

PHYSIOTHERAPY TECHNICIAN

NSQF LEVEL - 3

TRADE PRACTICAL

SECTOR: HEALTH CARE

(As per revised syllabus July 2022 - 1200 Hrs)



Directorate General of Training

DIRECTORATE GENERAL OF TRAINING
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
GOVERNMENT OF INDIA



**NATIONAL INSTRUCTIONAL
MEDIA INSTITUTE, CHENNAI**

Post Box No. 3142, CTI Campus, Guindy, Chennai - 600 032

Sector : Healthcare

Duration : 1 Year

Trades : Physiotherapy Technician - Trade Practical - NSQF LEVEL - 3 (Revised 2022)

Developed & Published by



National Instructional Media Institute

Post Box No.3142

Guindy, Chennai - 600032

INDIA

Email: chennai-nimi@nic.in

Website: www.nimi.gov.in

Copyright © 2022 National Instructional Media Institute, Chennai

First Edition : November 2022

Copies : 1000

Rs.270/-

All rights reserved.

No part of this publication can be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording or any information storage and retrieval system, without permission in writing from the National Instructional Media Institute, Chennai.

FOREWORD

The Government of India has set an ambitious target of imparting skills to 30 crores people, one out of every four Indians, by 2020 to help them secure jobs as part of the National Skills Development Policy. Industrial Training Institutes (ITIs) play a vital role in this process especially in terms of providing skilled manpower. Keeping this in mind, and for providing the current industry relevant skill training to Trainees, ITI syllabus has been recently updated with the help of Media Development Committee members of various stakeholders viz. Industries, Entrepreneurs, Academicians and representatives from ITIs.

The National Instructional Media Institute (NIMI), Chennai, has now come up with instructional material to suit the revised curriculum for **Physiotherapy Technician - Trade Practical - NSQF LEVEL - 3 (Revised 2022) in Healthcare Sector under Yearly Pattern**. The NSQF Level - 3 (Revised 2022) Trade Practical will help the trainees to get an international equivalency standard where their skill proficiency and competency will be duly recognized across the globe and this will also increase the scope of recognition of prior learning. NSQF Level - 3 (Revised 2022) trainees will also get the opportunities to promote life long learning and skill development. I have no doubt that with NSQF Level - 3 (Revised 2022) the trainers and trainees of ITIs, and all stakeholders will derive maximum benefits from these Instructional Media Packages IMPs and that NIMI's effort will go a long way in improving the quality of Vocational training in the country.

The Executive Director & Staff of NIMI and members of Media Development Committee deserve appreciation for their contribution in bringing out this publication.

Jai Hind

Addl. Secretary / Directorate General of Training
Ministry of Skill Development & Entrepreneurship
Government of India.

New Delhi - 110 001

PREFACE

The National Instructional Media Institute (NIMI) was established in 1986 at Chennai by then Directorate General of Employment and Training (D.G.E & T), Ministry of Labour and Employment, (now under Directorate General of Training, Ministry of Skill Development and Entrepreneurship) Government of India, with technical assistance from the Govt. of Federal Republic of Germany. The prime objective of this Institute is to develop and provide instructional materials for various trades as per the prescribed syllabi under the Craftsman and Apprenticeship Training Schemes.

The instructional materials are created keeping in mind, the main objective of Vocational Training under NCVT/NAC in India, which is to help an individual to master skills to do a job. The instructional materials are generated in the form of Instructional Media Packages (IMPs). An IMP consists of Theory book, Practical book, Test and Assignment book, Instructor Guide, Audio Visual Aid (Wall charts and Transparencies) and other support materials.

The trade practical book consists of series of exercises to be completed by the trainees in the workshop. These exercises are designed to ensure that all the skills in the prescribed syllabus are covered. The trade theory book provides related theoretical knowledge required to enable the trainee to do a job. The test and assignments will enable the instructor to give assignments for the evaluation of the performance of a trainee. The wall charts and transparencies are unique, as they not only help the instructor to effectively present a topic but also help him to assess the trainee's understanding. The instructor guide enables the instructor to plan his schedule of instruction, plan the raw material requirements, day to day lessons and demonstrations.

IMPs also deals with the complex skills required to be developed for effective team work. Necessary care has also been taken to include important skill areas of allied trades as prescribed in the syllabus.

The availability of a complete Instructional Media Package in an institute helps both the trainer and management to impart effective training.

The IMPs are the outcome of collective efforts of the staff members of NIMI and the members of the Media Development Committees specially drawn from Public and Private sector industries, various training institutes under the Directorate General of Training (DGT), Government and Private ITIs.

NIMI would like to take this opportunity to convey sincere thanks to the Directors of Employment & Training of various State Governments, Training Departments of Industries both in the Public and Private sectors, Officers of DGT and DGT field institutes, proof readers, individual media developers and coordinators, but for whose active support NIMI would not have been able to bring out this materials.

Chennai - 600 032

EXECUTIVE DIRECTOR

ACKNOWLEDGEMENT

National Instructional Media Institute (NIMI) sincerely acknowledges with thanks for the co-operation and contribution extended by the following Media Developers and their sponsoring organisation to bring out this IMP (**Trade Practical**) for the trade of **Physiotherapy Technician - Trade Practical - NSQF LEVEL - 3 (Revised 2022)** under the **Healthcare** Sector for ITIs.

MEDIA DEVELOPMENT COMMITTEE MEMBERS

Dr. M. Parthiban M.Tech, Ph.D	-	Assistant Professor (S.G) Department of Fashion Technology PSG College of Technology Coimbatore - 641004.
Dr. T. Jayanthi	-	Physiotherapist, 86, Saraswathi Garden Coimbatore - 641048.

NIMI - COORDINATORS

Shri. Nirmalya Nath	-	Deputy Director, NIMI, Chennai - 32.
Shri. V. Gopala Krishanan	-	Manager NIMI, Chennai - 32.

NIMI records its appreciation of the Data Entry, CAD, DTP Operators for their excellent and devoted services in the process of development of this Instructional Material.

NIMI also acknowledges with thanks, the invaluable efforts rendered by all other staff who have contributed for the development of this Instructional Material.

NIMI is grateful to all others who have directly or indirectly helped in developing this IMP.

INTRODUCTION

TRADE PRACTICAL

The trade practical manual is intended to be used in workshop . It consists of a series of practical exercises to be completed by the trainees during the one year course of the **Physiotherapy Technician** trade supplemented and supported by instructions / informations to assist in performing the exercises. These exercises are designed to ensure that all the skills in compliance with NSQF LEVEL - 3 (Revised 2022)

The manual is divided into eight modules. The distribution of time for the practical in the eight modules are given below.

Module 1	-	Anatomy
Module 2	-	Physiology
Module 3	-	Conductive thermal energy modalities
Module 4	-	High frequency current
Module 5	-	Low frequency current
Module 6	-	Massage therapy
Module 7	-	Exercise therapy
Module 8	-	Clinical physiotherapy

The skill training in the shop floor is planned through a series of practical exercises centred around some practical project. However, there are few instances where the individual exercise does not form a part of project.

While developing the practical manual a sincere effort was made to prepare each exercise which will be easy to understand and carry out even by below average trainee. However the development team accept that there is a scope for further improvement. NIMI, looks forward to the suggestions from the experienced training faculty for improving the manual.

TRADE THEORY

The manual of trade theory consists of theoretical information for the one year course of the **Physiotherapy Technician** Trade. The contents are sequenced according to the practical exercise contained in the manual on Trade practical. Attempt has been made to relate the theoretical aspects with the skill covered in each exercise to the extent possible. This co-relation is maintained to help the trainees to develop the perceptual capabilities for performing the skills.

The Trade theory has to be taught and learnt along with the corresponding exercise contained in the manual on trade practical. The indicating about the corresponding practical exercise are given in every sheet of this manual.

It will be preferable to teach/learn the trade theory connected to each exercise atleast one class before performing the related skills in the shop floor. The trade theory is to be treated as an integrated part of each exercise.

The material is not the purpose of self learning and should be considered as supplementary to class room instruction.

CONTENTS

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
Module 1 : Anatomy			
1.1.01	Identification of electrotherapy modalities		1
1.1.02	Cataloging of exercise tools and equipments		4
1.1.03	Illustration and demonstration of human body		7
1.1.04	Sketch and demonstrate the planes and axis		9
1.1.05	Sketch and demonstrate the anatomical and fundamental positions		11
1.1.06	Illustration and demonstration of skeleton system	1,2&3	14
1.1.07	Names and side determination of bones		15
1.1.08	Illustration and demonstration of skull bones		17
1.1.09	Presentation of joints by using bones		20
1.1.10	Trace diagrams of major joints of human body		22
1.1.11	Perform X-ray practical by using X-ray films		23
1.1.12	Show muscles structure with proper labelling		27
1.1.13	Demonstration of major muscles of upper limb		29
1.1.14	Demonstration of major muscles of lower limb		30
1.1.15	Illustration and demonstration of abdomen, trunk, thorax, neck and face		31
Module 2 : Physiology			
1.2.16	Sketch labelled picture of cell		33
1.2.17	Microscopic diagram of different tissues		35
1.2.18	Make postures of skin		36
1.2.19	Videos of cell structure		38
1.2.20	Idea of reflexes and their examination		39
1.2.21	Demonstration and A.V. display		41
1.2.22	Display charts of nervous system		42
1.2.23	Representation of neuron, brain, spinal cord, reflex arc, plexus	5,6,7,8,	43
1.2.24	Pain assessment	9&10	44
1.2.25	Designing of charts of heart structure and circulation		45
1.2.26	Description of heart location and position by using mannequin		46
1.2.27	A.V display of heart circulation		47
1.2.28	Pulse and blood pressure examination		48
1.2.29	Mark a balanced diet chart for different age groups		49
1.2.30	Display the organs of digestive system on mannequins		50
1.2.31	Demonstration of A.V. display		51
1.2.32	Figuration of main and accessory organs of digestive system		52
1.2.33	Display the organs of respiratory system on mannequins		53
1.2.34	Display respiratory mechanism by using videos		54

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.2.35	Measure chest inspiration and expiration with inch tape		55
1.2.36	Respiratory rate examination		56
1.2.37	Portrait charts of organs of respiratory system		57
1.2.38	Explanation of parts of excretory and reproductive system on mannequin		58
1.2.39	Presentation and A.V. videos of excretory system		59
1.2.40	Micturition reflex by showing charts		60
	Module 3 : Conductive thermal energy modalities		
1.3.41 - 1.3.44	Preparation of hot packs		61
1.3.45 - 1.3.47	Assessment of the affected part before applying wax bath		63
1.3.48	Application of IRR with precautions		65
1.3.49	Show different positions of patient during treatment		66
1.3.50	Placement of IRR at proper distance from skin		67
1.3.51	Practice on preparation and application of ice pack, cold pack, ice towels, ice bath, ice cube massage according to the contour of the body	11,12,13 &14	68
1.3.52	Practice of preparation of patient		69
1.3.53	Plan precautions while giving treatment		70
1.3.54	Explanation of all parts of SWD		71
1.3.55	Testing of SWD		72
1.3.56	Positioning of patient and placement of electrodes		73
1.3.57	Flowchart of SWD circuit		74
1.3.58	SWD cable methods		75
1.3.59	Precautions		76
	Module 4 : High frequency current		
1.4.60	Methods of testing		77
1.4.61	Methods of application	15	78
1.4.62	Handling and operating of UST modality with precautions		79
1.4.63	Precaution of patient		80
	Module 5 : Low frequency current		
1.5.64	Practice on muscle stimulator for major muscles of upper limb and lower limb		81
1.5.65	Preparation of patient for muscle stimulation		84
1.5.66	Demonstration of muscles stimulator on face		85
1.5.67	Plan precautions during treatment	16	86
1.5.68	Practice on placement of electrodes with using proper gel		87
1.5.69	Create difference between TENS and IFT for pain producing conditions		88
1.5.70	Demonstrate on placement of TENS and IFT pads for radiating and local pain respectively		89

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.5.71	Methods of treatment		91
1.5.72	Testing methods of all modalities		92
Module 6 : Massage therapy			
1.6.73	Positioning of patient and therapist		93
1.6.74	Techniques used in massage for upper and lower limb		95
1.6.75	Illustrate a practical of massage on face	17	97
1.6.76	Elaborate methods of trunk massage		98
1.6.77	Precautions while giving massage		100
1.6.78	Rules and direction of massage		101
1.6.79	Direction of using materials (oil, powder, etc...) during massage		103
1.6.80	Therapeutic application of massage		104
Module 7 : Exercise therapy			
1.7.81	Show positioning of patient and therapist		105
1.7.82	Perform practical of different exercises		106
1.7.83	Rules and directions of exercises		107
1.7.84	Demonstrate exercise to increase ROM by using continuous passive movement equipments		108
1.7.85	Presentation of passive movements manually		109
1.7.86	Assessment of range of motion of major joints by using goniometer scales		113
1.7.87	Perform measurement of spine ROM by using inch tape		115
1.7.88	Exhibit active and active assisted movements		117
1.7.89	Illustrate strengthening exercises by using weight cuffs for upper and lower limb joints	18&19	120
1.7.90	Perform strengthening exercises by utilizing thera-bands/thera tubes		123
1.7.91	Demonstrate resisted exercises (manually)		124
1.7.92	Representation of quadriceps and hamstring resisted exercise on quadriceps chair and multipurpose chair		127
1.7.93	Practical use of different exercise equipments using shoulder wheel, shoulder pulley and swiss ball		128
1.7.94	Assessment of coordination and balance		130
1.7.95	Describe equilibrium and non-equilibrium tests		132
1.7.96	Schedule exercise programs for stretching of major muscles (manually)		133
1.7.97	Elaborate methods of stretching		136
1.7.98	Explain positioning of patient during postural drainage		137
1.7.99	Collaborate massage techniques with postural drainage		138
1.7.100	Prepare a chart of measurements of chest inspiration and expiration by using hands and inch tape at different chest levels		139
1.7.101	Perform resistive exercises for thorax muscles		140
1.7.102	Practical based on breathing exercises		141

Exercise No.	Title of the Exercise	Learning Outcome	Page No.
1.7.103	Illustrate a practical on PNF techniques for upper and lower limbs		143
1.7.104	Presentation of PNF techniques for trunk, face and neck		146
1.7.105	Explanation of D1 and D2 patterns of PNF		147
1.7.106	Determination of grades of MMT for upper and lower limb		148
1.7.107	Practical based on grading of MMT for trunk and abdominals		150
1.7.108	Representation of MMT exercises for face		152
1.7.109	Proper demo of relaxation techniques by using pillows		153
1.7.110	Execute testing of traction		155
1.7.111	Demonstrate the positioning of patient while giving traction		156
1.7.112	Teach how to calculate patient's weight to be used in treatment		157
1.7.113	Develop different methods of application of traction		158
1.7.114	Impart skills of manual cervical and lumbar traction		160
1.7.115	Instruct normal gait patterns		161
1.7.116	Presentation of gait phases on floor		162
1.7.117	Perform abnormal gaits		163
1.7.118	Demonstrate a practical on walking aids		164
1.7.119	Give a brief idea of parts of wheel chair		165
1.7.120	Give guidelines for walking aids' usage for patients		166
1.7.121	Design gait pattern for weight bearing and non-weight bearing		168
1.7.122	Performance of gait training		169
	Module 8 : Clinical physiotherapy		
1.8.123	Display videos showing causes of clinical conditions		172
1.8.124	Perform observational assessment in various conditions		173
1.8.125	Perform clinical examination		175
1.8.126	Demonstrate various orthopaedic tests		177
1.8.127	Demonstrate various neurological tests		180
1.8.128	Prepare a chart of orthopaedic, neurology assessment		183
1.8.129	Make a cardiopulmonary assessment chart		186
1.8.130	Make a diagnosis after assessment	20	190
1.8.131	Plan a rehabilitation program for patients		192
1.8.132	Develop home exercise programs		196
1.8.133	Demonstrate precautions to be considered during and after treatment		198
1.8.134	Develop ergonomics		199
1.8.135	Evaluate the prognosis		201
1.8.136	Make postures showing diagrammatical calculation of burn		202
1.8.137	Calculate obesity according to BM1		203
1.8.138	Illustrate precautions related to treatment		204
1.8.139	Clinical presentation in hemiplegia, hemiparesis to differentiate it		206
1.8.140	Plan antenatal and postnatal exercises		208

LEARNING / ASSESSABLE OUTCOME

On completion of this book you shall be able to

Sl.No	Learning Outcome	Exercise No
1	Operate using suitable tools and equipments with basic outline of physiotherapy and develop a vocabulary of appropriate terminology following safety precautions.	1.1.01 - 1.1.05
2	Analyze and assemble the components of skeleton system.	1.1.06 - 1.1.08
3	Analyze the joints by using X-Ray films.	1.1.09 - 1.1.11
4	Differentiate various muscles.	1.1.12 - 1.1.15
5	Recognize basic cell structure and its organelles.	1.2.16 - 1.2.19
6	Identify the major neural tissues.	1.2.20 - 1.2.24
7	Relate the anatomical position of circulatory system on mannequin.	1.2.25 - 1.2.28
8	Categorize foods according to nutrients and assemble organs of digestive system.	1.2.29 - 1.2.32
9	Illustrate respiratory system.	1.2.33 - 1.2.37
10	Arrange organs on dummy of excretory and reproductive system.	1.2.38 - 1.2.40
11	Design a treatment plan for stiff parts of body.	1.3.41 - 1.3.47
12	Illustrate the effects of IRR.	1.3.48 - 1.3.50
13	Execute remedial effects of cryotherapy.	1.3.51 - 1.3.53
14	Enumerate the benefits of SWD.	1.3.54 - 1.3.59
15	Test and lay out therapeutic uses of UST.	1.4.60 - 1.4.63
16	Plan a regimen to stimulate muscles.	1.5.64 - 1.5.72
17	Asses and create a massage therapy	1.6.73 - 1.6.80
18	Carry out physiotherapy assessment and develop exercise regimen.	1.7.81 - 1.7.108
19	Develop remedial measures for back pain and abnormal gaits.	1.7.109 - 1.7.122
20	Prepare assessment chart and rehabilitation protocol.	1.8.123 - 1.8.140

SYLLABUS

Physiotherapy Technician - One Year

Duration	Reference Learning Outcome	Professional Skill (Trade Practical) (With indicative hour)	Professional Knowledge (Trade Theory)
Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Operate using suitable tools and equipments with basic outline of physiotherapy and develop a vocabulary of appropriate terminology following safety precautions.	<ol style="list-style-type: none"> 1 Identify electrotherapy modalities (02 hrs.) 2 Cataloging of exercise tools and equipments. (03 hrs.) 3 Draw human body and label its parts. (05 hrs.) 4 Demonstrate planes, axis, anatomical and fundamental positions. (05 hrs.) 5 Sketch planes, anatomical and fundamental positions. (05 hrs.) 	<p>Introduction</p> <ol style="list-style-type: none"> a Definition of Physiotherapy, terms of Physiotherapy: Electrotherapy, Exercise-therapy, Massage-Therapy, Ergonomics, Rehabilitation. b Definition of Electrotherapy, safety precautions in Electrotherapy. c Name of modalities which are used in physiotherapy. <p>Introduction to Anatomy/ Physiology</p> <ol style="list-style-type: none"> a Definition and subdivisions of anatomy. b Anatomical and fundamental position. c Anatomical regions, section and planes. The descriptive anatomical terms. (06 hrs)
Professional Skill 45 Hrs; Professional Knowledge 12 Hrs	Analyze and assemble the components of skeleton system.	<ol style="list-style-type: none"> 6 Demonstrate skeleton system. (10 hrs.) 7 List the names, side determination and parts of all bones of upper limb and lower limb. (15 hrs.) 8 Identify side determination and parts of bones of skull, vertebral column and thorax. (20 hrs.) 	<p>Osteology</p> <ol style="list-style-type: none"> a Skeleton system. b Structure, functions and classification of bone and cartilage. c Name of human bones. d Side determination and parts of bones of upper limb, lower limb, skull, vertebral column and thorax. (12 hrs)
Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Analyze the joints by using X-Ray films.	<ol style="list-style-type: none"> 9 Prepare presentation of joints formation by using bones. (10 hrs.) 10 Identify the major joints of human body. (10 hrs.) 11 Perform X-Ray practical by using X-Ray films- <ul style="list-style-type: none"> • Recognize bones. • Identify of joints. • Demonstration of some normal and abnormal X-ray plates. (05 hrs.) 	<p>Orthology</p> <ol style="list-style-type: none"> a) Definition and classification of joints. b) The terms related to the movements of joints. c) Description of joints of upper and lower extremities with their ligaments.(06 hrs)
Professional Skill 45 Hrs;	Differentiate various muscles.	<ol style="list-style-type: none"> 12 Show muscles structure with proper labelling. (8 hrs.) 	<p>Myology</p> <ol style="list-style-type: none"> a Macroscopic and microscopic structure of muscle.

Professional Knowledge 12 Hrs		<p>13 Demonstrate major muscles of upper limb. (8 hrs.)</p> <p>14 Demonstrate major muscles of lower limb. (8 hrs.)</p> <p>15 Identify major muscles of abdomen trunk, thorax, neck and face with diagram. (21 hrs.)</p>	<p>b Classification of muscles.</p> <p>c Parts of muscle.</p> <p>d Neuromuscular junction.</p> <p>e Sliding contraction theory.</p> <p>f Description of all major muscles with their origin, insertion, nerve supply and action. (12 hrs)</p>
Professional Skill 20Hrs; Professional Knowledge 06 Hrs	Recognize basic cell structure and its organelles.	<p>16 Sketch labelled picture of cell. (04 hrs.)</p> <p>17 Prepare Microscopic diagram of different tissues e.g. Connective tissues, muscular tissues, nervous tissues etc. (07 hrs.)</p> <p>18 Prepare postures of skin. (06 hrs.)</p> <p>19 Identify cell structure. (03 hrs.)</p>	<p>a Cell- definition, structure and function, cellular organelles.</p> <p>b Tissue- Structure and function.</p> <p>Skin and temperature regulation</p> <p>a Structure of skin.</p> <p>b Function of skin.</p> <p>c Temperature regulation system. (06 hrs)</p>
Professional Skill 45 Hrs; Professional Knowledge 12 Hrs	Identify the major neural tissues.	<p>20 Idea of reflexes and their examination. (08 hrs.)</p> <p>21 Demonstrate and A.V. display. (07 hrs.)</p> <p>22 Prepare Display charts of Nervous system (07 hrs.)</p> <p>23 Represent neuron, brain, spinal cord, reflex arc, and plexus. (10 hrs.)</p> <p>24 Perform Pain assessment (13 hrs.)</p>	<p>Neurology</p> <p>a Parts of nervous system.</p> <p>b Structure and function of Nervous, types of neurological cells.</p> <p>c Structure and function of Brain and spinal cord.</p> <p>d Reflex Arc, blood-brain barrier.</p> <p>e Structure of a nerve, Cranial nerves (names and functions) and spinal nerves (Introduction).</p> <p>f Nerve plexus of the body with their distributions (cervical plexus, brachial plexus, lumbosacral plexus).</p> <p>g About the nerve fibres, motor and sensory.</p> <p>h Blood circulation of brain and spinal cord. (12 hrs)</p>
Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Relate the anatomical position of circulatory system on mannequin.	<p>25 Prepare of charts of heart structure and circulation. (04 hrs.)</p> <p>26 Identify heart location and position by using mannequin.(04 hrs.)</p> <p>27 Identify A.V. display of blood circulation.(04 hrs.)</p> <p>28 Prepare for Pulse and blood pressure examination.(08 hrs.)</p>	<p>Circulatory system</p> <p>a Structure and function of heart.</p> <p>b Nodes of heart, heart rates and heart sound.</p> <p>c Physiology of heart circulation.</p> <p>d Blood pressure and the influencing factors.</p> <p>e Composition and function of blood.</p> <p>f Circulatory system of body. (06 hrs)</p>

Professional Skill 20 Hrs; Professional Knowledge 06 Hrs	Categorize foods according to nutrients and assemble organs of digestive system.	29 Prepare balance diet chart for different age graphs. (04 hrs.) 30 Display the organs of digestive system on mannequin. (04 hrs.) 31 Demonstrate A.V. display. (04 hrs.) 32 Recognise Figuration of main and accessory organs of digestive system. (08 hrs.)	Food and nutrition a Definition of food and nutrition. b Carbohydrate, protein, fat, minerals, vitamins, water with example and brief description. c Balanced diet. Digestive system a Structure and functions of digestive organs. b Absorption and metabolism (in brief) (06 hrs)
Professional Skill 20Hrs; Professional Knowledge 06 Hrs	Illustrate respiratory system.	33 Demonstrate the organs of respiratory system on mannequin. (04 hrs.) 34 Prepare Display respiratory mechanism by using videos. (04 hrs.) 35 Measure chest inspiration and expiration with inch tape. (04 hrs.) 36 Check Respiratory rate examination. (04 hrs.) 37 Check Portrait charts of organs of respiratory system. (04 hrs.)	Respiratory system a Structure and function. b Process of respiration. c Cardio-respiratory relation. d Artificial respiration. e Neurological control. f Volumes and capacities values of respiration. Endocrinology a Definition, character and function of Hormones. b About the hormone secreting glands (in brief). (06 hrs)
Professional Skill 20Hrs; Professional Knowledge 06 Hrs	Arrange organs on dummy of excretory and reproductive system.	38 Identify parts of excretory and reproductive system on mannequin. (08 hrs.) 39 Perform the Presentation and A.V. videos of excretory system. (04 hrs.) 40 Identify Micturition reflex by showing charts. (08 hrs.)	Excretory system a Structure and function of kidney. b Organs of excretory system. c Structure of nephron. d Formation of Urine e Micturition Gynaecology and obstetrics a Pelvic floor muscles(names) b Introduction of human reproductive system (in brief). c Physiology of pregnancy. (06 hrs)
Professional Skill 20Hrs; Professional Knowledge 06 Hrs	Design a treatment plan for stiff parts of body.	41 Prepare hot packs. (02 hrs.) 42 Preparation of patient.(02 hrs.) 43 Apply hot packs at different regions of body. (02 hrs.) 44 Plan precautions while giving treatment to patient. (02 hrs.) 45 Assessment of the affected part before applying wax bath. (04 hrs.)	Thermotherapy Superficial heating agents a Hot packs: Physiological effects, indications and contraindications. Types of hot packs (hydrocollators, hot water bag, electrical heating pads) with their techniques of application

		<p>46 Perform Techniques of wax bath for instance with brush, bowl etc. (04 hrs.)</p> <p>47 Apply wax bath with precautions and proper layering and thickness, removal of wax. (04 hrs.)</p>	<p>b Wax bath: Description of a wax bath unit, composition and method of preparation of wax bath, physiological effects, techniques of application, indications and contra indications. (06 hrs)</p>
<p>Professional Skill 20Hrs;</p> <p>Professional Knowledge 06 Hrs</p>	<p>Illustrate the effects of IRR.</p>	<p>48 Apply IRR with precautions. (10 hrs.)</p> <p>49 Demonstrate different positions of patient during treatment. (05 hrs.)</p> <p>50 Placement of IRR at proper distance from skin. (05 hrs.)</p>	<p>a) Infra-Red Radiation: About the infra-red rays, sources of infra-red rays, technical data, physiological effects, techniques of application, termination of IRR, Indications and contra indications. (06 hrs)</p>
<p>Professional Skill 20Hrs;</p> <p>Professional Knowledge 06 Hrs</p>	<p>Execute remedial effects of cryotherapy.</p>	<p>51 Practice on preparation and application of ice pack, cold pack, ice towels, ice bath, ice cube massage according to the contour of the body. (08 hrs.)</p> <p>52 Practice of preparation of patient.(05 hrs.)</p> <p>53 Plan precautions while giving treatment. (07 hrs.)</p>	<p>Cryotherapy</p> <p>a Physiological effects.</p> <p>b Methods of application (Ice pack, cold pack, ice towels, ice bath, ice cube massage, vapo coolant sprays)</p> <p>c Cryokinetics.</p> <p>d Indications and contra-indications. (06 hrs)</p>
<p>Professional Skill 20Hrs;</p> <p>Professional Knowledge 06 Hrs</p>	<p>Enumerate the benefits of SWD.</p>	<p>54 Explain all parts of SWD. (03 hrs.)</p> <p>55 Testing of SWD. (03 hrs.)</p> <p>56 Positioning of patient and placement of electrodes. (04 hrs.)</p> <p>57 Draw Flow chart of SWD circuit. (04 hrs.)</p> <p>58 SWD cable methods. (04 hrs.)</p> <p>59 Precautions. (02 hrs.)</p>	<p>Deep heating agents</p> <p>A S.W.D.: meanings of Short-wave & Diathermy, Effects of S.W.D. Technical data, Descriptions of a S.W.D Instrument, Method of application, Positioning of Electrode pads During, Treatment, Dose & Duration of treatment, Indications & Contraindications. (06 hrs)</p>
<p>Professional Skill 20Hrs;</p> <p>Professional Knowledge 06 Hrs</p>	<p>Test and lay out therapeutic uses of UST.</p>	<p>60 Methods of testing. (04 hrs.)</p> <p>61 Methods of application. (04 hrs.)</p> <p>62 Handling and operating of UST modality with precautions. (08 hrs.)</p> <p>63 Precaution of patient. (04 hrs.)</p>	<p>B M.W.D- Introduction.</p> <p>C U.S.T- About the Ultra sound, Effects of U.S.T in Human body, Technical data, Descriptions of an U.S.T. Instrument, Description about different types of Coupling medium, Method of application of U.S.T, Dose & Duration of treatment, Indications & Contraindications. (06 hrs)</p>
<p>Professional Skill 65Hrs;</p> <p>Professional Knowledge 18 Hrs</p>	<p>Plan a regimen to stimulate muscles.</p>	<p>64 Practice on muscle stimulator for major muscles of upper limb and lower limb. (10 hrs.)</p>	<p>Stimulators-</p> <p>a Faradic - About the Faradic type of current, Technical data's, Description of a</p>

		<p>65 Preparation of patient (04 hrs.)</p> <p>66 Demonstration of muscles stimulator on face. (04 hrs.)</p> <p>67 Plan precautions during treatment. (10 hrs.)</p> <p>68 Practice on placement of electrodes with using proper gel. (10 hrs.)</p> <p>69 Create difference between TENS and IFT for pain producing conditions. (09 hrs.)</p> <p>70 Demonstrate on placement of TENS and IFT pads for radiating and local pain respectively. (08 hrs.)</p> <p>71 Methods of treatment. (04 hrs.)</p> <p>72 Testing methods of all modalities. (04 hrs.)</p>	<p>Faradic Stimulator & Electrodes, Physiological effects, Method of application, Application of continuous & Surged Faradic, Dose & Duration of treatment, Indications & Contraindications.</p> <p>b Galvanic- About the Galvanic type of current, Technical data, Descriptions of a Galvanic Stimulator, Physiological effects, Method of application, application of continuous & Interrupted Galvanic, Dose & duration of treatment, Indications & Contraindications.</p> <p>c T.E.N.S- Meaning of 'Transcutaneous', Description of a T.E.N.S., Physiological effects (along with pain gate Theory), Method of application (Trigger point stimulation method, Acupuncture point stimulation method etc.), Placements of T.E.N.S electrodes, Application of continuous, surged & burst mode. Dose & Duration of treatment, Indications & contraindications.</p> <p>d I.F.T- Introduction, application, Indications & Contraindications. (18 hrs)</p>
<p>Professional Skill 45 Hrs;</p> <p>Professional Knowledge 12 Hrs</p>	<p>Asses and create a massage therapy</p>	<p>73 Positioning of patient and therapist. (04 hrs.)</p> <p>74 Techniques used in massage for upper and lower limb. (08 hrs.)</p> <p>75 Illustrate a practical of massage on face. (05 hrs.)</p> <p>76 Elaborate methods of trunk massage. (07 hrs.)</p> <p>77 Precautions while giving massage. (06 hrs.)</p> <p>78 Rules and direction of massage. (03 hrs.)</p> <p>79 Direction of using materials (oil, powder etc.) during massage. (03 hrs.)</p> <p>80 Therapeutic application of massage. (09 hrs.)</p>	<p>MASSAGE THERAPY & REHABILITATION</p> <p>a Definition of Massage</p> <p>b Aim of Massage</p> <p>c Physiological effects of Massage</p> <p>d Therapeutic uses of Massage.</p> <p>e Contraindications of Massage</p> <p>f Materials used in Massage (oil, powder, ice etc.)</p> <p>g Rules & direction of Massage</p> <p>h Types of Massage (12 hrs)</p>

<p>Professional Skill 155 Hrs;</p> <p>Professional Knowledge 42 Hrs</p>	<p>Carry out physiotherapy assessment and develop exercise regimen.</p>	<p>81 Show positioning of patient and therapist. (04 hrs.)</p> <p>82 Perform Practical of different exercises. (04 hrs.)</p> <p>83 Rules and directions of exercises. (04 hrs.)</p> <p>84 Demonstrate exercise to increase ROM by using continuous passive movement equipments. (04 hrs.)</p> <p>85 Presentation of passive movements (manually). (05 hrs.)</p> <p>86 Assessment of range of motion of major joints by using goniometer scales. (05 hrs.)</p> <p>87 Perform measurement of spine ROM by using inch tape. (04 hrs.)</p> <p>88 Exhibit active and active-assisted movements. (02 hrs.)</p> <p>89 Illustrate strengthening exercises by using weight-cuffs for upper and lower limb joints. (02 hrs.)</p> <p>90 Perform strengthening exercises by utilizing therabands/ theratubes. (05 hrs.)</p> <p>91 Demonstrate resisted exercises (manually). (04 hrs.)</p> <p>92 Representation of quadriceps and hamstring resisted exercises on quadriceps chair and multipurpose chair. (06 hrs.)</p> <p>93 Practical use of different exercise equipments (e.g. Shoulder wheel, shoulder pulley, Swiss ball etc.) (07 hrs.)</p> <p>94 Assessment of coordination and balance. (04 hrs.)</p> <p>95 Describe equilibrium and non-equilibrium tests. (05 hrs.)</p> <p>96 Schedule exercise programs for stretching of major muscles (Manually). (08 hrs.)</p> <p>97 Elaborate methods of stretching (Static, mechanical etc.) (05 hrs.)</p>	<p>EXERCISE THERAPY AND YOGA</p> <p>1 Fundamental of exercise:</p> <p>a Definition of therapeutic exercise.</p> <p>b Benefits of exercise.</p> <p>c Classification of exercise- active, passive, resistive, isometric, functional, stretching, isokinetic, closed-chain, open-chain etc.</p> <p>2 Applied exercise therapy</p> <p>a Passive movements.</p> <p>b Goniometry.</p> <p>c Exercise with instrument.</p> <p>d Active movements, active-assisted movements.</p> <p>e Resistive exercise.</p> <p>f Co-ordination and balance.</p> <p>g Stretching exercise.</p> <p>h Techniques for chest physiotherapy.</p> <p>i Manual muscle testing.</p> <p>j Techniques of PNF (brief).</p> <p>k Indications and contra indications of passive movements.</p> <p>l Indications and contra indications of breathing exercise.</p> <p>m Grades of MMT.</p> <p>n Precautions while performing these exercises on patient. (42 hrs)</p>
---	---	--	---

		<p>98 Explain positioning of patient during postural drainage. (05 hrs.)</p> <p>99 Collaborate massage techniques with postural drainage. (05 hrs.)</p> <p>100 Prepare a chart of measurements of chest inspiration and expiration by using hands and inch tape at different chest levels. (08 hrs.)</p> <p>101 Perform resistive exercises for thorax muscles. (08 hrs.)</p> <p>102 Practical based on breathing exercises. (08 hrs.)</p> <p>103 Illustrate a practical on PNF techniques for upper and lower limbs. (brief) (09 hrs.)</p> <p>104 Presentation of PNF techniques for trunk, face and neck. (brief) (08 hrs.)</p> <p>105 Explanation of D1 and D2 patterns of PNF (brief)(05 hrs.)</p> <p>106 Determination of grades of MMT for upper and lower limb. (08 hrs.)</p> <p>107 Practical based on grading of MMT for trunk and abdominals. (08 hrs.)</p> <p>108 Identify MMT exercises for face. (05 hrs.)</p>	
<p>Professional Skill 130 Hrs;</p> <p>Professional Knowledge 36 Hrs</p>	<p>Develop remedial measures for back pain and abnormal gaits.</p>	<p>109 Proper demo of relaxation techniques by using pillows. (08 hrs.)</p> <p>110 Execute testing of traction. (05 hrs.)</p> <p>111 Demonstrate positioning of patient while giving traction.(08 hrs.)</p> <p>112 Teach how to calculate patient's weight to be used in treatment.(06 hrs.)</p> <p>113 Develop different methods of application of traction.(08 hrs.)</p> <p>114 Impart skills of manual cervical and lumbar traction.(08 hrs.)</p> <p>115 Instruct normal gait patterns. (08 hrs.)</p> <p>116 Presentation of gate phases on floor. (10 hrs.)</p>	<p>Exercise Physiology</p> <p>1 Thermoregulation and exercise organs:</p> <ol style="list-style-type: none"> Conduction, convection & evaporation. Homeostasis Physiological thermoregulation <p>2 Respiration:</p> <ol style="list-style-type: none"> Muscles for inspiration and expiration. Static and Dynamic Lung volume. Gaseous exchange. <p>3 Cardiovascular adaptations:</p> <ol style="list-style-type: none"> Sub maximal exercise. At maximal exercise. <p>4 Fatigue: Types, symptoms, recovery.</p> <p>5 Endurance: Definition, endurance training.</p>

		<p>117 Perform abnormal gaits.(12 hrs.)</p> <p>118 Demonstrate a practical on walking aids (eg. Crutches, walker). (18 hrs.)</p> <p>119 Give a brief idea of parts of wheelchair. (05 hrs.)</p> <p>120 Give guidelines for walking aids' usage for patients (eg. Two step, three step etc.). (11 hrs.)</p> <p>121 Design gait pattern for weight bearing and non-weight bearing. (11 hrs.)</p> <p>122 Performance of gait training. (11 hrs.)</p>	<p>6 Kinesiology & Biomechanics: Basic terminologies.</p> <p>7 Relaxation exercises.</p> <p>8 TRACTION: Introductions, contraindications, therapeutic uses and effects.</p> <p>9 Activities of daily living (in brief).</p> <p>10 Gait: Definition, phases, abnormal gait patterns (in brief).</p> <p>11 Walking aids: Types, indications, precautions. (36 hrs)</p>
<p>Professional Skill 70Hrs;</p> <p>Professional Knowledge 24 Hrs</p>	<p>Prepare assessment chart and rehabilitation protocol.</p>	<p>123 Display videos showing causes of clinical conditions. (03 hrs.)</p> <p>124 Perform observational assessment in various conditions. (03 hrs.)</p> <p>125 Perform clinical examination. (03 hrs.)</p> <p>126 Demonstrate various orthopaedic tests. (04 hrs.)</p> <p>127 Demonstrate various neurological tests. (04 hrs.)</p> <p>128 Prepare a chart of orthopaedic, neurology assessment. (02 hrs.)</p> <p>129 Make a cardiopulmonary assessment chart. (04 hrs.)</p> <p>130 Make a diagnosis after assessment. (04 hrs.)</p> <p>131 Plan a rehabilitation program for patients. (04 hrs.)</p> <p>132 Develop home exercise programs.(03 hrs.)</p> <p>133 Demonstrate precautions to be considered during and after treatment. (04 hrs.)</p> <p>134 Develop ergonomics. (04 hrs.)</p> <p>135 Evaluate the prognosis. (03 hrs.)</p> <p>136 Make postures showing diagrammatical calculation of burn. (05 hrs.)</p> <p>137 Calculate obesity according to BMI. (05 hrs.)</p>	<p>Applied Anatomy: Causes, Deformity, loss of functions in following conditions:</p> <ol style="list-style-type: none"> Carpal tunnel syndrome. Erb's and kulmpke palsy De Quervain's disease. Rotator cuff syndrome. Wrist drop. Trendelenburg's sign. Tarsal tunnel syndrome. Genu valgum/varum. Coxa valgus/ varus. Foot drop. <p>ORTHO-NEURO-GENERAL Orthopaedic condition: Etiology, C/F & physiotherapy management of the followings:</p> <ol style="list-style-type: none"> Kyphosis, Lordosis & Scoliosis Cervical & Lumbar Spondylosis Ankylosing Spondylosis Tennis Elbow Golfer's Elbow Gout Osteoarthritis Rheumatoid Arthritis Frozen Shoulder Fracture (brief) Dislocation & subluxation Sprain Tendonitis Rickets

- 138 Illustrate precautions related to treatment. (05 hrs.)
- 139 Clinical presentation in hemiplegia, hemiparesis to differentiate it. (05 hrs.)
- 140 Plan antenatal and postnatal exercises. (05 hrs.)

- xv Osteomalacia
 xvi Osteomyelitis
 xvii Calcaneal Spur
 xviii Flatfoot.

**Neurological Condition:
 Etiology, C/F, & Physiotherapeutic
 Management of the following:**

- i Cerebral palsy
 ii Hemiplegia
 iii Paraplegia
 iv Quadriplegia
 v Myalgia
 vi Fibromyositis
 vii Polio Myelitis
 viii Parkinsonism
 ix Bell's palsy
 x C.V.A (brief)
 xi Upper & Lower Motor Neuron diseases
 xii Peripheral Nerve Injury
 xiii Spinal Cord Injury
 xiv Sciatica

**General Condition:
 Etiology, C/F, Investigations &
 Physiotherapeutic Management
 of the following:**

i Obesity
 ii Burns
 (24 hrs)

Project work/ Case Study

Broad Areas:

- a Perform practical of different exercises.
- b Assessment of range of motion of major joints by using goniometer scales.
- c Prepare a chart of measurements of chest inspiration and expiration by using hands and inch tape at different chest levels.
- d Execute testing of traction.
- e Prepare a chart of orthopaedic, neurology assessment.
- f Calculate obesity according to BMI.

Identification of electrotherapy modalities

- Objectives:** At the end of this exercise you shall be able to
- identify the electrotherapy modalities used in physiotherapy
 - write their names and safety precautions to operate.

Requirements	
Tools/Instruments	
• Ultrasound	- 1 No.
• Laser	- 1 No.
• Transcutaneous Nerve Stimulation	- 1 No.
• Magnetic Field Therapy	- 1 No.


PROCEDURE:

Note:Trainer may display all the equipments in the section and brief their names, uses and the safety point to be observed for each equipment. Trainees will note down all the displayed equipment names, uses and the safety precaution to be observed while working with each equipment.

TASK 1: Identification of Ultrasound therapy device

- 1 See the image provided in the Table-1
- 2 Identify the name of the device
- 3 Write the name of the device and the safety aspect to operate the same in the appropriate space provided in the Table -1.


Table 1

SI.No	Electrotherapy image	Name of the equipment	Safety instruction to operate(if any)
1			

TASK 2: Identification of laser therapy device

- 1 See the image provided in the Table - 2.
- 2 Identify the name of the device.
- 3 Write the name of the device and the safety aspect to operate the same in the appropriate space provided in the Table - 2.

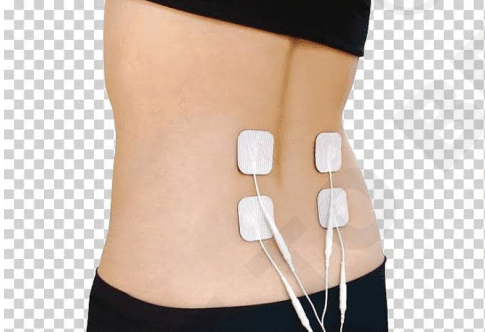
Table 2

SI.No	Electrotherapy image	Name of the equipment	Safety instruction to operate(if any)
1			

TASK 3: Placement mode of transcutaneous nerve stimulation therapy

- 1 See the image provided in the Table-3.
- 2 Identify the name of the device.
- 3 Write the name of the device and the safety aspect to operate the same in the appropriate space provided in the Table -3.

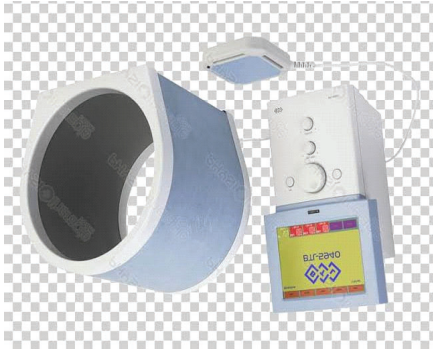
Table 3

SI.No	Electrotherapy image	Name of the equipment	Safety instruction to operate(if any)
1			

TASK 4: Identification of Magnetic Field Therapy

- 1 See the image provided in the Table-4.
- 2 Identify the name of the device.
- 3 Write the name of the device and the safety aspect to operate the same in the appropriate space provided in the Table - 4.

Table 4

Sl.No	Electrotherapy image	Name of the equipment	Safety instruction to operate(if any)
1			

© NIMI
NOT TO BE REPUBLISHED

Cataloging of exercise tools and equipments

Objectives: At the end of this exercise you shall be able to

- identify the various forms of therapeutic tools used in physiotherapy
- Write the name of different exercise therapies and safety precautions to operate.

Requirements			
Tools/Instruments			
• Exercise therapy setup	- 1 No.	• Therapy using heat setup	- 1 No.
• Massage therapy setup	- 1 No.	• Traction	- as reqd.
• Therapy using ice setup	- 1 No.	• Whirlpool	- as reqd.


PROCEDURE:

Note: Trainer shall display all the types of therapies provided for therapeutic and rehabilitation to the patients. Trainees will write down the name of the therapy and safety point to be observed for each therapy.

TASK 1: Operating exercise therapy

- 1 See the image provided in the Table-1.
- 2 Identify the name of the therapy.
- 3 Write the name of the therapy and the safety aspect to operate the same in the appropriate space provided in the Table - 1.


Table 1

Sl.No	Exercise therapy image	Name of the therapy	Safety measures (if any)
1			

TASK 2: Operating massage therapy

- 1 See the image provided in the Table-2.
- 2 Identify the name of the therapy.
- 3 Write the name of the therapy and the safety measures required in the appropriate space provided in the Table - 2.


Table 2

Sl.No	Exercise therapy image	Name of the therapy	Safety measures (if any)
1			

TASK 3: Therapy using ice

- 1 See the image provided in the Table-3.
- 2 Identify the name of the therapy.
- 3 Write the name of the therapy and the safety measures required in the appropriate space provided in the Table - 3.

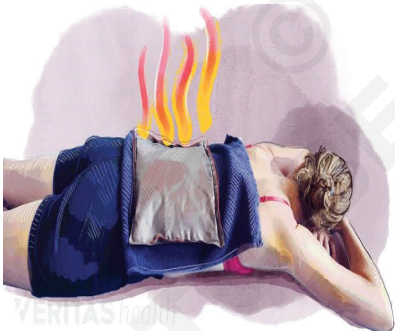
Table 3

SI.No	Exercise therapy image	Name of the therapy	Safety measures (if any)
1			

TASK 4: Therapy using heat

- 1 See the image provided in the Table-4.
- 2 Identify the name of the therapy.
- 3 Write the name of the therapy and the safety measures required in the appropriate space provided in the Table - 4.


Table 4

SI.No	Exercise therapy image	Name of the therapy	Safety measures (if any)
1			

TASK 5: Representation of Traction therapy

- 1 See the image provided in the Table-5.
- 2 Identify the name of the therapy.
- 3 Write the name of the therapy and the safety measures required in the appropriate space provided in the Table -5.

Table 5

SI.No	Exercise therapy image	Name of the therapy	Safety measures (if any)
1			

TASK 6: Equipment used for whirlpool therapy

- 1 See the image provided in the Table-6.
- 2 Identify the name of the device.
- 3 Write the name of the device and the safety aspect to operate the same in the appropriate space provided in the Table -6.

Table 6

SI.No	Exercise therapy image	Name of the therapy	Safety measures (if any)
1			

Illustration and demonstration of human body

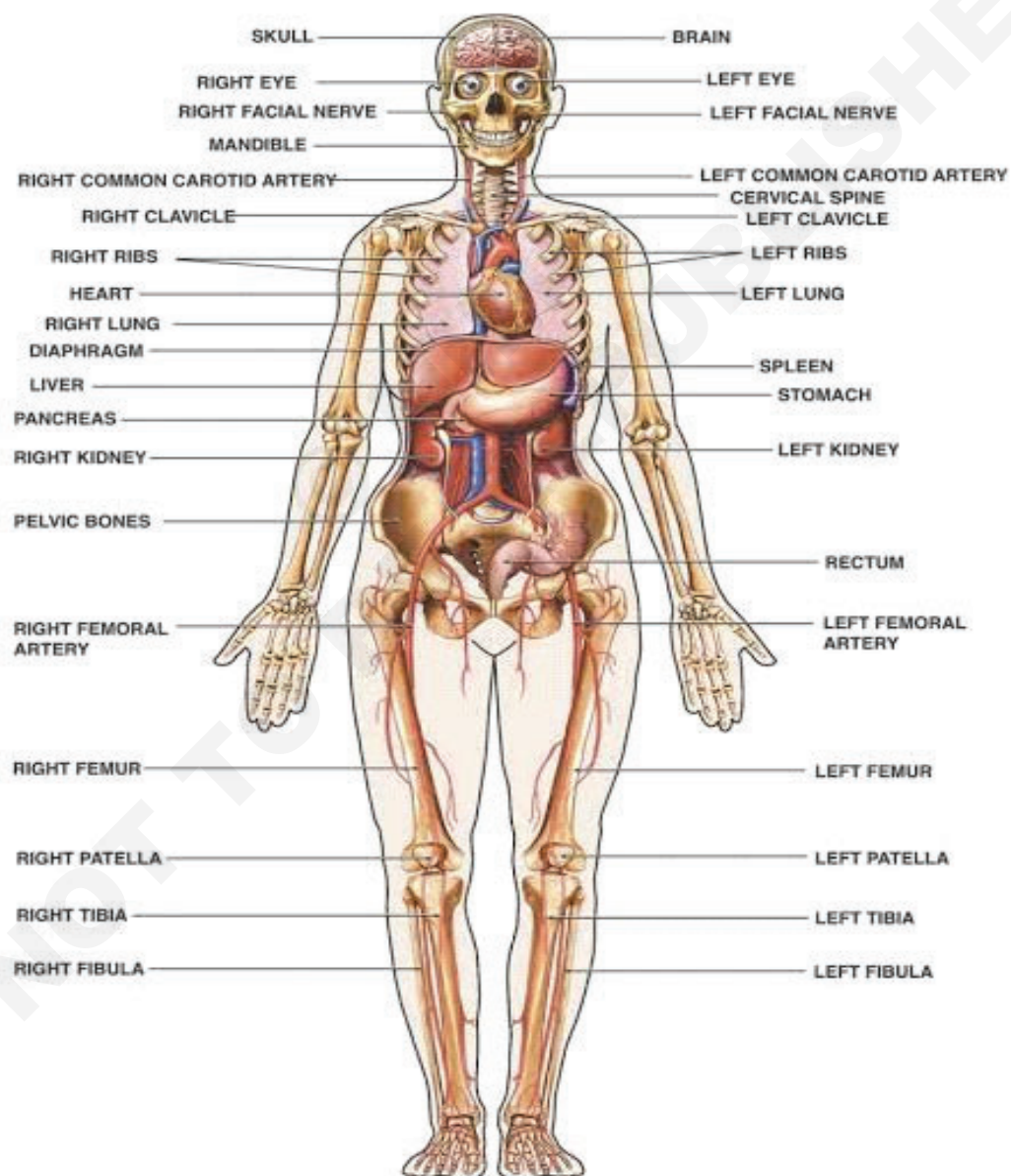
Objectives: At the end of this exercise you shall be able to

- sketch the parts of the human body
- write down the name of different parts of the human body from the given figure.

PROCEDURE:

Note: Trainer shall illustrate the human body and ask the trainees to identify the parts of the human body by locating it from the given illustration.

Fig 1



TASK 1: Sketch the parts of the human body and write the names

- 1 See the image provided above, identify the various parts and make a list of the parts in the given Table 1.

Table 1

Sl.No	List the different parts of the human body from the given image
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

© NIMI
NOT TO BE REPUBLISHED

Sketch and demonstrate the planes and axis

Objectives: At the end of this exercise you shall be able to

- sketch the planes and axis of the human body and write the names of the same
- demonstrate the functions of planes and axis of human body.

PROCEDURE:

Note: Trainer shall sketch the planes and axis of the human body and ask the trainees to write the names of the same. The trainees should also write the functions of planes and axis of human body.

TASK 1: Planes of reference

- 1 See the image provided in the Table 1.
- 2 Draw the human body as shown in (Fig 1).
- 3 Divide the body by inserting the plane into anterior and posterior positions is named as coronal plane (frontal plane).
- 4 Divide the body by inserting the next plane into left and right positions is called sagittal plane.
- 5 Divide the body by inserting the third plane into superior and inferior portions is named as transverse plane.

Note: Sagittal plane is also called as mid-sagittal plane or Parasagittal plane.

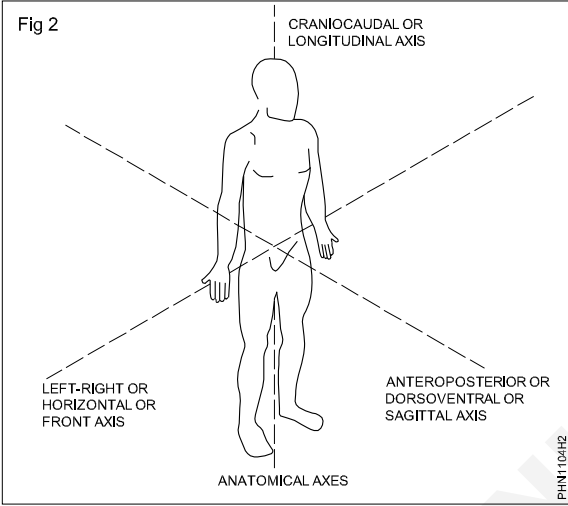
Table 1

S.No	Planes of reference	Name the different planes of reference	Functions of the same
1	<p>Fig 1 XY PLANE (VERTICAL) YZ PLANE (LATERAL) XZ PLANE (HORIZONTAL) Y-AXIS X-AXIS Z-AXIS</p> <p>TOP VIEW LEFT VIEW FRONT VIEW RIGHT VIEW BACK VIEW BOTTOM VIEW</p> <p>(YZ FRONTAL PLAN) CORONAL PLANE FROM & BACK VIEW (XY VERTICAL PLANE) SAGITAL PLANE LEFT & RIGHT VIEW (XZ HORIZONTAL PLANE) TRANSVERSE PLANE TOP & DOWN VIEWS</p>		

TASK 2: Anatomical axis

- 1 See the image provided in the Table-2.
- 2 Draw the human body as shown in (Fig 1').
- 3 Divide the body by into three anatomical axes.
- 4 The body divided vertically with respect to body axis is known as longitudinal axis.
- 5 The body divided right left to the body axis is referred as antero-posterior or sagittal axis.
- 6 The body divided left right to the body axis is referred as horizontal or frontal axis.

Table 2

S.No	Sketch of Anatomical axis	Name the different form of anatomical axis	Functions of the same
1			

Sketch and demonstrate the anatomical and fundamental positions

- Objectives:** At the end of this exercise you shall be able to
- identify the anatomical and fundamental positions of the human body
 - write the anatomical and fundamental positions of the human body
 - demonstrate the perfect positions of body at different postures.

PROCEDURE:

Note: Trainer shall sketch the anatomical and fundamental positions of the body and the trainees need to write down the same and also able to demonstrate the perfect positions of the body at different postures.

TASK 1: Practice on Anatomical Position of the body

- 1 See the image provided in the Table-1.
- 2 In the anatomical position, the body is upright, directly facing the observer, feet flat and directed forward. The upper limbs are at the body's sides with the palms facing forward.
- 3 Locate the anatomical positions represented from the below figure.

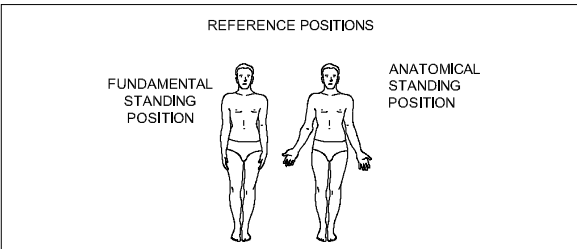
Table 1

S.No	Sketch of Anatomical position of the human body	Name the different forms of anatomical position	Locate the positions in the human body
1			

TASK 2: Practice on Fundamental Positions of the body

- 1 See the image provided in the Table-2.
- 2 Stand erect with hands together close to the body is called as fundamental standing position.
- 3 Keeping the body straight with reference to any region or part of the body in a specific stance is called as anatomical position.

Table 2


S.No	Sketch of fundamental position of the human body	Names the fundamental position	How to perform the position -Demonstrate
1	<p style="text-align: center;">REFERENCE POSITIONS</p> 		

TASK 3: Practice on Kneeling- Fundamental Position

- 1 See the image provided in the Table-3.
- 2 Upright the body from the bones which are held at a right angle.
- 3 Keep the arms by the sides.

Note: The base consists of only of the legs and centre of gravity is high and the lines of gravity lies close to the edge of the base.

Table 3


S.No	Sketch of fundamental position of the human body	Names the fundamental position	How to perform the position -Demonstrate
1	<p>Kneeling (Kn.)</p> <ul style="list-style-type: none"> • Body is upright from the knees which are held at a right angle. Arms are by the sides. <p>The base consists only of the legs and the centre of gravity is high and the time of gravity fails close to the edge of the base.</p> <p>Unstable and difficult to maintain.</p> 		

TASK 4: Practice on Sitting- Fundamental Position

- 1 See the image provided in the Table-4.
- 2 The position of the person is taken on chair or stool.

Note: 1 - It is preferable to leave; 2 or 3 inches of space between the back of your knees and the edge of the seat.

Table 4

S.No	Sketch of fundamental position of the human body	Names the fundamental position	How to perform the position -Demonstrate
1	<p>3 - Sitting</p> <ul style="list-style-type: none"> • The position is taken on chair or stool. • 1 - It is preferable to leave. 2 or 3 inches of space between the back of your knees and the edge of the 		

TASK 5: Practice on Lying- Fundamental Position

1 See the image provided in the Table-5.

2 The body is fully supported and fully stable on a horizontal surface in supine position.

Table 5


S.No	Sketch of fundamental position of the human body	Names the fundamental position	How to perform the position -Demonstrate
1	<p>Lying Definition</p> <ul style="list-style-type: none">• This is the easiest fundamental position as the body in which the body is fully supported and fully stable on a horizontal surface in supine position. 		

Illustration and demonstration of skeleton system

Objectives: At the end of this exercise you shall be able to

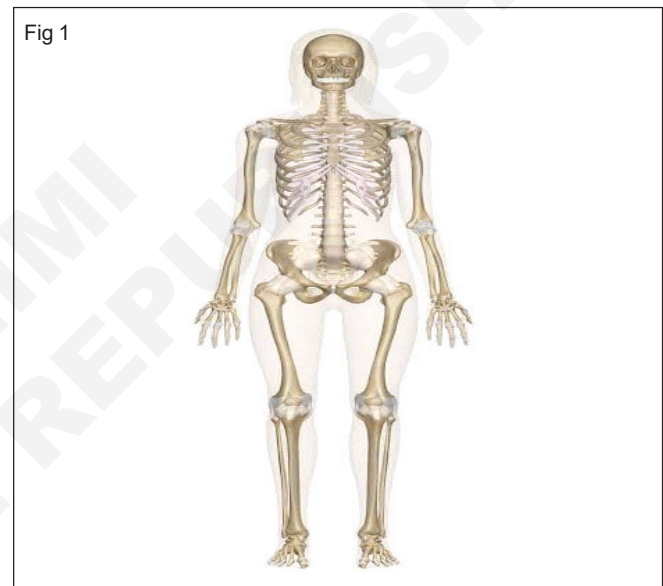
- sketch the parts of the skeleton system
- write the names of the different parts of skeletal system from the given figure.

Requirements	
Tools/Instruments	
<ul style="list-style-type: none"> • Skeletal diagram - 1 No. • Sketches, pencils, A4 sheets - as reqd. 	

PROCEDURE:

Note: Trainer shall illustrate the skeletal system and ask the trainees to identify the parts of the skeletal system by locating it from the given illustration.

Skeletal system (Fig 1)



TASK 1: Sketch the parts of the skeleton system and write the names

- 1 See the image provided above, identify the various parts and make a list in the given Table1.

Table 1

SI.No	List the different parts of skeletal system from the given image
1	
2	
3	
4	
5	
6	
7	

Names and side determination of bones

Objectives: At the end of this exercise you shall be able to

- identify the names of the various bones
- write the names and sides of the bones.

Requirements	
Tools/Instruments	
<ul style="list-style-type: none"> • Different human bone structures • Sketches, pencils, A4 sheets 	<ul style="list-style-type: none"> - as reqd. - as reqd.

PROCEDURE:

Note: Trainer shall display the different types of bones. Trainees will write down the names, parts and sides of each bone.

TASK 1: Identify the names of the various bones

- 1 See the image provided above, identify the names and sides of bones from the given Table 1.

Table 1



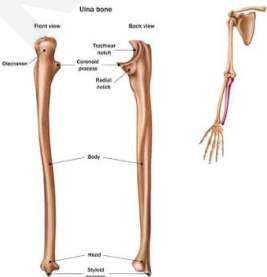
Image given	Name of the bone	Side of the bone (left or right)
		
		
		




Image given	Name of the bone	Side of the bone (left or right)
		
		
		

Illustration and demonstration of skull bone

Objectives: At the end of this exercise you shall be able to

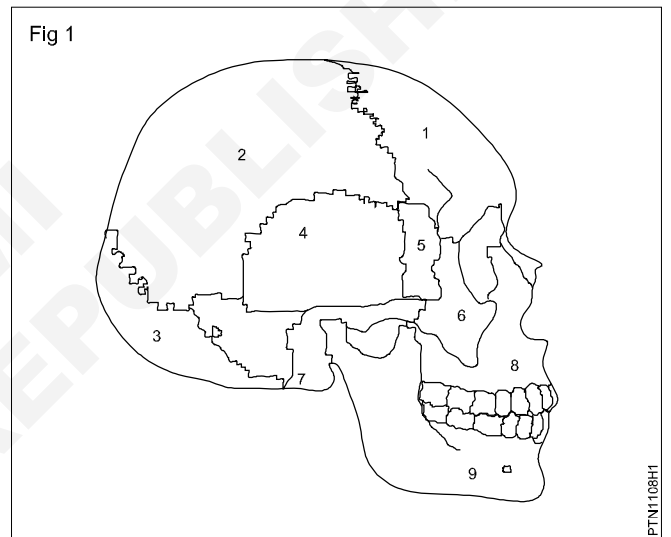
- sketch the parts of the skull bone
- write the names of the different parts of skull bones from the given figure.

Requirements			
Tools/Instruments			
• Skull bone illustration	- 1 No.	• Thorax illustration	- 1 No.
• Illustration of vertebral column	- 1 No.	• Sketches, pencils, A4 sheets	- as reqd.

PROCEDURE:

Note: Trainer shall illustrate the skeletal system and ask the trainees to identify the parts of the skull bone by locating it from the given illustration.

Skull bones (Fig 1)



TASK 1: Sketch the parts of the skull bone and write the names

- 1 See the image provided above, identify the various different parts and make a list in the given Table 1.

Table 1

SI.No	List the different parts of skeletal system from the given image
1	
2	
3	
4	
5	
6	
7	
8	
9	

Illustration and demonstration of vertebral column

Objectives: At the end of this exercise you shall be able to

- sketch the vertebral column
- write the names of the vertebral column from the given figure.

Note: Trainer shall illustrate the vertebral column and ask the trainees to identify the parts of the vertebral column and make him to write the numbers of each vertebral group from the given illustration.

Sketch the vertebral column and write the names

- See the image provided above, identify the various different parts and make a list in the given Table 1.

Vertebral column (Fig 1)



Table 1

Sl.No	List the vertebrae from the given image	Write the numbers of vertebrae
1		
2		
3		
4		
5		

Illustration and demonstration of thorax

Objectives: At the end of this exercise you shall be able to

- sketch the parts of the thorax
- write the names of the parts in thorax from the given figure.

Note: Trainer shall illustrate the skeletal system and ask the trainees to identify the parts of the skeletal system by locating it from the given illustration.

Sketch the parts of the thorax and write the names

- See the image provided above, identify the various parts and make a list in the given Table 1.

Thorax (Fig 1)

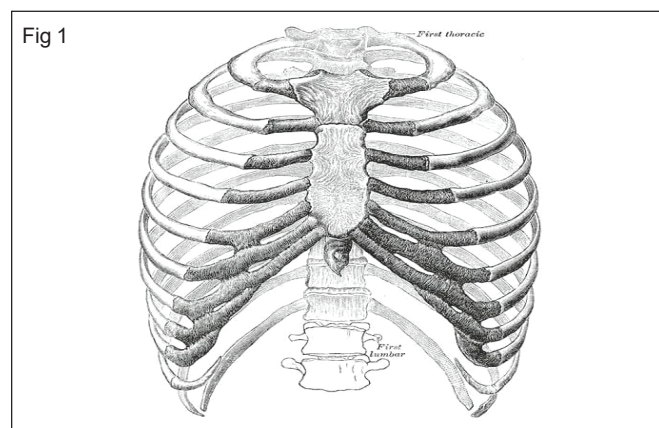


Table 1

Sl.No	List the different parts of thorax from the given image
1	
2	
3	
4	
5	
6	
7	

© NIMI
NOT TO BE REPUBLISHED

Presentation of joints by using bones

Objectives: At the end of this exercise you shall be able to

- identify the various types of bones
- write the names of the bones and joints
- identify the articular surface of joints ad to form the joints.

Requirements

Tools/Instruments

- Bones of human body - each 1 No.
- Images of joints - 1 No.
- Sketches, pencils, A4 sheets - as reqd.

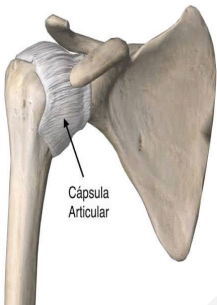

PROCEDURE:



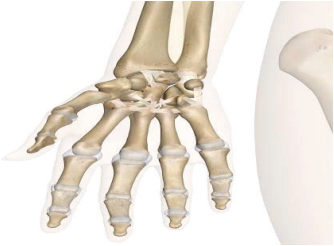
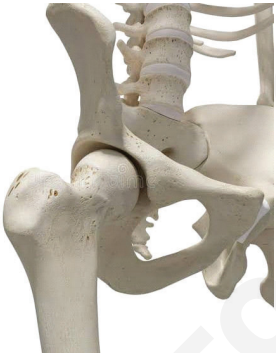
Note: Trainer shall display the images of joints provided. Trainees will write down the name of the joint and articular surfaces.

TASK 1: Identify the various types of bones and write thenames

- 1 See the image provided in the Table 1.
- 2 Identify the name of the joint.
- 3 Write the articular surfaces of each joint in the appropriate space provided in the Table 1.

Table 1

Images of joints	Name of the joint	Articular surface
		
		

Images of joints	Name of the joint	Articular surface
		
		
		
		

Trace diagrams of major joints of human body

Objectives: At the end of this exercise you shall be able to

- trace the main joints of human body
- write the parts of the bones
- write the articulating parts of joints.

Requirements

Tools/Instruments

- Sketches, pencils, A4 sheets - as reqd.

PROCEDURE:

Note: Trainer shall illustrate the human body joints and ask the trainees to trace the diagrams and to identify the parts of joints.

TASK 1: Write the parts of the bones

Draw the following human body joints and label its parts

- 1 Shoulder joint
- 2 Elbow joint
- 3 Wrist joint
- 4 Hip joint
- 5 Knee joint
- 6 Ankle joint

Perform X-ray practical by using X-ray films

Objectives: At the end of this exercise you shall be able to

- identify the bones in x-ray films
- identify the joints in x-ray films.

Requirements	
Tools/Instruments	
• Sketches, pencils, A4 sheets	- as reqd.
• X-ray films	- as reqd.

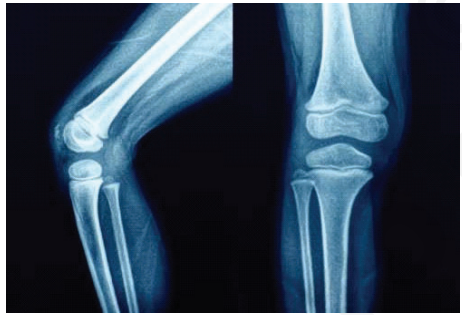

PROCEDURE:

Note: Trainer shall display the x-ray films of human bones and joints. Trainees will write down the names of the bone and joints in the given Table 1.

TASK 1: Identify the bones and joints in x-ray films

- 1 See the image provided in the Table 1.
- 2 Identify the bones and name of the joints.
- 3 Write the names of bones and joints in the appropriate space provided in the Table 1.

Table 1

Images of x-ray film	Name of the bones	Name of the joints
		
		

Images of x-ray film	Name of the bones	Name of the joints
		
		
		
		

Demonstration of some normal and abnormal x-ray plates

Objectives: At the end of this exercise you shall be able to


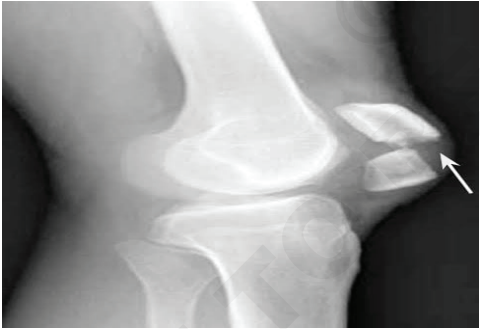

- identify the normal and abnormal bones in x-ray
- identify the fracture and dislocation of bones.


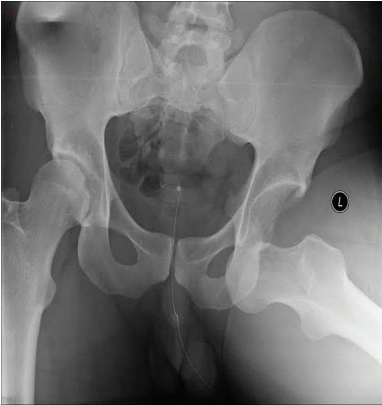
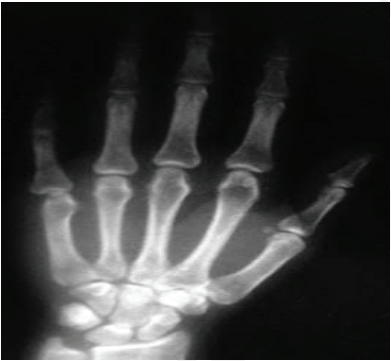
Note: Trainer shall display the x-ray films of normal and abnormal bones and joints and demonstrate the abnormalities in the bones and joints and ask the trainees to identify the same from the images given in Table 1.

Identify the normal and abnormal bones in x-ray

- See the image provided in the Table 1.
- Identify the joint and write the abnormality found in the x-ray film in the appropriate space provided in the Table 1.

Table 1

Images of x-ray film	Abnormalities of the bone
	
	
	

Images of x-ray film	Abnormalities of the bone
	
	
	

Show muscles structure with proper labelling

Objectives: At the end of this exercise you shall be able to

- sketch the parts of the skeletal muscles
- write down the name of different parts of skeletal muscles from the give figure.

Requirements

Tools/Instruments

- Sketches, pencils, A4 sheets - as reqd.
- Image of skeletal muscles of human body

Image of skeletal muscles of human body (Fig 1)

Fig 1



PROCEDURE:

Note: Trainer shall illustrate the human body and ask the trainees to identify the parts of the skeletal muscles by locating it from the given illustration.

TASK 1: Sketch the parts of the skeletal muscles and write down the names

- 1 See the image provided above.
- 2 Identify the various parts and make a list of the parts in the given Table 1.

Table 1

Sl.No	List the different parts of skeletal muscles from the given image

© NIMI
NOT TO BE REPUBLISHED

Demonstration of major muscles of upper limb

Objectives: At the end of this exercise you shall be able to

- identify the various muscles of upper limb
- write the origin, insertion, nerve supply and action of different muscles.

Requirements

Tools/Instruments

- Sketches, pencils, A4 sheets - as reqd.

PROCEDURE:

Note: Trainer shall demonstrate the major muscles of upper limb. Trainees will write the origin, insertion, nerve supply and actions of various muscles given in the Table 1

TASK 1: Identify the various muscles of upper limb

- 1 See the name of the muscle given in the Table 1
- 2 Write the origin, insertion, nerve supply and action of the muscles provided in the Table 1.

Table 1 – Different name of muscles

S.No	Name of the muscle	Origin	Insertion	N.S	Action
1	Deltoid				
2	Pectoralis Major				
3	Pectoralis Minor				
4	Trapezius				
5	Latissimus dorsi				
6	Biceps				
7	Triceps				

Demonstration of major muscles of lower limb

Objectives: At the end of this exercise you shall be able to

- identify the various muscles of lower limb
- write the origin, insertion, nerve supply and action of different muscles.

Requirements
Tools/Instruments • Sketches, pencils, A4 sheets - as reqd.

PROCEDURE:

Note: Trainer shall demonstrate the major muscles of lower limb. Trainees will write the origin, insertion, nerve supply and actions of various muscles given in the Table 1.

TASK 1: Identify the various muscles of lower limb

- 1 See the name of the muscle given in the Table 1
- 2 Write the origin, insertion, nerve supply and action of the muscles provided in the Table 1

Table 1 – Different name of muscles

S.No	Name of the muscle	Origin	Insertion	Nerve Supply	Action
1	Hamstrings				
2	Quadiceps				
3	Soleus				
4	Gastronemius				
5	Gluteali				

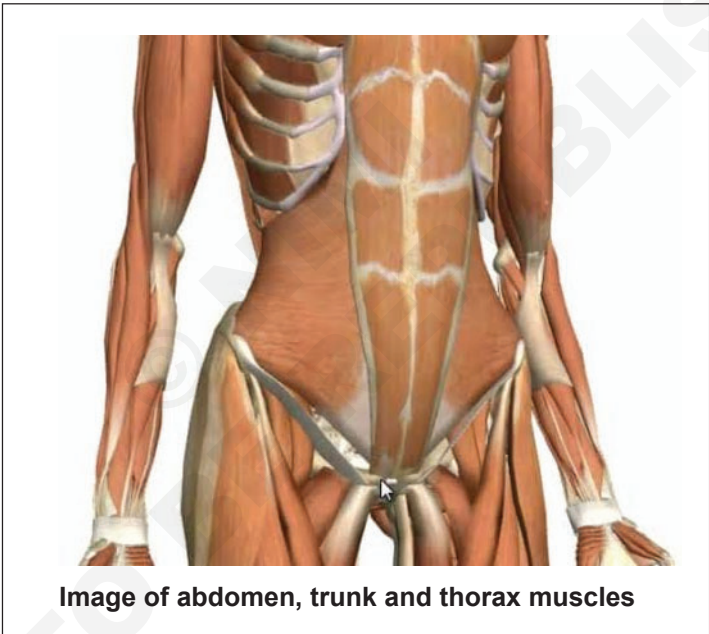
Illustration and demonstration of abdomen, trunk, thorax, neck and face

- Objectives:** At the end of this exercise you shall be able to
- sketch the parts of abdomen, trunk and thorax muscles
 - write down the names of muscles from the given figure.

Requirements	
Tools/Instruments	
<ul style="list-style-type: none"> • Sketches, pencils, A4 sheets - as reqd. 	<ul style="list-style-type: none"> • Images of abdomen, trunk and thorax muscles - as reqd.

PROCEDURE:

Note: Trainer shall illustrate the picture and ask the trainees to identify the parts of muscles of abdomen, trunk and thorax by locating it from the give figure.



TASK 1: Sketch the parts of abdomen, trunk and thorax muscles and write down the names

- 1 See the image provided above.
- 2 Identify the various parts and make a list of the parts in the given Table 1.

Table 1 - List of different muscles

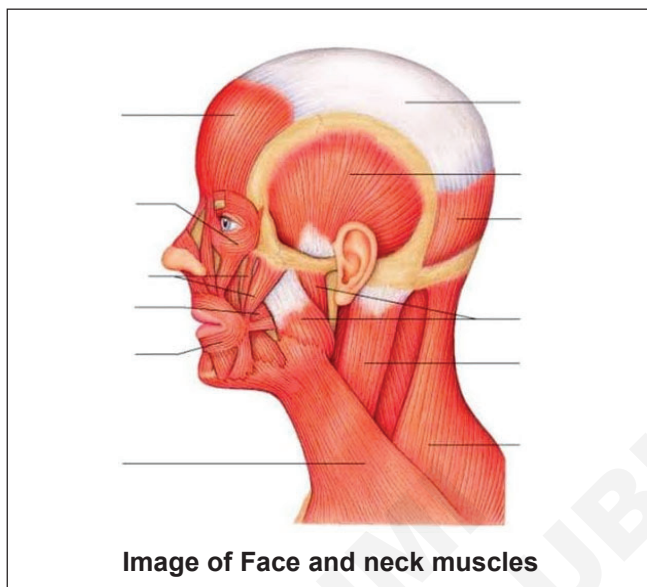
S.No	List the different muscles from the given image

Illustration and demonstration of face and neck muscles

Objectives: At the end of this exercise you shall be able to

- sketch the parts of face and neck muscles
- Write down the names of muscles from the given figure.

Note: Trainer shall illustrate the picture and ask the trainees to identify the parts of muscles by locating it from the give figure.



Sketch the parts of face and neck muscles and write down the names

- 1 See the image provided above.
- 2 Identify the various parts and make a list of the parts in the given Table 1.

Table 1 - List of different muscles

S.No	List the different muscles from the given image

Sketch labelled picture of cell

Objectives: At the end of this exercise you shall be able to

- identify the different types of cell structure from the given image
- sketch the picture and label the parts of the same.

Requirements

Tools/Instruments

- Images of cell structure - 1 No.
- Sketches, pencils, A4 sheets - as reqd.

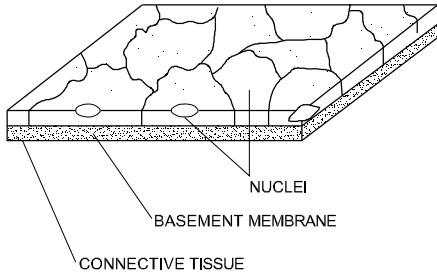
PROCEDURE:

Note: Trainer shall display the image of the cell structure to the trainees. Ask the trainees to observe the parts of the cell structure and instruct them to sketch and label its parts.

TASK 1: Identify the different types of cell structure from the given Fig 1

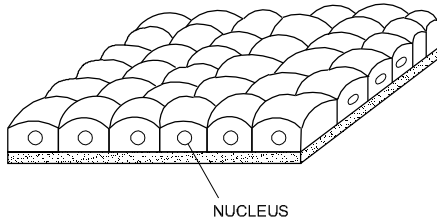
- 1 See the image provided below.
- 2 Identify the parts of the cell structure.
- 3 Sketch and label its parts neatly in a sheet.

Fig 1



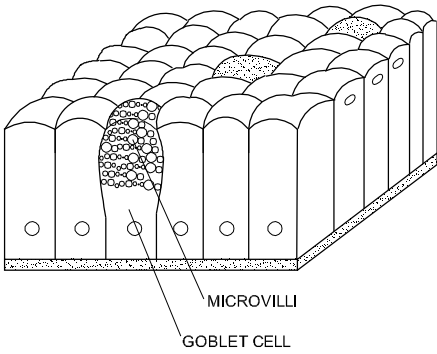
SIMPLE SQUAMOUS EPITHELIUM

CELLS: SINGLE (SCALE LIKE) LAYER
NUCLEI: FLATTENED, CENTRALLY LOCATED
FUNCTIONS: DIFFUSION, LUBRICATION



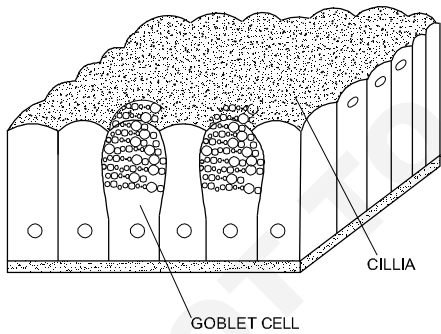
SIMPLE CUBOIDAL EPITHELIUM

CELLS: SINGLE (SQUARE LIKE) LAYER
NUCLEI: CENTRALLY LOCATED AND SPHERICAL
FUNCTIONS: ABSORPTION, SECRETION, PROTECTION



SIMPLE COLUMNAR EPITHELIUM

CELLS: TALL, SINGLE-LAYERED
NUCLEI: BASALLY LOCATED AND ENLONGATED
FUNCTIONS: ABSORPTION, SECRETION, PROTECTION (MAY BEAR CILIA AND MAY CONTAIN GOBLET CELLS WITH MICROVILLI)



PSEUDOSTRATIFIED EPITHELIUM

CELLS: DIFFER IN HEIGHT, NOT ALL CELLS REACH THE APICAL SURFACE
NUCLEI: AT VARIOUS POSITIONS
FUNCTIONS: ABSORPTION, SECRETION, TRANSPORTATION

EPITHELIAL TISSUES
CELL STRUCTURE

PHN1216H1

Microscopic diagram of different tissues

- Objectives:** At the end of this exercise you shall be able to
- visualize the different types of tissues from the given cell structure
 - sketch and label its parts.

Requirements
Tools/Instruments <ul style="list-style-type: none">• Diagrammatic representation of tissues - as reqd.• Sketches, pencils, A4 sheets - as reqd.

PROCEDURE:

Note: Trainer shall teach the diagrammatic representation of the tissues to the trainees. Ask the trainees to observe the parts of the tissues and instruct them to reproduce the illustration and label its parts.

TASK 1: Identify the different types of tissues from the given cell structure

- 1 Identify the parts of the tissues from the cell structure.
- 2 Sketch and label its parts neatly.
- 3 Record it under Table 1.

Table 1 – Draw the different types of tissues and label its parts

Diagrammatic representation	Parts of the tissues

Make postures of skin

Objectives: At the end of this exercise you shall be able to

- identify the various postures of our human skin
- recognize the condition of skin from different patients.

Requirements




Tools/Instruments


- Images of different postures of skin - 1 No.
- Sketches, pencils, A4 sheets - as reqd.

PROCEDURE:

Note: Trainer shall display the different images of postures of skin and explain the condition of the same to the trainees. Take the trainees to the hospital nearby and ask them to record the skin nature from different patients available on that day.

- 1 See the image provided in the Table 1.
- 2 Identify the posture of skin.
- 3 Write the condition of the similar skin observed from different patients.

Images of postures of skin	Nature of skin	Record/Observation from patients
	<p>Ring worm</p>	
	<p>Measles</p>	
	<p>Bites and Stings</p>	

Images of postures of skin	Nature of skin	Record/Observation from patients
	<p style="text-align: center;">Scabies</p>	
	<p style="text-align: center;">Eczema</p>	
	<p style="text-align: center;">Scarlet Fever</p>	
	<p style="text-align: center;">Rheumatic fever</p>	
	<p style="text-align: center;">Dermatomyocytis</p>	
	<p style="text-align: center;">Chemical burns</p>	
	<p style="text-align: center;">Acrodermatitis</p>	

Videos of cell structure

Objectives: At the end of this exercise you shall be able to

- analyse the cell structure
- recognize the cell structure and able to carry out observations from patients.

PROCEDURE:

Note: Ask the trainees to analyse the detailed cell structure from the given links/video provided. Take the trainees to the hospital nearby and ask the trainees are able to record/observe the same from the given microscopic images of the different patients.

Capture the Video link: <https://youtu.be/URUJD5NEXC8>

Note: The trainee should ask the patient to record/observe the same from the given microscopic images of the different patients.

Idea of reflexes and their examination

Objective: At the end of this exercise you shall be able to
• how to examine the reflexes.

Requirements
Tools/Instruments
• Reflex hammer - 1 No.
• couch - 1 No.

PROCEDURE:

Note: Trainer shall explain the types of reflexes and how to examine the reflexes in patients. Trainees will listen and practice with the patients.

TASK 1: Examine Biceps reflex

- 1 It is a reflex test that examine the function of the C₅ reflex and the C₆ reflex arc.
 - 2 The test is performed using a tendon hammer to quickly depress the biceps brach tendon as it passes through the cubital fossa. Brisk or absent reflex are used as clues to the location of neurological disease.
- Place your thumb or finger firmly on the biceps tendon.
 - Strike with reflex hammer so that the blow is aimed through your thumb towards the biceps tendon.
 - Observe flexion at the elbow and watch for and feel the contraction of the biceps muscle.

TASK 2: Examine Triceps reflex

- 1 The patient may be sitting or supine lying. Flex the patient's arm at the elbow, with palm toward the body and pull it slightly across the chest.
- 2 Strike the triceps tendon above the elbow use a direct blow from directly behind it.
- 3 Watch for contraction of the triceps muscles and extension at the elbow.

TASK 3: Examine Supinator jerk

It is the reflex that examines the function of (C₆ - C₇) roots, radial nerve.

Strike the lower end of the radius with the hammer and watch for elbow and finger flexion.

TASK 4: Examine Hoffman reflex

It is the reflex that examines the function of C₇, C₈.

- 1 Flick the patient's terminal phalanx suddenly stretching the flexes tendon on release.
- 2 Thumb flexion indicates hyperreflexia.

TASK 5: Examine Knee jerk

It is the reflex that examine the function of L₂, L₃, L₄ roots.

Ensure that the patients leg is reflexed by resting it over examiners arm or by hanging it over the edge of the bed.

- 1 Top the patellar tendon with the hammer and observe quadriceps contraction.
- 2 Note impairment or exaggeration.

TASK 6: Examine Ankle jerk

It is the reflex that examines the function of S1, S2 roots.

- 1 Externally rotates the patient's leg
- 2 Hold the foot in slight dorsiflexion
- 3 Ensure the foot is reflexed by palpating the tendon of tibialis anterior. If this is taut, then no ankle jerk will be elicited.
- 4 Tap the achilles tendon and watch for calf muscle contraction and plantarflexion.

Plantar response:

- 5 Check that the big toe is relaxed.

- 6 Stroke the lateral aspect of the scale across the ball of the foot.
- 7 Note the first movement of big toe. Flexion should occur.
- 8 Extension due to contraction of extension hallucis longus (a 'Babinski's reflex') indicates an upper motor neuron.
- 9 This is usually accompanied by synchronous contraction of the knee flexors and tensor fasciae latae.

Elicit Chaddock's sign by stimulating lateral border of the foot. The big toe extends with upper motor neuron lesions.

© NIMI
NOT TO BE REPUBLISHED

Demonstration and A.V. display

Objective: At the end of this exercise you shall be able to
• **how to examine the reflexes.**

Requirements

Tools/Instruments

- Reflex hammer - 1 No.
- couch - 1 No.

Note: The patient is advised to observe the given video links and try to perform the reflex examination based on the procedure explained in the video.

Hyper Link 1: <https://youtu.be/BNzskBYjt4c>

© NIMI
NOT TO BE REPUBLISHED

Display charts of nervous system

Objectives: At the end of this exercise you shall be able to

- demonstrate the various units in nervous system
- represent the functions of nervous system.

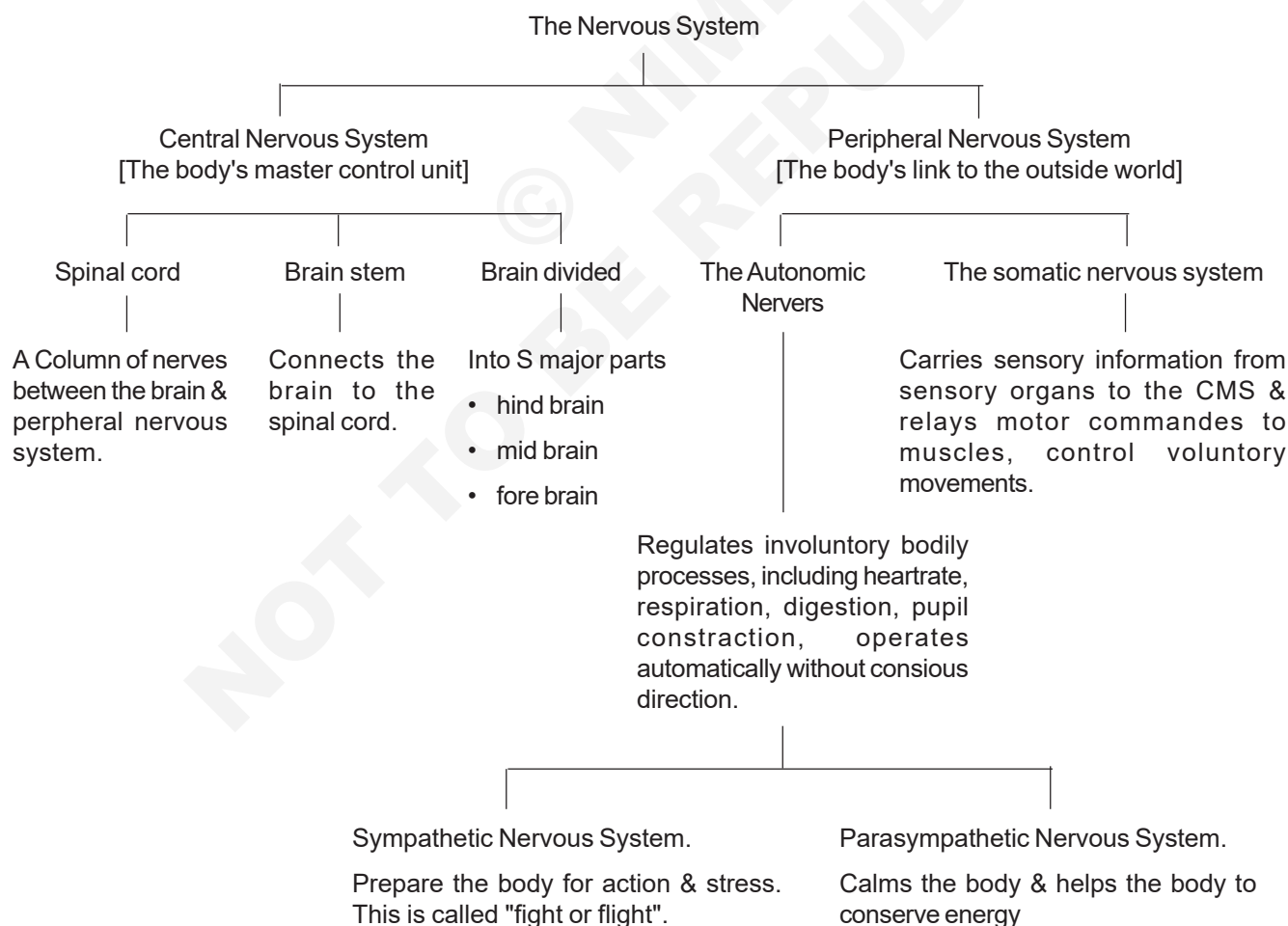
Requirements	
Tools/Instruments	
• Charts of nervous system	- 1 No.

PROCEDURE:

Note: Trainer shall display the chart of nervous system provided, trainees should explain the chart provided.

TASK 1: Identify the nervous system

- 1 See the chart provided.
- 2 Explain the chart of nervous system.



Representation of neuron, brain, spinal cord, reflex arc, plexus

Objectives: At the end of this exercise you shall be able to

- draw the images of neuron, brain, spinal cord, reflex arc, plexus
- locate the parts of the same.

PROCEDURE:

Note: Trainer should provide diagrammatic representation of neuron, brain, spinal cord, reflex arc and plexus. Trainee will observe it.

TASK 1: Drawing the parts

- 1 Draw the images of neuron, brain, spinal cord, reflex arc, plexus.
 - a Neuron
 - b Brain
 - c Spinal cord
 - d Reflex arc
 - e Plexus.
- 2 Locate the parts of the same,
 - a Neuron
 - b Brain
 - c Spinal cord
 - d Reflex arc
 - e Plexus.

© NIMI
NOT TO BE REPUBLISHED

Pain assement

- Objectives:** At the end of this exercise you shall be able to
- identify the types of scale used to assess the pain of the patient
 - identify the intensity of patients pain.

PROCEDURE:

TASK 1: Practice on pain assessment by number scale

Note: Trainer should explain the different types of scale used to assess the pain for patients. Trainee will listen and patient with the patients

- 1 Explain about most pain assessment done in the form of a scale to the patient.

- 2 Ask patients to rate their pain on a scale from 0-10, 0 being no pain and 10 being the worst pain imaginable.
- 3 Collect the answers for the questions from the patients as mentioned in the pain assessment model table -1.

Face scale

A Scale with corresponding faces depicting various levels of pain is shown to the patient and they scaled one.



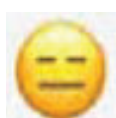
0

No hurt



2

Hurts little bit



4

Hurts littlemore



6

Hurts evenmore



8

Hurts wholelot



10

Hurts worst

Table 1: Pain Assessment Model

S	Site	Where exactly is the pain?
O	Onset	What were they doing when the pain started?
C	Character	What does the pain feel like?
R	Radiates	Does the pain flow anywhere else?
A	Associates symptoms	Eg. Nausea / Vomiting
T	Time / Duration	How long have they had the pain?
E	Exacerbating / Relieving factors	Does anything make the pain better or worse?
S	Severity	Obtain on initial pain score

Designing of charts of heart structure and circulation

Objectives: At the end of this exercise you shall be able to

- sketch the structure of heart and label its parts
- sketch the diagram of blood circulation in heart and explain.

PROCEDURE:

Note: Trainer asks the trainees to sketch the structure of heart and its circulation & also ask them to demonstrate.

TASK 1: Sketch the structure of heart and label its parts and diagram of blood circulation in heart and explain

- 1 Draw the structure of heart and label its parts.
- 2 Draw the circulation of hearts and explain.

Fig 1



Description of heart location and position by using mannequin

Objective: At the end of this exercise you shall be able to
• identify the location and position of heart in human body.

Requirements
Tools/Instruments • Mannequin - as reqd.

PROCEDURE:

Note: Trainer shall display the mannequin to the trainees and ask them to locate the position of heart.

Description:

- The heart is located in the chest between the lungs behind the sternum and above the diaphragm.
- Its centre is located about 1.5 cm to the left of the mid sagittal plane.

A.V display of heart circulation

Objective: At the end of this exercise you shall be able to

- identify the locatin and position of heart in human body.

Requirements

Tools/Instruments

- Mannequin - as reqd.

Note: By visualizing the above video link the trainer shall able to teach heart circulation clearly.

<https://youtu.be/SwHjwO7BnsI>

© NIMI
NOT TO BE REPUBLISHED

Pulse and blood pressure examination

Objective: At the end of this exercise you shall be able to
• examine the blood pressure and pulse of the patients.

PROCEDURE:

Note: The Trainer shall explain the methods of examining the blood pressure & pulse & the trainees do the same.

TASK 1: Examine the pulse rate of the patient

- 1 Use the radial pulse & the brachial pulse to obtain the pulse and BP measurements.
- 2 Pulse can be felt with the finger sat different pulse
- 3 Normal rate of pulse is between 70 - 100 bpm.

TASK 2: Examine Blood pressure of the patient

- 1 Ensure that you have the necessary equipments.
 - A Sphgmomamometer
 - A Stethoscope
- 2 Wrap the cuff around the patient's uppwr arm ensuring the arrow is in line with the brachail ortery. This should be determined by the feeling the brachail pulse.
- 3 Determine the rough value for the systalic blood pressure. This can be done by the palpating the barchail or radial pulse & inflating the cuff until the pulse can no longer be felt. The reading at this point should be noted and the cuff defalted.
- 4 Now you have rough valve, the true valve can be measured. Place the diaphragm sethoscope over the barchail ortery or reinflate the cuff to 20 - 50 mmHg higher than the estimated valve taken before.
- 5 Deflate the cuff at 2 -3 mmHg per second until you hear the first Karatkaff sound - this is the systalic blood pressure.
- 6 Continue to deflate the cuff untill the sounds disappear, the 5th Karatkaff sound - this is the diastalic pressure.

Table 1: Measurement Ranges

BP	Systalic	Diastalic
Normal	Under 120	Under 80
Prehypertension	120 - 139	80 - 89
Hypertension (Stage 1)	140 - 159	90 - 99
Hypertension (Stage 2)	Above 160	Above 100
Hypertensive crisis	Above 180	Above 110

Mark a balanced diet chart for different age groups

Objectives: At the end of this exercise you shall be able to

- identify the diet chart for different age groups
- record the diet and prepare a chart.

Requirements
Tools/Instruments <ul style="list-style-type: none">• Display of diet chart - 1 No.• Sketches, pencils, Chart papers - as reqd.

PROCEDURE:

Note: Trainer shall display the diet chart to the trainees. Ask the trainees to observe the various diets to be followed for different age groups and prepare a chart.

TASK 1: Identify the diet chart for different age groups

BALANCED DIET CHART PERPARTION

AGE (YEARS)	GENDER	SEDENTARY (NON-ACTIVE)	MODERATELY ACTIVE	ACTIVE
4-8				
9-13				
14-18				
19-30				
31-50				
51 AND OLDER				

Display the organs of digestive system on mannequins

Objectives: At the end of this exercise you shall be able to

- identify organs of digestive system on human body
- demonstrate the functions of digestive system using mannequin.

Requirements

Tools/Instruments

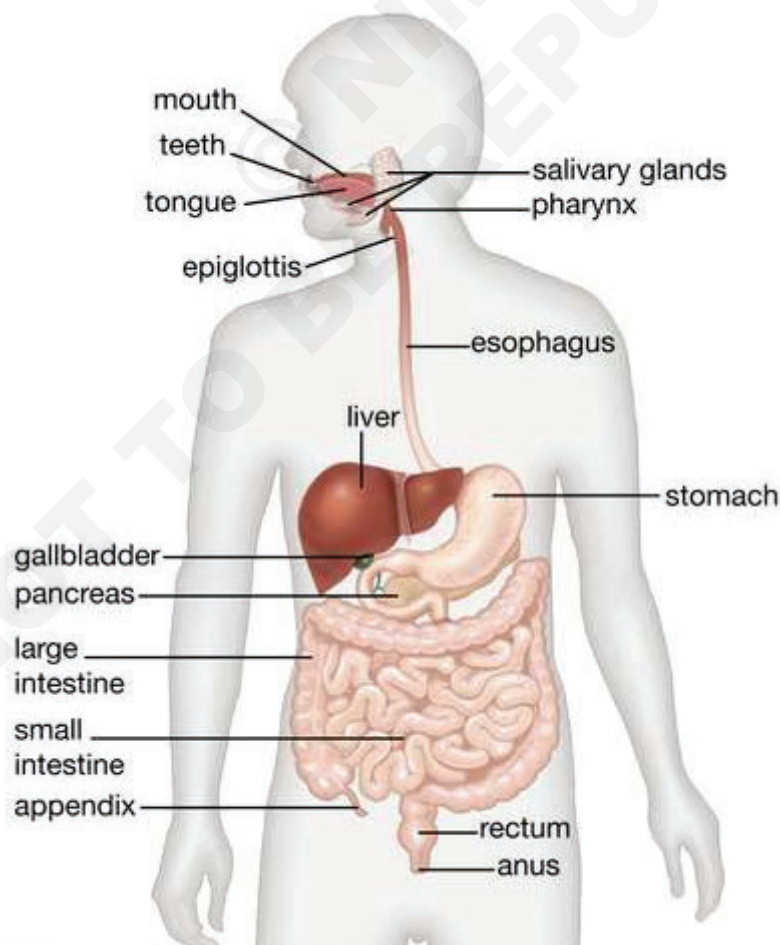
- Sketches, pencils, Chart papers - as reqd.
- Mannequins - as reqd.

PROCEDURE:

Note: Trainer shall display the mannequin to the trainees. Ask the trainees to locate the organs of digestive system using the mannequin and demonstrate the functions of digestive system.

TASK 1: Demonstrate the functions of digestive system using mannequin

- 1 Display of the mannequin and ask the trainee to locate the digestive system and ask the trainees to demonstrate the organs of digestive system and explain its function.



Demonstration of A.V. display

Objectives: At the end of this exercise you shall be able to

- display of digestive system
- recognize the organs of digestive system and able to carry out observations from patients.

PROCEDURE:

Note: Ask the trainees to analyse the detailed digestive system from the given links/video provided. Take the trainees to the hospital nearby and ask the trainees are able to record/observe the same from the given microscopic images of the different patients.

Capture the Video link: <https://youtu.be/X3TAR0otFfM>

Note: Ask the trainees are able to record/observe the same from the given microscopic images of the different patients.

Figuration of main and accessory organs of digestive system

Objectives: At the end of this exercise you shall be able to

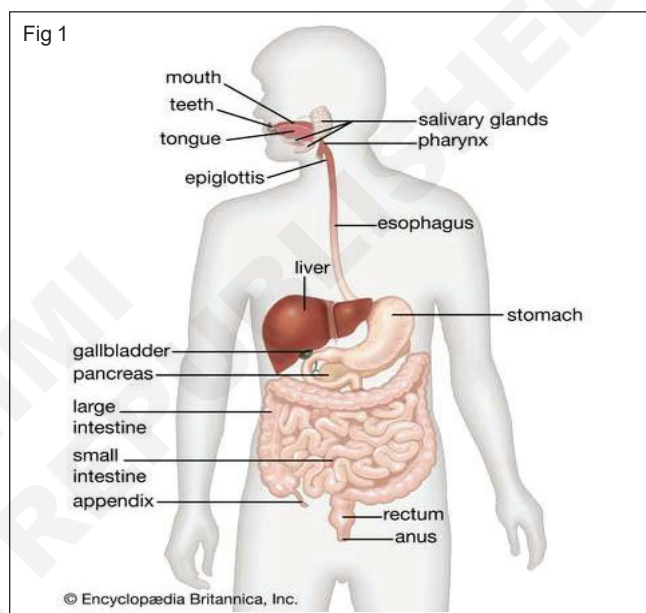
- illustrate the main organs of digestive system
- illustrate the accessory organs of digestive system.

PROCEDURE:

Note: Trainer shall display the images of the digestive system to the trainees. Ask the trainees to observe the organs of digestive system and reproduce the same with suitable illustrations.

TASK 1: Illustrate the accessory organs of digestive system

- 1 Illustrate the main organs and accessory of digestive system. (Fig 1)



Display the organs of respiratory system on mannequins

Objectives: At the end of this exercise you shall be able to

- identify organs of respiratory system on human body
- demonstrate the functions of respiratory system using mannequin.

Requirements

Tools/Instruments

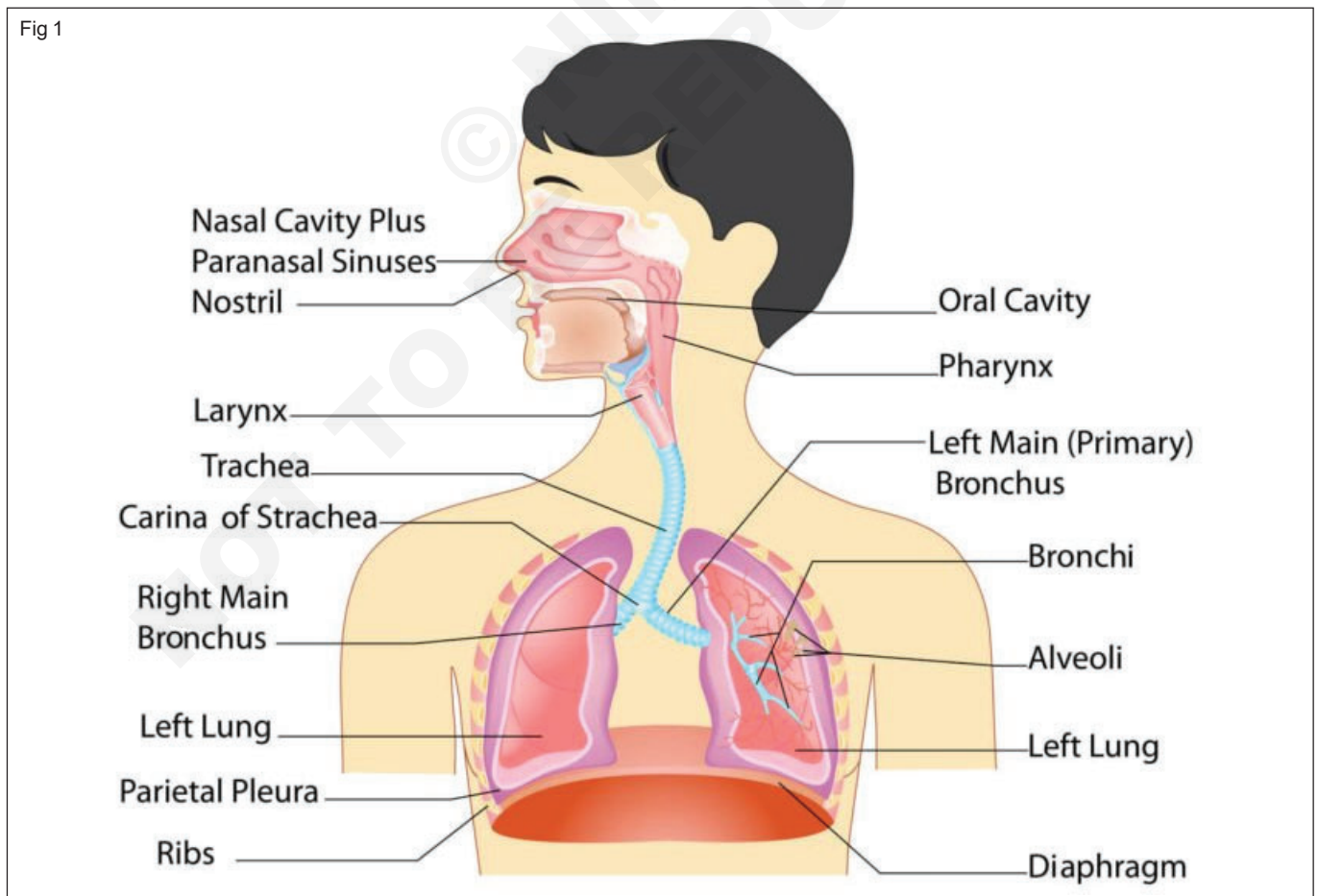
- Sketches, pencils, Chart papers - as reqd.
- Mannequins - as reqd.

PROCEDURE:

Note: Trainer shall display the mannequin to the trainees. Ask the trainees to locate the organs of respiratory system using the mannequin and demonstrate the functions of respiratory system.

TASK 1: Demonstrate the functions of respiratory system using mannequin

- 1 Display of the mannequin and ask the trainee to locate the respiratory system and ask the trainees to demonstrate the organs of respiratory system and explain its function.



Display respiratory mechanism by using videos

Objectives: At the end of this exercise you shall be able to

- display of respiratory mechanism
- recognize the organs of respiratory system and able to carry out observations from patients.

PROCEDURE:

Note: Ask the trainees to analyse the detailed mechanism of respiratory system from the given links/ video provided. Take the trainees to the hospital nearby and ask the trainees are able to record/observe the same from the given microscopic images of the different patients.

Capture the Video link: <https://youtu.be/wc2K1Olt4Q8>

Note: Ask the trainees are able to record/observe the same from the given microscopic images of the different patients.

Measure chest inspiration and expiration with inch tape

Objectives: At the end of this exercise you shall be able to

- **assess the chest expansion with deep inspiration and expiration**
 - **identify the side of abnormality.**
-

PROCEDURE:

TASK 1: Assess the chest expansion with deep inspiration and expiration

1 Measurement of overall chest expansion:

- Take a tape and encircle chest around the level of nipple.
- Take measurements at the end of deep insertion and expiration

Inference:

- Normally a 2-5" of chest expansion can be observed.
 - Any lung or pleural disease can give rise to decrease in overall chest expansion.
 - It is typically low in patients with COPD.
 - These patients have a very high FRC and have limited capacity to expand the chest from this position.
-

TASK 2: Identify the side of abnormality

1 Symmetry of chest expansion:

- Have patient seated erect or stand with arms on the side.
- Stand behind patient
- Grab the lower hemi thorax on either side of axilla and gently bring your thumbs to the midline.
- Have patient slowly take a deep breath and expire.
- Watch the symmetry of movement of hemi thorax.
- Simultaneously, feel the chest expansion.

- Place your hands over the upper chest and apex to repeat the process.
- Next stand in front and lay your hands over both apices of the lung and anterior chest and assess chest expansion.

Inference:

- Normal:** Chest expansion is symmetrical. Both sides take off the same time to same extent
 - Abnormal:** Asymmetrical chest expansion is abnormal
-

Respiratory rate examination

Objectives: At the end of this exercise you shall be able to

- estimate the patient's respiratory rate and
- evaluate the breathing function.

PROCEDURE:

Note: The examiner estimates the patient's respiratory rate by observing how many times the patient breathes in and out with the span of one minute.

Adults normally breathe about 14 to 20 times per minute, while infants may breathe up to 44 times per minute.

Evaluation of breathing function

1 Chart review

- History
- Chest x-ray
- Blood test

- Respiratory rate
- Posture

2 Physical examination

- Breathe sound
- Dyspnea index
- Cough ability
- Functional capacity

3 Observation/Palpation

- Chest mobility
- Shape of chest wall
- Accessory muscle firing

Portrait charts of organs of respiratory system

Objectives: At the end of this exercise you shall be able to

- display the charts of organs of respiratory system
- demonstrate the functions of the organs of the respiratory system.

Requirements

Tools/Instruments

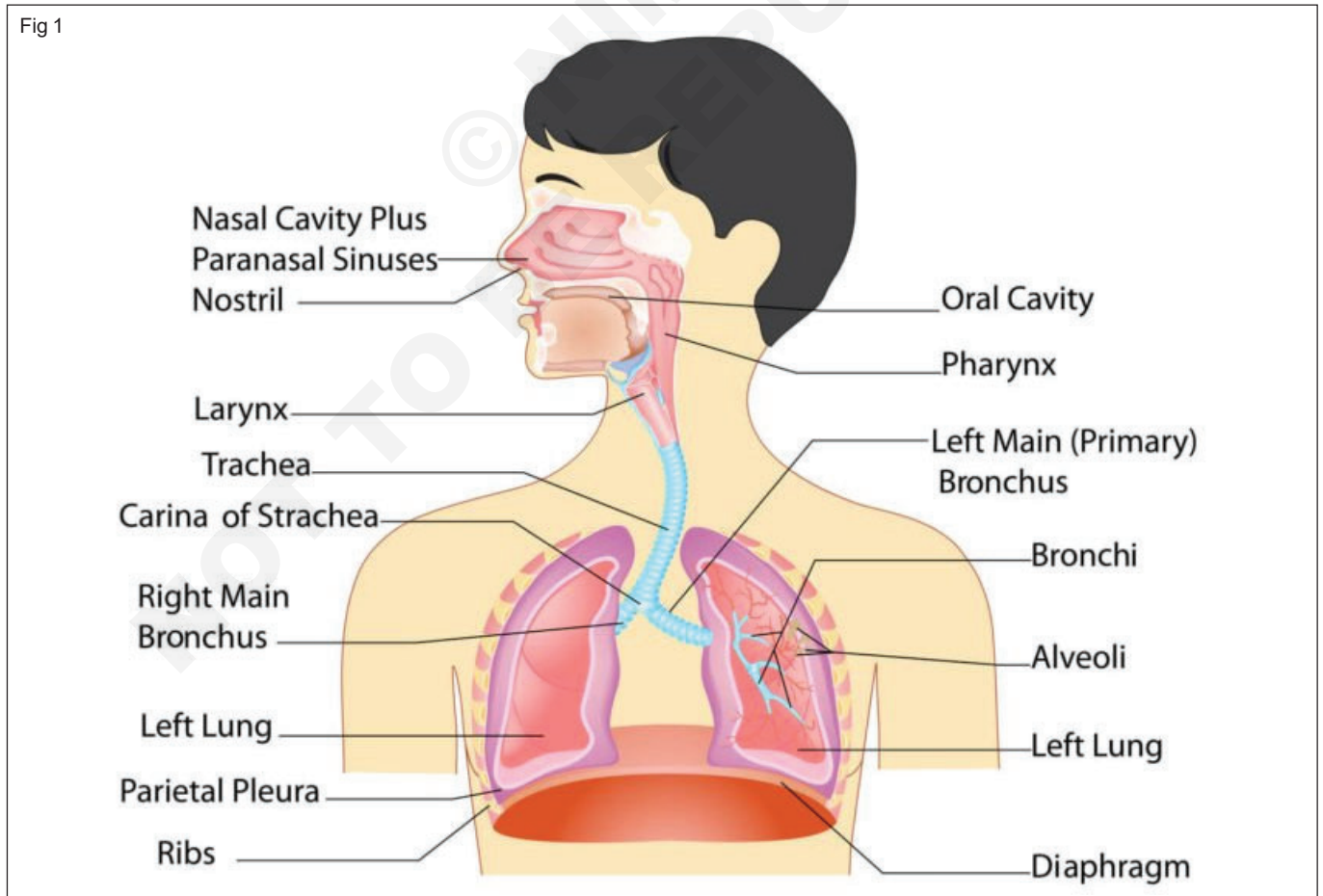
- Illustration of the organs of respiratory system - as reqd.
- Sketches, pencils, Chart papers - as reqd.

PROCEDURE:

Note: Trainer shall display the organs of the respiratory system to the trainees. Ask the trainees to observe the functions of the organs and demonstrate the same through proper illustration.

TASK 1: Demonstrate the functions of the organs of the respiratory system

- 1 Illustrate the organs of respiratory system using a chart paper and demonstrate the functions of the organs of the respiratory system using the illustration.



Explanation of parts of excretory and reproductive system on mannequin

Objectives: At the end of this exercise you shall be able to

- identify organs of excretory and reproductive system on human body
- demonstrate the functions of excretory and reproductive system using mannequin.

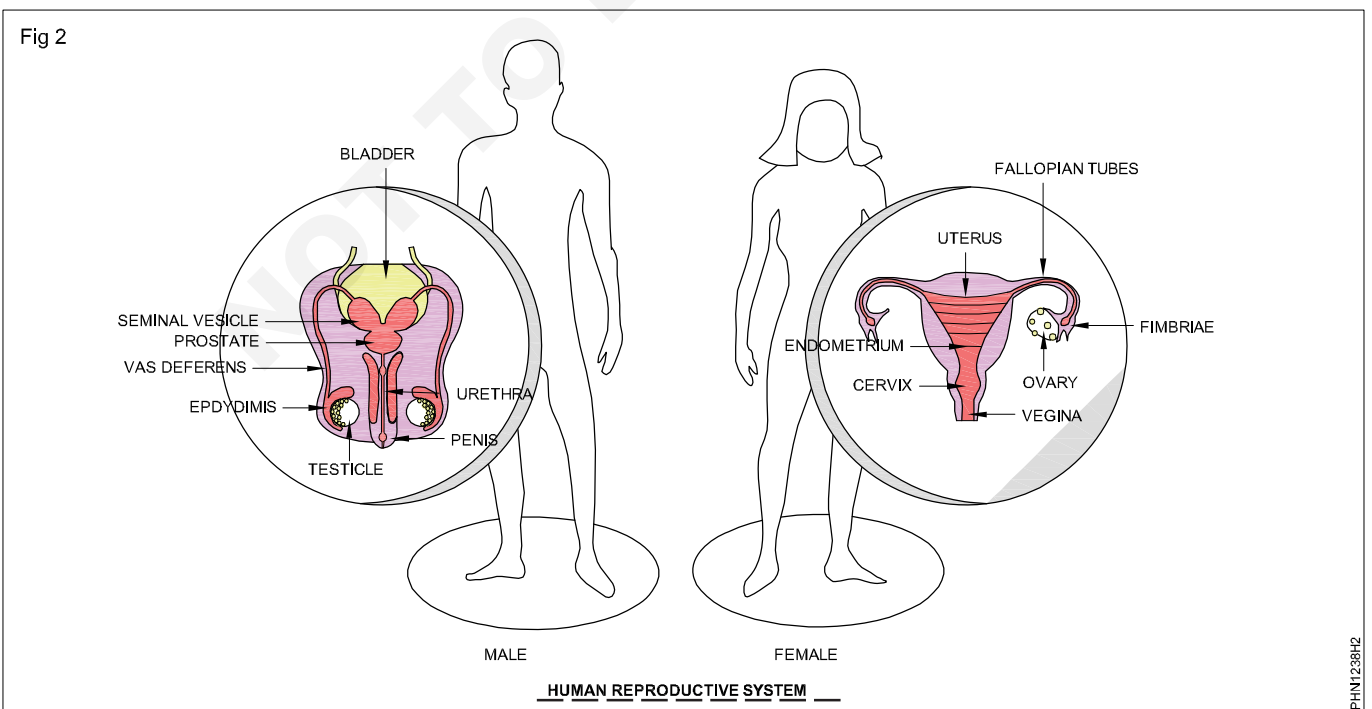
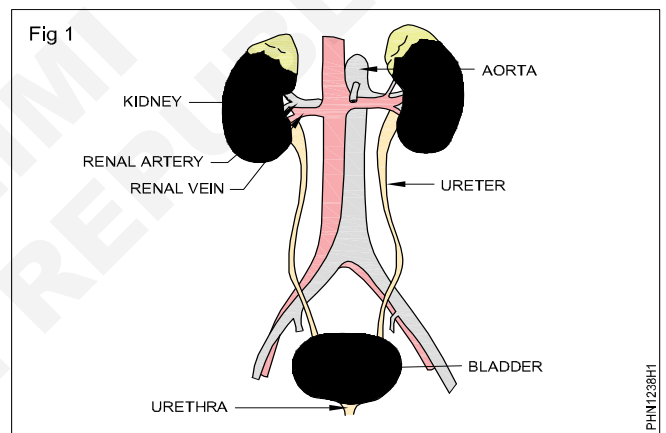
Requirements	
Tools/Instruments	
• Sketches, pencils, Chart papers	- as reqd.
• Mannequins	- as reqd.

PROCEDURE:

Note: Trainer shall display the mannequin to the trainees. Ask the trainees to locate the organs of excretory and reproductive system using the mannequin and demonstrate the functions of excretory and reproductive system.

TASK 1: Demonstrate the functions of excretory and reproductive system using mannequin

- 1 Display of the mannequin and ask the trainee to locate the excretory and reproductive system and ask the trainees to demonstrate the organs of excretory and reproductive system and explain its function



Presentation and A.V. videos of excretory system

Objectives: At the end of this exercise you shall be able to

- display of excretory and reproductive systems
- recognize the organs of excretory and reproductive systems and able to carry out observations from patients.

PROCEDURE:

Note: Ask the trainees to analyse the detailed mechanism of excretory and reproductive system from the given links/video provided. Take the trainees to the hospital nearby and ask the trainees are able to record/observe the same from the given microscopic images of the different patients.

Capture the Video link: <https://youtu.be/EhnRhFLyOg>

Note: Ask the trainees are able to record/observe the same from the given microscopic images of the different patients.

Micturition reflex by showing charts

Objectives: At the end of this exercise you shall be able to

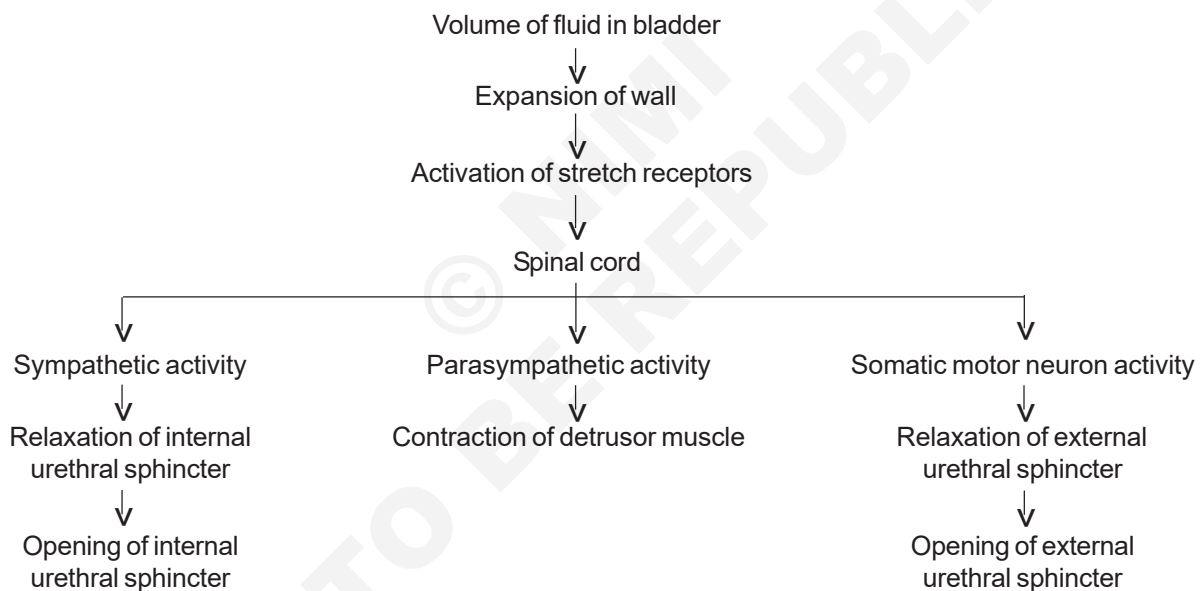
- prepare the micturition chart
- demonstrate the micturition reflex.

Requirements			
Tools/Instruments			
• Display of micturition chart	- 1 No.	• Sketches, pencils, Chart papers	- as reqd.

PROCEDURE:

Note: Trainer shall display the micturition chart to the trainees. Ask the trainees to observe the prepare the micturition chart and demonstrate the micturition reflex.

TASK 1: a) Preparation of Micturition charts and Demonstration of the prepared chart



Preparation of hot packs

Objective: At the end of this exercise you shall be able to

- treat the patient with hot packs.

Requirements	
Tools/Instruments	
• Hot packs	- as reqd.
• Towels	- as reqd.
• Chair/Couch	- as reqd.

PROCEDURE:

Note: Trainer should explain the trainees how to prepare hot packs & applicatin of hot packs to the patients.

TASK 1: Practice on preparation of hot packs

- | | |
|--|---|
| <p>1 Prepare Hot packs of correct size & shape for the area to be treated.</p> | <p>2 Keep adequate pillows, towels, bed sheets.</p> <p>3 keep all the collected materials should be placed near to the treatment couch.</p> |
|--|---|



Preparation of patient for treatment

Objective: At the end of this exercise you shall be able to

- prepare the patient for his treatment.

Prepare the patient for treatment

- | | |
|---|--|
| <ul style="list-style-type: none"> • Place patient in a well-supported, comfortable and relaxed position. • Use adequate pillows, towels, and bed sheets. • Expose the body parts to be relaxed, have patient remove all jewellery form the area. • Drop te untreated part of the patient to preserve but allow easy access to the body part to be treated. • If there is any oil/cream/dust - clean the area with water and soap. • Make sure the treatment part is dry. | <ul style="list-style-type: none"> • Make sure that ther are no local contra indications for the treatment. <ul style="list-style-type: none"> - Open wounds - Scar - Local skin infection - Cuts - Abrasions - Eczema - Localised hamarhagic spots |
|---|--|

Application of hot packs at different regions of body

Objective: At the end of this exercise you shall be able to

- apply hot packs for the patient with hot packs at different regions of body.
-

Practice on different Technique / Methods of application of treatment

- Remove the pack from the unit and place it on the towel.
- Fold another towel into 4-6 layers and place it over the pack.
- Warp the whole pack with the bottom towel.

The treatment of the wrapped place should not exceed 44°C.

- Set appropriate treatment time (20 - 30 min) for the patient condition.

- Monitor the initial report from the patient to treatment during the first 5-10 mins.
- Remove periodically the towel and check the skin for moisting.
- Ask the patient for feedback and by visually inspection the skin every 5 mins.
- Adjust with more layers of toweling, if the patient reports excess heat.
- Maintain the position of hot packs, during the treatment.

Plan precautions while giving treatment

Objective: At the end of this exercise you shall be able to

- plan precautions while giving treatment.
-

Plan the precautions while giving treatment

- 1 Instruct the patient not to move the treatment part, not to touch the power card and the generator, not to sleep during treatment.
- 2 Inform the patient that he/she should feel only warmth; if it becomes hot the patient should immediately report.

- 3 Warn the patient if he/she sleeps not reporting the feeling of warmth during the treatment, there is a chance of getting burns over the treatment area.

Assessment of the affected part before applying wax bath

Objective: At the end of this exercise you shall be able to

- **assess the affected part before applying wax bath.**

Requirements	
Tools/Instruments	
• Hot packs	- 1 No.
• Towels	- as reqd.
• Chair/Couch	- as reqd.

PROCEDURE:

Note: Trainer should explain the trainees how to prepare wax and application of wax to the patient.

TASK 1: Assess the affected parts for wax bath

- | | |
|--|---|
| <ol style="list-style-type: none"> 1 Place patient in well-supported, comfortable and relaxed position. 2 Expose the body part to be relaxed, have patient remove all jewellery from the area. 3 Make sure the treatment part is dry. | <ol style="list-style-type: none"> 4 Make sure that there are no local contraindications for the treatment. <ul style="list-style-type: none"> - Open wounds - Scar - Local skin infection - Cuts |
|--|---|

Preparation of patient for treatment

Objective: At the end of this exercise you shall be able to

- **prepare the patient for his treatment.**

Note: Trainer should explain the trainees how to perform wax bath with instance using towel and brush.

Practice on Towel method

- Treat the patient directly immersed into the container of paraffin wax for 2 - 3 sec. & taken out.
- Again immerse the part after 2-3 sec to make another layer of wax.
- Repeat this process is 6 - 12 times until 3 .4 mm layer is formed,

- Wrapper around by plastic sheet & towel.

Practice on Wrappig method

- Immerse a roll of bandage in molten paraffin wax & wrap around the body part.
- This is used for treating proximal parts of the body.

Practice on Brushing method

- Apply 8 - 10 Coats of wax to the area with a paint brush using even & rapid strokes.
- Wrap the area with tower for 10 - 20min & after this time, paraffin wax is removed & discarded.

Apply wax bath with precautions and proper layering and thickness, removal of wax

Objective: At the end of this exercise you shall be able to
• apply wax to the patient with proper precautions.

Note: Trainer should explain the trainees how to prepare wax and application of wax to the patient.

Precautions to be take care before application

- 1 Existing fever
- 2 Cardiac irregularities
- 3 Decreased skin sensation
- 4 Infections
- 5 Active bleeding
- 6 Acute inflammatory conditions
- 7 Malignancy
- 8 Impaired kidney, heart & lung functions
- 9 Headache

- 10 Anesthetic area
- 11 Open wound
- 12 Unreliable patient
- 13 Impaired thermal sensation
- 14 Scar tissue
- 15 Infections area
- 16 Circulatory dysfunction
- 17 Analgesic drug
- 18 Tuberculosis
- 19 Deep x - ray therapy.

Removal of wax:

- 1 After 10 to 20 min of application the wax is removed and discarded.

Application of IRR with precautions

Objectives: At the end of this exercise you shall be able to

- identify the areas of application of IRR techniques to patients
- demonstrate the precautions to be taken care while applying IRR to patients.

Requirements

Tools/Instruments

- Sketches, pencils, chart papers - as reqd.
- IRR model - 1 No.

PROCEDURE:

Note: Trainer shall advice the trainees how to apply the IRR techniques for patients. The trainee could also ask the trainer to observe the precautions to be taken care while applying IRR to patients.

TASK 1: Identify the areas of application of IRR techniques to patients

- 1 List down the application of IRR techniques to patients.

Two types of infra red sources are used in physiotherapy practice.

- Non - Luminous generators - Produces only infrared rays of wavelength 750nm to 1500nm.
- Luminous generators - Also known as high temperature generators. Emits visible rays, uv rays, & IRR of wavelength 350nm to 4000nm.

Apparatus - Non - luminous generators take some time to get heated, so they should be switched on before 5 - 7 min of treatment.

Luminous generator needs no warm up time & can be switched on once the patient is ready for the treatment.

TASK 2: Demonstrate the precautions to be taken care while applying IRR to patients

- 1 Ask the trainees to demonstrate the precautions to be taken care while applying IRR techniques to patients.
- Unreliable & elderly patients.

- Never apply heat directly to eyes or the genitals.
- Never heat the abdomen during pregnancy (first & last trimester).

Show different positions of patient during treatment

Objectives: At the end of this exercise you shall be able to

- illustrate the different positions of patients during IRR treatment
- demonstrate the treatment according to the condition of the patient.

Requirements

Tools/Instruments

- Sketches, pencils, chart papers - as reqd.
- Images - as reqd.

PROCEDURE:

Note: Trainer shall show the trainees the images of various positions of patients during treatment and ask them to demonstrate the same according to the condition of the patients.

TASK 1: a) Illustrations representing the different positions of patients during IRR treatment

- a Treatment for patients suffering from Periarthritis
- b IRR Treatment at patient's waist
- c IRR Treatment at patient's knee
- d IRR Treatment at patient's Joint
- e IRR Treatment at patient's back

IRR Treatment conditions (Fig 1)



RR Treatment conditions for back (Fig 2)

Note: The above mentioned figures are the position to place the IRR apparatus for various treatment conditions.

Application

- 1 At the commencement of the treatment, Intensity of the radiation should be low but after 5-10 minutes (after vasodilatation) strength of radiation can be increased.
- 2 Physiotherapists should be near the patient throughout the treatment.
- 3 Sweating is encouraged.

Fig 2



TASK 2: Demonstrate the treatment according to the condition of the patient

- 1 Ask the trainees to demonstrate the treatment procedure according to the above mentioned condition of patients.

Patient position: Place the patient in a suitable, Well supported position with the area to be treated exposed.

Application

- 1 At the commencement of the treatment, intensity of the radiation should be low but after 5-10 min intensity can be increased.

- 2 Therapist should be near the patient throughout the treatment.

Dosage

For acute case - 10-15 min daily to 1 to 3 times as per the requirement.

For chronic case - upto 30 min once (daily) or on alternate days.

Placement of IRR at proper distance from skin

Objectives: At the end of this exercise you shall be able to

- demonstrate the placement of IRR at proper distance from skin
- identify the instructions and warnings with respect to placement.

Requirements	
Tools/Instruments	
• Sketches, pencils, chart papers	- as reqd.
• Lamp 1RR	- 1 No.

PROCEDURE:

Note: Trainer should able to demonstrate the placement of IRR at proper distance from skin and also identify the instructions and warnings with respect to placement.

TASK 1: Identify the instructions and warnings with respect to placement

- | | |
|--|---|
| <p>1 Write the specific instructions and warnings during the arrangement of IRR lamp with respect to patient's skin.</p> <ul style="list-style-type: none"> • The patient is warned that he should experience comfortable warnings. | <ul style="list-style-type: none"> • Patient should report immediately if the heating becomes excessive. • Patient should not touch any part of the lamp or to move nearer to it. |
|--|---|

TASK 2: Demonstrate the placement of IRR at proper distance from skin

- | | |
|--|---|
| <p>1 Demonstrate the placement of IRR at proper distance from skin.</p> <ul style="list-style-type: none"> • Expose the skin to be irradiated & cover or shield the eyes. | <ul style="list-style-type: none"> • The lamp is positioned opposite to the treatment area such that rays strike the skin at right angles. • Set the lamp at an appropriate distance which is usually 50 - 70 cm. |
|--|---|

Physiotherapy Technician - Conductive Thermal Energy Modalities

Practice on preparation and application of ice pack, cold pack, ice towels, ice bath, ice cube massage according to the contour of the body

Objectives: At the end of this exercise you shall be able to

- identify the preparation methods of ice pack, cold pack, ice towels, ice bath and ice cube massage
- demonstrate the application of the above techniques according to the contour of the body.

Requirements	
Tools/Instruments	
• Patients	- as reqd.
• Ice pack, ice towel, cold pack, ice bath and ice cube	- as reqd.
• Massage therapy arrangement	- as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preparation ice pack, cold pack, ice towels, ice bath and ice cube as dealt in theory. They should able to learn the same and demonstrate the application of these massage therapy according to the contour of the patient's body conditions.

TASK 1: Write down the preparation of various therapies accord to the condition of the patients

- | | |
|---------------------|----------------------|
| a Ice pack therapy | d Ice cube therapy |
| b Cold pack therapy | e Ice towels therapy |
| c Ice bath therapy | |

TASK 2: Demonstrate the application of the above therapies to various patient's

- | | |
|--|---|
| <p>A Ice packs.</p> <ul style="list-style-type: none"> i Ice is wrapped in dry or moist toweling. ii Applied for 10-15 min for more superficial areas and 15-20 min for areas of deeper tissue. <p>B Cold gel packs.</p> <ul style="list-style-type: none"> i Kept in cooling unit at temperature of 0-10 F. ii Improper use may cause frostbite. ii They do not lower skin temperature as much as ice, thus patients may not reach point of anesthesia. <p>C Ice immersion.</p> <ul style="list-style-type: none"> i Used to treat distal extremities. ii Container big enough to hold extremity is filled with ice and water. Body part is then immersed. iii Temperature range between 13-18°C for treatment, which may last 10-20 min. <p>D Ice massage.</p> <ul style="list-style-type: none"> i Slow circular motion for 5-10 min. | <ul style="list-style-type: none"> ii Used mostly for small areas of inflamed tissue or acute muscle guarding. iii Direction of application should be parallel to muscle fibers. iv Application is continued for 3-10 min until anesthesia is reached. <p>E Vapocoolant sprays (eg. fluro methane, ethyl chloride).</p> <ul style="list-style-type: none"> i Vapourised liquid nitrogen. ii When sprayed on skin, it produces significant cooling through evaporation. iii Container should be held about 2 feet from the body part and sprayed in one direction only at rate of 4 inches/sec using 1-2 sweeps while maintaining passive stretch. iv Ethyl chloride is flammable and may freeze skin on contact, therefore, fluro methane is preferred. v Effective in reducing painful muscle guarding and desensitizing trigger point areas. |
|--|---|

Practice of preparation of patient

Objectives: At the end of this exercise you shall be able to

- identify the preparation methods of patients for cryotherapy
- demonstrate the precautions to be taken care while preparing the patients.

Requirements

Tools/Instruments

- Cryotherapy arrangement - as reqd.
- A4 sheet, pencils, eraser and charts - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preparation methods of patients for cryotherapy as dealt in theory. They should able to learn the same and demonstrate the precautions to be taken care while preparing the patient's for the therapy.

TASK 1: a) List down the methods of preparing the patient for cryotherapy.

- | | |
|---|---|
| <ol style="list-style-type: none"> 1 The patient need to wear shorts or cotton underwear and cover your feet and hands to avoid frostbite. 2 The patient can wear a few pairs of gloves and socks to protect those areas from the cold. | <ol style="list-style-type: none"> 3 Also ensure the patient whatever he wears is completely dry and remove all jewelry before entering. |
|---|---|

TASK 2: a) Demonstrate the precautions to be taken care while preparing the patients for cryotherapy

- | | |
|--|---|
| <ol style="list-style-type: none"> 1 Prolonged exposure will lead to freezing of tissue. 2 Previous treatment to cryotherapy. 3 Do not use on suspected cancerous lesions. 4 Cautions around nails and nail bed. | <p>Do not use on eyelids, elbow, digits-relative contra indications.</p> <ol style="list-style-type: none"> 1 Nose, ears, lips, anterior, tibial area-caution. 2 Dark skin 3 Vascular compromised. 4 Immuno compromised patients. |
|--|---|

Plan precautions while giving treatment

Objectives: At the end of this exercise you shall be able to

- identify the preventive measures to be taken care during treatment
- planning the treatment procedures according to the patient.

Requirements
<p>Tools/Instruments</p> <ul style="list-style-type: none"> • Cryotherapy arrangement - as reqd. • A4 sheet, pencils, eraser and charts - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preventive measures to be taken care for cryotherapy as dealt in theory. They should able to learn the same and plan and prepare the treatment procedures according to the condition of the patient.

TASK 1: a) List down the preventive measures to be taken care during cryotherapy

Cryotherapy is not recommended for those who have health conditions that include:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1 Heart attack 2 Blood clot 3 Neurotherapy | <ol style="list-style-type: none"> 4 High blood pressure 5 Open wounds 6 Blood vessel disease 7 Pregnancy 8 Cold Allergies |
|--|---|

TASK 2: a) Plan and prepare the treatment according to the patient conditions for cryotherapy

- | | |
|--|--|
| <p>A Ice packs.</p> <ol style="list-style-type: none"> i Ice is wrapped in dry or moist toweling. ii Applied for 10-15 min for more superficial areas and 15-20 min for areas of deeper tissue. <p>B Cold gel packs.</p> <ol style="list-style-type: none"> i Kept in cooling unit at temperature of 0-10 F. ii Improper use may cause frostbite. ii They do not lower skin temperature as much as ice, thus patients may not reach point of anesthesia. <p>C Ice immersion.</p> <ol style="list-style-type: none"> i Used to treat distal extremities. ii Container big enough to hold extremity is filled with ice and water. Body part is then immersed. iii Temperature range between 13-18°C for treatment, which may last 10-20 min. <p>D Ice massage.</p> <ol style="list-style-type: none"> i Slow circular motion for 5-10 min. | <ol style="list-style-type: none"> ii Used mostly for small areas of inflamed tissue or acute muscle guarding. iii Direction of application should be parallel to muscle fibers. iv Application is continued for 3-10 min until anesthesia is reached. <p>E Vapocoolant sprays (eg. fluro methane, ethyl chloride).</p> <ol style="list-style-type: none"> i Vapourised liquid nitrogen. ii When sprayed on skin, it produces significant cooling through evaporation. iii Container should be held about 2 feet from the body part and sprayed in one direction only at rate of 4 inches/sec using 1-2 sweeps while maintaining passive stretch. iv Ethyl chloride is flammable and may freeze skin on contact, therefore, fluro methane is preferred. v Effective in reducing painful muscle guarding and desensitizing trigger point areas. |
|--|--|

Explanation of all parts of SWD

Objectives: At the end of this exercise you shall be able to

- identify the image of SWD and able to locate the parts of the unit
- demonstrate the SWD instrument based on the given diagram.

Requirements

Tools/Instruments

- SWD instrument - 1 No.
- Images - as reqd.

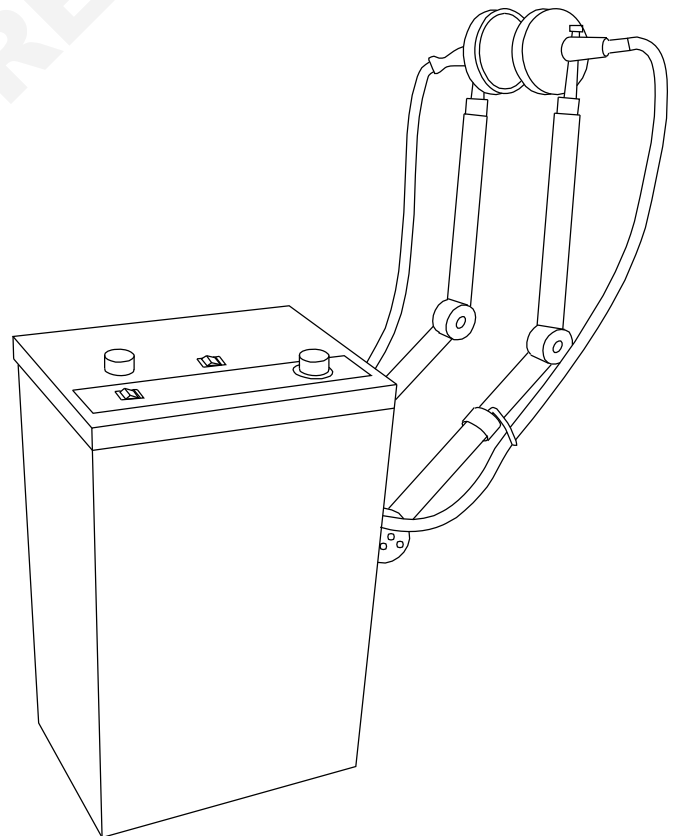
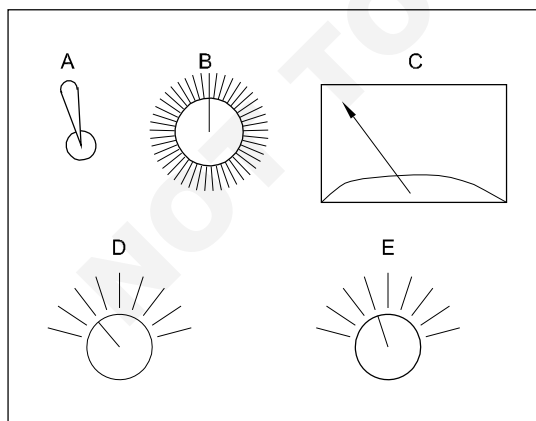
PROCEDURE:

Note: Trainer will teach the parts of the S.W.D instrument and ask them to explain the same based on the given figure

Shortwave Diathermy Unit Instrument (Fig 1)

- A = Power switch
- B = Timer
- C = Power meter (monitors current from power supply not current entering patient-volume control)
- D = Output intensity (%max power to patient)
- E = Turning control (tunes output from RFO)

Fig 1



Testing of SWD

Objectives: At the end of this exercise you shall be able to

- operate the SWD and ensure the preparedness of the instrument for the patients
- handle the instrument effectively.

Requirements
<p>Tools/Instruments</p> <ul style="list-style-type: none"> • SWD instrument - as reqd.

PROCEDURE:

Note: Trainer will teach the operation of the instrument of S.W.D and trainee should able to prepare the instrument ready for the patient’s testing and also able to handle the instrument safely and effectively.

TASK 1: a) Check the condition of the S.W.D instrument ready for use based on the instructions provided in theory

- | | |
|--|--|
| <ol style="list-style-type: none"> 1 Electrical safety tests were also carried out for the equipment and the installation. 2 Check out the physical integrity of the equipment and to guarantee the appropriate requirements of safety and performance. 3 The equipment must have marks and identification over both internal and external sides of the instrument. | <ol style="list-style-type: none"> 4 The environment in which the equipment is utilized must be inspected and controlled to assure that metal objects are not present in the room. 5 The therapist should verify the heat from the probes. |
|--|--|

Positioning of patient and placement of electrodes

Objectives: At the end of this exercise you shall be able to

- identify the placement of electrodes on the patient
- proper positioning and checking on patients.

Requirements

Tools/Instruments

- Electrodes - as reqd.
- A4 sheet, pencils, eraser and charts - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the placement of electrodes on patients depending on the treatment required and also able to position it properly according to the patient history.

TASK 1: Look into the images provided below regarding the positioning of electrodes on patient

Note: Practice the same on different patient according to their history and treatment.

Note: Place the electrode on the respective positions on the patient based on the images provided above.

The above pictures are the various treatment positions according to the condition of the patients.

Electrode placement in patients (Fig 1)

Fig 1



Flowchart of SWD circuit

Objectives: At the end of this exercise you shall be able to

- identify the production of SWD circuit
- redraw and demonstrate the circuit promptly.

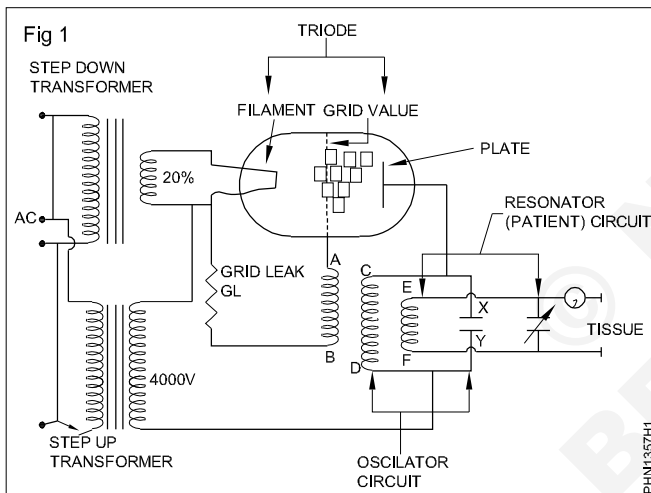
Requirements

Tools/Instruments

- SWD circuit - 1 No.
- A4 sheet, pencils, eraser and charts - as reqd.

Note: Trainer will teach the trainee regarding the production of SWD circuit and ask the trainee to redraw and reproduce the circuit promptly.

Flowchart of SWD circuit (Fig 1)



SWD cable methods

Objectives: At the end of this exercise you shall be able to

- identify the various types of cable methods
- demonstrate the SWD cable methods to the patient.

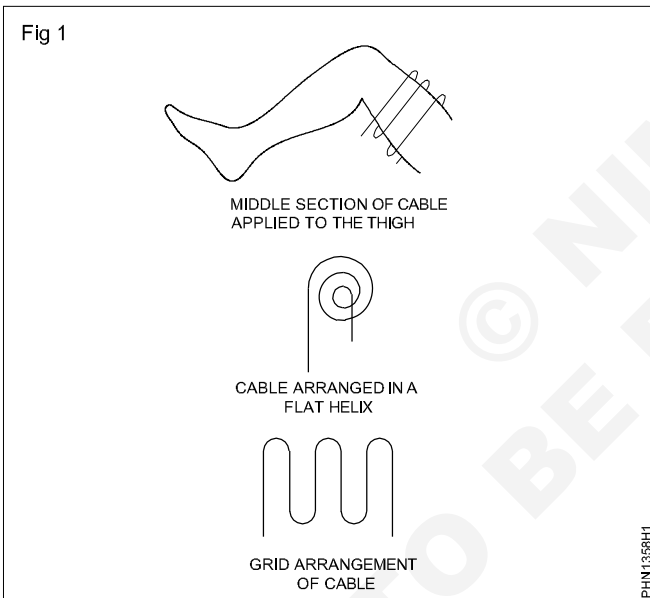
Requirements

Tools/Instruments

- Images/Figures of cable methods - as reqd.

Note: Trainer will teach the trainee regarding various cable methods of SWD and ask the trainee to able to reproduce the same and carry out the cable treatment procedures on patient's promptly.

Cable method – I (Fig 1)



Note: When short wave diathermy is applied by use of a cable the effect of the electric field may be used or that of the magnetic field (inductothermy), or use may be made of both effects at the same time.

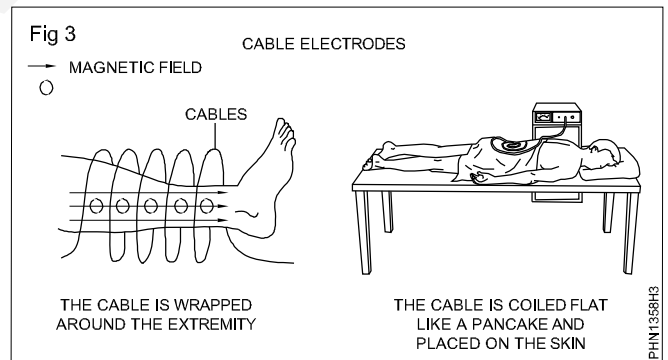
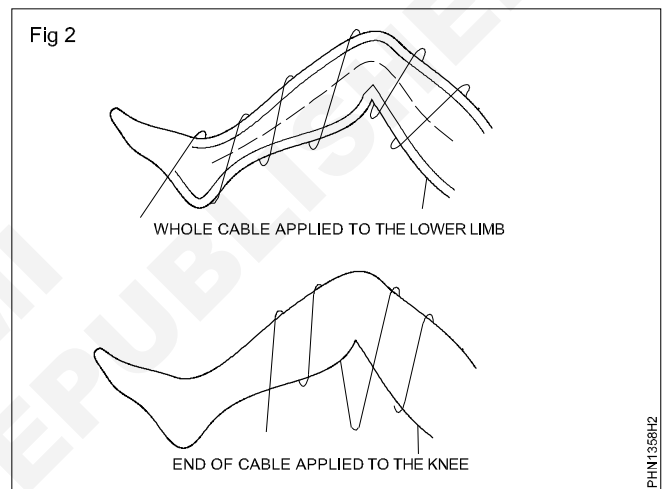
Cable method – II (Fig 2)

Note: The electrode consists of a thick, insulated cable which completes the patient's circuit of the machine. As the high frequency current oscillates in the cable, a varying electrostatic field is set up between its ends and a varying magnetic field around its central part.

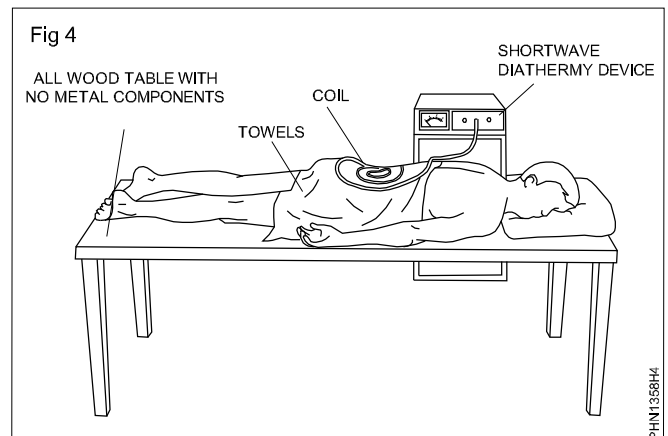
Cable method – III (Fig 3)

The cable is wrapped around the extremities.

The cable is coiled flat like a pan cake and placed on the skin.



Cable method – IV (Fig 4)



Precautions

- Objectives:** At the end of this exercise you shall be able to
- identify the preventive measures before using SWD instrument
 - identify the safety measures if any while operating SWD.

Requirements
Tools/Instruments
• A4 sheet, paper, charts - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preventive measures to be taken care for SWD as dealt in theory. They should able to learn the same and plan and prepare the treatment procedures according to the condition of the patient.

TASK 1: a) List down the preventive measures to be taken care during SWD treatment

- | | |
|--|--|
| 1 Aim of diathermy safety should be prevent mains voltage from entering the patient circuit. | 12 Difficult to be localized areas. |
| 2 Care with use on pedunculated structures. | 13 Overheating tissues may cause damage. |
| 3 Inflammable anesthetic gases - sparks prohibited within 25cm of gases. | - Deep aching |
| 4 Electrocution | - Fat neurosis |
| 5 Alcohol preps | - Burning |
| 6 Gas accumulation within the bladder. | Dangers: |
| 7 Poor plate to patient contact - thermoelectric burn. | 1 Burns |
| 8 Never allow cables to touch (short circuit). | 2 Scalds |
| 9 Do not allow perspiration. | 3 Electric shock |
| 10 Never allow direct contact with skin. | 4 Overdose |
| 11 Excessive fat in area may overheat area. | 5 Precipitation of gangrene |
| | 6 Faintness & Giddiness |

TASK 2: a) Plan and prepare the treatment according to the patient conditions for SWD

Patient Preparation:

- 1 Ensure that the patient is free of all contraindications & the patient must be comfortable & the part to be treated should be fully supported.
- 2 Remove all jewellery, coins & other metallic items from the patient.
- 3 The treatment tissue should not be covered by clothing.
- 4 Wash the skin over treatment area, thoroughly dry the skin prior to treatment.
- 5 Treatment should be on a couch, chair or a table, which must be wooden & free from metals.
- 6 Skin sensation must be tested before treatment starts.

Position & Size of electrodes:

This has been considered in the sections of the condenser field & cable methods of treatment.

When arranging the electrodes it is important to remember that an electric field can be set up around the edges & back of the electrode as well as from the front.

If these parts approach too close to the patient's tissue a field is set up in this area & may cause uncomfortable heating.

For Ex. When treating one knee-joint the back of the electrode placed on the medial aspect of the joint may lie too close to the other knee, which is consequently heated.

Dosage and Duration

In most cases the intensity of the application should be sufficient to cause a comfortable warmth & duration should be 20 - 30 min.

The treatment may be carried out daily or an alternate days.

Methods of testing

Objectives: At the end of this exercise you shall be able to

- operate the UST and ensure the preparedness of the instrument for the patients
- handle the instrument effectively.

Requirements
Tools/Instruments
• UST instrument - 1 No.

PROCEDURE:

Note: Trainer will teach the operation of the instrument of UST and trainee should able to prepare the instrument ready for the patient's testing and also able to handle the instrument safely and effectively.

TASK 1: a) Check the condition of the U.S.T instrument ready for use based on the instructions provided in theory

- 1 Testing should always be carried act prior to treatment.
- 2 The simplest way of finding out whether ultrasound is in fact being produced is to use a water bath & to reflect an ultrasonic beam up to the surface where it should produce ripples.
- 3 The apparatus is turned on & off with the treatment head below the water.

Methods of application

Objectives: At the end of this exercise you shall be able to

- identify methods of application of U.S.T
- demonstrate the application of the above techniques to different patients.

Requirements	
Tools/Instruments	
• U.S.T	- 1 No.
• A4 sheet, charts. Sketch, Pencils, etc...	- as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the various methods of application of U.S.T as dealt in theory. They should be able to learn the same and demonstrate the application of these U.S.T according to the patient's body conditions.

TASK 1: Write down the preparation of U.S.T according to the condition of the patients

- 1 Apply a hydrogel sheet over the wound, removing any air bubbles.
- 2 The ultrasound head should be 1.5 or 2 times the size of the treated area.
- 3 If the area is large, treatment can be completed in sections with 1 to 2 min per zone.
- 4 Ultrasound medium is applied to the transducer and in contact with the hydrogel sheet.

TASK 2: Demonstrate the application of the U.S.T techniques to various patient's

- 1 Direct contact
 - If the surface to be treated is fairly regular then a coupling medium is applied to the skin.
 - The treatment head is moved in small concentric circles over the skin.
 - The machine is turned on & off while in contact with the patient.
- 2 Water bath
 - A water bath filled with de-gassed water is used if possible.
 - If tap water has to be used then the gas bubbles must be wiped from these surfaces frequently.
- 3 Water bag
 - The technique of application is that the treatment head is held 1cm from the skin & moved in small concentric circles, keeping the front plate parallel to the skin surface to reduce reflection to a minimum.
 - On irregular bony surface a rubber bag filled with degassed water can be used.

A coupling medium has to be placed both between the rubber bag & between the rubber bag & the treatment head to eliminate any air.

Handling and operating of UST modality with precautions

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the operation of UST modality with preventive measures
 - identify the safety measures if any while operating UST.

Requirements
Tools/Instruments <ul style="list-style-type: none">• A4 sheet, paper, charts - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding operation of UST modality with safety precautions. The trainer should be able to demonstrate the UST treatment procedures according to the necessity of the patient.

TASK 1: a) List down the safety measures to be taken care during UST treatment for patients

Contraindications

- 1 Vascular conditions
- 2 Acute sepsis
- 3 Radio therapy
- 4 Tumors
- 5 Pregnancy
- 6 Cardiac disease

Dangers

- 1 Burns
- 2 Cavitation
- 3 Over dose
- 4 Damage to equipment

TASK 2: a) Demonstrate the working of the instrument on various patients

Indications of ultra sound therapy

- 1 Increase deep tissue heat
- 2 Decrease inflammation
- 3 Decrease muscle spasm

- 4 Decrease pain
- 5 Decrease joint adhesions

Precaution of patient

- Objectives:** At the end of this exercise you shall be able to
- identify the preventive measures before using UST instrument
 - identify the safety measures while exposing patients to UST.

Requirements
Tools/Instruments
• A4 sheet, paper, charts - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preventive measures to be taken care for UST as dealt in theory. They should able to learn the same and plan and prepare the treatment procedures according to the condition of the patient.

TASK 1: a) List down the preventive measures to be taken care during UST treatment

- 1 Symptoms may increase after the initial treatments.
- 2 Use caution when applying around the spinal cord, esp. After laminectomy.
- 3 The use of ultrasound over metal implants is not contra indicated.
- 4 Use caution when applying over epiphyseal plates of growing bone.
- 5 Keep the sound head moving
- 6 Open wounds
- 7 Impaired communication
- 8 Pregnancy
- 9 Peripheral vascular disease
- 10 Pain with pressure
- 11 Lack of sensation.

TASK 2: a) Plan and prepare the treatment according to the patient conditions for UST

- 1 Direct contact
 - If the surface to be treated is fairly regular then a coupling medium is applied to the skin.
 - The treatment head is moved in small concentric circles over the skin.
 - The machine is turned on & off while in contact with the patient.
- 2 Water bath
 - A water bath filled with de - gassed water is used if possible.
 - If top water has to be used then the gas bubbles must be wiped from these surfaces frequently.
- 3 Water bag
 - The technique of application is that the treatment head is held 1cm from the skin & moved in small concentric circles, keeping the front plate parallel to the skin surface to reduce reflection to a minimum.
 - On irregular bong surface a rubber bag filled with degassed water can be used.

A coupling medium has to be placed both between the rubber bag & between the rubber bag & the treatment head to eliminate any air.

Practice on muscle stimulator for major muscles of upper limb and lower limb

Objectives: At the end of this exercise you shall be able to

- practice on muscle stimulator for major muscles of upper limb
- practice on muscle stimulator for major muscles of lower limb.

Requirements	
Tools/Instruments	
<ul style="list-style-type: none"> • Preparation of therapist setup - as reqd. • Images/Figures - as reqd. 	<ul style="list-style-type: none"> • Stimulator - 1 No.

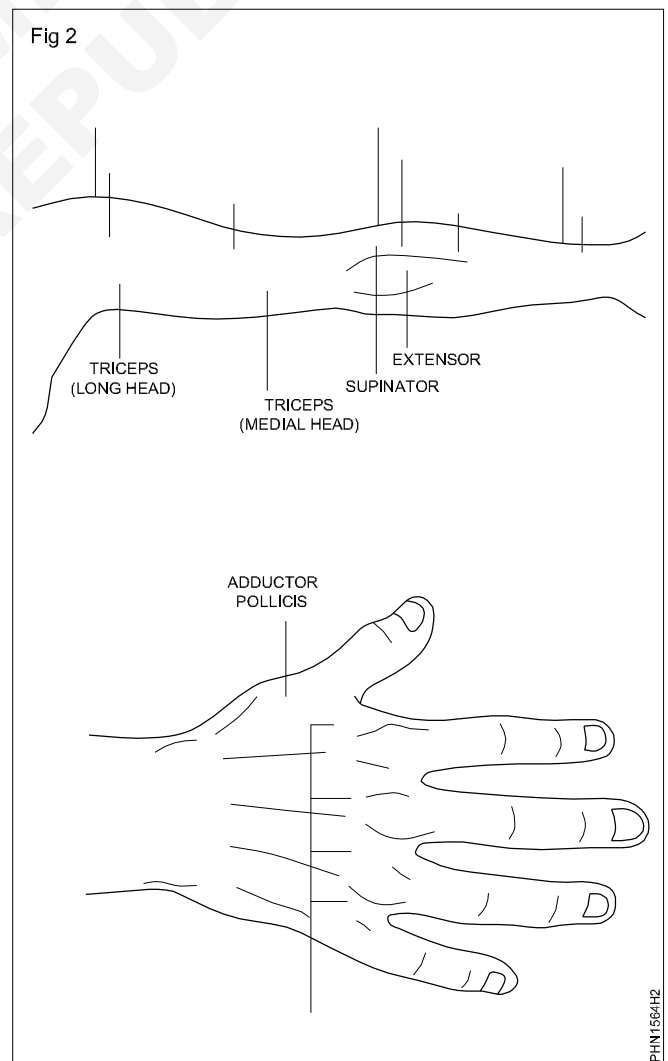
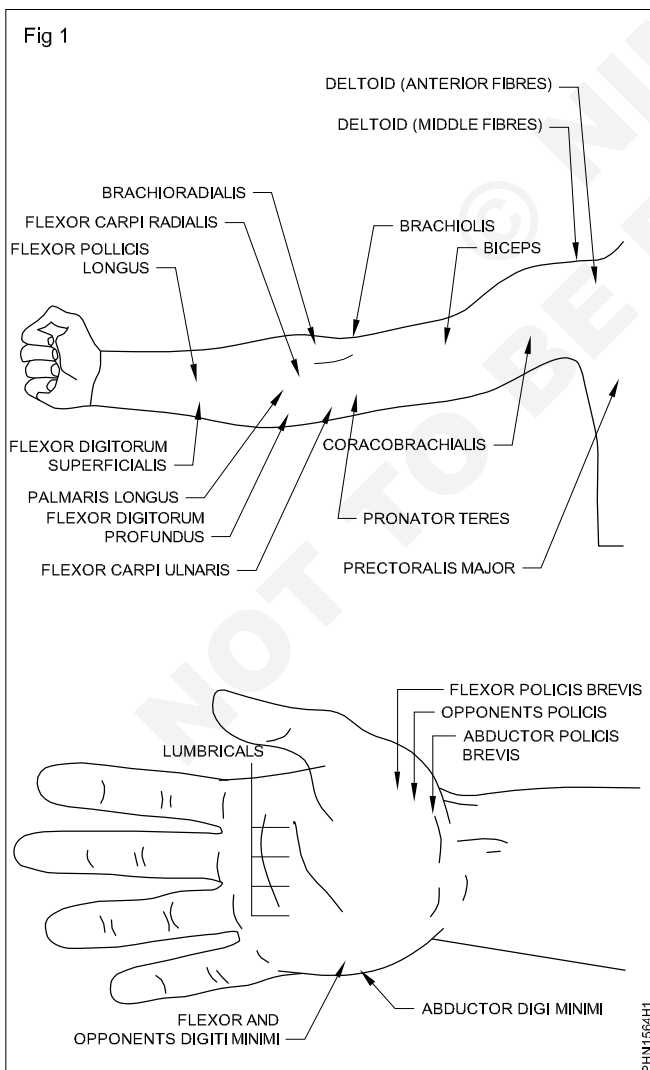
PROCEDURE:

Note: Trainer will teach trainee regarding the demonstration and operation of muscle stimulator for major muscles of upper and lower limb. The trainee need to practice to operate the machinery on the patients.

TASK 1: Practice stimulation of upper limb

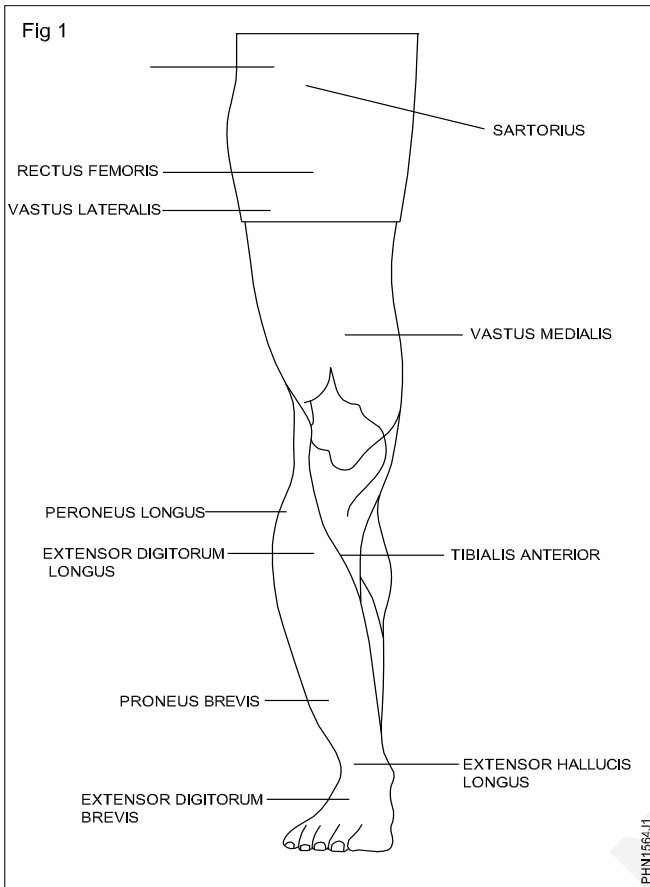
Approximate positions of some of the motor points on the anterior aspect of (a) the right arm, (b) the hand (Fig 1)

Approximate positions of some of the motor points on the posterior aspect of (a) the right arm (b) the hand (Fig 2)

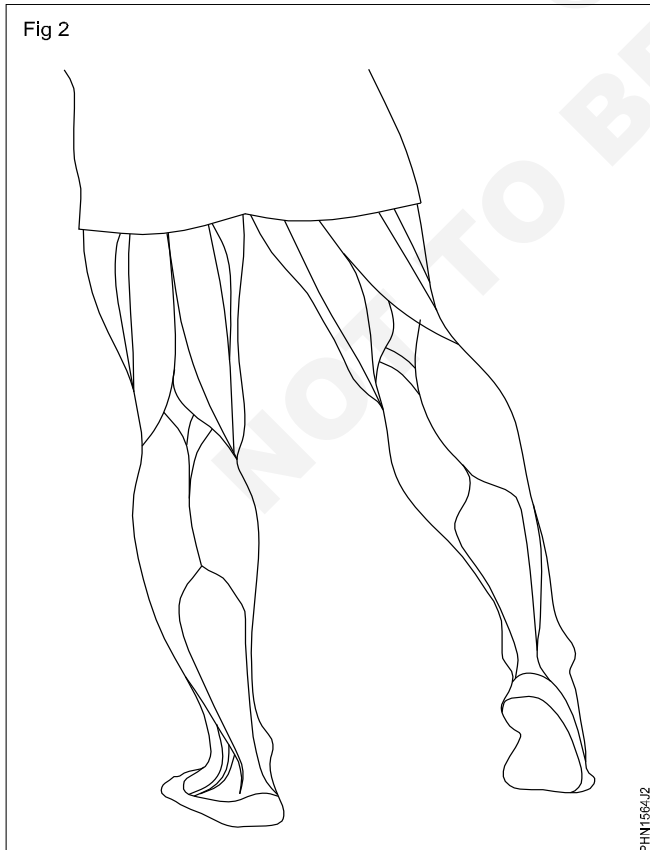


TASK 2: Practice stimulation of lower limb

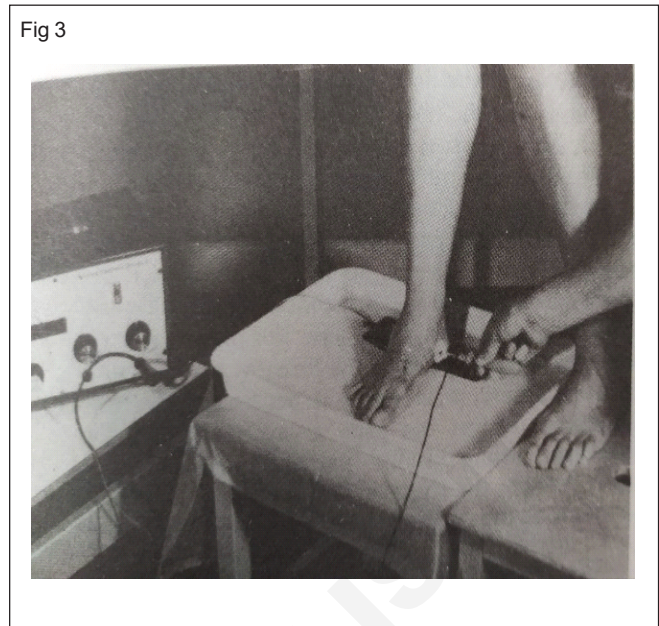
Approximate positions of some of the motor points on the anterior aspect of the right leg. (Fig 1)



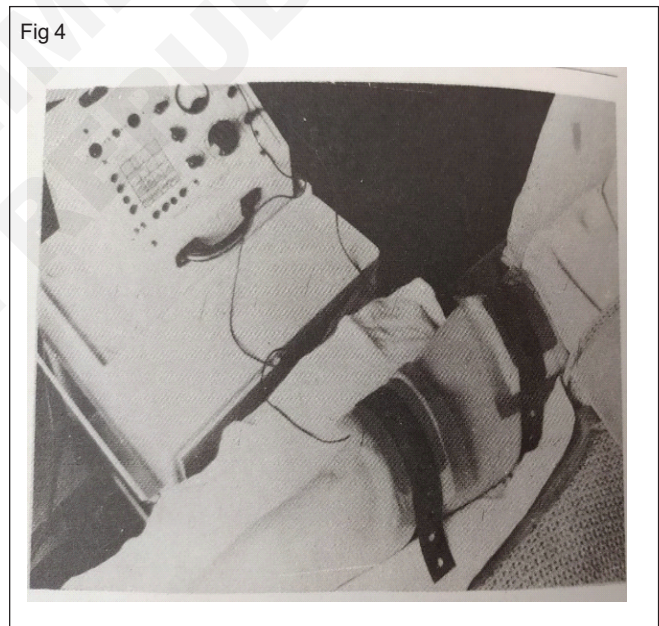
Approximate positions of some of the motor points on the posterior aspect of the left leg. (Fig 2)



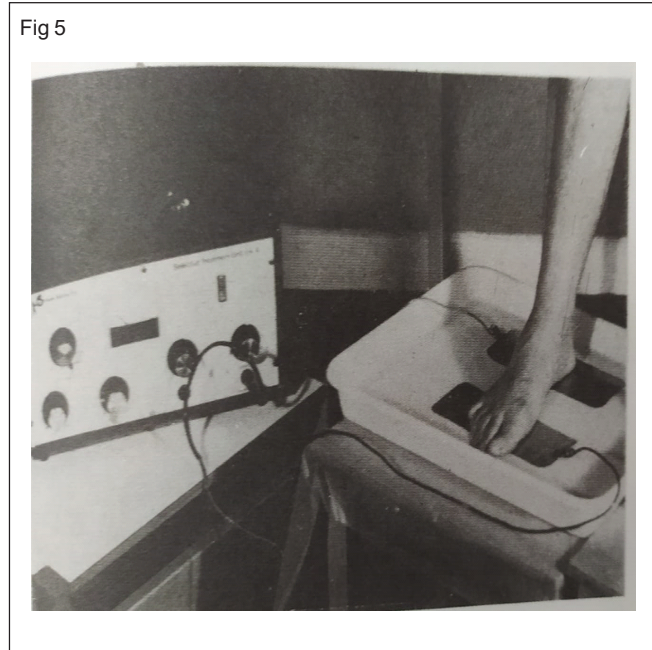
Stimulation of the abductor hallucis with a faradic-type current. (Fig 3)



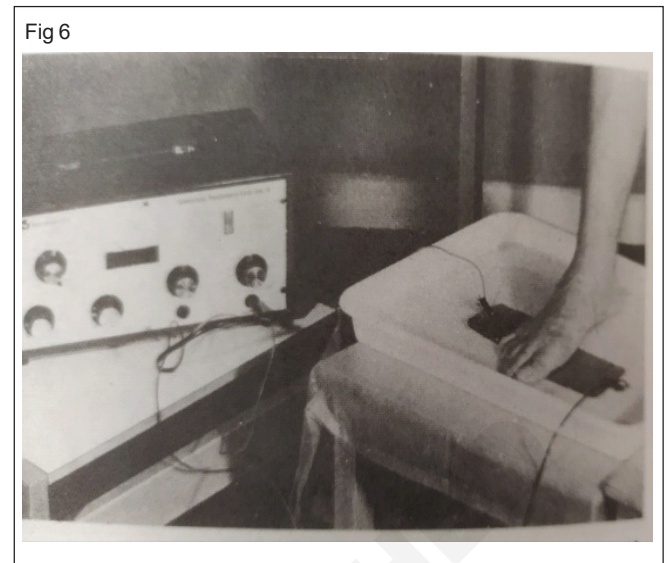
Stimulation of the quadriceps with a faradic-type current. (Fig 4)



Stimulation of the lumbrical muscles with a faradic-type current. (Fig 5)



Stimulation of the plantar interossei with a faradic – type current. (Fig 6)



Step: The motor points of the upper limb muscles are shown in the figures above. The trainer should stimulate the motor points with the help of electrical stimulator.

Preparation of patient for muscle stimulation

Objectives: At the end of this exercise you shall be able to

- prepare the patient for the muscle stimulation
- demonstrate the procedures of treatment to the patients.

Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Muscle stimulator	- 1 No.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preparation of patients for the muscle stimulation and also demonstrate the precautions to be taken care during preparation. The trainee will able to perform the same according to the different patients.

TASK 1: Prepare the patient for the muscle stimulation therapy

- 1 Remove the cloth from the area to be treated and the patient is supported comfortably in a good light.
- 2 Reduce the resistance by washing with soap & water to remove the natural oils. The skin has a high electrical resistance as the superficial layers, being dry, contain few ions.

Note:

- The indifferent pad should be large to reduce the current density under it to a minimum.
- The indifferent electrode maybe bandaged or fixed with a rubber strap, or body-weight maybe sufficient to hold it in position.

TASK 2: Demonstrate the procedures of muscle stimulator treatment to the patient

- 1 Apply modified D.C, the aim of treatment must be arranged so that the current passes through all the fibers of the muscle.
- 2 To achieve, one pad may be fixed over the origin of the muscle group & each muscle stimulated in turn with the active electrodes.
- 3 Use as an alternative two disc electrodes, one placed over each end of the muscle to be stimulated. Step 4: Place the two pads one over the origin & the other over the lower end of the muscle group to be stimulated.
- 4 Apply an active pad which completely covers the muscle or group of muscles to be stimulated, the circuit being completed with a large directing or indifferent electrode.

Dose & Duration:

Frequency selection: 100Hz- Pain relief

50-60Hz- Muscle contraction

1-50Hz Increased circulation

Time consuming: Stimulation session/day three or five sets of 5-20 isometric contractions.

5s- Rest period/contraction 1m- Rest period/set.

Demonstration of muscles stimulator on face

Objectives: At the end of this exercise you shall be able to

- practice on muscle stimulator on face
- hands on operation for different patients.

Requirements	
Tools/Instruments	
<ul style="list-style-type: none"> • Therapist setup • Images/Figures • Stimulator 	<ul style="list-style-type: none"> - as reqd. - as reqd. - 1 No.

PROCEDURE:

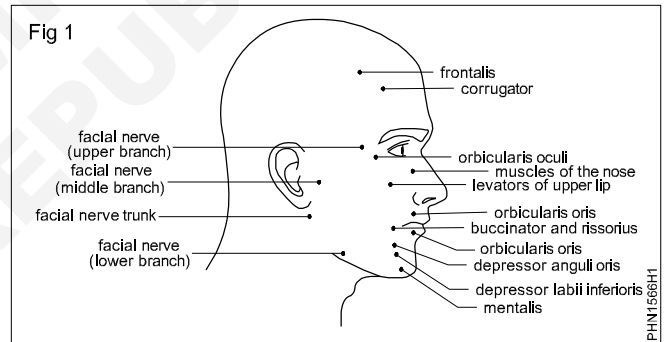
Note: Trainer will teach trainee regarding the demonstration and operation of muscle stimulator for face. The trainee need to practice to operate the machinery on the patients.

TASK 1: Practice stimulation of face for different patient

1 Stimulation procedures are same as that of Exercise No: 65 explained in TASK 1 and TASK 2.

2 Stimulate the points are given in (Fig 1).

Approximate positions of some of the motor points of the face (Fig 1).



Plan precautions during treatment

- Objectives:** At the end of this exercise you shall be able to
- identify the preventive measures before providing treatment
 - identify the safety measures while giving treatment.

Requirements
Tools/Instruments <ul style="list-style-type: none">• A4 sheet, paper, charts - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preventive measures to be taken care for various stimulator treatments as dealt in theory. They should able to learn the same and plan and prepare the treatment procedures according to the condition of the patient.

TASK 1: List down the preventive measures to be taken care during different stimulations

- 1 Remember that not all muscles are of equal strength, you cannot expect smaller muscle group to be able to receive the same current intensity as a larger group of muscles.
- 2 Ensure always that all intensity dials are at zero before applying.
- 3 Test the machine on yourself prior to application.
- 4 turn up the intensity only during the surge period.

Do not overheat the muscles.

- 5 check always the condition of the wires & electrode pads before connecting.
- 6 Ensure the electrode pads are moistened with sufficient saline solution or water.
- 7 Ensure that they have a clear view of the treatment.

Do not stimulate muscles that do not require strengthening for example the corrugator muscle.

Do not move the electrode when the current is surging.

TASK 2: Plan and prepare the stimulator treatment according to the patient conditions

- 1 Remove the cloth from the area to be treated and the patient is supported comfortably in a good light.
- 2 The skin has a high electrical resistance as the superficial layers, being dry, contain few ions. The resistance is reduced by washing with soap & water to remove the natural oils.
- 3 The indifferent pad should be large to reduce the current density under it to a minimum.
- 4 The indifferent electrode maybe bandaged or fixed with a rubber strap, or body-weight maybe sufficient to hold it in position.

Dose & Duration:
Frequency selection: 100Hz- Pain relief
50-60Hz- Muscle contraction
1-50Hz Increased circulation
Time consuming: Stimulation session/day three or five sets of 5-20 isometric contractions.
5s- Rest period/contraction 1m- Rest period/set.

Practice on placement of electrodes with using proper gel

Objectives: At the end of this exercise you shall be able to

- identify the placement of electrodes on the patient
- proper positioning and checking on patients.

Requirements

Tools/Instruments

- Electrodes - as reqd.
- Chairs/couch - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the placement of electrodes on patients depending on the treatment required and also able to position it properly according to the patient history.

TASK 1: Practice the same on different patient according to their history and treatment using proper gel

Note: Same chapter discussed in Ex. No. 70 could be utilized for the same module and some figures from the exercise could be incorporated here as well.

(Content remains the same only in both the exercises terminology is changed).

Create difference between TENS and IFT for pain producing conditions

Objectives: At the end of this exercise you shall be able to

- identify the differences between TENS and IFT
- choose the right modality according to the pain of the patients.

Requirements	
Tools/Instruments	
• TENS	- as reqd.
• IFT	- as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the uses of TENS and IFT instrument and able to choose the right modality according to the pain of the patients.

TASK 1: Identification of difference between TENS and IFT and able to locate the exact modality for operation

- 1 IFT uses the stimulation of the inferential electricity that concentrates at the intersection point of the electrodes while TENS stimulates the generation of current that can flow through its leads to electrodes that are placed on specific locations on the person's skin.
- 2 IFT focuses its function primarily to block the pain message on the peripheral nerve fibers. On the other hand, a TENS unit's electric reactions are for the sensory and motor nerve fibers.
- 3 IFT usually delivers at 4000Hz versus TENS which modulates at a low frequency of 125Hz.
- 4 IFT can deliver electric currents with much comfort than a TENS unit.
- 5 IFT can reach greater depths and offers electrotherapy to a larger number of tissues than TENS.
- 6 IFT stimulates circulation, and TENS can stimulate endorphin production.
- 7 IFT is used to manage edema, pain, and inflammation which are caused by trauma or degenerative alterations with the involvement of soft tissues while TENS can only treat conditions with low risk involved like treating back pains. It is contraindicated for pregnant women.

- 8 IFT has a role in stimulating healing and restoration of tissues while TENS only focuses on controlling pain.



Demonstrate on placement of TENS and IFT pads for radiating and local pain respectively

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the placement of TENS for radiating and local pain
 - demonstrate the placement of IFT for radiating and local pain.

Requirements

Tools/Instruments

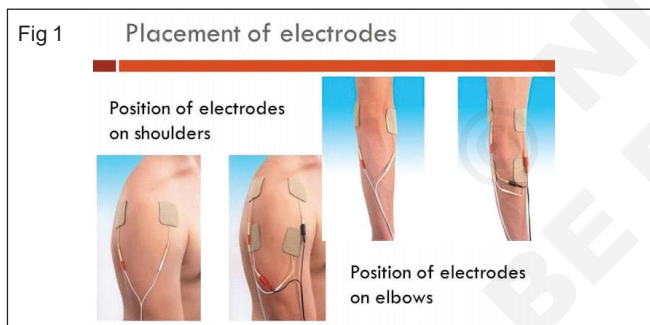
- TENS - as reqd.
- IFT - as reqd.
- Chair/Couch - as reqd.

PROCEDURE:

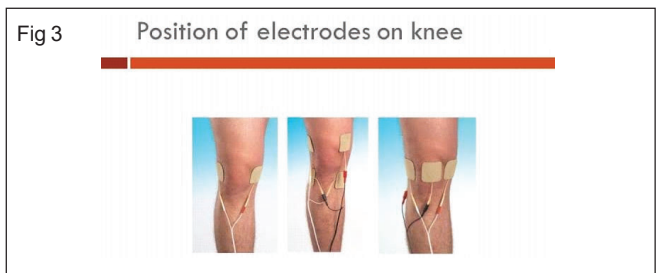
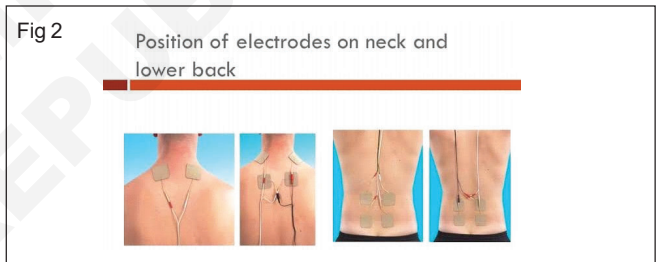
Note: Trainer will teach the trainee regarding placement of electrodes of TENS and IFT for radiating and local pain and able to demonstrate the same.

TASK 1: Placement of IFT electrodes

- 1 Placement of electrodes on shoulders and elbows. (Fig 1)

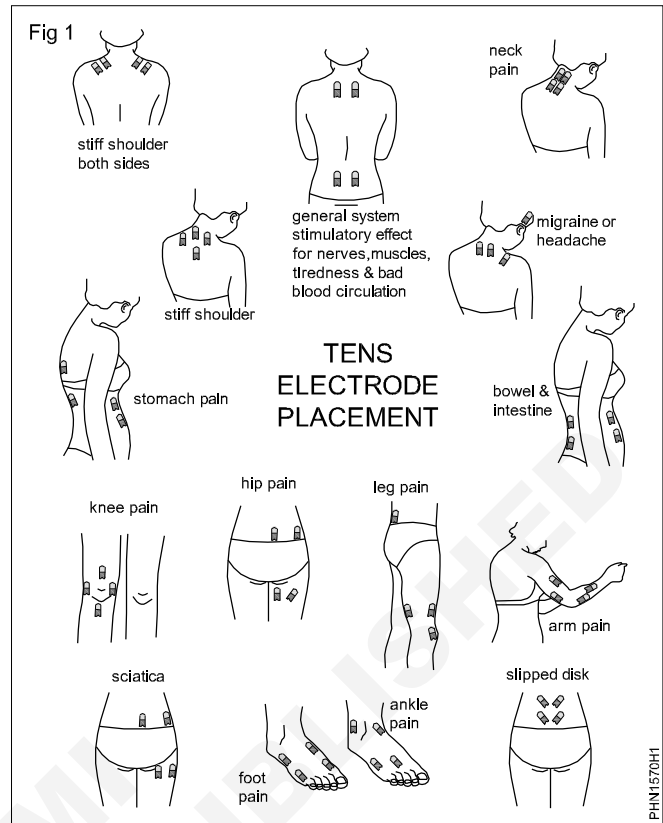


- 2 Placement of electrodes on neck and lower back (Fig 2)
- 3 Placement of electrodes on knee (Fig 3)



TASK 2: Placement of TENS electrodes

- 1 Place of electrodes as shown in (Fig 1) for the different cases.



Methods of treatment

Objectives: At the end of this exercise you shall be able to

- identify methods of application of TENS/IFT
- demonstrate the application of the above techniques to different patients.

Requirements	
Tools/Instruments	
• TENS	- as reqd.
• IFT	- as reqd.
• Chair/Couch	- as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the various methods of application of U.S.T as dealt in theory. They should able to learn the same and demonstrate the application of these U.S.T according to the patient's body conditions.

TASK 1: Write down the preparation of TENS and IFT modality according to the condition of the patients

Steps for TENS & IFT modality:

- | | |
|---|--|
| 1 Care needs to be taken when setting the sweep on a machine in that with some devices, the user sets the actual base and top frequencies (e.g. 10 and 25Hz). | 5 Most machines offer several sweep patterns, though there is very limited 'evidence' to justify some of these options. |
| 2 Other machines the user sets the base frequency and then how much needs to be added for the sweep (e.g. 10 and 15Hz). | 6 In the classic 'triangular' sweep pattern, the machine gradually changes from the base to the top frequency, usually over a time period of 6 seconds - though some machines offer 1 or 3 second options. |
| 3 Knowing which was round your machine works is critical to effective treatment. | 7 The machine is set to sweep from 90 to 130Hz employing a triangular sweep pattern. |
| 4 The pattern of the sweep makes a significant difference to the stimulation received by the patient. | 8 All frequencies between the base and top frequencies are delivered in equal proportion. |
-

TASK 2: Demonstrate the application of the TENS and IFT techniques to various patient's

- | | |
|--|--|
| 1 The patient is positioned comfortably & the skin is prepared as for any low - frequency stimulation. | 4 An appropriate treatment frequency is selected (e.g. between 0-100Hz, constant, to relieve pain) and the current intensity is turned up until the patient experiences a mild tingling sensation. |
| 2 The site for treatment is accurately located & the two pairs of electrodes positioned so that the crossing point of the two current is over or within the lesions. | 5 After 15min of treatment if is common for the machine to be turned down. |
| 3 The patient is warned that he will fell a tingling sensation which should not be uncomfortable or burning. | |
-

Testing methods of all modalities

Objectives: At the end of this exercise you shall be able to

- operate the TENS/IFT and ensure the preparedness of the instrument for the patients
- handle the instrument effectively.

Requirements	
Tools/Instruments	
• IFT instrument	- 1 No.

PROCEDURE:

Note: Trainer will teach the operation of the instrument of TENS/IFT and trainee should be able to prepare the instrument ready for the patient's testing and also be able to handle the instrument safely and effectively.

TASK 1: Check the condition of the TENS/IFT instrument ready for use based on the instructions provided in theory

- 1 Care needs to be taken when setting the sweep on a machine in that with some devices, the user sets the actual base and top frequencies (e.g. 10 and 25Hz)
- 2 Other machines the user sets the base frequency and then how much needs to be added for the sweep (e.g. 10 and 15Hz).
- 3 Knowing which way your machine works is critical to effective treatment.
- 4 The pattern of the sweep makes a significant difference to the stimulation received by the patient.
- 5 Most machines offer several sweep patterns, though there is very limited 'evidence' to justify some of these options.
- 6 In the classic 'triangular' sweep pattern, the machine gradually changes from the base to the top frequency, usually over a time period of 6 seconds - though some machines offer 1 or 3 second options.
- 7 The machine is set to sweep from 90 to 130Hz employing a triangular sweep pattern.
- 8 All frequencies between the base and top frequencies are delivered in equal proportion.

TASK 2: Handling the instrument by switching it ON/OFF.

Positioning of patient and therapist

Objectives: At the end of this exercise you shall be able to

- position the patient according to the treatment
- position of therapist.

Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Images/Figures	- as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the various positioning of patient according to their treatment and also able to demonstrate the position of therapist for the respective treatment.

TASK 1: Positioning of patient

Depending upon the age, sex, condition and the part to be treated, patient should be placed in a suitable and comfortable position. The aim of this positioning is to ensure the following:

- 1 The part to be treated should be fully supported to ensure relaxation and to gain the confidence of patient.
- 2 The body part should be easily approachable to the therapist.
- 3 It should not hamper the continuity of massage.

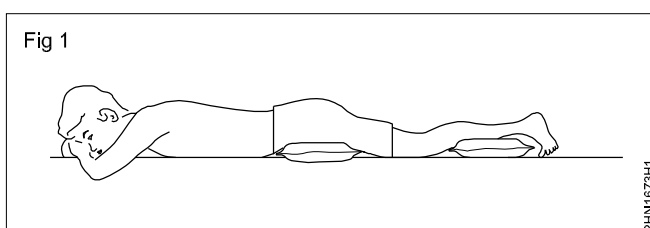
Following are the different positions for therapeutic application of massage:

- 1 **Prone lying:** For back and posterior aspect of lower limb.
- 2 **Supine lying:** For anterior aspect of lower limb, upper limb and face.
- 3 **Half lying:** For lower limb, upper limb and chest.
- 4 **Side lying:** For upper limb, chest and lower limb.
- 5 **Sitting:** For upper limb, upper back and face.

Adequate number of pillows should be placed according to body contour to ensure proper support, complete relaxation and gravity assisted drainage

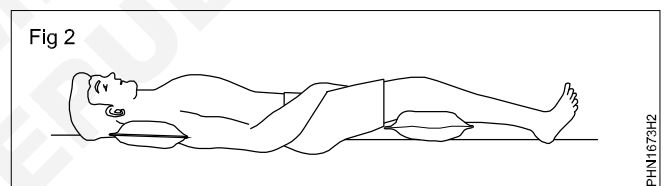
1 Prone lying

Patient's positioning in prone lying (Fig 1)



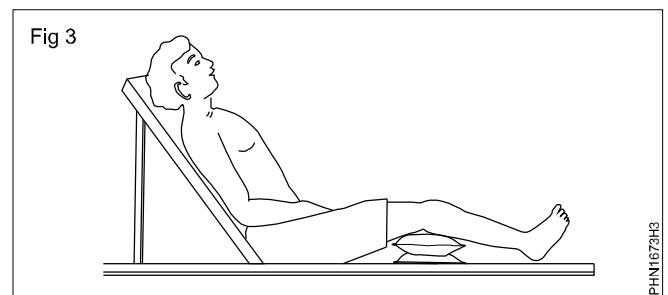
2 Supine lying

Patient's positioning in supine lying (Fig 2)



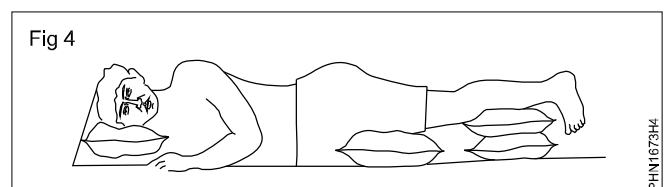
3 Half lying

Patient's positioning in half lying (Fig 3)



4 Side lying

Patient's positioning in side lying (Fig 4)



5 Sitting

Patient's positioning in sitting for massage of upper limb (Fig 5)

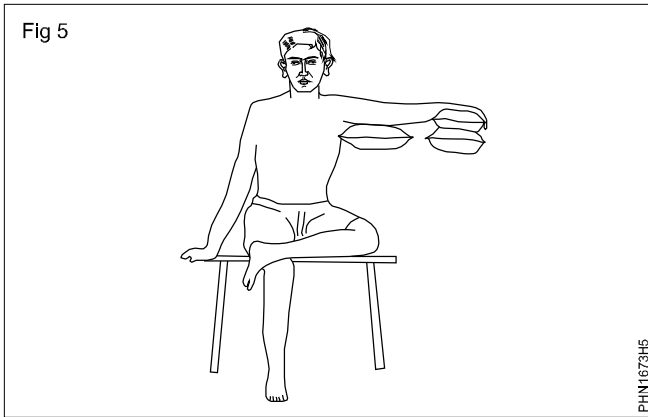
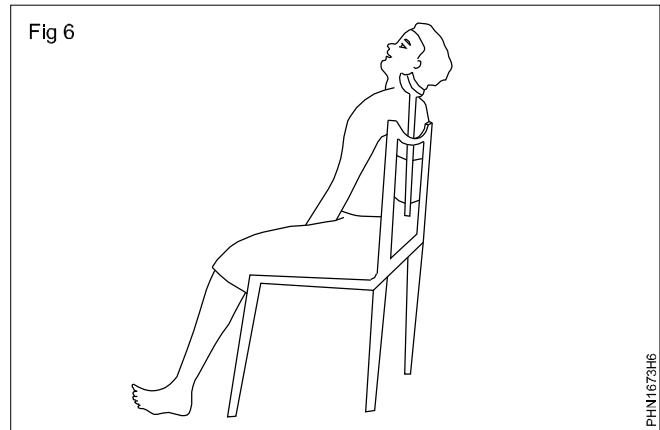


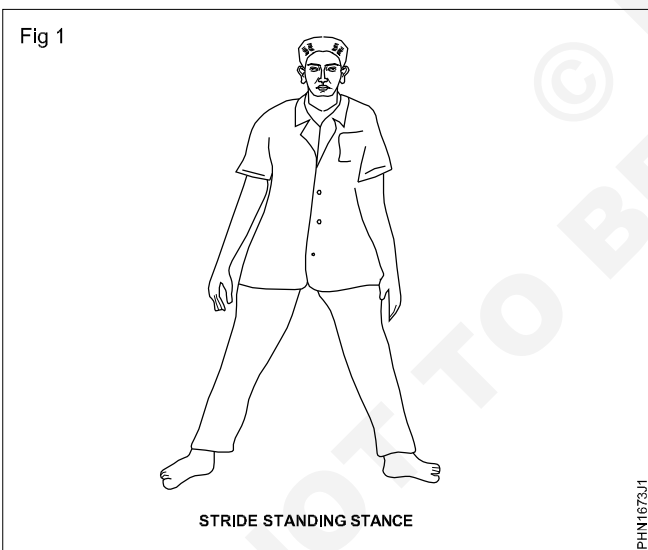
Fig 5
Patient's positioning for facial massage in sitting position (Fig 6)



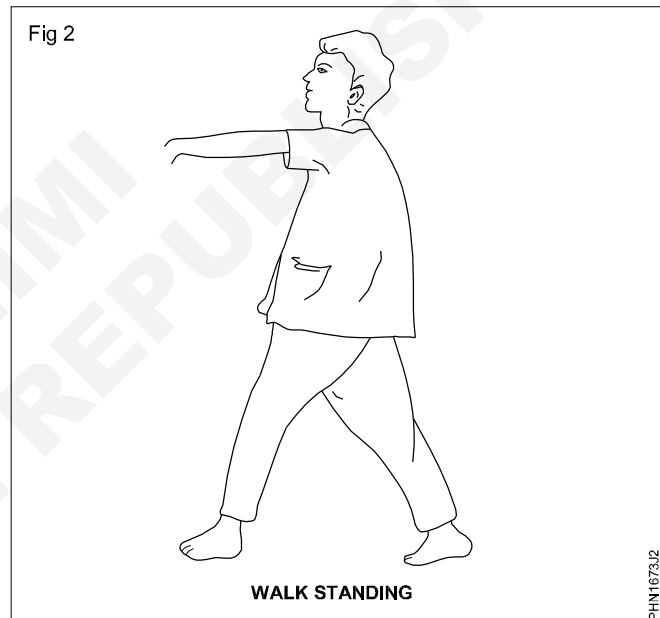
TASK 2: Position of Therapist

- 1 While performing massage, the therapist should adopt a position which can provide,
 - a Wide base to ensure proper stability during manipulations
 - b Free body movement to have rhythm and maintain the continuity of massage
 - c Effective use of the body weight to minimize muscle work while applying pressure.

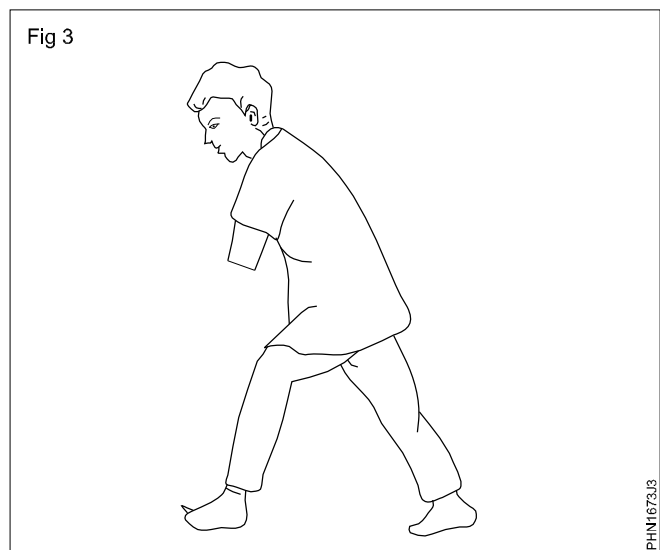
Stride standing stance (Fig 1)



2 Walk Standing (Fig 2)



3 Fall out standing (Fig 3)



Techniques used in massage for upper and lower limb

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the techniques used in massage for upper limb
 - demonstrate the techniques used in massage for lower limb.

Requirements	
Tools/Instruments	
• Chair/couch	- as reqd.
• Images/Figures	- as reqd.

PROCEDURE:

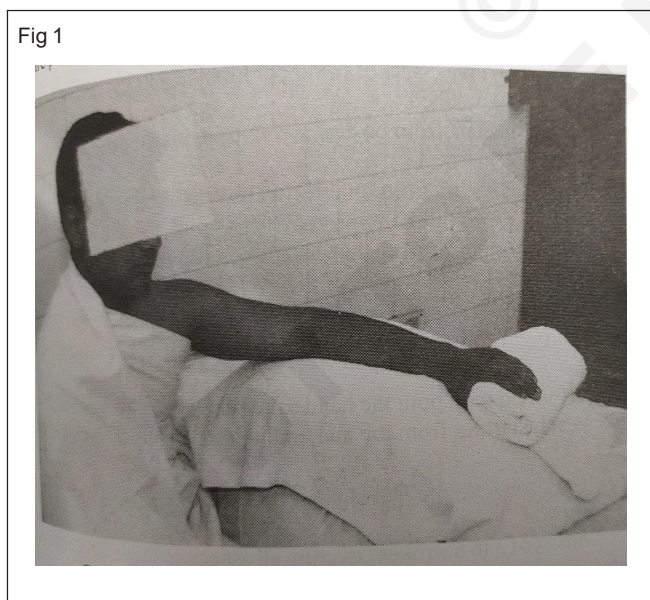
Note: Trainer will teach trainee regarding the various techniques used for massaging the upper limb and lower limb of patient's. The proper tools/ equipment need to be kept ready and the trainee should be able to demonstrate the same.

TASK 1: Sequence of the massage for upper limb

Superficial stroking: From shoulder to fingers 4 to 5 strokes covering all aspects of upper limb.

Effleurage: Performed with only one hand the other hand holds the patient's hand and changes the position of patient's forearm. Consist of 4 to 5 strokes each ends at axilla.

Preparation of patient for upper limb massage (Fig 1)



Strokes are performed in the following order:

Forearm Pronated

- 1 Starts from postero lateral border of hand – Ulnar border of forearm- medial, surface of arm- axilla
- 2 Dorsum of hand –Posterior surface of forearm- Posterior aspect of arm – axilla

Forearm Mid Pronated

- 3 Lateral border of hand including thumb –radial border of forearm – lateral surface of arm – axilla

Forearm supinated

- 4 Palm of hand –anterior surface of forearm – anterior aspect of arm- axilla
- 5 Antero –medial border of hand –antero medial aspect of forearm – medial surface of arm –axilla

Kneading

- a Double handed finger kneading – around shoulder joint
- b Single handed finger kneading – over deltoid
- c Alternated handed palmar kneading over –biceps and triceps
- d Palmer kneading – to upper part of forearm
- e Fingertip kneading – on the interosseous space
- f Thumb kneading – Over thenar and hypothenar eminences

Picking up

To deltoid – triceps –biceps –flexors of forearm and brachioradialis

Hacking

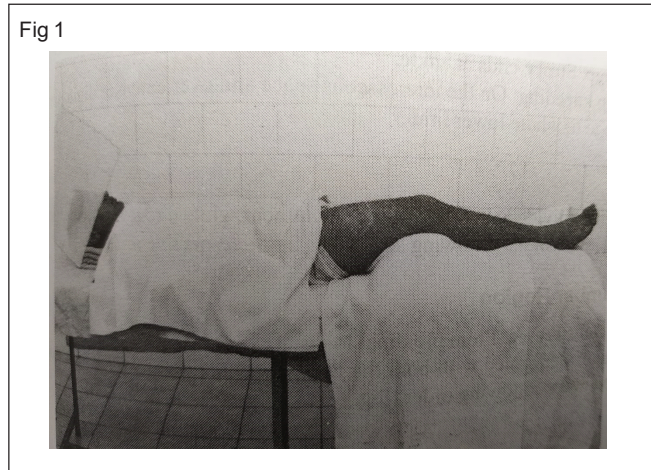
Forearm pronated: Start from posterior wall of axilla – Posterior deltoid – Triceps – Forearm extensors

Forearm supinated: Start from anterior wall of axilla –anterior deltoid –biceps – forearm flexors- palm

Effleurage to whole upper limb again (distal to proximal ending at axilla)

TASK 2: Sequence of massage for lower limb

Preparation of patient for lower limb massage (Fig 1)



LOWER LIMB:

Superficial stroking: From thigh to toe 3 to 6 strokes, covering all aspects of lower limb.

Effleurage: Performed with both the hands alternatively or simultaneously consist of 3 to 6 strokes each starting from toe and ending at the inguinal lymph nodes.

Over Thigh

Effleurage: Consist of 3 to 6 strokes covering all aspects of thigh. Stroke ends at inguinal lymph nodes.

Kneading : Double handed palmar kneading to

- i Antero- posterior aspect together
- ii Medio- lateral aspect together

Picking up: On quadriceps, adductors and hamstrings

Hacking

Beating

Effleurage

Over Knee

Effleurage: Performed by crossing both the hands above patella, stroke ends at the popliteal fossa.

Thumb kneading: Around margin of patella

Finger kneading: Around medial and lateral, collateral ligaments of knee joint

Over Leg

Effleurage: Starts from toe or ankle; stroke ends at popliteal fossa. Rotate the limb into lateral rotation to approach the postero- medial aspect of leg.

Over Calf muscles

Palmar kneading on the upper calf, thumb or finger kneading on the lower calf

Picking up

Hacking

Rotate the leg into medial rotation to approach the postero –lateral aspect of leg.

Over Tibial and Peroneal Muscles

Palmar kneading on the upper half/thumb or finger kneading on the lower calf.

Picking up

Hacking

Effleurage

Over Foot

Effleurage: Stroke ends at ankle.

Fingertip kneading: On the interosseous space and over extensor digitorum brevis.

Effleurage to whole lower limb.

Illustrate a practical of massage on face

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the techniques used for massage face
 - prepare the patient according to the treatment.

Requirements
Tools/Instruments
<ul style="list-style-type: none">• Chair/couch - as reqd.• Images/Figures - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the various techniques used for massaging the face of patient's. The proper tools/ equipment need to be kept ready and the trainee should be able to demonstrate the same.

TASK 1: Sequence of the massage for face

Effleurage: Consists of 4 strokes directed from midline of face to the submandibular lymph nodes performed in the following order:

- i Starts from midline of forehead- downward – below the ear
- ii From nose – cheeks – submandibular nodes
- iii From above and below mouth – submandibular gland
- iv From under chin – submandibular gland

Finger kneading: In the same line of the stroke of the effleurage

Wringing: Performed with pulp of index finger and thumb over the entire face

Skin rolling

Tapping

Vibration and kneading with one finger over the exist of trigeminal nerve i.e., supra orbital submental and infraorbital foramina and facial nerve, i.e, stylomastoid foramina

Effleurage

Elaborate methods of trunk massage

Objectives: At the end of this exercise you shall be able to

- demonstrate the techniques used for trunk massage
- prepare the patient according to the treatment.

Requirements	
Tools/Instruments	
• Chair/couch	- as reqd.
• Images/Figures	- as reqd.

PROCEDURE:

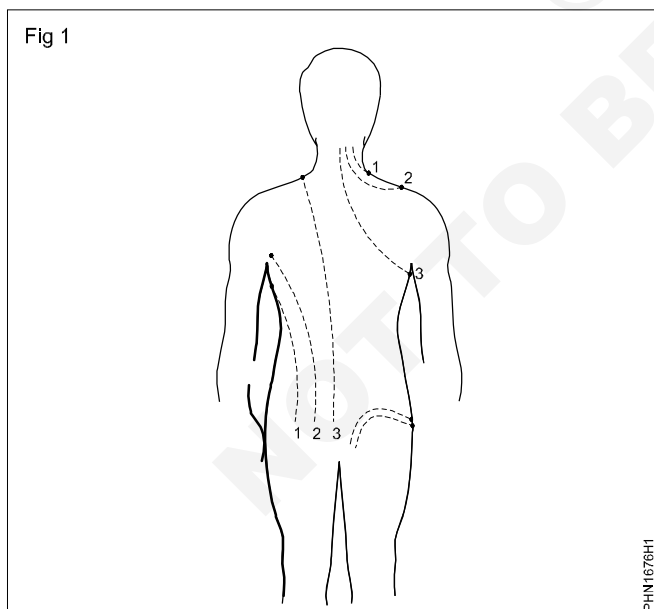
Note: Trainer will teach trainee regarding the various techniques used for massaging the trunk of patient's. The proper tools/ equipment need to be kept ready and the trainee should be able to demonstrate the same.

TASK 1: The back can be divided into 3 areas –thoracolumbar, gluteal region and the neck. Massage may be performed in the following sequences in the respective areas

Thoracolumbar region

- 1 Superficial stroking: From proximal to distal
- 2 Effleurage: Performed with both the hands working together, it consist of 3 strokes executed in the following order

Direction of effleurage strokes in the region of back (Fig 1)



- i Starts from the most lateral lumbar region- goes upto axilla
- ii Central lumbar region – upto axilla
- iii From posterior – superior iliac spine –midline of back –neck- supraclavicular nodes

Ironing: Over the entire back therapist should change his side while approaching the opposite side

Finger kneading: Over paravertebral area both the hands used simultaneously preferably starting from lower back and proceeding gradually toward, upper back.

Hacking: Entire back leaving the spinus processes and scapulae.

Beating or Pounding.

Skin rolling: From side to mid-line or vice-versa.

In mid line from distal to proximal.

For beginner, respiratory massage techniques i.e, clapping, vibration and shaking can be included in massage of upper thoracic region for the sake of mastering the techniques.

Gluteal region

Effleurage: Consists of 3 curved strokes performed with one hand, each stroke ends at the groin. Direction of strokes is from PSIS to iliac crest upward and from iliac crest to groin obliquely downward inorder to terminate at inguinal lymph nodes.

Palmar kneading: Over gluteal muscles

Ironing

Finger kneading: Over the margin of illiac crest

Picking up

Wringing

Hacking

Effleurage

Neck

Effleurage: Performed with palmar aspect of adducted fingers. It consists of 3 strokes in the following order. The direction of stroke is from upper to lower neck

Side of neck: Supraclavicular area

Back of neck : Supraclavicular area

Midline –side of neck – scapular muscle –axilla

Finger pulp kneading to -occiput, upper trapezius – midscapular muscles

Picking up – to upper fibre of trapezius

Hacking

Effleurage

© NIMI
NOT TO BE REPUBLISHED

Precautions while giving massage

- Objectives:** At the end of this exercise you shall be able to
- identify the preventive measures before providing massage
 - identify the safety measures while giving massage treatment.

Requirements
<p>Tools/Instruments</p> <ul style="list-style-type: none"> • A4 sheet, paper, charts - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preventive measures to be taken care for various massage treatments as dealt in theory. They should able to learn the same and plan and prepare the treatment procedures according to the condition of the patient.

TASK 1: a) List down the preventive measures to be taken care during different massage

General	Local
High fever Several renal or Deep x-ray therapy Severe spasticity Very hairy skin	Acute inflammation. Skin disease. cardiac disease Recent fractures, Osteoporosis, Severe varicose veins. Atherosclerosis. Thrombosis, Patient's preference, Myositis ossificans. Malignancy. Open wound.

Rules and direction of massage

- Objectives:** At the end of this exercise you shall be able to
- identify the rules for providing massage to the patient
 - demonstrate the direction of massage according to the treatment.

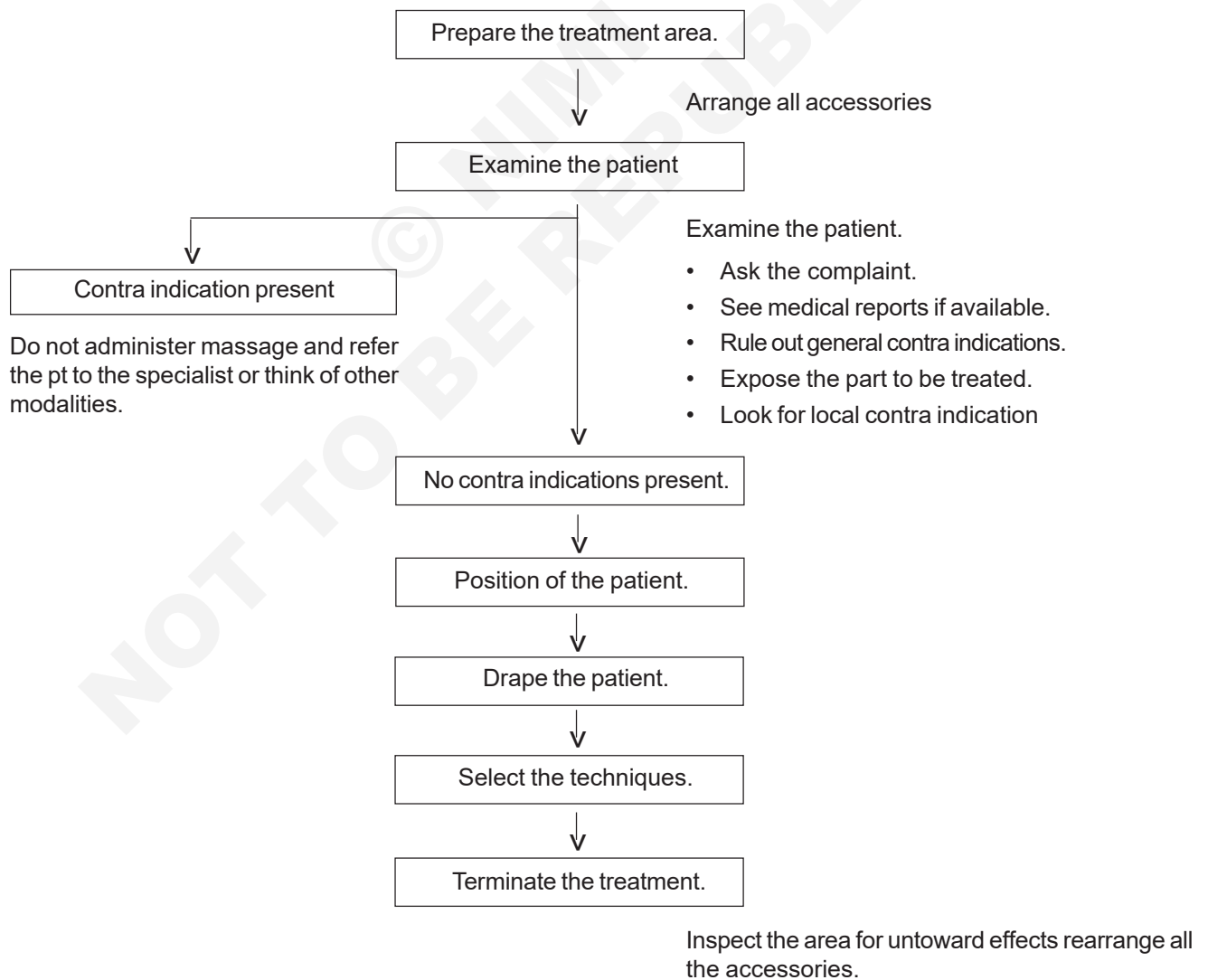
Requirements	
Tools/Instruments	
• A4 sheet, paper, charts	- as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding rules for providing massage to the patient. The trainee should also be able to demonstrate the direction of massage according to the treatment.

TASK 1: a) List the rules to be taken care during massage treatment for patient

Flow chart of massage treatment.



TASK 2: a) Demonstrate the direction of massage treatment on the patient and perform the same

Technique	Salient features
Streaking	Linear movements of hand or parts thereof, along the entire length of segment, with the lightest pressure and constant touch
Effleurage	Linear movement of hand or a part thereof, along the entire length of segment, with moderate pressure and constant touch
Kneading	Circular movements of soft tissue, parallel to the long axis of underlying bone, with constant touch and intermittent pressure.
Petrissage	Circular movements of soft tissue, perpendicular to the long axis of underlying bone, with constant touch and intermittent pressure.
Friction	Small range to and fro movement of soft tissue with constant touch and constant deep pressure.
Percussion	Oscillatory movement of hand or a part thereof with intermittent touch and pressure.
Shaking	Small range oscillatory movement of hands in sideways directions with constant touch.

© NIMI
NOT TO BE REPRODUCED

Direction of using materials (oil, powder, etc...) during massage

Objectives: At the end of this exercise you shall be able to

- demonstrate the direction of using oil for patients
- demonstrate the direction using powder during massage.

Requirements

Tools/Instruments

- A4 sheet, paper, charts - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding direction of using materials (oil, powder) for patient during massage. The trainee should also be able to demonstrate the direction of using materials according to the treatment.

TASK 1: a) Demonstrate the direction of using oil during massage for patient and perform the same

Oils

Oil is helpful when the skin is dry and scaly.

Most commonly used oils are edible oils (mustard and coconut oil, olive oil, etc) mineral oil (liquid paraffin) and some medical oils.

(The direction of massage is same as described in the previous chapter.)

Please include the same here.

TASK 2: b) Demonstrate the direction of using powder during massage for patient and perform the same

Powder

Preferably it should be a non-perfumed one, as many people are allergic to the fragrance. French chalk or talcum powders are commonly used in the presence of profuse sweating as it is readily absorbs the moisture.

(The direction of massage is same as described in the previous chapter.)

Therapeutic application of massage

Objectives: At the end of this exercise you shall be able to

- identify methods of application of therapeutic massage
- demonstrate the application of the above techniques to different patients.

Requirements

Tools/Instruments

- Therapeutic tools setup - as reqd.
- A4 sheet, charts. Sketch, Pencils, etc... - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the various methods of application of therapeutic massage as dealt in theory. They should be able to learn the same and demonstrate the application of these massage according to the patient's body conditions.

TASK 1: Write down the preparation of therapeutic massage according to the condition of the patients

Forearm Pronated

- 1 Starts from postero lateral border of hand - Ulnar border of forearm- medial, surface of arm- axilla.
- 2 Dorsum of hand -Posterior surface of forearm- Posterior aspect of arm - axilla.

Forearm Mid Pronated

- 1 Lateral border of hand including thumb -radial border of forearm - lateral surface of arm - axilla.

Forearm supinated

- 1 Palm of hand -anterior surface of forearm - anterior aspect of arm- axilla.
- 2 Antero -medial border of hand -antero medial aspect of forearm - medial surface of arm -axilla.

Kneading

- 1 Double handed finger kneading - around shoulder joint
b Single handed finger kneading - over deltoid.

- 2 Alternated handed palmar kneading over -biceps and triceps.
- 3 Palmer kneading - to upper part of forearm.
- 4 Fingertip kneading - on the interosseous space.
- 5 Thumb kneading - Over thenar and hypothenar eminences.

Picking up

To deltoid - triceps -biceps -flexors of forearm and brachioradialis.

Hacking

Forearm pronated: Start from posterior wall of axilla - Posterior deltoid - Triceps - Forearm extensors.

Forearm supinated: Start from anterior wall of axilla -anterior deltoid -biceps - forearm flexors- palm.

Effleurage to whole upper limb again (distal to proximal ending at axilla).

TASK 2: Demonstrate the application of these massage to various patients and perform the same

Oils

Oil is helpful when the skin is dry and scaly.

Most commonly used oils are edible oils (mustard and coconut oil, olive oil, etc) mineral oil (liquid paraffin) and some medical oils.

(The direction of massage is same as described in the previous chapter.)

Please include the same here.

Powder

Preferably it should be a non-perfumed one, as many people are allergic to the fragrance. French chalk or talcum powders are commonly used in the presence of profuse sweating as it is readily absorbs the moisture.

(The direction of massage is same as described in the previous chapter.)

Show positioning of patient and therapist

- Objectives:** At the end of this exercise you shall be able to
- position the patient according to the treatment
 - position of therapist.

Requirements

Tools/Instruments

- Therapeutic setup - as reqd.
- Images/Figures - as reqd.
- Couch - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the various positioning of patient according to their treatment and the trainee should be able to demonstrate the position of therapist for the respective treatment.

TASK 1: Teach the positioning of patient according to the therapeutic treatment

Position for IRR (for both front and back pain) (Fig 1)



Application

- 1 At the commencement of the treatment, Intensity of the radiation should be low but after 5-10 minutes (after vasodilatation) strength of radiation can be increased.
- 2 Physiotherapists should be near the patient throughout the treatment. (Fig 2)
- 3 Sweating is encouraged.

Fig 2



Note: The patient should be placed for the appropriate treatment.

Perform practical of different exercises

Objectives: At the end of this exercise you shall be able to

- demonstrate the benefits of exercise
- perform the therapeutic exercises.

Requirements

Tools/Instruments

- Images/Figures - as reqd.
- Couch - as reqd.

PROCEDURE:

TASK 1: a) Demonstrate the benefits of exercise

Note: Trainer will teach trainee regarding the various benefits of exercise and the trainee should be able to perform the therapeutic exercises on the patients and examine the improvement.

TASK 2: b) Perform the therapeutic exercises on the patient and examine the improvement

- 1 Passive movements
 - 2 Active movements
 - 3 Strengthening exercise
-

Rules and directions of exercises

Objectives: At the end of this exercise you shall be able to

- **demonstrate the rules of exercises**
- **demonstrate the direction of carrying out exercise.**

Requirements
Tools/Instruments <ul style="list-style-type: none">• Therapist setup - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the rules of exercises and the trainee should able to demonstrate the direction of carrying out exercise.

TASK 1: Practical suggestions for effective exercise instruction

- | | |
|---|---|
| 1 Select a non-distracting environment for exercise instruction. | 6 Have the patient demonstrate an exercise to you as you supervise and provide feedback. |
| 2 Demonstrate the proper performance of an exercise. Then have the patient model your movements. | 7 Provide specific, action related feedback rather than general non-descriptive feedback.. |
| 3 If appropriate or feasible, initially guide the patient through the desired movement. | 8 Teach an entire exercise program in small increments to allow time for a patient to practice and learn components of the program over several visits. |
| 4 Use clear and concise verbal and written directions. | |
| 5 Compliment written instructions for a home exercise program with illustrations of the exercise. | |
-

TASK 2: Instructional strategies

- | | |
|--|--|
| 1 Identify the purpose of the exercise or functional task. | 6 Practice only a few motor tasks. Keep repetitions low an alternate tasks to ensure safety and avoid fatigue. |
| 2 Demonstrate the movements. | 7 Provide frequent and explicit positive feedback. |
| 3 Initially guide or assist the patient through the movements. | 8 Use a variety of forms of feedback. |
| 4 Point out the distance and speed of the movement. | 9 Introduce a concept of self-evaluation and self-correction of movements. |
| 5 Break complex movements into parts when appropriate. | 10 Allow trial and error to occur within safe limits. |
-

Demonstrate exercise to increase ROM by using continuous passive movement equipments

Objectives: At the end of this exercise you shall be able to

- demonstrate the exercise to increase ROM using continuous motion device
- perform exercise using the equipment.

Requirements

Tools/Instruments

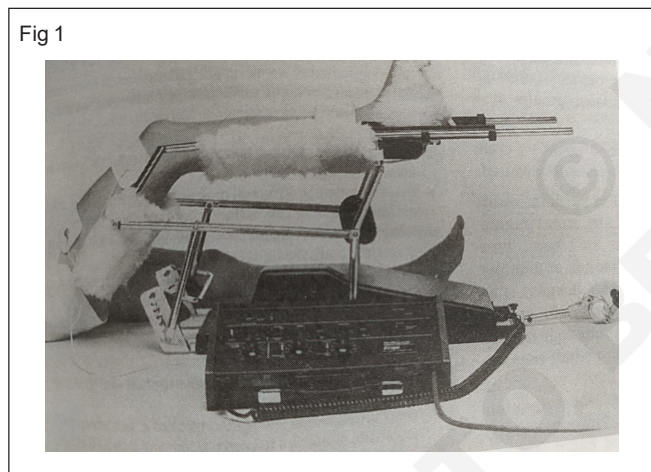
- Continuous motion device - 1 No.

PROCEDURE:

Note: Trainer will teach trainee regarding the operation of continuous passive movement equipments and the trainee should be able to perform the exercise using continuous motion device.

TASK 1: Operate the below equipment on patient to increase ROM based on the general guidelines provided below

Continuous motion device (Fig 1)



Continuous passive motion (CPM) refers to passive motion that is performed by a mechanical device that moves a joint slowly and continuously through a controlled range of motion.

General Guidelines

- 1 The device may be applied to the involved extremity immediately after surgery while the patient is still under anesthesia or as soon as possible if bulky dressings prevent early motion.
- 2 The rate of motion is determined usually 1 cycle 45 seconds or per 2 minutes is well tolerated.
- 3 The amount of time on the CPM machine varies for different protocols; anywhere from continuous for 24 hours to continuous for 1 hour; three times a day.
- 4 Duration minimum for CPM is usually less than 1 week or when a satisfactory range of motion is reached.

Presentation of passive movements manually

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the techniques to apply passive movements
 - perform the passive movements manually to the patients.

Requirements	
Tools/Instruments	
• Passive exercise setup	- as reqd.
• Couch	- as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the demonstrate the techniques to apply passive movements and perform the passive movements manually to the patients.

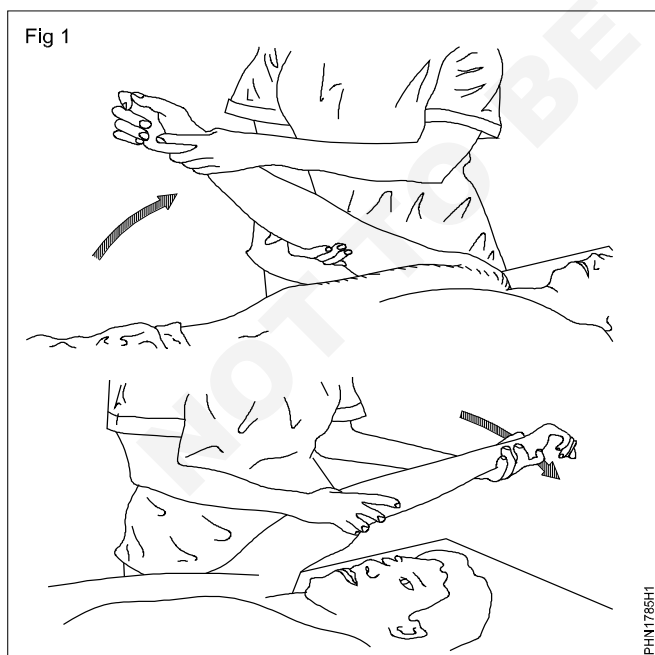
Upper extremity

TASK 1: a) Shoulder: Flexion and Extension

Hand Placement and Procedure

- 1 Grasp the patient's arm under the elbow with your lower hand
- 2 With the top hand, cross over and grasp the wrist and palm of the patient's hand
- 3 Lift the arm through the available range and return

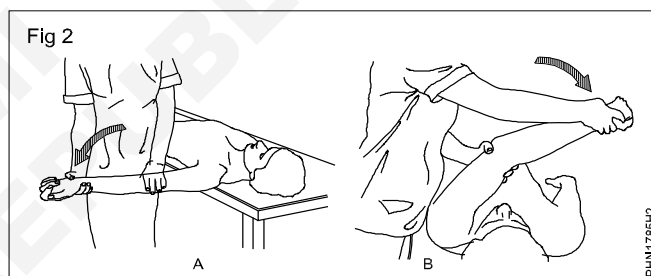
Hand placement and positions for initiating and completing shoulder flexion (Fig 1)



Shoulder: Abduction and Adduction

Hand Placement and Procedure: Use the same hand placement as with flexion but move the arm out to the side. The elbow may be flexed.

Abduction and adduction of the shoulder (Fig 2)

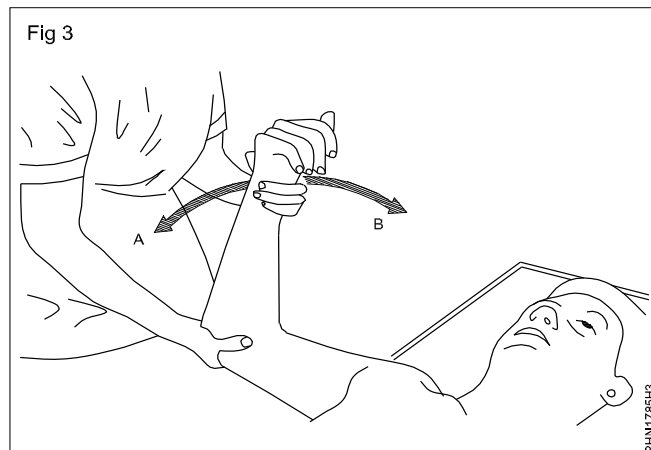


Shoulder: Internal and External Rotation

Hand Placement and Procedure

- 1 Grasp the hand and the wrist with your index finger between the patient's thumb and index finger.
- 2 Place your thumb and the rest of your fingers on either side of the patient's wrist.
- 3 With the other hand stabilize the elbow.
- 4 Rotate the humerus by moving the forearm like a spoke on a wheel.

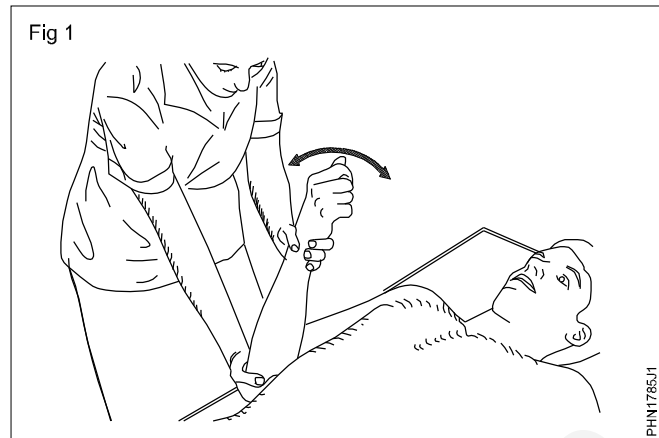
Position for initiating internal and external rotation of the shoulder (Fig 3)



TASK 2: b) Elbow: Flexion and Extension

Hand Placement and Procedure: Hand placement is the same as with shoulder flexion except the motion occurs at the elbow as it is flexed and extended.

Elbow flexion and extension (Fig 1)



TASK 2: c) Forearm: Pronation and Supination

Hand Placement and Procedure

- 1 Grasp the patient's wrist, supporting the hand with the index finger and placing the thumb and the rest of the finger on either side of the distal forearm.
- 2 Stabilise the elbow with the other end.
- 3 The motion is a rolling of the radius around the ulna at the distal radius.

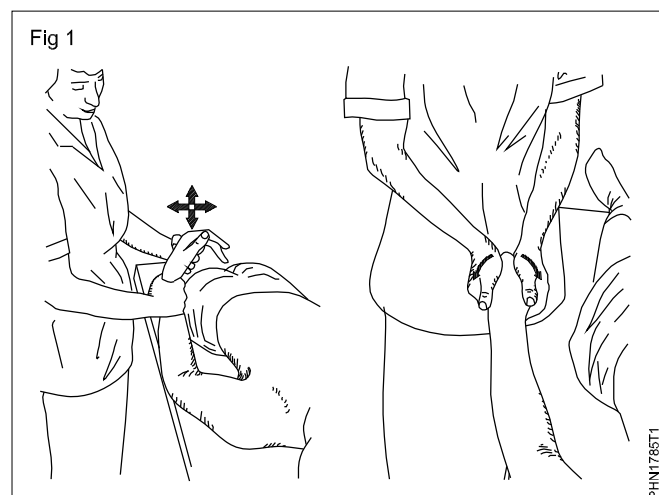
Pronation and supination of forearm (Fig 2)



TASK 3: Wrist: Flexion and Extension. Radial and Ulnar deviation

Hand Placement and Procedure: For all wrist motion, grasp the patient's hand just distal to the joint with one hand, and stabilize the forearm with your other hand.

Range of motion at the wrist (Fig 1)

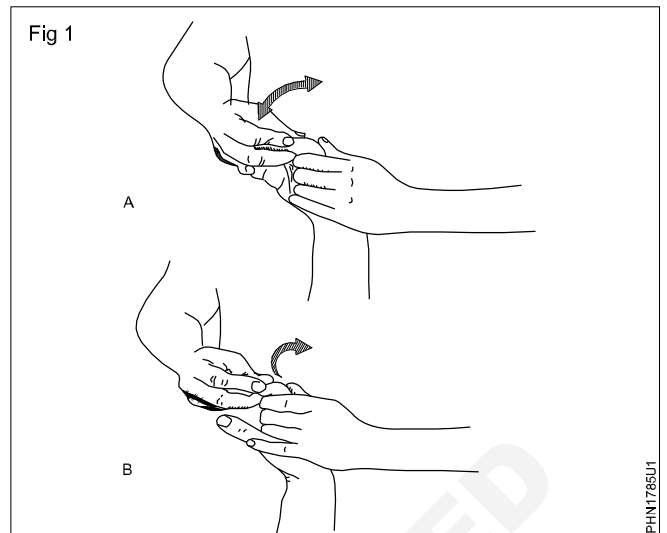


TASK 4: Joints of thumb and Fingers: Flexion and Extension and Abduction and Adduction

Hand Placement and Procedure

- 1 Depending on the position of the patient, stabilize the forearm and hand on the bed or table or against your body.
- 2 Move each joint of the patient's hand by stabilizing the proximal bone with the index finger and thumb of one hand and moving the distal bone with the index finger and thumb of the other hand.

ROM to the metacarpophalangeal joint of the thumb and interphalangeal joint of a finger. (Fig 1)



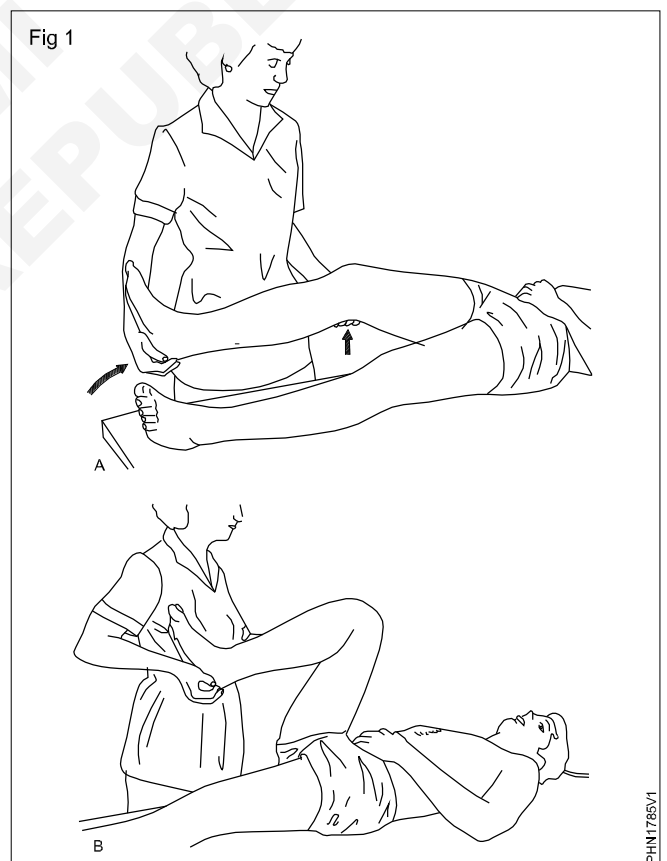
Lower Extremity

TASK 1: a) Hip: Flexion and Extension

Hand Placement and Procedure

- 1 Support and lift the patient's leg with the palm and fingers of the top hand under the patient's knee and the lower hand under the heel.
- 2 As the knee flexes full range, swing the fingers to the side of the thigh.

Hip: Flexion and Extension. (Fig 1)

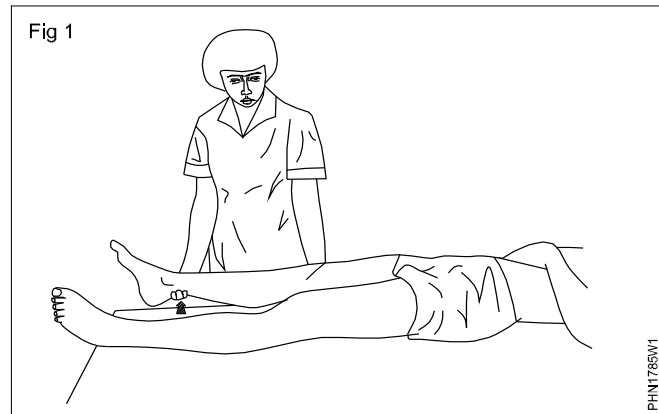


TASK 2: b) Hip: Abduction and Adduction

Hand Placement and Procedure

- 1 Support the patient's leg with the upper hand under the knee and the lower hand under the ankle.
- 2 For full range of adduction, the opposite leg needs to be in a partially abducted position.
- 3 Keep the patient's hip and knee in extension and neutral to rotation as abduction and adduction are performed.

Abduction and Adduction of hip. (Fig 2)

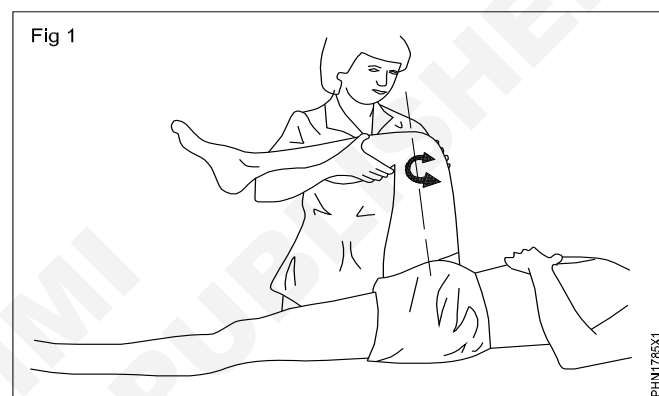


TASK 3: Hip: Internal and External Rotation

Hand Placement and Procedure

- 1 Flex the patient's hip and knee to 90 degrees; support the knee with the top hand.
- 2 Cradle the thigh with the bottom arm and also support the proximal calf with the bottom hand.
- 3 Rotate the femur by moving the leg like a pendulum.

Internal and External Rotation of hip. (Fig 1)

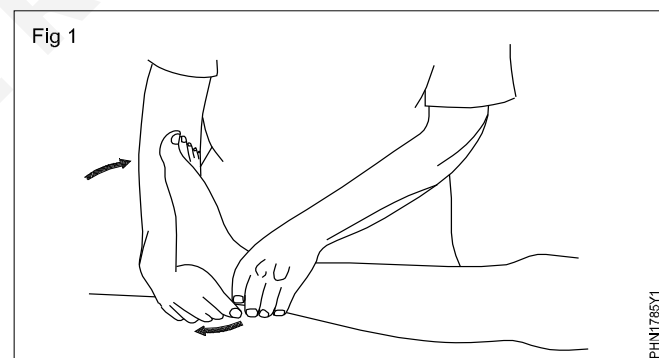


TASK 4: Ankle: Dorsiflexion and Plantarflexion

Hand Placement and Procedure

- 1 Support the heel with the bottom hand.
- 2 Place the top hand on the dorsum of the foot and push it into dorsiflexion and plantarflexion.

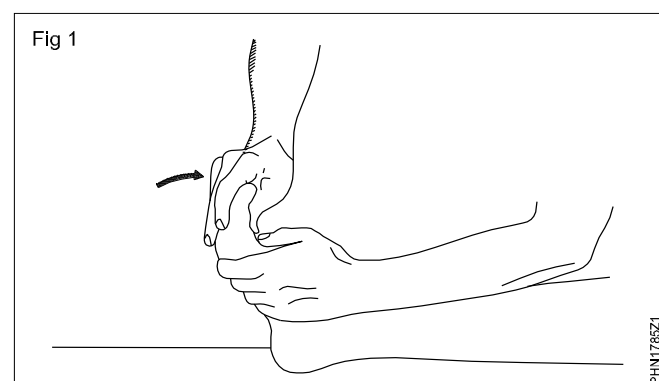
Dorsiflexion and Plantarflexion of ankle. (Fig 1)



TASK 5: Joints of the Toes: Flexion and Extension, Abduction and Adduction“Hand Placement and Procedure

- 1 With one hand, stabilise the bone proximal to the joint that is to be moved and move the distal bone with the other hand.
- 2 The technique is the same as with ROM of the fingers.

Movement of joints of toes. (Fig 1)



Assessment of range of motion of major joints by using goniometer scales

Objectives: At the end of this exercise you shall be able to

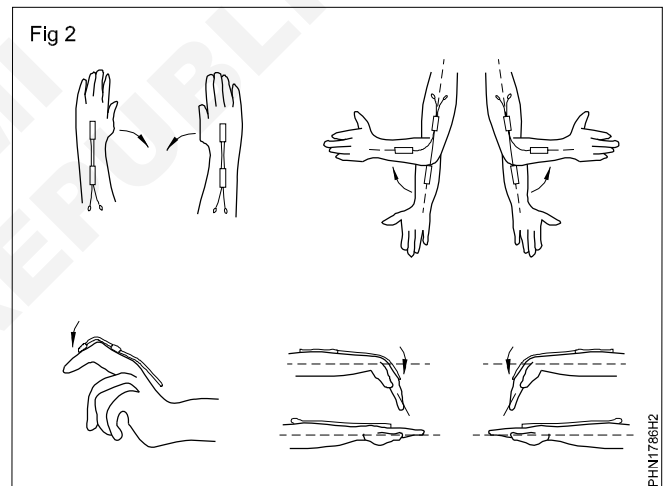
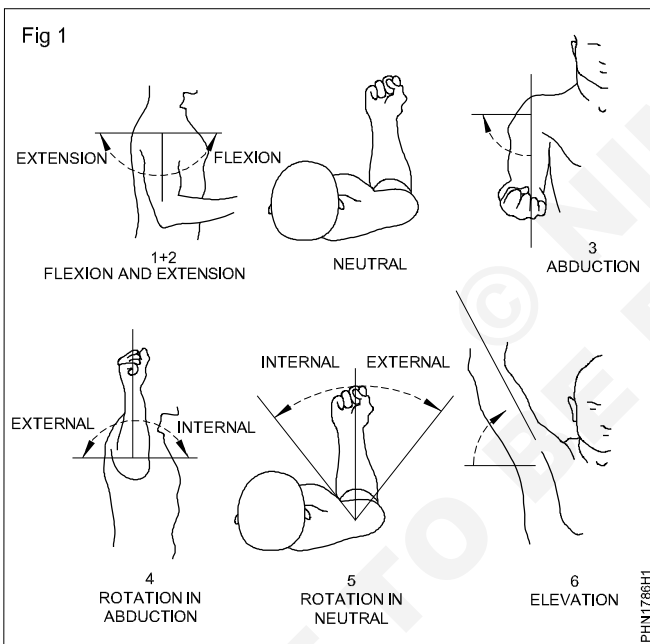
- demonstrate the assessment of joints by goniometer scales
- perform the assessment to the patients.

Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Goniometer Scale	- 1 No.

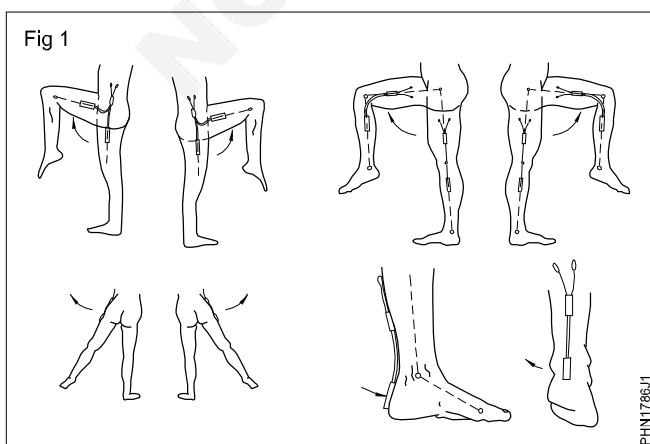
PROCEDURE:

Note: Trainer will teach trainee regarding the demonstrate the assessment of joints by goniometer scales and perform the assessment to the patients.

TASK 1: Refer figure 1 and figure 2 to carry out upper extremity movements for the patients



TASK 2: Refer figure 1 to carry out upper extremity movements for the patients



Note: Please refer the Standard values of joints represented below.

Table 1 – Standard values

joint	Motion	Normal Values
Cervical	Flexion	0-45°
	Extension	0-45°
	Lateral rotation	0-60°
	Lateral bending	0-45°
Shoulder	Flexion	0-180°
	Extension	0-60°
	Abduction	0-180°
	Internal rotation	0-90°
	External rotation	0-90°
Elbow	Flexion	0-150°
	Extension	0-150°
Forearm	Pronation	0-90°
	Supination	0-90°
Wrist	Flexion	0-80°
	Extension	0-70°
	Radial deviation	0-20°
	Ulnar deviation	0-30°
Hip	Flexion	0-120°
	Extension	0-10°
	Abduction	0-45°
	Adduction	0-30°
	External rotation	0-45°
	Internal rotation	0-45°
Knee	Flexion	0-135°
	Extension	0-135°
Ankle	Dorsiflexion	0-20°
	Plantarflexion	0-40°
	Inversion	0-35°
	Eversion	0-35°

Perform measurement of spine ROM by using inch tape

- Objectives:** At the end of this exercise you shall be able to
- perform measurement of spine ROM by using inch tape
 - evaluate the improvement of the patient after therapy.

Requirements

Tools/Instruments

- Preparation of patient
- Preparation of therapist
- Inch tape

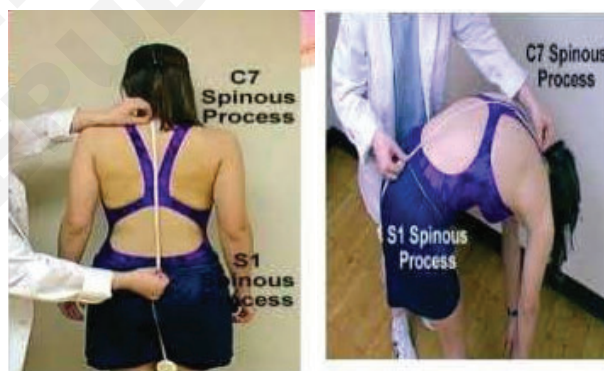
PROCEDURE:

Note: Trainer will teach trainee regarding the measurement of spine ROM by using inch tape and evaluate the improvement of the patient after therapy.

TASK 1: Measurement of trunk flexion (Fig 1)

- 1 Starting position: the tape is placed proximally on the spinous process of C7 and distally to Si.
- 2 Ending position: following flexion of the vertebrae using the same landmark.
- 3 Calculate the difference in distance between starting and ending positions.
- 4 ROM approximately 4 in.
- 5 The difference between starting and ending position.

Fig 1

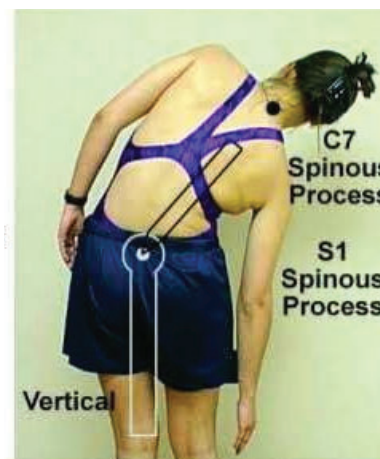


TASK 2: Measurement of thoracic and lumbar lateral flexion (Fig 1)

Thoracic and lumbar lateral flexion

- 1 Position
- 2 Standing erect
- 3 Axis - Si spinous process
- 4 Stationary arm - vertical
- 5 Moving arm - C7 spinous process
- 6 Stabilization
- 7 The pelvis is stabilized

Fig 1



TASK 3: Trunk hyperextension (Fig 1)

- 1 The tape alignment is just the same as for trunk flexion.
- 2 ROM 2 inches

Precautions

- 1 Prevent hip extension
- 2 Prevent trunk rotation

Factors Limiting ROM

- 1 Tension of anterior abdominal muscles (muscles of trunk flexion)
- 2 Contact of spinous processes.
- 3 Tension of longitudinal ligament of spine.



TASK 4: Cervical movements (Fig 1)



Note: Please refer the Standard values of joints represented below

	Cervical	Thoracic	Lumbar
Flexion	0-60	0-50	0-60
Extension	0-75	0-45	0-25
Lateral flexion	0-45	0-40	0-25
Rotation	0-80	0-30	0-18

Exhibit active and active assisted movements

Objectives: At the end of this exercise you shall be able to

- exhibit active movements to the patients
- exhibit active assisted movements to the patients.

Requirements

Tools/Instruments

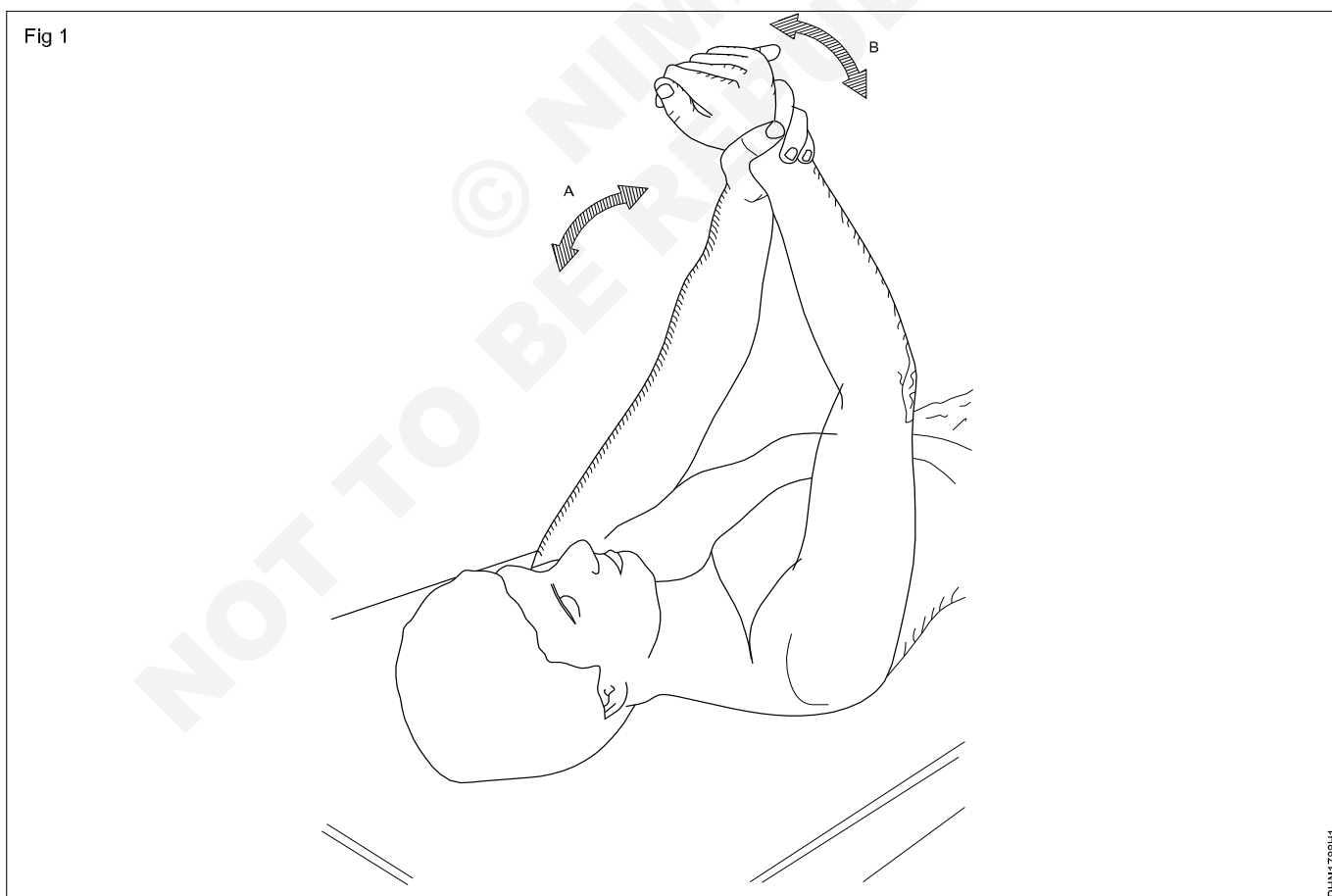
- Therapist setup - as reqd.
- Couch - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the active and active assisted movements to the patients and perform the same on the patient.

TASK 1: Upper extremity

Patient giving self-assisted range of motion to a) shoulder flexion and extension; b) horizontal abduction and adduction. (Fig 1)



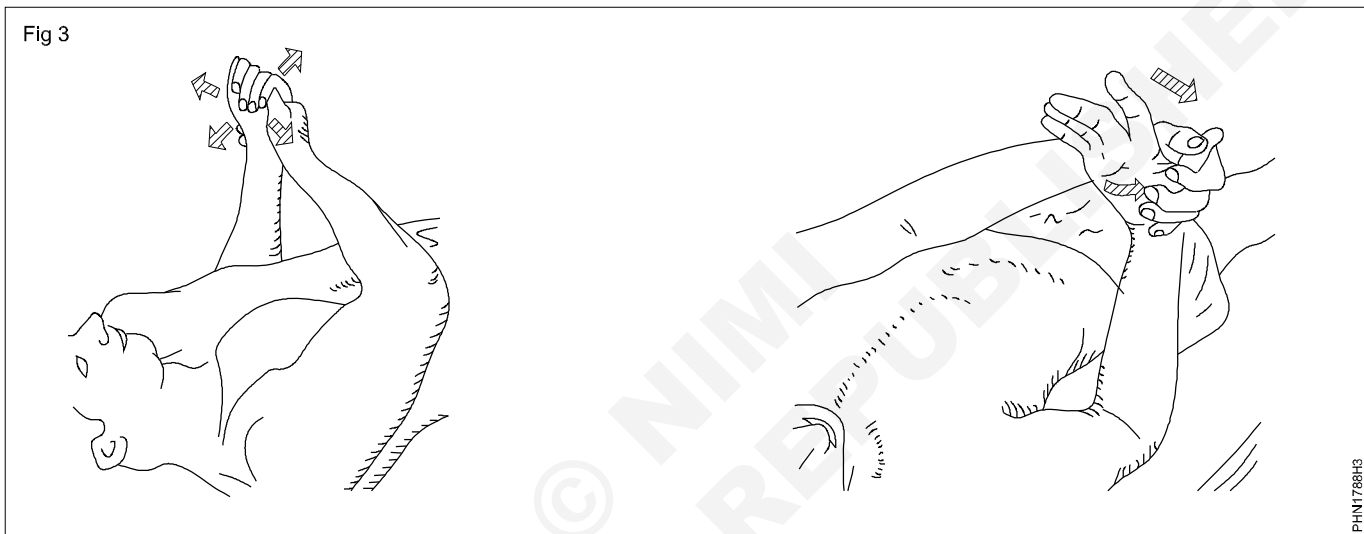
Step 1: Patient position (supine lying). Ask the patient to do self-assisted exercises as per the postures provided in the above figure 1.

Arm position of patient for giving self-assisted ROM to internal and external Rotation of shoulder.

Patient applying self- Assisted finger flexion to and extension. (Fig 2)



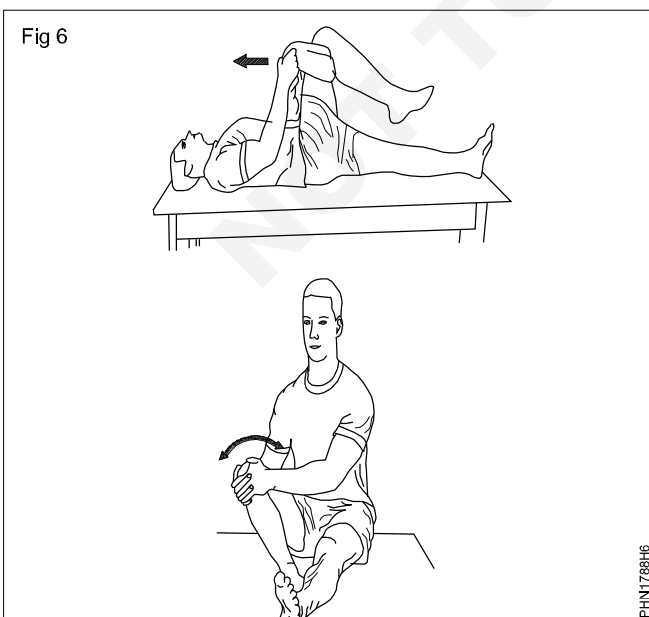
Patient applying self-assisted wrist motions and Thumb extension. (Fig 3)



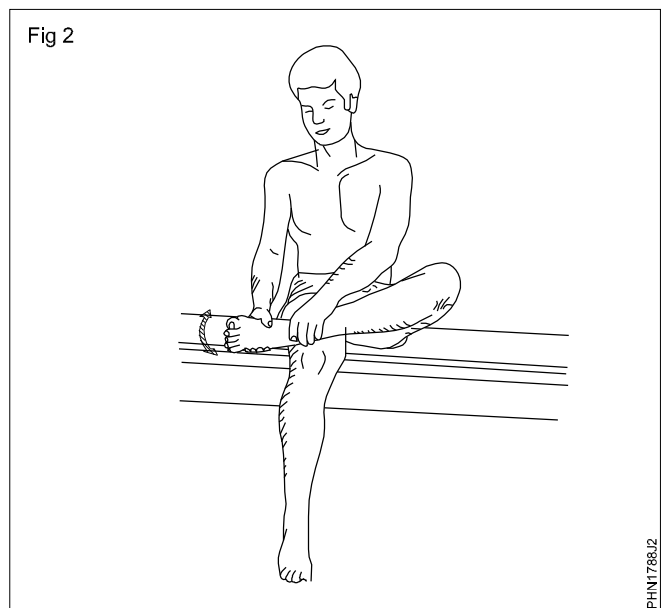
Step 2: The patient should perform the exercise by himself by using the unaffected limb.

TASK 2: Lower extremity

Self-assisted ROM of the hip a) flexion b) abduction and external rotation. (Fig 1)

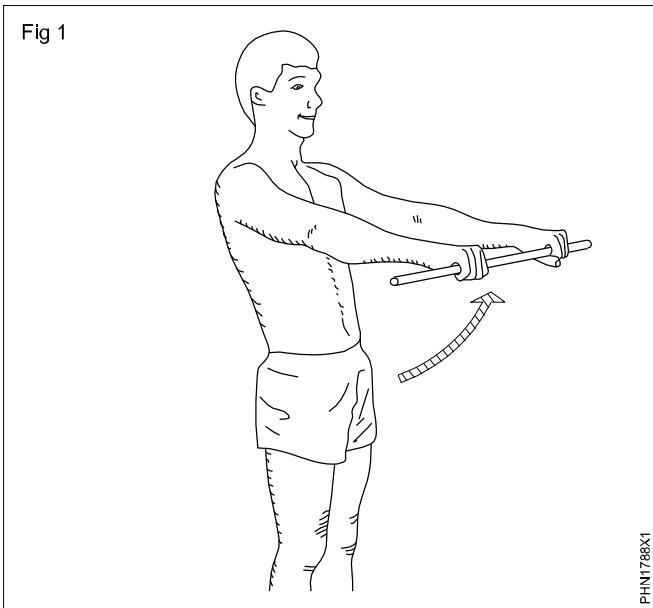


Self assisted angle motions. (Fig 2)

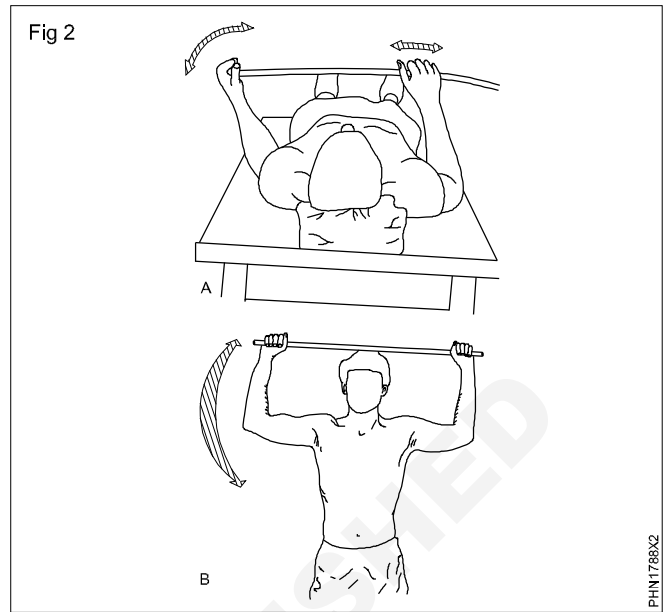


TASK 3: Wand (T-bar) exercise

Patient using a wand for self-assisted shoulder flexion. (Fig 1)

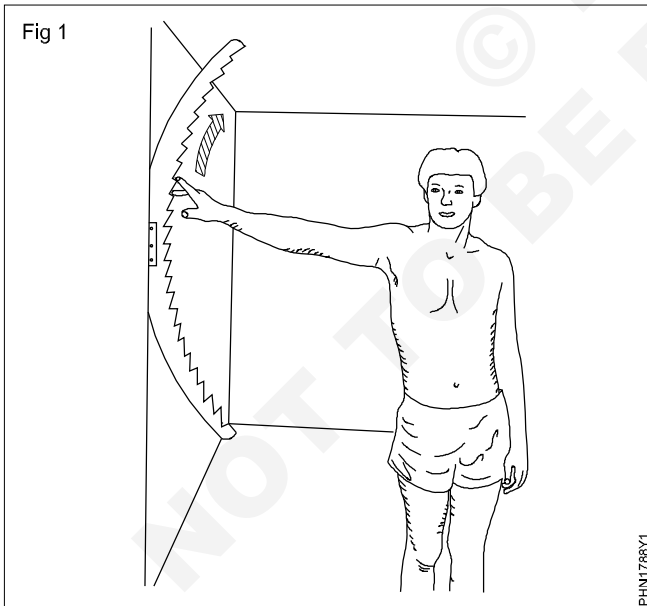


Self-assisted shoulder rotation. (Fig 2)

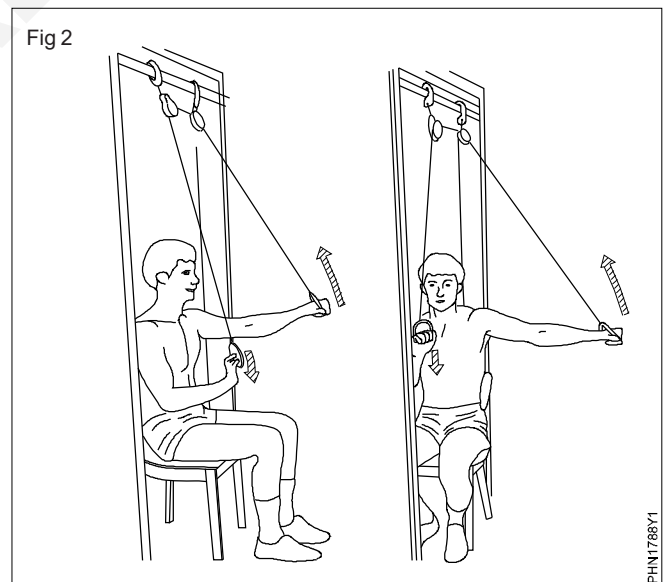


TASK 4: Ladder/ Wall Climbing

Shoulder abduction using a finger ladder. (Fig 1)



a) shoulder flexion and b) abduction using overhead pulleys to assist the motion. (Fig 2)



Illustrate strengthening exercises by using weight cuffs for upper and lower limb joints

Objectives: At the end of this exercise you shall be able to

- illustrate strengthening exercises by using weight cuffs for upper limb joints
- illustrate strengthening exercises by using weight cuffs for lower limb joints.

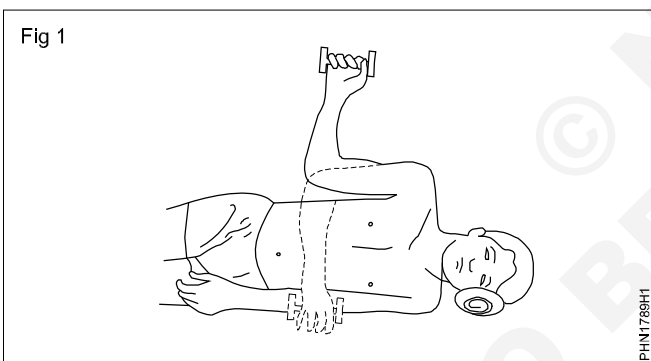
Requirements	
Tools/Instruments	
• Therapist setup	- as reqd. • Weight cuffs
	- as reqd.

Note: Trainer will teach trainee regarding the strengthening exercises by using weight cuffs for upper limb and lower limb joints and ask the trainee to perform the same on the patients.

TASK 1: Upper limb

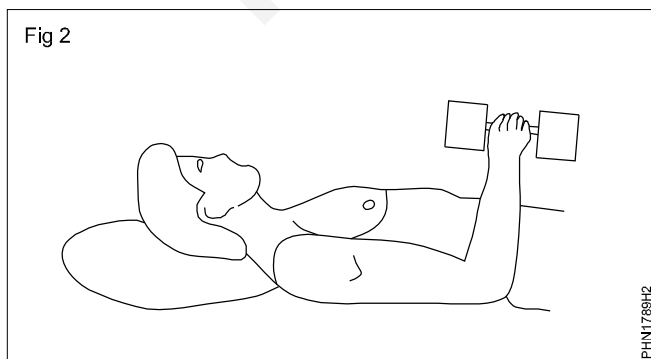
External Rotation (Fig 1): These muscles are small and generally can tolerate less weight than those that perform internal rotation.

Holding on to a resisted band or pulley, rotate your upper arm away from your body without moving your elbow forward or backward. Again, imagine your arm is on a rotisserie. Return to the start position.



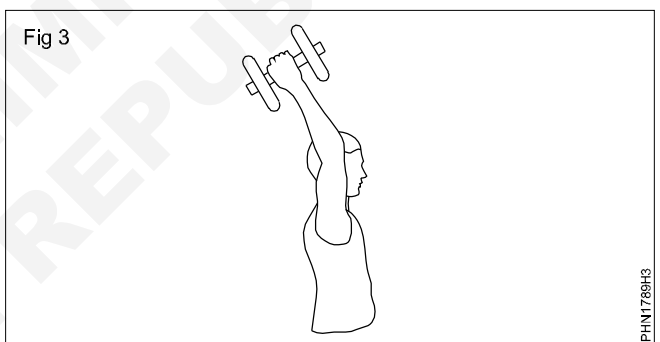
Internal Rotation (Fig 2): It is best to perform internal rotation first to assist in setting the ball in the socket—or the head of your humerus in the shoulder joint.

Holding on to a resisted band or pulley, rotate your upper arm toward your body without moving your elbow forward or backward. Think of that upper arm spinning as if it is on a rotisserie. Return to the start position.



Shoulder flexion (Fig 3): Stand facing a wall. Slowly walk your fingers up the wall until you feel a stretch. Hold the stretch for 30 seconds. Return to the starting position.

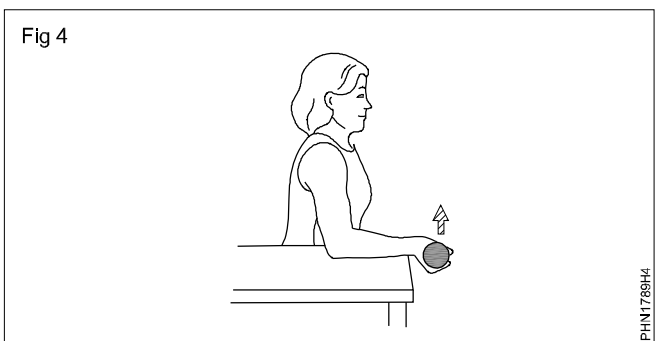
Strengthening the wrist



Wrist extension (Fig 4): To start the wrist strengthening exercises, sit in a chair with your forearm resting on a table. Hang your wrist and hand over the edge of the table.

Hold a two- or three-pound dumbbell in your hand with your palm facing down and slowly lift your hand so the back of your hand moves towards the ceiling. Your forearm should remain on the table.

Once your wrist is fully extended, hold the end position for a few seconds, then slowly lower your hand down. Repeat this motion for 10 to 15 repetitions, and perform two to three sets.

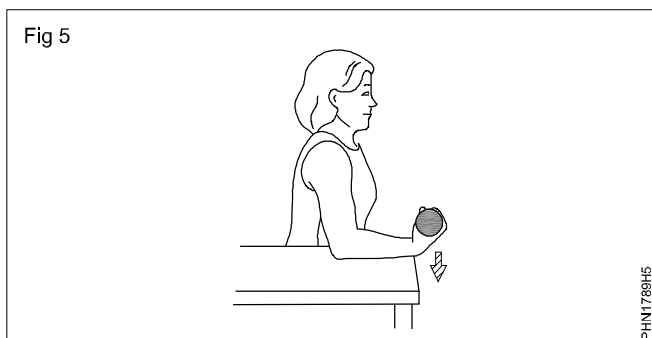


Wrist flexion (Fig 5): After performing wrist extensions, continuing resting your forearm on the table and turn your hand over so your palm is facing the ceiling.

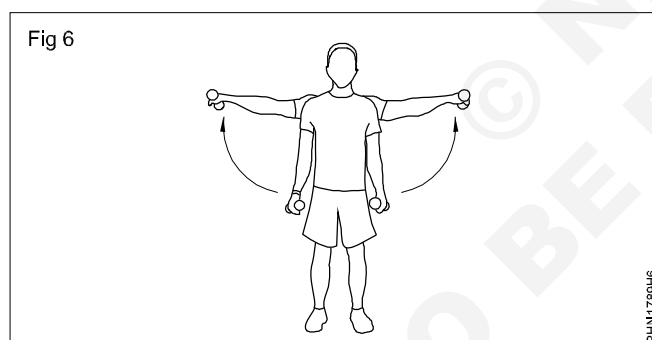
While keeping your forearm against the table, flex your wrist up so that your palm moves towards the ceiling.

Once your wrist is fully flexed, hold the position for two to three seconds. Then, slowly lower hand back to the starting position.

Repeat the wrist flexion exercise for two to three sets of 10-15 repetitions. Then move on to the next exercise.

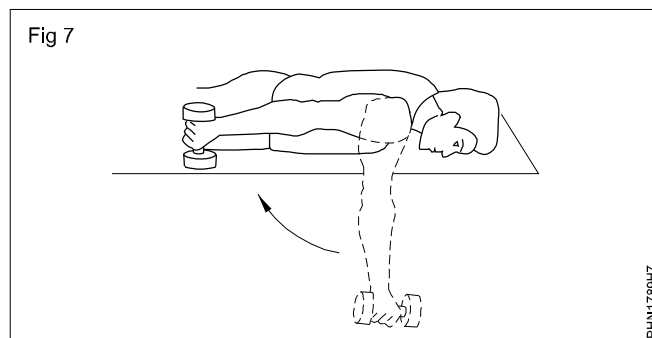


Shoulder abduction (Fig 6): Abduction occurs when you have arm movement away from the middle of your body. When you raise your arm out from the sides of your body, it's an abduction of your shoulder. A normal range for abduction, starting with your palms at your sides, is around 150 degrees in a healthy shoulder. This places your hands above your head with your arms straight.

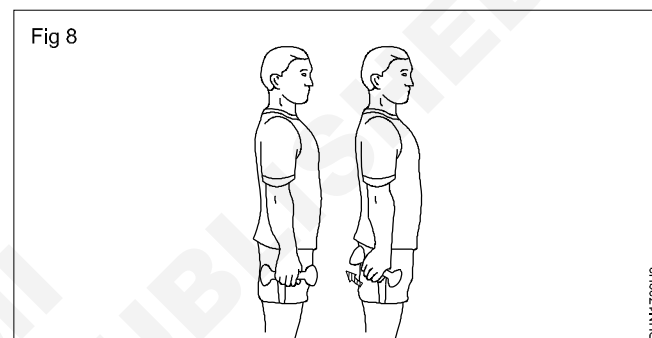


Strengthening the back muscles

Rhomboid (Fig 7): Back muscles are also important in throwing. Lying on your stomach, lift the weight and raise it until your arm is straight out to the side, keeping the elbow extended. Slowly lower it to the starting position.



Ulnar deviation (Fig 8): Stand up straight. Hold a hand weight in your right hand. Your healthcare provider will tell you what size of hand weight to use. Keep your arm straight down at your side. Bend your wrist backward to lift the weight. Hold for 5 seconds. Slowly lower your hand back down. Repeat 5 to 10 times, or as instructed.



These exercises should be done daily. Begin the program by doing two sets of 10 each using a light two pound weight for resistance. The amount of weight can be increased slowly but this should be done gradually, so that it does not cause sickness.

We hope that by working on these specific shoulder and arm conditioning and strengthening techniques, you may be able to avoid injury and to improve the efficiency of your throwing motion.

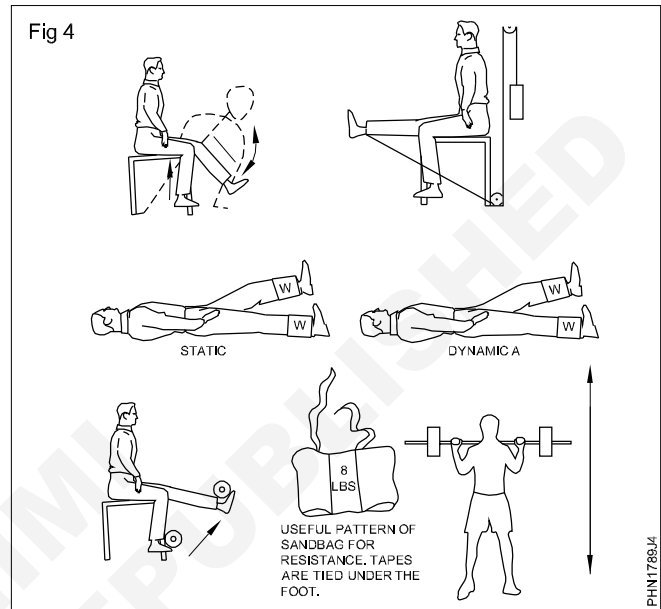
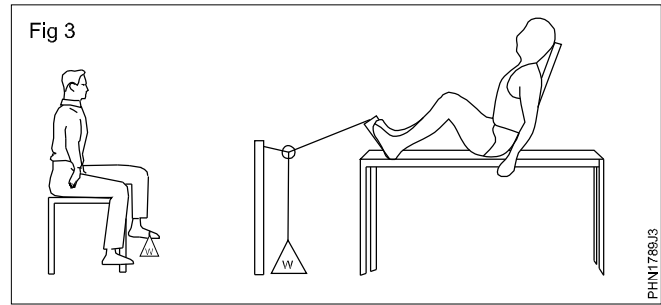
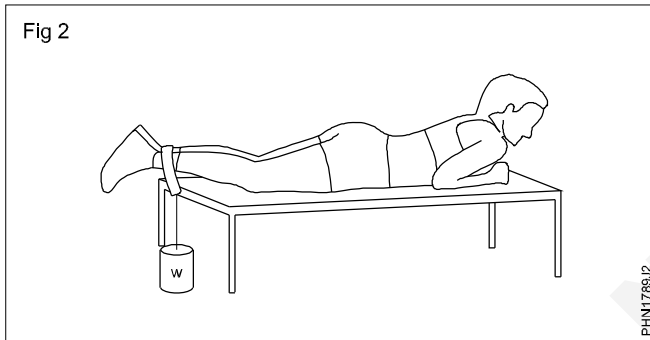
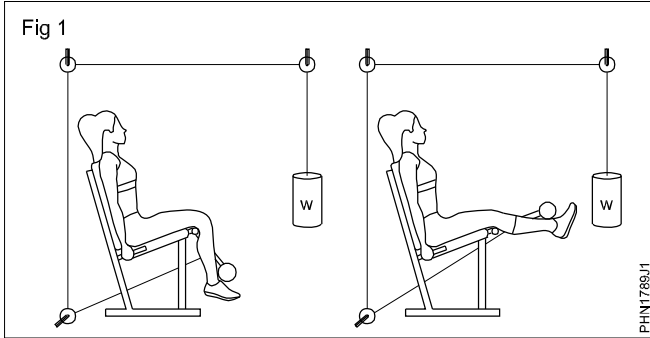
Steps to follow for (Fig 1-8):

- 1 Ask the patient to lie side holding the cuff in his arms and ask him to carry out internal and external rotation.
- 2 Ask the patient to sit in a chair holding the cuff in his arms and carry out flexion and extension movements.
- 3 Ask the patient to sit in a chair with arm rest position holding the cuff in hand and carry out the wrist flexion and extension.
- 4 Ask the patient to stand the upright and place the cuff in his hand and do the ulnar deviation.

TASK 2: Lower limb

Steps for (Fig 1) to (Fig 4):

- 1 Ask the patient to bear some weight on his leg and to do the flexion and extension exercises.
- 2 Ask the patient to do the static and dynamic movements using the weights on his legs.
- 3 Ask the patient to perform exercise using the weights.



Perform strengthening exercises by utilizing thera-bands/thera tubes

- Objectives:** At the end of this exercise you shall be able to
- perform strengthening exercises by utilizing thera-bands
 - perform strengthening exercises by utilizing thera-tubes.

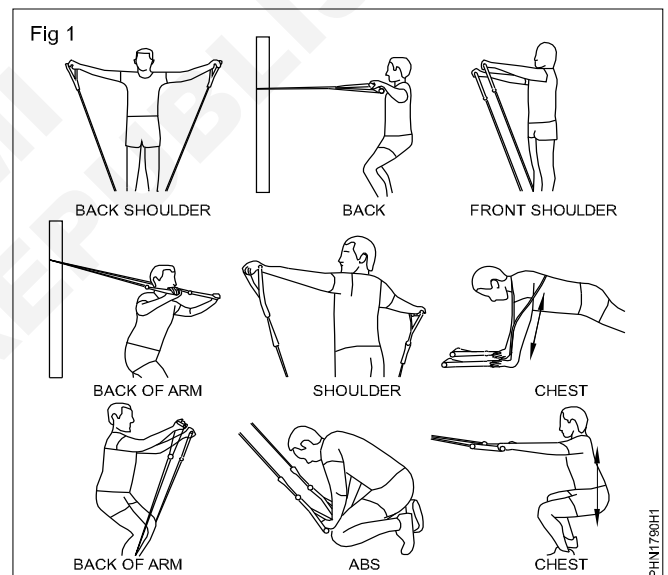
Requirements	
Tools/Instruments	<ul style="list-style-type: none"> • Thera-bands • Thera-tubes
<ul style="list-style-type: none"> • Preparation of patient • Preparation of therapist 	

PROCEDURE:

Note:Trainer will teach trainee regarding strengthening exercise by utilizing thera-bands and thera-tubes and ask the trainee to perform the same.

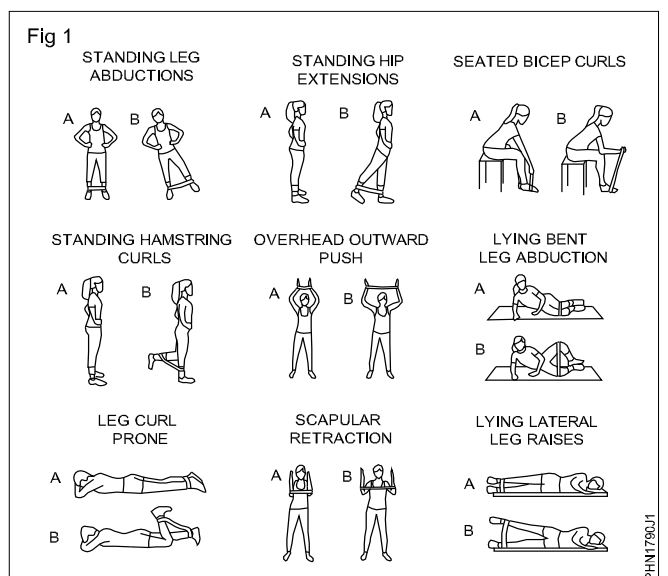
TASK 1: Thera-band exercises (Fig 1)

- 1 Anchor the center of your band in doorjamb or tie against a heavy object at chest level. Hold both ends of the bands in one hand (you will switch sides eventually).
- 2 Get down into side plank position. Place your forearm on the floor with a 90 degree angle at your elbow. Try to keep your elbow in line with your shoulder.
- 3 Lie on the floor so that the top of your head is facing toward the door. Extend the arm holding the ends of the bands towards the ceiling with your palms facing down toward your feet. Slowly pull your arm down to your hip while keep it straight.
- 4 Flip sides by rolling over and holding the side plank on the other side and switching the ends of the bands to your other hand.



TASK 2: Thera-tube exercises (Fig 1)

- 1 Tie your resistance band together in a loop or use an adapter to connect the ends together.
- 2 Place one end of your looped resistance band under one foot and loop the other end of the resistance band over the top of your other foot.
- 3 Lift the foot with the resistance band on top of your foot off the ground. Keeping your foot flexed, raise your knee up to hip level. Make sure to keep the resistance band looped across the top of your raised foot.
- 4 Pause at the top and then slowly lower your leg back down to the starting position. Switch legs after one set.



Demonstrate resisted exercises (manually)

Objectives: At the end of this exercise you shall be able to

- demonstrate manual resisted exercises
- perform resisted exercise manually to the patients.

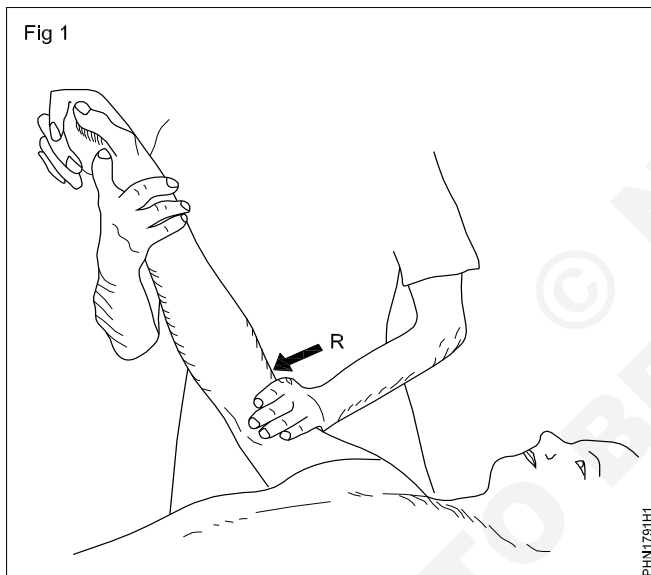
Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Couch/Chairs	- as reqd.

PROCEDURE:

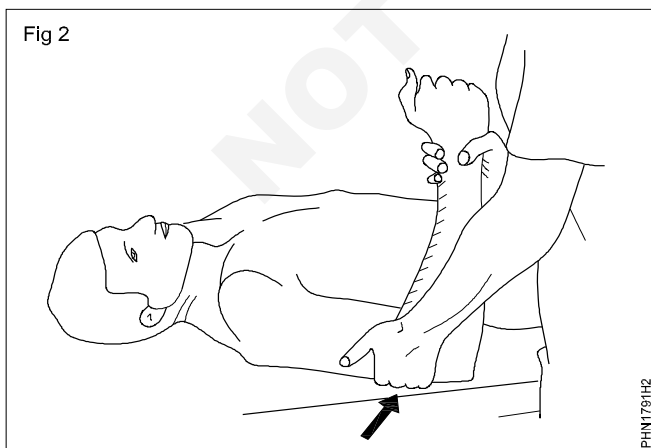
Note: Trainer will teach trainee regarding manual resisted exercises and ask the trainee to perform the same manually to the patients.

TASK 1: Upper extremity

Resisted shoulder flexion. (Fig 1)

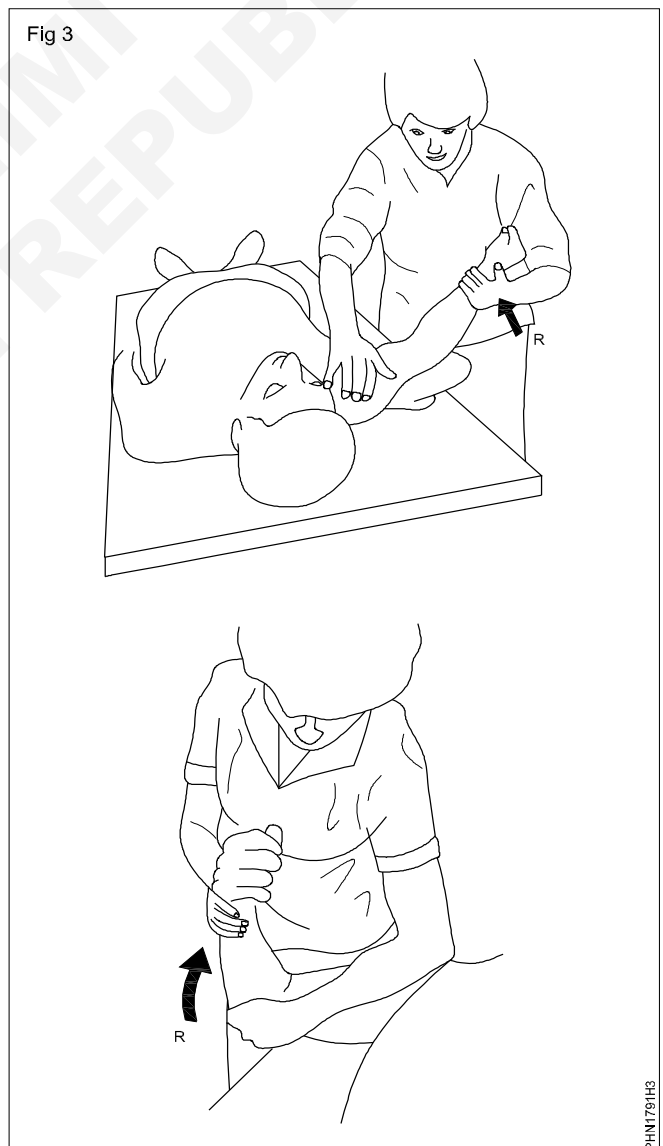


Resisted shoulder abduction. (Fig 2)

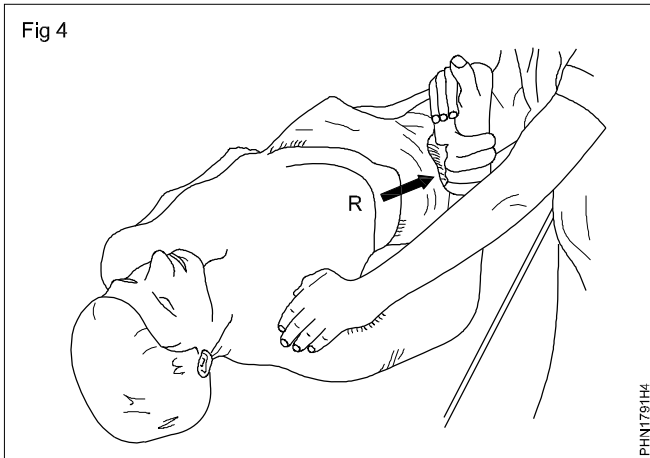


a Initially place the humerus in the plane of scapula when resisting internal and external rotation of the shoulder, resisted shoulder external rotation in the POS and

b Resisted shoulder internal rotation with the shoulder in 90 degrees of abduction. (Fig 3)



Resisted elbow flexion with proximal stabilization. (Fig 4)

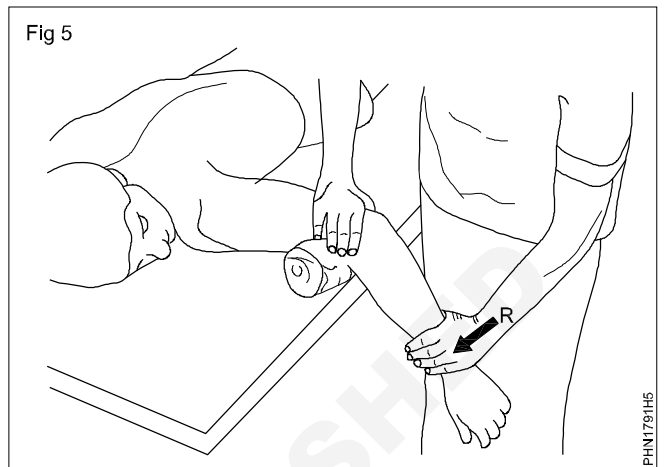


Resisted elbow extension. (Fig 5)

- 1 Lie on your back with your arm at your side. Raise your hand overhead, keeping elbow straight.
- 2 Lie on your back or stand straight. Raise arms out to side, keeping elbows straight.

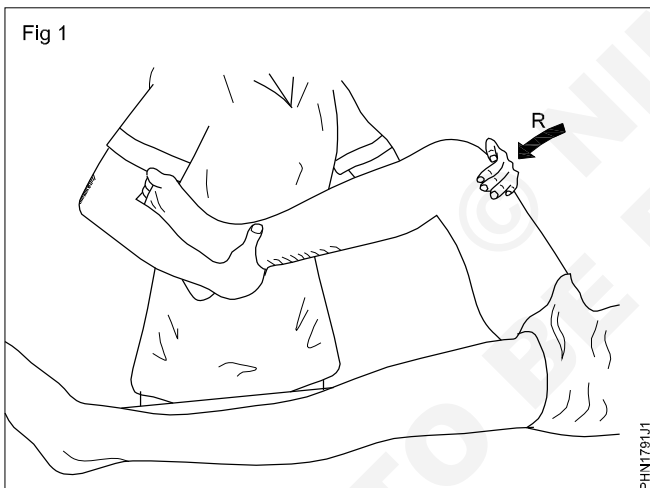
- 3 Lie on your back with your elbows straight out from your shoulders.
- 4 Hold your right arm out with the palm of your hand facing upward.

Note: The therapist should give resistance to the appropriate movement of the muscles.

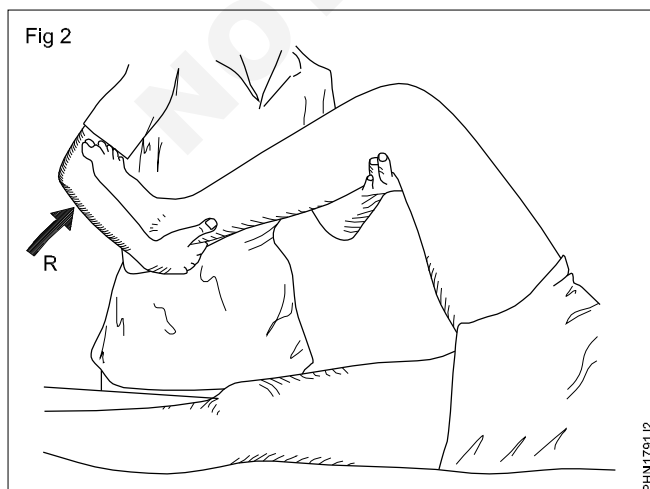


TASK 2: Lower extremity

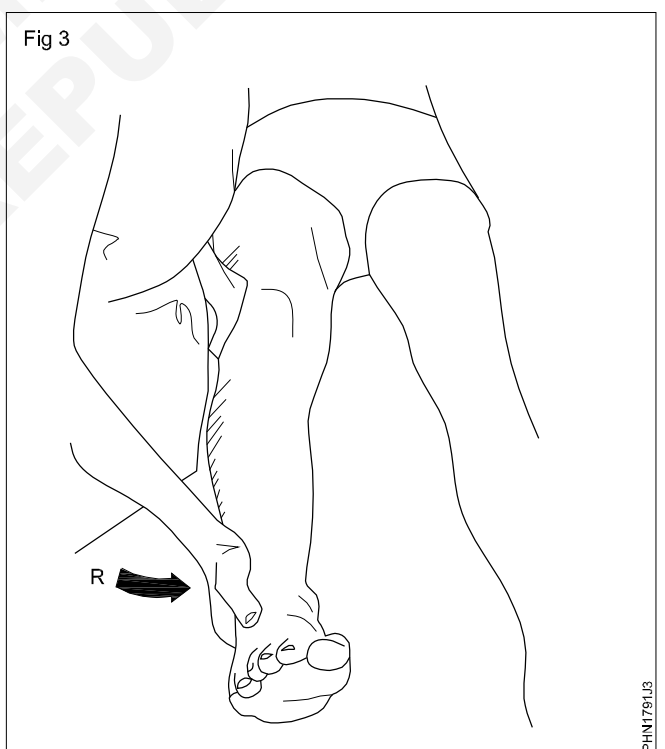
Resisted flexion of hip with the knee flexed. (Fig 1)



Resisted hip and knee extension with hand placement at the popliteal space to prevent hyperextension of the knee. (Fig 2)



Resisted hip abduction. (Fig 3)

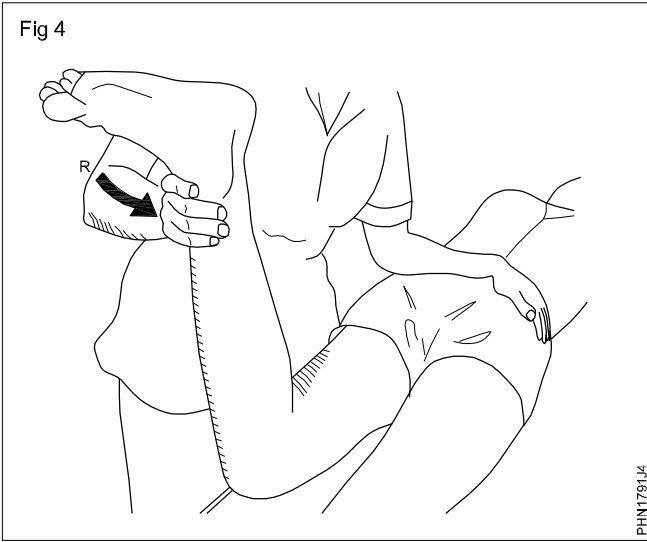


Resisted external rotation of hip with the patient supine. (Fig 4)

Resisted internal rotation of hip with the patient prone. (Fig 5)

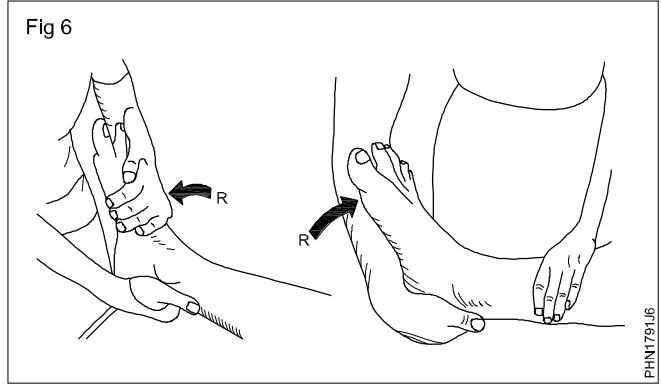
a) Resisted dorsiflexion and b) Resisted plantar-flexion of the ankle (Fig 6)

Fig 4



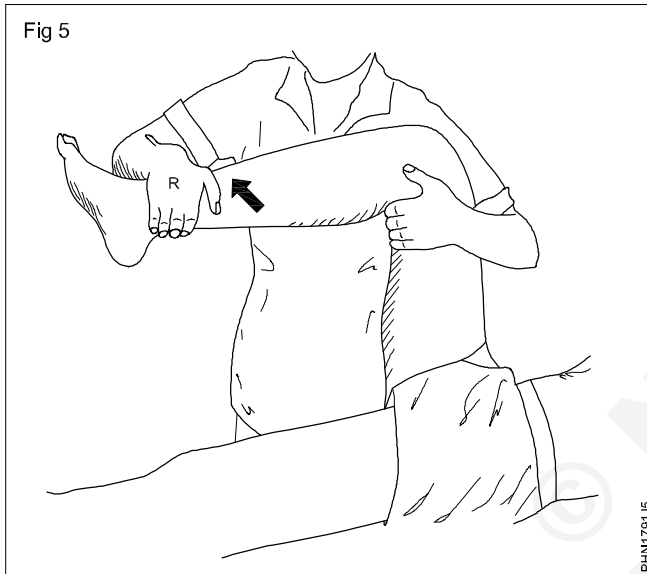
PHN1791.4

Fig 6



PHN1791.6

Fig 5



PHN1791.5

- 1 Lie on your back.
- 2 Lie on your back and bend your right knee up.
- 3 Lie on your back with your legs straight.
- 4 Lie on your side with your bottom leg bent and your top leg straight.
- 5 Lie on your back with legs straight and slightly apart.
- 6 Lie on your back.
- 7 Keep your leg still and rotate your foot in a circular motion.

Note: The therapist should give resistance to the appropriate movement of the muscles.

Representation of quadriceps and hamstring resisted exercises on quadriceps chair and multipurpose chair

Objectives: At the end of this exercise you shall be able to

- represent of quadriceps and hamstring exercises using multipurpose chair
- perform the exercises using quadriceps and multipurpose chair.

Requirements

Tools/Instruments

- Therapist setup - as reqd.
- Quadriceps/Multipurpose chair - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the quadriceps and hamstring exercises using multipurpose chair and quadriceps chair and ask the trainee to perform the same to the patients.

TASK 1: Exercise for hamstrings

- 1 Stand erect. Hold your hands firmly.
- 2 Extend your knees. Give some resistance over the lower part of the limb.
- 3 Ask the patient to flex the knee.
- 4 The exercise can be done in lying position as shown in (Fig 1,2 &3).

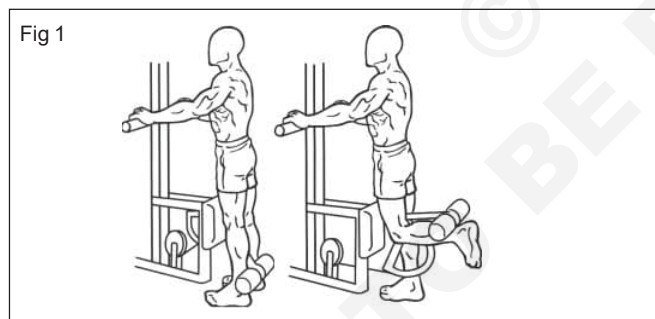


Fig 2

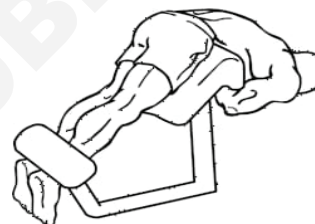
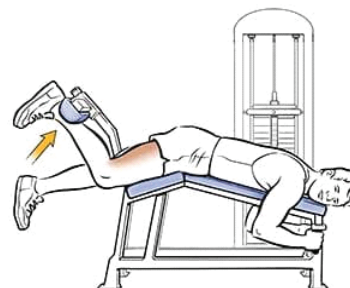


Fig 3



TASK 2: Quadriceps Chairs (Fig 1)

- 1 Lie on your back and use a yoga block or basketball to prop your knee up.
- 2 Slowly straighten your bent knee until it is all the way straight.
- 3 Tighten your quad muscle with your toes pointed toward the ceiling and hold it tight for five seconds.
- 4 Slowly lower your leg down.
- 5 Repeat for 15 repetitions.

Fig 1



Practical use of different exercise equipments using shoulder wheel, shoulder pulley and swiss ball

Objectives: At the end of this exercise you shall be able to

- demonstrate the practical use of different exercise equipments namely shoulder wheel, swiss ball and shoulder pulley
- perform the exercises to the patients.

Requirements			
Tools/Instruments			
• Therapist setup	- as reqd.	• Shoulder wheel	- 1 No.
• Shoulder Pulley	- 1 No.	• Swiss ball	- 1 No.

PROCEDURE:

Note: Trainer will teach trainee regarding the practical use of different exercise equipments namely shoulder wheel, swiss ball and shoulder pulley and ask the trainee to perform the same to the patients.

TASK 1: Shoulder Wheel Exercise (Fig 1)



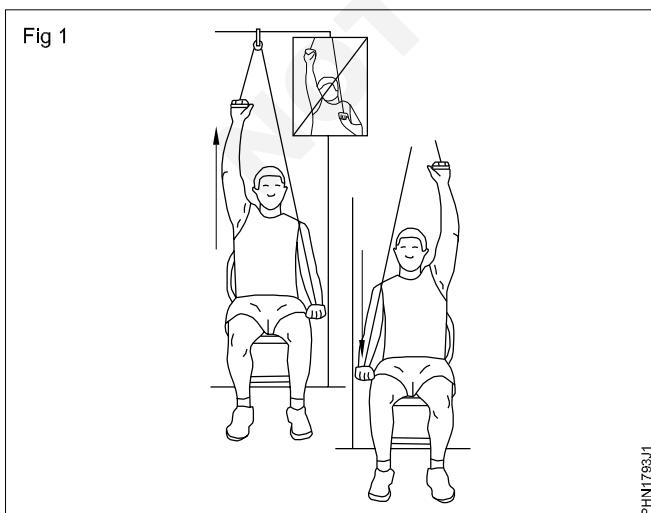
Step:

Shoulder wheel is just such a mechanism that allows patients to perform resistance exercise to improve range of motion and relieve pain.

Uses:

- 1 Mobilising the shoulder complex.
- 2 Improve the abduction and external rotation movements.
- 3 Use in patients with frozen shoulder, after fractures.

TASK 2: Shoulder pulley exercise (Fig 1)



Step 1:

Shoulder pulley is a system that is hooked over the top of a door, with a small pulley system near the top with a rope with the handles that hang down from the pulley.

Step 2:

The patient can use the pulleys to perform various shoulder exercise to help improve range of motion in different directions in your shoulder.

Uses:

In the condition such as frozen shoulder, rotator cuff tendinitis, shoulder surgery, cervical radiculopathy, proximal humeral fracture.

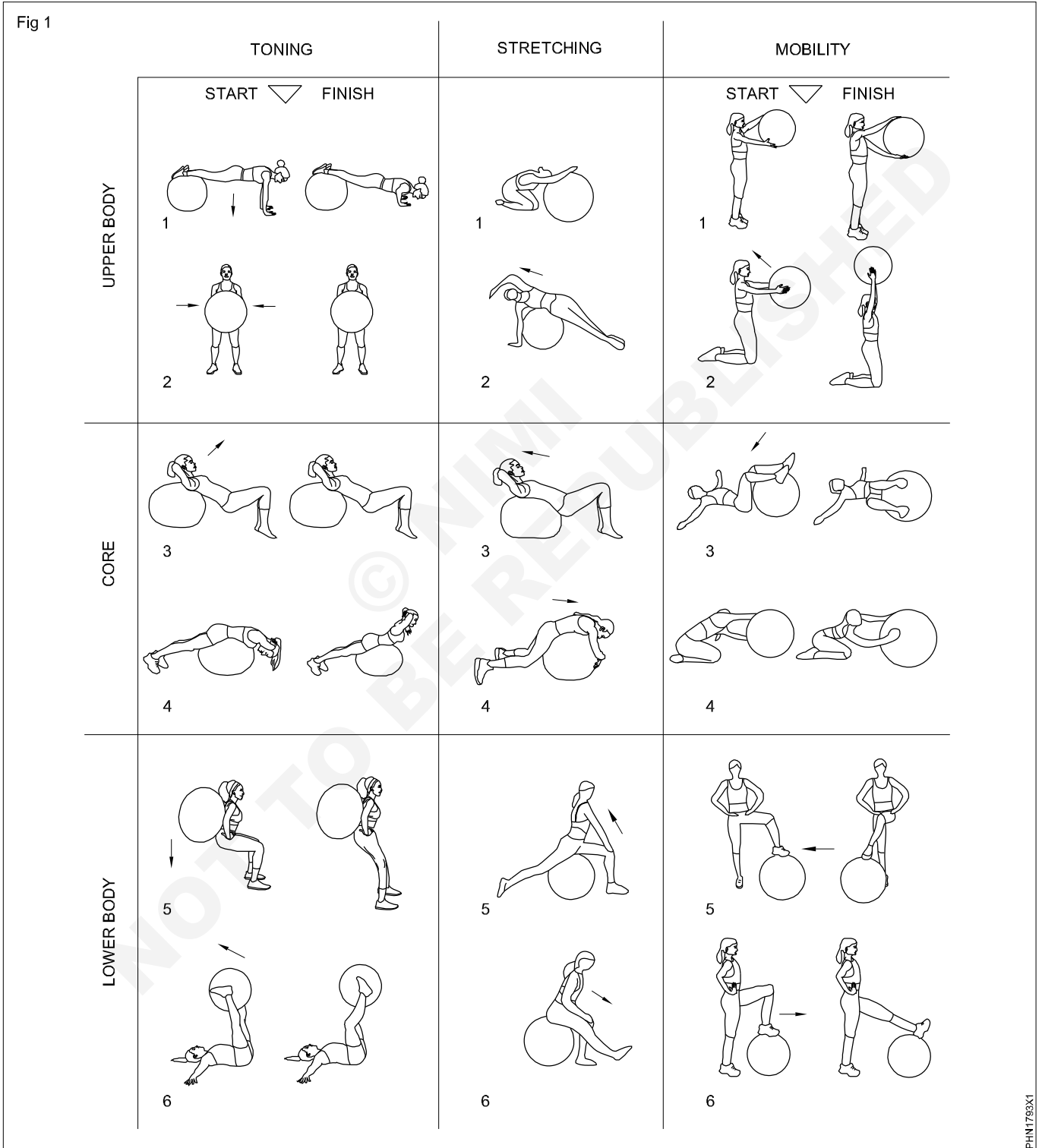
TASK 3: Swiss Ball exercise (Fig 1)

Steps:

- 1 Swiss ball using swiss ball can help you build your abdominal and lower back, muscles, also known as the core.
- 2 These muscles protect your lumbar spine as well as help to maintain the core stability of your frame.

Uses:

- 1 Back and spine health
- 2 Core stability
- 3 Muscle balance
- 4 Improved posture



PHN1783X1

Assessment of coordination and balance

Objectives: At the end of this exercise you shall be able to

- demonstrate the assessment of coordination and balance
- perform the assessment to the patients.

Requirements

Tools/Instruments

- Preparation of patient
- Preparation of therapist

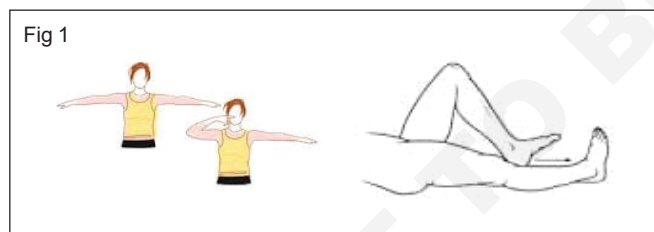
PROCEDURE:

Note: Trainer will teach trainee regarding the assessment of coordination and balance and ask the trainee to perform the same.

TASK 1: Assesment of coordination and balance to the patients

Neuro - Assesment

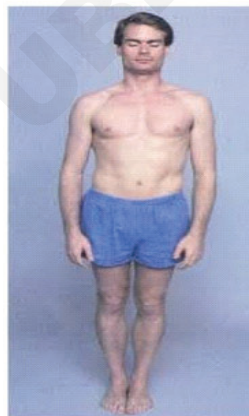
- 1 Testing - Have patient:
 - hold arms out to slides then alternate touching nose with right and left index fingers
 - alternate between own nose and examiners finger, test one arm, then the other
 - move heel down the shin from knee to ankle
- 2 Limb ataxia cannot be tested in patients with significant weakness. (Fig 1)



Romberg's test

- 1 Station & stance
 - Pt stant with feet together
 - First, eyes open
 - Then, close eyes
 - If okay with eyes open, but sways w/ eyes closed =+ Romberg
 - Mainly tests position sense (Vision can compensate for loss of position sense) (Fig 2)

Fig 2



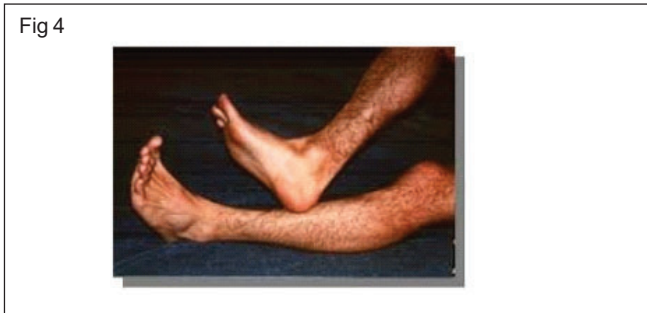
Test for Gait

Gait is evaluated by having the patient walk across the room under observation. Gross gait abnormalities should be noted. Next ask the patient to walk heel to toe across the room, then on their toes only, and finally on their heels only. (Fig 3)

Fig 3



Next have the patient perform the heel to shin coordination test. With the patient lying supine, instruct him or her to place their left shin just below the knee and then slide it down their shin to the top of their foot. Have them repeat this motion as quickly as possible without making mistakes. (Fig 4)



Test for Coordination (Fig 5)

Rapidly Alternating Movement Evaluation

Ask the patient to place their hands on their thighs and then rapidly turn their hands over and lift them off their thighs.



© NIMI
NOT TO BE REPUBLISHED

Describe equilibrium and non-equilibrium tests

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the equilibrium and non-equilibrium tests
 - perform the tests to the patients.

Requirements
Tools/Instruments
• Therapist setup - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the equilibrium and non-equilibrium tests and ask the trainee to perform the same to the patients.

TASK 1: Equilibrium and Non-equilibrium tests

- 1 Standing in a normal comfortable posture.
- 2 Standing with feet together (narrow base of support).

Equilibrium coordination test:

- Standing in a normal comfortable posture.
- Standing with feet together (narrow base of support)
- Standing with one foot exactly in front of the other in tandem (toe of one foot touching heel of opposite foot).
- Standing on one foot.

Non - Equilibrium coordination test:

- Finger to nose: The shoulder is abducted to 90° with the elbow extended, the patient is asked to bring tip of the index finger to the tip of nose.
- Finger to therapist finger: The patient and the therapist sit opposite to each other, the therapist index finger is held in front of the patient, the patient is asked to touch the tip of the index finger to the therapist index finger.

Schedule exercise programs for stretching of major muscles (manually)

Objectives: At the end of this exercise you shall be able to

- demonstrate exercise programs for stretching of major muscles by manually
- perform the exercise programs for stretching of major muscles (manually).

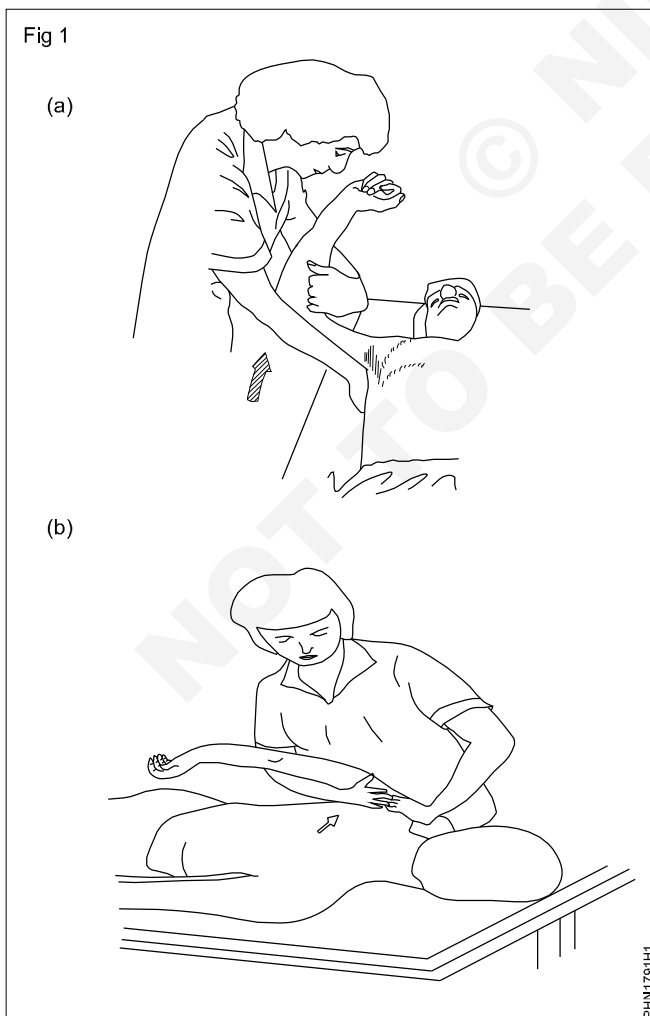
Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Couch	- as reqd.

PROCEDURE:

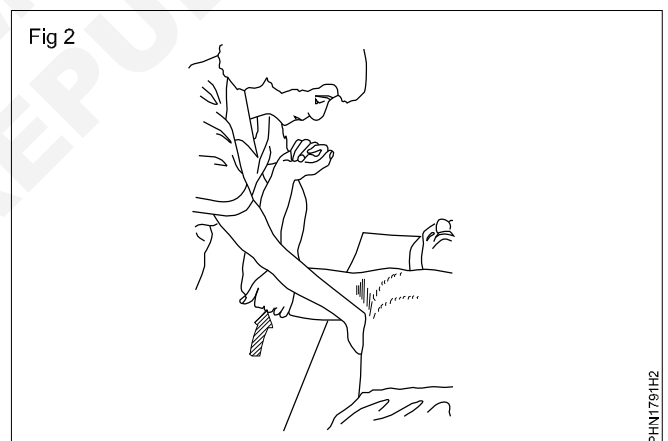
Note: Trainer will teach trainee regarding the exercise programs for stretching of major muscles by manually and ask the trainee to perform the exercise programs for stretching of major muscles (manually).

TASK 1: Upper extremity

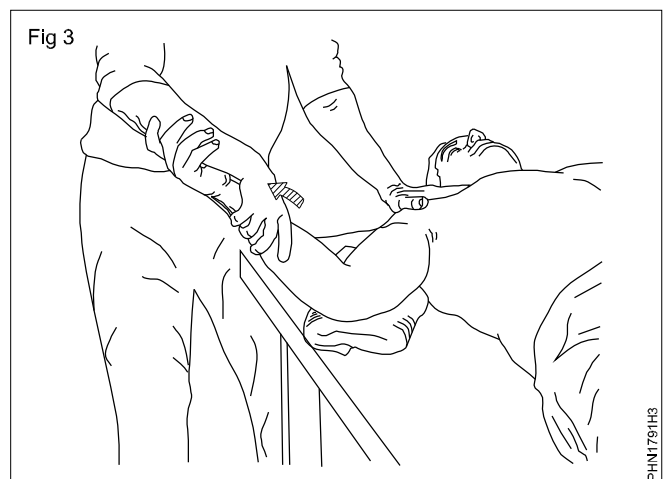
a) Hand placement and stabilisation of the scapula for stretching procedure to elongate the teres major. and b) Hand placement and stabilisation of scapula to increase hyperextension of the shoulder (Fig 1)



Hand placement and stabilization of the scapula for stretching procedure to increase shoulder abduction. (Fig 2)



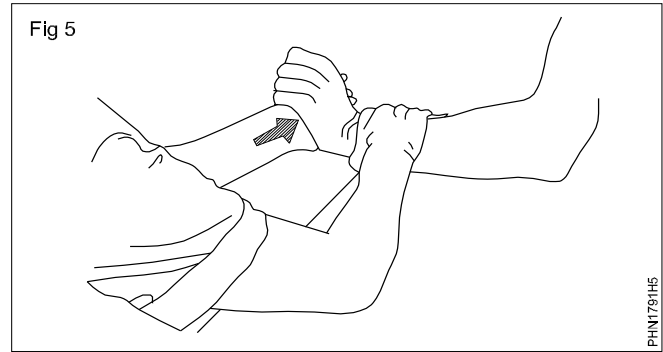
Shoulder position and hand placement at the mid proximal forearm to increase external rotation of the shoulder. (Fig 3)



Hand placement and stabilization of the shoulder to increase internal and external rotation. (Fig 4)



Hand placement and stabilization of forearm for stretching procedure to increase extension of wrist. (Fig 5)

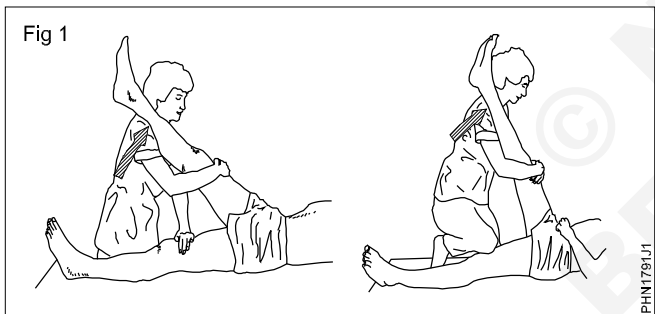


Hand placement and stabilization of scapula and proximal humerus for stretching procedures to increase elbow extension. (Fig 6)



TASK 2: Lower extremity

Hand placement and stabilization of the pelvis and low back for stretching procedures to increase hip flexion with knee extension. (Fig 1)



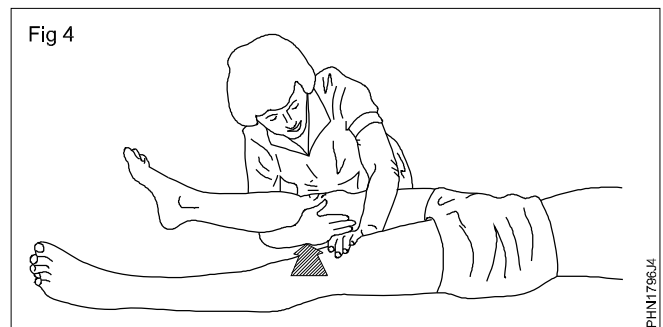
Hand placement and stabilization of the pelvis to increase hyper-extension of the hip with the patient lying supine. (Fig 2)



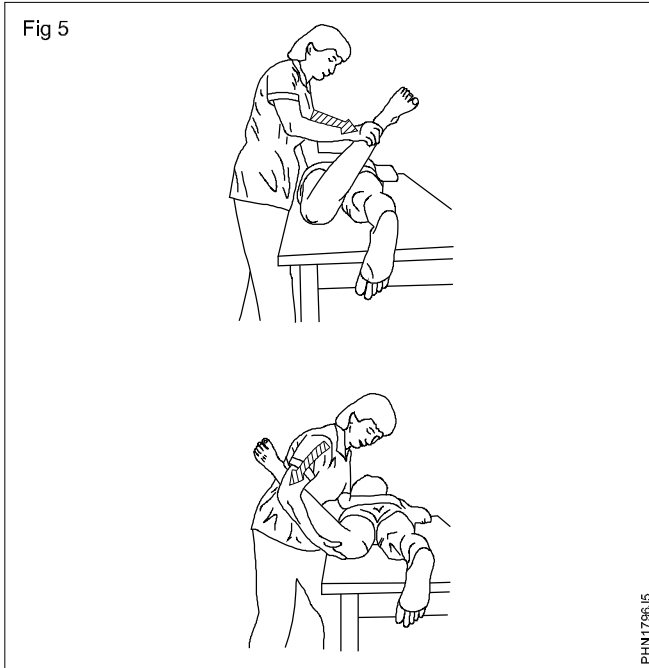
Hand placement and stabilization to increase hyperextension of hip with patient lying prone. (Fig 3)



Hand placement and stabilization of the opposite extremity and pelvis for stretching procedure to increase abduction of the hip. (Fig 4)



Hand placement and stabilization to increase external and internal rotation of the hip with patient prone. (Fig 5)



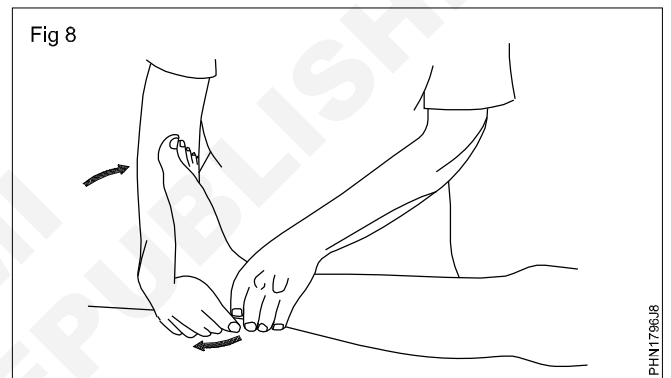
Hand placement and stabilization to increase knee flexion with the patient lying prone. (Fig 6)



Hand placement to increase knee extension with patient lying prone. (Fig 7)



Hand placement and procedures to increase dorsiflexion of the ankle with the knee extended. (Fig 8)



Elaborate methods of stretching

Objectives: At the end of this exercise you shall be able to

- demonstrate the methods of stretching
- perform the stretching techniques to the patients.

Requirements

Tools/Instruments

- Preparation of patient
- Preparation of therapist
- Couch

PROCEDURE:

Note: Trainer will teach trainee regarding the methods of stretching and perform the stretching techniques to the patients.

TASK 1: Methods of stretching

Static stretching: It is the most common term used to describe a method by which soft tissues are lengthened just passed the point of tissue resistance and then held in the lengthened position for an extended period of time with a sustained stretch force. The duration of static stretch is either pre-determined prior to stretching or based on the patient's response during the stretching procedure.

Static Progressive Stretching: It is another term that describes how static stretch is applied for a maximum effectiveness. The shortened soft tissues are held in a comfortably lengthened position until a degree of relaxation is felt by the patient or therapist. Then the shortened tissues are incrementally lengthened even further and again held in a new end range position for an additional duration of time.

Cyclic (intermittent) stretching: A relatively short duration stretch force that is repeatedly but gradually applied, released and then re-applied is described as a cyclic stretch. Each cycle of stretch is held between 5 and 10 seconds. The end range stretch force is applied gradually and in a controlled manner and at a relatively low intensity.

Ballistic stretching: A rapid forceful intermittent stretch, that is, a high speed and high intensity stretch, it is characterized by the use of vigorous bouncing movements that create momentum to carry the body segment quickly through the ROM to stretch shortened structures.

Manual stretching: A therapist or other trained practitioner applies an external force to move the involved body segment

slightly beyond the point of tissue resistance and available ROM. The therapist manually controls the site of stabilization as well as direction, speed, intensity and duration of stretch. Manual stretching usually employs a gentle, controlled, end range, static and progressive stretch held for about 30-60 seconds and then repeated for several or more cycles.

Self-stretching: It is a type of stretching procedure that a patient can carry out independently after careful instruction and supervised practice. Self-stretching can be performed in several ways:

- 1 The patient can passively move a distal segment of a restricted joint with one or both hands
- 2 If the distal attachment of the shortened muscle is fixed, body weight can be used as the source of the stretch force to passively elongate the shortened muscle tendon unit.

Mechanical stretching: There are many ways to use equipment to stretch a contracture and increase joint ROM. The equipment can be as simple as a cuff weight or weight pulley system or as sophisticated as some orthoses or automated stretching machines. Mechanical stretching devices apply a very low intensity stretch force over a prolonged period of time to create plastic deformation of tissues.

The duration of mechanical stretch ranges from fifteen to twenty minutes or as long as 8 to 10 hours at a time depending on the type of device, the severity of impairment and patient's tolerance

Explain positioning of patient during postural drainage

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the positioning of patient during postural drainage
 - perform the drainage technique to the patient.

Requirements			
Tools/Instruments			
• Therapist setup	- as reqd.	• Couch/Chairs	- as reqd.

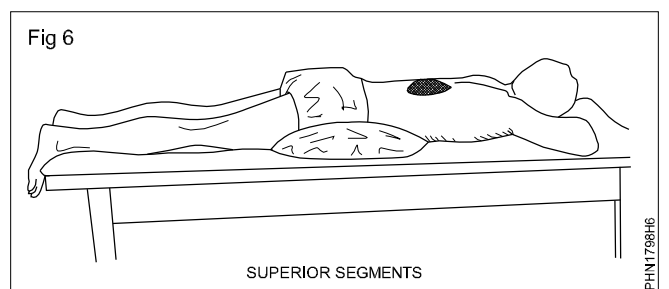
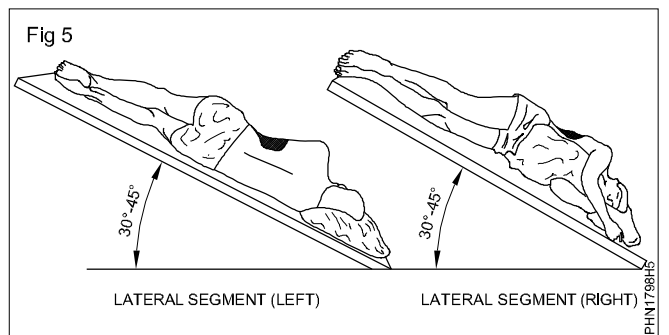
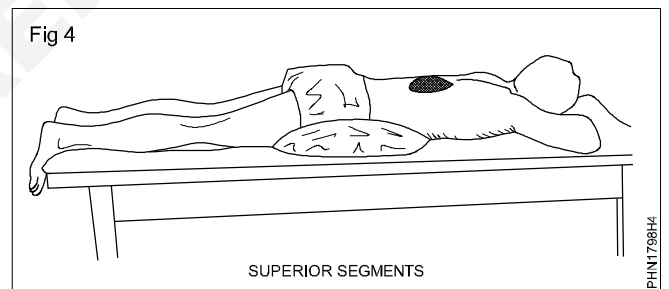
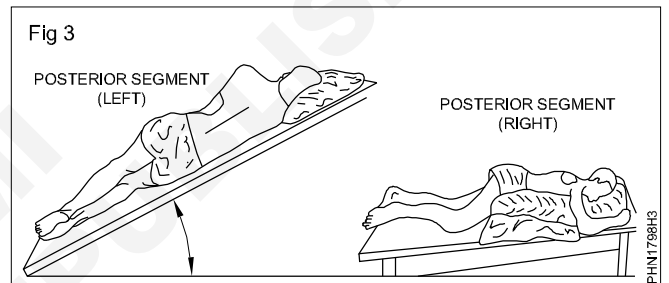
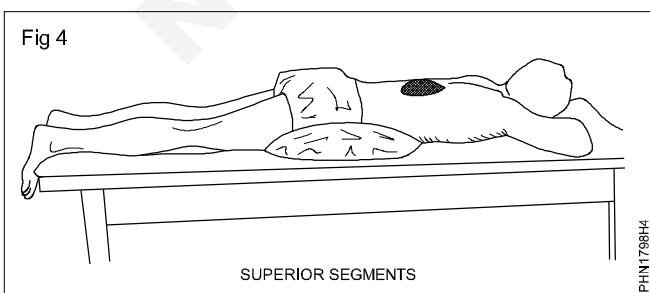
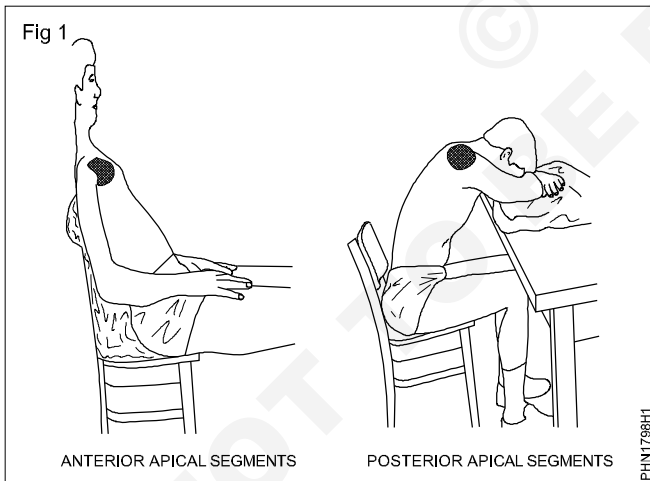
PROCEDURE:

Note: Trainer will teach trainee regarding the positioning of patient during postural drainage and ask the trainee to perform the drainage technique to the patient.

TASK 1: Practice on Right and left upper lobes

- 1 Postural drainage uses gravity to help move mucus from the lungs up to the throat.
- 2 Lies or sits the person in various positions so that the segment to be drained is uppermost on the patient's body.
- 3 Drain the segment using percussion, vibration and gravity.

Note: The patient should be placed in such a position according to the problem in his lungs.



Collaborate massage techniques with postural drainage

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the massage techniques with postural drainage
 - perform the massage technique to the patient.

Requirements

Tools/Instruments

- Therapist setup - as reqd.
- Couch/Chairs - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the massage techniques with postural drainage and ask the trainee to perform the massage technique to the patient.

TASK 1: Massage techniques

The following techniques are all part of chest physical therapy:

- 1 Percussion/clapping/cupping
- 2 Vibration
- 3 Postural drainage

Procedure

- 1 Postural drainage position.
 - 2 3-4 thoracic expansion with percussion.
 - 3 Pause for relaxed diaphragmatic breathing.
 - 4 1-2 Huff in mid or low lung volume combined with shaking.
 - 5 Pause for controlled breathing.
 - 6 Secretion in upper airways another huff or cough is added.
-

Prepare a chart of measurements of chest inspiration and expiration by using hands and inch tape at different chest levels

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the measurement of chest expansions during breathing
 - perform the chest expansion techniques to the patients.

Requirements			
Tools/Instruments			
• Therapist setup	- as reqd.	• Inch tape	- as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the measurement of chest expansions during breathing and perform the chest expansion techniques to the patients.

while the measuring tape is drawn taut; he is then asked to breathe in as deeply as possible, at the same time allowing the tape measure to be released. The two measurements are recorded. The measurements are usually taken at three levels.

Measurements: Chest expansion may be measured using a tape measure although it is not regarded as being fully accurate. The flat tape should be placed around the chest. The patient is then asked to breathe out as far as possible

- The fourth costal cartilage
- The xiphisternum
- Anterior end of the 9th costal cartilage

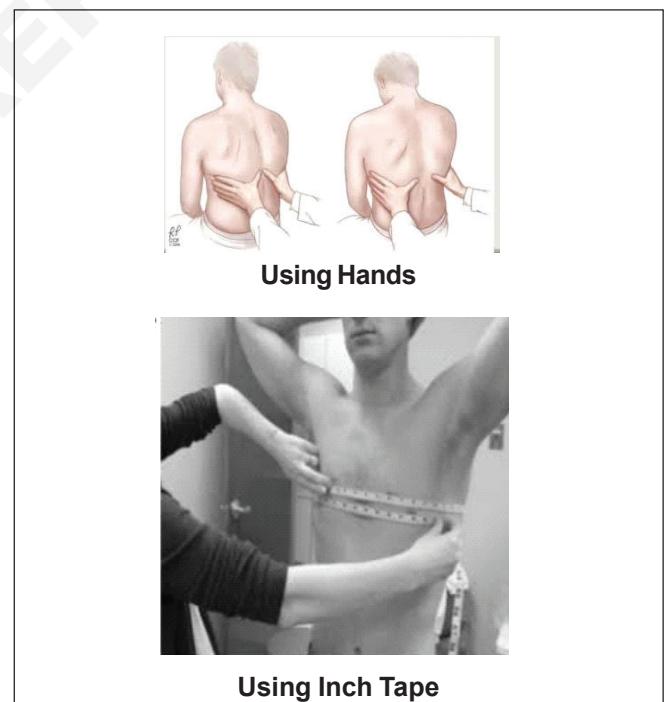
TASK 1: Chest measurement using hands and inch tape

Chest expansion

- Measured as the difference between maximal inspiration and maximal forced expiration in the fourth intercostal space in males or just below the breasts in females.
- Normal chest expansion is ≥ 5 cm.

Chest expansion measurement

- Chest expansion can be measured with tape meter around the chest at about the level of the nipples or 4th intercostals space in males or just below the breasts in females on deep maximum inspiration and on maximal forced expiration.
- Take the difference between these two measurements.
- In children, normally it is 2cm
- In a fit young man, the chest may expand >5 cm (range 5-8cm)
- In severe emphysema, it may expand less than 1cm.



Measurement of chest at different levels

	Normal	Deep inspiration	Deep expiration
Axilar	92	94	92
Epigastric	95	96.5	94
Subcostal	94.5	96.5	94.5

Perform resistive exercises for thorax muscles

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the resistive exercises for thorax muscles
 - perform the resistive exercises to the patients.

Requirements

Tools/Instruments

- Therapist setup - as reqd.
- Couch - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the resistive exercises for thorax muscles and ask the trainee to perform the resistive exercises to the patients.

TASK 1: Resisted exercise for the extensors of the spine

Resistance can be given from prone lying, the physiotherapist placing one hand on the occiput with her other forearm fixing the thighs. Weight resistance is simple and effective.

- 1 Relaxed leg prone lying; Trunk raising to lift a medicine ball.

- 2 Relaxed stoop stride standing; Trunk raising to lift a sandbag above Head and lower it to the ground between the Feet.

- 3 Prone lying with Feet fixed; Trunk raising or Leg lifting.

TASK 2: Resisted exercise for the flexors of the spine

Resistance to rounding of the back from lying can be offered by a weight held on the chest or with the arms extended. Manual resistance can be given from sitting on the forehead and/or on the front of one or both shoulders.

TASK 3: Resisted exercise for the side flexors

In the upright position a weight held or lifted in one hand is a simple method of resistance, a vertical throw of a medicine ball above the head provides strong work for the muscles.

TASK 4: Resisted exercise for the trunk rotators

Trunk rotation in close sitting is resisted manually with pressure on the shoulders. Weights held in the hand can be added in prone kneeling. Spring or weights and pulleys are arranged horizontally with the patient in reach grasp side sitting.

Practical based on breathing exercises

Objectives: At the end of this exercise you shall be able to

- **Demonstrate the breathing exercises to the patients**
- **Perform the breathing exercises to the patients.**

Requirements
Tools/Instruments
<ul style="list-style-type: none">• Therapist setup - as reqd.• Couch/Chairs - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the breathing exercises to the patients and ask the trainee to perform the breathing exercises to the patients.

TASK 1: Expiratory exercises

These are general breathing exercises with emphasis on expiration and relaxation

Examples of exercises to increase the expiratory range

- 1 Half lying; general relaxation.
- 2 Half lying; diaphragmatic breathing emphasizing relaxation of abdominal wall on inspiration and contraction on expiration.
- 3 Half lying; breathing with pressure during expiration on lower ribs by the patient's own hands, a strap or by the

physiotherapist's hands. Coarse vibrations may also be given to increase the effect of the pressure.

- 4 Half lying; breathing with Hip and Knee bending to press on chest during expiration.
- 5 Relaxed stoop sitting; trunk raising with inspiration and relaxing on prolonged expiration.
- 6 Sitting; trunk turning with loose arm swinging, breathing out and relaxing during turn, breathing in coming forwards.

TASK 2: Inspiratory exercises

- 1 Crook half lying; relaxation and general deep breathing.
- 2 Crook half lying; lower costal expansion –against resistance of webbing strap. "Enlarge all the way round".
- 3 Relaxed, crook sitting, back arching with deep inspiration.
- 4 Sitting, arm rotation outwards with deep inspiration.
- 5 Relaxed sitting, arm lifting and trunk raising with inspiration as in yawning and stretching.
- 6 Skipping ,running or swimming to "Get out of breath".

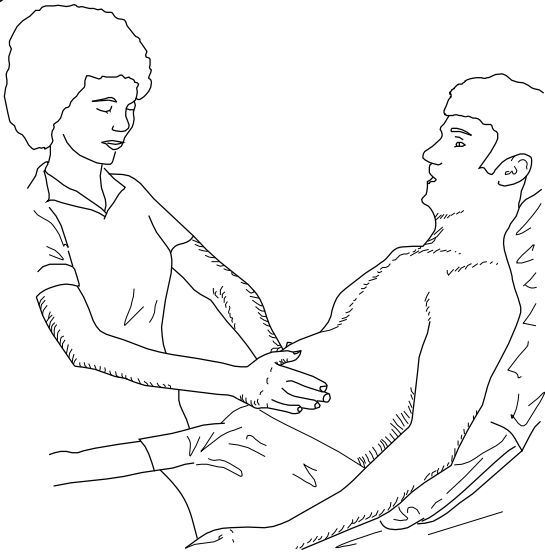
The semireclining and semi-fowler's positions are comfortable, relaxed positions in which to teach diaphragmatic breathing. (Fig 1)

The patient places his or her hands on the abdomen to feel the movement of proper diaphragmatic breathing. The patient can also feel the contraction of the abdominals which occurs with controlled expiration or coughing. (Fig 2)

The patient applies his or her own manual pressure during lateral costal expansion. (Fig 3)

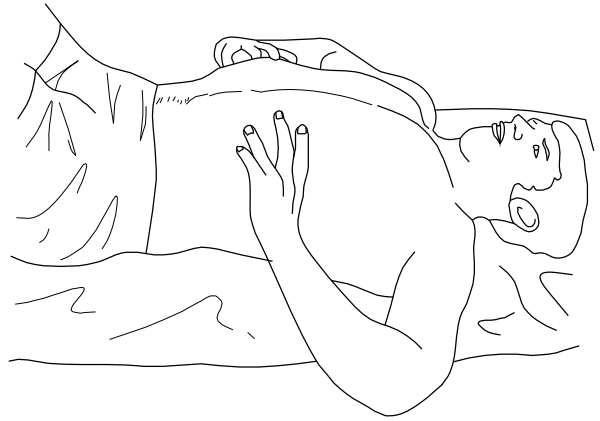
Bilateral lateral costal expansion sitting. (Fig 4)

Fig 1



PHN17102H1

Fig 3



PHN17102H3

Fig 2



PHN17102H2

Fig 4



PHN17102H4

Illustrate a practical on PNF techniques for upper and lower limbs

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the PNF techniques for upper limbs and lower limbs
 - perform the PNF techniques to the patients.

Requirements

Tools/Instruments

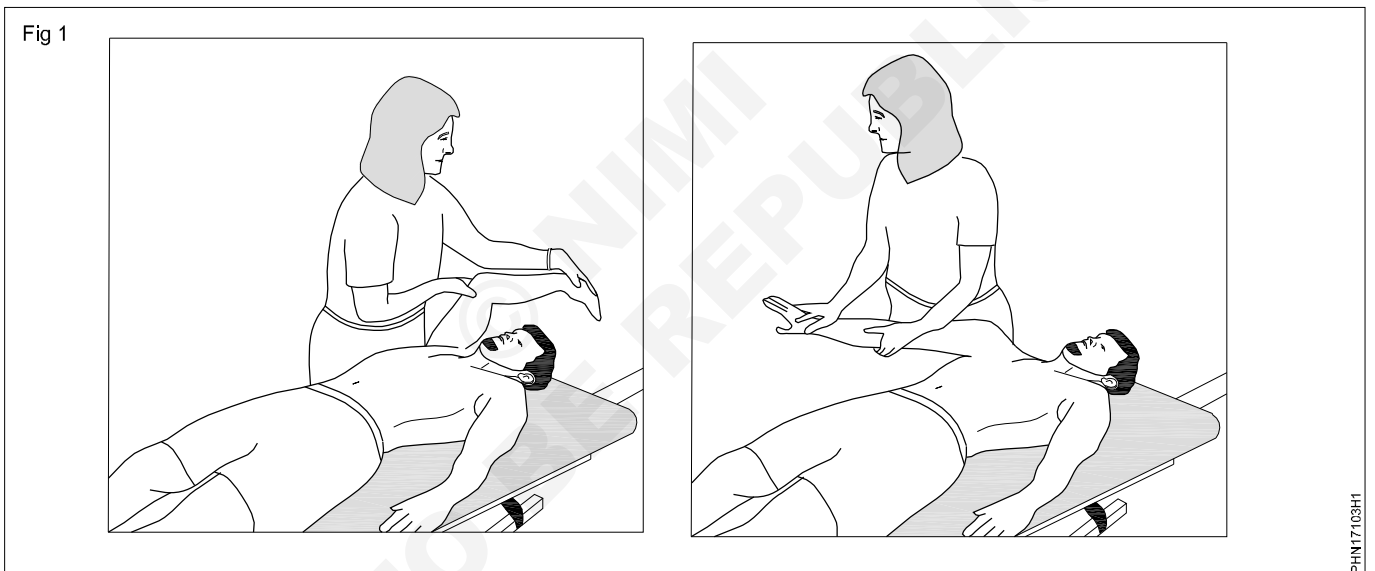
- Therapist setup - as reqd.
- Couch/Chairs - as reqd.

PROCEDURE:

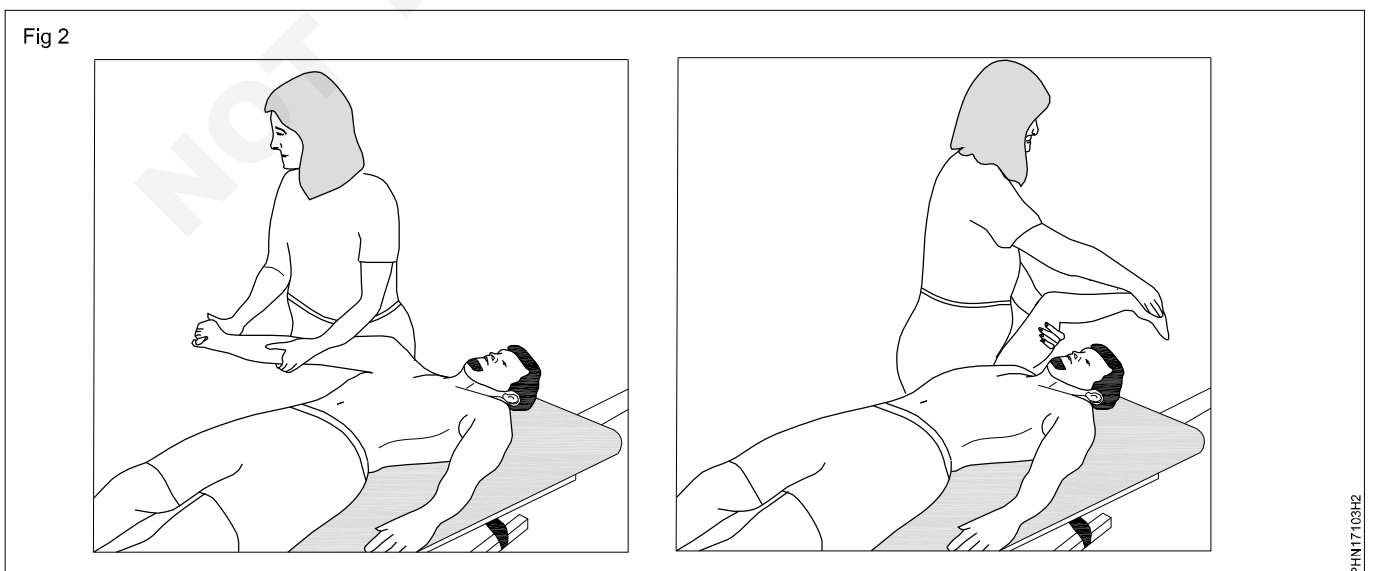
Note: Trainer will teach trainee regarding the PNF techniques for upper limbs and lower limbs and perform the PNF techniques to the patients.

TASK 1: Upper extremity patterns

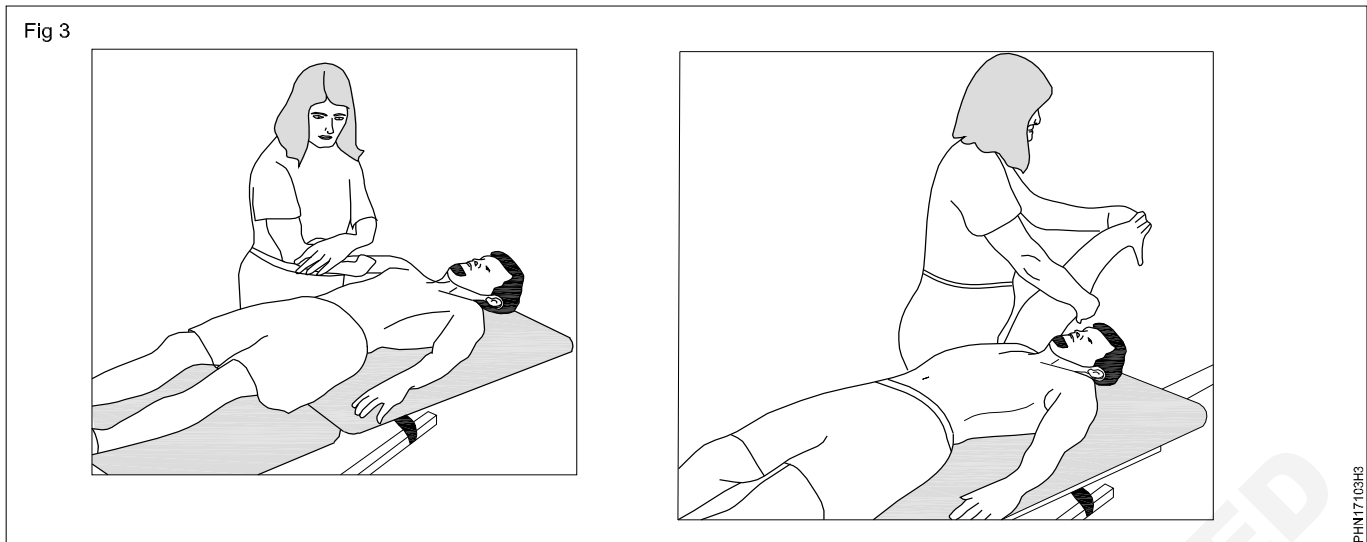
(a) Starting position and (b) ending position for D1 extension of the upper extremity (Fig 1)



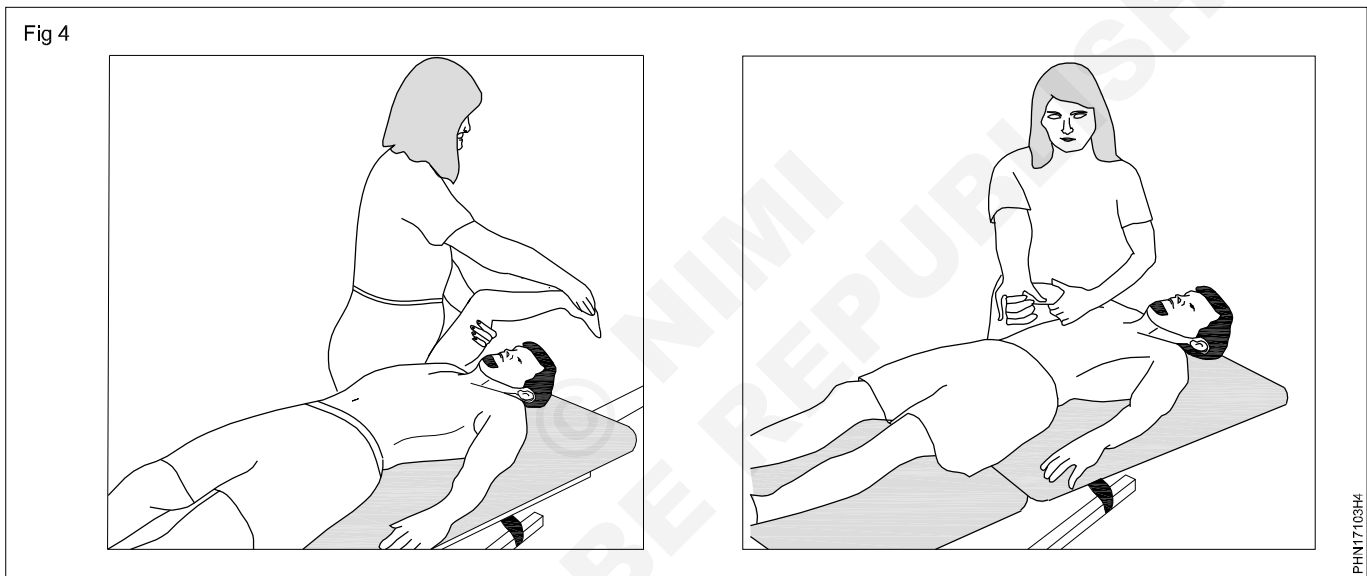
(a) Starting position and (b) ending position for D1 flexion of the upper extremity (Fig 2)



(a) Starting position and (b) ending position for D2 flexion of the upper extremity (Fig 3)

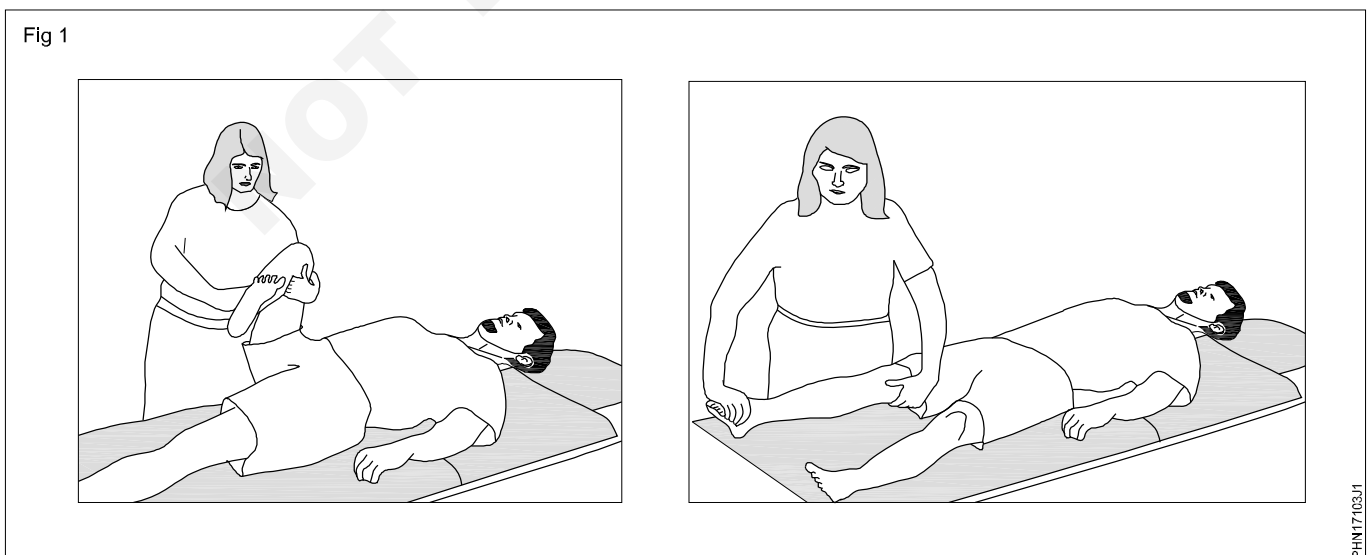


(a) Starting position and (b) ending position for D2 extension of the upper extremity (Fig 4)

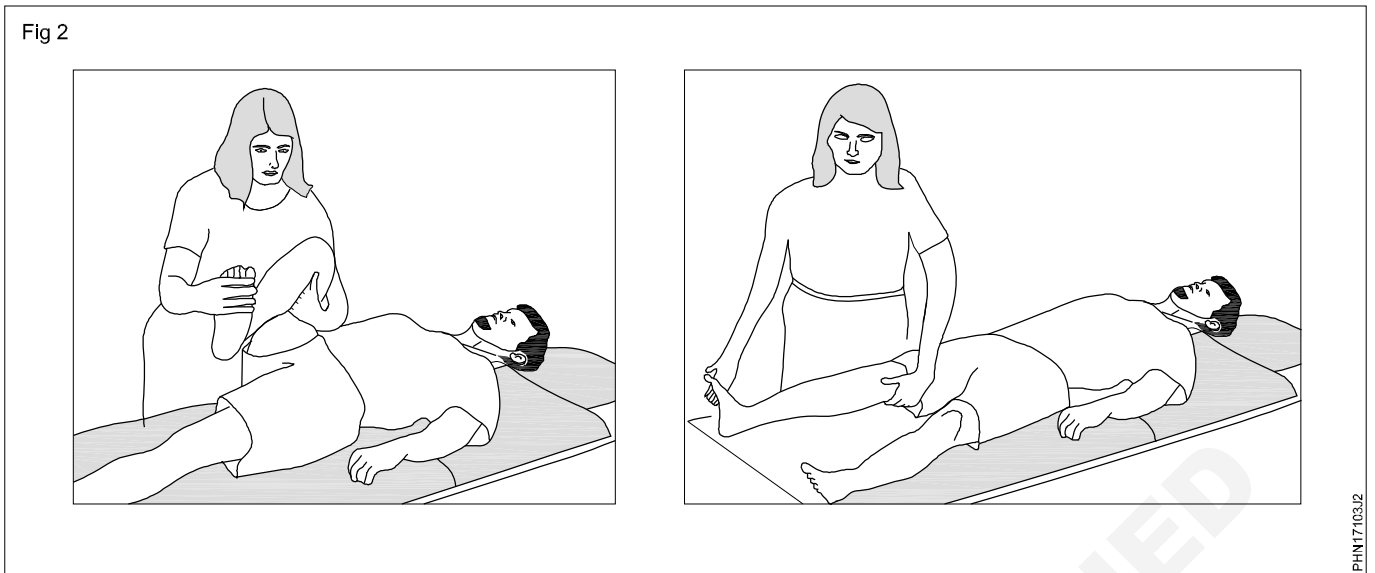


TASK 2: Lower extremity patterns

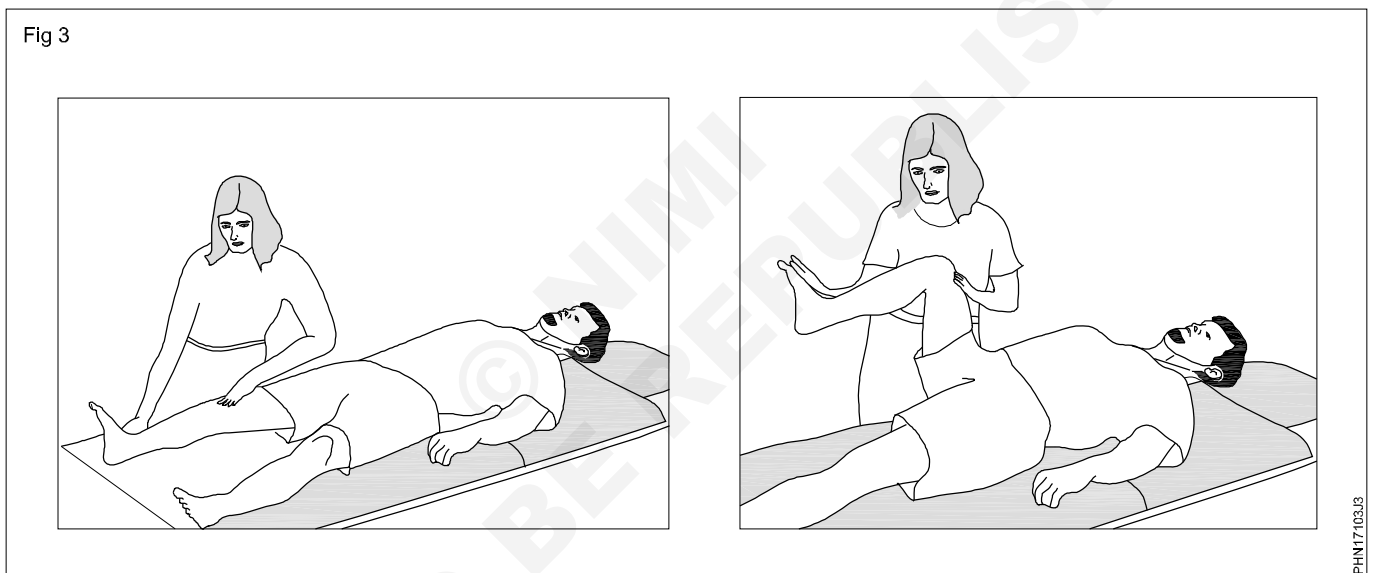
(a) Starting position and (b) ending position for D1 flexion of the lower extremity (Fig 1)



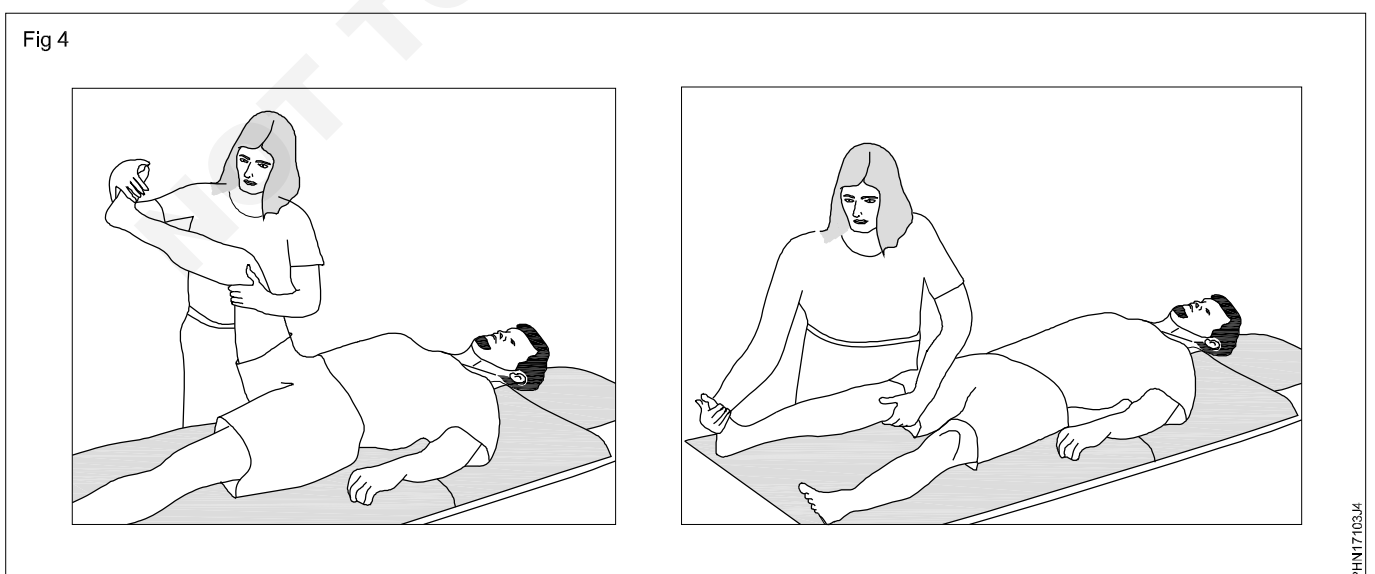
(a) Starting position and (b) ending position for D1 extension of the lower extremity (Fig 2)



(a) Starting position and (b) ending position for D2 flexion of the lower extremity (Fig 3)



(a) Starting position and (b) ending position for D2 extension of the lower extremity (Fig 4)



Presentation of PNF techniques for trunk, face and neck

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the PNF techniques for trunk, face and neck
 - perform the PNF techniques to the patients.

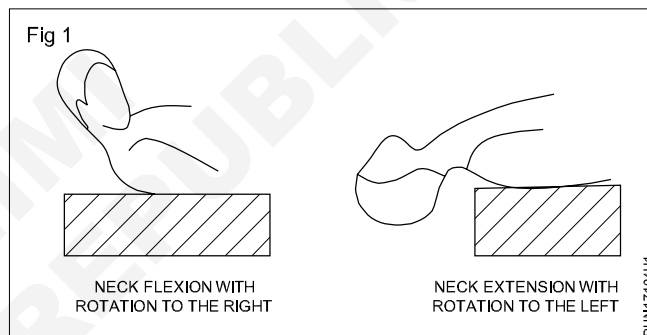
Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Couch/Chairs	- as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the PNF techniques for trunk, face and neck and ask the trainee to perform the PNF techniques to the patients.

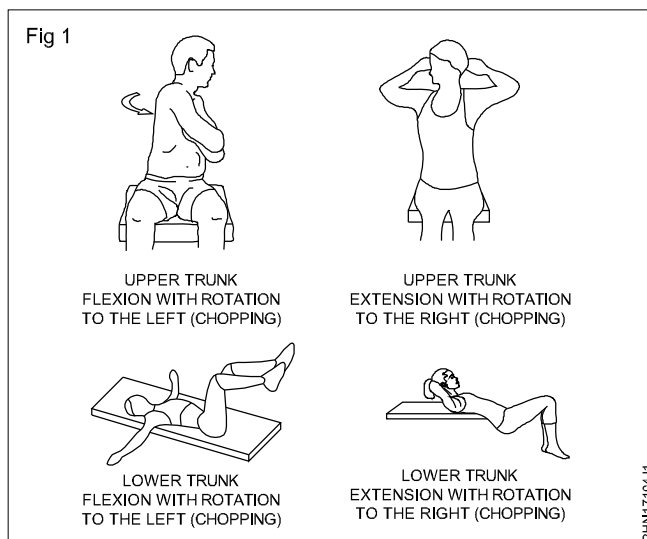
TASK 1: Practice on neck pattern

- 1 Rotate the neck to the right as shown in (Fig 1) for neck flexion.
- 2 Rotate the neck to the left as shown in (Fig 1) for neck extension.



TASK 2: Practice on trunk pattern

- 1 Rotate to the left (Chopping) as shown in (Fig 1) for upper trunk flexion with rotation.
- 2 Rotate to the left as shown in (Fig 1) for lower trunk flexion with rotation.
- 3 Rotate to the right (lifting) as shown in (Fig 1) for upper trunk extension with rotation.
- 4 Rotate to the right as shown in (Fig 1) for lower trunk extension with rotation.



TASK 3: Practice on face pattern

PNF of face which is training with added resisted movement to motions such as lifting the upper lip, lowering the lower

lip and sticking out the tongue, to adapt the perioral muscles to the new morphological circumstances.

Explanation of D1 and D2 patterns of PNF

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the PNF techniques for upper limbs and lower limbs
 - perform the PNF techniques to the patients.

Requirements			
Tools/Instruments			
• Therapist setup	- as reqd.	• Couch/Chairs	- as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the D1 and D2 patterns of PNF techniques and ask the trainee to perform the D1 and D2 patterns of PNF techniques to the patients.

TASK 1: Practice on Upper extremity component motions

- 1 Study the table - 1 and understand the D1 & D2 patterns.

Joints or Segments	Diagonal 1: Flexion (D1 Flx)	Diagonal 1: Extension (D1 Ext)	Diagonal 2: Flexion (D2 Flx)	Diagonal 2: Extension (D2 Ext)
Shoulder	Flexion-Adduction External Rotation	Extension-Abduction Internal Rotation	Flexion-Abduction External Rotation	Extension-Adduction Internal Rotation
Scapula	Elevation, Abduction upward rotation	Depression, Adduction Downward rotation	Elevation-Abduction Upward rotation	Depression, adduction Downward rotation
Elbow	Flexion or extension	Flexion or extension	Flexion or extension	Flexion or extension
Forearm	Supination	Pronation	Supination	Pronation
Wrist	Flexion, radial deviation	Extension, ulnar deviation	Extension, radial deviation	Flexion, ulnar deviation
Fingers and thumb	Flexion, adduction	Extension, abduction	Extension, abduction	Flexion, adduction

TASK 2: Practice on Lower extremity component motions

- 1 Study the table - 2 and understand the D1 & D2 pattern.

Joints or Segments	Diagonal 1: Flexion	Diagonal 1: Extension	Diagonal 2: Flexion	Diagonal 2: Extension
Hip	Flexion-Adduction External Rotation	Extension-Abduction Internal Rotation	Flexion-Abduction Internal Rotation	Extension-Adduction External Rotation
Knee	Flexion or extension	Flexion or extension	Flexion or extension	Flexion or extension
Ankle	Dorsiflexion, inversion	Plantar flexion, eversion	Dorsiflexion, eversion	Plantar flexion, inversion
Toes	Extension	Flexion	Extension	Flexion

Determination of grades of MMT for upper and lower limb

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the grades of MMT for upper and lower limb
 - perform the grading techniques to the patients.

Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Couch/Chairs	- as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding grades of MMT for upper and lower limb and ask the trainee to perform the grading techniques to the patients.

TASK 1: MMT grading scales for upper and lower limbs

- 1 Study the table determine the grade of MMT for upper and lower limb.

Movement	ROM Normal position	Optimal client Stabilizer	Therapist applied	Resistance
Shoulder flexion	0-180	Seated	Shoulder	Distal humerus
Shoulder extension	0-60	Prone	Shoulder	Distal humerus
Shoulder abduction	0-180	Seated	Shoulder/Scapula	Distal humerus
Shoulder External rotation	0-90	Prone	Distal humerus	Distal forearm
Shoulder internal rotation	0-70	Prone	Distal humerus	Distal forearm
Elbow flexion	0-135	Seated	Distal humerus	Distal forearm
Elbow extension	135-0	Prone	Humerus	Distal forearm
Supination	0-80/90	Seated	Distal humerus	Distal forearm
Pronation	0-80/90	Seated	Distal humerus	Distal forearm
Wrist flexion	0-90	Seated forearm resting on table in mid position	Distal forearm	Palm on radial side
Wrist extension	0-80	Seated forearm resting on table in mid position	Distal forearm	Palm over end and third mcp distal
Hip flexion	0-120	Supine lying	Ankle	Anterior aspect of distal thigh

Movement	ROM Normal position	Optimal client Stabilizer	Therapist applied	Resistance
Hip extension	0-10	Supine lying	Ankle	Posterior aspect of distal thigh
Hip abduction	0-45	Supine	Later aspect of knee	Later aspect of thigh
Hip adduction	0-50	Supine	Medial aspect of knee	Medial aspect of thigh
Hip external rotation	0-45	Supine with hip and knee flexed	Lateral aspect of thigh	Lateral aspect of distal thigh
Hip internal rotation	0-45	Supine with hip and knee flexed	Medial aspect of thigh	Medial aspect of distal thigh
Knee flexion	0-135	Prone with hip extended	Lower leg	Posterior aspect of lower leg
Knee extension	0-135	Supine	Lower leg	Anterior aspect of lower leg
Ankle dorsiflexion	0-20	Supine	Foot	Dorsum of the foot
Ankle Plantar flexion	0-40	Supine	Foot	Plantar surface of the foot
Inversion	0-35	Supine	Foot	Medial aspect of first metatarsal
Eversion	0-35	Supine	Foot	Lateral aspect of fifth metatarsal

Practical based on grading of MMT for trunk and abdominals

Objectives: At the end of this exercise you shall be able to

- demonstrate the grading of MMT for trunk and abdominals
- perform the grading of MMT for trunk and abdominals.

Requirements

Tools/Instruments

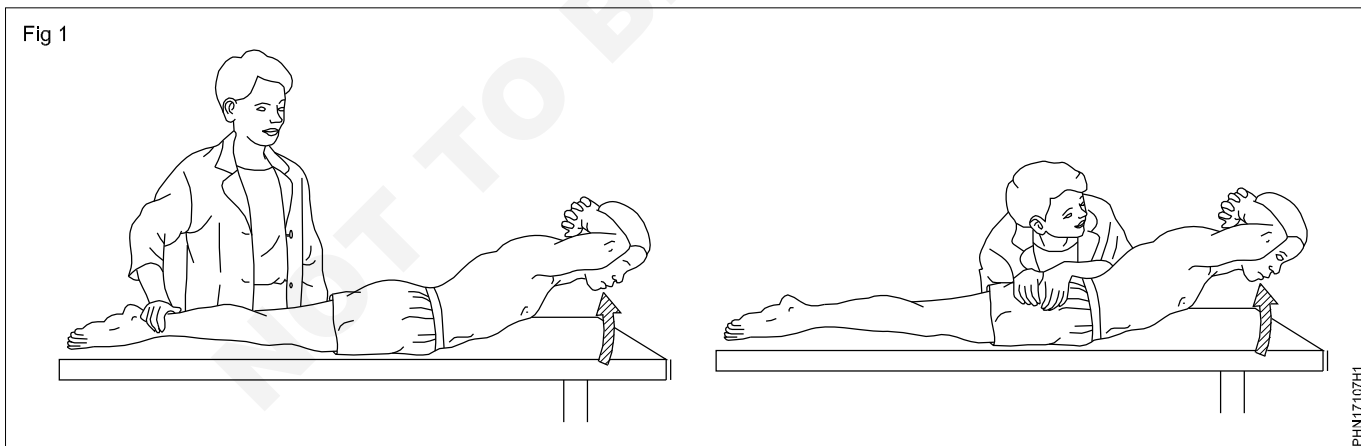
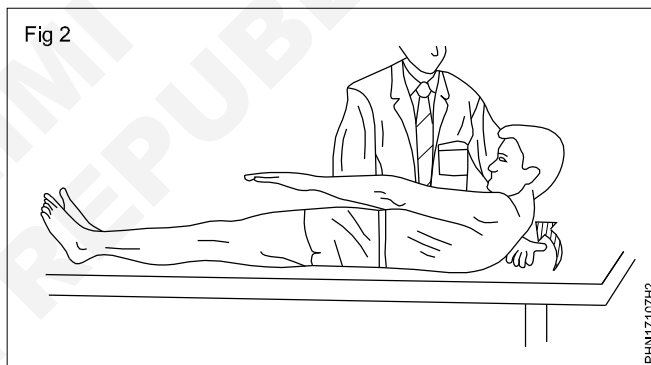
- Therapist setup - as reqd.
- Couch/Chairs - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the grading of MMT for trunk and abdominals and ask the trainee to perform the grading of MMT for trunk and abdominals.

TASK 1: Perform MMT for trunk (Figs 1&2)

- 1 Make patients position as prone lying.
- 2 Hold the lower part of the leg and ask the patient to lift the trunk.
- 3 Make patients position as supine lying.
- 4 Ask the patient to lift the trunk.



TASK 2: Perform MMT for abdominals

- 1 Make patients position as prone lying.
- 2 Hold the lower part of the leg.
- 3 Ask the patient to lift the trunk and check for abdominal muscles range of motion.
- 4 Find the explanation based on scale value as below in table -1.

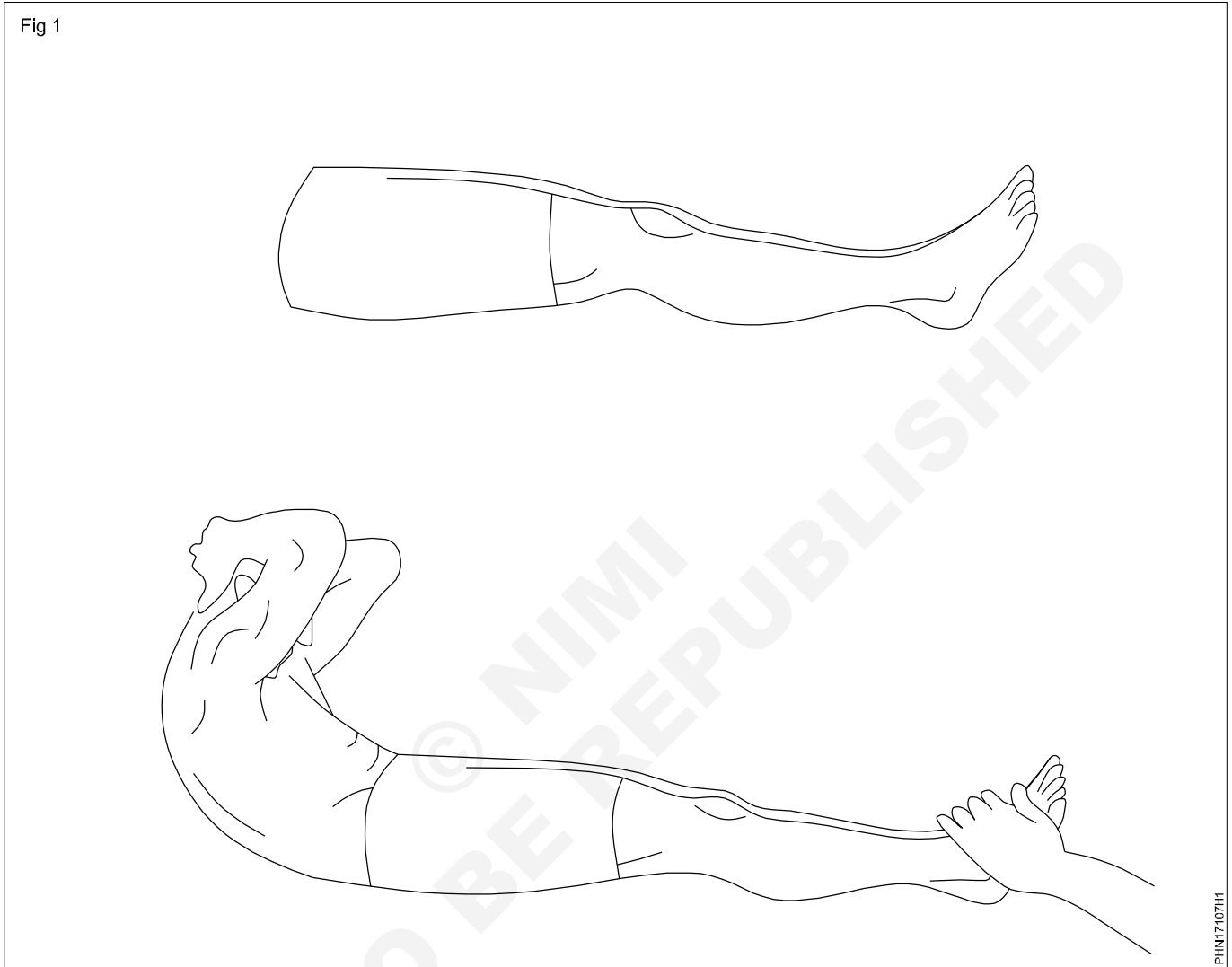


Table - 1

SCALE	EXPLANATION
0	No contraction is present
1	There is flicker contraction
2	Full ROM with gravity counter balance
3	Full ROM against gravity
4	Full ROM against gravity + added resistance
5	Muscle function normally

Representation of MMT exercises for face

Objectives: At the end of this exercise you shall be able to

- demonstrate the MMT exercises for face
- perform the MMT exercises for face.

Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Chair	- as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the MMT exercises for face and ask the trainee to perform the MMT exercises for face.

TASK 1: Perform the Facial nerve grading

At rest	0	1	2	3	4
Wrinkle forehead	0	1	2	3	4
Blink	0	1	2	3	4
Slight closure of eye	0	1	2	3	4
Tight closure of eye	0	1	2	3	4
Closure of eye on the involved side only	0	1	2	3	4
Wrinkle nose	0	1	2	3	4
Whistle	0	1	2	3	4
Grin	0	1	2	3	4
Depress lower lip	0	1	2	3	4

1 Award the score based on the following scale by checking the patient.

The scale	Score
Consists of normal,	4
Slight paralysis,	3
Moderate paralysis,	2
Severe paralysis	1
Total paralysis	0

Proper demo of relaxation techniques by using pillows

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the relaxation techniques by using pillows
 - perform the same to the patients.

Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Images/Figures	- as reqd.
• Couch	- as reqd.
• Pillows	- as reqd.

PROCEDURE:

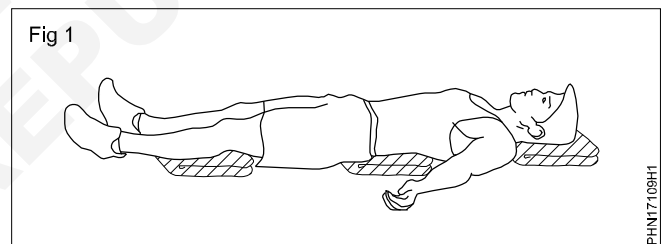
Note: Trainer will teach trainee regarding the relaxation techniques by using pillows and perform the same to the patients.

TASK 1: Lying supine

Lying supine for relaxation (Fig 1)

A Head pillow is required which is sufficiently soft to prevent the head from rolling to either side and to be well moulded to support the neck posteriorly.

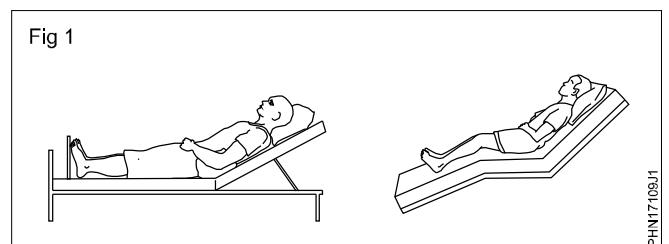
A small pillow under the knees relieves tension on the hamstrings and ilio-femoral ligament. The feet are held in mid-position rest on a pillow.



TASK 2: Half lying

Half Lying for relaxation and Half lying –another method (Fig 1)

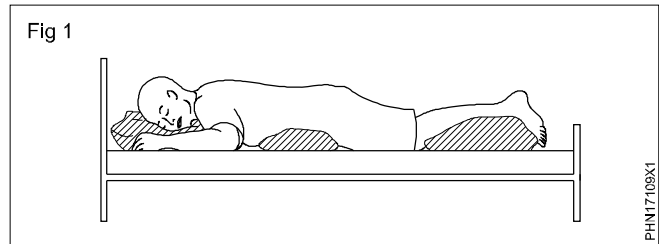
- 1 This is similar to previous position but breathing is easier as there is less weight on the back and abdominal pressure on the under surface of the diaphragm is reduced.
- 2 An arm chair makes a quite substitute for a plinth or bed, the thighs are fully supported and the feet rest on the floor or footstool or a T shaped footrest.



TASK 3: Prone lying

Prone Lying for relaxation (Fig 1)

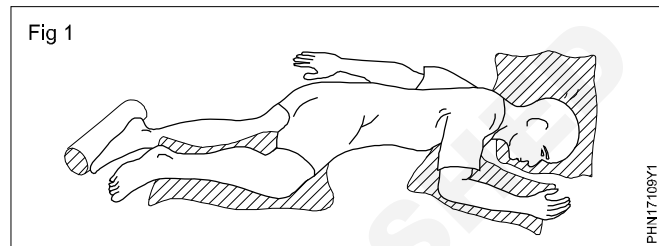
- 1 Turn the head to one side and may rest on a small pillow, if more comfortable.
- 2 Place a firm pillow under the hip and the lower abdomen prevents hollowing the back.
- 3 Elevate the lower leg, so that the knees are slightly bend and toes free.



TASK 4: Side lying

Side Lying for relaxation (Fig 1)

- 1 Rest the arm and the leg which are uppermost may be on the supporting surface instead of pillows.
- 2 Supports the head and neck in alignment with the body and must not be too high by the head pillow.



Execute testing of traction

Objectives: At the end of this exercise you shall be able to

- demonstrate the testing methods of traction
- perform the same to the patients.

Requirements			
Tools/Instruments			
• Therapist setup	- as reqd.	• Chair/Couch	- as reqd.
• Images/Figures	- as reqd.		

PROCEDURE:

Note: Trainer will teach trainee regarding the testing methods of traction and ask the trainee to perform the same for the patients.

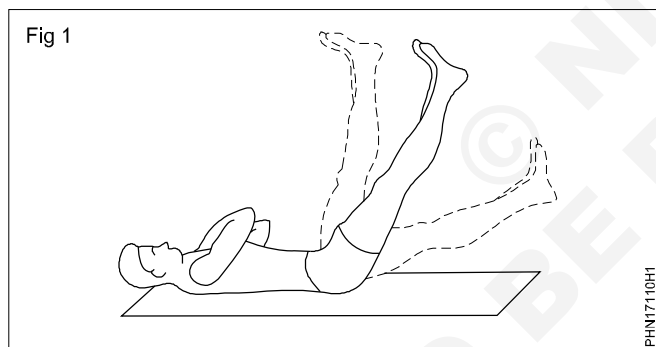
The following tests need to be done before giving traction.

TASK 1: Test for Lumber

Position: Supine lying (Fig 1)

Action: Ask him to raise the leg with knees extended.

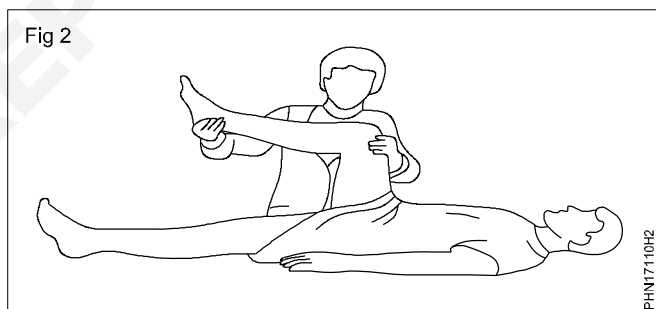
Positive: If the pain in the sciatic distribution.



Position: Supine lying (Fig 2)

Action: Thigh bent at 90 degrees and knee at 90 degrees. Gradually extend the knee keeping hip flexed.

Positive: Thigh pain radiates down the leg.

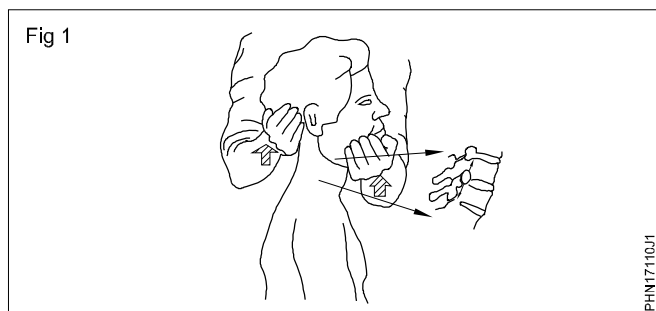


TASK 2: Test for Cervial

Position: Sitting (Fig 1)

Action: Place one palm of the hand under the patient's chin and the other hand is upon occiput. Gradually lift the hand.

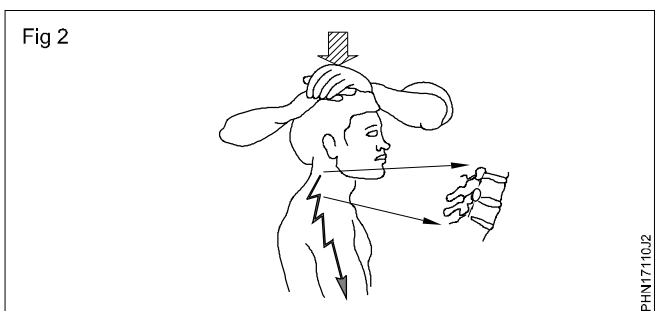
Positive: The pain get relieves by decreasing the pressure on the joint around the facet joints.



Position: Sitting (Fig 2)

Action: Press down upon the top of patient's head.

Positive: If there is pain in either cervical spine or upper extremity.



Demonstrate the positioning of patient while giving traction

- Objectives:** At the end of this exercise you shall be able to
- demonstrate the positioning of patient while giving traction
 - perform the same to the patients.

Requirements

Tools/Instruments

- Preparation of patient
- Preparation of therapist
- Images/Figures
- Traction

PROCEDURE:

Note: Trainer will teach trainee regarding the positioning of patient while giving traction and ask the trainee to perform the same for the patients.

TASK 1: Lumbar Traction (Fig 1)

- 1 Make the patient to lie down on the cervical traction couch.
- 2 Place the cervical belt one end under the neck and another end over the chin.
- 3 Join the belt to the traction machine
- 4 Follow the treatment time and weight according to the patient's weight as demonstrated in the below chapter exercises.

Fig 1



TASK 2: Cervical Traction (Fig 1&2)

- 1 Make the patient to lie down on the lumbar traction couch.

- 2 Place the lumbar belt around the hip.
- 3 Join the belt to the traction machine.
- 4 Follow the treatment time and weight according to the patient's weight as demonstrated in the below chapter exercises.

Fig 1



Fig 2



Teach how to calculate patient's weight to be used in treatment

- Objectives:** At the end of this exercise you shall be able to
- teach the patient's to calculate weight to be used in treatment
 - measure the weight for different patient.

Requirements

Tools/Instruments

- Preparation of patient
- Preparation of therapist
- Images/Figures

PROCEDURE:

Note: Trainer will teach how to calculate patient's weight to be used in treatment and ask the trainee to measure the same for different patients.

TASK 1: Cervical Traction (Fig 1)

Level	Minimum Weighth	Maximum Weighth
C1	2.3 kg	4.5 kg
C2	2.7 kg	4.5 - 5.4 kg
C3	3.6 kg	4.5 - 6.7 kg
C4	4.5 kg	6.7 - 9.0 kg
C5	5.4 kg	9.0 - 11.3 kg
C6	6.7 kg	9.0 - 13.5 kg
C7	8.2 kg	11.3 - 15.8 kg

Note: The maximum weight and minimum weight is explained above. The trainer should fix the weight according to the patient's weight. Apply the same weight as per the procedure given in the precious exercise.

TASK 2: Lumbar Traction

- 1 To be effective, lumbar traction must overcome lower extremity weight ($\frac{1}{4}$ - $\frac{1}{2}$ of body weight)
- 2 Friction is a strong counterforce aganist lumbar traction
 - Split table is to reduce friction.

Note: In Lumbar traction, the weight could be maintained from quarter to half of the patient's body weight.

For example, if the patient weight is 50 kg, approximately 20 to 25 kgs could be given.

Develop different methods of application of traction

- Objectives:** At the end of this exercise you shall be able to
- demonstrate different methods of application of traction
 - perform the same to the patients.

Requirements

Tools/Instruments

- Therapist setup - as reqd.
- Images/Figures - as reqd.
- Traction - as reqd.

PROCEDURE:

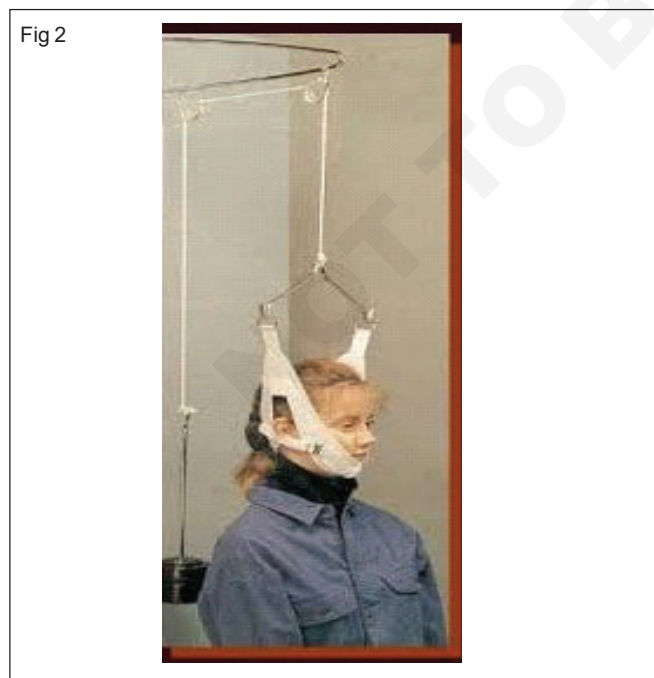
Note: Trainer will teach trainee regarding different methods of application of traction and ask the trainee to perform the same to the patients.

TASK 1: Difference methods of cervical traction

Lying Position (Fig 1)



Sitting Position (Fig 2)



Steps to perform cervical traction (Fig 1)

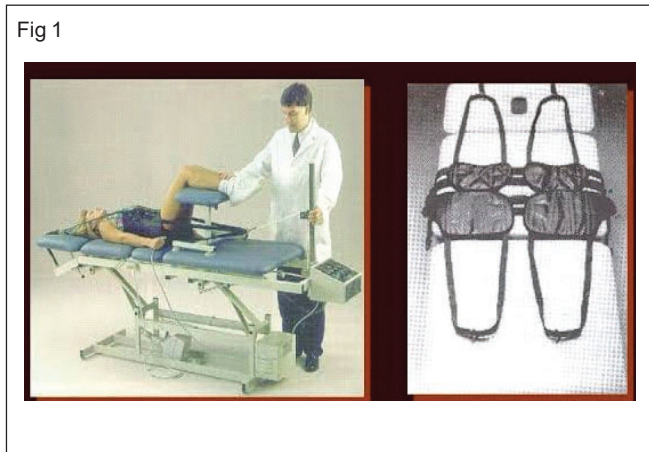
- 1 Make the patient to lie down on the cervical traction couch.
- 2 Place the cervical belt one end under the neck and another end over the chin.
- 3 Join the belt to the traction machine
- 4 Follow the treatment time and weight according to the patient's weight as demonstrated in the below chapter exercises.

Sitting position (Fig 2)

- 1 Use wall mounted device.
- 2 The patient neck should be in neutral position.
- 3 Hold the neck in cervical collar.
- 4 Gentle pull should be given (10-20 pounds).
- 5 Treatment time (20-25 min).

TASK 2: Difference methods of Lumbar traction

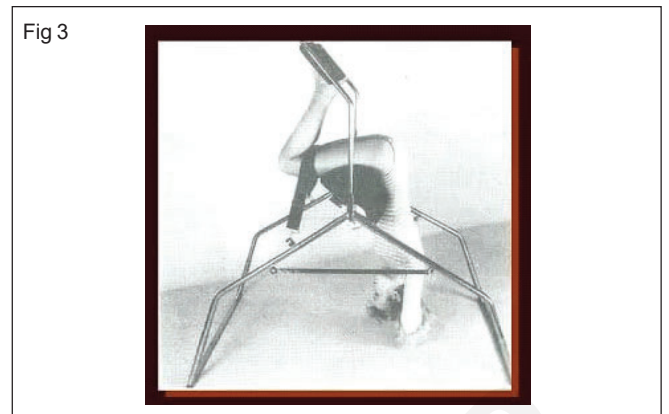
Supine lying position (Fig 1)



Prone lying position (Fig 2)



Inversion Traction (Fig 3)



Steps to perform lumbar traction:

- 1 Make the patient to lie down on the lumbar traction couch.
- 2 Place the lumbar belt around the hip.
- 3 Join the belt to the traction machine.
- 4 Follow the treatment time and weight according to the patient's weight as demonstrated in the below chapter exercises.

Prone lying position:

- 1 Prone position
 - 2 Place pillows under abdomen.
 - 3 Place the lumbar belt around the hip.
 - 4 Join the belt to the traction machine.
 - 5 Follow the treatment time and weight according to the patient's weight as demonstrated in the below chapter exercises.
 - 6 It is best for disk protrusions.
-

Impart skills of manual cervical and lumbar traction

Objectives: At the end of this exercise you shall be able to

- impart skills of manual cervical traction
- impart skills of manual lumbar traction.

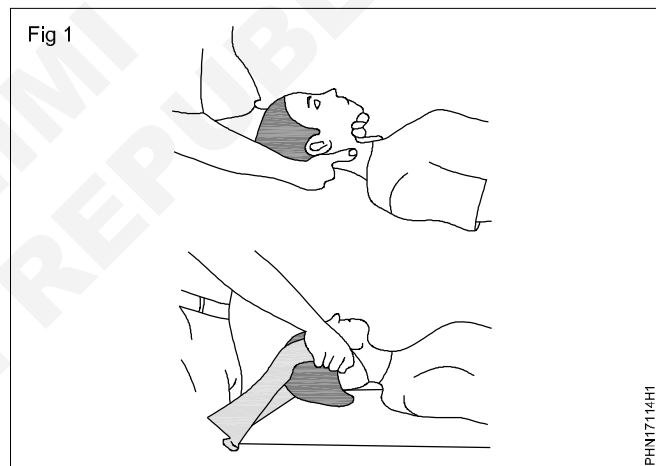
Requirements
Tools/Instruments
<ul style="list-style-type: none">• Therapist setup - as reqd.• Images/Figures - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the skills of imparting cervical and lumbar traction manually and ask the trainee to perform the tasks manually.

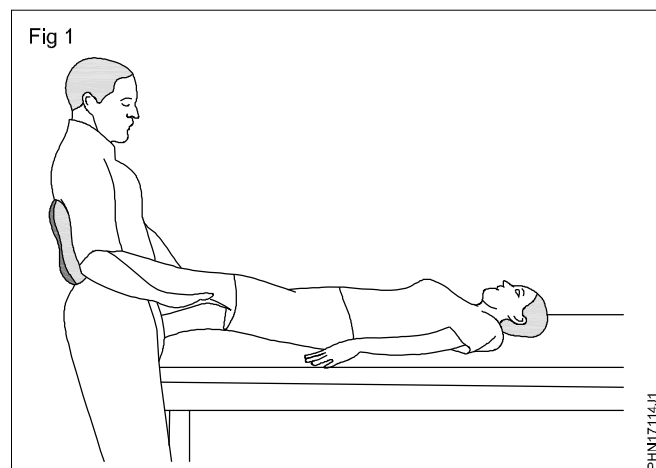
TASK 1: Practice Manual Cervical traction

- 1 Sit at head of table facing patient.
- 2 Cradle head to allow distraction of cervical vertebrae without hurting patient traction is applied.
- 3 Move the head slowly to maximize relaxation and comfort by;
 - Neutral position pain: affecting upper cervical vertebrae.
 - Flexed 30 degree pain: affecting lower cervical vertebrae.
 - Lateral flexion pain: pressure on spinal nerves with radiating pain in to arms or hands.



TASK 2: Manual Lumbar Traction

- 1 Allow the clinician to feel patients reaction to treatment.
- 2 Use hands or belts to pull on patients leg, separating vertebrae.



Instruct normal gait patterns

Objectives: At the end of this exercise you shall be able to

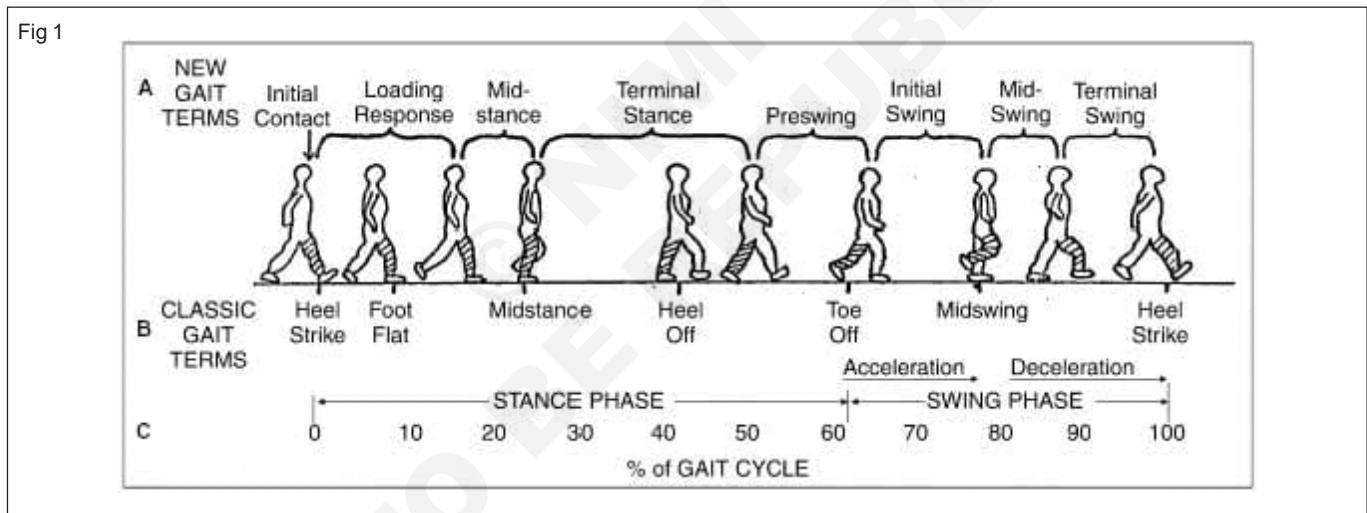
- instruct normal gait patterns
- impart the same to the patients.

Requirements	
Tools/Instruments	
• Therapist setup	- as reqd.
• Images/Figures	- as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the normal gait patterns applied to the patients and ask the trainee to perform the same for the patients.

TASK 1: Normal Gait Patterns (Fig 1)



Note: The above figure represents the normal gait patterns of the human being and instruct the patients to follow the same during gait training.

Stance phase:

Write same as mentioned in Ex.No 116. From heel contact to toe off.

Swing phase:

- 1 **Pressing:** It begins at contralateral initial contact and ends at toe off.
- 2 **Initial swing:** During this, the hip, knee and ankle are flexed to begin advancement of the limb forward and create clearance at the foot over the ground.
- 3 **Mid swing:** Limb advancement continues and the thigh reaches its peak advancement.
- 4 **Technical swing:** It is the final phase of gait cycle.

Presentation of gait phases on floor

Objectives: At the end of this exercise you shall be able to

- demonstrate the gait phases on floor
- perform the gait phases on floor to the patients.

Requirements

Tools/Instruments

- Therapist setup - as reqd.
- Images/Figures - as reqd.

Note: Trainer will teach trainee regarding the phases of gait on floor and ask the trainee to perform the same to the patients.

Stance phase: Consists of the entire time that a foot is on the ground (60%). (Fig 1)

Swing phase: Consists of the entire time that the foot is in the air (40%).

Gait cycle subdivisions (Fig 2)

1 **Heel contact:** The initial contact, the instant the foot contacts the ground.

2 **Foot flat:** Refers to the forefoot loading so that the entire foot is in ground contact.

3 **Mid- stance:** It is the point where the support limb moves from the shock absorption to more of a stability function.

4 **Heel off:** The heel comes off the ground of the lead leg.

5 **Toe-off:** It is before the stage of swing phase.

Fig 1

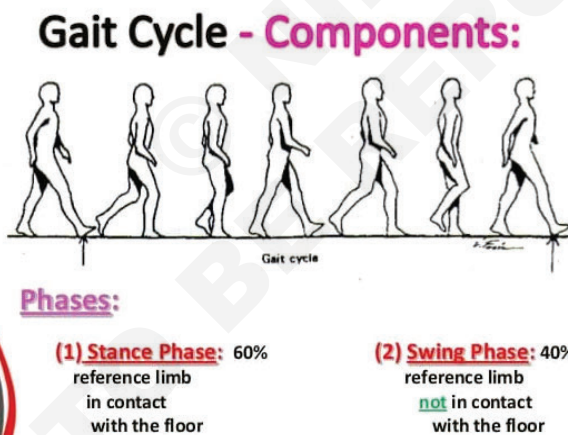
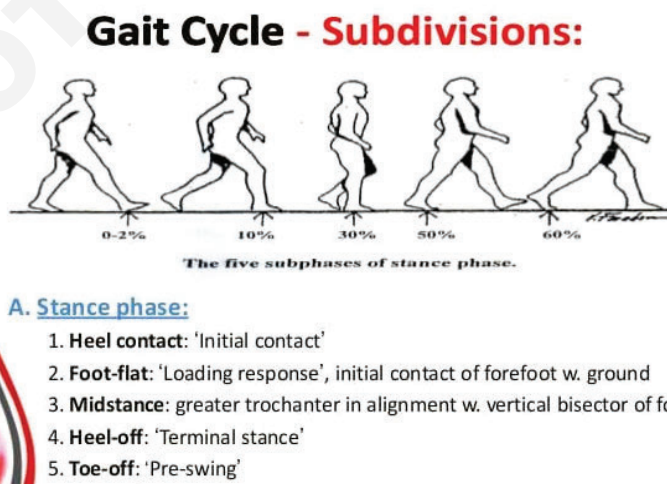


Fig 2



Perform abnormal gaits

Objectives: At the end of this exercise you shall be able to

- demonstrate abnormal gaits
- identify different types of gaits with the patients.

Requirements

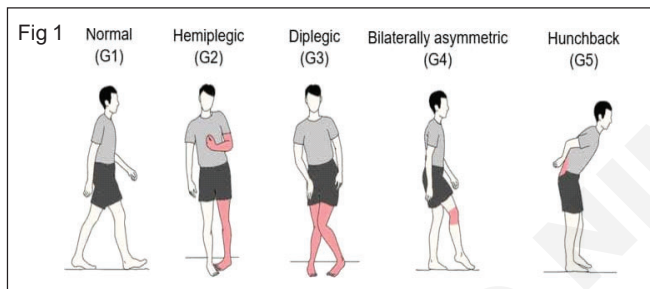
Tools/Instruments

- Therapist setup - as reqd.
- Images/Figures - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the different types of gaits with the patients and ask the trainee to demonstrate the same to the patients.

TASK 1: Types of gaits



NOTE: The above figures represent the different forms of gaits in various clinical conditions.

Step 1:

Hemiplegic gait includes impaired natural swing at the hip and knee with leg circumduction.

The pelvis is often tilted upward on the involved side to permit adequate circumduction.

With ambulation, the leg moves forward and then swings back toward the midline in a circular movement.

Step 2:

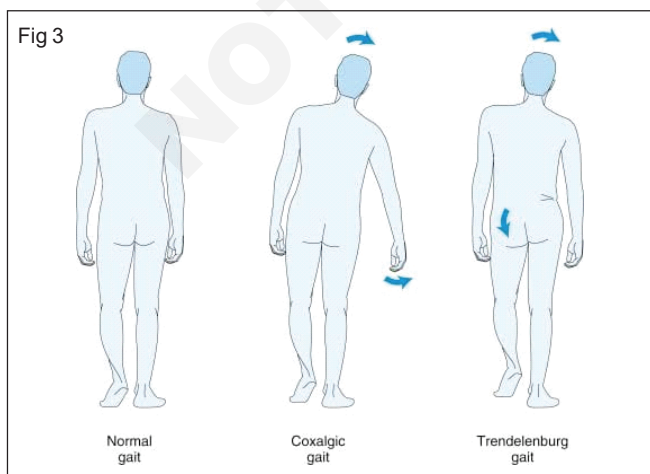
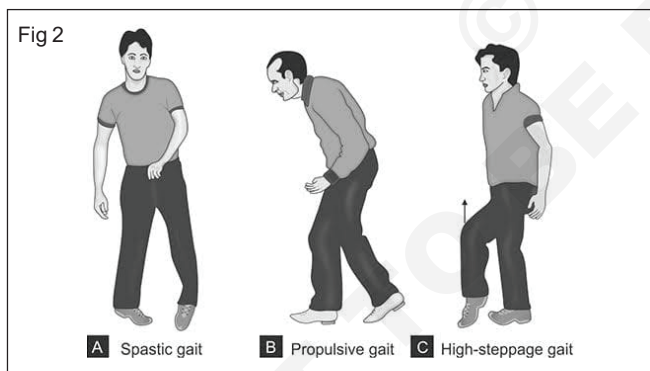
Common to patients with cerebral palsy or multiple sclerosis, spastic gait is a way of walking in which one leg is stiff and drags in a semicircular motion on the side most affected by long-term muscle contraction.

Step 3:

Propulsive gait is when a person walks with his or her head and neck pushed forward. It can appear as though the person is rigidly holding a slouched position. In addition to these five types, a person with a limp is also considered to have an abnormal gait.

Step 4:

Steppage gait (High stepping, Neuropathic gait) is a form of gait abnormality characterised by foot drop or ankle equinus due to loss of dorsiflexion. The foot hangs with the toes pointing down, causing the toes to scrape the ground while walking, requiring someone to lift the leg higher than normal when walking.



Demonstrate a practical on walking aids

- Objectives:** At the end of this exercise you shall be able to
- practice on muscle stimulator for major muscles of upper limb
 - demonstrate the practical on walking aids.

Requirements
Tools/Instruments <ul style="list-style-type: none">• Walking aids - as reqd.

PROCEDURE:

Note: Trainer will teach trainee regarding the practical on walking aids and ask the trainee to demonstrate the same.

There are number of aids available to assist people who have difficulty in walking or who cannot walk independently. These external aids are crutches, sticks and frames.

TASK 1: Crutch walking

The physiotherapist should have an assistance when the patient is to stand and walk for the first time. The therapist must instruct the assistance on how to support the patient to the upright position and how to transfer the patient on to the crutches.

i Non-weight bearing: The patient should always with a triangular base that is the crutches either in front or behind the weight bearing leg. To walk, the patient first moves the crutches a little further forward takes weight

down through the crutches and lifts the foot forward to a position just behind the line of the crutches. Once this is mastered, the patient may progress to lifting the foot forward to a position just in front of the line of the crutches.

ii Partial weight bearing: The crutches and affected leg are taken forward and put down together. Weight is then taken through the crutches and the affected leg while the unaffected leg is brought through.

TASK 2: Sticks

iii Sticks: The patient may use two sticks in the same way as the method described for partial weight bearing walking with crutches. One stick may be used on the unaffected side so that the stick and the affected leg are placed forward together taking some of the weight through the stick.

TASK 3: Frames

iv Frames: The patient lift the frame forward, then leans on it and takes two steps. The patient should take even steps keeping the frame well forward.

Give a brief idea of parts of wheel chair

Objectives: At the end of this exercise you shall be able to

- illustrate the parts of wheel chair
- demonstrate the same to the patients.

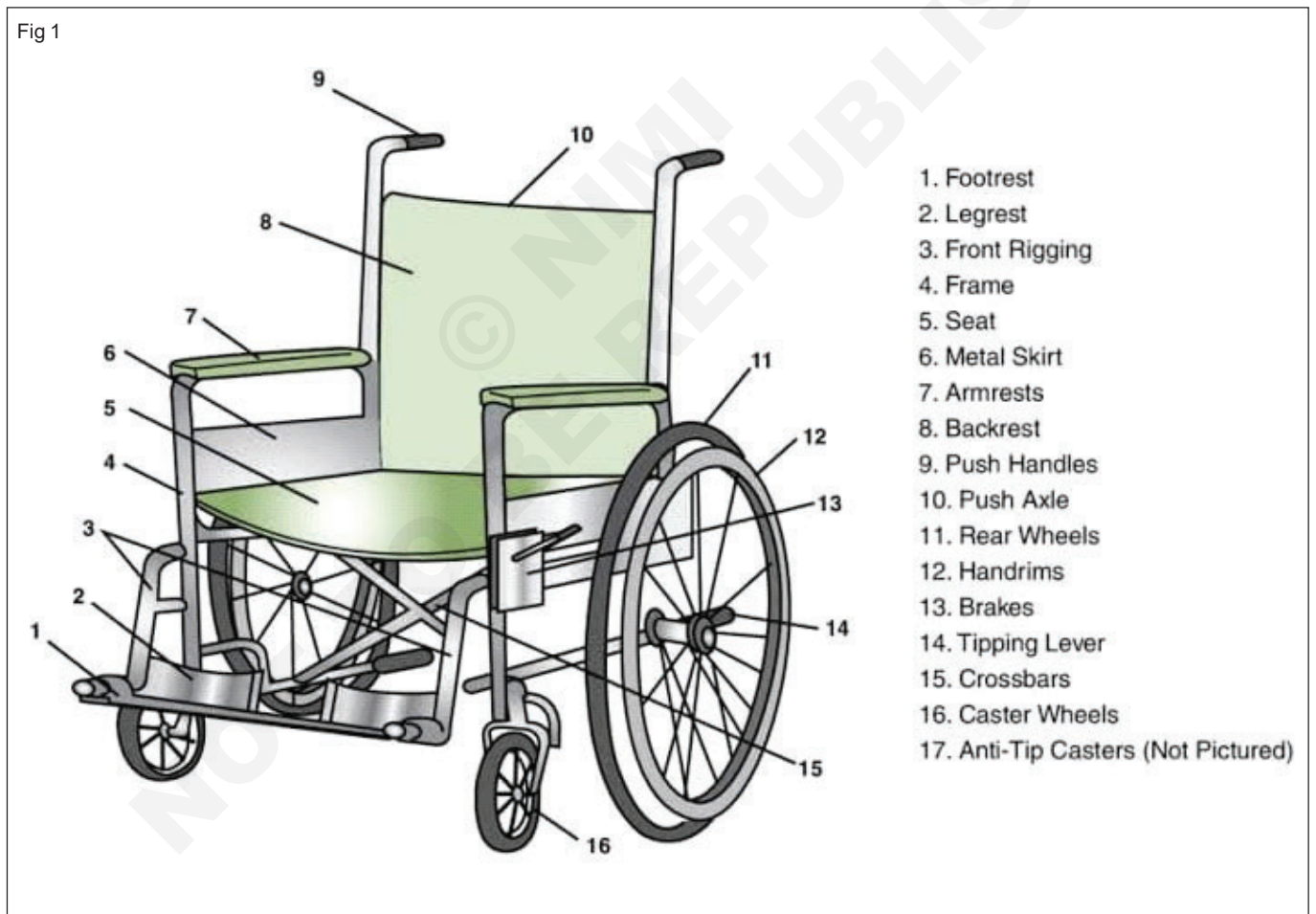
Requirements

Tools/Instruments

- Wheel chair - 1 No.

Note: Trainer will teach trainee regarding the parts of wheel chair and demonstrate the same to the patients.

Parts of Wheel Chair (Fig 1)



Give guidelines for walking aids' usage for patients

Objectives: At the end of this exercise you shall be able to

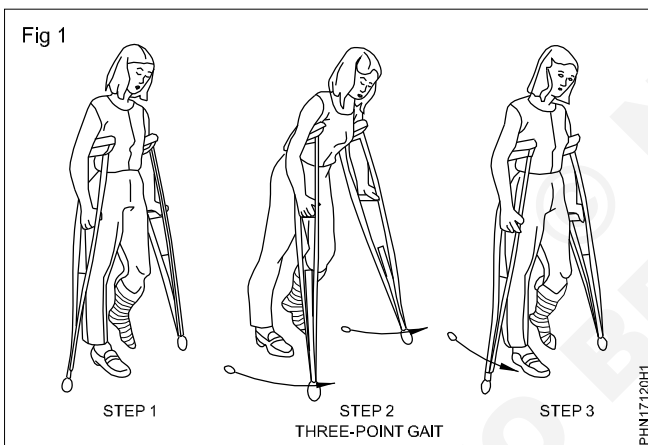
- provide guidelines for walking aids usage for patients
- demonstrate the guidelines to the patients.

Requirements	
Tools/Instruments	
• Gait patterns	- as reqd.

Note: Trainer will teach trainee regarding the guidelines for walking aids usage for patients and ask the trainee to demonstrate the same to the patients.

There are several different walking patterns that an individual using crutches may use including the below figures namely,

Three point gait (Fig 1)



Step 1: Patient moves two crutches and the affected leg simultaneously.

Step 2: Then moves the unaffected leg.

NOTE: Three-point gait that in which both crutches and the affected leg are advanced together and then the normal leg is moved forward. See illustration at crutches.

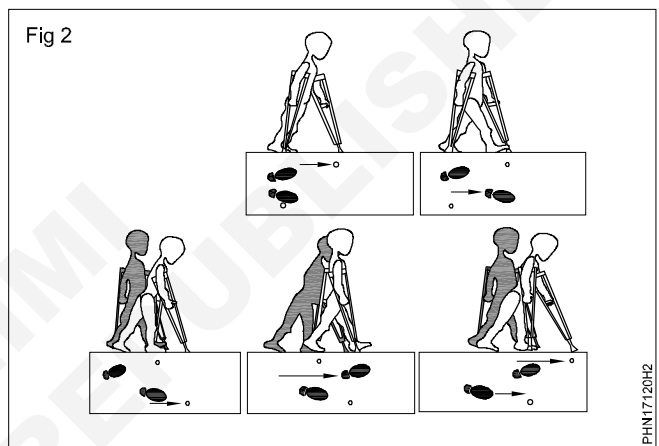
Four point gait (Fig 2)

Step 1: Move left crutch forward.

Step 2: Then right lower extremity.

Step 3: Move right crutch forward.

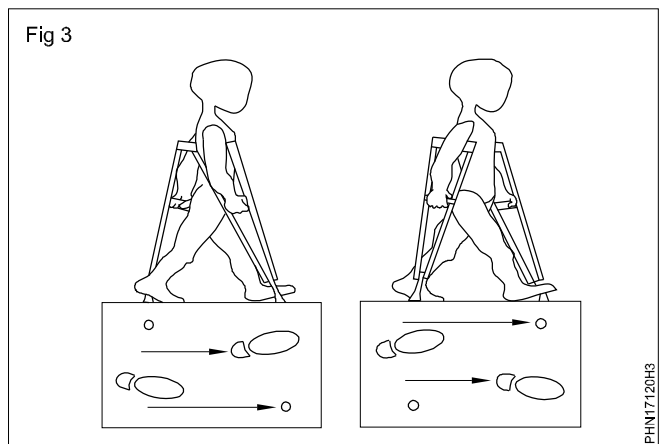
Step 4: Then right lower extremity.



Two point gait (Fig 3)

Step 1: Patient moves the right leg and right crutch simultaneously.

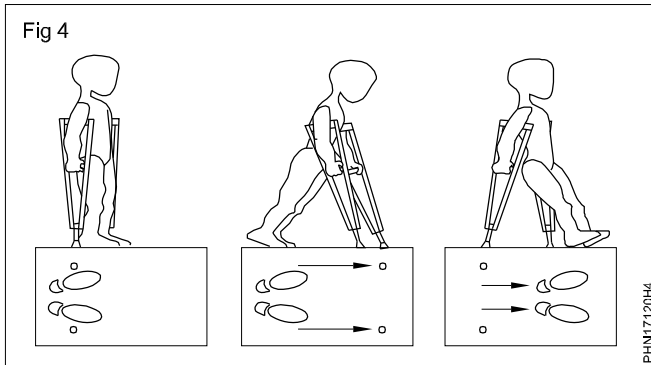
Step 2: Then moves the left leg and left crutch simultaneously.



Swing through gait (Fig 4)

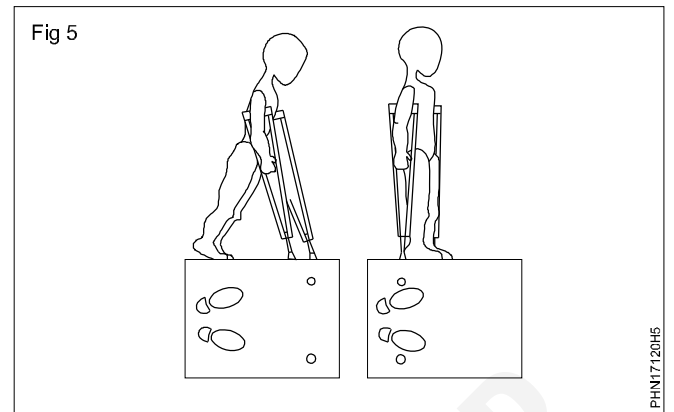
Step 1: Fastest gait requires functional abdominal muscles.

Step 2: In the swing through gait, the crutches are moved forward together but the lower extremities are swing beyond the crutches.



Swing to gait (Fig 5)

Step : Both crutches both lower limbs almost to crutch level.



Design gait pattern for weight bearing and non-weight bearing

Objectives: At the end of this exercise you shall be able to

- design gait pattern for weight bearing
- design gait pattern for non-weight bearing.

Requirements	
Tools/Instruments	
• Walking aids	- as reqd.

PROCEDURE:

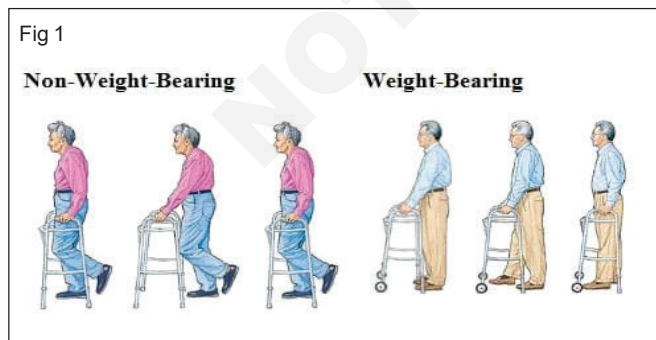
Note: Trainer will teach trainee regarding the designing of gait patterns for weight and non-weight bearing to the patients and ask the trainee to perform the same for the patient.

TASK 1: Levels of weight bearing

Levels of weight bearing (Table)

Level	Definition
Non-weight-bearing	No weight is placed on the injured limb
Touch-down weight-bearing	The injured limb is used only for balance
Partial weight-bearing	A percentage of body weight is placed on the injured limb
Weight-bearing as tolerated	A "comfortable" amount of weight is placed on the limb (measured by patient's comfort level, not by percentage of body weight)
Full weight-bearing	Full body weight is placed on the injured limb

Patterns of gait (Fig 1)



Patterns of gait using crutches

Non-weight bearing: The patient should always with a triangular base that is the crutches either in front or behind the weight bearing leg. To walk, the patient first moves the crutches a little further forward takes weight down through the crutches and lifts the foot forward to a position just behind the line of the crutches. Once this is mastered, the patient may progress to lifting the foot forward to a position just in front of the line of the crutches.

Partial weight bearing: The crutches and affected leg are taken forward and put down together. Weight is then taken through the crutches and the affected leg while the unaffected leg is brought through.

Partial weight bearing walking instructions

- 1 Bear some weight about 50 per cent on affected limb as one walks.
- 2 Standing on unaffected leg, lift both crutches at the same time and place the crutches one step's length in front.
- 3 Bring the affected leg forward so that it is line with the crutches. Only put up to 50% of body weight on this leg as place it on the ground.
- 4 Push down on the handgrips with hands while squeezing the top of the crutches between your chest and upper arms.
- 5 Putting your weight through the handgrips, hop forward with unaffected leg to meet the crutches, or slightly ahead of the crutches, making sure that only 50% of body weight is put through the affected leg.

Performance of gait training

Objectives: At the end of this exercise you shall be able to

- demonstrate the gait training
- perform the gait training.

Requirements

Tools/Instruments

- Gait patterns - as reqd.

Note: Trainer will teach trainee regarding the gait training to the patients and ask the trainee to perform the same for the patient.

Foot Exercises for Gait Training

- 1 Ankle Dorsiflexion (Passive) from a seated position, cross your affected leg over you other leg.
- 2 Assisted Toe Raises (Passive) Toe raises are the most difficult movement to perform with foot drop.
- 3 Heel Raises (Active).
- 4 Seated Marching.
- 5 Knee Extension.

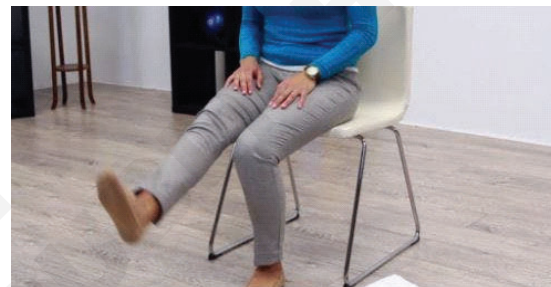
Seated Marching (Fig 1)

Fig 1



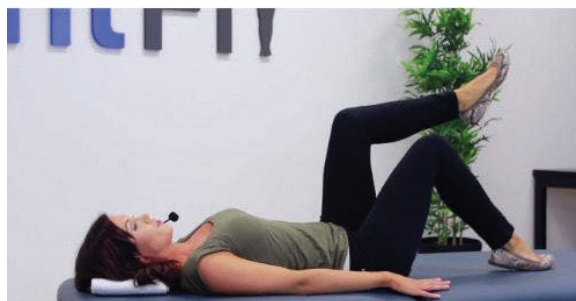
Knee Extension (Fig 2)

Fig 2



Toe Taps (Fig 3)

Fig 3



Knee to chest (Fig 4)

Fig 4



Ankle Dorsiflexion (Fig 5)

Fig 5



Assisted Toe raises (Fig 6)

Fig 6



Assisted Heel Raises (Fig 7)

Fig 7

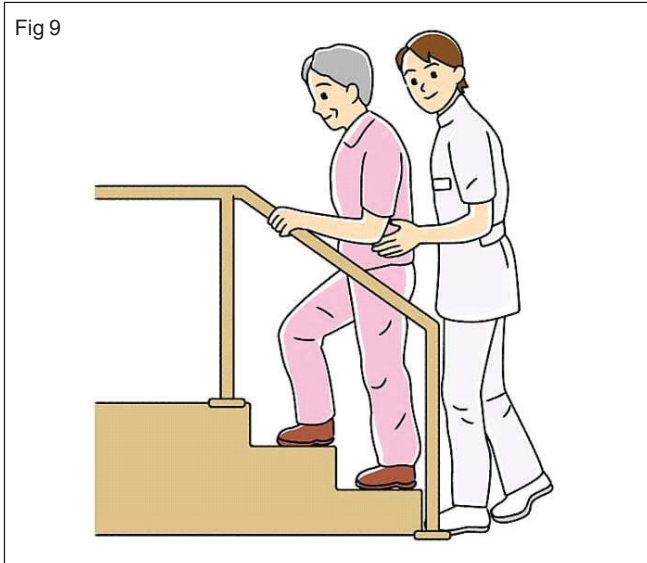


Gait training using frames (Fig 8)

Fig 8



Gait training on ascending and descending stairs (Fig 9)



Gait training with parallel bars (Fig 10)



Step 1: While climbing stairs, good to step up with unaffected limb as first move and then to step up with affected limb. Similarly, while moving downwards, affected limb should be moved forward and then you should step down the unaffected limb.

Step 2: Move forward using parallel bars. Practice the same.

© NIMI
NOT TO BE REPUBLISHED

Display videos showing causes of clinical conditions

- Objectives:** At the end of this exercise you shall be able to
- display the videos showing causes of clinical conditions
 - demonstrate the same.

Requirements

Tools/Instruments

- | | |
|--------------------------|------------|
| • Computer with internet | - 1 No. |
| • Pencil & pen | - as reqd. |
| • A4 sheet | - as reqd. |

PROCEDURE:

Note: Trainer will show trainee regarding the videos showing causes of clinical conditions and ask them to demonstrate the same

Link 1: <https://www.youtube.com/watch?v=VYj-JfX0wT0>

Link 2: <https://www.youtube.com/watch?v=ARdGaE1sbBM>

Link 3: <https://www.youtube.com/watch?v=EB5zxdAQQzU>

Link 4: <https://www.youtube.com/watch?v=qoE3Mp07tWI>

Link 5: <https://www.youtube.com/watch?v=9r0ebb-QM6E>

TASK 1: List the causes of clinical conditions

- | | |
|--|----------------------------------|
| 1 See the vides in the above link provided. | 4 Cause of Parkinson disease. |
| 2 List the nerves & links in the posterior and anterior divisions. | 5 Cause of Rheumatoid arthritis. |
| 3 List the Spinal causes and non spinal causes. | 6 What is facial pals. |
-

Perform observational assessment in various conditions

- Objectives:** At the end of this exercise you shall be able to
- perform the observational assessment in various conditions
 - evaluate the condition using assessment.

Requirements	
Tools/Instruments	
• Pen & pencil	- as reqd.
• A4 sheet	- as reqd.

PROCEDURE:

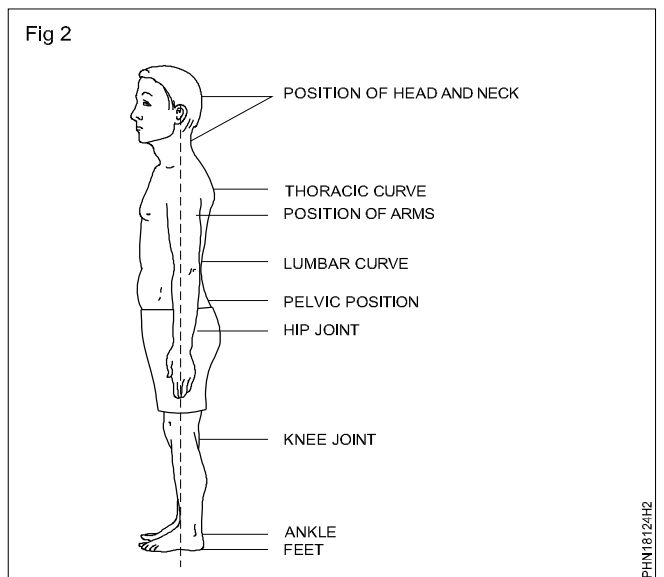
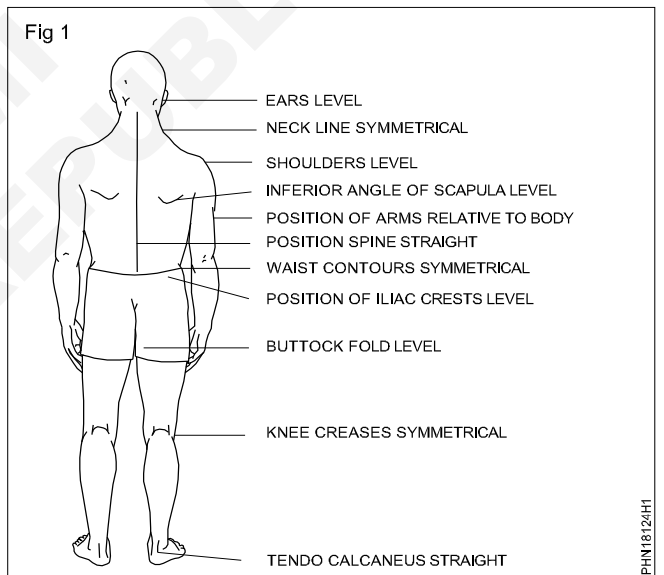
Note: Trainer will ask the trainee regarding to perform the observational assessment in various conditions and ask them to demonstrate the condition using the assessment

TASK 1: Practice on observational assessment

You could start picking information from the patient from the very first moment. This begins as soon as you see the patient in the waiting area and continues until they leave your company. Everything they do is a potential clue to their problem.

- 1 Take note of how they're sitting (or are they standing?).
- 2 Do they look like they're in pain? When they stand up, is it a struggle, or effortless?.
- 3 Watch them walk to the cubicle, do they limp, do they favour one side, and are they steady on their feet?
- 4 Watch them closely If they have to undress,. If they're saying they can't lift up their arm and yet remove a T-shirt with no apparent discomfort, are they faking it (if it's a medico- legal issue) or are they just having a pain-free day?
- 5 Collect the details of the following during Assessment.
 - i General Condition of the patient: Poor/Good/Medium.
 - ii Body built
 - iii Posture
 - Standing, sitting, lateral views.
 - Anterior, Posterior and Lateral views.
 - Deviations at different regions should be checked.

Surface Marking Points to Note (Figs 1&2)



- iv Ambulatory Status
 - v Deformity
 - vi External appliances
 - vii Gait analysis
 - Perform a general overview of patient's posture.
 - Observe walking at normal speed then slow and fast speed.
 - The examiner must watch the lumbar spine, pelvis, hips, knees, feet and ankle during walking.
- Patient should walk bare foot.
 - Also examine the patient walking with and without aids.
- viii Observation in anterior view.
 - ix Observation in lateral view.
 - x Pathological gait.
 - xi Tropical changes/Surgical scar.

© NIMI
NOT TO BE REPUBLISHED

Perform clinical examination

Objectives: At the end of this exercise you shall be able to
• **demonstrate the clinical examination.**

Requirements
Tools/Instruments <ul style="list-style-type: none">• Pencil & pen - as reqd.• A4 Sheet - as reqd.

Physiotherapy evaluation and examination is a very important process in physiotherapy practice. You become a detective of some sort. It becomes a skill that is sharpened as you see more people requiring physiotherapy evaluation and treatments.

- 1 Introduce yourself and make your client comfortable talking to you, before getting any data from, you should always. If possible, the area should be clear of distractions such as an open door where people are seen passing all the time. In addition, sitting in front of your client without any barrier (a table perhaps) between you and your client may be even better. This could probably make the person more comfortable talking to you.
- 2 You ask questions that are related to the specific problem of your client to get the history of present illness, or HPI. This may include asking:
 - What made you come here?
 - What did you feel? Please describe to me (Location/ Intensity/Duration). What other symptoms did you feel? Please describe them.
 - What was your activity at the time your symptoms occurred? / What were you doing when your symptoms occurred?
 - What makes your symptoms worse? What makes it better?
 - What did you do about your symptoms? (Medications/ Consultations and treatments provided including relevant lab works and results if available)
 - What other concerns do you have?
- 3 Ask why he or she decided to have a consultation today "If your client's symptoms had been present in the past".
- 4 Use mnemonics OLD CARTS, which stands for Onset, Location, Duration.

Character, Aggravating factors, Relieving factors, Timing and Severity.

Sometimes, you will know what your client's problem is as he or she enters the evaluation room before the actual evaluation and examination. This is your clinical eye working."For example, your client is walking with exaggerated right hip and knee bending, lifting the foot to clear it off the ground while walking. Having your clinical eye working, you might expect that he has weakness or paralysis of his ankle dorsiflexors (muscles in front of the leg). Since you know that that may be the case with your client, you can now prepare your questions in your mind.

- 5 Ask about previous medical conditions or other treatments that they are having for another health problem i.e Past Medical History (PMHx).
- 6 Ask Family Medical History.

Some conditions are inherited. Sometimes, health problems, such as heart disease or diabetes runs in their family, putting them at risk for the condition, as well.
- 7 Establish a baseline data, which will become your basis for possible change in your physiotherapy treatment plan.

Measurements that are essential in your physiotherapy documentation may include:

 - Blood pressure (BP), heart rate (HR), pulse rate (PR) and temperature (T°).
 - Joint range of motion.
 - Manual muscle tests (MMT) / Testing for baseline muscle strength.
 - Other relevant measurements specific for your client's problem. For example, stump measurement for a patient who have had an amputation.
- 8 Perform orthopedic special tests to determine the actual structure affected. For example, the Lachman test, which can be used to test for anterior cruciate ligament injury or the McMurray test for meniscus injuries.

9 Set Client / Patient Goals:

Setting goals for physiotherapy rehabilitation should involve the person (your client). The goals should be realistic and achievable according to person's condition and problems. By making your client actively participating in setting goals, he or she will feel more comfortable and may be more motivated in achieving those goals, thus, resulting in better outcomes.

10 Plan the Treatment for your client:

Again, in formulating physiotherapy treatment plan, your client should always be involved. Besides, he or she is the most important person in the rehabilitation team. The treatment options to be followed should address the problems that you gathered from your examination and the goals set with your client. Your client should feel that you are putting great importance on what he or she thinks." Always remember that rehabilitation is a collaboration between you and your client and the rest of the rehab team. Without motivation and active participation of the person (your client), the set goals may be hard to achieve.

© NIMI
NOT TO BE REPUBLISHED

Demonstrate various orthopaedical test

Objectives: At the end of this exercise you shall be able to

- **demonstrate various orthopaedical test**
- **perform the test to the patients.**

Requirements			
Tools/Instruments			
• Orthopaedical test setup	- as reqd.	• Couch/Chair	- as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the various orthopaedical tests and ask them to demonstrate various orthopaedical test to the patients

TASK 1: Practice on Faber Test (Fig 1)

Test positioning

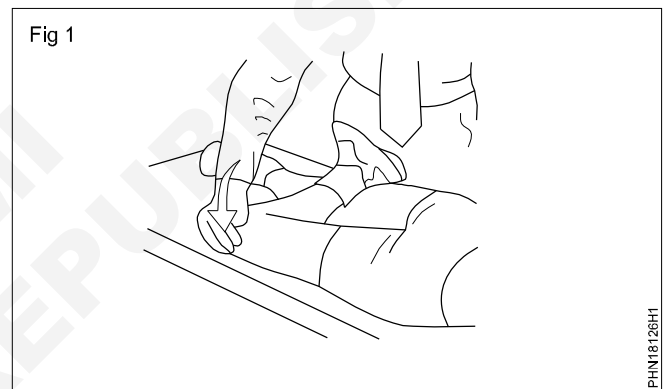
- 1 Make the person lies supine on table.

Action

- 2 Flexes passively, abducts, and externally rotate involved leg until foot rests on top of the knee of the noninvolved lower extremity.

Positive finding

- 3 Reveal the positive finding, when the involved lower extremity does not abduct below the level of the non involved lower extremity. This may be indicative of iliopsoas, sacroiliac, or even hip joint abnormalities.



TASK 2: Practice on Hoover Test (Fig 1)

Test positioning

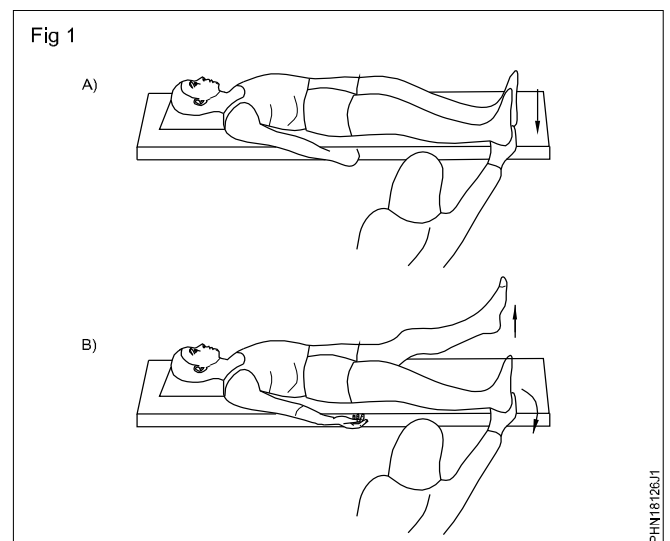
- 1 Make the patient to Supine lying.

Action

- 2 Ask to perform a unilateral straight leg raise.

Positive finding

- 3 Inability to lift the leg may reflect a neuromuscular weakness.



TASK 3: Practice on Joint Compression Test (Fig 1)

Test positioning

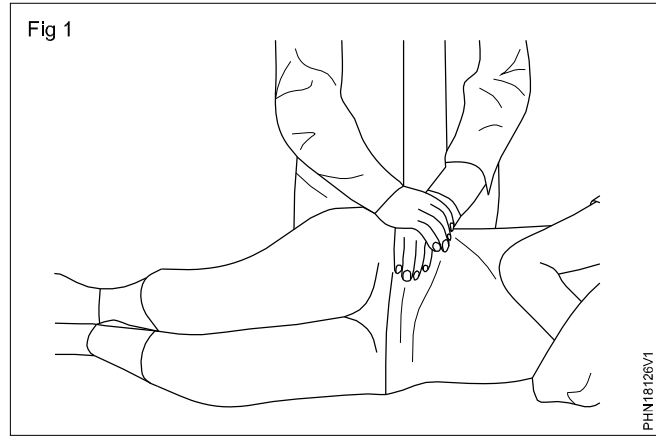
- 1 Make the Patient lies on his side.

Action

- 2 Apply downward pressure over the hip joints.

Positive finding

- 3 Increased pain or pressure is indicative of SI joint dysfunction.



TASK 4: Practice on Bilateral Straight Leg Raising Test (Fig 1)

Test positioning

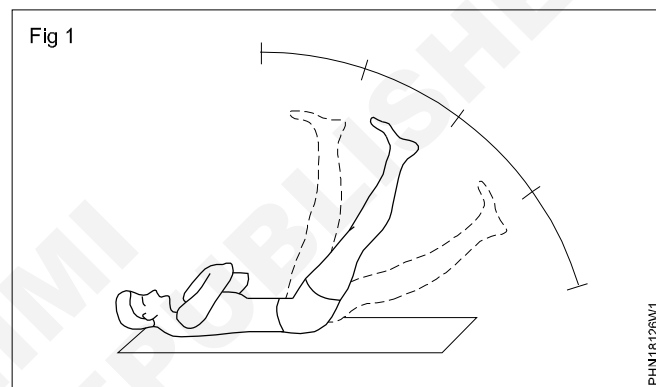
- 1 Make the Patient lies supine with both hips and knees extended.

Action

- 2 Raise slowly the legs until pain or tightness is noted.

Positive finding

- 3 Low back pain at less than 70 degree indicates SI joint involvement. Low back pain at greater than 70 degree indicates lumbar spine involvement.



TASK 5: Practice on Thomas Test (Fig 1)

Test positioning

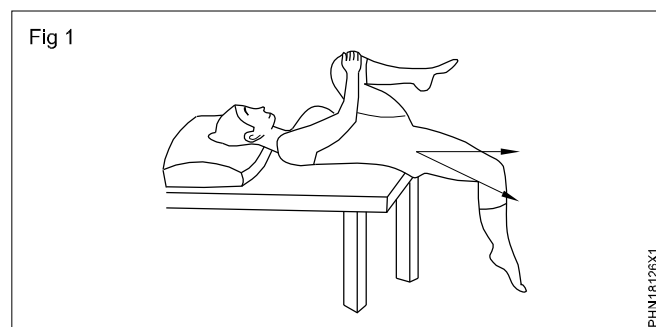
- 1 Make the Patient supine lying with both knees fully flexed against chest and buttocks near the table edge.

Action

- 2 Lowers slowly test leg until leg is fully relaxed or until either anterior pelvic tilting or increase in lumbar lordosis occurs.

Positive finding

- 3 Lack of hip extension with knee flexion greater than 45 degree indicates iliopsoas tightness. Full hip extension with knee flexion less than 45 degrees is indicative of rectus femoris tightness.



TASK 6: Practice on Tennis Elbow Test (Fig 1)

Test positioning

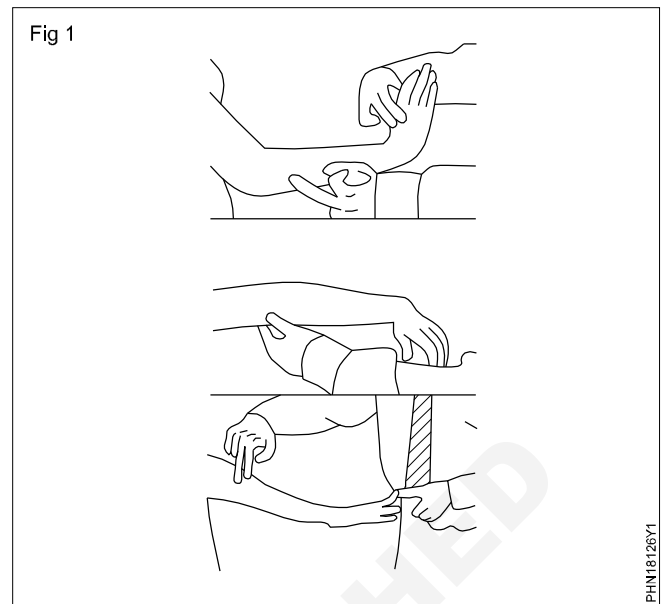
- 1 Make the Patient seated.

Action

- 2 Make patient fist and extend it against resistance.

Positive finding

- 3 Forcing the extended wrist into flexion will increase the pain.



TASK 7: Practice on Posterior drawer test (Fig 1)

Test positioning

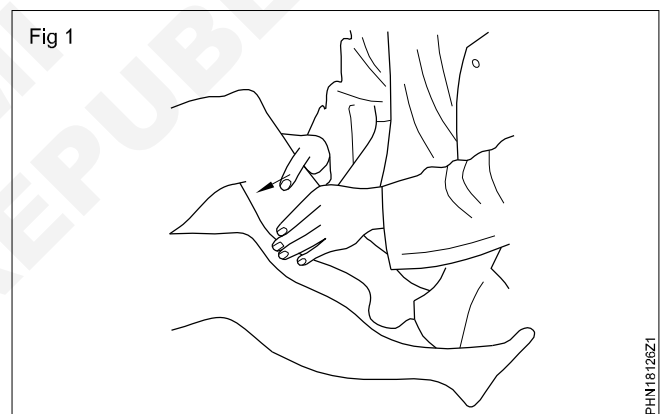
- 1 Make the Patient lying.

Action

- 2 Make patient tibia is pushed posteriorly.

Positive finding

- 3 The tibia glides posteriorly on the femur, then it is positive.



TASK 8: Practice on Golfer's elbow test

Test positioning

- 1 Make the Patient seated.

Action

- 2 Give resistance to wrist flexion.

Positive finding

- 3 Sudden severe pain in the medial epicondyle.

TASK 9: Practice on Mill's test

Test positioning

- 1 Make the Patient seated.

Action

- 2 Pronate and flexes the wrist fully and extend the elbow.

Positive finding

- 3 Sudden severe pain in the area of lateral epicondyle of the humerus.

Demonstrate various neurological tests

Objectives: At the end of this exercise you shall be able to

- demonstrate various neurological tests
- perform the test to the patients.

Requirements			
Tools/Instruments			
• Neurological tests setup	- as reqd.	• Couch/Chair	- as reqd.

PROCEDURE:

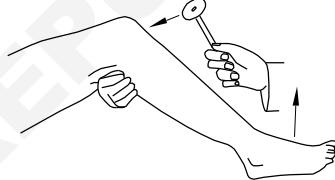
Note: Trainer will teach the trainee regarding the various neurological tests and ask them to demonstrate various orthopaedical test to the patients.

TASK 1: Practice on Reflex Test (Fig 1)

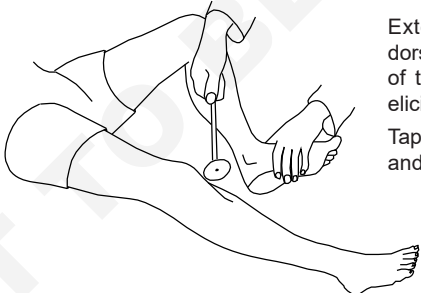
- 1 Ask the patient to easily locate the tendon, to contract the muscle to which it is attached.
- 2 Confirm precise location, when the muscle shortens, you should be able to both see and feel the cord like tendon.
- 3 Strike the tendon with a single, brisk, stroke. You should not elicit pain.

Fig 1

REFLEXES
Knee Jerk: L2,L3,L4 roots.
Ensure that the patient's leg is relaxed by resting it over examiner' arm or by hanging it over the edge of the bed. Tap the petellar tendon with the hammer and observe quadriceps contraction. Note impairment or exaggeration.



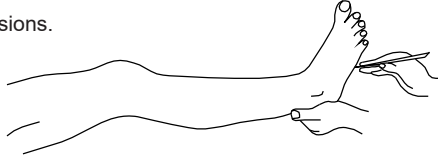
Externally rotate the patient's leg. Hold the foot in slight dorsiflexion. Ensure the foot is relaxed by palpating the tendon of tibialis anterior. If this is taut, then no ankle jerk will be elicited.
Tap the Achilles tendon and watch for calf muscle contraction and plantarflexion.



Reflex enhancement
When reflexes are difficult to elicit, they may be enhanced by asking the patient to clench the teeth or to try to pull clasped hands apart (Jendressik's manoeuvre).

Plastar response
Check that the big toe is relaxed. Stroke the lateral aspect of the sole and across the ball of the foot. Note the first movement of the big toe. Flexion should occur. Extension due to contraction of extensor hallucis longus (a 'Babinski' reflex) indicates an upper motor neuron lesion. This is usually accompanied by synchronous contraction of the knee flexors and tensor fasciae latae.

Elicit chaddock's sign by reflexlating the lateral border of the foot. The big toe extends with upper motor neuron lesions.
To avoid ambiguity do not reach the innermost aspect of the sole or the toes themselves.



PHN18127H1

TASK 2: Practice on Test for Muscle power upper limb (Fig 1)

Test for serratus anterior:

- 1 Ask the patient to press arms against wall.
- 2 Look for winging of acapula (i.e) rises from chest wall.

Shoulder abduction:

- 1 Lie arm more than 15 degree from the body.
- 2 Give resistance by the therapist while the patient tends to abduct.

Elbow flexion:

Arms flexed against resistance with the hand fully supinated.

Elbow extension:

Extends patient arm against resistance.

Brachioradialis:

Arm flexed against resistance with hand in mid-position between pronation and supination.

Finger extension:

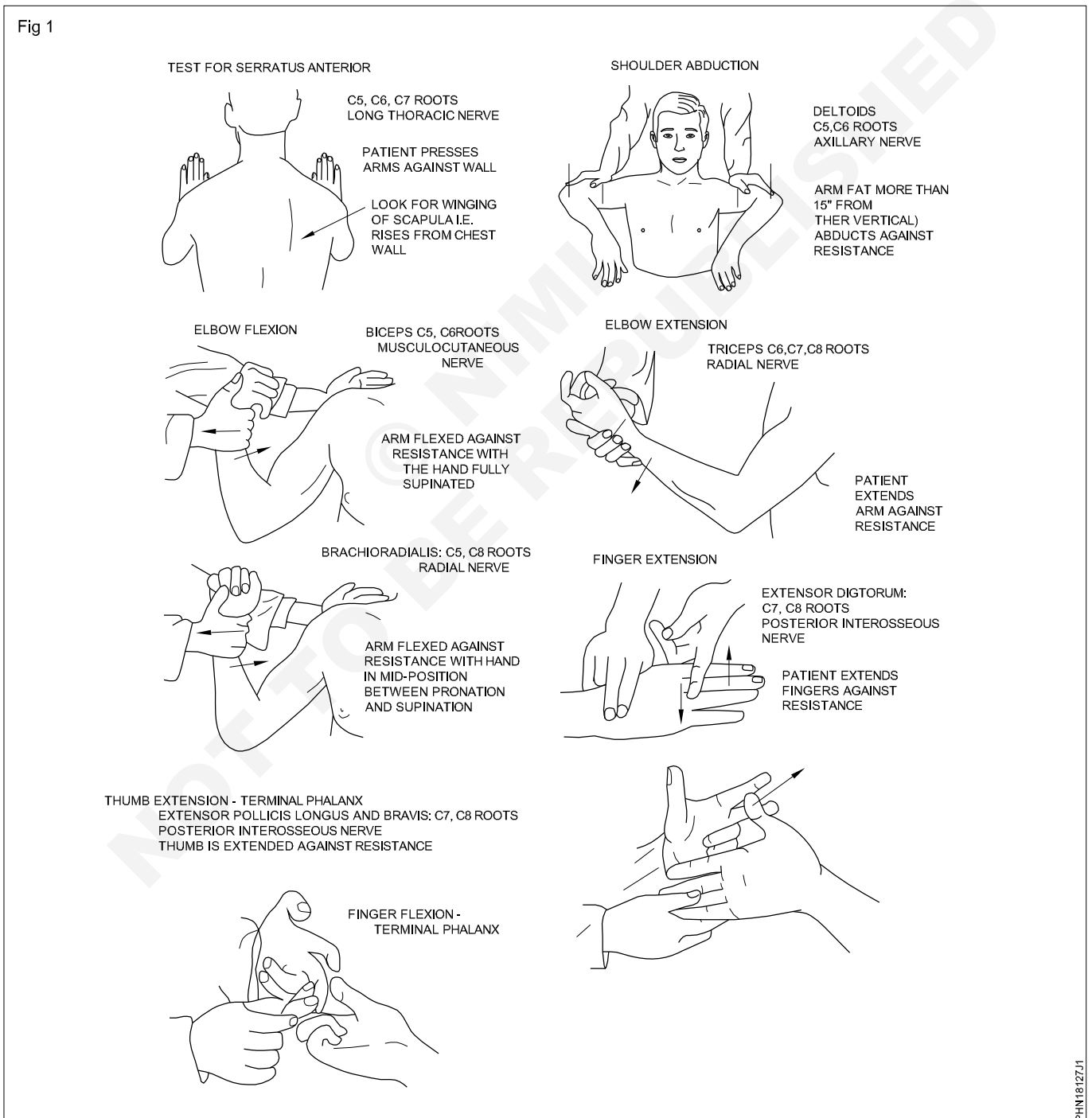
Extends patient finger against resistance.

Thumb extension:

Thumb is extended against resistance.

Finger flexion:

Tries to extend patient's flexed terminal phalanges.



TASK 3: Practice on test for Muscle power for lower limb (Fig 1)

Hip extension:

Position: Supine lying

Action: Hip should be flexed against resistance.

Hip abduction:

Position: Supine lying

Action: Patient tries to abduct the leg against resistance.

Hip adduction:

Position: Supine lying

Action: Patient tries to pull knees together against resistance.

Knee flexion:

Position: Supine lying

Action: Patient pulls heels towards the buttock and tries to maintain this position against resistance.

Knee extension

Position: Supine lying

Action: Patient tries to extend knee against resistance.

Dorsi flexion:

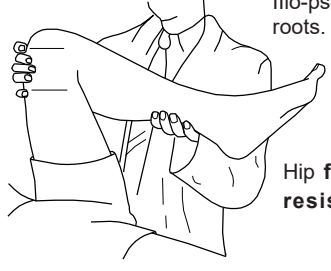
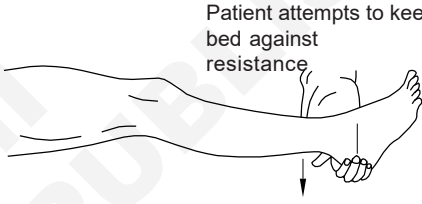
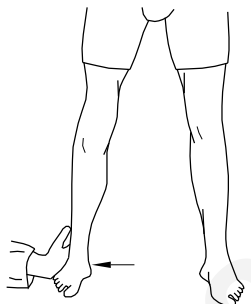
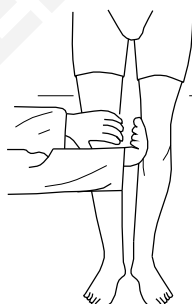

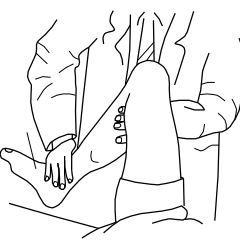
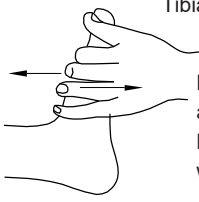
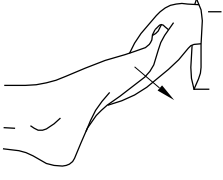
Position: Supine lying

Action: Patient dorsi flexes the ankle against resistance.

Plantar flexion:

Position: Supine lying

Action: Patient plantar flexes the ankle against resistance.

Fig 1 Power When testing each muscle group, think of root and nerve supply.	
<p>Hip flexion</p>  <p>Ilio-psoas: L1,L2,L3 roots. Femoral nerve</p> <p>Hip flexed against resistance</p>	<p>Hip extension</p> <p>Gluteus maxi.....5, S1, S2 roots. Inferior gluteal nerve</p>  <p>Patient attempts to keep heel of bed against resistance</p>
<p>Hip abduction</p>  <p>Gluteus medius and minimus and tensor fasciae latae: L4, L5, S1 roots. Superior gluteal nerve</p> <p>Patient lying on back tries to abduct the leg against resistance</p>	<p>Adductors: L2, L3, L4 roots Obturator nerve</p>  <p>Patient lying on back tries to pull knees together against resistance</p>
<p>Knee flexion</p>  <p>Hamestrings L5, S1, S2 roots Sciatic nerve</p> <p>Patient pulls heel towards the buttock and tries to maintain this position against resistance.</p>	<p>Quadriceps: L2, L3, L4 roots. Femoral nerve</p>  <p>Patient tries to extend knee against resistance</p>
<p>Dorsiflexion</p>  <p>Tibialis anterior: L4, L5 roots. Deep peroneal nerve</p> <p>Patient dorsiflexes the ankle against resistance. May have difficulty in walking on heels</p>	<p>Plantarflexion</p> <p>Gastrocnemius sole us: S1, S2, roots. Tibial nerve</p>  <p>Patient plantarflexes the ankle against resistance. May have difficulty in walking on toes before weakness can be directly detected</p>

PHN18127X1

Prepare a chart of orthopaedic, neurology assessment

Objectives: At the end of this exercise you shall be able to

- prepare a chart of orthopaedic assessment
- prepare a chart of neurological assessment.

Requirements	
Tools/Instruments	
• A4 sheet, pen & pencil	- as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preparation of chart for orthopaedic and neurological assessment and ask the trainee to perform the same.

TASK 1: Orthopaedic assessment

<p>Subjective assessment</p> <p>Name:</p> <p>Age:</p> <p>Sex of the patient:</p> <p>Address:</p> <p>Dominant side:</p> <p>Chief complaint:</p>	<p>Frequency:</p> <p>Nature: constant/periodic</p> <p>Pain aggravating & relieving factor</p> <p>Intensity:</p>
<p>History</p> <p>Present History</p> <p>Date of onset of injury</p> <p>Mechanism of injury</p> <p>Mode of onset:</p> <p> 1 Sudden</p> <p> 2 Gradual</p> <p>Duration</p> <p> 1 Acute</p> <p> 2 Sub-acute</p> <p> 3 Chronic</p> <p>Condition</p> <ul style="list-style-type: none"> • Improved • Worsen <p>Current Treatment</p>	<p>Past Medical History</p> <p>Relevant previous medical problem to present condition</p> <p>History of other disease and injuries</p> <p>Medication</p>
<p>Pain assessment</p> <p>Site:</p> <p>Side:</p> <p>Type: nerve pain, muscle pain, etc....</p>	<p>Personal History</p> <p>Personal Habits</p> <p>Physical activities</p> <p>Family History</p> <p>Similar problem in relatives</p> <p>Hereditary disease</p> <p>Consanguinity</p> <p>Functional History</p> <p>Previous</p> <p>Current</p> <p>Objective assessment</p> <p>1 General Condition of the patient: Poor/Good/Medium</p> <p>2 Body built</p> <p>3 Posture</p> <p> a Standing, sitting, lateral views</p> <p> b Anterior, Posterior and Lateral views</p> <p> c Deviations at different regions should checked</p> <p>4 Ambulatory Status</p> <p>5 Deformity</p>

- 6 External appliances
- 7 Gait analysis
 - Perform a general overview of patient’s posture.
 - Observe walking at normal speed then slow and fast speed.
 - The examiner must watch the lumbar spine, pelvis, hips, knees, feet and ankle during walking.
 - Patient should walk bare foot.
 - Also examine the patient walking with and without aids.
- 8 Observation in anterior view
- 9 Observation in lateral view
- 10 Pathological gait
- 11 Tropical changes/Surgical scar

On Palpation

- Tenderness
- Crepitation
- Scar
- EDEMA

On Examination

- Vital Signs
 - 1 Heart rate
 - 2 Blood pressure
 - 3 Temperature
 - 4 Respiratory rate

- Motor Examination
- Range of Motion
- Active
- Passive

Sensory Assessment

- Superficial sensation
- Deep sensation
- Cortical sensation

MRC Grading

REFLEXES

- Grading of reflexes
- Limb length measurement
 - a True limb length measurement
 - b Apparent limb length measurement

Gait analysis

- Functional evaluation
 - a Evaluation of upper limb
 - b Evaluation of lower limb

- Investigations
- Pathological findings
- Special test
- Physiotherapy aims
- Treatment

TASK 2: Neurological assessment

Checklist for neuro assessment.

NEUROLOGIC EXAM CHECKLIST

I Mental Status (Screening)

- Orientation _____ Yes _____ No
- Registration / recall _____ Yes _____ No
- Serial 7’s or WORLD backward _____ Yes _____ No
- Repeat “No ifs, ands, or buts” _____ Yes _____ No
- 3-step command _____ Yes _____ No
- Drawing clock _____ Yes _____ No

II Cranial Nerves

- Visual acuity (each eye separately) _____ Yes _____ No
- Visual fields (each eye separately) _____ Yes _____ No
- Pupillary reaction to light _____ Yes _____ No
- Extraocular movement _____ Yes _____ No
- Optic discs _____ Yes _____ No
- Temp and light touch in 3 areas of face _____ Yes _____ No

- Eyebrow raising, eye closing, smile (show teeth) _____ Yes _____ No
- Hearing to finger rub _____ Yes _____ No
- Palate elevation _____ Yes _____ No
- Trapezius and SCM strength _____ Yes _____ No
- Tongue inspection, strength _____ Yes _____ No

III Motor

- Pronator drift _____ Yes _____ No
- Upper extremity strength
 - Tone _____ Yes _____ No
 - Proximal (deltoid muscle) _____ Yes _____ No
 - Distal (hand grip) _____ Yes _____ No
- Lower extremity strength
 - Tone _____ Yes _____ No
 - Proximal (iliopsoas, muscle) _____ Yes _____ No
 - Distal (foot dorsiflexion and plantar-flexion) _____ Yes _____ No

IV Sensory

- Upper extremity - pinprick or temp
 - Compare sides _____ Yes _____ No
 - Compare distal to proximal on same side _____ Yes _____ No
- Upper extremity - vibration (DIP joint of both index fingers) _____ Yes _____ No
- Upper extremity - proprioception (index finger on both hands) _____ Yes _____ No
- Lower extremity - pinprick or temp
 - Compare sides _____ Yes _____ No
 - Compare distal to proximal on same side _____ Yes _____ No
- Lower extremity - vibration (distal interphalangeal joint of great toes) _____ Yes _____ No
- Lower extremity - proprioception (great toe on both feet) _____ Yes _____ No
- Romberg (proprioception-may be combined with gait tests) _____ Yes _____ No

V Reflexes

- Biceps _____ Yes _____ No
- Brachioradialis _____ Yes _____ No
- Triceps _____ Yes _____ No
- Patellar _____ Yes _____ No
- Achillies _____ Yes _____ No
- Plantar response (report as extensor or flexor) _____ Yes _____ No

VI Coordination and Gait

- Rapid alternating movements (RAM) _____ Yes _____ No
- Coordination in limbs
 - Finger-to-nose (FIN) _____ Yes _____ No
 - Heel-to-shin (HTS) _____ Yes _____ No
- Casual gait _____ Yes _____ No
- Tandem walking _____ Yes _____ No
- Heel and toe walking _____ Yes _____ No

Make a cardiopulmonary assessment chart

Objective: At the end of this exercise you shall be able to
 • **make a cardiopulmonary assessment chart.**

Requirements			
Tools/Instruments			
• Thermometer	- 1 No.	• BP apparatus	- as reqd.
• Pulse oximeter	- 1 No.	• Weighing machine	- 1 No.

PROCEDURE:

Note: Trainer will teach the trainee regarding the preparation of chart for cardiopulmonary assessment and ask the trainee to perform the same.

The subjective assessment is an important part of the client experience. It allows the client to express their symptoms from their viewpoint and helps to guide the objective assessment and plan a treatment programme with the client's needs at the forefront. Each subjective assessment should include the following components.

TASK 1: Prepare the subjective assessment report by collecting the details of following components

- 1 Main Complaint
- 2 History of Present Illness:
 - a Site, Intensity, Type, Aggravating factor and Relieving factor (SITAR)
 - b Onset - sudden or gradual
 - c Location - radiating
 - d Duration - frequency or chronology (seasonal or daily variations)
 - e Characteristics - quality or severity
 - f Current situation - improving or deteriorating
 - g Effect on activity of daily living (ADL)
 - h Previous diagnosis of similar episodes
 - i Previous treatment and efficacy
- 3 Past Medical History
 - a Thoracic, nasal, pharyngeotracheal, trauma or surgery, hospitalisation for pulmonary disorders.
 - b Use of ventilation - assisting devices
 - c COPD - TB, bronchitis, emphysema, etc
 - d Other chronic disorders - cardiac, cancer, blood clotting disorders
 - e Allergy
 - f Immunization (pneumococcal , influenza)
 - g Diabetes Mellitus/ Tuberculosis/ Blood pressure/ asthma
- 4 Surgical History

- 5 Endoscopy, tracheostomy, lobectomy
- 6 Personal and social history
- 7 Sleep
- 8 Appetite / bowel, bladder / nutrition
- 9 Smoking
- 10 Exercise tolerance
- 11 Home environment
- 12 Economic condition - poor / fair / good

Cardinal Signs and Symptoms

Cough[5]

- 1 Onset: sudden or gradual
- 2 Duration: Acute < 3 weeks
- 3 Chronic: >3 weeks
- 4 Nature: Dry irritation; Wet signs of infection
- 5 Type: Mucoïd; Mucopurulent TB; Frothy pulmonary oedema; Rusty (blood) TB, lobar pneumonia
- 6 Odour: foul infection

Sputum

- 1 Amount (tea spoon, table spoon, cup)
- 2 Normal - 100 ml of tracheobronchial secretions are produced daily and cleared subconsciously.

Color

- 1 Blood streaked sputum inflammation of throat (larynx, trachea) or bronchi, lung cancer, ulcers.
- 2 Pink sputum sputum and blood formed from alveoli and small peripheral bronchi.

- 3 Copious amounts of blood - cavitory TB , lung abscess, bronchieactasis , lung infarction , pulmonary embolism.
- 4 Green or greenish coloured infection pneumonia, cystic fibrosis (green from degenerative changes in cell debris).
- 5 Rust colored - pneumococcal bacteria , pulmonary TB.
- 6 Brownish - chronic bronchitis (greenish / yellowish / brown) , chronic pneumonia (whitish - brown).
- 7 Yellowish purulent - pus - haemophilus.
- 8 Yellowish/green (mucopurulent) - treatment with antibiotics that reduce symptoms - bronchiectasis, cystic fibrosis , pneumonia.
- 9 Whitish grey - chronic allergic bronchitis (no. of eosinophils).
- 10 White, milky or opaque (mucoid) - viral infection or allergy (asthma).
- 11 Foamy white - earlier phase - pulmonary edema.
- 12 Frothy pink - severe pulmonary edema.
- 13 Black - black specks in mucoid secretions - smoke inhalation (fires, tobacco, heroine), coaldust.

Breathlessness

The physiotherapist should always relate breathlessness to the level of function that the patient can achieve.

- 1 Exercise tolerance (e.g. number of stairs client can climb or can walk).
- 2 Shortness of breath at rest.
- 3 Association of paroxysmal nocturnal dyspnea (PND).
- 4 Associated swelling of ankles or recent weight gain.
- 5 Activities : Sudden (pneumothorax, pulmonary embolism, DVT).
- 6 Constant breathlessness (fibrosis, fluid).

Grading Breathlessness

- 1 New York Heart Association (NYHA) Grade 1 - no symptoms and limitation in ordinary physical activity Grade 2 - mild symptoms , angina and slight limitation in ordinary activities Grade 3 - marked limitation in activity due to symptom , even during less than ordinary activity. Grade 4 - severe limitation, experience symptoms even at rest mostly bed bound patient.

- 2 Modified Medical Research Council (MMRC) Grade 0 - no dyspnea except with strenuous exercise Grade 1 - dyspnea when walking up on the hill or hurrying on the level Grade 2 - walks slower than most on the level or stops after 15 minutes of walking on the level. Grade 3 - stops after few minutes of walking on the level. Grade 4- dyspnea with minimal activity such as getting dressed or too dyspneic to leave the house.
- 3 American Thoracic Society (ATS) Grade 0- none - no trouble of dyspnea on level / uphill Grade 1 - mild - dyspnea on at level / uphill. Grade 2 - moderate - walks slower than person of same age Grade 3 - severe - stops after 100 yards Grade 4 - very severe - breathlessness.

Chest Pain

Chest pain in respiratory patients usually originate from musculoskeletal , pleural or tracheal inflammation as lung parenchyma and small airways contain no pain fibres. Pain relief can be achieved by heat, splinting or pain medication. Typical examples of the causes of chest pain include:

- 1 Pleuritic chest pain
- 2 Tracheitis
- 3 Musculoskeletal (chest wall) pain
- 4 Angina pectoris
- 5 Pericarditis

Incontinence

Coughing and huffing increases intra - abdominal pressure which may precipitate urinary leakage.

Other Symptoms

- 1 Fever (pyrexia) - TB
- 2 Headache - morning headache - nocturnal CO2 retention
- 3 Peripheral oedema - right heart failure
- 4 Shivering
- 5 Weight loss
- 6 Palpitations
- 7 Vomiting and nausea
- 8 Gastro intestinal reflex

TASK 2: Prepare the Objective Assessment report by collecting the details of following components

Once the subjective assessment has been completed there will indicators on what to look for during the objective assessment. A thorough and detailed objective assessment will assist with the planning and management of an individualised treatment programme that focuses on the presentation and needs of the client.[3][4]

General Examination

- 1 Vital signs

- 2 Temperature
- 3 Pulse
- 4 Respiratory rate
- 5 Blood pressure
- 6 Oxygen saturation (SpO2)
- 7 General Appearance
- 8 Ectomorph

- 9 Endomorph
- 10 Mesomorph
- 11 Body weight - BMI and weight in kg
- 12 Height
- 13 Nails - clubbing
- 14 Eyes - pallor (anaemia); Plethora (high haemoglobin); Jaundice (yellow color due to liver or blood disturbance).
- 15 Tongue and mouth - Cyanosis - hypoxemia.
- 16 Jugular venous pressure - increased in right heart failure, chronic lung disease, dehydrated patient.
- 17 Peripheral oedema - seen in decreased albumin level, impaired venous or lymphatic function , increased steroids.
- 18 Pressure sores (in bedbound patients)
- 19 Observation of Chest
- 20 Transverse diameter > AP Diameter
- 21 Kyphosis
- 22 Kyphoscoliosis - restrictive lung defect
- 23 Pectus carinatum - pigeon chest
- 24 Hyperinflation or barrel chest - AP = transverse - ribs horizontal.
- 25 Breathing Pattern
- 26 Typical rate - 12 to 16 breath per minute.
- 27 Typical Inspiratory : expiratory ratio = 1:1.5 to 1:2.
- 28 Check for bradypnea , tachypnea , hyperventilation.
- 29 Prolonged expiration - 1:3 to 1:4
- 30 Pursed lip breathing
- 31 Hypopnea
- 32 Kussmaul 's respiration - metabolic acidosis
- 33 Cheyne strokes respiration - drugs (narcotics) , heart failure , neurological disturbances.
- 34 Ataxic breathing - cerebellar disease
- 35 Apneustic breathing - brain damage
- 36 Thoracoabdominal - female ; abdominothoracic
- 37 ICU Patients
- 38 Mode of ventilation - supplemental oxygen; intermittent positive pressure ventilation.
- 39 Route of ventilation - face mask, nasal cannula, endotracheal tube, tracheostomy.
- 40 Level of consciousness - measured with Glasgow coma scale.
- 41 Central venous pressure (CVP) and pulmonary artery pressure (PAP).
- 42 Palpation
- 43 Trachea - tracheal deviation indicates underlying mediasternal shift . trachea may be pulled towards in collapsed or fibrosed upper lobe or pushed away from pneumothorax or large pleural effusion.
- 44 Measuring Chest Expansion (using a tape measure) Technique at residual volume , the examiner 's hands are placed spanning the posterolateral segment of both bases , with the thumbs touching in the midline posteriorly . both the sides should move equally with 3 - 5 cm being the normal displacement.
- 45 Supramammary - 1.5cm
- 46 Mammary - 1.5 cm
- 47 Inframammary - 1cm
- 48 Hoover's sign Paradoxical movement of the lower chest can occur in patients with severe chronic airflow limitation who are extremely hyperinflated . as the dome of the diaphragm cannot descend any further diaphragm contraction during inspiration pulls the lower ribs inwards. This is called hoover' s sign.
- 49 Vocal Fremitus It is the measure of speech vibrations transmitted through the chest wall to the examiner' s hands .It is the measure by asking the patient to repeatedly say 'ggg' or 111 whilst the examiner' s hands are placed flat on both sides of the chest.
- 50 Increase in patient whose lung underneath is relatively solid (consolidated).
- 51 Decrease in patient - pneumothorax or pleural effusion.
- 52 Percussion It is performed by placing the left hand firmly on the chest wall so that the finger have good contact with the skin . the middle finger of the left hand is struck over the DIP joint with the middle finger of the right hand . for all the positions , percuss at 4 to 5 cm intervals over the intercostal spaces , moving systematically from superior to inferior and medial to lateral.
- 53 Resonance - the expected sound can usually be heard over all areas of the lungs.
- 54 Hyper resonance - associated with hyperinflation may indicate emphysema , pneumothorax or asthma.
- 55 Dullness or flatness - pneumonia , atelectasis , pleural effusion , pneumothorax or asthma.
- 56 Tympany - sound usually associated with percussion over the abdomen.
- 57 Auscultation Auscultation with the stethoscope provides important clues to the condition of the lungs and pleura. all sounds can be characterized in the same manner as the percussion notes, intensity, pitch, quality and duration.
- 58 Normal breath sounds bronchial, vesicular.

- 59 Abnormal breath sounds - crackles, rhonchi, wheeze, pleural friction rub.
- 60 Vocal resonance - Transmission of voice through the airway and lung tissue to the chest wall where it is heard through a stethoscope, it is usually tested by instructing the patient to say '99' repeatedly.
- 61 Decrease in resonance - emphysema , pneumothorax, pleural thickening or pleural effusion.
- 62 Heart sounds
- 63 1st - closure of mitral and tricuspid valve.
- 64 2nd - closure of pulmonary and aortic valves.
- 65 3rd - cardiac failure
- 66 4th - heart failure , hypertension , aortic valve disease

Diagnostics

There are many different tests that can assist in diagnosing respiratory conditions and help implement and guide the best treatment options.

Spirometry

This is a simple respiratory test that measures the forced expiratory volume in 1 second (FEV) , the forced vital capacity (FVC) and peak expiratory flow rate (PEFR) are important measures of ventilatory function.[6]

Arterial Blood Gases

ABG provide an accurate measure of O₂ uptake and CO₂ removal by the respiratory system as a whole. Typical values are listed below:

- 1 pH : 7.35 TO 7.45
- 2 PaO₂: 10.7 to 13.3 kPa (80 - 100 mmHg)
- 3 PaCO₂: 4.7 TO 6.0 KPa (35 to 45 mm hg)
- 4 HCO₃: 22 - 26 MMOL / L
- 5 Base excess : -2 to +2

Chest x-ray

Chest x-rays are often taken early if a respiratory disorder is suspected. As well as revealing the condition of the lungs they can also diagnose:

- 1 Pneumonia
- 2 Emphysema
- 3 Mass or nodule in the lung
- 4 Pleural effusion (fluid around the lung)
- 5 Rib fracture
- 6 Tuberculosis
- 7 Congestive heart failure
- 8 Enlarged heart

Make a diagnosis after assessment

Objectives: At the end of this exercise you shall be able to

- assess the diagnosis of patient
- evaluate after diagnosis.

Requirements

Tools/Instruments

- A4 sheet, pen&pencil - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding assessment procedure for diagnosis of patient and able to evaluate the same after diagnosis.

Task 1: Physical therapy diagnosis

Diagnosis is the identification of the nature and cause of a certain phenomenon, an experience to determine “cause and effect”. The aim of Physical Therapy Diagnosis (PTD) or Functional Diagnosis (FD) is to diagnose movement system impairments to guide intervention for health optimization such that the disability can be minimized.

TASK 2: Common diagnoses - Physical therapy

Follows is a list of the common disorders and diagnoses that can be treated with physical therapy.

Head and Neck:

- 1 Whiplash
- 2 Headaches
- 3 Stiffness/decreased range of motion due to arthritis
- 4 Disc degeneration
- 5 Disc protrusion/herniation

Shoulder:

- 1 Frozen shoulder (adhesive capsulitis)
- 2 Rotator cuff tendonitis and tears (pre and post-op)
- 3 Bursitis
- 4 Biceps tendonitis
- 5 Scapular dyskinesia/winging

Elbow/Wrist/Hand:

- 1 Medial epicondylitis (golfers elbow)
- 2 Lateral epicondylitis (tennis elbow)
- 3 Carpel tunnel
- 4 DeQuervein's Tenosynovitis/thumb pain

- 5 Fracture
- 6 Trigger finger

Lumbar/Thoracic spine:

- 1 Disc protrusion/herniation/degeneration
- 2 Sciatica
- 3 Core weakness/instability
- 4 Scoliosis
- 5 Rib pain
- 6 Pelvic/sacral malalignment
- 7 Coccyx (tailbone) pain

Hip:

- 1 Bursitis
- 2 Iliotibial Band Syndrome (ITB)
- 3 Arthritis/ hip replacement
- 4 Femoral acetabular impingement
- 5 Muscle strain
- 6 Piriformis syndrome

Knee:

- 1 Patellofemoral syndrome

- 2 Jumper's knee
- 3 Runner's knee
- 4 ACL (pre and post surgical)
- 5 Meniscus tears
- 6 Tendonitis
- 7 Hamstring and Quadriceps muscle strains/tears

Ankle/Foot:

- 1 Ankle Sprain
- 2 Achilles tendonitis
- 3 Shin Splints
- 4 Plantar fasciitis/fibromatosis

- 5 Bunion and hammer toes
- 6 Orthotic and Shoe recommendations

Other Disorders that benefit from physical therapy intervention:

- 1 Fibromyalgia
- 2 Multiple Sclerosis
- 3 Balance and Gait disturbances
- 4 Vertigo/Dizziness
- 5 Parkinson's Disease
- 6 Fractures

© NIMI
NOT TO BE REPUBLISHED

Plan a rehabilitation program for patients

Objectives: At the end of this exercise you shall be able to

- plan a rehabilitation program for patients
- perform the same for the patients.

Requirements	
Tools/Instruments	
• Rehabilitation setup	- as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the rehabilitation programs for patients and perform the same for the patients.

TASK 1: Practice on Rehabilitation exercises (Fig 1)

Prone Hip Extension

- 1 Lie on your stomach on the floor with your legs straight. You can lie on a mat or towel. Rest your head on your arms.
- 2 Raise your right leg a few inches off the floor. Keep the right knee straight. Hold for 5 seconds.
- 3 Back down slowly lower your leg.
- 4 Repeat 5 times above steps.

Towel Stretch

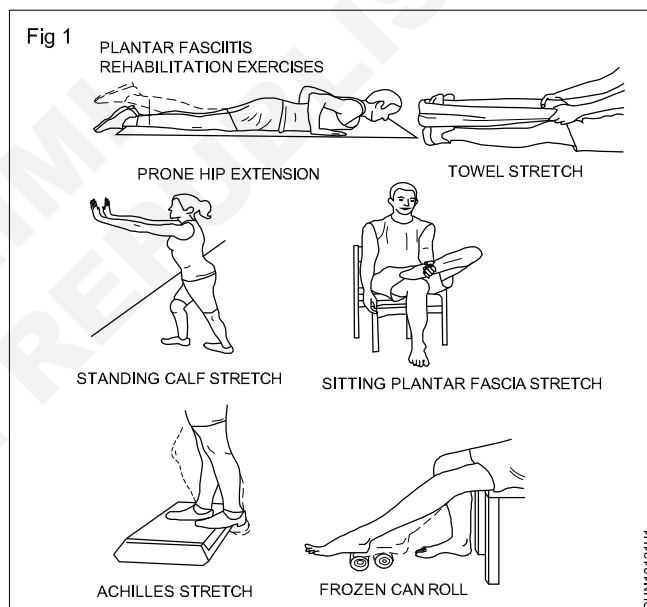
- 1 Sit with your legs extended and knees straight.
- 2 Place a towel around your foot just under the toes.
- 3 Hold each end of the towel in each hand, with your hands above your knees.
- 4 Pull back with the towel so that your foot stretches toward you.
- 5 Hold the position for at least 15 to 30 seconds

Calf Stretch

- 1 Stand near a wall with one foot in front of the other, front knee slightly bent.
- 2 Keep your back knee straight, your heel on the ground, and lean toward the wall.
- 3 Feel the stretch all along the calf of your back leg.
- 4 Hold this stretch for 20-30 seconds

Seated Plantar fascial stretch

- 1 Sit in a chair and cross the injured foot over the knee of your other leg.
- 2 Place your fingers over the base of your toes and pull them back toward your shin until you feel a comfortable stretch in the arch of your foot.



- 3 Hold 15 seconds and repeat 3 times.

Achilles Stretch

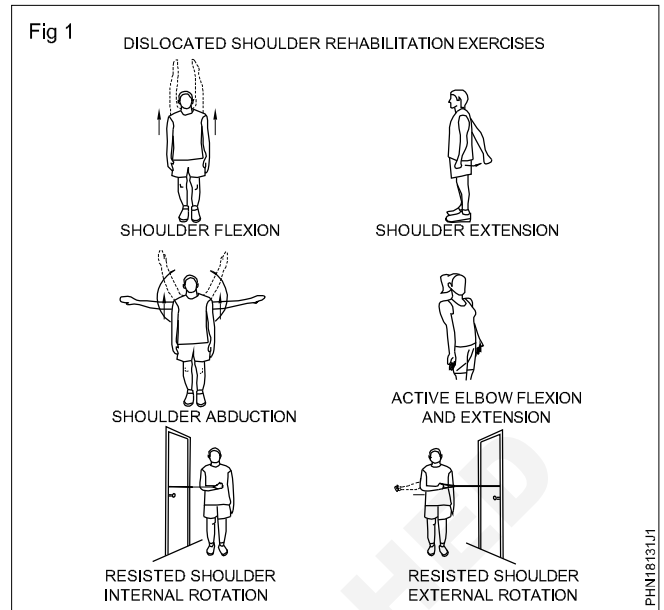
- 1 Stand with your toes on a step and your heels off the edge.
- 2 Slowly lower your heels down. Hold for 15 seconds and then lift your heels to their starting position.
- 3 Repeat 5 times.

Frozen Can Roll

- 1 Roll using a can, back and forth from your toes to your heels.
- 2 Repeat this atleast twice daily.

TASK 2: Practice on Dislocated Shoulder Rehabilitation Exercises (Fig 1)

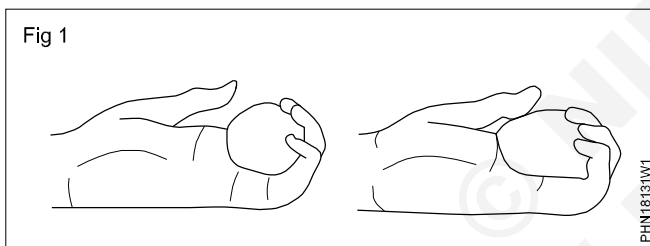
- 1 Rock your arm backward and forward as far as your pain allows.
- 2 Keep your elbow into your side and hold on your affected arm's wrist. Gently move your arm to 90 degree to the body.
- 3 Stand with outside of your hand. Attempt to move the affected hand outwards.



TASK 3: Practice on Theraputty exercises

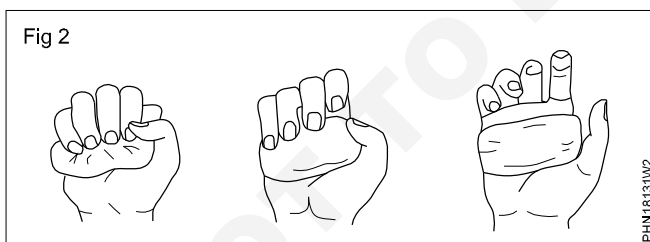
Finger Hook (Fig 1)

Make a hook with your fingers as you press into putty.



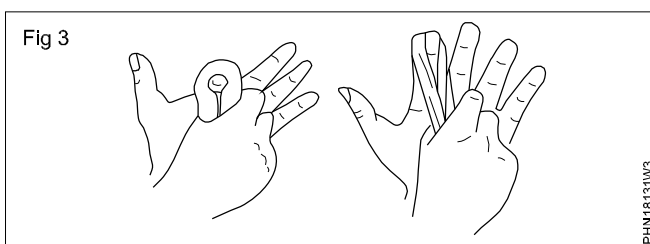
Full grip (Fig 2)

Squeeze your finger into the putty like you are making a fist.



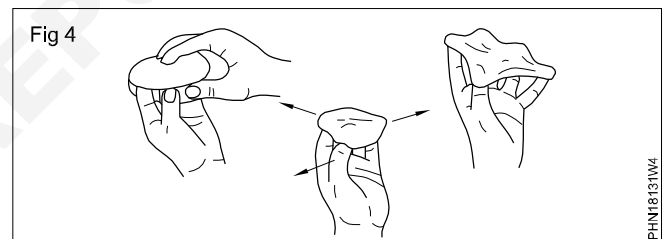
Finger Extension (Fig 3)

- 1 Loop the putty over the end of the finger while its bent.
- 2 Try to strengthen your finger.



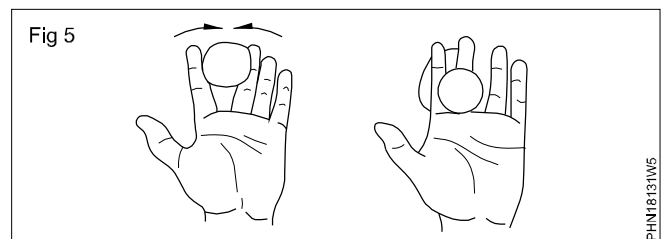
Finger Spread (Fig 4)

- 1 Spread the putty like pancake over your fingers and thump.
- 2 Try to spread them apart.



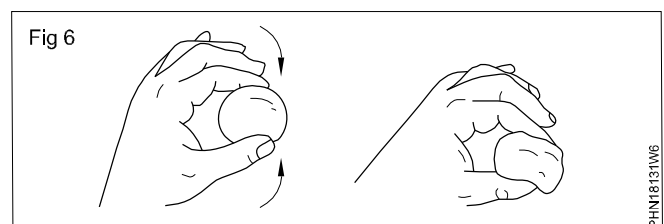
Finger Scissor (Fig 5)

Place a 1 inch thick piece of putty between each part of fingers and squeeze together.



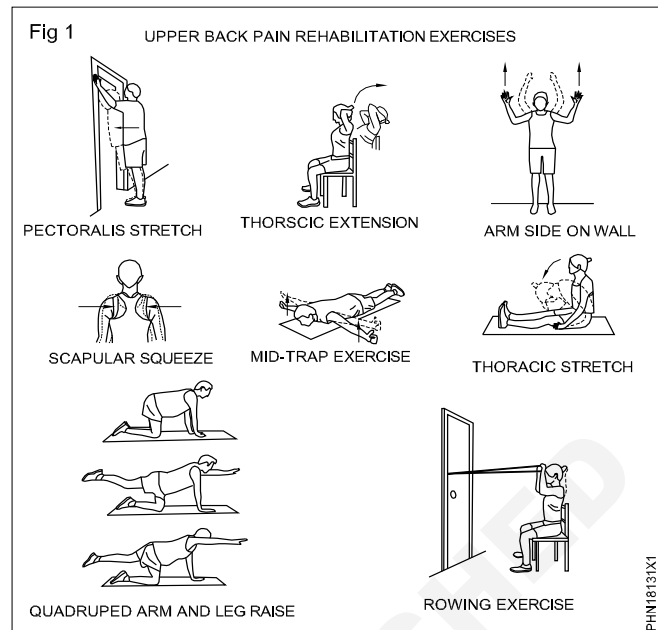
Finger pinch (Fig 6)

Pinch the putty between the each fingers and the thump.



TASK 4: Steps for Upper back pain rehabilitation exercises (Fig 1)

- Pectoralis stretch:** Stand in an open doorway or corner with both hands slightly above your head on the door frame or wall. Slowly lean forward until you feel a stretch in the front of your shoulders. Hold 15 to 30 seconds. Repeat 3 times.
- Thoracic extension:** Sit in a chair and clasp both arms behind your head. Gently arch backward and look up toward the ceiling. Repeat 10 times. Do this several times each day.
- Arm slide on wall:** Sit or stand with your back against a wall and your elbows and wrists against the wall. Slowly slide your arms upward as high as you can while keeping your elbows and wrists against the wall. Do 2 sets of 8 to 12.
- Scapular squeeze:** While sitting or standing with your arms by your sides, squeeze your shoulder blades together and hold for 5 seconds. Do 2 sets of 15.
- Mid-trap exercise:** Lie on your stomach on a firm surface and place a folded pillow underneath your chest. Place your arms out straight to your sides with your elbows straight and thumbs toward the ceiling. Slowly raise your arms toward the ceiling as you squeeze your shoulder blades together. Lower slowly. Do 3 sets of 15. As the exercise gets easier to do, hold soup cans or small weights in your hands.
- Thoracic stretch:** Sit on the floor with your legs out straight in front of you. Hold your mid-thighs with your hands. Curl your head and neck toward your belly button. Hold for a count of 15. Repeat 3 times.
- Quadruped arm and leg raise:** Get down on your hands and knees. Pull in your belly button and tighten

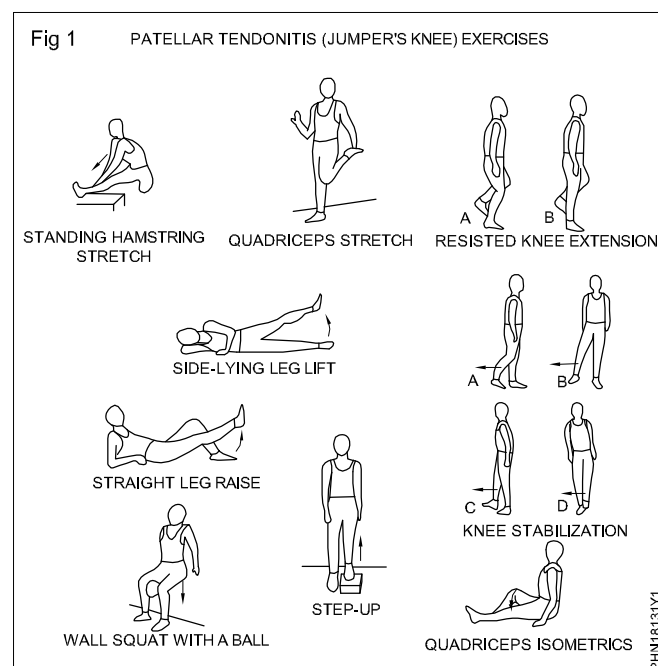


your abdominal muscles to stiffen your spine. While keeping your abdominals tight, raise one arm and the opposite leg away from you. Hold this position for 5 seconds. Lower your arm and leg slowly and change sides. Do this 10 times on each side.

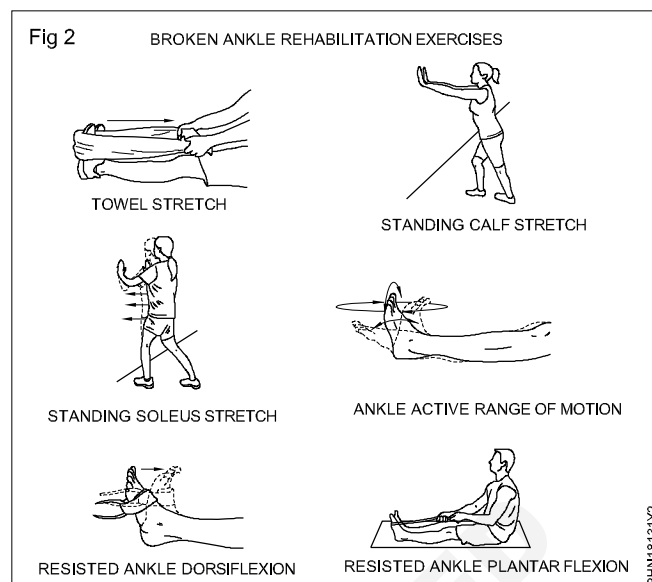
- Rowing exercise:** Close middle of elastic tubing in a door or wrap tubing around an immovable object. Hold 1 end in each hand. Sit in a chair, bend your arms 90 degrees, and hold one end of the tubing in each hand. Keep your forearms vertical and your elbows at shoulder level and bent 90 degrees. Pull backward on the band and squeeze your shoulder blades together. Do 2 sets of 15.

TASK 5: Steps for Rehabilitation exercises (common for Fig 1 & 2)

- Quadriceps stretch:** Stand on your left leg, one knee touching the other. You can hold a chair or the wall to keep you steady if needed. Grab your right foot, using your right hand, and pull it towards your butt. ...Hold the position for 20 to 30 seconds, then repeat, switching from your left leg to your right.
- Hamstring stretch on wall:** Bend forward at the waist until there is a stretch in the hamstring muscle. To increase the intensity of the stretch, bend forward slightly, placing the hands on the leg or the table for support. Hold the stretch for up to 30 seconds. Wait 15 seconds then repeat three times.
- Gluteal stretch:** Sit upright in a sturdy chair. Place your right ankle on your left thigh, just above your knee. Place your hands on your shins. Keeping your spine straight, lean slightly forward to deepen the stretch. Hold for 20-30 seconds. Return to the starting position. Repeat with the other leg.

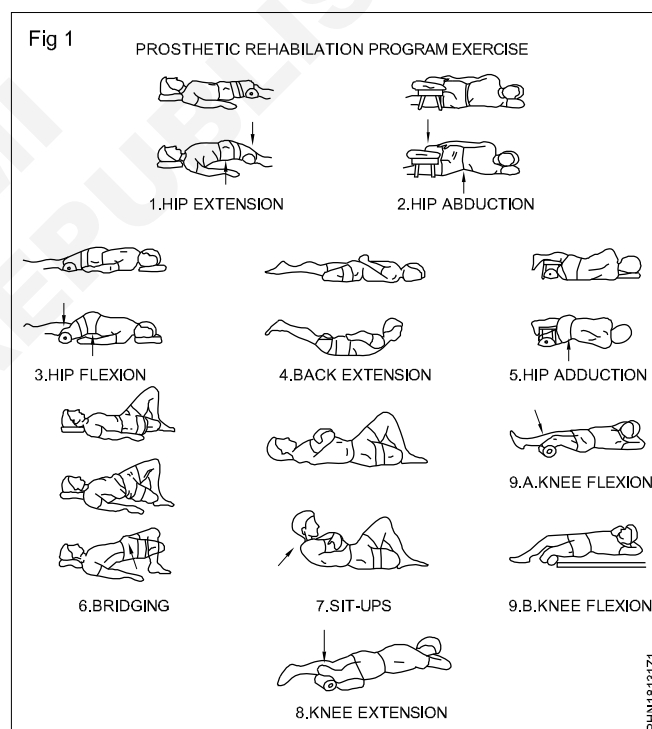


- 4 **Iliotibial stretch:** The forward fold stretch helps relieve tension and tightness along your IT band. You'll feel a stretch along the muscles on the side of your thigh as you do it. To stretch more deeply, place all of your weight onto your back foot.
- 5 **Prone hip extension:** Rest your head on your arms. Raise your right leg a few inches off the floor. Keep the right knee straight. Hold for 5 seconds.
- 6 **Side lying leg lift:** Lie sideways and lift your leg until you get a stretch. Hold it for 20 seconds.



TASK 6: Steps for prosthetic rehabilitation exercise (Fig 1)

- 1 **Hip extension:** Place a pillow under the hip, can do bridging using the residual limb to lift the pelvis from the supporting surface.
- 2 **Hip abduction:** Lie on the amputated limb, then bridging to lift the pelvis from the supporting surface.
- 3 **Hip adduction:** Lie on the side opposite to the amputation. The involved limb rest on the padded stool while the bottom hip is flexed so that it rest comfortably in front of the stool.
- 4 **Hip flexion:** Prone lying for thirty minutes twice a day prevent hip flexar tightness.
- 5 **Bridging:** Place a pillow under the hip. Flex the knee joint of the unaffected limb and do bridging.
- 6 **Back extension:** Lie prone and lift your back.
- 7 **Situps:** Flex your uninvolved limb and lift your upper back.
- 8 **Knee flexion and extension:** Place a pillow under the amputated knee and try to flex and extend the joint.



Develop home exercise programs

Objectives: At the end of this exercise you shall be able to

- develop home exercise programs
- perform the same to the patients.

Requirements	
Tools/Instruments	
• Home exercise setup	- as reqd.

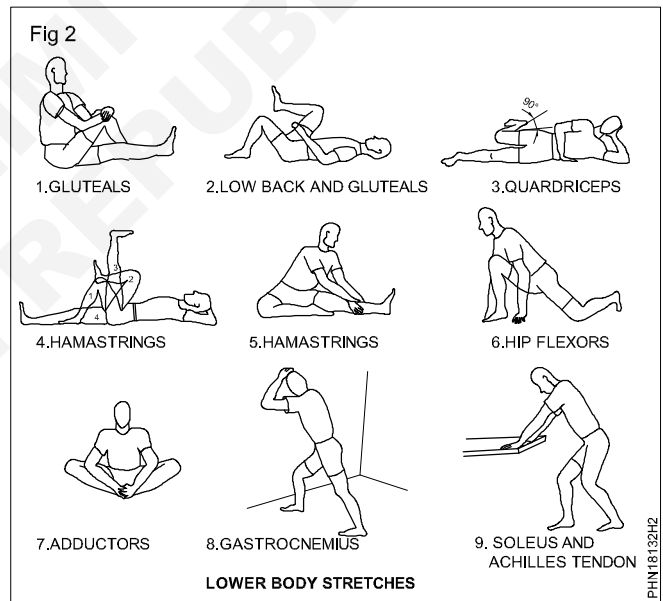
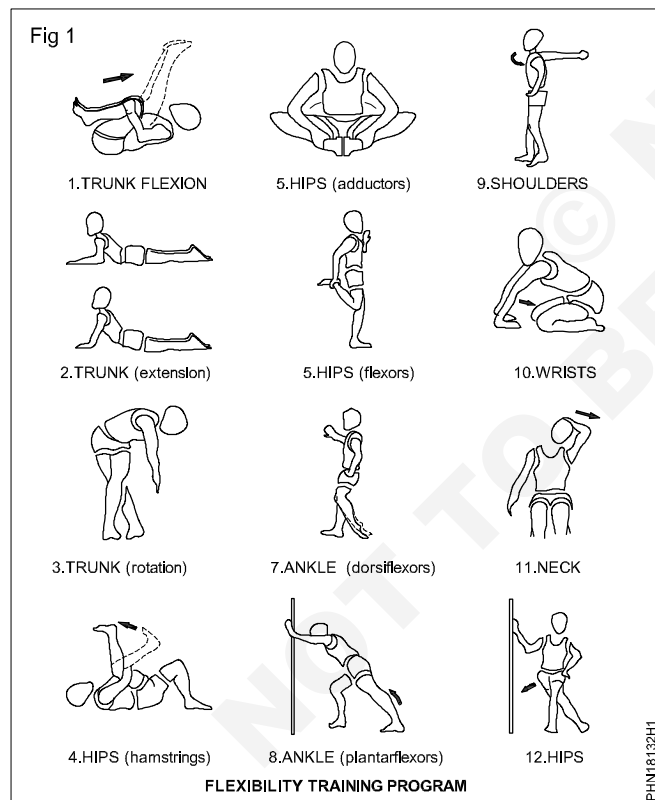
PROCEDURE:

Note: Trainer will teach the trainee how to develop home exercise programs and ask the trainee to perform the same to the patients.

TASK 1: Practice on home exercise programs

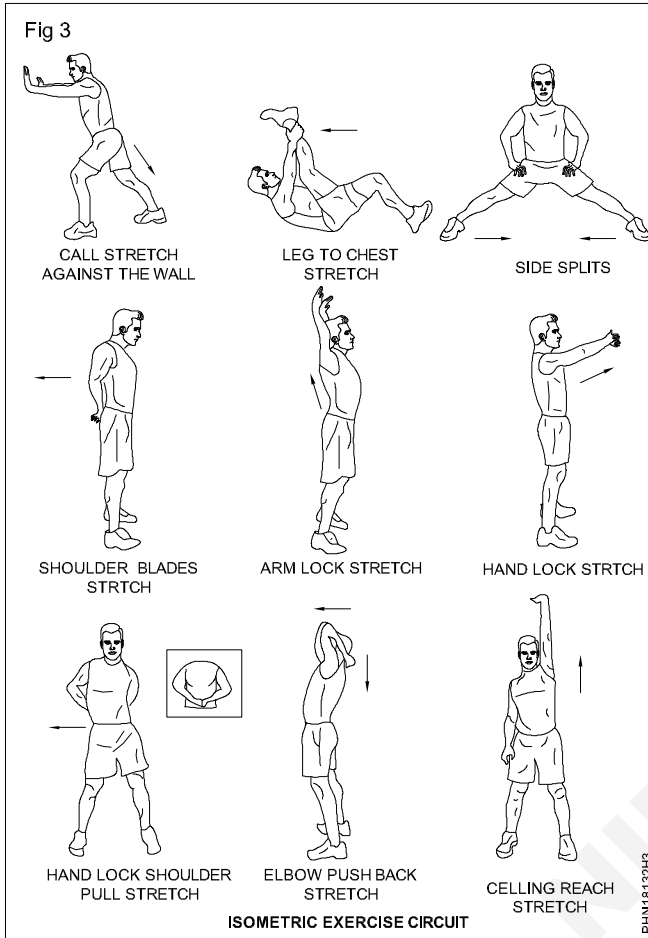
1 Carry out the flexibility training programs for trunk, hip Neck and ankle as per the posture provided in the (Fig 1).

2 Carry out the stretching exercise for lower limb as per the posture provided in the (Fig 2).



3 Perform the isometric exercise as per the posture provided in the (Fig 3).

4 Perform the legs toning and butt toning workout as per the posture provided in the (Fig 4).



Demonstrate precautions to be considered during and after treatment

- Objectives:** At the end of this exercise you shall be able to
- demonstrate precautions to be considered during treatment
 - demonstrate precautions to be considered after treatment.

Requirements
Tools/Instruments <ul style="list-style-type: none">• A4 sheet, pen & pencil - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the precautions to be considered during and after treatment and ask the trainee to perform the same.

TASK 1: Precautions during treatment

- 1 Consider general contraindications to electrotherapy.
- 2 Spread of infection to the tissues.
- 3 Pregnancy – Avoid treating lower thorax, lung and pelvic region.
- 4 Malignant tissue.
- 5 Active epiphysis.
- 6 Higher dose ultrasound is avoided at fracture sites.
- 7 Impaired sensation.
- 8 Impaired cognitive function.
- 9 Over exposed or unprotected spinal cord.
- 10 Hypertension – careful monitoring is needed because of transient increases that can occur in systolic and diastolic blood pressure. Treatment should be discontinued if increase in blood pressure is seen.
- 11 Elderly patient: Decreased efficiency with vasoconstriction. Therefore they have decreased ability to conserve heat.
- 12 Length of treatment : Do not use cold gel packs longer than 15 to 20 min directly on skin and do not apply any cryotherapy directly to the skin for more than one hour continuously.
- 13 Extended treatment may lead to neurapraxia or axonotmesis of superficial peripheral nerves.

TASK 2: Precautions after physiotherapy

- 1 Drink plenty of water. We usually advise this after exercise based treatments, such as hydrotherapy or an exercise class, to help restore hydration and improve recovery times.
- 2 Follow any advice from your Physio. – Use hot/cold packs where required.
- 3 Do your exercises.
- 4 Take note of unusual pain.

Develop ergonomics

Objectives: At the end of this exercise you shall be able to

- **develop ergonomics**
- **demonstrate the same to the patients.**

Requirements
Tools/Instruments <ul style="list-style-type: none">• Ergonomics setup - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding how to develop ergonomics and demonstrate the same to the patients.

TASK 1: How do you start an ergonomic program?

- 1 Identify risk factors.
- 2 Involve and train management and workers.
- 3 Collect health and medical evidence.
- 4 Implement an ergonomic program.
- 5 Evaluate the ergonomic program.
- 6 Promote worker recovery through healthcare management and return to work.

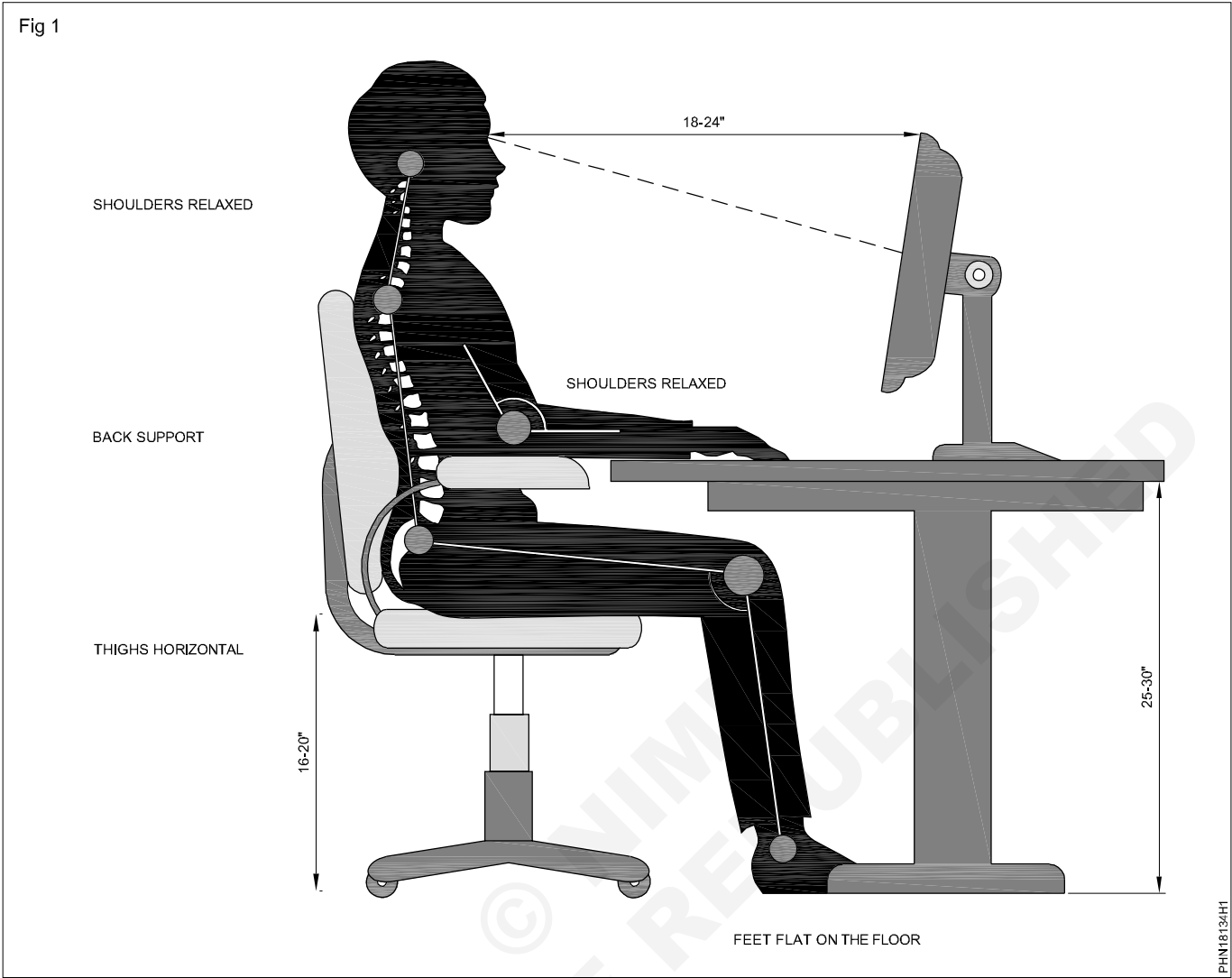
Ergonomic Requirement:

- 1 Posture - Activity - Exercise - Maintain proper posture, paying careful attention to positioning of head, neck, spine, arms, wrists, hips/thigh and feet.
- 2 Lighting - Air - Noise - Maintain appropriate light levels for specific task.
- 3 Work style - Organisation - Breaks.

TASK 2: Seven simple steps for improving workplace ergonomics

- 1 Practice Good Posture. ...
- 2 Change it up. ...
- 3 Lift with your Knees. ...
- 4 Get a Good Chair. ...
- 5 Make your Computer Work for You. ...
- 6 Look after your Eyes. ...
- 7 Chill Out.

Ergonomic Posture (Fig 1)



Evaluate the prognosis

Objectives: At the end of this exercise you shall be able to

- assess the prognosis to the patient
- evaluate the prognosis to the patient.

Requirements
Tools/Instruments
<ul style="list-style-type: none"> • A4 sheet, pen & pencil - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the assessment of prognosis to the patient and evaluate the same.

TASK 1: Write the factors elements that determine the prognosis

Read the factor and write the elements that causes the factor.

SI.No	Factors	Elements
1	Overall clinical factors	
2	Systematic environmental factors	
3	Local factors	
4	Prosthetic /restorative factors	

TASK 2: Procedure to evaluate prognosis

Read the causes in the table and write the types of prognosis.

SI.No	Causes	Type of prognosis
1	No bone loss, excellent gingival condition, good patient cooperation, no systemic environmental factors.	
2	Adequate remaining bone support, adequate possibilities to control etiologic factors and establish a maintainable dentition adequate patient cooperation, no systemic environmental factors or well controlled systemic factors.	
3	Less than adequate remaining bone support, some tooth mobility, grade I furcation involvement, adequate maintenance possible, acceptable patient cooperation, presence of limited systemic/environmental factors.	
4	Moderate to advanced bone loss, tooth mobility grade 1 & 2 furcation involvement, difficult to maintain areas and doubtful patient cooperation, presence of systemic/environmental factors	

Make postures showing diagrammatical calculation of burn

- Objectives:** At the end of this exercise you shall be able to
- make postures showing diagrammatical calculation of burn
 - evaluate the same to the patients.

Requirements	
Tools/Instruments	
• A4 sheet, pencil & pen	- as reqd.

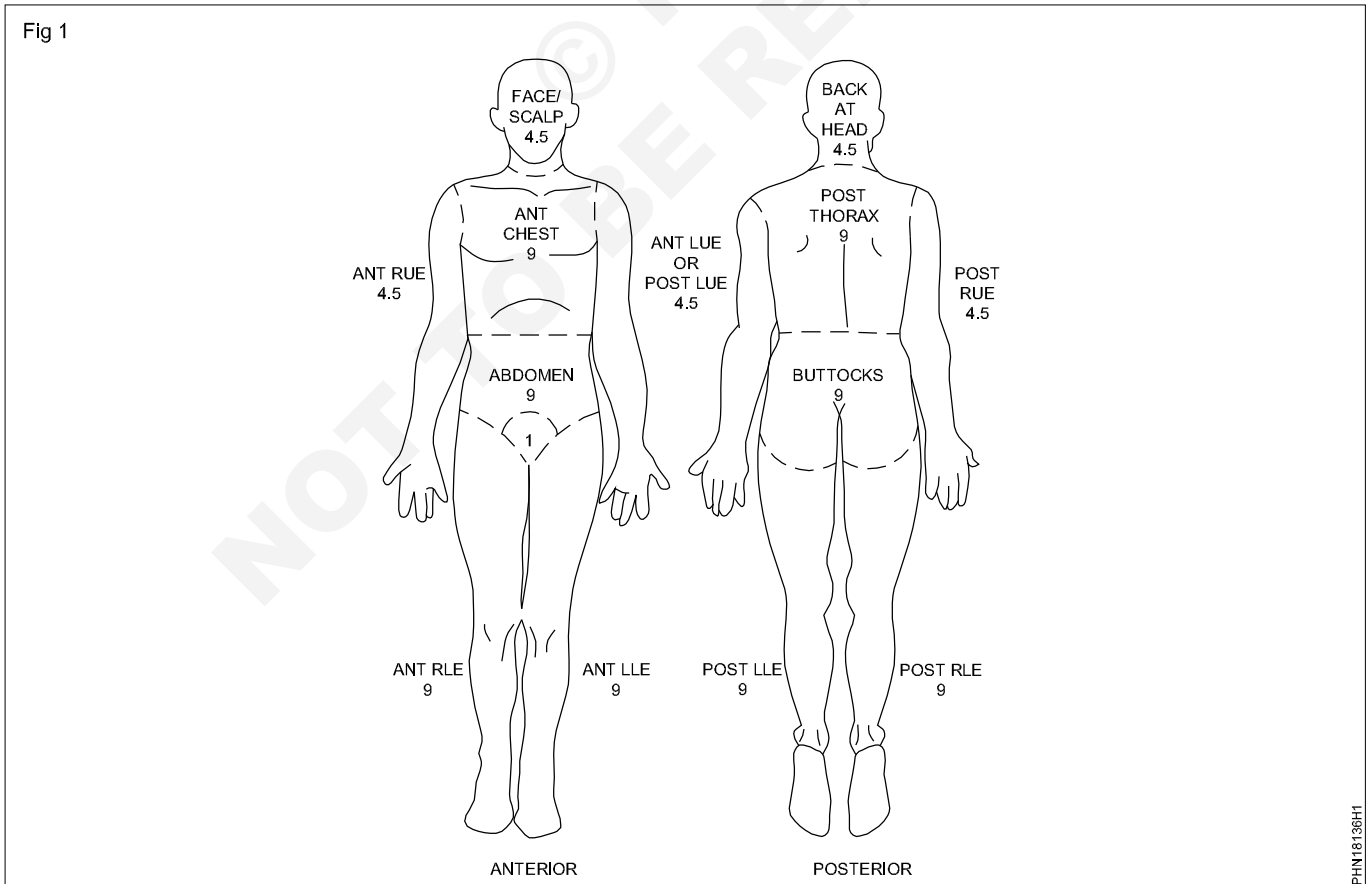
PROCEDURE:

Note: Trainer will teach the trainee regarding the various postures showing diagrammatical calculation of burn and ask the trainee to evaluate the same to the patients.

TASK 1: Estimation of Burn

- 1 Draw the anterior and posterior as shown in (Fig 1).
- 2 Mark burn area for chest, stomach, upper back, lower back, the front & back of each leg and foot and groin area.
 - a Chest equals 9% of the body's surface area.
 - b Stomach equals 9% of the body's surface area.
 - c The upper back equals 9% and the lower back equals 9% of the body's surface area.
 - d The front and back of each leg and foot equal 18% of the body's surface area.
 - e The groin area equals 1% of the body's surface area.

Postures showing diagrammatical calculation of burn (Fig 1)



Calculate obesity according to BM1

Objectives: At the end of this exercise you shall be able to

- calculate obesity according to BM1
- evaluate the same to the patients.

Requirements

Tools/Instruments

- Pencil & pen - as reqd.
- Weighing Machine - 1 No.
- Measuring tape 100 cm - 1 No.
- A4-Sheet - as reqd.
- Calculator - 1 No.

PROCEDURE:

Note: Trainer will teach the trainee regarding how to calculate obesity according to BM1 and ask the trainee to evaluate the same.

TASK 1: Calculation for BM1

- 1 Measure the weight of the patient by using weighing machine and write in the sheet in kg.
- 2 Measure the height of the patient by using inch tape and write in the sheet in m.
- 3 Calculate the BMI by using the given formula.

$$\text{BMI} = \left(\frac{\text{Weight in Pounds}}{(\text{Height in inches}) \times (\text{Height in inches})} \right) \times 703$$

(or)

$$\text{BMI} = \frac{\text{Weight in Pounds}}{(\text{Height in inches}) \times (\text{Height in inches})}$$

- 4 Evaluate the category of the patient by using the BMI referring the Table 1.

Table 1

Category	BMI (kg/m ²)
Underweight	<18.5
Normal weight	<18.5 - 24.9
Class I Obesity- Overweight	<25 - 29.9
Class II Obesity	<30 - 39.9
Class III	>40

Illustrate precautions related to treatment

Objectives: At the end of this exercise you shall be able to

- illustrate precautions related to treatment
- demonstrate the same to the patients.

Requirements			
Tools/Instruments			
• Chair	- as reqd.	• Couch	- as reqd.

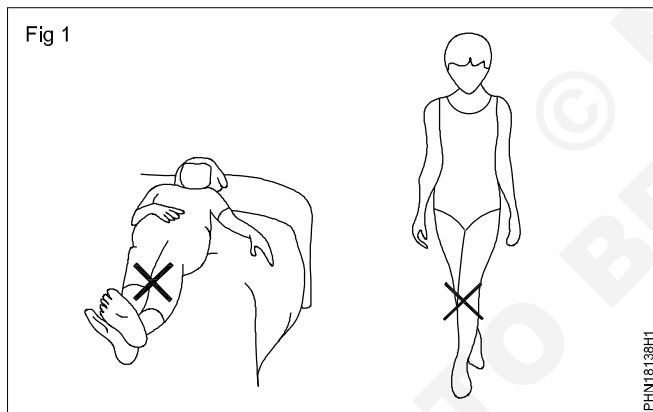
PROCEDURE:

Note: Trainer will teach the trainee regarding the precautions related to treatment and demonstrate the same to the patients.

TASK 1: Precautions for Hip Dislocation

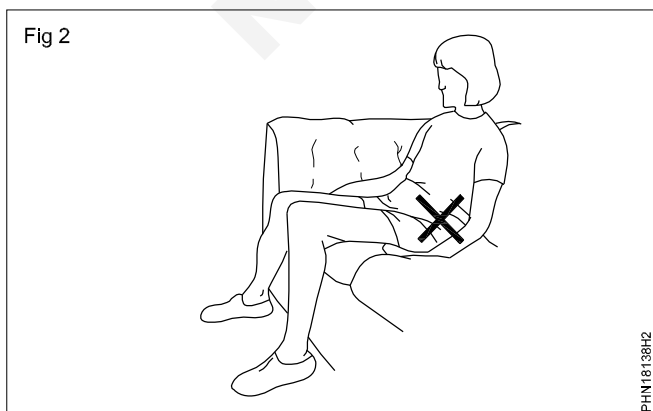
A Hip Precautions: No Adduction (Fig 1).

- 1 Keep legs apart at all times.
- 2 Do not cross legs whether standing, sitting, or lying down.
- 3 Use a pillow to keep legs apart in bed.



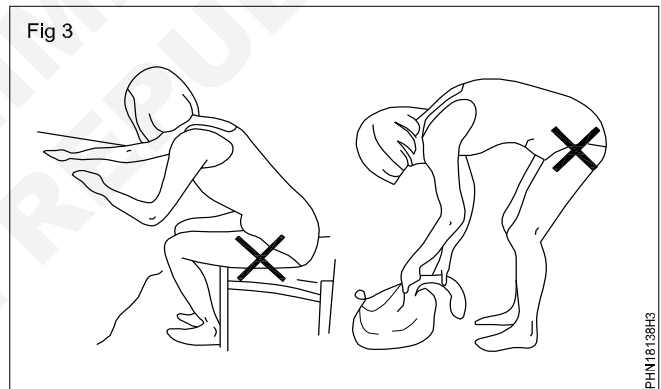
B Hip precautions: Sitting (Fig 2)

- 1 Do not sit on low or soft seats as this forces bending at hips and rolling inwards at knees.
- 2 Avoid recliners, rocking chairs and low stools.



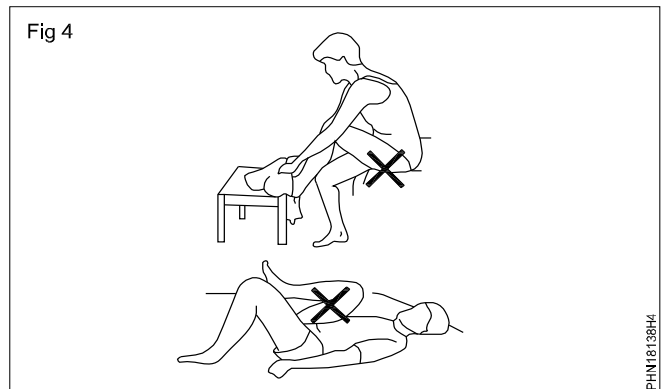
C Hip Precautions: limit Hip Flexion (Fig 3)

Do not bend forward at hips past 100 degrees while standing sitting or lying down.



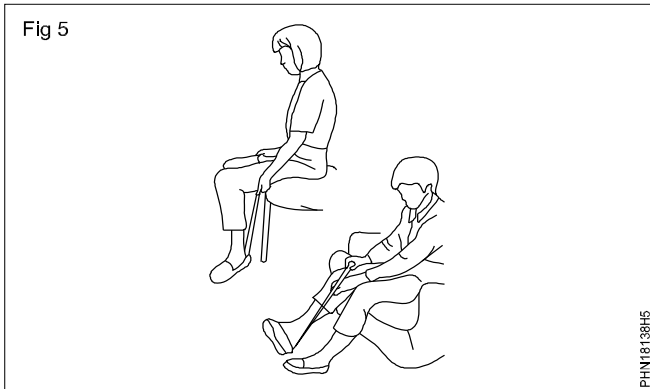
D Hip Precautions: limit lifting leg (Fig 4)

Do not prop or lift leg up past 100 degrees at affected hip.



E Dressing: Shoes & socks (Fig 5)

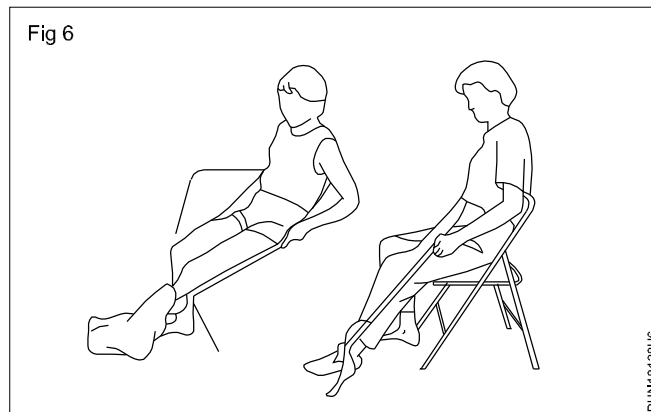
- 1 Step in shoes or elastic shoelaces eliminate bending.
- 2 Use long handled shoe horn to don shoes.
- 3 Use a sock aid to don socks.



F Dressing: Limited hip flexion (Fig 6)

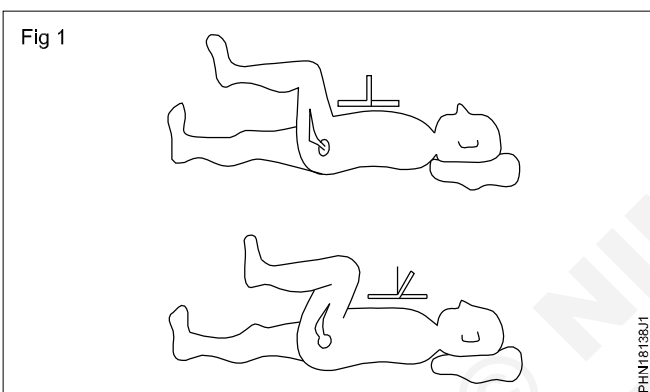
- 1 Use always long handled devices for self care.

- 2 Keep reachers handy to pick up dropped items.

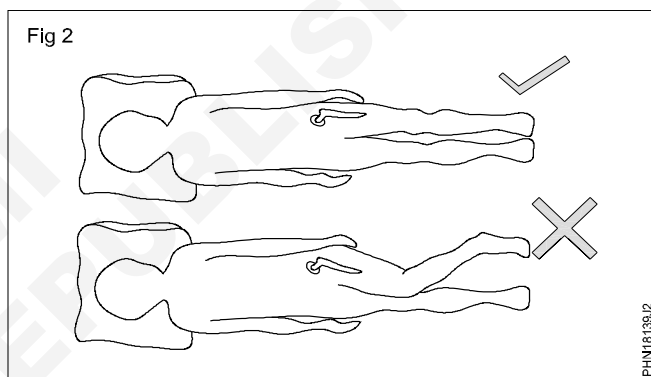


TASK 2: Hip precautions after hip surgery

- 1 Do not bend the affected hip more than 90 degree. (Fig 1)



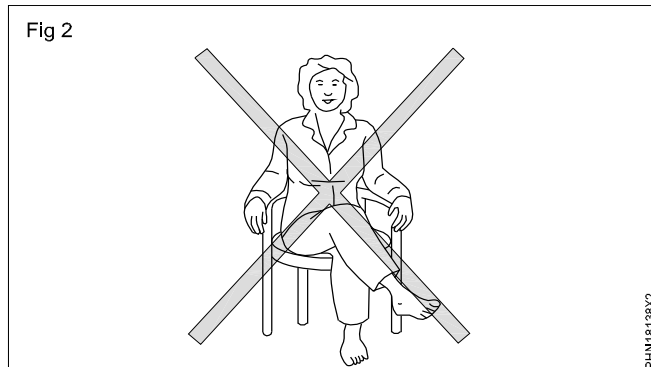
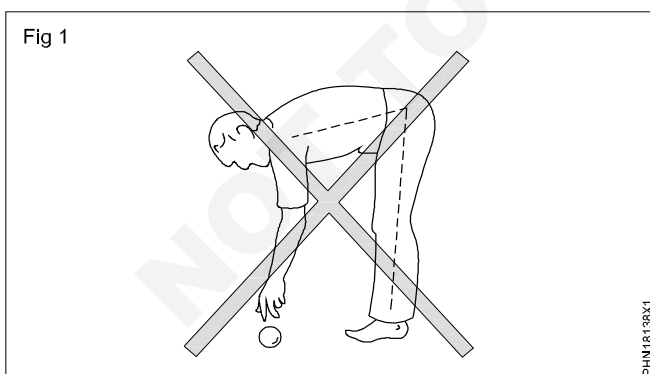
- 2 Do not roll or turn your affected leg towards the other leg or turn your toes inward. (Fig 2)



TASK 3: Practice on general precautions

A Flexion Precaution (Fig 1)

- 1 Do not bend over at the waist.
- 2 Do not sit with your hips lower than your knees.

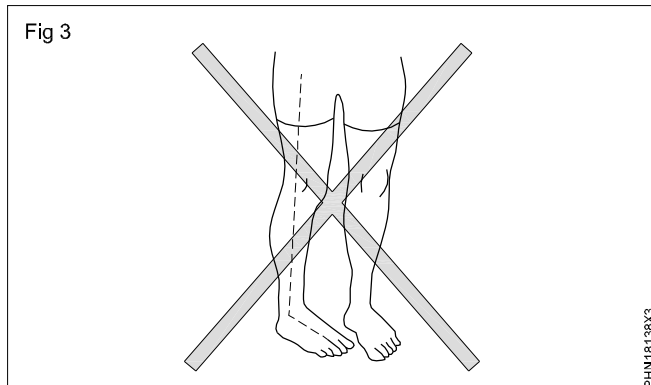


B Adduction Precaution (Fig 2)

- 1 Do not cross your operated leg over your other leg.
- 2 Keep always your thighs apart.

C Internal rotation Precaution (Fig 3)

- 1 Do not turn your operated leg inward.
- 2 Keep always your thighs apart.



Clinical presentation in hemiplegia, hemiparesis to differentiate it

Objectives: At the end of this exercise you shall be able to

- present the clinical procedures in hemiplegia
- present the clinical procedures in hemiparesis.

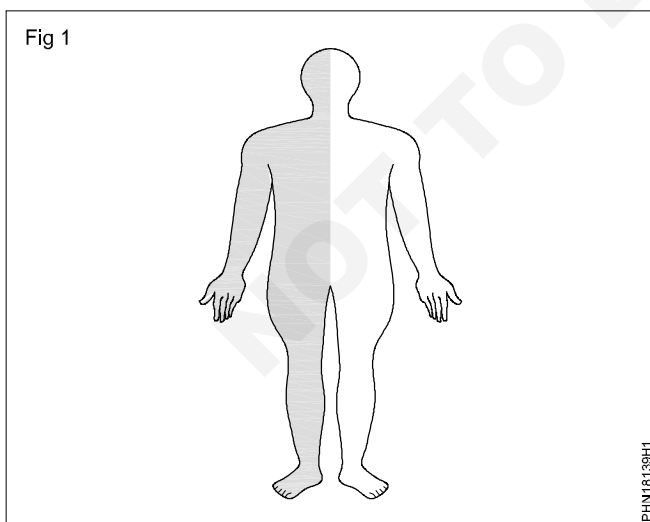
Requirements	
Tools/Instruments	
• A4 sheet, pencil & pen	- as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the clinical procedures in hemiplegia and hemiparesis and able to differentiate it.

TASK 1: Identify Hemiplegia in patients by Clinical presentation

- 1 Check the patient, if weakness of one half of body with or without involvement of face it is the indication of Hemiplegia.
- 2 Hemiplegia is a condition caused by brain damage or spinal cord injury that leads to paralysis on one side of the body.
- 3 It causes weakness, problems with muscle control, and muscle stiffness.
- 4 Hemiplegia is caused by injury to parts of the brain that control movements of the limbs, body, face, etc.
- 5 This injury may happen before, during or soon after birth (up to two years of age approximately), when it is known as congenital hemiplegia (or unilateral cerebral palsy). (Fig 1)
- 3 Shorter step and stride length
- 4 Slower gait speed
- 5 Decreased walking efficiency
- 6 Poor endurance

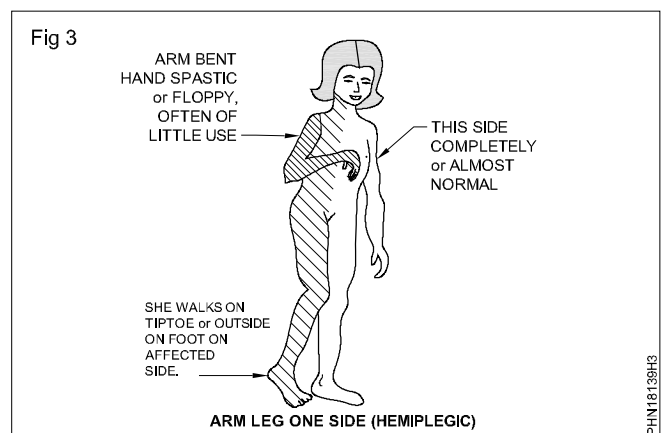


Hemiplegic Gait Description (Fig 2)

- 1 Broader base of support
- 2 Increased double stance time



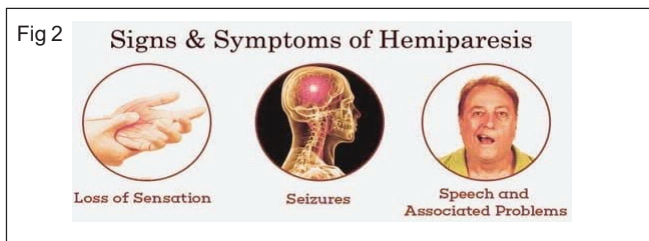
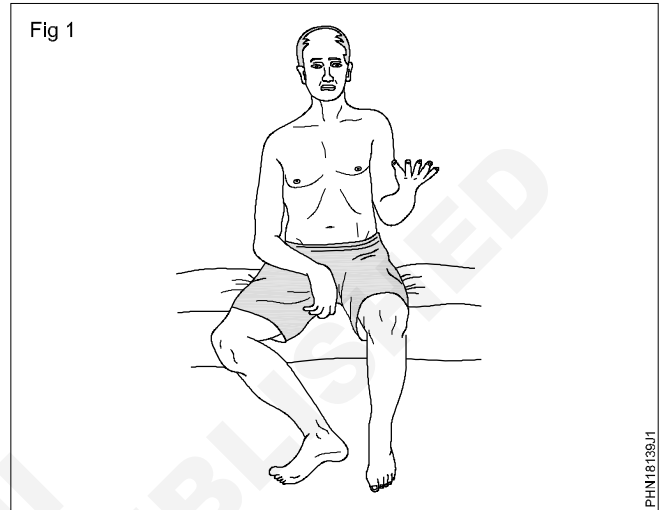
Hemiplegic sign and symptoms (Fig 3)



- 1 Vary tremendously from person to person.
 - Difficulty with gait.
 - Difficulty with balance while standing or walking.
 - Having difficulty with motor activities like holding, grasping or pinching.
- Increasing stiffness of muscles.
- Muscles spasms
- Difficulty with speech.

TASK 2: Identify hemiparesis in patients by clinical presentation (Figs 1&2)

- 1 Hemiparesis, or unilateral paresis, is weakness of one entire side of the body (hemi- means "half").
- 2 Hemiplegia is, in its most severe form, complete paralysis of half of the body.
- 3 Hemiparesis and hemiplegia can be caused by different medical conditions, including congenital causes, trauma, tumors, or stroke.



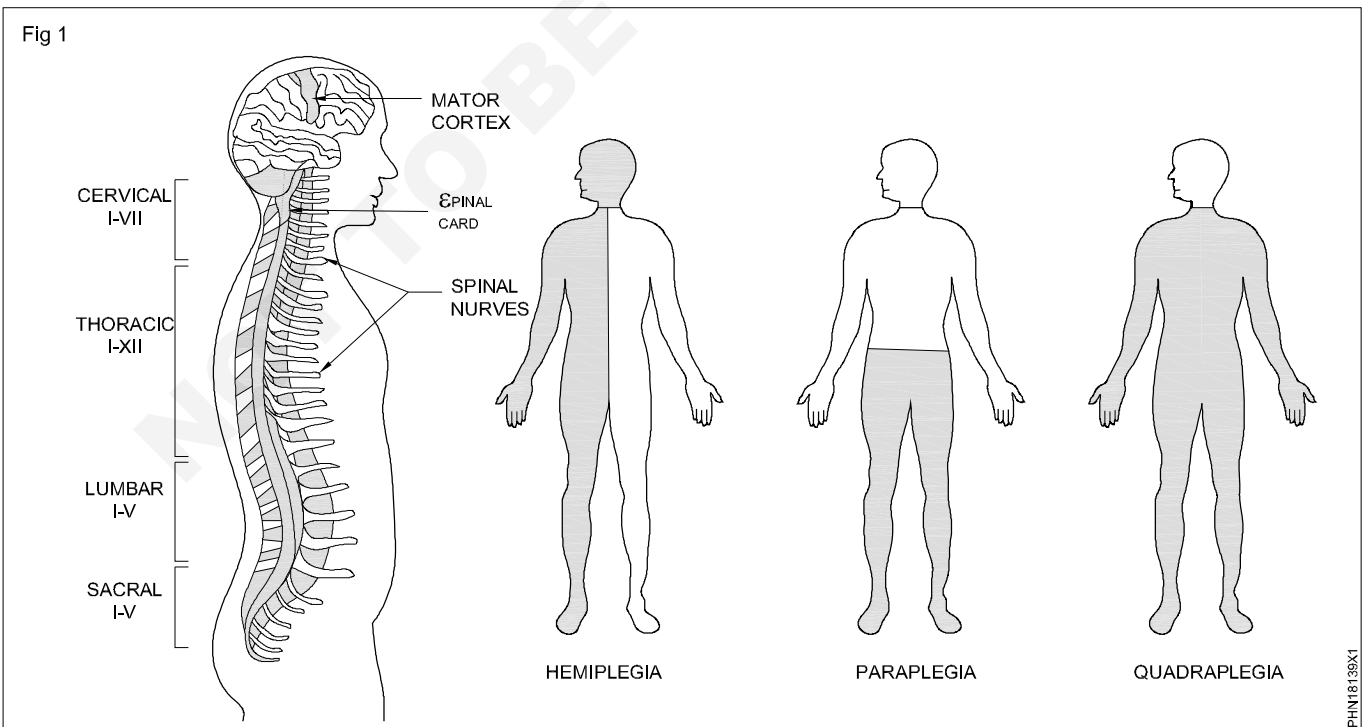
TASK 3: Clinical difference between hemiplegis and hemiparesis (Fig 1)

Hemiplegia

The total paralysis arm, leg and trunk on one side of the body.

Hemiparesis

Weakness on one side of the body. it is less severe than hemiplegia.



Plan antenatal and postnatal exercises

Objectives: At the end of this exercise you shall be able to

- plan antenatal exercises for the patients
- plan postnatal exercises for the patients.

Requirements

Tools/Instruments

- Experimental setup for antenatal & postnatal - as reqd.

PROCEDURE:

Note: Trainer will teach the trainee regarding the antenatal and postnatal exercises for the patients and ask the trainee to perform the patient.

TASK 1: Antenatal exercises

Steps for pelvic floor exercise:

- 1 To strengthen your pelvic floor muscles, sit comfortably and squeeze the muscles 10 to 15 times.
- 2 Do not hold your breath or tighten your stomach, bottom or thigh muscles at the same time.
- 3 When you get used to doing pelvic floor exercises, you can try holding each squeeze for a few seconds.
- 4 Steps for back and abdominal exercise:
- 5 Lie on your back on floor with hips and knees bent to 90 degrees with feet flat on floor.
- 6 Draw in abdominal muscles and maintain throughout exercise.
- 7 Slowly and with control, rotate knees to one side keeping hips in contact with the floor;
- 8 Engage obliques to pull knees back to center and repeat on opposite side;
- 9 Repeat.

Steps for ankle exercise:

- 1 Sitting in a chair, raise your foot off the floor, and place a resistance band under the ball of your foot, holding the ends of the band with your hands.
- 2 Slowly flex your ankle down as far as you can.
- 3 Then slowly return your foot back to the starting position.
- 4 Repeat 10 times on each foot.

Steps for lower limb relaxation exercises:

- 1 Gentle stretching of this muscle can help decrease tightness and pain.
- 2 Sit on a chair with your feet flat on the ground.

- 3 Cross one foot over the other knee in the shape of the number "4."

- 4 As you exhale, slowly lean forward keeping a flat back until you feel a stretch in your lower back and buttocks

Steps for Breathing exercise:

- 1 Take a small, silent breath in and a small, silent breath out.
- 2 Hold your nose with your fingers to prevent air from entering your lungs.
- 3 Count how many seconds until you feel the first signs of air hunger.
- 4 At the first sign of air hunger, you will also feel the first involuntary movements of your breathing muscles.

Exercises for a healthy back: (Fig 1, 2 &3)

- 1 Back Flexion Exercise. While lying on your back, pull both your knees up to your chest and push your head forward until you feel a gentle stretch. ...
- 2 Knee to Chest Stretch.
- 3 Chin to Chest Stretch.
- 4 Ear to Shoulder Stretch.
- 5 Hip Stretch.

Types of antenatal exercise

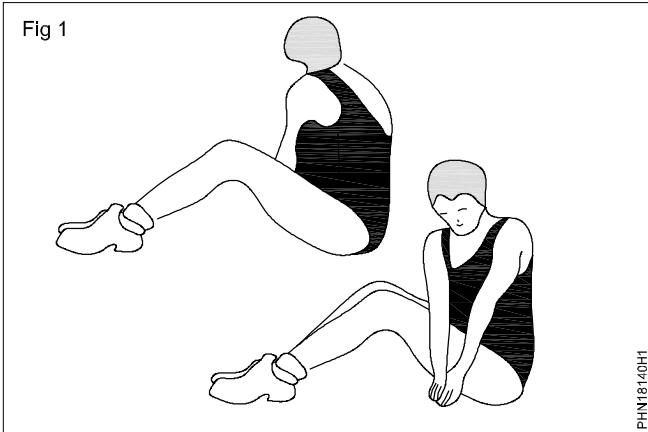
- 1 Pelvic floor exercise
- 2 Back and abdominal exercise
- 3 Ankle exercise
- 4 Lower limbs relaxation exercise
- 5 Breathing exercise

Exercise for healthy back

Diagonal Curl (Fig 1)

This exercise strengthens the muscles of your back, hips, and abdomen. If you have not already been exercising regularly skip this exercise.

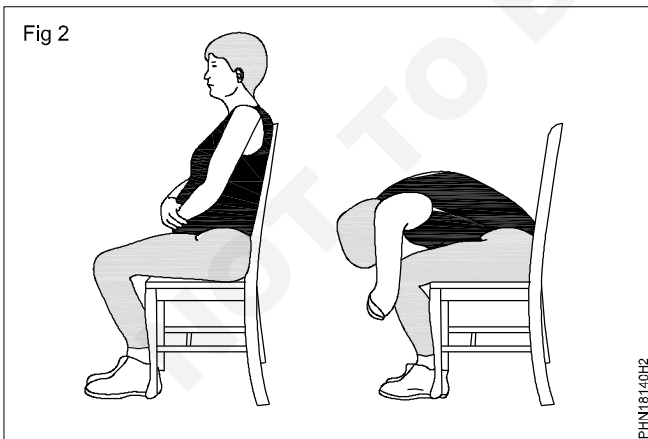
- 1 Sit on the floor with your knees bent, feet on the floor, and hands clasped in front of you.
- 2 Twist your upper torso to the left until your hands touch the floor. Do the same movement to the right. Repeat on both sides 5 times.



Forward Bend (Fig 2)

This exercise stretches and strengthens the muscles of your back.

- 1 Sit in a chair in a comfortable position. Keep your arms relaxed.
- 2 Bend forward slowly, with your arms in front and hanging down. If you feel any discomfort or pressure on your abdomen, do not push any further.
- 3 Hold this position for a count of 5, then get up slowly without arching your back. Repeat 5 times.



Back Press (Fig 3)

This exercise strengthens the muscles of your back, torso, and upper body and promotes good posture.

- 1 Stand with your feet 10 – 12 inches away from a wall.
- 2 Press the lower part of your back against the wall.

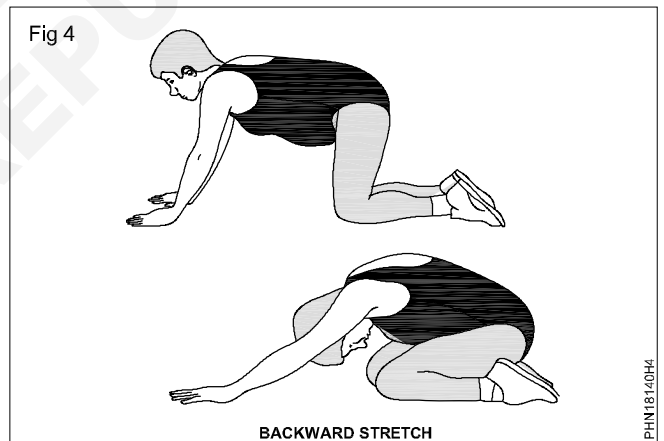
- 3 Hold this position for a count of 10, then release. Repeat 10 times.



Backward Stretch (Fig 4)

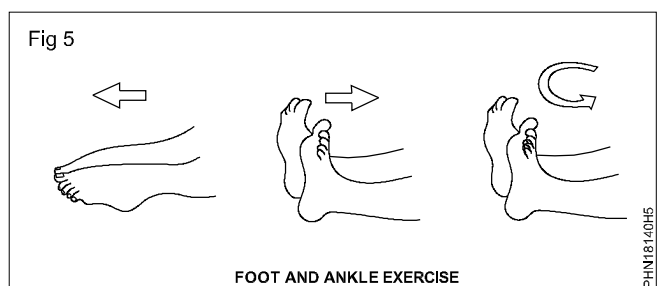
This exercise stretches and strengthens the muscles of your back, pelvis and thighs.

- 1 Kneel on hands and knees, with your knees 8-10 inches apart and your arms straight (hands under your shoulders).
- 2 Curl backward slowly, tucking your head toward your knees and keeping your arms extended.
- 3 Hold for 5 seconds, then return to all fours slowly. Repeat 5 times.



Foot and ankle exercise (Fig 5)

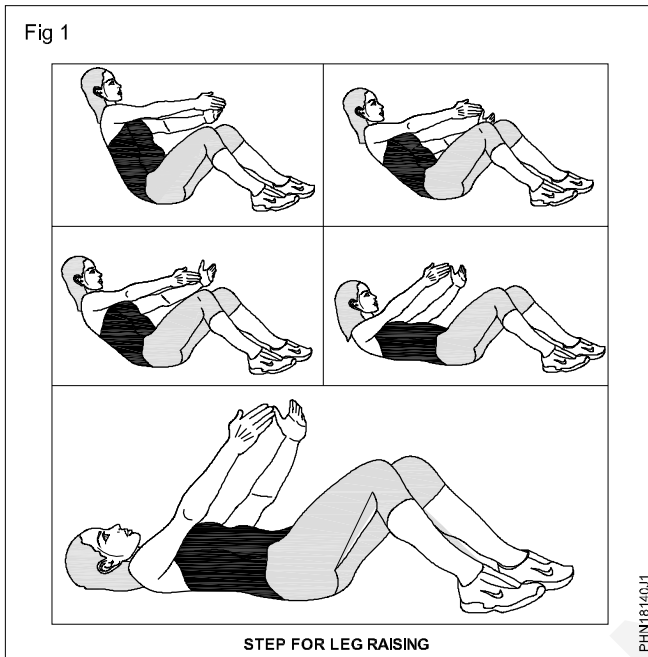
- 1 Keep knees relaxed for both exercises.
- 2 Bend and stretch ankles vigorously up and down for 30 seconds.
- 3 Circle both feet 10 times in each direction.
- 4 Repeat these exercises frequently.



TASK 2: Postnatal exercises

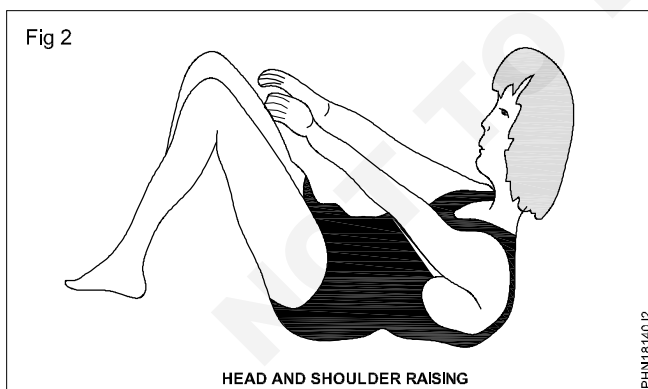
Steps for gentle tummy exercise (Fig 1)

- 1 Place your hands on your thighs, across your chest or behind your ears.
- 2 Slowly curl up towards your knees until your shoulders are about 3 inches off the floor.
- 3 Hold the position for a few seconds and lower down slowly. Perform 12 stomach crunches.



Steps for head and shoulder raising (Fig 2)

- 1 On the 2nd post partum day, lie flat and raise head until the chin is touching the chest.
- 2 On the 3rd post partum day, raise both head and shoulder off the bed and lower them slowly and increase gradually.



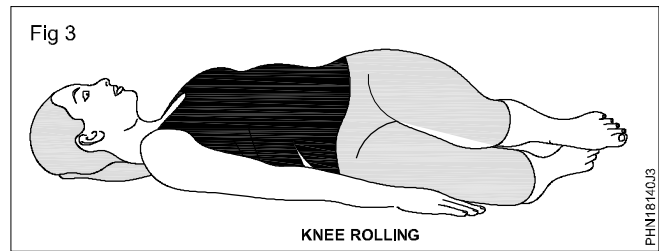
Steps for knee rolling (Fig 3)

- 1 Lie on your back with knees bend.
- 2 Roll both the knees to one side as far as comfortable.
- 3 Keep your shoulders flat.

Steps for Leg raising (Fig 4)

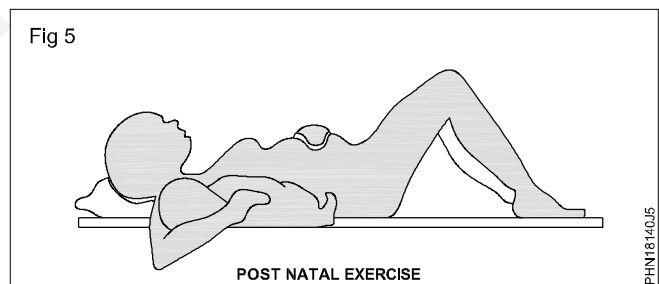
- 1 Begun on 7th post partum day.

- 2 Lying down on the floor with no pillows under the head.
- 3 Point toe and slowly raise one leg keeping the knee straight.
- 4 Lower the leg slowly.



Steps for Post natal exercise (Fig 5)

- 1 Lie on bed with knees bend with a pillow behind.
- 2 Breathe in deeply with nose.
- 3 Sigh out
- 4 Repeat five times



Steps for foot and ankle exercise (Fig 6)

- 1 Keep knees related for both exercises.
- 2 Bend and stretch ankles vigorously up and down for 30 seconds.
- 3 Circle both feet 10 times in each direction.

