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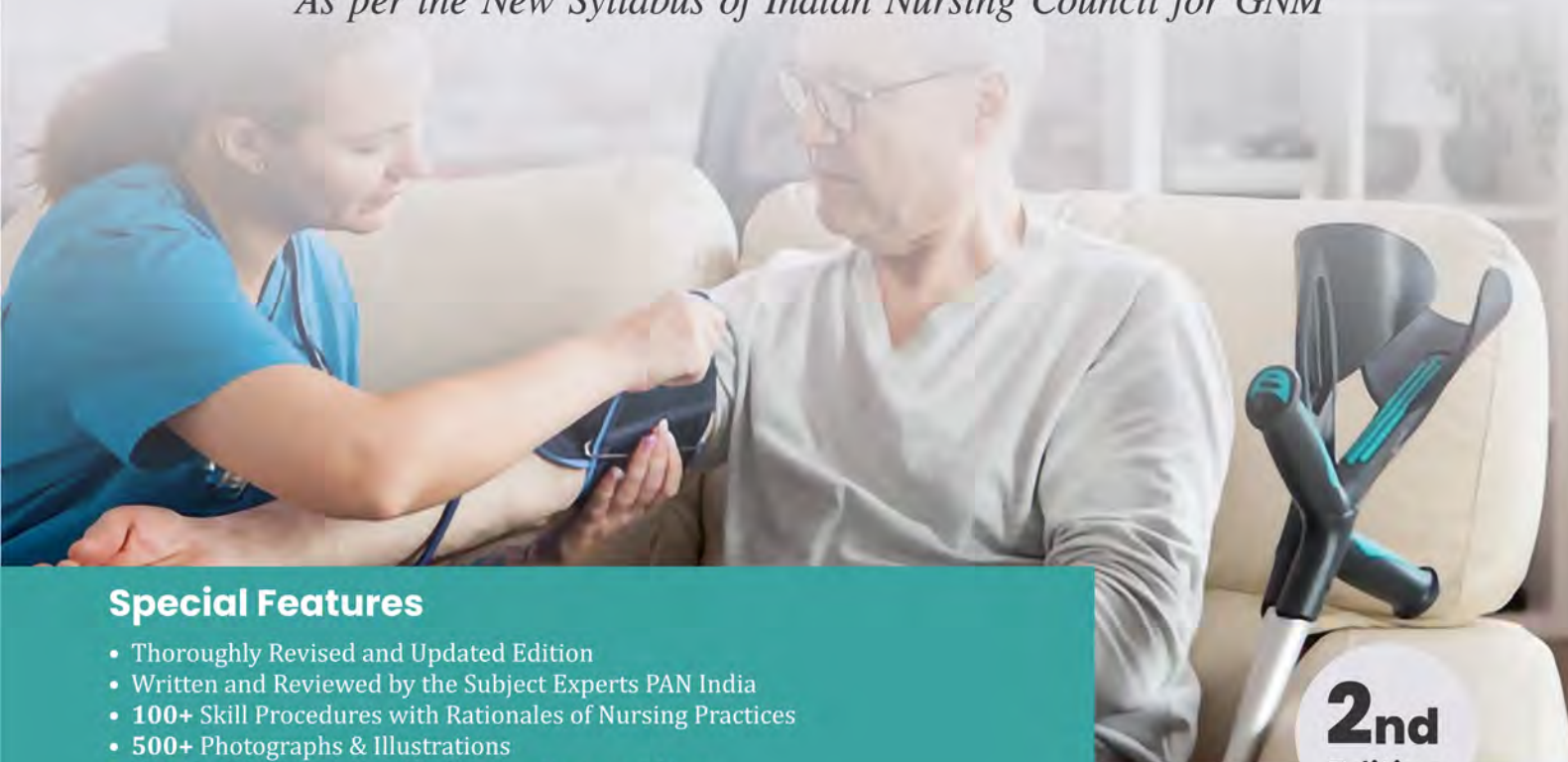
LOOKinside



Textbook of Nursing Foundations

for GNM Nursing Students

As per the New Syllabus of Indian Nursing Council for GNM



Special Features

- Thoroughly Revised and Updated Edition
- Written and Reviewed by the Subject Experts PAN India
- **100+** Skill Procedures with Rationales of Nursing Practices
- **500+** Photographs & Illustrations
- Text Enriched with Nursing Interventions and Alerts
- A Perfect Amalgamation of Theoretical and Clinical Practices

2nd
Edition



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Harindarjeet Goyal



Textbook of **Nursing Foundations** for GNM Nursing Students

As per the New Syllabus of Indian Nursing Council for GNM

Second Edition

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Preface

Keeping in mind the challenge that today's nurses confront with, it becomes imperative to provide them necessary skills of compassionate nursing care in a variety of health care settings, which they could apply for patients in the various stages of illness. At the same time, there are ample opportunities for health promotion activities for individuals and groups; this is an integral part of providing nursing care.

It gives me immense pleasure and satisfaction to introduce and present new edition of title of **Textbook of Nursing Foundations**. The book is specifically designed for the nursing education in Asia to prepare nurses to think critically and practice collaboratively within today's challenging and complex health care delivery system.

Health care is an exciting and challenging field with opportunities and advancements. The entire health care system reverberates with change. The role of nurses in this system is expanding and extending, hence the process of embracing change inevitably requires adaptation and a constant demand for literary excellence. This textbook has been developed comprehensively with an incredible outlook to help nurses develop their clinical skills which are fundamental aspect of nursing care.

The book is organized into **15 Units having 64 chapters**. The content has been designed for the GNM Nursing students and is based on prescribed curriculum and requirements, which is conforming to Indian Nursing Council.

Training is an integral part of the nursing profession. A nurse must possess a strong theoretical base and practical skills. This book will act as a standard prescription for educators and mentors to teach and demonstrate the clinical nursing procedures to budding and practicing nurses. The text has been developed keeping in mind the clinical requirements of a student nurse at all levels of nursing education.

I hope you will enjoy reading the book as much as I enjoyed writing it. Constructive criticism from the readers is always welcome to improve upon in further edition. Happy Reading!

Harindarjeet Goyal

Nursing Knowledge Tree
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Special Features of the Book

Important **Learning Objectives** of every chapter are highlighted in the beginning.

Learning Objectives

After completing this chapter, you will be able to:

- Define health and its changing concepts
- Describe the health-illness continuum
- Enumerate the various factors influencing health
- Explain the causation of disease with the help of model
- Discuss the impact of illness on patient and family

Important **Key Terms** used in the chapter are presented to familiarize the readers with the important terminologies.

Key Terms

- Health
- Biomedical concept
- Ecological concept
- Psychosocial concept
- Holistic concept
- Agent
- Host
- Environment

Chapter Outline is given in the beginning of every chapter to make the reader go through the topics covered in a particular chapter.

Chapter Outline

- Introduction
- Concept of Health and Disease
- Changing Concepts of Health
- Health-illness Continuum
- Factors Influencing Health
- Illness and Illness Behavior

Numerous **Tables** are used to clarify the concept and make the reading enjoyable and informative.

TABLE 1: Clinical observations for nutritional assessment

Parameters/body area	Signs of good nutritional status	Signs of poor nutritional status
Appearance	Alert, responsive	Listless, apathetic
Vitality	Energetic, vigorous, sleeps well	Lacking energy, tired, apathetic
Weight	Normal as per height, age and body build	Overweight or underweight
Hair	Shiny, lustrous, healthy scalp	Dull, dry, brittle, thin
Skin	Smooth, good color, slightly moist, no rashes or swelling	Rough, dry, swollen, pale, pigmented, bruises, petechia
Nails	Pink, firm	Spoon-shaped, pale, brittle

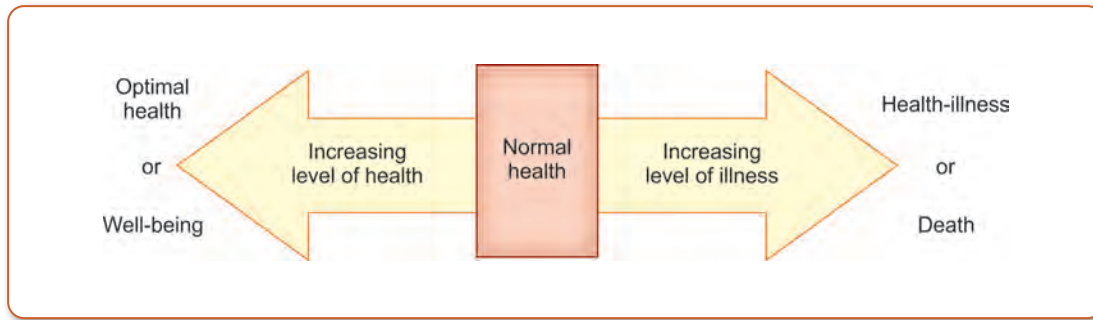


Fig. 1: Health-illness continuum

Studded with 200 + fully colored **Images and Illustrations** for easy grasp of the relevant topic.

At the end of every chapter, **Bibliography** has been added for further reference to enhance knowledge.

BIBLIOGRAPHY

1. Park K. *Park's Textbook of Preventive and Social Medicine, 25th edition: Banarsidas Bhanot. Jabalpur, MP: 2017.*
2. Lewis LW. *Fundamental Skills in Patient Care, 2nd edition: Lippincott Williams and Wilkins.*
3. Christensen K. *Fundamentals of Nursing, 8th edition: Mosby Publishing. Maryland Heights Missouri: 2010.*
4. Sharma S. *Potter and Perry's Fundamentals of Nursing. A South Asian edition: India. Gurugram: Elsevier 2013.*

Added information **Boxes** have been supplemented throughout the book.

Box 1

Change of Shift Report

- Bed no. 104- M₂X
- Admitted last night with head injury
- Allergic to penicillin
- I/V Dextrose 5% infusing 100 mL/hour in (L) forearm
- Needs urgent CT scan
- Temp. 102°F Pulse 98/minute, RR 24/minute
- Blood pressure 110/70 mm of Hg.
- GCS-11

Syllabus

NURSING FOUNDATIONS

Placement: First Year

Time: 210 hours
Fundamentals of Nursing: 190 hours

Course description: This course is designed to help students develop an ability to meet the basic health need of the patients with regard to nursing care and develop skill in the competencies required for rendering effective patient care.

Unit	Learning Objectives	Content	Hours	Method of Teaching	Assessment Methods
I	<ul style="list-style-type: none"> Define nursing and explain its nature, meaning, scope, ethics and principles in nursing. Identify the qualities of a professional nurse health care agencies and its functions. Describe the holistic approach to nursing and the determinants of health and the effects of illness. 	Introduction to Nursing <ul style="list-style-type: none"> Nursing—concept, meaning, definitions, scope and functions History of nursing in India Nursing as a profession Nursing professional—qualities and preparation Ethics in nursing—roles and responsibilities of a nurse Health care agencies—hospital and community service—types and function of hospitals health team. Modern approaches to nursing care including holistic nursing care Health and disease: <ul style="list-style-type: none"> Definition of health, determinants of health status. Basic human needs Illness and its effects on individual 	25	Lecture cum discussions	<ul style="list-style-type: none"> Short answer Objective type Essay type
II	<ul style="list-style-type: none"> Describe nursing care of the patient/client in hospital using nursing process. Demonstrate skill in the admission and discharge process, maintenance of safe environment and records and reports. 	Nursing Care of the Patient <ul style="list-style-type: none"> Patient environment in the hospital: Patients unit Therapeutic environment: <ul style="list-style-type: none"> Physical factors—lighting temperature, ventilation, humidity, noise, pestilence. Safety needs prevention of environmental hazard Psychosocial and aesthetic factors. Patient's adjustment to the hospital: <ul style="list-style-type: none"> Understanding the patient as a person socioeconomic and cultural background, health status, etc. Effect of hospitalization on patient and family. Admission, transfer, discharge procedures 	6	<ul style="list-style-type: none"> Lecture cum discussions Demonstration of maintaining the records and reports Role play 	<ul style="list-style-type: none"> Short answer Objective type Essay type Return demonstration

Contd...

Unit	Learning Objectives	Content	Hours	Method of Teaching	Assessment Methods
		<ul style="list-style-type: none"> • Basic nursing skills: <ul style="list-style-type: none"> ▪ Communication ▪ Nursing interview ▪ Recording and reporting • Nursing process: <ul style="list-style-type: none"> ▪ Meaning and importance ▪ Assessment, planning, implementation and evaluation ▪ Nursing care plan 			
III	<ul style="list-style-type: none"> • Describe basic needs of the patient • Demonstrate skill in meeting basic care of the patient 	<p>Meeting the Basic Needs of a Patient</p> <ul style="list-style-type: none"> • Physical needs: <ul style="list-style-type: none"> ▪ Comfort, rest, Sleep and exercise—importance and its promotion ▪ Body mechanics—moving, lifting, transferring ▪ Position and posture maintenance ▪ comfort devices ▪ Beds and bed making—principles of bed making, types and care of bed linen ▪ Safety devices, restraints and splints ▪ Exercises—active and passive • Hygienic needs: <ul style="list-style-type: none"> ▪ Personal and environmental hygiene ▪ Nurses role in maintaining personal and environmental hygiene ▪ Care of eyes, nose, ears, hands and feet ▪ Care of mouth, skin, hair and genitalia ▪ Care of pressure areas, bed sores • Elimination needs: <ul style="list-style-type: none"> ▪ Health and sickness ▪ Problems—constipation and diarrhea, retention and incontinence of urine ▪ Nurse’s role in meeting elimination needs ▪ Offering bedpan and urinal ▪ Observing and recording abnormalities ▪ Preparation and giving of laxative, suppositories, enemas, bowel wash, flatus tube ▪ Perineal care, care of patient with urinary catheter, diapers ▪ Maintenance of intake and output record • Nutritional needs: <ul style="list-style-type: none"> ▪ Diet in health and disease ▪ Factors affecting nutrition in illness ▪ Nurse’s role in meeting patient’s nutritional needs ▪ Modification of diet in illness ▪ Diet planning and serving ▪ Feeding helpless patients including artificial methods of feeding 	65	<ul style="list-style-type: none"> • Lecture cum discussion • Demonstration 	<ul style="list-style-type: none"> • Short answer • Objective type • Essay type • Return demonstration • Assessment using checklist

Contd...

Unit	Learning Objectives	Content	Hours	Method of Teaching	Assessment Methods
		<ul style="list-style-type: none"> • Psychological and spiritual needs: <ul style="list-style-type: none"> ▪ Importance ▪ Nurse's role—diversional and recreational therapy • Care of terminally ill and dying patient: <ul style="list-style-type: none"> ▪ Dying patient's signs and symptoms of approaching death, needs of dying patient and family ▪ Nursing care of dying—special considerations; advance directives, euthanasia, will, dying declaration, organ donation, etc. ▪ Medico legal issues ▪ Care of the dead body ▪ Care of unit ▪ Autopsy ▪ Embalming 			
IV	Describe the principles of assessment demonstrate skills in assessing the patient	Assessment of Patient/Client <ul style="list-style-type: none"> • Physical assessment: <ul style="list-style-type: none"> ▪ Importance, principles, methods of assessment ▪ Height, weight, posture ▪ Head to toe examination • Physiological assessment: <ul style="list-style-type: none"> ▪ Vital signs, normal, abnormal characteristics, factors influencing the variations ▪ Observation and collection of specimens-urine, stool, vomitus and sputum • Psychological assessment: <ul style="list-style-type: none"> ▪ Mood, intelligence, emotions normal and abnormal behavior 	14	<ul style="list-style-type: none"> • Lecture cum discussions • Demonstration 	<ul style="list-style-type: none"> • Short answer • Objective type • Essay type • Return demonstration • Assessment using checklist
V	<ul style="list-style-type: none"> • Describe the infection control, methods in the clinical setting. • Demonstrate infection control practices. 	Infection Control <ul style="list-style-type: none"> • Infection control: <ul style="list-style-type: none"> ▪ Nature of infection ▪ Chain of infection transmission ▪ Defence against infection: Natural and acquired ▪ Hospital acquired infection (nosocomial infection) • Concept of asepsis: <ul style="list-style-type: none"> ▪ Medical and surgical asepsis ▪ Isolation precautions, barrier nursing ▪ Hand washing: Simple, hand asepsis, surgical asepsis (scrub) ▪ Isolation—source and protection ▪ Personal protective equipments—types, uses and techniques of wearing and removing ▪ Decontamination of unit and equipment ▪ Transportation of infected patient ▪ Standard safety precaution ▪ Transmission-based precautions 	20	<ul style="list-style-type: none"> • Lecture cum discussion • Demonstration • Explain using manual of biomedical waste management of Government of India • Demonstration • Videos • Simulation exercises 	<ul style="list-style-type: none"> • Short answers • Essay type • Objective type

Contd...

Unit	Learning Objectives	Content	Hours	Method of Teaching	Assessment Methods
		<ul style="list-style-type: none"> • Biomedical waste management: <ul style="list-style-type: none"> ▪ Importance ▪ Types of hospital wastes ▪ Hazards associated with hospital waste ▪ Decontamination of hospital waste ▪ Segregation and transportation ▪ Disposal 			
VI	Describe therapeutic nursing care	Therapeutic Nursing Care <ul style="list-style-type: none"> • Care of patients with respiratory problems/dyspnea <ul style="list-style-type: none"> ▪ Deep breathing and coughing exercises ▪ O₂ inhalation ▪ Dry and moist inhalation ▪ Oronasal suctioning • Care of patient with altered body temperature—Hot and cold applications • Care of patients with fluid and electrolyte imbalance • Care of unconscious patient • Care of the bedridden patient (traction, fractures, etc.) • Care of patient with pain • Care of patients with body elimination deviation 	30	<ul style="list-style-type: none"> • Lecture cum discussions • Demonstration 	<ul style="list-style-type: none"> • Short answer • Objective type • Essay type • Return demonstration • Assessment using checklist
VII	Explain the principles, routes, effects of administration of medications	Introduction to Clinical Pharmacology Administration of medication: <ul style="list-style-type: none"> • General principles/considerations: <ul style="list-style-type: none"> ▪ Purposes of medication ▪ Principles: Rights, special considerations, prescriptions, safety in administering medications and medication errors ▪ Drugs forms ▪ Routes of administration ▪ Storage and maintenance of drugs and nurses responsibility ▪ Broad classification of drugs ▪ Therapeutic effect, side effect, toxic effect, allergic reaction, drug tolerance, drug interactions ▪ Factors influencing drug actions ▪ Systems of drug measurement: metric system, household measurements ▪ Converting measurements units: Conversion within one system, between systems, dosage calculations ▪ Terminologies and abbreviations used in prescription of medications 	30	<ul style="list-style-type: none"> • Lecture cum discussions • Demonstration 	<ul style="list-style-type: none"> • Short answer • Objective type • Essay type • Return demonstration • Assessment using checklist

Contd...

Unit	Learning Objectives	Content	Hours	Method of Teaching	Assessment Methods
		<ul style="list-style-type: none"> • Oral drug administration: Oral, sublingual, buccal : equipment and procedure • Parentral: <ul style="list-style-type: none"> ▪ General principles ▪ Types of parentral therapies ▪ Types of syringes, needles, canulas and infusion sets ▪ Protection from needle stick injuries, giving medications with a safety syringe ▪ Routes of parentral therapies: Purposes, site equipment, procedure and special considerations in giving intradermal, subcutaneous, intramuscular and intravenous medications. ▪ Advanced techniques: Epidural, intrathecal, intraosseous, intraperitoneal, intrapleural, intra-arterial ▪ Role of nurse • Topical administration: Purposes, site, equipment, procedure, special considerations for applications to skin and mucous membrane. • Direct application: <ul style="list-style-type: none"> ▪ Gargle, throat swab ▪ Insertion of drug into body cavities: Nasal pack, suppositories/ medicated packing into rectum/ vagina ▪ Instillations: Ear, eye, nasal, bladder and rectal. ▪ Irrigations: Eye, ear, bladder, vaginal and rectal. ▪ Spray: Nose and throat • Inhalations: nasal, oral, endotracheal, tracheal (steam, oxygen and medications)—purposes, types, equipment, procedure and special considerations • Recording and reporting of medications administered 			

FIRST AID

Time: 20 hours

Course description: This course is designed to help students develop and understanding of community emergencies and be able to render first aid services as and when need arises.

General objectives: Upon completion of this course, the students shall be able to:

1. Describe the rules of first aid.
2. Demonstrate skills in rendering first aid in case of emergencies.

Unit	Learning Objectives	Content	Hours	Method of Teaching	Assessment Methods
I	Describe the importance and principle of first aid	Introduction <ul style="list-style-type: none"> • Definition, Aims and Importance of first aid • Rules/ General principles of First Aid • Concept of emergency 	2	Lecture cum discussions	<ul style="list-style-type: none"> • Short answer • Objective type
II	Demonstrate skill in first aid techniques	Procedures and Techniques in First Aid <ul style="list-style-type: none"> • Preparation of First Aid kit. • Dressing, bandaging and splinting(spiral, reverse spiral, figure of 8 spica, shoulder, hip, ankle, thumb, finger, stump, single and double eye, single and double ear, breast, jaw, capelin), triangle bandages uses, abdominal binder and bandage, breast binder, T and many tail bandage, knots reef, clove. • Transportation of the injured • CPR: Mouth to mouth, Sylvester, Schafer, External cardiac massage 	8	<ul style="list-style-type: none"> • Lecture • Discussions • Demonstration • Videos simulation exercises 	<ul style="list-style-type: none"> • Short answer • Objective type • Return demonstration
III	Describe first aid in common emergencies	First Aid in Emergencies <ul style="list-style-type: none"> • Asphyxia, drowning, shock • Wounds and Bleeding • Injuries to the Bones, Joints and Muscle-fractures, sprains, strains, hanging, falls • Burns and scalds • Poisoning – ingestion, inhalation, bites and stings • Foreign body in eye, ear nose and throat. 	6	<ul style="list-style-type: none"> • Lecture cum discussions • Videos Demonstration 	<ul style="list-style-type: none"> • Short answer • Objective type • Return demonstration
IV	List various community emergencies and community resources.	Community Emergencies and Community Resources <ul style="list-style-type: none"> • Fire, explosion, floods, earth-quakes, famines etc • Role of nurses in disaster management • Rehabilitation • Community Resources <ul style="list-style-type: none"> ▪ Police, Ambulance services ▪ Voluntary agencies-local, state national and international 	4	<ul style="list-style-type: none"> • Lecture cum discussions • Videos mock drill • Simulation exercise • Videos field visit to voluntary agencies 	<ul style="list-style-type: none"> • Short answer • Objective type • Essay type

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UNIT **XI**

THERAPEUTIC USE OF HEAT AND COLD APPLICATIONS

Unit Outline

Chapter 53 Hot Application

Chapter 54 Cold Application

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Hot Application

Learning Objectives

After completing this chapter, you will be able to:

- ◆ Define key terms in hot applications
- ◆ Explain the physiological changes taking place due to application of heat
- ◆ Explain the effects of hot applications
- ◆ List down various types of hot applications
- ◆ List the indications and contraindications of hot applications
- ◆ Demonstrate procedures skillfully

Key Terms

- ◆ Medical fomentation
- ◆ Surgical fomentation
- ◆ Stupes
- ◆ Poultices
- ◆ Sitz bath
- ◆ Moist hot pack
- ◆ Counter-irritants
- ◆ Rubefacients
- ◆ Vesicants
- ◆ Postulants

Chapter Outline

- ◆ Introduction
- ◆ Related Anatomy of the Skin
- ◆ Effects of Heat Application
- ◆ Principles of Application of Hot Therapy
- ◆ General Instructions
- ◆ Contraindications
- ◆ Local Dry Heat Application
- ◆ Local Moist Heat Application
- ◆ General Application of Dry Heat
- ◆ General Moist Heat Applications

INTRODUCTION

Hot application is the application of hot agent, warmer than skin either in a moist or dry form on the surface of the body. Application of heat is commonly used in the hospital and home as therapeutic measure. Hot application also serves as comfort measure. The nurse, therefore, needs knowledge of the physiological reactions resulting from this measure and also to any untoward reaction, which may occur.

RELATED ANATOMY OF THE SKIN

Skin is one of the sensory and excretory organs. It has important functions like protection, secretion, excretion,

temperature regulation and sensation. Skin consists of three layers: epidermis, dermis and subcutaneous layer.

The epidermis is the outer layer and is composed of several layers of cells undergoing different stages of maturation. The innermost layer of epidermis generates new cells that migrate slowly toward the epidermal surface, that is stratum corneum. The epidermis also contains melanocytes which produce melanin, or dark pigment of the skin.

The dermis is the thicker layer containing collagen and elastic fibers to support the epidermis. It contains the nerve fibers, blood vessels, sweat glands, sebaceous glands and hair follicles. Sebum from sebaceous glands lubricate the skin and hair. There are two types of sweat glands: Eccrine glands (present throughout the skin, but more in forehead,

palms and soles) and apocrine glands (found in axillary and genital area). The subcutaneous tissue contains blood vessels, lymph and loose connective tissue filled with fat. The fatty tissue serves as a heat insulator.

Appendages

Hairs, nails and sebaceous glands are the appendages of skin.

EFFECTS OF HEAT APPLICATION

Local Effect of Heat

- ◆ Vasodilatation and increase of blood flow to the affected area.
- ◆ Increases inflammation bringing oxygen, nutrients, antibodies, and leukocytes.
- ◆ Promotes soft tissue healing and reduces tissue swelling. When applied, blood vessels dilate, causing increased blood flow, increasing oxygen and nutrition to area and removing excess fluid from tissues.
- ◆ Decreases joint stiffness, relieves pain and relaxes muscles.
- ◆ Sedative effect.

Systemic Effects of Heat

The effect of heat application depends on a number of factors (Fig. 1).

Heat and cold are relative degrees of temperature dependent, to some extent, on the perception of the individual. The temperature at the surface of the skin of the torso is generally 33.9°C (93°F). Local tolerance is thought to range between 41.4°C (105°F) and 43.3°C (110°F). Hot applications that are 11.1°C (20°F) below or 8.3°C (15°F) above this level excite cutaneous nerve fibers.

Purposes

- ◆ To promote circulation
- ◆ To relieve congestion, reduce edema or inflammation
- ◆ To increase suppuration

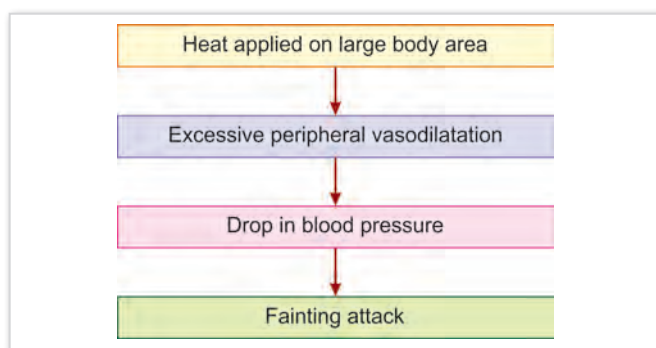


Fig. 1: Systemic effects of heat application

- ◆ To promote tissue relaxation
- ◆ To relieve pain
- ◆ To soften exudates
- ◆ To provide warmth and comfort
- ◆ To stimulate peristalsis

Classification

Classification of hot application is shown as in Figure 2.

Therapeutic Effect of Heat Application

Vasodilatation (by increased blood supply)	Relieves pain caused by ischemia and local congestion
Reduces blood viscosity	Improves the supply of leukocytes, antibodies and nutrients to the injured area of the body.
Reduces muscle tension	Heat relieves the stiffness or spasm of the muscles by relaxing the muscles and stimulating blood circulation and relieves fatigue.
Increased capillary permeability and tissue metabolism	It provides local warmth and promotes movement of waste products and nutrients.

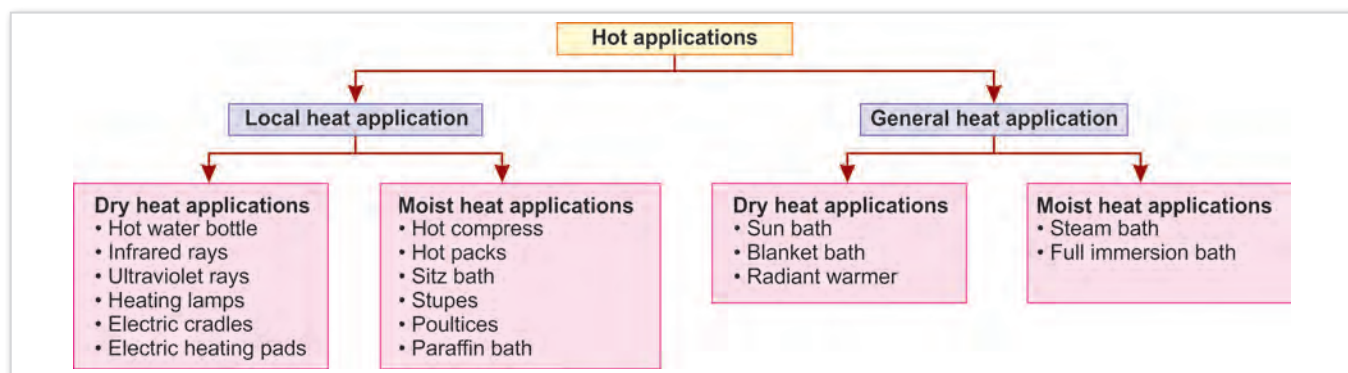


Fig. 2: Classification of hot applications

PRINCIPLES OF APPLICATION OF HOT THERAPY

- ◆ Heat is a form of energy resulting from the internal vibration of the molecules of which the body is composed.
- ◆ Heat is always passed from a hotter body to a cooler one.
- ◆ Heat causes expansion and change of state. Any chemical action capable of being accelerated is increased by rise of temperature.
- ◆ Heat is distributed throughout the body by the circulating blood and by direct conduction throughout the tissue.
- ◆ Heat is lost from the body through conduction, convection, radiation and evaporation.
- ◆ The amount of heat loss from the body is directly proportional to the amount of blood circulating close to the skin's surface. This is influenced by the dilatation and constriction of the peripheral arterioles.
- ◆ Moisture conducts heat better than air.
- ◆ People vary in their ability to tolerate heat or cold. People at both extremes of age spectrum (very old and very young) are particularly more sensitive to heat and cold.
- ◆ People become less sensitive to repeated application of heat and cold.
- ◆ The length and time of exposure to extremes in temperature affects the body's tolerance to the temperature.

GENERAL INSTRUCTIONS

- ◆ Assess the patient's condition prior to, during and after the therapy.
- ◆ Maintain correct temperatures for the entire duration of application.
- ◆ Never use any equipment unless you know its operation completely.
- ◆ There must be a recovery period between application of heat because it is detrimental to health and tissues.
- ◆ Expose patient only to a safe temperature.
- ◆ Don't allow patients to adjust temperatures of appliances such as short-wave diathermy, electric heating pads, etc.
- ◆ Never ignore even small complaints of patients.
- ◆ Ensure that patient is in a position to remove application or to remove device, if it is causing a discomfort
- ◆ The patient must have a calling signal within his reach.
- ◆ Since water is a good conductor of heat, squeeze off water from moist heat application to prevent scalding.
- ◆ Apply a thin layer of oil to the skin prior to moist heat application. This protective layer reduces soaking of the skin and therefore prevents maceration.
- ◆ Do not use electrical appliance close to open oxygen or near water and other fluids. Badly maintained equipment with signs of deterioration should never be used.

- ◆ Be extremely careful when patient is unconscious, anesthetized or unable to respond to pain.
- ◆ Any signs of complication should be early recognized, stop the procedure, and report immediately.
- ◆ After the procedure, dry the part gently by patting and not by rubbing to remove the moisture thereby preventing maceration of the skin and further cooling by evaporation.
- ◆ During the procedure protect the patient from chills. Shivering can raise the temperature. It also allows patient to catch a cold.

CONTRAINDICATIONS

- ◆ In malignancy, heat increases metabolism of both normal and abnormal cells.
- ◆ When heat involves a large body area, blood supply of vital organs gets reduced. This may pose a serious problem to patients of renal impairment, heart and lung diseases.
- ◆ Edema associated with venous and lymphatic disease e.g., arteriosclerosis, atherosclerosis which is common in diabetes mellitus patients.
- ◆ Cutaneous injuries (e.g., stomas or scar tissues).
- ◆ Patients with paralysis.
- ◆ Heat is not applied in areas where diffusibility of heat is limited e.g., in abscess of tooth or in an inflamed appendix as heat might cause these areas to rupture, spreading infection in the blood stream.
- ◆ It should not be applied to very young or very old or debilitated patients.

PROCEDURES RELATED TO HEAT APPLICATION

LOCAL DRY HEAT APPLICATION

The application of dry heat means the use of an agent warmer than the skin, which is applied in dry form to produce local effect.

Hot Water Bottle

- ◆ Hot Water Bottle is the commonest and inexpensive method of applying dry heat locally to the body as a therapeutic and comfort measure
- ◆ *Objective:* To supply heat to the area, to provide comfort, a feeling of general warmth and to promote healing
- ◆ *Indications:* To relieve pain (rheumatoid arthritis backache, dysentery and dysmenorrhoea), to relieve muscle spasm, to reduce inflammation and congestion, and to relieve retention of urine.



SKILL: HOT WATER BOTTLE APPLICATION

Preparation of Articles

Articles	Rationale
A hot water bag with cover/towel-1	To provide treatment
Jugs-2	One to keep hot water and the other to keep cold water
Duster-1	To wipe outside of the bottle
Lotion thermometer	To check the temperature
Vaseline/oil	To apply on the skin
A kidney tray and paper bag	To receive waste

Preliminary Assessment

- Check for the diagnosis and physician's instructions

Steps of Procedure

Action/steps	Rationale
1. Wash hands	To prevent cross-infection, pathogens can transfer from the source to the new host
2. Screen the patient	To maintain privacy. It helps in giving relaxation and comfort to the patient
3. Collect supplies from the equipment room	To economize time, energy and material. Organization facilitates performance of task
4. Mix hot and cold water and check the temperature (120–149°F or 49–65°C) or keep boiling water till steam disappears	To prepare application within the acceptable range
5. Pour some water into the hot water bottle and empty it	To warm the hot water bottle and minimize heat lost through conduction and convection
6. Pour water to fill the half or two-third of the capacity of hot water bottle	To avoid unnecessary weight on body parts, especially if applied on abdomen and allows to mould over the area to provide even heat
7. Expel the air by placing the bag over a flat surface. Cork it tightly (Fig. 3).	Air in the bag will interfere with the conduction of heat and it will not mould easily to the patient's body



Fig. 3: Expelling air from hot water bag

- Inspect the body part that is to receive treatment for any lesion or injury
- Check the general condition of the patient and ability to follow commands
- Determine the duration and frequency of treatment as instructed

Preparation of the Patient (Planning)

- Explain the purpose of the procedure to build rapport
- Maintain privacy of the patient, drape the patient if needed
- Provide a comfortable position to the patient
- Prevent chills by covering patient with blanket or bed cover

Contd...

Action/steps	Rationale
8. Dry the outside of the bottle and hold it upside down for checking leakage	To prevent scalding of the patient To ensure that the bottle is not leaking
9. Cover the bag with a bottle cover or other protector and apply to the prescribed area	Protects the skin from direct contact with hot rubber
10. Keep bottle in place for 20–30 minutes, change position if needed and inspect area for redness, pain and swelling	Maximum therapeutic effects from application of heat occur within 20–30 minutes. Extended use of heat causes tissue congestion and vasoconstriction. Inspection and changing position prevent burns

After Care of Patient and Articles

- ◆ Remove the bag when treatment is over.
- ◆ Inspect area for redness. If present, apply vaseline or oil.
- ◆ Note the patient’s response and make him comfortable.
- ◆ Take all articles to utility room and remove the bag cover. Empty the bag and wash its outside with soap and water.
- ◆ Dry the bag by hanging upside down. When dried, fill with some air, cork it and store in a proper place.

- ◆ Wash the cover of the bag, dry it and put it in a proper place.
- ◆ Wash hands.

Documentation

- ◆ Record the procedure with date, time, the area to which it is applied, the purpose and reaction, if any.

Evaluation

- ◆ Observe for its therapeutic effectiveness.

Heating Lamp

Flexible necked lamps are used to supply dry heat to the body part and are placed 18–30 inches from the area to be treated. The distance between the exposed part and the lamps depends on the voltage of the light bulb, the pigmentation of the skin and heat tolerance by the patient. The duration of treatment is 20–30 minutes.

The recommended distances are:

- ◆ **25 watt bulb:** 35 cms away from the body part
- ◆ **40 watt bulb:** 45 cms away from the body part
- ◆ **60 watt bulb:** 60 cms away from the body part

Objectives/indications

- ◆ To provide dry heat to increase circulation to a small area such as in decubitus ulcer
- ◆ To reduce inflammation

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SKILL: HEATING LAMP APPLICATION

Articles Required

Articles	Rationale
A lamp with required voltage	To apply heat
Measuring tape	To check proper distance of the lamp and the body
Screen	To maintain privacy
Vaseline	To prevent skin burning
An extra bed-sheet	To drape the patient

Preliminary Assessment

- ◆ Assess the patient’s condition.
- ◆ Check the diagnosis and doctor’s instruction.
- ◆ Inspect, clean and dry the body area.
- ◆ Determine the distance of the lamp and frequency of treatment.
- ◆ Check the working condition of the instrument.

Preparation of the Patient (Planning)

- ◆ Explain the purpose of the procedure to build rapport.
- ◆ Maintain proper privacy. Drape patient as needed.
- ◆ Provide a comfortable position.

Steps of Procedure

Action/steps	Rationale
Implementation	
1. Screen and drape the patient	To maintain privacy
2. Wash hands and dry properly	To prevent cross-infection
3. Measure the proper distance from the lamp to the body	To get the maximum benefit of treatment
4. Focus the lamp at a proper angle	To supply heat
Evaluation	
5. Inspect the area for redness	To observe for any injury

After Care of Patient and Articles

- ♦ Switch off the lamp, cool it and keep it back in the inventory.
- ♦ Make the patient comfortable.
- ♦ Wash hands and record procedure.
- ♦ Apply Vaseline or oil if there is any redness.

Heat Cradles

Heat cradles are metallic half circle frames (bed cradle), in which several electrical light sources and sockets for luminous bulbs and a thermometer are installed. They are used when a large body part is to be heated such as abdomen, chest or legs.

Purposes

- ♦ To dry large plaster body casts
- ♦ To dry the wounds in burns or when patient's condition does not allow covering of the skin with gown or sheets.
- ♦ To take the weight off the body of top clothes

Steps of Procedure

- ♦ Place the cradle with electric light bulbs over the required area. Often this is covered by top bedding in order to hold in the heat and to prevent cooling by the circulatory air. Temperature should not exceed 52°C or 125°F.
- ♦ After the prescribed duration (20–30 minutes), cool the cradle and remove and replace. It may be used continuously, provided a low temperature is maintained.

Electric Pads

Electric pads and electric blankets are frequently used as a means of providing dry heat. These are composed of an electric coil with a waterproof rubber covering and heat control switch to maintain temperature at a desired level.

Precautions

- ♦ It should be covered with a flannel cloth to absorb the perspiration and to insulate the pad.

- ♦ No wet dressing should be applied while using heating pad.
- ♦ Do not apply heating pad with pressure since this reduces the number of air spaces between patient and appliance. It increases chance of burns.
- ♦ Instruct patient not to lean or lie against the heating pads

Infrared Lamp

Infrared lamp supply radiant heat or infrared rays (invisible heat rays beyond the red end of the spectrum). Infrared lamp is used to provide heat to a localized area of the body. It penetrates 3 mm of tissue at the most. Thus, it provides surface heat only.

The advantages over other forms of heat application:

- ♦ Dosage can be regulated easily.
- ♦ The application has no weight and the patient can be made comfortable and undisturbed throughout the procedure.

Uses

- ♦ Frequently used in treatment of decubitus ulcers.
- ♦ Used in obstetrical and gynecological cases to promote healing of suture area of the perineum.

Cautions

- ♦ Check that the patient's skin is dry
- ♦ Ask patient to wear cotton clothes
- ♦ The lamp should be placed 18–24 inches above the skin area
- ♦ The rays should strike the skin at right angle
- ♦ Observe patient frequently, note his reaction and terminate application at first sign of redness or pain

Duration of Treatment

- It is from 15 to 45 minutes. The length of time depends on the amount of erythema present during treatment.

Ultraviolet Lamps

Ultraviolet lamps are exposure of the body to the ultraviolet portion of light spectrum. A mercury vapor lamp or a cold quartz lamp is used for producing ultraviolet rays.

Uses

- The effects of exposure to ultraviolet lamps are pigmentation of the skin, production of vitamin D and bactericidal effects. It is mostly used for a number of skin conditions.
- The lamp is placed 30–36 inches away from the skin and the duration is 20–30 minutes.

Caution

- Patient and therapist must wear protective goggles as it may cause conjunctivitis.

Diathermy

Shortwave or diathermy is a method of heating to convert electrical or vibrational energy into thermal energy to provide heat, deep in the tissues. In preparation of a client

for diathermy, the nurse must see that all forms of metals are removed from patient's body.

LOCAL MOIST HEAT APPLICATION

Application of moist heat means the use of an agent warmer than the skin which is applied in moist form to produce local heat.

Fomentations

Fomentations are local application of moist heat to the skin by means of double thickness of flannel or other soft material.

They are of two types:

- Medical fomentation
- Surgical fomentation

Medical Fomentation

Medical fomentation is done by using only hot water with or without medicine.

Purposes

- To stimulate circulation and relax muscle tissue
- To relieve pain and congestion in inflamed areas
- To relieve retention of urine
- To promote suppuration
- To stimulate absorption of serous exudates and effusion from body cavities



SKILL: FOMENTATION APPLICATION

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Preparation of Articles

Articles	Rationale
A kettle with boiling water	To have boiling water at required temperature
Wringer with wringer rods placed in a basin/two artery forceps	To wring out the hot compress
Three pieces of flannel large enough to cover the area/fomentation pads	To apply warmth
Cotton balls in a container	To apply oil
Forceps	To hold cotton balls
Paper bag	To receive used swabs
Kidney tray	To receive used compress
Waterproof cover and cotton	To insulate the compress and to prevent heat loss
An abdominal binder and safety pin	To keep the compress in position
A hot water bag with cover	To keep over the compress
Screen, if necessary	To provide privacy

Preliminary Assessment

- ◆ Identify the patient
- ◆ Check diagnosis and physician's order
- ◆ Inspect body parts
- ◆ Determine the duration and frequency of treatment
- ◆ Check the patient's general condition
- ◆ Check the available articles

Preparation of Patient and Unit (Planning)

- ◆ Identify patient and explain procedure
- ◆ Screen the patient. Drape according to the need and expose only the needed part
- ◆ Switch off the fan
- ◆ Place the patient slightly off the center of the bed towards the edge of the bed for better proximity for treatment
- ◆ Place a mackintosh and a towel under the patient
- ◆ Keep the abdominal binder in place ready for application
- ◆ Prepare the part and apply oil or Vaseline

Steps of Procedure

Action/steps	Rationale
1. Wash hands	To prevent cross-infection
2. Screen and drape patient	To maintain privacy
3. Prepare hot compresses at bedside	To prevent heat loss to air. Moisture causes rapid cooling
4. Place the wringer and fomentation cloth in the basin with the free end outside.	Wringer helps to remove excess water from fomentation cloth without burning the nurse's hands
5. Test the temperature by applying at the back of the hand	To ensure that it will not cause a burn
6. Apply compress over the area. Change the compress frequently or cover with heating agent (hot water bottle, heating pad). Cover with waterproof cover and a cotton pad	Cover maintains constant temperature Also protects bed clothes from getting wet
7. Secure the binder with bandage	To get the maximum benefit of the treatment

After Care of Patients and Articles

- ◆ Change compress every 3 minutes for 15 minutes if a hot water bottle is not used. If single application is made and kept warm by hot water bottle, remove the last fomentation after 20 minutes.
- ◆ Dry the skin, observe for redness and blister. Report if any, and apply vaseline.
- ◆ Cover the patient and provide comfortable position.

Special Points

- ◆ Avoid chilling in between fomentations
- ◆ Report any redness and take immediate steps
- ◆ Always apply fomentation after ascertaining patient's sensitivity to heat

Evaluation

Observe for its effectiveness

Documentation

- ◆ Report and chart the procedure.
- ◆ Wash all articles. Disinfect pads and replace them in proper place.

Surgical Fomentation

Surgical fomentation is local application of moist heat requiring surgical asepsis when the skin is broken.

Purposes

- ◆ To promote suppuration by circulation
- ◆ To reduce swelling around a wound
- ◆ To hasten separation of slough
- ◆ To help in drainage of exudates



SKILL: SURGICAL FOMENTATION

Articles Required

- ♦ A kettle of boiling water
- ♦ Tray containing 2 sterile basins, 2 sterile fomentation pads, 2 sterile forceps, 2 sterile small bowls, a piece of plastic cover binder, a kidney tray and paper bag
- ♦ Dressing trolley
- ♦ Screen

Steps of Procedure

Action/steps	Rationale
Implementation	
1. Assess area for any circulation impairment (numbness, tingling, impaired sensation, cyanosis)	Circulatory impairment may interfere to perceive heat and place the patient at risk of burns
2. Check physician's order and explain the procedure	Explanation encourages patient's cooperation and redness apprehension
3. Gather equipment	Provides for an organized approach to the task
4. Wash hands	To prevent cross-infection
5. Close doors and switch off the fan. Expose the area	To provide privacy and warmth
6. Place mackintosh with waterproof lining under the patient	To protect the bed clothing
7. Assist patient to a comfortable position that provides easy access	To provide comfort and care of application
8. Open the dressing, observe the amount and nature of discharge. Discard dressing in kidney tray	Document the condition of the wound prior to the application
9. Clean the wound. Place sterile fomentation pad into the sterile basin	To maintain aseptic technique
10. Pour boiling water over sterile fomentation and squeeze moisture from it with the help of forceps and apply carefully and gently mould around the wound	Excess moisture may contaminate the surrounding area and is uncomfortable. Moulding compress to the skin promotes retention of warmth around the wound
11. Cover with sterile towels followed by a plastic cover, fix in place with a binder	Towels provide additional insulation
12. Check frequently for any sign of burns	Impaired circulation may affect sensitivity to heat
13. After 30 minutes, remove warm compress. Observe skin condition and patient's response	Maximum therapeutic effect of heat occurs within 20–30 minutes
14. Apply sterile dressing	Protects wound from infection
15. Make patient comfortable	To give comfort to the patient
16. Wash equipment and replace them	To keep it ready for reuse
Documentation	
17. Record with date, time, duration of treatment and condition of wound	Provides accurate documentation of procedure

Evaluation

Observe for its effectiveness.

Stupes

Stupes are medicated local application of moist heat where turpentine is used locally to augment the effects of the hot compress used. These are commonly used to relieve abdominal

distention or tympanites. Heat stimulates contraction of intestinal muscle, thereby increasing peristalsis and relaxing muscle spasm

Articles Required

- ◆ Same as for medical fomentation
- ◆ A drachm glass containing turpentine mixed with olive oil or sweet oil 1:2–3 in adults and 1:6 for children
- ◆ A swab stick in a container
- ◆ Articles for insertion of a flatus tube

Steps of Procedure

- ◆ Adopt same procedure as done for hot compress.
- ◆ Take turpentine and olive oil in correct proportion, mix well and warm the mixture by keeping the container in a bowl of hot water.
- ◆ Apply warm oil over the part with the help of swab stick.
- ◆ Apply hot compress and follow same procedure.
- ◆ After 10–15 minutes, insert flatus tube for expulsion of flatus.
- ◆ Report and chart time, duration and result of treatment.



Remember

- ◆ Mix turpentine and oil thoroughly
- ◆ Avoid blistering of the skin by carefully watching the area in every 15 minutes
- ◆ Avoid chills
- ◆ Be sure to report the effect of the treatment carefully

Poultices (Cataplast) and Plasters (Emplastrum)

A poultice is an application of moist heat in the form of a soft spongy mass that retains its heat for a length of time. According to the ingredients used, its effect depends on the heat they supply. The types of poultices are artiphlogestine, linseed, mustard, charcoal, starch, etc. As these are not used, details are not given. Detailed preparation of starch poultice is given below.

Making a Starch Poultice

Take starch and sodium bicarbonate in the proportion of 1:8. Make a paste with cold water. Add more boiling water when the mixture is being stirred. Cook the mixture and make a jelly mass. Spread the jelly on a lint piece with spatula to thickness of one fourth of half an inch. Cover it with another piece (leaving sufficient margin to turn it neatly). Take it to the patient, keeping it in hot plates. Apply on the area as in case of hot compress. It is left in place for half an hour to 1 hour.

Plaster (Emplastrum)

Plaster is made up of substance containing drugs which may be either irritating or soothing in character. The examples are belladonna and opium plaster applied for a soothing effect and a mustard plaster used as a counter-irritant. Application is similar to poultice.

Local Bath (Warm Soaks)

Local bath is a simple method of applying moist heat to the extremity or any part of the body by immersing the body part in warm water/medicated solution or to wrap a part in gauze dressing and then suturing the dressing with the solution. Soaks may employ either a clean or sterile technique. Sterile technique is indicated for open wounds.

Purposes

- ◆ To increase blood supply to locally infected area, thus hastening suppuration and softening the exudates.
- ◆ To apply medications.
- ◆ To aid in cleaning large sloughing wounds such as burns.
- ◆ To relieve edema, ischemia and muscle spasm.



SKILL: LOCAL BATH

Articles Required

- ◆ A bathtub with required solution at a correct temperature (105–110°F), arm bath tub, foot bath tub
- ◆ A mackintosh with cover
- ◆ A bath thermometer
- ◆ A hot water bottle with cover (for foot and arm bath)
- ◆ A screen and extra blanket (for foot and sitz bath)
- ◆ A dressing tray, if required
- ◆ A kidney tray and paper bag

Solutions Used

- ◆ **Sodium bicarbonate:** To relieve itching
- ◆ **Boric acid:** To sooth irritated skin, add 3 ounces of boric acid to a gallon of water at a temperature of 35.5°C
- ◆ **Potassium sulfate:** To destroy parasites. Add ½–3 oz of potassium sulphate to ½ gallon of water
- ◆ **Potassium permanganate:** To treat fungal infection and athlete foot, add one gram of potassium permanganate to one quarter of water

Contd...

Steps of Procedure

- ◆ Steps are the same as for hot compress
- ◆ Prepare the solution in a bathtub at a correct temperature and take to the bedside
- ◆ Explain the procedure and screen the patient
- ◆ Loosen top cover at the foot of the bed for giving foot bath
- ◆ Place the folded extra blanket at the foot of the bed
- ◆ Turn back the bed clothes above the knees, covering the unaffected foot with a blanket.
- ◆ Remove soiled dressing, if any
- ◆ Flex the knees or raise the patient to a sitting position
- ◆ Place the mackintosh and towel under the feet and test the temperature again
- ◆ Place the foot tub on the towel. Raise the feet, draw the tub in place and slowly lower the feet into the water
- ◆ Place the folded towel between the legs and the edge of the tub (or bring the bath towel up to cover the edge of tub where the back of the patient's legs is pressing against the tub). The patient's own towel can also be used.
- ◆ Hold the blanket in position while drawing down the cover. Keep the feet in water for 20–30 minutes. Keep the jug with water nearby and add from the side of the bath as required.
- ◆ Uncover the tub at one corner only when pouring water. Raise the foot and pour in gradually and not near the patient to prevent scalding.
- ◆ Turn back the top clothes leaving the blanket over the knees.
- ◆ Remove the towel from the edge of the tub.
- ◆ Raise the leg, hold over the tub to drain water and then lower the legs over the towel.
- ◆ Same steps are followed for giving **arm bath** using **arm bath tub**.

Paraffin Bath/Wax Bath

The paraffin bath is commonly used for painful hands and knees especially for patients with rheumatoid arthritis. The mixture for this treatment consists of 15–30 mL of mineral oil to 1 pound of paraffin wax. It is also used for patients having leprosy.

There are two common methods for use:

1. **Immersion bath:** The patient dips the body part in the wax and removes it so that it dries, then re-dips 6–12 times while allowing it to dry between dips. Then the patient immerses the body part for 5–10 minutes, with care being taken to avoid burning.
2. **Pack glove method:** This method is safer than the immersion bath because there is less chance of burning. With this, the patient dips the body part in the wax and lets it dry. This is repeated 7–12 times. After the last dip,

the body part is covered with a plastic bag and then a heat pack is placed over the injury to keep it in the heat.

Sitz Bath

Sitz bath is a local application of moist heat to the pelvic organs. The patient is usually immersed from the mid-thigh to the iliac crest. The temperature should be 110–115°F. Duration of bath is 15–30 minutes.

Purposes

- ◆ To relieve congestion of the pelvic organs, e.g., in treating dysmenorrhea
- ◆ To relieve pain following cystoscopy
- ◆ To relieve inflammation and pain (hemorrhoids, cystitis)
- ◆ To relieve pain in retention and painful micturition
- ◆ To promote wound healing by cleaning off the discharge and debris



SKILL: SITZ BATH

Solutions Used

- ◆ Potassium permanganate solution 1:5000
- ◆ Boric acid 1 dram to 1 pint
- ◆ Eusol solution
- ◆ Dettol 1:40

Equipment

- ◆ A bed-screen if treatment is to be done at bedside
- ◆ A suitable bathtub or basin/sitz bath tub
- ◆ A bath thermometer
- ◆ A jug with warm water

Contd...

- ♦ A bedside stool
- ♦ Gown
- ♦ Towel for drying

Steps of Procedure

- ♦ Explain the purpose of the procedure.
- ♦ Fill the tub with water about half full at a temperature of 100°F.
- ♦ Screen the patient if at bedside or wheel him to the bathroom in a chair if his condition permits.
- ♦ Assist the patient to undress and avoid unnecessary exposure. Stand directly at the patient's back; help the patient to sit down in the tub with the feet flat on the floor. There should be no pressure on the sacrum or thighs.
- ♦ Be sure that the thighs, buttocks and lower abdomen are immersed in the solution.
- ♦ Drape the patient's legs and thighs. Wrap a bath blanket around the patient's shoulder to protect him/her from chill.
- ♦ Observe closely for any sign of weakness or fatigue. Discontinue the bath if the patient has signs of faintness, pallor, rapid pulse and nausea
- ♦ Test the water in the tub several times and keep it at the desired temperature 105°F. Additional hot water may be added by pouring it slowly from the jug
- ♦ Allow the patient to remain in the basin for 15–30 minutes
- ♦ Do not leave the patient alone unless it is absolutely certain that it is safe to do so
- ♦ Help the patient to come out of the basin when the bath is completed. Stand in front of him. Place hands under the axilla and partially lift him from the tub to the stool
- ♦ Dry the patient with the bath towel and cover him adequately. Assist him into the bed
- ♦ Avoid chill
- ♦ Rinse the basin, scrub well with soap, rinse, dry and replace
- ♦ Leave the patient comfortable. Leave the bathroom in order. Remove the bedside stool
- ♦ Record time, duration, type of solutions used and reaction of the patient

Aquathermia Pads

Aquathermia pads come in various sizes. Instructions should be followed according to the manufacturer. These are waterproof pads used for treating muscle sprains, areas of mild inflammation or redness. It consists of a waterproof plastic or rubber pad connected by two hoses to an electrical control unit that has a heating element and motor. Distilled water circulates to the control unit where water is heated or cooled depending on setting of the temperature. Setting is fixed by inserting a plastic key into the temperature regulator. Mostly the temperature is maintained between 105°F and 110°F. Plain tap water is never added to the unit as it might leave mineral deposits. The pad is never applied directly on the skin. A thin towel or pillow cover should be fitted over this heating pad and later secured with the tape or gauze roll. Any type of pin is never used as it may cause a leak. Duration of total application is 20–30 minutes. Frequent observation of the skin is done for redness and burning. The patient should not be allowed to lie on the bed.

GENERAL APPLICATION OF DRY HEAT

Hot Dry Packs

Purposes

- ♦ To prevent chilling
- ♦ To relieve retention of urine

- ♦ To provide a warm bed with blankets and hot water bottles, thus preventing and treating surgical shocks.

Steps of Procedure

- ♦ The hot dry pack frequently follows a hot bath
- ♦ Wrap the patient in hot dry blankets
- ♦ Keep 2–3 hot water bottles surrounding the blanket
- ♦ Give hot drinks like hot soup
- ♦ Cold application may be done at the head if the patient has headache or throbbing pain

GENERAL MOIST HEAT APPLICATIONS

Hot Moist Packs

It is the application of hot moist blankets or flannel pieces to a larger area (sometimes whole body is covered). The hot packs may be used to relieve muscle spasms in poliomyelitis.

Whirlpool Bath or Full Immersion Bath

It is helpful in promoting sedation, relieving pain and encouraging debridement of widespread surface burns. When immersed in water, the body becomes buoyant and exercises are, therefore, performed with less efforts. It is expensive and inconvenient to use a warm whirlpool. Despite this, it is good for covering large, irregular surface areas. The temperature should range from 105°F to 110°F,

and the duration of treatment should last from 15 to 20 minutes.

Counter-Irritants

These are drugs used to augment the desired effect of heat application to induce vasodilation in the superficial tissues. When the skin absorbs counter-irritants, they irritate the sensory nerve endings and produce vasodilatation by reflex action.

Types of Counter-irritants

They are classified according to their effects and degree of irritation produced:

- ◆ **Rubefaciants:** It is a simple form of counter-irritant, which causes only reddening of the skin. The effect is immediate and lasts only for a short period. Common rubefaciants are mustard plaster, iodine, turpentine, camphor, etc.
- ◆ **Vesicants:** These counter-irritants cause blister formation and are not practiced commonly.
- ◆ **Pustulants:** They are counter-irritants which when applied on the skin, form pustules.

Steam Inhalation

Inhalation of warm steam to liquefy the secretions and to relieve congestion in the lungs is called steam inhalation.

Purposes

- ◆ To loosen the secretion and for easy expectoration
- ◆ To moisten the mucous membranes
- ◆ To relieve irritation and congestion
- ◆ To relax muscles and thus, relieve cough

Assessment

- ◆ Assess the patient's ability for self care
- ◆ Assess the level of consciousness
- ◆ Assess the general condition of the patient
- ◆ Auscultate the lungs to assess for the presence of secretions

Nursing Diagnosis

- ◆ Impaired gas exchange
- ◆ Ineffective breathing pattern
- ◆ Activity intolerance
- ◆ Anxiety
- ◆ Ineffective therapeutic regimen



SKILL: STEAM INHALATION

Planning

Articles Required

Articles required for steam inhalation are shown in Figure 4.

- ◆ A tray lined with towel containing
 - Enamel or steel bowl (big in size)
 - Nelson's inhaler wrapped with towel
 - Mouth piece which snugly fits Nelson's inhaler or electric inhaler
 - Cotton balls and gauze pieces in a bowl
 - Kidney tray and paper bag
- ◆ Kettle with boiling water (120°–160°F)
- ◆ Sputum cup
- ◆ Medications as per order such as:
 - Tincture benzoin 5 mL/500 mL of water
 - Eucalyptus 2 mL/500 mL of water
 - Methyl salicylate few drops in water
 - Few crystals of menthol in water



Fig. 4: Articles for steam inhalation

Contd...

Steps of Procedure

Action/steps	Rationale
Implementation	
1. Check for the doctor's order	To plan the care
2. Explain the procedure to the patient	Enhances cooperation and removes fear
3. Rinse the Nelson's inhaler with hot water	
4. Pour hot water into the inhaler from the kettle till the level of the spout (two third of the inhaler)	To prevent injury (scald)
5. Add medicine, if ordered. Close the inhaler with the mouth piece	To prevent heat loss
6. Switch off the air conditioner/fans and close windows and doors	To avoid draughts and chills to patient
7. Wrap the inhaler with towel and keep it in a bowl. Wrap the mouth piece with gauze piece and plug cotton balls into the spout of the inhaler	To prevent heat loss
8. Take it to bed-side and position the patient in Fowler's position and support with cardiac table or extra pillows.	To provide support
9. Keep the sputum cup within easy reach of the patient	To expel the sputum as need arises
10. Place the inhaler and ask the patient to inhale deeply with mouth, hold it to a count of three, exhale through the spout during expiration and remove it during inspiration (Fig. 5)	To liquefy the secretions and loosen the secretions To promote atmospheric air entry through spout.
	
<p>Fig. 5: Inhalation of steam</p>	
11. Continue the procedure for 10 minutes or till the steam remains	For effectiveness
12. Keep the patient warm during and after the procedure	To prevent chills
13. Give chest physiotherapy, encourage the patient to cough and spit the sputum into the sputum cup	To mobilize the secretions
14. Keep the sputum cup near the patient for 15–30 minutes	To expel the sputum
15. Reposition the patient comfortably	To promote comfort
16. Replace the articles	For the next time
17. Document the procedure done: Date, time, duration and medication added	To prevent duplication of care and serves as legal evidence

Evaluation

- ◆ Evaluate the patient's response
- ◆ Auscultate the lungs to assess the lung sounds
- ◆ Evaluate the color, thickness and odor of sputum
- ◆ Monitor the respiratory rate


CONCLUSION

The safe use of heat therapy requires an assessment of the patient's sensory function, identification of risk factors and understanding the physiological effect of heat. Different parts

of the body differ in tolerance to heat and cold and so does the physiological tolerance of individual. Warm applications are effective for improving circulation to wound sites and promoting muscle relaxation.

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About the Author

Harindarjeet Goyal *PhD, MPhil, MSc, BSc (Hons.), RN and RM*, is a former Principal, who served in Rajkumari Amrit Kaur College of Nursing, New Delhi. She held numerous positions, namely Clinical Instructor, Tutor, Assistant Professor, Associate Professor, Professor-cum-Vice Principal and Officiating Principal, during her 44 years' tenure at the institute.

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