 1, 2, 3	As per A.1.1.1
A.1.2	Demonstrates competence in the application and interpretation, with respect to musculoskeletal diagnosis, of the following epidemiological concepts: • sensitivity • specificity • predictive value • likelihood ratio • prevalence • pre-test probability • pre-test odds • post-test probability	Scholar	MSME 707 (1) Refs: 1, 2, 3, 8	As per A.1.1.1

	• post-test odds • reliability • validity • ratio - proportion - rate • frequency - prevalence - incidence • cumulative incidence • incidence rate • relative risk • associations - biases - confounding • odds ratio.			
A.1.3	Demonstrates competence in constructing, explaining and interpreting decision analysis trees.	Scholar	MSME 707 (1) Refs: 1, 2	As per A.1.1.1
A.1.4	Outlines a cogent approach to evaluating medical literature.	Scholar	MSME 707 (3) Refs: 1, 2, 7	As per A.1.1.1
A.1.5	Demonstrates a capacity to plan and interpret trials of diagnostic tests for musculoskeletal problems.	Scholar	MSME 701 and MSME 707 (3) Refs: 1, 2, 6	As per A.1.1.1
A.1.6	Demonstrates a capacity to plan and interpret trials of therapeutic interventions for musculoskeletal problems, including the concept of placebo.	Scholar	MSME 707 (3) Refs: 1, 2, 6	As per A.1.1.1
A.1.6.1	Demonstrates an ability to determine the effect-size of a treatment, so as to calculate and explain Number Needed to Treat.	Scholar	MSME 707 Refs: 1, 2, 6, 7	As per A.1.1.1
A.1.7	Discusses the relative merits of different types of clinical trials that might be conducted for the study of musculoskeletal problems: • descriptive • analytical - randomised controlled trials - cohort studies - case control studies • experimental • observational • cross-sectional • longitudinal.	Scholar	MSME 707 Refs: 1, 8	As per A.1.1.1
A.1.8	Demonstrates a capacity to understand evidence-based medicine (EBM) as it pertains to musculoskeletal medicine.	Scholar	MSME 707 Refs: 1, 2, 7	As per A.1.1.1
KEY REFERENCES				
1.	Sackett, D.L., Haynes, R.B., Guyatt, G.H., & Tugwell, P. (1991). *Clinical Epidemiology. A Basic Science for Clinical Medicine* (2nd ed.). Boston: Little, Brown and Co.			
2.	Bogduk, N. (2000). *Study Guide on Critical Reasoning*. Australasian Faculty of Musculoskeletal Medicine.			

3.	Bogduk, N. (1997). *Truth in Musculoskeletal Medicine. I: Confidence Intervals. Australasian Musculoskeletal Medicine,* 2:13-16.
4.	Bogduk, N. (1998). Truth in Musculoskeletal Medicine. II. Truth in Diagnosis: Reliability. *Australasian Musculoskeletal Medicine,* 3:21-23.
5.	Bogduk, N. (1999). Truth in Musculoskeletal Medicine. Truth in Diagnosis: Validity. *Australasian Musculoskeletal Medicine,* 4:32-39.
6.	Bogduk N. (1999). Truth in Musculoskeletal Medicine. Truth in Therapy. *Australasian Musculoskeletal Medicine,* 4:22-30.
7.	Bogduk, N. (1998). How to Write or Read a Paper on Pain Therapy. *Australasian Musculoskeletal Medicine*, 3:17-26.
8.	Friedman, G.D. (2004). *Primer of Epidemiology* (5th ed.). McGraw–Hill Book Company.

A.2 ANATOMY

To attain a knowledge of anatomy appropriate and sufficient to:

i. comprehend and describe the normal functions of the muscles and joints of the axial and appendicular skeletons, and the function of the nervous system as it pertains to musculoskeletal function
ii. comprehend the aberrations of function of the musculoskeletal systems
iii. understand the anatomical basis of techniques used to investigate and manage musculoskeletal complaints
iv. evaluate critically the established and new theories on the pathogenesis, mechanisms and management of musculoskeletal complaints.

CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
A.2.1	Describes in detail the biochemistry and microstructure of collagen, elastin, and proteoglycans.	Scholar	MSME 702 (1) Refs: 1, 2	Diploma exam; Final exam part A and part B
A.2.2	Describes in detail the biochemistry and microstructure of cartilage.	Scholar	MSME 702 (2) Ref: 1	As per A.2.1
A.2.3	Describes the biochemistry and microstructure of: • bones • joints • intra-articular inclusions • bursae • ligaments • muscles • tendons • enthuses • fasciae • nerves.	Scholar	MSME 702 (1 – 8) Refs: 1, 2	As per A.2.1
A.2.4	Describes the morphology, anatomical relations, and surface markings of the following components of the musculoskeletal system: • bones • joints and intra-articular inclusions • bursae • ligaments • muscles, including the attachments and actions • tendons and entheses • fasciae.	Scholar	MSME 702 (1 – 8) Refs: 1, 2	As per A.2.1
A.2.5.1	Describes the morphology, anatomical relations,	Scholar	MSME 702	As per A.2.1

	and surface markings of the following components of the nervous system: • nerves, including the peripheral and segmental nerve supply of every muscle and joint of the mobile skeleton • autonomic nerves, including their course and distribution in a detail appropriate to: a) the interpretation of musculoskeletal complaints b) the comprehension of investigations involving these nerves as they pertain to musculoskeletal complaints c) the safe execution of diagnostic and therapeutic procedures that may involve these nerves directly or inadvertently.		(1 – 8) Refs: 1, 2	
A.2.5.2	Describes the vertebral canal structures, including the disposition and attachments of these structures and the effects on these structures of movements of the vertebral column, head, and limbs.	Scholar	MSME702 (1 – 8) Ref: 3	As per A.2.1
A.2.5.3	Describes the central nervous system, including the topography and internal structure of the central nervous system in terms of the disposition within it of tracts and nuclei and their connections, in sufficient detail to explain mechanisms of motor function and pain perception, and to evaluate theories of the pathogenesis of musculoskeletal complaints involving these processes.	Scholar	MSME702 (1 – 8) Ref: 2	As per A.2.1
A.2.5.4	Describes peripheral arteries and the effects on these vessels of movements of the associated skeletal structures.	Scholar	MSME702 (1 – 8) Ref: 2	As per A.2.1
KEY REFERENCES				
1.	Ramachandran, M. (Ed.). (2007). *Basic Orthopaedic Sciences: The Stanmore Guide.* Hodder Arnold.			
2.	Buckwalter, J.A., Einhorn, T.A., & Simon, S.R. (Eds.). (2000). *Orthopaedic Basic Sciences–Biology and Biomechanics of the Musculoskeletal System.* American Academy of Orthopaedic Surgeons (2nd ed.).			
3.	Bogduk, N. (2005). *Clinical Anatomy of the Lumbar Spine and Sacrum* (5th ed.). Edinburgh: Churchill Livingstone.			

A.3 BIOMECHANICS				
To understand certain precepts of biomechanics and apply them to the musculoskeletal system.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
A.3.1	Demonstrates an ability to apply and interpret the following terms, with respect to any of the tissues of the musculoskeletal system: • stress • strain • stiffness • toughness	Scholar	MSME 702 Refs: 1, 2	Diploma exam; Final exam part A and part B

	• viscoelasticity • creep • hysteresis • fatigue failure.			
A.3.2	Describes the twelve degrees of freedom of movement of any joint in terms of translation and rotation about the biomechanical axes.	Scholar	MSME 702 Refs: 1, 2, 3	As per A.3.1
A.3.3	Demonstrates the qualitative and quantitative applications of the following terms to the description and interpretation of joint movement and analysis of equilibrium of any joint: • force • vector • moment • instant centre of rotation • screw axis.	Scholar	MSME 702 Refs: 1, 2, 3	As per A.3.1
A.3.4	Defines, in biomechanical terms, the following terms as they are applied to joints: • hypomobility and stiffness • hypermobility and instability.	Scholar	MSME 702 Refs: 1, 2, 3	As per A.3.1
A.3.5	Demonstrates a familiarity with the concept of moment of inertia and its application to the study of joint kinetics.	Scholar	MSME 702 Refs: 1, 2, 3	As per A.3.1
A.3.6	Demonstrates an ability to apply precepts of biomechanics to: • clinical features • posture • the gait cycle • activities of daily living, including occupational and recreational activities.	Scholar	MSME 702 Refs: 1, 2, 3	As per A.3.1

KEY REFERENCES	
1.	Frankel, V., & Nordin, M. (2012). *Basic Biomechanics of the Musculoskeletal System.* (4th ed.). Philadelphia: Lippincott Williams & Wilkins.
2.	Ramachandran, M. (Ed.). (2007). Basic Orthopaedic Sciences: The Stanmore Guide. Hodder Arnold.
3.	Bogduk, N. (1997). *Clinical Anatomy of the Lumbar Spine and Sacrum.* (3rd ed.). Edinburgh: Churchill Livingstone.

A.4 PHYSIOLOGY

To understand the physiological basis of the functions and disorders of the musculoskeletal system.

CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
A.4.1	Describes the distribution and metabolism of calcium in the musculoskeletal system, and their control.	Scholar	MSME 702 (3) Refs: 1, 3	Diploma exam; Final exam part A and part B
A.4.2	Describes the molecular and cellular processes involved in the growth, development, and homeostasis of bone.	Scholar	MSME 702 (3) Refs: 1, 3	As per A.4.1
A.4.3	Describes the biology of fibrous connective tissues.	Scholar	MSME 702 (1) Refs: 1, 3	As per A.4.1

A.4.4	Describes the biology of joints.	Scholar	MSME 702 (7) Refs: 1, 3	As per A.4.1
A.4.5	Describes the molecular and cellular processes involved in the growth, development, and homeostasis of skeletal muscle.	Scholar	MSME 702 (5) Refs: 1, 2, 3	As per A.4.1
A.4.6	Describes the generation and propagation of action potentials in muscle.	Scholar	MSME 702 (5) Refs: 1, 2, 3	As per A.4.1
A.4.7	Describes the molecular and cellular processes implicated in mechanisms of muscle contraction.	Scholar	MSME 702 (5) Refs: 1, 2, 3	As per A.4.1
A.4.8	Describes different types of muscle fibre.	Scholar	MSME 702 (5) Refs: 1, 2, 3	As per A.4.1
A.4.9	Describes the effects of rest, exercise, and ageing on skeletal muscle, in terms of histochemistry and molecular structure.	Scholar	MSME 702 (5) Refs: 2, 3	As per A.4.1
A.4.10	Describes the molecular and cellular processes involved in: • the generation and propagation of action potentials in nerve • excitatory and inhibitory synapsis • the neuromuscular junction • axonal transport.	Scholar	MSME 702 (6) PAIN 701 (1) Refs: 1, 2	As per A.4.1
A.4.11	Describes the activity and function of reflexes, including: • myotatic reflexes • flexion-withdrawal reflexes • crossed extensor reflexes • tonic-neck reflexes • the reflex behaviour of animals subjected to spinal, brainstem, and supracollicular transection.	Scholar	MSME 702 (6) Ref: 2	As per A.4.1
A.4.12	Describes the role in motor activities of the following entities, in sufficient detail to interpret and explain the symptoms and signs of disorders of the motor system and to evaluate theories of musculoskeletal conditions: • motor units • motor neurone pools • spinal cord tracts • the cerebellum • the reticular formation • the brainstem • the thalamus • the basal ganglia • the cerebral cortex.	Scholar	MSME 702 (6) Ref: 2	As per A.4.1
A.4.13	Describes the principles of electromyography and the use of EMG in research.	Scholar	MSME 702 (6) Ref: 2	As per A.4.1
A.4.14	Describes the physiological properties of sensory neurones and the systems used to	Scholar	MSME 702 (6) PAIN	As per A.4.1

	classify these neurones.		701 (1) Ref: 2	
A.4.15	Describes the properties and behaviour of peripheral afferent neurones.	Scholar	MSME 702 (6) PAIN 701 (1) Ref: 2	As per A.4.1
A.4.16	Describes the properties and behaviour of afferent fibres from muscles and joints.	Scholar	MSME 702 (6) PAIN 701 (1) Ref: 2	As per A.4.1
A.4.17	Describes the physiological properties of the pathways in the central nervous system that are involved in nociception.	Scholar	MSME 704 PAIN 701 (1) Ref: 2	As per A.4.1
A.4.18	Understands the peripheral and central nervous system mechanisms that subserve proprioception in sufficient detail to assess, interpret, and investigate impairments of proprioception.	Scholar	MSME 704 PAIN 701 (1) Ref: 2	As per A.4.1
A.4.19	Describes the phenomenon of referred pain, its clinical manifestations, and contemporary theories of its physiological and anatomical bases.	Scholar	MSME 704 PAIN 701 (1) Ref: 2	As per A.4.1
A.4.20	Describes the effects of the sympathetic nervous system on the cardiovascular system and on visceral and musculoskeletal structures.	Scholar	MSME 704 PAIN 701 (1) Ref: 2	As per A.4.1

KEY REFERENCES	
1.	Ramachandran, M. (Ed.). *Basic Orthopaedic Sciences: The Stanmore Guide.* Hodder Arnold.
2.	Guyton, A., & Hall, J. (2005). *Textbook of Medical Physiology.* (11th ed.). Elsevier.
3.	Buckwalter, J.A., Einhorn, T.A., & Simon, S.R. (Eds.). (2000). *Orthopaedic Basic Sciences–Biology and Biomechanics of the Musculoskeletal System.* American Academy of Orthopaedic Surgeons.

A.5 PATHOLOGY

To express a command of current knowledge of the pathology and pathogenesis of the more common disorders of the musculoskeletal system and the mechanisms of their clinical features.

CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
A.5.1	Lists in a systematic fashion all the disorders that may affect any region of the musculoskeletal system.	Scholar; Clinical expertise	Ref: 1	Final exam part A and part B
A.5.2	Highlights the cardinal, distinguishing clinical, radiological, or other diagnostic features of those disorders that may require other specialist management, and identifies the particular specialist or specialists to whom the patient would most appropriately be referred.	Scholar; Clinical expertise	MSME 701 and 703 Ref: 1	Diploma exam; Final exam part A and part B
A.5.3	Describes the biomechanical consequences and clinical features of congenital, developmental, and acquired deformities of the musculoskeletal system.	Scholar; Clinical expertise	Ref: 1	Final exam part A and part B

A.5.4	Describes in detail the theories and established facts relating to the aetiology, pathogenesis, pathology, biomechanical and functional consequences, clinical expression, and diagnostic features of age-related and so-called degenerative joint diseases of the musculoskeletal system.	Scholar	MSME 703	Diploma exam; Final exam part A and part B
A.5.5	Describes the pathology of the following: acute injuries of; fatigue failure of; delayed or aberrant repair of injuries of; long-term sequelae of injuries that do not resolve of: • bones • joints • intra-articular inclusions • bursae • intervertebral discs • ligaments • muscles • tendons • entheses • fasciae • nerves, nerve roots, and the spinal cord.	Scholar	MSME 703, 710 Refs: 1, 2	As per A.5.4
A.5.6	Describes the pathological and pathogenetic processes that underlie the cardinal features of inflammatory conditions of the following structures, and the basis of clinical, laboratory, and imaging techniques used for their diagnosis: • joints • bursae • synovial sheaths • intervertebral discs • muscles.	Scholar; Clinical expertise	MSME 703 (4, 5, 6) Ref: 1	As per A.5.4
A.5.7	Outlines and evaluates contemporary theories and emergent ideas concerning the mechanisms and pathology of spinal pain.	Scholar; Clinical expertise	MSME 705 Refs: 3, 4	As per A.5.4
A.5.8	Demonstrates an awareness of and an ability critically to access unconventional novel conjectures concerning the pathophysiological basis of chronic pain conditions.	Scholar; Clinical expertise	MSME 704 PAIN 701	As per A.5.4
A.5.9	Describes the biochemical, pathological and biomechanical consequences of joint immobilisation.	Scholar	MSME 702, 703, 710 Refs: 1, 2	As per A.5.4
A.5.10	Synthesises the available data and viewpoints on the pathophysiology of fibromyalgia and chronic fatigue syndrome.	Scholar; Clinical expertise	Ref: 5	As per A.5.4
A.5.11	Describes the pathology and pathophysiology of complex regional pain syndromes.	Scholar; Clinical expertise	MSME 704 (4) PAIN 701	As per A.5.4
A.5.12	Describes the pathology of radiculopathies, entrapment neuropathies, nerve injuries, and peripheral neuropathies.	Scholar; Clinical expertise	MSME 704 (4) PAIN 701 (6, 7) Refs: 3, 4	As per A.5.4

KEY REFERENCES	
1.	Blom, A., Warwick, D., & Whitehouse, M. (Eds.). (2017). *Apley and Solomon's System of Orthopaedics and Trauma.* (10th ed.). CRC Press.
2.	Ramachandran, M. (Ed.). *Basic Orthopaedic Sciences: The Stanmore Guide.* Hodder Arnold.
3.	Bogduk, N., & McGuirk, B. (2002). *Medical Management of Acute and Chronic Low Back Pain: An Evidence-Based Approach.* Elsevier.
4.	Bogduk, N., & McGuirk, B. (2006). *Medical Management of Acute and Chronic Neck Pain: An Evidence-Based Approach.* Elsevier.
5.	Hakeem, A., Keer, R., & Grahame, R. (Eds.). (2010). *Hypermobility, Fibromyalgia and Chronic Pain.* Churchill Livingstone Elsevier.

A.6 PHARMACOLOGY

To understand the use of substances with therapeutic effects on musculoskeletal and neural tissues and their employment in the management of musculoskeletal disorders.

CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
A.6.1	Describes the pharmacology, with particular reference to possible side-effects and interactions, of the following substances: • simple analgesics • non-steroidal anti-inflammatory drugs • skeletal muscle relaxants • corticosteroids • anti-rheumatoid agents (remittive drugs) • anti-hyperuricaemic agents • minor/major tranquillisers • antidepressants • membrane stabilising drugs • local anaesthetics • antiepileptic agents • opioid analgesics • rubefacients and counter-irritants • noradrenergic agents (such as clonidine) • adrenergic agents (such as phentolamine) • neurolytic agents • "sclerosants" • enzyme preparations (chymopapain) • anti-malarials (viz. quinine) • trace elements.	Scholar; Clinical expertise	MSME 708 (6) PAIN 702 (1–8) PAIN 703 Refs: 1, 2, 3	Diploma exam; Final exam part A and part B
A.6.2	Understands routes of delivery and/or application of the preceding pharmacologic agents: • oral • transmucosal -sublingual -intranasal -inhalational -rectal -vaginal. • transdermal/topical • parenteral	Scholar; Clinical expertise	MSME 708 (5, 6) MSME 709 PAIN 702 (1–8) Refs: 1, 2, 3	As per A.6.1

	-subcutaneous -intramuscular -intravascular -intra-articular -interstitial -intrathecal -epidural -perineural -intradiscal.			
A.6.3	Demonstrates a capacity to evaluate the putative effects of other drugs.	Scholar	Ref: 1	Final exam part A and part B
KEY REFERENCES				
1.	Brunton, L., & Hilal-Dandan, R. (2013). *Goodman and Gilman's Manual of Pharmacology and Therapeutics.* (2nd ed.). Europe: McGraw–Hill Education.			
2.	King, W. (1998). *Study Guide on Analgesics.* Australasian Faculty of Musculoskeletal Medicine.			
3.	Harding, G., Vivian, D., & Watson, P. (1998). *Study Guide on Local Anaesthetics.* Australasian Faculty of Musculoskeletal Medicine.			

B. PATIENT ASSESSMENT

B.1 HISTORY				
To understand the role of medical history-taking in the assessment of a patient with a musculoskeletal complaint and to describe the steps in taking a history appropriate for the diagnosis of a musculoskeletal disorder.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
B.1.1	Describes the recording of the patient's identification and social history including name, sex, age, laterality, address, domestic circumstances, dependants, present occupation (with work description), previous occupations, employment status, employer, source of income, sporting activities, hobbies, and other leisure interests.	Clinical Expertise	MSME 701, 711	Diploma exam; Supervisor and Instructor Reports; NZAMM Musculoskeletal Medicine Physician Skills Checklist (STANDARD Diagnostic Skills and Patient Management) Final exam part B
B.1.2	Describes the recording of the patient's present symptoms including pains, altered sensations, stiffness, deformity and loss of function, with particular reference to site, radiation, quality, periodicity, duration, mode of onset, aggravating and relieving factors, effects on lifestyle (in terms of activities of daily living), and treatment to date.	Clinical Expertise	MSME 701, 711	As per B.1.1
B.1.3	Describes the recording of previous episodes of similar symptoms and the effects of management on them.	Clinical Expertise	MSME 701, 711	As per B.1.1
B.1.4	Describes the recording of other previous musculoskeletal problems.	Clinical Expertise	MSME 701, 711	As per B.1.1
B.1.5	Describes the recording of the patient's general medical history, including intercurrent and past medical problems.	Clinical Expertise	MSME 701, 711	As per B.1.1
B.1.6	Describes the recording of the patient's history of drug intake, including tobacco, alcohol and all current medications, whether prescribed or otherwise.	Clinical Expertise	MSME 701, 711	As per B.1.1
B.1.7	Describes the recording of any known allergies.	Clinical Expertise	MSME 701, 711	As per B.1.1
B.1.8	Describes the recording of the patient's family medical history with particular reference to inheritable disorders.	Clinical Expertise	MSME 701, 711	As per B.1.1
B.1.9	Identifies biological and psychosocial risk factors that may be deleterious to the musculoskeletal system or that might compromise management or recovery from musculoskeletal impairment.	Clinical Expertise	MSME 701, 711 Refs: 3, 4	As per B.1.1

KEY REFERENCES	
1.	Refs as per Appendix 6kii_SUMMARY History taking, Physical Examination etc_23Jul16.doc.
2.	Merskey, H., & Bogduk, N. (Eds.). (1994). *Classification of Chronic Pain. Descriptions of Chronic Pain Syndromes and Definitions of Pain Terms.* (2nd ed.) Seattle: International Association for the Study of Pain Press.
3.	King, W. (2007). Musculoskeletal Examination. In R.F. Schmidt & W.D. Willis Jnr. (Eds). *Encyclopedic Reference of Pain* (pp. 1230-1232). Berlin: Springer-Verlag.
4.	Linton, S. *Understanding Pain for Better Clinical Practice: A Psychological Perspective.* (1st ed.). Elsevier.

B.2 PHYSICAL EXAMINATION

To describe and demonstrate the elements of physical examination of a patient for the purposes of:
i) making a differential diagnosis of any musculoskeletal disorders
ii) identifying non-musculoskeletal disorders that may mimic musculoskeletal disorders.

CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
B.2.1	Describes the anatomical, biomechanical, physiological, and pathological bases for physical signs elicited in musculoskeletal examination.	Clinical Expertise	MSME 701, 706, 711 Refs: 1, 2, 4	Diploma Exam; Supervisor and Instructor Reports; NZAMM Regional Examination Checklists; Final exam part B
B.2.2	Describes the physical signs attributed to specific musculoskeletal conditions, and demonstrates knowledge of the reliability and validity of these signs.	Clinical Expertise	MSME 701, 706, 711 Refs: 2, 4	As per B.2.1
B.2.3	Demonstrates those elements of physical examination pertinent to the assessment of a patient with any particular musculoskeletal complaint, and describes their interpretation in terms of the anatomical, biomechanical, physiological, and pathological bases of that complaint.	Clinical Expertise	MSME 701, 706, 711 Ref: 4	As per B.2.1
B.2.4	Describes the examination of static and dynamic posture, including gait.	Clinical Expertise	MSME 701, 706, 711	As per B.2.1
B.2.5	Describes and demonstrates the physical examination, with reference to landmarks, tenderness, position, length, and integrity, of: • bones • joints • intra-articular inclusions • bursae • ligaments.	Clinical Expertise	MSME 701, 706, 711 Refs: 2, 4	As per B.2.1
B.2.6	Demonstrates the examination of joint mobility, in terms of the twelve degrees of freedom, as: • active movements • passive movements • accessory movements.	Clinical Expertise	MSME 701, 706, 711	As per B.2.1

B.2.7	Demonstrates the examination, with reference to length, strength, tenderness, consistency and association with pain on loading, of: • muscles • tendons • entheses • fasciae.	Clinical Expertise	MSME 701, 706, 711	As per B.2.1
B.2.8	Describes and demonstrates the examination of the peripheral and central nervous systems as it pertains to musculoskeletal disorders.	Clinical Expertise	MSME 701, 706, 711 Ref: 3	As per B.2.1
B.2.9	Describes and demonstrates the behavioural features that may be elicited on examination, and discusses the validity of these features.	Clinical Expertise	MSME 701, 706, 711 Refs: 2, 4	As per B.2.1
KEY REFERENCES				
1.	Nordin, M., & Ozkaya, N. (1999). *Fundamentals of Biomechanics: Equilibrium, Motion, & Deformation* (or equivalent).			
2.	Cleland, J., Koppenhaver, S., & Su, J. *Netter's Orthopaedic Clinical Examination: An Evidence-Based Approach.* (3rd ed.). Elsevier.			
3.	Fuller, G. *Neurological Examination Made Easy.* (4th ed.) Churchill Livingston.			
4.	Respective chapters from the *Draft Guidelines for the Medical Management of Musculoskeletal Pain Problems. Australasian Faculty of Musculoskeletal Medicine*, 1998–2000. (Available to trainees as a PDF.)			

B.3 ANCILLARY INVESTIGATIONS				
To understand the indications for ancillary investigations of the musculoskeletal system, the principles of their performance, and the diagnostic significance of their results.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
B.3.1	Lists the indications and discusses the diagnostic significance of blood tests that may be used in the investigation of musculoskeletal complaints.	Clinical Expertise	MSME 701, 706, 711 Ref: 1	Diploma Exam; Supervisor and Instructor Reports; Final exam part B
B.3.2	Describes the principles of the techniques of joint aspiration and bone and muscle biopsy, and discusses the indications, diagnostic significance, and morbidity of these procedures.	Clinical Expertise	MSME 701, 706, 711 Ref: 1	As per B.3.1
B.3.3	Describes the underlying principles, techniques, reliability and validity of: • plain radiography • tomography • computerised axial tomography • magnetic resonance imaging • bone densitometry • ultrasonography • radio-isotope scans • cineradiography • arthrography • myelography • discography • provocation discography.	Clinical Expertise	MSME 701, 706, 711 Ref: 2	As per B.3.1
B.3.4	Describes the physiological basis of	Clinical	MSME 701,	As per B.3.1

	electrodiagnostic techniques, outlines the information that can be obtained using these techniques, and deduces the indications and limitations of: • nerve conduction studies • surface and needle electromyography • somatosensory evoked potentials • sensory nerve action potentials.	Expertise	706, 711 Ref: 1	
B.3.5	Describes the principles, techniques and validity of: • diagnostic nerve blocks • diagnostic epidural injections • sympathetic blocks.	Clinical Expertise	MSME 701, 706, 711 Refs: 3, 4	As per B.3.1
B.3.6	Lists the conditions or the nature of pathological changes that can be identified by each of the procedures listed in specific objectives B.3.1 – B.3.5.	Clinical Expertise	MSME 701, 706, 711 Refs: 3, 5	As per B.3.1
B.3.7	Recognises the cardinal investigation results associated with neoplastic, inflammatory, infective, metabolic, congenital, and traumatic "red-flag" conditions of the musculoskeletal system that may require urgent referral for special management.	Clinical Expertise	MSME 701, 706, 711 Ref: 1	As per B.3.1
KEY REFERENCES				
1.	Buckwalter, J.A., Einhorn, T.A., & Simon, S.R. (Eds). (2000). *Orthopaedic Basic Sciences–Biology and Biomechanics of the Musculoskeletal System. American Academy of Orthopaedic Surgeons.* (2nd ed.)			
2.	Anderson, J., & Read, J. *Atlas of Imaging in Sports Medicine.* (2nd ed.). McGraw-Hill. (or similar)			
3.	Bogduk, N. (ed.). (2013). *Practice Guidelines for Spinal Diagnostic and Treatment Procedures.* (2nd ed.)			
4.	Cohen, S.P., et al. Epidural Steroids: A Comprehensive, Evidence-Based Review. *Reg Anesth Pain Med* 2013. 38:175Y200			
5.	Respective chapters from the *Draft Guidelines for the Medical Management of Musculoskeletal Pain Problems. Australasian Faculty of Musculoskeletal Medicine*, 1998–2000. (Available to trainees as a PDF.)			

B.4 ERGONOMICS				
To understand the general principles of interactions between human and work, with specific emphases on the musculoskeletal demands of work activity, and on the musculoskeletal injuries that may result.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
B.4.1	Describes the basic anthropometric measurements relevant to the evaluation of human function in the workplace and the individual variability that may affect work performance.	Clinical Expertise	MSME 702, 703 Refs: 1, 2, 3	Diploma Exam; Supervisor and Instructor Reports; Final exam part B
B.4.2	Describes the basic biomechanical principles that apply to human performance at work, including body parts as levers and the determinants of torque at joints.	Clinical Expertise	MSME 702, 703 Refs: 1, 2, 3	As per B.4.1
B.4.3	Outlines the physical environmental factors that	Clinical	MSME 702,	As per B.4.1

	impact upon musculoskeletal function.	Expertise	703 Refs: 1, 2, 3	
B.4.4	Describes the particular musculoskeletal demands of specific work postures and activities.	Clinical Expertise	MSME 702, 703 Refs: 1, 2, 3	As per B.4.1
B.4.5	Describes basic concepts of neuromuscular and psychological fatigue, and their relationship to specific work activities.	Clinical Expertise	MSME 702, 703 Ref: 1	As per B.4.1
B.4.6	Demonstrates the assessment of ergonomic factors in cases of suspected work-related injury.	Clinical Expertise	MSME 702, 703 Refs: 1, 2, 3	As per B.4.1
KEY REFERENCES				
1.	Nordin, M., & Ozkaya, N. (1999). *Fundamentals of Biomechanics: Equilibrium, Motion, & Deformation.* (or equivalent)			
2.	Bogduk, N. *Clinical Anatomy of the Lumbar Spine and Sacrum.* (4th ed.). Elsevier.			
3.	Hargreave, C. M., & Pheasant, S. *Bodyspace: Anthropometry, Ergonomics and the Design of Work.* (3rd ed.) Taylor & Francis.			

B.5 ASSESSMENT TOOLS

CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
B.5.1	Describes the various aspects of pain evaluation, including use of pain drawings, different pain measurement scales and their respective advantages and disadvantages, pain descriptors, and the use of affective pain questionnaires in the evaluation process.	Clinical Expertise	MSME 708, 711 Ref: 4	Diploma Exam; Supervisor and Instructor Reports; Final exam part B
B.5.2	Describes an understanding of disability questionnaires in clinical assessment, including design, implementation, and interpretation of results.	Clinical Expertise	MSME 708, 711 Refs: 1, 2	As per B.5.1
B.5.3	Describes an understanding of the use of psychological questionnaires in clinical assessment.	Clinical Expertise	MSME 708, 711, PAIN 703 Refs: 3, 4	As per B.5.1
KEY REFERENCES				
1.	Bellamy, N. (1993). *Health Status Instruments and Functional Indices. Musculoskeletal Clinical Metrology.* Dordrecht: Kluwer Academic Publishers, pp. 77–101.			
2.	Bellamy, N. (1998). Principals of outcome assessment. In J.H. Klippel & P.A. Dieppe (Eds.), *Rheumatology*. London: Mosby, pp. 1–10.			
3.	Linton, S.J., & Shaw, W.S. (2011). Impact of psychological factors in the experience of pain. *Physical Therapy*, 91, pp. 700–711.			
4.	*Persistent Pain Assessment Instruments: A Compendium* (ACC)			

C. DIAGNOSIS

To understand the principles of diagnosis, evidence-based diagnostic formulation, and contemporary diagnostic taxonomy, with an appreciation of ideal diagnostic criteria, the limitations of diagnostic methods, and the statistical methods for quantifying them.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
C.1	Describes the principles of diagnosis as the process of determining the nature and circumstances of a medical condition by following a rational strategy: • integration of structural and functional information during assessment to determine which further steps are needed • appraisal of positive and negative findings resulting from history-taking, clinical examination, and ancillary investigations • relation of assessment findings to anatomical and pathological axes • correlation of postulated structural and functional impairments with known pathological entities and possible psychosocial sequelae.	Scholar	MSME 711 (2) Refs: 1, 3	Diploma exam; Final exam part A and part B
C.2	Demonstrates an awareness of different approaches to diagnostic formulation and the advantages and disadvantages of: • the gestalt or "heuristic" approach • the hypothetico-deductive approach • the exhaustive approach • the "decision-tree" or algorithm approach.	Scholar	MSME 711 (2) Refs: 1, 3	As per C.1
C.3	Demonstrates an ability to recognise features used to discriminate between specific musculoskeletal conditions and to evaluate the evidence on which they are based.	Scholar	MSME 711 (2) Refs: 2, 3	As per C.1
C.4	Exhibits an appreciation of the limitations of contemporary diagnostic methods in satisfying ideal diagnostic criteria of reliability and validity.	Scholar	MSME 711 (2) Ref: 4	As per C.1
C.5	Demonstrates an ability to apply to the process of diagnosis the elements of critical reasoning and clinical epidemiology outlined in specific objectives A.1.1–A.1.6 and the evidence on which they are based.	Scholar	MSME 707 (3) Ref: 4	As per C.1
C.6	Demonstrates ability to express musculoskeletal diagnoses in terms consistent with contemporary taxonomy, and with reference to anatomical and pathological axes, and the precepts of impairment, disability and handicap.	Scholar	MSME 711 (2) Ref: 2	As per C.1
C.7	Demonstrates critical evaluation of the accuracy and ambiguity of diagnostic terms and statements found in literature pertaining to musculoskeletal conditions.	Scholar	MSME 707 (3) Ref: 4	As per C.1

KEY REFERENCES	
1.	Sackett, D.L., Haynes, R.B., Guyatt, G.H., & Tugwell, P. (1991). *Clinical Epidemiology. A Basic Science for Clinical Medicine* (2nd ed.). Boston: Little, Brown and Co.
2.	Merskey, H., & Bogduk, N. (Eds.). (1994). *Classification of Chronic Pain. Descriptions of Chronic Pain Syndromes and Definitions of Pain Terms.* (2nd ed.). Seattle: IASP Press, p.106.
3.	King, W. (2000). *Study Guide on Diagnosis. Australasian Faculty of Musculoskeletal Medicine*.
4.	Bogduk, N. (2000). *Study Guide on Critical Reasoning. Australasian Faculty of Musculoskeletal Medicine*.

D. PREVENTION

To understand and apply the general principles of prevention as they pertain to musculoskeletal medicine.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
D.1	Demonstrates judicious use of knowledge of anatomy, physiology, biomechanics, and pathology to formulate and/or critically evaluate putative relationships between habits, postures, activities of daily living, diet, lifestyle, recreational and work activities, and the genesis of musculoskeletal disorders and complaints.	Clinical Expertise	MSME 707 Refs: 1, 2, 3	Diploma Exam; Final exam part B; Supervisor and Instructor Reports
D.2	In terms of theories described in D.1, outlines rational measures that could be taken to prevent the genesis of musculoskeletal disorders and evaluates the reliability of such measures to achieve these aims.			As per D.1
KEY REFERENCES				
1.	Nordin, M., & Ozkaya, N. (1999). *Fundamentals of Biomechanics: Equilibrium, Motion, & Deformation.* (or equivalent)			
2.	Bogduk, N. *Clinical Anatomy of the Lumbar Spine and Sacrum* (4th ed.). Elsevier.			
3.	Hargreave, C. M., & Pheasant, S. *Bodyspace: Anthropometry, Ergonomics and the Design of Work.* (3rd ed.) Taylor & Francis.			

E. PATIENT MANAGEMENT

OVERVIEW **To be able to develop, implement, explain and justify a plan of evidence-based management for a patient's musculoskeletal problems.**	
E.i	To appreciate and be able to describe the alleged, putative, and proven mechanisms of action of the therapeutic interventions listed below, their indications, contraindications and complications, and the current evidence concerning their effectiveness: • activity and rest • patient education, reassurance, and motivation • therapeutic exercise • supports and aids • thermo, hydro, and electrotherapies • manual therapy • traction • medication • neuromodulation • injection techniques • surgery • psycho-social management • rehabilitation.
E.ii	To be able to develop, implement, explain and justify an evidence-based plan of management for acute and chronic pain problems ascribed to: • the lumbar spine • the thoracic spine • the cervical spine • the shoulder girdle • the shoulder • the elbow • the wrist • the hand • the upper limb as a whole • the arm or forearm as a region • the pelvic girdle • the hip • the knee • the ankle • the lower limb as a whole • the thigh or leg as a region.

E.1 THERAPEUTIC INTERVENTIONS

E.1.1 Activity and Rest

To understand the physiological and pathological effects of rest and activity and the principles of their use in the management of musculoskeletal disorders.

CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.1.1	Describes the effects of rest and activity on the physiological and biomechanical functions of musculoskeletal tissues.	Scholar; Clinical expertise	MSME 702 Refs: 1, 2	Diploma exam; Final exam part A
E.1.1.2	Describes the relationships between rest and	Scholar;	MSME 702	As per E.1.1.1

	pathological processes.	Clinical expertise	Refs: 1, 2	
E.1.1.3	Describes the place of rest and activity in regimes for the treatment and prophylaxis of musculoskeletal disorders.	Scholar; Clinical expertise	MSME 705, 706, 710 Refs: 1, 2, 3	As per E.1.1.1
E.1.1.4	Describes types of rest and activity and the principles of their application, in particular: • general rest, including bed rest and modified activities • specific rest of an injured part.	Scholar; Clinical expertise	Refs: 1, 2	As per E.1.1.1
E.1.1.5	Describes the role of specific forms of rest in musculoskeletal management, including their indications for particular conditions, their contraindications, and means of monitoring their effects.	Scholar; Clinical expertise	MSME 705, 706, 710 Refs: 1, 2, 3	As per E.1.1.1
KEY REFERENCES				
1.	Brukner, P. (2017). *Brukner & Khan's Clinical Sports Medicine.*			
2.	*Orthopaedic Basic Science: Foundations of Clinical Practice.* (3rd or 4th ed.) Rosemont: American Academy of Orthopaedic Surgeons.			
3.	Australian Acute Musculoskeletal Pain Guidelines Group, Brooks, P., & Australian Acute Musculoskeletal Pain Guidelines Group. (2004). *Evidence-Based Management of Acute Musculoskeletal Pain: A Guide for Clinicians.* Bowen Hills, Qld: Australian Academic Press.			

E.1.2 Patient Education, Reassurance, and Motivation				
To understand and appreciate the role of patient education, reassurance, and motivation in the management of musculoskeletal disorders.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.2.1	Understands the biological, psychological, and social factors that may influence the course of a musculoskeletal condition, including: • biological and therapeutic influences • the fear-avoidance model of behaviour.	Scholar; Clinical expertise	MSME 704, 707, 708 Refs: 1, 2, 3, 4	Diploma exam; Final exam part A
E.1.2.2	Demonstrates appreciation of the role of explanation, reassurance, and motivation in encouraging the patient to take an active role in self-management.	Scholar; Clinical expertise	MSME 704, 707, 708 Refs: 1, 2, 3, 4	As per E.1.2.1
E.1.2.3	Describes the process of explaining to a patient the nature of that patient's musculoskeletal condition, its prognosis and factors that may influence its course, including: • the nature of the impairment • pathophysiological processes involved • biological influences on the course of the condition • psychosocial factors ("yellow flags").	Scholar; Clinical expertise	MSME 704, 707, 708 Refs: 1, 2, 3, 4	As per E.1.2.1
KEY REFERENCES				
1.	Australian Acute Musculoskeletal Pain Guidelines Group, Brooks, P., & Australian Acute Musculoskeletal Pain Guidelines Group. (2004). *Evidence-Based Management of Acute Musculoskeletal Pain: A Guide for Clinicians.* Bowen Hills, Qld: Australian Academic Press.			
2.	*New Zealand Acute Low Back Pain Guide.* (2004). ACC.			
3.	Bogduk, N., & McGuirk, B. (2002). *Medical Management of Acute and Chronic Low Back Pain: An Evidence-Based Approach.* Amsterdam: Elsevier.			

4.	Bogduk, N., & McGuirk, B. (2009). *Management of Acute and Chronic Neck Pain: An Evidence-Based Approach.* Philadelphia, Pa: Elsevier.

E.1.3 Therapeutic Exercise				
To understand the physiological effects of exercise and the place of exercise in the management of musculoskeletal disorders.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.3.1	Describes the effects of exercise on the physiological and biomechanical functions of the tissues involved.	Scholar; Clinical expertise	MSME 705, 706, 710 Refs: 1, 2	Diploma exam; Final exam part A
E.1.3.2	Describes the effects of exercise on pathological processes.	Scholar; Clinical expertise	MSME 705, 706, 710 Refs: 1, 2	As per E.1.3.1
E.1.3.3	Describes the place of exercise in regimes for the treatment and prophylaxis of musculoskeletal disorders.	Scholar; Clinical expertise	MSME 705, 706, 710 Refs: 1, 2, 3, 4, 5	As per E.1.3.1
E.1.3.4	Describes the performance of various types of therapeutic exercise, including: • stretching exercises • relaxation exercises • mobilisation exercises • strengthening exercises • endurance exercises • coordination exercises • balance exercises • proprioception exercises • posture training • neuro-muscular re-education (including EMG biofeedback and movement awareness training).	Scholar; Clinical expertise	MSME 705, 706, 710 Refs: 1, 2, 3, 4, 5	As per E.1.3.1
E.1.3.5	Describes the role of specific therapeutic exercises in musculoskeletal management including their indications for particular conditions, their contra-indications and means of monitoring their effects.	Scholar; Clinical expertise	MSME 705, 706, 710 Refs: 1, 2, 3, 4, 5	As per E.1.3.1
E.1.3.6	Describes the prescription of exercises as a treatment modality.	Scholar; Clinical expertise	MSME 705, 706, 710 Refs: 1, 2, 3, 4, 5	As per E.1.3.1
E.1.3.7	Describes various schools of thought on the uses of exercises in musculoskeletal management.	Scholar; Clinical expertise	MSME 705, 706, 710 Refs: 1, 2, 3, 4, 5	As per E.1.3.1
KEY REFERENCES				
1.	Brukner, P. (2017). Injuries, Vol. 1. *Brukner & Khan's Clinical Sports Medicine.* (5th ed.)			
2.	*Orthopaedic Basic Science: Foundations of Clinical Practice.* (3rd or 4th ed.)https://www.amazon.com/Orthopaedic-Basic-Science-Foundations-Clinical/dp/197511731X/ref=sr_1_1?s=books&ie=UTF8&qid=1545502050&sr=1-1&keywords=orthopaedic+basic+science			
3.	Bogduk, N., & McGuirk, B. (2002). *Medical Management of Acute and Chronic Low Back Pain:*			

	An Evidence-Based Approach. Amsterdam: Elsevier.
4.	Bogduk, N., & McGuirk, B. (2009). *Management of Acute and Chronic Neck Pain: An Evidence-Based Approach.* Philadelphia, Pa: Elsevier.
5.	Australian Acute Musculoskeletal Pain Guidelines Group, Brooks, P., & Australian Acute Musculoskeletal Pain Guidelines Group. (2004). *Evidence-Based Management of Acute Musculoskeletal Pain: A Guide for Clinicians.* Bowen Hills, Qld: Australian Academic Press.

E.1.4 Supports and Aid				
To understand the biomechanical effects of supports and aids on musculoskeletal tissues and the appropriate uses of such devices in the management of musculoskeletal disorders.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.4.1	Describes the biomechanical effects of support on musculoskeletal tissues.	Scholar; Clinical expertise	Refs: 1, 2	Final exam part A
E.1.4.2	Describes the principles of the use of supports and aids in musculoskeletal disorders.	Scholar; Clinical expertise	Refs: 1, 2	As per E.1.4.1
E.1.4.3	Describes the mechanism and degree of support provided by: • strapping • orthoses • prostheses.	Scholar; Clinical expertise	Refs: 1, 2	As per E.1.4.1
E.1.4.4	Describes the indications and contraindications for the use of supports and aids in the management of specific musculoskeletal disorders.	Scholar; Clinical expertise	Refs: 1, 2	As per E.1.4.1
KEY REFERENCES				
1.	Brukner, P. (2017). Injuries, Vol. 1. *Brukner & Khan's Clinical Sports Medicine.* (5th ed.)			
2.	AFMM White Papers.			

E.1.5 Thermo, Hydro and Electrotherapy				
To understand the effects of cooling, heating, hydrotherapy, and electrotherapies and the appropriate use of such modalities in the management of musculoskeletal disorders.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.5.1	Describes the physiological, biomechanical, and pathological effects of: • local cooling • spray and stretch • superficial heating • short wave diathermy • ultrasound • interferential • high voltage galvanism • hydrotherapy • electrical stimulation therapy • laser therapy • electromagnetic therapy • iontophoresis • infrared therapy.	Scholar; Clinical expertise	Refs: 1, 2	Final exam part B
E.1.5.2	Is able to discuss evidence for efficacy of the	Scholar;	Refs: 1, 2	As per E.1.5.1

	modalities listed in E.1.5.1.	Clinical expertise		
E.1.5.3	Is aware of typical indications and contraindications of the modalities listed in E.1.5.1.	Scholar; Clinical expertise	Refs: 1, 2	As per E.1.5.1
E.1.5.4	Is aware of clinical application of the modalities listed in E.1.5.1.	Scholar; Clinical expertise	Refs: 1, 2	As per E.1.5.1
KEY REFERENCES				
1.	Brukner, P. (2017). Injuries, Vol. 1. *Brukner & Khan's Clinical Sports Medicine.* (5th ed.)			
2.	AFMM White Papers.			

E.1.6 Manual Therapy				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.6.1	Describes manual therapy in terms of: • high velocity thrust manipulation • mobilisation • soft tissue techniques.	Scholar; Clinical expertise	MSME 709	Diploma exam
E.1.6.2	Describes the biomechanical and physiological effects of the techniques listed in E.1.6.1.	Scholar; Clinical expertise	MSME 709	As per E.1.6.1
KEY REFERENCES				
1.	Resources supplied as part of MSME 709.			

E.1.7 Traction				
To understand the principles and application of traction and its role in the management of musculoskeletal disorders.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.7.1	Is aware of the evidence of efficacy and role of traction in the treatment of musculoskeletal conditions.	Scholar; Clinical expertise	MSME 709	Diploma exam
KEY REFERENCES				
1.	Resources supplied as part of MSME 709.			

E.1.8 Medication				
To understand the use of substances with therapeutic effects and their employment in the management of musculoskeletal disorders.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.8.1	Describes the use of substances administered by local application, including: • rubefacients, counterirritants • locally applied non-steroidal anti-inflammatory drugs • locally applied corticosteroids.	Scholar; Clinical expertise	Clinical exposure; Relevant diploma Papers; Retreats, conferences, training weekends Refs: 1, 2	Supervisor, DoT and clinical placement reports; Final examination
E.1.8.2	Describes the use of substances administered via the alimentary tract, including: • antipyretic analgesics • opiate analgesics • skeletal muscle relaxants	Scholar; Clinical expertise	As per E.1.8.1	As per E.1.8.1

	• non-steroidal anti-inflammatory drugs • anti-rheumatoid agents • anti-gout agents • enzyme preparations • corticosteroid hormones • neutriceuticals.			
E.1.8.3	Describes the use of substances administered via injection.	Scholar; Clinical expertise	As per E.1.8.1	As per E.1.8.1
KEY REFERENCES				
1.	Ballantyne, J. C., Fishman, S. M., & Rathmell, J. P. (2019). *Bonica's Management of Pain* (5th ed.) Wolters Kluwer.			
2.	National Musculoskeletal Medicine Initiative Evidence-Based Clinical Practice Guidelines			

E.1.9 Neuromodulation				
To understand the application of neuromodulation in the practice of pain management as it applies to musculoskeletal medicine.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.9.1	Describes the theoretical mechanisms and application of: • transcutaneous electrical nerve stimulation (TENS) • peripheral electrical nerve stimulation (PENS) • acupuncture • spinal cord stimulation • peripheral nerve stimulation • peripheral nerve field stimulation • Baclofen and morphine pumps.	Scholar; Clinical expertise	Clinical exposure; AFMM 'White 'Papers'; Relevant diploma Papers; Retreats, conferences, training weekends Refs: 1, 2	Supervisor, DoT and clinical placement reports; Final examination
KEY REFERENCES				
1.	Ballantyne, J. C., Fishman, S. M., & Rathmell, J. P. (2019). *Bonica's Management of Pain* (5th ed.) Wolters Kluwer.			

E.1.10 Injection Techniques				
To understand the role of injections and other percutaneous techniques in musculoskeletal pain medicine, and outline the availability of such resources.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.10.1	To understand the rationale, indications, efficacy and complications of fluoroscopically and other imaging guided	Scholar; Clinical expertise	Clinical exposure; Relevant diploma	Supervisor, DoT and clinical placement reports; Final examination

	diagnostic injection techniques, as measured by real-time assessment: E.1.10.1.1: Spinal Injections • intra-articular: zygapophysial, atlantoaxial, atlantooccipital, sacroiliac • extra-articular: medial branch and dorsal ramus blocks • transforaminal epidural • disc injections: provocation discography • intrathecal. E.1.10.1.2: Ganglion Blocks E.1.10.1.3: Nerve Blocks E.1.10.1.4: Joint Injections, including: E.1.10.1.5: Musculotendinous: bursal, enthesis, tendon, ligament, muscle.		Papers; Retreats, conferences, training weekends Refs: 1, 2, 3, 4, 5	
E.1.10.2	To understand the rationale, indications, efficacy and complications of fluoroscopically and other imaging guided therapeutic injection techniques: E.1.10.2.1: Spinal • intra-articular: zygapophysial, atlantoaxial, atlantooccipital, sacroiliac • extra-articular: medial branch and dorsal ramus neurotomy (radiofrequency and chemical) • epidural: transforaminal, caudal, and interlaminar • intrathecal infusion • intradiscal electrothermal anuloplasty • spinal endoscopy • percutaneous vertebroplasty • chemonucleolysis E.1.10.2.2: Ganglia E.1.10.2.3: Nerves E.1.10.2.4: Joint Injections	Scholar; Clinical expertise	As per E.1.10.1	As per E.1.10.1

	E.1.10.2.5: Musculotendinous: bursal, enthesis, tendon/paratendon/synovial sheath, ligament, muscle			
E.1.10.3	To understand the effectiveness, indications, complications, rationale, and real-time assessment of the following techniques: E.1.10.3.1: Intravascular • intravenous regional sympathetic block • intravenous guanethidine, phentolamine • intravenous local anaesthetics. E.1.10.3.2: Continuous peripheral regional analgesia	Scholar; Clinical expertise	As per E.1.10.1	As per E.1.10.1
E.1.10.4	To be able to perform and understand the effectiveness, indications, complications, rationale, and real-time assessment of the following non-fluoroscopic techniques: E.1.10.4.1: Musculoskeletal Injections • myofascial • entheses • bursae • synovial sheaths • peripheral joints.	Scholar; Clinical expertise	As per E.1.10.1	As per E.1.10.1
E.1.10.5	To understand the rationale and interpretation of placebo blocks.	Scholar; Clinical expertise	As per E.1.10.1	As per E.1.10.1

KEY REFERENCES	
1.	Ballantyne, J. C., Fishman, S. M., & Rathmell, J. P. (2019). *Bonica's Management of Pain* (5th ed.) Wolters Kluwer.
2.	Waldman, S. D. *Interventional Pain Management (Interventional Pain Management (Waldman)).* (2nd ed.)
3.	Bogduk, N. (Ed.). (2013). *Practice Guidelines for Spinal Diagnostic and Treatment Procedures.* (2nd ed.)
4.	Bogduk, N., & McGuirk, B. (2002). *Medical Management of Acute and Chronic Low Back Pain: An Evidence-Based Approach.* Amsterdam: Elsevier.
5.	Bogduk, N., & McGuirk, B. (2009). *Management of Acute and Chronic Neck Pain: An Evidence-Based Approach.* Philadelphia, Pa: Elsevier.

E.1.11 Surgery				
To understand the nature and merits of various options available for the surgical management of patients with painful disorders of the musculoskeletal system.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.11.1	Describes the types of musculoskeletal disorders that may be treated by surgery.	Scholar; Clinical expertise	Clinical exposure; AFMM 'White 'Papers'; Relevant diploma Papers; Retreats, conferences, training weekends	Supervisor, DoT and clinical placement reports; Final examination
E.1.11.2	Describes the types of operations available for the treatment of musculoskeletal disorders.	Scholar; Clinical expertise	As per E.1.11.1	As per E.1.11.1
E.1.11.3	Describes the relative efficacy of surgical procedures for the management of pain.	Scholar; Clinical expertise	As per E.1.11.1	As per E.1.11.1
E.1.11.4	Describes the referral of patients who may require surgical management.	Scholar; Clinical expertise	As per E.1.11.1	As per E.1.11.1
E.1.11.5	Describes post-operative musculoskeletal management.	Scholar; Clinical expertise	As per E.1.11.1	As per E.1.11.1
E.1.11.6	Understands the potential for pain to present as a complication of surgery of any kind (somatic/visceral/neurological).	Scholar; Clinical expertise	As per E.1.11.1	As per E.1.11.1
KEY REFERENCES				
1.	Ballantyne, J. C., Fishman, S. M., & Rathmell, J. P. (2019). *Bonica's Management of Pain* (5th ed.) Wolters Kluwer.			

E.1.12 Psycho-Social Management				
To recognise the significance of psychological and social factors in musculoskeletal impairment and to understand the principles of their management.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.12.1	Describes the roles of psychosocial risk factors in the course of impairment, disability, and handicap with particular reference to musculoskeletal conditions.	Scholar; Clinical expertise	Clinical exposure; AFMM 'White 'Papers'; Relevant diploma Papers; Retreats, conferences,	Supervisor, DoT and clinical placement reports; Final examination

			training weekends Refs: 1, 2	
E.1.12.2	Describes the effects of impairment, disability, and handicap on lifestyle, including working capacity, leisure activities, household tasks, sexual activities, and personal care.	Scholar; Clinical expertise	As per E.1.12.1	As per E.1.12.1
E.1.12.3	Describes the processes of litigation in relation to musculoskeletal disorders, and the effects of such legal processes on the patient's psyche and lifestyle.	Scholar; Clinical expertise	As per E.1.12.1	As per E.1.12.1
E.1.12.4	Describes counselling strategies useful for the modification of the psychological and social effects of musculoskeletal disorders and their sequelae.	Scholar; Clinical expertise	As per E.1.12.1	As per E.1.12.1
E.1.12.5	Describes the behavioural techniques involved in the psychosocial management of patients with chronic pain and disability arising from musculoskeletal impairment.	Scholar; Clinical expertise	As per E.1.12.1	As per E.1.12.1
E.1.12.6	Describes the circumstances in which referral to specialised psychosocial services is required, and the nature and availability of such resources.	Scholar; Clinical expertise	As per E.1.12.1	As per E.1.12.1
KEY REFERENCES				
1.	Ballantyne, J. C., Fishman, S. M., & Rathmell, J. P. (2019). *Bonica's Management of Pain* (5th ed.) Wolters Kluwer.			
2.	Linton, S. *Understanding Pain for Better Clinical Practice: A Psychological Perspective (Pain Research and Clinical Management).* (1st ed.) Elsevier.			

E.1.13 Rehabilitation				
To understand the principles of rehabilitation of patients with musculoskeletal disorders and the rehabilitation services available to them.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
E.1.13.1	Describes the principles of rehabilitation and their application for patients with musculoskeletal disorders: • the realisation of optimal function despite residual	Scholar; Clinical expertise	Clinical exposure; Relevant diploma Papers; Retreats,	Supervisor, DoT and clinical placement reports; Final examination

	disability, or the development of a person to the fullest physical, psychological, social, vocational, and educational potential consistent with his or her physiological or anatomical impairment and environmental limitations.		conferences, training weekends Refs: 1, 2	
E.1.13.2	Describes the rehabilitation services available to patients with musculoskeletal disorders: • education • medical: -physical modalities and aids -exercises and reconditioning -functional reactivation -pharmacological medications and therapeutic blocks -psychological counselling -surgical options. • assessment: -home assessment and support -functional assessment and training -ergonomic assessment -impairment evaluation -ADL and quality of life assessment. • hospital-based inpatient and outpatient rehabilitation facilities • pain management units.	Scholar; Clinical expertise	As per E.1.13.1	As per E.1.13.1
E.1.13.3	Describes referral of patients with musculoskeletal disorders to appropriate rehabilitation medicine services: • identifying the appropriate service for the particular need	Scholar; Clinical expertise	As per E.1.13.1	As per E.1.13.1

	• initiating the referral and requesting the required service • liaison with the service provider • follow-up.			
E.1.13.4	In cases or work-related injury, demonstrates an ability to integrate the principles of musculoskeletal management into the broader context of occupational rehabilitation: • job site assessment and re-injury risk evaluation • ergonomic assessment • functional capacity evaluation • return to work program and re-evaluation • vocational assessment and work placement • liaison with the employer, rehab provider, insurer, and case manager.	Scholar; Clinical expertise	As per E.1.13.1	As per E.1.13.1
KEY REFERENCES				
1.	Ballantyne, J. C., Fishman, S. M., & Rathmell, J. P. (2019). *Bonica's Management of Pain* (5th ed.) Wolters Kluwer.			
2.	*DeLisa's Physical Medicine and Rehabilitation: Principles and Practice*. (2010). Two Volume Set. (5th ed.) North America Edition: Lippincott Williams & Wilkins.			

F. PRACTICE CONDUCT

Describes the equipment, personnel, and record systems necessary for the safe and efficient conduct of a musculoskeletal practice.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
F.1	Describes how the architectural design of practice rooms may facilitate or compromise the safe and efficient conduct of musculoskeletal practice.	Management	bPAC pre-practice visit questionnaire	Practice visit; Supervisor and Instructor report
F.2	Lists the equipment and other ancillary facilities required for the safe conduct of musculoskeletal practice.	Management	bPAC pre-practice visit questionnaire	As per F.1
F.3	Describes when and where the presence of other personnel may be necessary.	Management	bPAC pre-practice visit questionnaire	As per F.1
F.4	Describes and demonstrates a system of recording musculoskeletal information and maintaining patient records, recognising the advantages and disadvantages of any preferred technique.	Management	bPAC pre-practice visit questionnaire	As per F.1
F.5	Describes the format and content of written reports of suitable standards for communications to: • patients • other medical practitioners • paramedical health professionals • members of the legal profession • government and statutory bodies.	Management	NZAMM Clinic Letter Quality Checklist	As per F.1
F.6	Describes contractual obligations with: • employers • employees • funders • government departments.	Management	The appropriate Acts of Parliament Refs: 1, 2	As per F.1
KEY REFERENCES				
1.	http://www.legislation.govt.nz			
2.	If a member: Medical Assurance Society.			

G. SCIENTIFIC DEVELOPMENTS

To develop awareness of new developments in the science of musculoskeletal medicine and in scientific methods of managing patients with musculoskeletal impairment.				
CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
G.1	Appreciates the evolving scientific developments in basic sciences relating to the musculoskeletal system, and applies those developments in the assessment and management of patients with musculoskeletal impairment.	Scholar	Online resources via Pub-Med, Google scholar, or other appropriate search engine. Subscription to Spinal Intervention Society (*Pain Medicine*) and/or IASP (*Pain*)	Supervisor and Instructor reports; Final exam part B
G.2	Appreciates evolving scientific developments in patient management, such as gene therapy, that may become applicable to the management of patients with musculoskeletal impairment, and is able to describe the alleged, putative, and proven mechanisms of action of therapeutic interventions based on those developments, their indications, contraindications, and complications, and the current evidence concerning their effectiveness.	Scholar	As per G.1	As per G.1
KEY REFERENCES				
1.	Spinal Interventional Society and its journal *Pain Medicine*.			
2.	International Association for the Study of Pain and its journal *Pain*.			

H. ETHICS

CODE	LEARNING OUTCOME	ROLE	RESOURCES	ASSESSMENT
H.1	Describes and demonstrates the concepts as outlined in "Coles Medical Practice" and in keeping with Code of Rights in everyday practice and clinical encounters.	Professional	Refs: 1, 2, 3	Supervisor and Instructors reports
H.2	Clinical Care—consistently exhibits the following values: • Altruism • Commitment • Compassion • Honesty • Humility • Integrity • Respect	Professional	Refs: 1, 2	As per H.1
H.3	Research—describes role of an ethics committee in any research application.	Professional	n/a	n/a
KEY REFERENCES				
1.	Morris, K. (Ed.) (2017). *Coles Medical Practice in New Zealand.* (13th ed.) Medical Council NZ.			
2.	Campbell, A., Gillett, G., & Jones, G. *Medical Ethics.* (4th ed.) Oxford.			
3.	Health & Disability Commissioner and the Code of Rights: www.hdc.org.nz			

I: CULTURAL COMPETENCY

To develop awareness of and understanding for the diversity of cultural beliefs, feelings and values. Being culturally aware will improve health outcomes for those patient of different ethnicities/races/religions.				
CODE	**LEARNING OUTCOME**	ROLE	RESOURCES	ASSESSMENT
I.1.1	Knowledge: The Code of Health and Disability Services Consumers' Rights, or "The Code" -Is familiar with the Code and the rights of the consumer.	Professional	The Code	Supervisor and Instructor Reports; final written and oral examinations
I.1.2	Knowledge: Cultural Self-Awareness -Articulates insights into own cultural rules and biases (e.g. seeking complexity; aware of how her/his experiences have shaped these rules, and how to recognise and respond to cultural biases, resulting in a shift in self-description.)	Professional	CALD; training sessions; MCNZ statements and resources	Supervisor and Instructor Reports; final written and oral examinations
I.1.3	Knowledge: Cultural Worldview Frameworks -Demonstrates sophisticated understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy, beliefs, and practices.	Professional	CALD; training sessions; MCNZ statements and resources	Supervisor and Instructor Reports; final written and oral examinations
I.1.4	Skills: Empathy -Interprets intercultural experience from the perspectives of own and more than one worldview and demonstrates ability to act in a supportive manner that recognises the feelings of another cultural group.	Professional	CALD; training sessions; MCNZ statements and resources	Supervisor and Instructor Reports; final written and oral examinations
I.1.5	Skills: Verbal and Nonverbal Communication -Articulates a complex understanding of cultural differences in verbal and nonverbal communication (e.g. demonstrates understanding of the degree to	Professional	CALD; training sessions; MCNZ statements and resources	Supervisor and Instructor Reports; final written and oral examinations

	which people use physical contact or direct/indirect and explicit/implicit meanings while communicating in different cultures) and is able to skilfully negotiate a shared understanding based on those differences.			
I.1.6	Attitude: Curiosity -Asks complex questions about other cultures, seeks out and articulates answers to these questions that reflect multiple cultural perspectives.	Professional	CALD; training sessions; MCNZ statements and resources	Supervisor and Instructor Reports; final written and oral examinations
I.1.7	Attitude: Openness -Initiates and develops interactions with culturally different others. Suspends judgment in valuing her/his interactions with culturally different others. -Demonstrates evidence of adjustment in own attitudes and beliefs because of working within and learning from a diversity of communities and cultures. Promotes others' engagement with diversity. -Demonstrates ability to assess the impact of assumptions, judgments, and/or biases related to one's own and other cultures.	Professional	CALD; training sessions; MCNZ statements and resources	Supervisor and Instructor Reports; final written and oral examinations

KEY REFERENCES	
1.	Health & Disability Commissioner and the Code of Rights: www.hdc.org.nz
2.	https://bpac.org.nz/BPJ/2011/august/cultural_comp.aspx
3.	https://www.mcnz.org.nz/assets/News-and-Publications/Statements/Statement-on-cultural-competence.pdf
4.	On-line CALD resources (https://www.ecald.com); MoH resources (https://www.health.govt.nz/news-media/news-items/cultural-competency-course-added-learnonline)