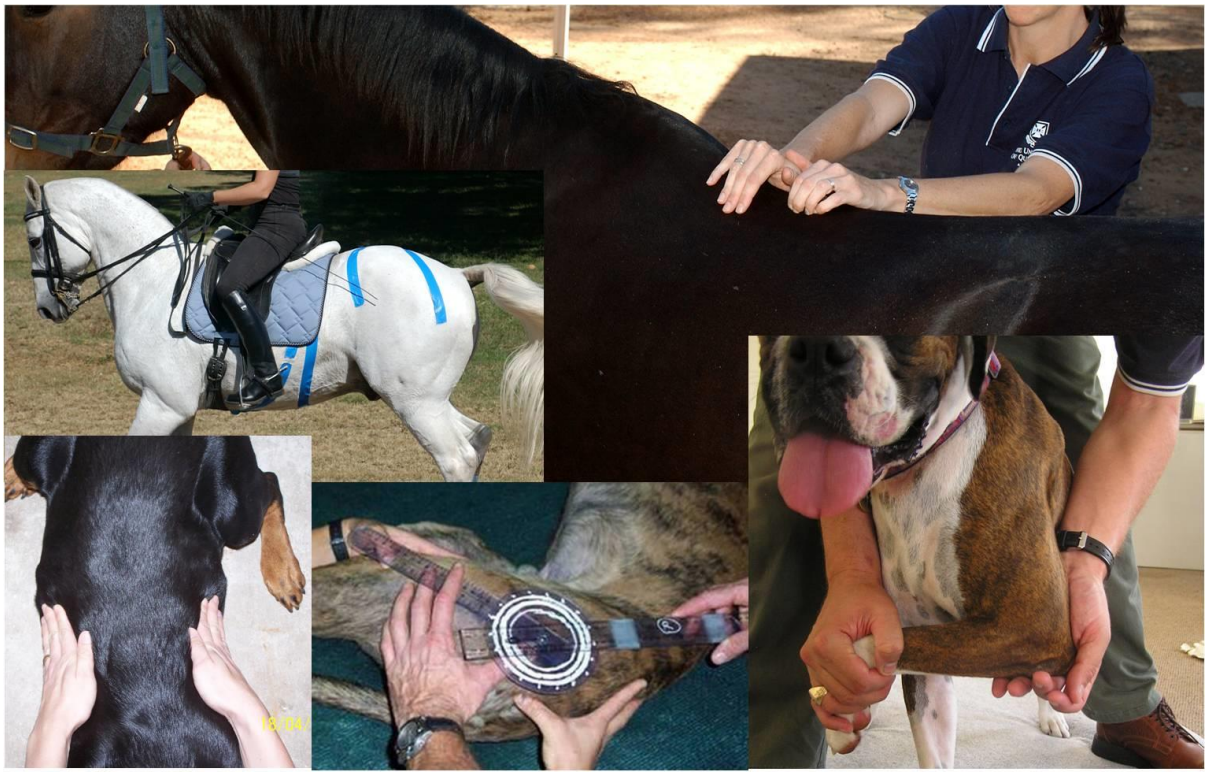
UNIVERSITY OF LIVERPOOL

PG Diploma / MSc Veterinary Physiotherapy



Physiotherapy Skills Workbook

Contents

Introduction

This self directed work book has been developed to prepare for the assessment of your basic human musculoskeletal and neurological physiotherapy skills. The assessment of these skills will take place at the end of the Residential School in year one. A practice “skills test” will be held at the beginning of the residential week.

Don’t panic! To many, these skills will be used daily in your physiotherapy practice. However to others, not currently employed in an out-patient environment or neuromuscular field, or who are a little ‘rusty’ this book is designed to point out the areas where you need to brush up on your skills. We are not expecting evidence of specialist expertise, just confirmation that you are aware of the indications, contraindications and able to apply these core skills in a competent manner. In this way, when embarking on a veterinary placement, your clinical educators will be able to assist you in the application of your physiotherapy knowledge and skills to veterinary practice from day one rather than concentrating on developing/revising the basics.
If you have any queries relating to your revision, please email Suzanne Cottriall, Programme Coordinator (**suzcot@liv.ac.uk**)

Good luck with your studies.

Suzanne

Aim of the self directed study

To ensure the safe and competent physiotherapy practice in the assessment and basic treatment of neurological and musculoskeletal conditions (including assessment techniques, manual skills and electrotherapy modalities) and effective communication skills prior to veterinary practice placements.

Learning Outcomes

Knowledge and understanding

By the end of the self directed study and independent practice, successful students will be able to:

1. Relate the anatomy and biomechanics of the neurological and musculoskeletal system to the potential clinical features of neurological and musculoskeletal dysfunction.
2. Explain the pathological processes involved in the development of common clinical features of neurological and musculoskeletal dysfunction.
3. Examine the application of the principles of clinical reasoning to the management of patients with neurological and musculoskeletal dysfunction.
4. Review the theory underpinning management strategies relevant to patients with neurological and musculoskeletal dysfunction.

Skills and Attributes

By the end of the self directed study successful students will be able to:

5. Demonstrate the application of a range of assessment and treatment procedures suitable for patients with neurological and musculoskeletal dysfunction.
6. Discuss the progression of physiotherapy treatments suitable for patients with neurological and musculoskeletal dysfunction.
7. Recognise the importance of effective communication in order to optimise patient care.

Essential Knowledge and Understanding

By the end of the self directed study and independent practice, successful students will be able to:

1. Relate the *anatomy* and *biomechanics* of the neurological and musculoskeletal system to the potential *clinical features* of neurological and musculoskeletal dysfunction.
2. Explain the *pathological processes* involved in the development of common clinical features of neurological and musculoskeletal dysfunction.
3. Examine the application of the *principles of clinical reasoning* to the management of patients with neurological and musculoskeletal dysfunction.
4. Review the theory underpinning *management strategies* relevant to patients with neurological and musculoskeletal dysfunction.

In order to meet these learning outcomes you will need to review:

- **The anatomy of the neurological and musculoskeletal system relating structure to function:**

    a. Bones – Spine, scapular, clavicle, humerus, ulna, radius, hand, femur, tibia, fibula, foot.
    b. Muscles and tendons – Upper and lower quadrant and spinal muscles.
    c. Nerves – Spinal and peripheral.
    d. Joints and ligaments – Inter-vertebral, shoulder, elbow, wrist, hip, knee, ankle.

- **The relevant biomechanics related to the following:**

    a. Joints – spinal and peripheral
    b. Gait
    c. Posture
    d. Muscle Imbalance

- **The pathological processes and related dysfunction resulting from the following:**

    a. Osteoarthritis
    b. Soft tissue injuries
    c. Fractures

- **The following physiological mechanisms:**

    a. Pain
    b. Inflammation
    c. Healing process (bone, muscle, tendons, nerves and skin)

Essential Skills

By the end of the self directed study, successful students will be able to:

1. Demonstrate the application of a range of assessment and treatment procedures suitable for patients with neurological and musculoskeletal dysfunction.
2. Discuss the progression of physiotherapy treatments suitable for patients with neurological and musculoskeletal dysfunction.
3. Recognise the importance of effective communication in order to optimise client care.

In order to meet these learning outcomes you will need to review:

- Subjective assessment
- Objective assessment of a peripheral joint
- Objective assessment of the spine
- Joint mobilisation
- Soft tissue massage
- Muscle imbalance assessment and re-education programmes
- Exercise Prescription
- Electrotherapy modalities

For further details see the following sections.

Skill 1 – Subjective Assessment

- Undertake a subjective examination with reference to patients with neurological and musculoskeletal dysfunction.
- Understand the relevance of the questions/responses in the context of the clinical decision making process.

Areas to Consider

- Communication with patient/model
- Structure of assessment
- 24 hour behaviour
- Special questions and interpretation of responses
- Aggravating and easing factors
- Severity, irritability and nature

Recommended Resources

Clarkson, H.M. (2000). *Musculoskeletal assessment: joint range of motion and manual muscle strength.* 2nd Ed. Philadelphia, Lippincott Williams & Wilkins.

CSAG (1994). Clinical standards advisory group report on back pain. HMSO, London.

Gifford, L. (Ed.) (2000). *Topical Issues in Pain 2: Biopsychosocial assessment and management: Relationships and pain.* Falmouth: CNS Press.

Grant, R. (2002). *Physical Therapy of the Cervical and Thoracic Spine.* (3rd ed). Edinburgh: Churchill Livingstone.

Greenhalgh,, S. and Selfe, J. (2006). *Red Flags: A guide to identifying serious pathology of the spine*. London, Churchill Livingstone.

Grieve, G. (1988). *Common Vertebral Joint Problems*. (2nd ed). Edinburgh: Churchill Livingstone.

Higgs, J. & Jones, M. (Eds.). *Clinical reasoning in the health professions*. (2nd ed). Oxford: Butterworth-Heinemann.

Jones, M. (1995). 'Clinical reasoning and pain', *Manual Therapy*, 1, 17-24.

Jones, M. A. & Rivett, D. (2004). *Clinical reasoning for manual therapists.* Oxford: Butterworth Heinemann

Moore, K.L. & Dalley, A.F. (1999). *Clinically oriented anatomy,* 4th ed. Baltimore, Lippincott Williams & Wilkins.

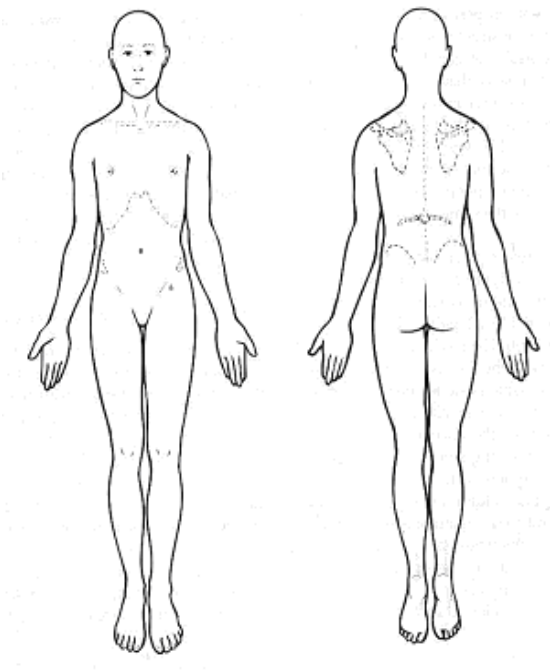
Palastanga, N., Field, D. & Soames, R. (2002). *Anatomy and human movement:*

structure and function. 4th ed. Oxford, Butterworth-Heinemann.

Petty, N. & Moore, A. (2006). *Neuromusculoskeletal examination and assessment: a handbook for therapists*. 3rd ed. Edinburgh, Elsevier Churchill Livingstone.

Subjective Examination

Body Chart



Relationship of symptoms

Name

Age

Date

24 Hour behaviour

Wake

Sleep

AM

Position

Midday

Mattress

PM

Pillow

Function

Improving Static Worsening

Special Questions

General Health

Weight Loss

RA

Drugs

Steroids

Anticoagulants

X-ray / Scan / Investigations

Aggravating Factors	HPC
Easing Factors	PMH
Severity **I**rritability **High/moderate/low** **low/high** **N**ature	SH
Intensity of pain (VAS) 0 1 2 3 4 5 6 7 8 9 10 |_____|_____|	Plan for Physical Examination MUST SHOULD COULD

Skill 2 – Objective Assessment of a Peripheral Joint

- Outline the key components of a physical examination of a peripheral joint
- Undertake the physical examination of the following peripheral joints – hip, knee, ankle, foot, shoulder, elbow, wrist and hand.

Areas to Consider

- Observation
- Assessment of active range of movements
- Assessment of passive physiological movements
    - Demonstrate correct handling of the joint through passive movements
    - End feel
    - Overpressure
    - Apply principles of patient comfort, and therapist safety/comfort/efficiency
    - Interpret findings when assessing the physiological/accessory range of a joint and draw simple movement diagrams
    - Identify the precautions and contraindications to the application of passive movement testing
    - Apply the concave/convex rule when using passive movement testing
- Assessment of passive accessory movements
    - Record ROM using the neutral zero method (Clarkson, 2000)
- Stretching, activating, and palpating the muscles around the joint
- Grading the contraction available in the muscles around the joint
- Performing special tests to help differentiate problems

Recommended Resources

Clarkson, H.M. (2000). *Musculoskeletal assessment: joint range of motion and manual muscle strength.* 2nd Ed. Philadelphia, Lippincott Williams & Wilkins.

Kendall, F., McCreary, E. & Provance, P. (1983). *Muscles Testing and Function.* (4th ed). Baltimore: Williams and Wilkins.

Magee, D. (1992). *Orthopaedic physical assessment.* 2nd ed. Philadelphia, WB Saunders Co.

Maitland, G.D. (1991). *Peripheral manipulation,* 3rd ed. Oxford, Butterworth-Heinemann.

McKenzie, R. A. (2003). *The human extremities: mechanical diagnosis and therapy.* (2nd ed). New Zealand:Spinal Publications.

Petty, N. & Moore, A. (2006). *Neuromusculoskeletal examination and assessment: a handbook for therapists*. 3rd ed. Edinburgh, Elsevier Churchill Livingstone.

Skill 3 – Objective Assessment of the Spine

- Outline the key components of a spinal physical examination
- Perform a full physical assessment of the Cervical, Thoracic and Lumbar spine

Areas to consider

- Significance of observation skills in the physical examination
- Ideal posture and typical postural deviations
- Palpation of main structures, including soft tissues
- Examination of active spinal movement, applying overpressure and combined movement if indicated
- Examination of passive spinal movements, both physiological and accessory

Recommended Resources

Chaitow, L. (1996). *Palpation Skills.* Edinburgh: Churchill Livingstone.

Field, D. (2001). *Anatomy, palpation and surface markings.* 3rd ed. Butterworth-Heinemann

Kendall, F., McCreary, E. & Provance, P. (1983). *Muscles Testing and Function.* (4th ed). Baltimore: Williams and Wilkins.

Magee, D. (1992). *Orthopaedic physical assessment.* 2nd ed. Philadelphia, WB Saunders Co.

Maitland, G.D., Hengeveld, E., Banks, K. & English, K. (2001). *Maitland's vertebral manipulation.* 6th ed. Oxford, Butterworth-Heinemann.

McKenzie, R. A. (2003). *The human extremities: mechanical diagnosis and therapy.* (2nd ed). New Zealand:Spinal Publications.

Middleditch, A. & Oliver, J. (2005) *Functional anatomy of the spine.* 2nd ed. Oxford, Butterworth Heinemann.

Moore, K.L., Dalley AF (1999). *Clinically oriented anatomy,* 4th ed. Baltimore, Lippincott Williams & Wilkins.

Palastanga N, Field D, Soames R (2002). *Anatomy and human movement: structure and function*. 4th ed. Oxford, Butterworth-Heinemann.

Petty N, Moore A (2006). *Neuromusculoskeletal examination and assessment: a handbook for therapists*. 3rd ed. Edinburgh, Elsevier Churchill Livingstone.

Skill 4 – Joint Mobilisation

- Perform a range of mobilisation techniques, accessory and physiological, that may be used in the management of commonly encountered neurological and musculoskeletal conditions/dysfunction

Areas to consider

- Precautions and contraindications to the application of mobilisations
- Grading of accessory and physiological movements
- Physiological effects of mobilisations
- Efficient and effective application of a selection of mobilisation techniques for the lumbar spine
- Select appropriate techniques and relate to pathologies
- Evaluation of the techniques' effect
- Progression/regression of techniques
    - How would you progress the mobilisations – e.g. change start position, higher grade, increase frequency or reps
    - What other techniques could you use – e.g. exercise

Recommended Resources

Boyling, J. D. & Palastanga, N. (Eds) (1994). *Grieve's Modern Manual Therapy - The Vertebral Column.* (2nd ed). Edinburgh: Churchill Livingstone.

Butler, D. (1991). *Mobilisation of the Nervous System.* Edinburgh: Churchill Livingstone.

Grant, R (2002). *Physical Therapy of the Cervical and Thoracic Spine.* (3rd ed). Edinburgh: Churchill Livingstone.

Grieve, G. (1991). *Mobilisation of the Spine*. (5th ed). Edinburgh, Churchill Livingstone.

Grieve, G. (1988). *Common Vertebral Joint Problems*. (2nd ed). Edinburgh: Churchill Livingstone.

Maitland GD, Hengeveld E, Banks K, English K (2001). *Maitland's vertebral manipulation.* 6th ed. Oxford, Butterworth-Heinemann.

McKenzie, R. A. (2003). *The human extremities: mechanical diagnosis and therapy.* (2nd ed). New Zealand:Spinal Publications.

Web Sites

Royal College of General Practitioners Acute Low Back Pain Guidelines
http://www/rcgp.org.uk/rcgp/clinspec/guidelines/backpain/backpain8.asp

Manipulation Association of Chartered Physiotherapists
http://www.macp-online.co.uk

Skill 5 - Soft Tissue Massage

- Perform a range of massage techniques that may be used in the management of commonly encountered neuromusculoskeletal soft tissue injuries

Areas to Consider

- Techniques
    - Stroking
    - Kneading
    - Effleurage
    - Frictions
- Indications, contraindications and precautions
- Application of techniques
- Evaluation of effects
- Progression/regression of treatment

Recommended Resources

Atkinson, K., Coutts, F. & Hassenkamp, A. (2005). *Physiotherapy in orthopaedics: A problem-solving approach.* 2nd Ed. Edinburgh, Churchill Livingstone.

Butler, D. (1991). *Mobilisation of the Nervous System.* Edinburgh: Churchill Livingstone.

Chaitow, L. (1996). *Palpation Skills.* Edinburgh: Churchill Livingstone.

Field, D. (2001). *Anatomy, palpation and surface markings.* 3rd ed. Butterworth-Heinemann

Holey, E. & Cook, E. (2003). *Therapeutic Massage.* 2nd ed. London, WB Saunders

McKenzie, R. A. (2003). *The human extremities: mechanical diagnosis and therapy.* (2nd ed). New Zealand:Spinal Publications.

Skill 6 – Muscle Imbalance - Assessment and Re-education Programmes

- Perform a range of muscle imbalance assessment and re-education techniques that may be used in the management of commonly encountered neurological and musculoskeletal dysfunction

Areas to Consider

- Theoretical concepts of muscle imbalance, including the main characteristics of mobilising and stabilising muscles
- Principles of treatment of muscle imbalance
- How the muscle imbalance concept relates to treatment of joints and neural tissues in patients with neuromusculoskeletal dysfunction
- Assessment of the activation and endurance of stability muscles
- Selection and performance of tests to assess the length of stability muscles
- Selection, or non selection of, exercises which may re-educate the stability muscles
- Accurate and effective re-education of the stability muscles
- Detection of substitution strategies which may occur during the performance of these tests/exercises

Recommended Resources

Comerford, M J and S L Mottram (2001). 'Functional stability re-training: principles and strategies for managing mechanical dysfunction', *Manual Therapy*, 6, 1, 3-14.

Comerford, M J and S L Mottram (2001). 'Movement and stability dysfunction- contemporary developments', *Manual Therapy,* 6, 1, 15-26

O'Sullivan, P B (2000). 'Masterclass. Lumbar segmental 'instability': clinical presentation and specific stabilizing exercise management', *Manual Therapy,* 5, 1, 2-12.

Richardson, C A, Jull, G A and Hides, J A (2000). 'A new clinical model of the muscle dysfunction linked to the disturbance of spinal stability: implications for treatment of low back pain', In: Twomey, L T and Taylor, J R (Eds). *Physical therapy of the low back*, 3rd ed., New York, Churchill Livingstone, chapter 8.

Skill 7 - Exercise Prescription

- Prescribe a range of exercises that may be used in the management of neurological and musculoskeletal dysfunction

Areas to Consider

- Prescription and justification of a range of different types of exercises.
    - Stretching
        - Static and dynamic
    - Strengthening
    - Mobilising
    - Cardiovascular fitness
- Modification of a range of different types of exercises
    - Repetitions
    - Frequency
    - Application of resistance
    - Base of support
- Identification and correction of substitute movements
- Identification and implementation of suitable strategies to help motivate and to aid adherence and compliance
- Consideration of the additional properties of water when developing an exercise programme

Recommended Resources

Ashe, M.C. & Khan, K.M. (2004) Exercise Prescription.*Journal of the American of Orthopaedic Surgeons Vol 12, No 1,* January/*February*: 21-27.

Hall, C. & Thein Brody, L. (1998). *Therapeutic exercise: Moving towards function.* Philidelphia, Lippincott Williams & Wilkins.

Kisner, C. & Colby, L.A. (2002). *Therapeutic exercise: Foundations and techniques.* Philadelphia, FA Davis Company.

Witvrouw, E., Mahieu, N, Danneels, L. & McNair, P. (2004) Stretching and Injury Prevention- An Obscure Relationship. Sports Medicine; 34 (7)

Skill 8 – Electrotherapy and other Physical Modalities

Areas for Consideration

- Fundamental properties of the modality
- Key parameters that can be set from the machine
- Identification of the physiological effects of the modality
- Appreciation of the range of clinical applications commonly employed
- Selection and modification of appropriate treatment dose
- Identification of contraindications and precautions for the modality
- Explanations for application of the modality and, where appropriate, identification of the dangers
- Safe application of the modality
- Justification of appropriate grade/dosage of the modality for a range of commonly encountered neuromusculoskeletal conditions in various stages of presentation
- Evaluation of the effects
- Modification of application in response to evaluation of effect

Modalities to be considered

- Ultrasound
- Interferential
- Transcutaneous Electrical Nerve Stimulation
- Heat
- Cryotherapy

Recommended Resources

Robertson, V., Ward, A., Low, V.J. and Reed A (2006) *Electrotherapy Explained : Principles and Practice.* Edinburgh: Elsevier.

Watson, T (2008) *Electrotherapy: Evidence Based Practice*. Edinburgh:Elsevier

Web Sites

Electrotherapy Website

http://www.electrotherapy.org

Assessment of Skills

A Practical Test will be held prior to you attending formal veterinary clinical placements; this will take place at the end of the Residential School in Year One. The test, consisting of a number of stations, is designed to assess your knowledge, understanding and ability to perform physiotherapy skills including electrotherapy and manual therapy skills, in a human context.

Unsuccessful students will normally be prevented from commencing clinical placements until a successful outcome is achieved.

Example stations

REGION Upper Limb

Clinical Features

A 25 year old dancer is presenting with a painful arc of abduction in her left shoulder The pain is non severe, non irritable.

TASKS ON THE MODEL

1. Demonstrate an appropriate assessment procedure for impingement in the left shoulder joint.

2. Explain to the examiner what you are looking for.

3. Demonstrate an appropriate manual therapy treatment technique for this condition.

4. Justify your choice of treatment to the examiner and possible progression of treatment.

REGION Upper Limb

Clinical Features

A 65 year old presents with a stiff right shoulder following a diagnosis of frozen shoulder, 1 year ago, he has mild pain, non-irritable.

TASKS ON THE MODEL

1. Demonstrate how you would assess shoulder range of movement, with goniometry where appropriate.

2. Explain to the examiner what you are looking for.

3. Demonstrate an appropriate passive physiological technique to increase lateral rotation of the glenohumeral joint.

4. Justify your choice of treatment to the examiner and possible progression of treatment.

REGION: Spinal Dysfunction

CLINICAL FEATURES:

A 45 year old librarian presents with an 18 month history of unilateral right neck pain, with referred pain into the right arm. It is not severe or irritable.

TASKS ON THE MODEL:

1. Demonstrate how you would palpate the cervical spine.

2. Explain what you might expect to find with the clinical features outlined above.

3. Demonstrate a manual treatment technique suitable for the management of this patient.

4. Justify your choice to the examiner.

REGION: Spinal Dysfunction

CLINICAL FEATURES:

A 50 year old kennel worker had a car accident two days ago sustaining a whiplash injury. Pain is mainly in the low cervical spine. A neurological examination is normal. Symptoms are mild and not irritable.

You can assume that there is no serious pathology involved.

TASKS ON THE MODEL:

1. Advise the patient on the management of their symptoms over the next five days.

2. Justify your choice of advice to the examiner.

3. Teach the patient 2 exercises for home.

4. Justify your choice to the examiner.

REGION: Spinal Dysfunction

CLINICAL FEATURES:

A 55 year old farmer is complaining of pain and stiffness in his mid thoracic spine. It is moderate pain and non-irritable.

TASKS ON THE MODEL:

1. Examine the thoracic posture of the model.

2. Explain to the examiner what you are looking for.

3. Demonstrate an appropriate manual therapy technique for this patient.

DISCUSSION WITH EXAMINER

4. Justify your choice of technique to the examiner.

REGION Shoulder/TENS

CLINICAL FEATURES:

A 45 old jockey is complaining of a left frozen shoulder. Symptoms are constant, severe (7/10 VAS) and irritable. You decided to use 'Acupuncture-like' TENS (Transcutaneous Electrical Nerve Stimulation) as part of their management programme.

TASK ON THE MODEL

1. Demonstrate how you would position the patient to teach them the use of TENS and explain to the patient the reason for using TENS in the management of their symptoms.
2. Teach the patient how to apply Acupuncture-like TENS in the management of a painful left frozen shoulder.

DISCUSSION WITH EXAMINER

3. Justify the use of TENS in the management of upper quadrant neuromusculoskeletal dysfunction.
4. The machine has been tested and there are no contraindications to its use.