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(Includes BCLS Module)

As per the Revised INC Syllabus (2021-22) for BSc Nursing

2nd Edition

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Authors
Jaideep Herbert
Shweta Pattnaik
Anil Sharma

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Editor
Jaideep Herbert

Editor-in-Chief
Usha Ukande

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Nursing Knowledge Tree
An Initiative by CBS Nursing Division

Second Edition

Editor-in-Chief

Usha Ukande PhD, MSN
Former Principal
Choithram College of Nursing
Indore, Madhya Pradesh

Editor

Jaideep Herbert PhD, MSN, BSN
Chief Operating Officer
Vidyanta Skills Institute, Medical Simulation Center
Gurugram, Haryana

Authors

Jaideep Herbert PhD, MSN, BSN
Chief Operating Officer
Vidyanta Skills Institute, Medical Simulation Center
Gurugram, Haryana

Shweta Pattnaik PhD, MSN, BSN, RN, RM
Professor and HOD MSN Department
Choithram College of Nursing
Indore, Madhya Pradesh

Anil Sharma PhD, MSN
Professor and Principal
Manikaka Topawala Institute of Nursing
CHARUSAT University
Anand, Gujarat

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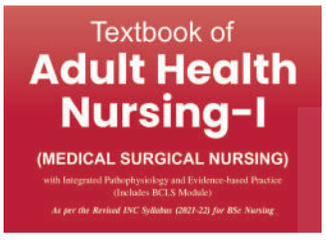

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4819/XI Prahlad Street, 24 Ansari Road, Daryaganj, New Delhi 110 002, India.
Ph: +91-11-23289259, 23266861, 23266867 Website: www.cbspd.com
Fax: 011-23243014
e-mail: delhi@cbspd.com; cbspubs@airtelmail.in.

Corporate Office: 204 FIE, Industrial Area, Patparganj, Delhi 110 092
Ph: +91-11-4934 4934 Fax: 4934 4935
e-mail: feedback@cbspd.com

Branches

- **Bengaluru:** Seema House 2975, 17th Cross, K.R. Road, Banashankari 2nd Stage, Bengaluru 560 070, Karnataka
  Ph: +91-80-26771678/79 Fax: +91-80-26771680 e-mail: bangalore@cbspd.com
- **Chennai:** 7, Subbaraya Street, Shenoy Nagar, Chennai 600 030, Tamil Nadu
  Ph: +91-44-26680620, 26681266 Fax: +91-44-42032115 e-mail: chennai@cbspd.com
- **Kochi:** 68/1534, 35, 36-Power House Road, Opp. KSEB, Cochin-682018, Kochi, Kerala
  Ph: +91-484-4059061-65 Fax: +91-484-4059065 e-mail: kochi@cbspd.com
- **Kolkata:** Hind Ceramics Compound, 1st floor, 147, Nilganj Road, Belghoria, Kolkata-700056, West Bengal
  Ph: +91-033-2563-3055/56 e-mail: kolkata@cbspd.com
- **Lucknow:** Basement, Khushnuma Complex, 7-Meerabai Marg (Behind Jawahar Bhawan), Lucknow-226001, Uttar Pradesh
  Ph: +0522-4000032 e-mail: tiwari.lucknow@cbspd.com
- **Mumbai:** PWD Shed, Gala No. 25/26, Ramchandra Bhatt Marg, Next to J.J. Hospital Gate No. 2, Opp. Union Bank of India, Noor Baug, Mumbai-400009, Maharashtra
  Ph: +91-22-66661880/89 Fax: +91-22-24902342 e-mail: mumbai@cbspd.com

Representatives

- **Hyderabad** +91-9885175004
- **Jharkhand** +91-9811541605
- **Nagpur** +91-9421945513
- **Patna** +91-9334159340
- **Pune** +91-9623451994
- **Uttarakhand** +91-9716462459

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Extends its Tribute to

Florence Nightingale

For glorifying the role of women as nurses,
For holding the title of " The Lady with the Lamp,"
For working tirelessly for humanity–
Florence Nightingale will always be
remembered for her
selfless and memorable services to the
human race.

Florence Nightingale
(May 1820 – August 1910)

About the Editor-in-Chief and Authors

Usha Ukande, PhD, MSN, is the former Principal of Choithram College of Nursing, Indore, Madhya Pradesh. She is the editor of the Indian Journal of Nursing Studies, and President of NRSI and SOMI, Indore Chapter. She has published and presented more than 30 scientific papers and contributed a chapter to the book *Nursing Research and Statistics*, published by a reputed publishing house. She has been awarded the Hall of Fame by Nursing Honor Society of India in 2004, Best All-Round Student Nurse Award in 1971, and the University Gold Medal for BSc (N) and MSc (N). Moreover, Professor Ukande promotes research activities among PG students, using qualitative and mixed methods with a view to ensuring holistic health and well-being of populations.

Jaideep Herbert, PhD, MSN, BSN, is presently working in the capacity of Chief Operating Officer (COO) at Vidyanta Skills Institute, Medical Simulation Center, Gurugram, Haryana. He is a distinguished and visionary leader in simulation-based nursing education, whose contributions have redefined the landscape of clinical training in India. He is a Gold Medalist in BSc (N), a postgraduate specialist in Cardiovascular and Thoracic Nursing, and holds a Doctoral degree. He brings over 15 years of impactful experience combining academic excellence, clinical precision, and educational innovation. In recognition of his pioneering work, he received the prestigious Best Practice Innovator Award from INACSL in 2025, becoming the first Asian recipient of this global honor. He is credited with introducing the INACSL Standards of Best Practice in India and establishing the country's first INACSL-affiliated Simulation Center. He also holds an International Simulation Expert Certification from George Washington University, USA and serves as India's official expert and jury member for the WorldSkills Competition in Healthcare and Social Care.

He stands at the forefront of global nursing education; his commitment to excellence, innovation, and simulation pedagogy has positioned him as a transformative leader in healthcare training across India and beyond.

Shweta Pattnaik, PhD, MSN, BSN, RN, RM, is presently serving as the Professor and Head of the Medical Surgical Nursing Department at Choithram College of Nursing, Indore, Madhya Pradesh. She also leads key institutional portfolios, including Global Citizenship Program Coordinator, ISO 21001 Management Representative, and Clinical Coordinator, where she oversees clinical training and practice-readiness of students.

She is a distinguished doctorate nurse with over 17 years of expertise in nursing education, clinical practice, research, and leadership. She holds a BSc in Nursing, an MSc in Medical Surgical Nursing (Cardiovascular & Thoracic Nursing), and a PhD in Nursing.

She is an active contributor to nursing leadership and research innovation as Treasurer of the Nurse Researchers Society for Innovations (NRSI) and Coordinator of NSGR–NRSI Seed Grants. She has played a pivotal role in developing strategic training initiatives such as the Internship Program, New Staff Nurse Orientation, Project SPUN, and Project CTP.

A passionate healthcare advocate, she has counseled cancer patients and provided lifestyle education to diabetic clients. She also serves as a State-Level Trainer and Mentor for Community Health Officers under national health programs, NHM specializing in Elderly and Palliative Care and Emergency Response.

She has secured competitive grants from national scientific bodies and has coordinated major training programs in nursing leadership. Her academic contributions include serving on editorial boards, acting as an external examiner for multiple universities, and authoring key academic resources, including a nationally published module on noncommunicable diseases. Widely recognized for her academic excellence, research leadership, and clinical proficiency, she continues to be a transformative leader in nursing education and healthcare innovation.

Anil Sharma, PhD, MSN, is presently working in the capacity of Professor and Principal at the Manikaka Topawala Institute of Nursing, a constituent of CHARUSAT University, Anand, Gujarat. He is a qualified cardiothoracic nurse, completed his BSc Nursing in 2004 and MSc in Medical Surgical Nursing with a cardiothoracic specialization in 2009. He earned his doctorate in clinical research in 2016. He has 19 years of academic, clinical, and health research experience. He joined Charotar University of Science and Technology (CHARUSAT; accredited with grade A+ by NAAC) in 2010 as a lecturer and has been extensively involved in academics, clinical training, and health research. Since 2011, he has held the administrative responsibility of nursing school.

He is credited with 73 published research papers and has supervised 14 doctoral students. He holds the position of Vice-President of Nurse Researcher Society for Innovations (NRSI) and is actively involved in various national research projects. He was a core team member in designing critical care nursing SoPs for CCUs in Indian hospitals. His research expertise lies in clinical and public health research. Presently, he is leading two funded projects (ICMR, GoI) of public health on Cancer screening among tobacco farmers and implementation of WHO ANC model. He is one of 30 national mentors in India, guiding 36,000 Community Health Officers (CHOs). He has been widely involved in designing the curricula for Bachelor and Master of Science in Nursing at various universities in India. He is a certified NAAC and NAQS assessor. He has delivered expert talks as a speaker at more than 80 scientific events on national and international platforms. He has also authored seven chapters in a textbook on medical surgical nursing.

Preface to the Second Edition

We are pleased to present the **Second Edition** of the textbook **Adult Health Nursing**, thoughtfully organized into two comprehensive volumes comprising 28 chapters. These chapters are structured in alignment with the revised Undergraduate Nursing Syllabus (2021–22) prescribed by the Indian Nursing Council (INC).

- Chapters 1–8 provide an introduction to the foundational concepts of medical surgical nursing and commonly encountered conditions.
- Chapters 9–28 explore system-specific disorders along with their medical, surgical, and nursing management.

The revised INC syllabus emphasizes bridging the gap between theory and clinical practice, therefore, this textbook is designed to address both, conceptual understanding and practical application. Notably, for the first time in a medical surgical nursing textbook, realistic case scenarios and a comprehensive list of nursing procedures are included for each disease condition. These features are intended to enhance critical thinking skills among students and assist faculty in developing clinical judgment exercises.

To further support practical learning, the book includes:

- Clinical procedures aligned with disease conditions to facilitate integration with clinical postings
- Operation theater instruments and surgical set preparations for commonly performed procedures
- Surgical positioning and draping techniques for clear explanation.

Understanding pathophysiology often poses a challenge for students. To overcome this issue, flowcharts have been used extensively to explain the mechanism of each disease and to make the complex concepts more accessible.

Each chapter includes detailed nursing care plans, focusing specifically on nursing responsibilities and critical thinking approaches. The content is presented in a concise, student-friendly format, with the use of bullet points, tables, and illustrations for quick reference and better retention.

For every disease condition, the book consistently follows a structured subheading format:

- Definitions
- Causes/Risk Factors
- Signs and Symptoms
- Pathophysiology (in diagrams and explanation both)
- Assessment
- Diagnostic Tests
- Medical and Surgical Management
- Nursing Care Plan
- Alternative Therapies

To support exam preparation and self-assessment, each chapter concludes with a set of:

- Long Answer Questions
- Short Answer Questions
- Multiple Choice Questions
- Case-based Questions

We believe that this textbook will become a preferred resource for both nursing students and educators, serving as a reliable and continually relevant guide. Its content has been updated with the latest research findings, technologies, and clinical advancements, ensuring it remains a vital tool for years to come.

Authors

Preface to the First Edition

The **Textbook of Adult Health Nursing** is organized into two volumes. These two volumes carry 23 chapters, strictly designed according to the new Undergraduate Nursing Syllabus (2021–22) prescribed by the Indian Nursing Council (INC).

- Chapters 1–3 cover the common medical surgical conditions and concept of medical surgical nursing.
- Chapters 4–23 cover the system wise disease conditions with their medical, surgical and nursing management.

The revised INC syllabus emphasizes bridging the gap between theory and practice. As a result, this book is designed to address both the theoretical and practical aspects. This is the first time a medical surgical textbook has included case scenarios and a list of nursing procedures related to the disease conditions. The case scenarios not only help nursing students improve critical thinking but also assist nursing instructors in preparing similar scenarios for clinical judgment exercises. The list of clinical procedures in each chapter helps the teachers and students to correlate with the clinical postings and also reminds to learn the procedure.

The book also contains practice-oriented features, such as operation theater instruments and preparation of sets for common surgical procedures, and positioning and draping techniques for these procedures. While studying medical surgical nursing or any disease condition, the nursing students always face challenges in understanding pathophysiology; this book has made it easy as the pathophysiology of all disease conditions has been explained through flowcharts.

This book covers detailed nursing care plan for various diseases, emphasizing the nursing perspective and focusing on the development of critical thinking skills.

Students always prefer to study in a concise manner; therefore, the causes, risk factors, along with signs and symptoms, are presented using bullet points and diagrams to make them easy to grasp.

An easy-to-use format includes subheadings for every disease condition:

- Definition
- Risk factors/Causes
- Signs and Symptoms
- Pathophysiology
- Assessment
- Diagnostic Tests
- Medical/Surgical Management
- Nursing Care Plan
- Alternative Therapies

All types of questions—long answer questions, short answer questions and multiple choice questions—are added at the end of every chapter for self-evaluation and practice.

We believe that this book will be the most preferred book for nursing students and faculty.

Special Features of Adult Health Nursing I & II

- Authored, edited and reviewed by top nursing faculty across India
- 1200+ figures, illustrations and tables covered
- First ever book developed in the Indian context
- An exclusive book conforming to the latest INC syllabus
- Emphasis on critical thinking and clinical judgment through various case scenarios
- Enriched with evidence-based information, nursing care plans, nursing implications and clinical procedures

Acknowledgments

First and foremost, I express my deepest gratitude to my Lord Jesus, whose strength and guidance illuminate every path I take. Without His grace, nothing would be possible.

I extend my heartfelt gratitude to my beloved parents, whose unwavering support and encouragement laid the foundation of my educational journey. I am certain they take immense pride in my professional accomplishments, and I owe them much of what I am today.

To my loving wife, Shweta, thank you for your cheerful spirit, your unending patience, and your constant encouragement. Your companionship has been a pillar of strength throughout the completion of this book.

A special mention goes to my precious daughter, Saesha, who is truly my lucky charm. I signed the contract for this publication in the very month she was born—a divine coincidence I will always cherish.

I express my sincere gratitude to my sisters, both remarkable nurses themselves. Their positivity and belief in my work have always been uplifting and motivating.

A heartfelt thanks to Dr Usha Ukande for her constant guidance and encouragement. Her blessings and mentorship have deeply influenced my journey.

I also wish to thank my contributors Robia, Shilpa, and Angelika Masih, for their invaluable contribution in bringing this publication to life.

With warm appreciation, I acknowledge all those who have played a role, directly or indirectly, in shaping my professional journey. Your influence and support have not gone unnoticed.

I am especially grateful to my nursing mentors and educators, who have been a constant source of inspiration throughout my career.

With heartfelt thanks,
Jaideep Herbert

We extend our special thanks to **Mr Satish Kumar Jain** (Chairman) and **Mr Varun Jain** (Managing Director), M/s CBS Publishers and Distributors Pvt Ltd for their wholehearted support in publication of this book.

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Jaideep Herbert
Shweta Pattnaik
Anil Sharma

Contributors and Reviewers

Special Contribution

Anju Dhir

PhD, MSc (Micro), BSc (Med and Micro)

Ex-Lecturer (Micro)

Shivalik Institute of Nursing

Shimla, Himachal Pradesh

Sr. Product Manager cum Commissioning Editor

CBS Publishers & Distributors Pvt. Ltd.

Saumya Srivastava

MSN (Oncology Nursing), RN, RM

Nursing Tutor

Vivekananda College of Nursing

Lucknow, Uttar Pradesh

Reviewer Board

A Maria Therese

PhD (N), MSc (MSN), MA (Hosp. Adm), GG DG&C

Professor

Mother Theresa Post Graduate and Research Institute of Health Sciences

(Government Institution), Puducherry

Amandeep Kaur

(Medical Surgical Nursing – Oncology Nursing)

MSc (N)

Professor cum Vice Principal

Institute of Nursing Education

Guru Teg Bahadur Sahib (C) Hospital

Model Town, Ludhiana, Punjab

A Rathiga

(Medical Surgical Nursing)

PhD (N)

Principal

Sankara College of Nursing

Kanchipuram, Tamil Nadu

Amit Dhengre

(Medical Surgical Nursing, Cardio Speciality)

MSc (N)

Assistant Professor

Datta Meghe College of Nursing

Nagpur, Maharashtra

Alexcy Mary Alex

(Medical Surgical Nursing-CCN)

MSc (MSN), RN, RM

Professor and HOD, MSN Department

Ruxmaniben Deepchand Gardi College of Nursing

Ujjain, Madhya Pradesh

Amrita Lenka

MSc (N)

Principal

KIMS (KIIT DU)

Kalinga Institute of Medical Sciences (KIMS)

Former Professor cum Principal

Government College of Nursing

Berhampur, Odisha

Alka Saxena

(Medical Surgical Nursing)

PhD (N), MSc (N)

Professor cum Principal

Government College of Nursing

Baba Raghav Das Medical College

Gorakhpur, Uttar Pradesh

Ancy Ramesh

(Medical Surgical Nursing)

MSc (N) GNM, BSc (N)

Professor cum Principal

Kasturba Nursing College

Sevagram, Maharashtra

Reviewers' names are arranged in alphabetical order.

Anu Gauba
PhD (N), MSc (N)
Principal (Department of Nursing)
GD Goenka University
Gurugram, Haryana

Asha Sajji
(Medical Surgical Nursing)
PhD (Scholar), MSc (N)
Professor and HOD
RajaRajeswari College of Nursing
Bengaluru, Karnataka

Asheesh Kumar Gautam
PhD (Pursuing), MSc (N), RN, RM
Assistant Professor (Acting Principal)
AKG Institute of Nursing
Lucknow, Uttar Pradesh

Asokan R
PhD (Scholar)
Professor and HOD
MSN Department
Kalinga Institute of Nursing Sciences (KINS)
KIIT University
Bhubaneswar, Odisha

Athar Javeth
(Medical Surgical Nursing)
Assistant Professor
College of Nursing
All India Institute of Medical Sciences
Kalyani, West Bengal

Babita Sood
PhD (N), MSc (MSN), BSc(N)
Diploma in Hospital Administration
Principal
Amar Professional College of Nursing
Mohali, Punjab

Bhawna Gupta
(Medical Surgical Nursing)
PhD (N)
Professor
Chief Khalsa Diwan International Nursing College
Amritsar, Punjab

C Fuela Esther Thangam
(Medical Surgical Nursing)
PhD(WS), PhD (N), PGDBS, MSc (N)
Principal
Nehru College of Nursing and Research Institute,
Nehru gardens
Thirumalayampalayam, Coimbatore

C Kanniammal
(Medical Surgical Nursing)
PhD (N), MSc (N)
Dean
SRM College of Nursing
Kancheepuram, Tamil Nadu

Carline K
MSc (N)
Tutor (Medical and Surgical Department)
Tagore College of Nursing
Chennai, Tamil Nadu

Chandra Prakash Sharma
PhD (N), MSc (N)
Principal
BDM College of Nursing
Chhuchhakwas, Jhajjar, Haryana

D Mahalakshmi
MSc (N)
Tutor
Tagore College of Nursing
Chennai, Tamil Nadu

Dainy Thomas
PhD (Scholar) (INC), MSc (N)
MSN Cardiology/CTVS, FIECMO
Nurse Educator
All India Institute of Medical Sciences
New Delhi

Davinder Kaur
(Medical Surgical Nursing)
PhD (N), MSc (N)
Principal
Gian Sagar College of Nursing
Rajpura, Punjab

Diana Lobo
PhD (N), MSc (N)
Professor
Laxmi Memorial College of Nursing
Balmatta, Mangalore

Dominic Arockia Mary
(Medical Surgical Nursing)
PhD (N), MSc (N)
HOD/Professor
Tagore College of Nursing
Chennai, Tamil Nadu

Reviewers' names are arranged in alphabetical order.

Don Jose K
(Medical Surgical Nursing)
MSc (N)
Assistant Professor
Amala College of Nursing
Thrissur, Kerala

Elsa Sanatombi
(Medical Surgical Nursing)
PhD, MSc (N)
Professor
Manipal College of Nursing
Manipal, Karnataka

Farukh Khan
(Medical Surgical Nursing)
PhD, MSc (MSN)
Professor Cum HOD (MSN)
Post Graduate College of Nursing
Gwalior, Madhya Pradesh

Firoz Mansuri
(Medical Surgical Nursing)
MSc (N)
Vice Principal
Jaiswal College of Nursing
Kota, Rajasthan

Foziya Manzoor
(Medical Surgical Nursing)
MSc (MSN), BSc (N)
Nursing Tutor
Noorani Paramedical Training Institute
Pulwama, Jammu and Kashmir

Girijabhaskaran
MSc (N)
Professor
Department of Medical Surgical Nursing
Sree Balaji College of Nursing
Chromepet, Chennai, Tamil Nadu

Harindarjeet Goyal
PhD, MPhil, MSc (MSN), BSc (Hons.), RN, RM
Former Principal
Rajkumari Amrit Kaur College of Nursing
New Delhi

Hepsi Natha
(Medical Surgical Nursing)
PhD (N) Scholar, MSc (N)
Vice Principal cum Professor
College of Nursing
Government Medical College
Azamgarh, Uttar Pradesh

Insha
(Medical Surgical Nursing)
MSc (MSN), BSc (Hon. Nursing)
Nursing Incharge
Shifa Medical Centre
Srinagar, Jammu and Kashmir

Israel Jeba Prabu D
(Medical Surgical Nursing)
PhD (N)
Vice Principal
Bee Enn College of Nursing
Jammu, Jammu and Kashmir

Jaya Kuruvilla
PhD, MSc (N), BSc (N)
Principal and Professor
College of Nursing
PD Hinduja National Hospital and MRC
Mumbai, Maharashtra

Jeenath Justin Doss K
(Medical Surgical Nursing)
Principal
Shri Anand Institute of Nursing
Rajkot, Gujarat

Jesudian K Nath
MSc (N), RN, RPN
Associate Professor, Principal Incharge
United Institute of Nursing
United University
Prayagraj, Uttar Pradesh

Jyoti Grace Masih
MSc (N), BSc (N)
Vice Principal
FI College of Nursing
Lucknow, Uttar Pradesh

Jyoti Srivastava
(Medical Surgical Nursing)
Cardiothoracic Vascular Surgery (CTVS)
RN, RM, MSc (N)
Assistant Professor
United Institute of Nursing and Paramedical Sciences, United University
Prayagraj, Uttar Pradesh

Kailash Chandra Saini
(Medical Surgical Nursing)
MSc (N)
Principal and Associate Professor
Apex University
Jaipur, Rajasthan

Reviewers' names are arranged in alphabetical order.

Kanika Rai
(Medical Surgical Nursing)
PhD (N), Gold Medalist in MSc (N), BSc (N)
Professor and Head of Department (Medical Surgical Nursing)
Vice Principal
Chitkara University
Rajpura, Punjab

Kannammal C
PhD (Scholar), MSc (N), RN, RM
Professor and Vice Principal, HOD
Hind College of Nursing (HIMS)
Barabanki, Uttar Pradesh

Kiranjit Kaur
(Medical Surgical Nursing)
MSc (N)
Principal
GHG College of Nursing
Raikot, Punjab

Kripa Angeline A
(Medical Surgical Nursing)
PhD (N)
Professor cum Nursing Superintendent
Kasturba Gandhi Nursing College
Mahatma Gandhi Medical College and Research Institute
Pillaiyarkuppam, Puducherry

Leena Pravil John
MSc (N), RN, RM
Associate Professor cum Vice Principal
Christian College of Nursing, SIHAS, SHUATS
Prayagraj, Uttar Pradesh

M Reena
PhD (N), MSc (N), MSc (Psychology)
MPhil (Sociology)
Vice Principal
Madras University
Tagore College of Nursing
Tagore Medical College and Hospital (Campus)
Rathinamangalam, Chennai, Tamil Nadu

Madan Mohan Gupta
PhD (N), MSc (N)
Professor cum Principal
Vatsalya Nursing College
Gomti Nagar, Lucknow, Uttar Pradesh

Mallika Faruk Vhora
(Medical Surgical Nursing)
PhD (N) Scholar, MSc (N)
Principal
Tirupati School of Nursing
Sharda Mandir Campus
Salatwada, Vadodara, Gujarat

Manikandan T
(Medical Surgical Nursing)
PhD, MSc (N), RN, RM, DCA
Assistant Professor cum SNA Advisor, Medical Surgical Nursing
Vinayaka Mission's College of Nursing
Kirumampakkam, Puducherry

Maya P Joseph
(Medical Surgical Nursing)
MSc (N)
Vice Principal
Medical Trust College of Nursing
Ernakulam, Kochi, Kerala

Monica Nancy Lal
MSc (N), RN, RM
Nursing Tutor
King George's Medical University,
KGMU College of Nursing
Lucknow, Uttar Pradesh

Monika Bhushan
MSc (N), RN, RM
Assistant Professor
Government College of Nursing
Baba Raghav Das Medical College
Gorakhpur, Uttar Pradesh

Monika Thakur
(Medical Surgical Nursing)
MSc (N)
Nursing Tutor
MMU University
Solan, Himachal Pradesh

Nanak Chand Suman
MSc (N), RN, RM
Associate Professor
Government College of Nursing
Baba Raghav Das Medical College
Gorakhpur, Uttar Pradesh

Reviewers' names are arranged in alphabetical order.

Neelam Rai
MSc (N), RN, RM
Associate Professor
Savitri Hospital and Paramedical Institute
Gorakhpur, Uttar Pradesh

Neelam Dass
(Medical Surgical Nursing)
MSc (N)
Professor
College of Nursing
Mohandai Oswal Hospital
Ludhiana, Punjab

Neeraj Kumar Bansal
(Medical Surgical Nursing)
PhD (N), MSc (N)
Professor cum PhD Coordinator
Jai Institute of Nursing and Research (JINR)
Gwalior, Madhya Pradesh

Nischal Pathak
(Medical Surgical Nursing-CCN)
MSc (MSN), RN, RM
Male Nursing Officer
Government Jai Prakash District Hospital
Bhopal, Madhya Pradesh

P Kalavathi
(Medical Surgical Nursing)
MSc (N), MSc (Psychology), MBA
Associate Professor
Indira College of Nursing
Thiruvallur, Tamil Nadu

Padmakumar Sukumaran Naor
PhD (N), MSc (N)
Principal
Shri Bharat Singh Gemalsingh
Makwana College of Nursing
Vesu, Surat, Gujarat

Pankaj Yadav
MSC (N), BSc (N)
Nursing Officer
ESIC Hospital, Shalimar Garden Extension-2
Gaziabad, Uttar Pradesh

Patricia Reddy
(Medical Surgical Nursing)
MSc (N)
Assistant Professor
MKSSS's Sitabai Nargundkar
College of Nursing
Nagpur, Maharashtra

Prabhjot Saini
(Medical Surgical Nursing)
PhD (N), MSc (MSN)
Principal and Professor
SKSS College of Nursing
Ludhiana, Punjab

Ponvijay Anantharaj.G
(Medical Surgical Nursing)
MSN, MS (EDU MGT), M PHIL (MGT), PGDHM
Principal
N R T College of Nursing
Madurai Road, Theni
Shanmugasundarapuram, Tamil Nadu

Pooja Thakur
(Medical Surgical Nursing) (Critical Care Nursing)
MSc (N), RN
Nursing Tutor
All India Institute of Medical Sciences
Patna, Bihar

Poovaragavan V
PhD (N)
Vice Principal
Vignesh Nursing College
Tiruvannamalai, Tamil Nadu

Punithamani G
MSc (N)
Principal
Department of Medical Surgical Nursing
St. Mary's College of Nursing
Chitradurga, Karnataka

Rahul Sharma
MSc (N)
Associate Professor
Seedling School of Nursing
Jaipur National University
Jaipur, Rajasthan

Raj Kumar Gill
(Medical Surgical Nursing)
MSc (N)
Principal
RR College of Nursing
Rajasthan

Rajni
MSc (N), RN, RM
Nursing Tutor
Lala Lajpat Rai Memorial College of Nursing
Meerut, Uttar Pradesh

Reviewers' names are arranged in alphabetical order.

Rakesh Sharma
PhD (N), MSc (MSN), BSc (N)
Assistant Professor
College of Nursing
All India Institute of Medical Sciences (AIIMS)
Rishikesh, Uttarakhand

Renuka K
PhD (N), MSc (N), BSc (N)
Professor and Principal
College of Nursing
All India Institute of Medical Sciences
Gorakhpur, Uttar Pradesh

Ramesh Bandagar
PhD Scholar, MSc (N)
Principal
The Yash Foundations College of Nursing and
Medical Research Institute
Ratnagiri, Maharashtra

Renuka Malladad
(Medical Surgical Nursing)
MSc (N)
Associate Professor
RajaRajeswari College of Nursing
Bangalore, Karnataka

Rashmi E John
MSc (N)
Officiating Principal
KGMU
Lucknow, Uttar Pradesh

Reshma Kharvi
(Medical Surgical Nursing)
MSc (N)
Associate Professor
RajaRajeswari College of Nursing
Bangalore, Karnataka

Ratna Prakash (Chakraborty)
PhD, MSc (MSN), PGDHE, DRD, Dip. Med. Informatics
Professor and Academic Director (Former Principal)
Pal College of Nursing and Medical Sciences
Haldwani, Uttarakhand

Rimpa Ghosh Roy
(Medical Surgical Nursing)
MSc (N)
Associate Professor
Ideal Institute of Nursing
Kalyani, West Bengal

Raveesh Kumar
(Medical Surgical Nursing)
MSc (N)
Professor and HOD
Government College of Nursing KIMS
Hubballi, Andhra Pradesh

Rinu Mathew
MSc (N), RN, RM
Principal
Shrey Institute of Nursing and Allied Sciences
Ahmedabad, Gujarat

Reena Thakur
(Medical Surgical Nursing)
PhD (N), MSc (N)
Professor
Index Nursing College
Indore, Madhya Pradesh

Rose Mary George
PhD (Scholar), MSc (N)
Professor
Parul Institute of Nursing
Parul University
Vadodara, Gujarat

Reetika William
(Medical Surgical Nursing-CTVS)
PhD (Scholar), MSc (N), RN, RM
Associate Professor
Varma Union Nursing College
Indore, Madhya Pradesh

S Sridevy
MSc (N)
Associate Professor
Department of Medical and Surgical Nursing
College of Nursing
Mother Theresa Post Graduate and Research
Institute of Health Sciences
(Government Institution), Puducherry

Reviewers' names are arranged in alphabetical order.

S Suryakala
MSc (N)
Assistant Professor
Tagore College of Nursing
Chennai, Tamil Nadu

Shankar Gundaiya
MSc (N), MSN
Nursing Tutor
College of Nursing
S N Medical College
Agra, Uttar Pradesh

Sabina Ali
MSc (N), MSN, RN, RM
(Critical Care Nursing)
Mastermind Faculty
Nursing Next Live

Shany Thomas
(Medical Surgical Nursing)
MSc (N)
Professor
Institute of Nursing Sciences
Bhaikaka University
Karamsad, Anand, Gujarat

Sahil George Lal
MSc (N)
Assistant Professor
Apex Trust Nursing College
Mirzapur, Uttar Pradesh

Sheikh Javed
PhD (N), MSc (N), RN, RPN
Professor and Principal
Regency Institute of Nursing
Kanpur, Uttar Pradesh

Sarika Rokade
PhD (N), MSc (N) CVTS, MA (Sociology)
Principal
Bhausaheb Mulak Nursing College
Nagpur, Maharashtra

Shraddha Chandrakar
(Medical Surgical Nursing)
MSc (N)
HOD
Government Nursing College
Raipur, Chhattisgarh

Sathiyakala K
Nursing Faculty
College of Nursing
All India Institute of Medical Sciences (AIIMS)
Patna, Bihar

Shraddha Raut Mesram
(Medical Surgical Nursing)
MSc (N), BSc (N)
Assistant Professor
MedPro College of Nursing
Nagpur, Maharashtra

Savita Dhoble
MSc (N), PB BSc (N)
Diploma in Cardio Thoracic Nursing
Vice Principal
Suretech College of Nursing
Nagpur, Maharashtra

Siva Jeya Anand T
MSc (N)
Professor cum Vice Principal
Chitra College of Nursing
Pandalam, Pathanamthitta, Kerala

Shampa Gupta
(Medical Surgical Nursing)
(Critical Care Speciality) (Specialized in Cardiovascular Thoracic Nursing)
MSc (N)
Vice Principal
Neotia Academy of Nursing
Kolkata, West Bengal

Sonia
(Medical Surgical Nursing)
MSc (N), RN, RM
Nursing Tutor
All India Institute of Medical Sciences
Raebareli, Uttar Pradesh

Reviewers' names are arranged in alphabetical order.

Sonveer Sharma
(Medical Surgical Nursing-CCN)
MSc (N), RN, RM
Associate Professor
R D Gardi College of Nursing
Ujjain, Madhya Pradesh

Theyamma Joseph
(Medical Surgical Nursing)
PhD, MSc (MSN), RN,
Principal
Mar Sleeva College of Nursing
Kottayam, Kerala

Sripriya Gopalkrishnan
(Medical Surgical Nursing)
PhD (N)
Principal
Sadhu Vaswani College of Nursing
Pune, Maharashtra

V Andria
(Medical Surgical Nursing)
MSc (N)
Vice Principal
Hindustan College of Nursing
Coimbatore, Tamil Nadu

Susan Mathai
MSc (N)
Associate Professor
Malankara Orthodox Syrian Church
College of Nursing (MOSC)
Eranakulam, Kochi, Kerala

V Sivaraman
(Medical Surgical Nursing)
MSc (N)
Assistant Professor
Tagore College of Nursing
Chennai, Tamil Nadu

Sushma Pandey
PhD (MSN)
Professor
KJ Somaiya School and College of Nursing
Sion, Mumbai, Maharashtra

Vipin Kumar Pillai
(Medical Surgical Nursing)
MSc (N)
Principal
Udaipur College of Nursing
Udaipur, Rajasthan

T Hepsiba Beula Rajam
MSc (N)
Assistant Professor
Tagore College of Nursing
Chennai, Tamil Nadu

Virendra Singh Choudhary
(Medical Surgical Nursing)
PhD (N), MSc (N), BAMS(AM), MBA
Principal/Dean
NIMS Nursing College
NIMS University Jaipur, Rajasthan

T Sivabalan
(Medical Surgical Nursing)
PhD (N), FAIMER Fellow
Professor and Principal
Bhonsala Institute of Nursing
Nashik, Maharashtra

Wangkheimayum Ashalata Devi
(Medical Surgical Nursing)
MSc (N)
Professor and HOD
Sikkim Manipal College of Nursing
Sikkim Manipal University
Gangtok, Sikkim

Tarika Sharma
(Medical Surgical Nursing)
MSc (N), BSc (N)
Faculty
College of Nursing
Institute of Liver and Biliary Sciences
New Delhi

Yashodhara Ghosh Sen
(Medical Surgical Nursing)
MSc (N)
Assistant Professor
Institute of Nursing, Brainware University
Kolkata, West Bengal

Reviewers' names are arranged in alphabetical order.

Special Features of the Book

Learning Objectives at the beginning of every chapter help readers understand the purpose of the chapter.

LEARNING OBJECTIVES

After the completion of the chapter, the readers will be able to:

- Define the scope and significance of medical surgical nursing in healthcare delivery.
- Describe the historical evolution and current trends in medical surgical nursing.
- Explain the roles, responsibilities, and competencies of a medical surgical nurse.
- Identify key principles of medical surgical nursing practice.

CHAPTER OUTLINE

- Introduction
- Evolution of Medical and Surgical Nursing
- Indian Medicine
- History of Surgical Nursing
- Social Trends Influencing Development of Nursing
- Development of Medical Surgical Nursing
- Trends in Medical Surgical Nursing
- Health

Chapter Outline gives a glimpse of the content covered in the chapter.

Key Terms are added in each chapter to help understand difficult scientific terms in an easy language.

KEY TERMS

Acute illness: A sudden and short-term health condition requiring prompt and often intensive care.
Chronic illness: A long-lasting health condition that typically requires ongoing treatment and self-management.
Clinical competence: The nurse's ability to apply knowledge, skills, and judgment to deliver safe and effective care.
Clinical decision-making: The process of selecting the best course of action based on clinical evidence and patient needs.

TABLE 1.1: Leavells model of natural history of disease

Stimulus to the host	Host reaction		Recovery
Interconnection of agent, host and environment	Latent period (pre-symptomatic)	Symptoms, signs (clinical)	With or without defect, disability
Prepathogenesis	Period of pathogenesis		
Health promotion specific protection	Early diagnosis and treatment	Disability limitation rehabilitation	

Numerous **Tables** have been used in the chapters to facilitate learning.

The book is well illustrated with relevant colorful **Figures** to add value to the content.

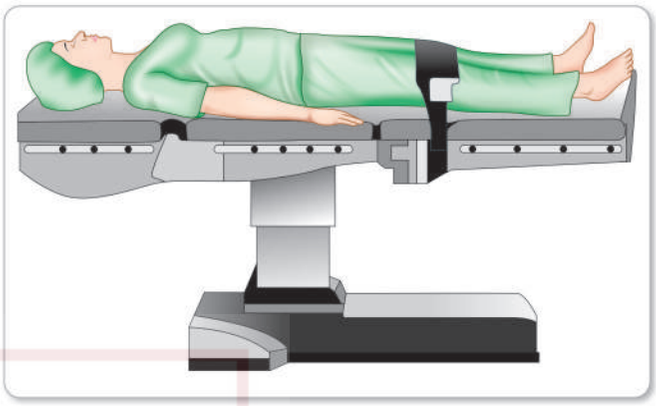


Fig. 6.41: Supine position

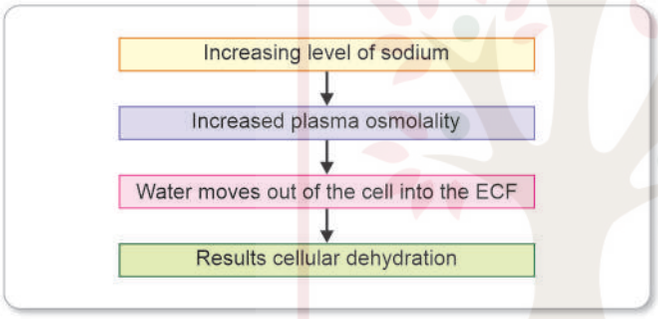


Fig. 8.9: Pathophysiology of hypernatremia

The pathophysiology of each disease condition has been explained through attractive Flowcharts.

Additional information related to the respective topic is given in **High-Yield Points** boxes.

High-Yield Point

Sorbitol, a widely used sweetener in chewing gum, sweets and dietary products, acts as a laxative. A stick of sugar free gum contains 1.25 g of sorbitol. Consuming 20 g/day will cause diarrhea. Possible side effects are usually metioned only in the fine print on labels of products containing sorbitol (Bauditz, 2008).

Must Know

Nurse Physician Collaboration

There is no other area where a collaborative effort by the nurse and physician is required than in critical care unit and the primary focus remains the patient. Nurses appreciate and value a physician for:

- Staying near when a patient's condition deteriorates
- Keeping the family informed of patient's condition
- Teaching nurses about new therapy and intervention
- Recognizing the maximum efforts of nurse and assisting her in emergency situation

The **Must Know** boxes give an overview of important facts and terms of the concerned topic.

Each and every chapter is beginning with **Clinical Skills** covering respective system case presentations.

Clinical Skills

1. IV cannulation
2. Parenteral nutrition routes
3. IV Therapy
4. Assessment of phlebitis
5. Total parenteral nutrition (TPN)
6. Fluid calculation
7. Use of infusion pump
8. Use of syringe pump
9. Use of various pain scales
10. Assessment of shock

CASE SCENARIOS RELATED TO THE MANAGEMENT OF COMMON CLINICAL PRESENTATIONS

CASE SCENARIOS

Scenario 1

Ms Poonam 34-year-old female postoperative cholecystectomy patient, found to be hypotensive at 9 pm in the same night of surgery. IV therapy continues and patient feels warm, flushed and general pruritic, but patient is found asymptomatic. The history of patient includes:

- **Previous medical history:** None significant
- **Weight:** 69 kg
- **Marital status:** Married
- **Job:** Homemaker
- **Smoking and drinking:** None
- **Lifestyle:** Sedentary lifestyle

NURSING CARE PLAN

1. Nursing Diagnosis: Acute Pain

Related to tissue injury or surgical procedure
As evidenced by verbal reports of pain, restlessness, and protective behavior.
Goal: To reduce pain to a tolerable level within 24–48 hours.

Nursing interventions:

Intervention	Rationale
Assess pain regularly using a standardized pain scale.	Ensures timely evaluation and effectiveness of interventions.
Administer prescribed analgesics and evaluate response.	Relieves pain and allows for better rest and recovery.
Apply non-pharmacological methods (cold/heat, relaxation, distraction).	Supports pain control and improves comfort.
Encourage position changes for comfort and pressure relief.	Reduces muscle tension and discomfort.

Expected outcome: Patient will report pain relief (rated ≤3 on a 0–10 scale) and demonstrate improved comfort during activity and rest.

Nursing Care Plan for each disease condition has been covered in a tabular format with its diagnosis, goal, intervention, rationale and evaluation.

The book covers **Nursing Procedures** in separate boxes.

PROCEDURE

1. Gather all necessary equipment. Place it within easy reach.
2. Explain the procedure to the patient. Secure a signed consent.
3. Position the client as mentioned above.
4. Expose the puncture site by removing the gown on the affected side. Put rubber protector below point.

NURSING MANAGEMENT

Nursing Management of Pain

Effective pain management requires proper assessment, physical examination and findings of laboratory values. Nurse may attempt following interventions to manage pain.

- Assess pain level along with its intensity, duration, location, type and quality at each visit. Also identify how it affects with activities of daily living.

Each disease/condition has been elaborated with its relevant **Nursing Management** considerations.

The book also includes **Evidence-Based Practice** facts.

EVIDENCE-BASED PRACTICE

A meta-analysis was conducted to examine the impact of antipyretic therapy on mortality in critically ill adults with sepsis. The results revealed that antipyretic treatment does not significantly improve 28-day or hospital mortality in this patient population.

SUMMARY

- Balance of fluid and electrolyte is an important/vital process for survival (Homeostasis). Whenever human body falls ill, the fluid and electrolyte balance get disturbed. Sometimes this imbalance becomes crucial and fatal.
- **Hypovolemia** refers to a state of combined salt and water loss. This will lead to reduction of ECF volume, whereas dehydration refers to only water loss alone, with increased serum sodium level.

Important takeaway points of respective chapters have been highlighted under **Summary** boxes.

To give extra edge to the study references, **Further Readings** have been included at the end of every chapter.

FURTHER READINGS

- Alexander M, Corrigan A, Gorski L, et al. (2010). Infusion Nursing-An evidence, based approach, 3rd ed. St. Louis: Saunders Elsevier.
- American pain society (2008). Principles of analgesics use in the treatment ofacute and cancer pain, 6th ed. Glenview,, IL: Author.
- Ansari & Kaur's," A textbook of Medical Surgical Nursing ", Part A, 2011 edition, PV Books – pp. 180–196.

STUDENT ASSIGNMENT

LONG ANSWER QUESTIONS

1. Define diarrhea. Explain types, pathophysiology and nursing management of diarrhea.
2. Define theories of pain. Explain categories of pain and nursing management.

SHORT ANSWER QUESTIONS

1. Write briefly about hyperkalemia along with its etiology.
2. Define respiratory alkalosis.

CASE-BASED QUESTIONS

Scenario 1: Mrs Sharma, a 65-year-old woman, recovering from abdominal surgery, reports moderate pain rated 6/10 on the pain scale. She appears anxious and restless.

1. **What is the most appropriate initial nursing action?**
   a. Tell her to rest and ignore the pain
   b. Administer prescribed analgesics and reassess pain after 30 minutes

MULTIPLE CHOICE QUESTIONS

1. **Which of the following is an early clinical sign of hypovolemia (fluid volume deficit)?**
   a. Hypertension
   b. Bounding pulse
   c. Dry mucous membranes
   d. Jugular vein distension
2. **A patient has a serum potassium level of 2.9 mEq/L. Which of the following symptoms would the nurse expect to find?**
   a. Muscle twitching and tetany
   b. Bradycardia and hypotension
   c. Muscle weakness and cardiac dysrhythmias
   d. Increased deep tendon reflexes

At the end of each chapter, **Student Assignment** section is given which contains frequently asked questions in exams to help students attain mastery over the subject.

Syllabus

ADULT HEALTH NURSING-I

(With Integrated Pathophysiology)

Placement: BSc Nursing (III SEMESTER)

Theory: 7 Credits (140 hours)

Practical: Lab/Skill Lab (SL) – 1 Credit (40 hours) Clinical – 6 Credits (480 hours)

Course Content **T – Theory, L/SL – Lab/Skill Lab**

Unit	Time (Hrs)	Learning Outcomes	Content	Teaching/Learning Activities	Assessment Methods
I	6 (T) 4 (L/SL)	• Narrate the evolution of medical surgical nursing • Apply nursing process in caring for patients with medical surgical problems • Execute the role of a nurse in various medical surgical setting • Develop skills in assessment and care of wound • Develop competency in providing pre- and postoperative care	**Introduction** • Evolution and trends of medical and surgical nursing • International classification of diseases • Roles and responsibility of a nurse in medical and surgical settings ▪ Outpatient department ▪ In-patient unit ▪ Intensive care unit • Introduction to medical and surgical asepsis ▪ Inflammation, infection ▪ Wound healing—stages, influencing factors ▪ Wound care and dressing technique • Care of surgical patient ▪ Preoperative ▪ Postoperative • Alternative therapies used in caring for patients with medical surgical disorders	• Lecture cum discussion • Demonstration and practice session • Role play • Visit to outpatient department, in patient and intensive care unit	• Short answer • OSCE
II	15 (T) 4 (L/SL)	• Explain organizational set up of the operating theater • Differentiate the role of scrub nurse and circulating nurse • Describe the different positioning for various surgeries • Apply principles of asepsis in handling the sterile equipment • Demonstrate skill in scrubbing procedures	**Intraoperative care** • Organization and physical set up of the operation theater ▪ Classification ▪ OT design ▪ Staffing ▪ Members of the OT team ▪ Duties and responsibilities of the nurse in OT • Position and draping for common surgical procedures • Instruments, sutures and suture materials, equipment for common surgical procedures	• Lecture cum discussion • Demonstration, practice session, and case discussion • Visit to receiving bay	• Caring for patient intra-operatively • Submit a list of disinfectants used for instruments with the action and precaution

Contd...

Unit	Time (Hrs)	Learning Outcomes	Content	Teaching/Learning Activities	Assessment Methods
		• Demonstrate skill in assessing the patient and document accurately the surgical safety checklist • Develop skill in assisting with selected surgeries • Explain the types, functions, and nursing considerations for different types of anesthesia	• Disinfection and sterilization of equipment • Preparation of sets for common surgical procedures • Scrubbing procedures—gowning, masking and gloving • Monitoring the patient during the procedures • Maintenance of the therapeutic environment in OT • Assisting in major and minor operation, handling specimen • Prevention of accidents and hazards in OT • Anesthesia—types, methods of administration, effects and stages, equipment and drugs • Legal aspects		
III	15 (T) 4 (L/SL)	• Identify the signs and symptoms of shock and electrolyte imbalances • Develop skills in managing fluid and electrolyte imbalances • Perform pain assessment and plans for the nursing management	**Nursing Care of Patients with Common Signs and Symptoms and Management** • Fluid and electrolyte imbalance • Shock • Pain	• Lecture, discussion • Demonstration • Case discussion	• Short answer • MCQs • Case report
IV	18 (T) 4 (L)	• Demonstrate skill in respiratory assessment • Differentiate different breath sounds and list the indications • Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of common respiratory problems • Describe the health behavior to be adopted in preventing respiratory illnesses	**Nursing Management of Patients with Respiratory Problems** • Review of anatomy and physiology of respiratory system • Nursing assessment—history taking, physical assessment and diagnostic tests • Common respiratory problems: ▪ Upper respiratory tract infections ▪ Chronic obstructive pulmonary diseases ▪ Pleural effusion, empyema ▪ Bronchiectasis ▪ Pneumonia ▪ Lung abscess ▪ Cyst and tumors ▪ Chest injuries ▪ Acute respiratory distress syndrome ▪ Pulmonary embolism • Health behaviors to prevent respiratory illness	• Lecture, discussion, • Demonstration • Practice session • Case presentation • Visit to PFT Lab	• Essay • Short answer • OSCE

Contd...

Unit	Time (Hrs)	Learning Outcomes	Content	Teaching/Learning Activities	Assessment Methods
V	16 (T) 5 (L)	• Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of gastrointestinal disorders • Demonstrate skill in gastrointestinal assessment • Prepare patient for upper and lower gastrointestinal investigations • Demonstrate skill in gastric decompression, gavage, and stoma care • Demonstrate skill in different feeding techniques	**Nursing Management of Patients with Disorders of Digestive System** • Review of anatomy and physiology of GI system • Nursing assessment—history and physical assessment • GI investigations • Common GI disorders: ▪ Oral cavity: Lips, gums and teeth ▪ GI: Bleeding, infections, inflammation, tumors, obstruction, perforation and peritonitis ▪ Peptic and duodenal ulcer ▪ Malabsorption, appendicitis, hernias ▪ Hemorrhoids, fissures, fistulas ▪ Pancreas: Inflammation, cysts, and tumors ▪ Liver: Inflammation, cysts, abscess, cirrhosis, portal hypertension, hepatic failure, tumors ▪ Gallbladder: Inflammation, cholelithiasis, tumors • Gastric decompression, gavage and stoma care, different feeding techniques • Alternative therapies, drugs used in treatment of disorders of digestive system	• Lecture, discussion • Demonstration, • Role play • Problem-based learning • Visit to stoma clinic	• Short answer • Quiz • OSCE
VI	20 (T) 5 (L)	• Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of cardiovascular disorders • Demonstrate skill in cardiovascular assessment • Prepare patient for invasive and noninvasive cardiac procedures • Demonstrate skill in monitoring and interpreting clinical signs related to cardiac disorders • Complete BLS/BCLS module	**Nursing Management of Patients with Cardiovascular Problems** • Review of anatomy and physiology of cardiovascular system • Nursing assessment: History and physical assessment • Invasive and noninvasive cardiac procedures • Disorders of vascular system: Hypertension, arteriosclerosis, Raynaud's disease, aneurysm and peripheral vascular disorders • Coronary artery diseases: Coronary atherosclerosis, angina pectoris, myocardial infarction • Valvular disorders: Congenital and acquired • Rheumatic heart disease: Pericarditis, myocarditis, endocarditis, cardiomyopathies • Cardiac dysrhythmia, heart block • Congestive heart failure, cor pulmonale, pulmonary edema, cardiogenic shock, cardiac tamponade • Cardiopulmonary arrest	• Lecture, discussion • Demonstration • Practice session • Case discussion • Health education • Drug book/ presentation • Completion of BCLS module	• Care plan • Drug record • BLS/BCLS evaluation

Contd...

Unit	Time (Hrs)	Learning Outcomes	Content	Teaching/Learning Activities	Assessment Methods
VII	7 (T) 3 (L)	• Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of hematological disorders • Interpret blood reports • Prepare and provide health education on blood donation	**Nursing Management of Patients with Disorders of Blood** • Review of anatomy and physiology of blood • Nursing assessment: History, physical assessment and diagnostic tests • Anemia, polycythemia • Bleeding disorders: Clotting factor defects and platelets defects, thalassemia, leukemia, leukopenia, agranulocytosis • Lymphomas, myelomas	• Field visit to blood bank • Counseling	• Interpretation of blood reports • Visit report
VIII	8 (T) 2 (L)	• Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of endocrine disorders • Demonstrate skill in assessment of endocrine organ dysfunction • Prepare and provide health education on diabetic diet • Demonstrate skill in insulin administration	**Nursing Management of Patients with Disorders of Endocrine System** • Review of anatomy and physiology of endocrine system • Nursing assessment—history and physical assessment • Disorders of thyroid and parathyroid, adrenal and pituitary (hyper, hypo, tumors) • Diabetes mellitus	• Lecture, discussion • Demonstration • Practice session • Case discussion • Health education	• Prepare health education on self-administration of insulin • Submits a diabetic diet plan
IX	8 (T) 2 (L)	• Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of disorders of integumentary system • Demonstrate skill in integumentary assessment • Demonstrate skill in medicated bath • Prepare and provide health education on skin care	**Nursing Management of Patients with Disorders of Integumentary System** • Review of anatomy and physiology of skin • Nursing assessment: History and physical assessment • Infection and infestations; dermatitis • Dermatoses; infectious and noninfectious • Acne, allergies, eczema and pemphigus • Psoriasis, malignant melanoma, alopecia • Special therapies, alternative therapies • Drugs used in treatment of disorders of integumentary system	• Lecture, discussion • Demonstration • Practice session • Case discussion	• Drug report • Preparation of home care plan

Contd...

Unit	Time (Hrs)	Learning Outcomes	Content	Teaching/Learning Activities	Assessment Methods
X	16 (T) 4 (L)	• Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of musculoskeletal disorders • Demonstrate skill in musculoskeletal assessment • Prepare patient for radiological and nonradiological investigations of musculoskeletal system • Demonstrate skill in crutch walking and splinting • Demonstrate skill in care of patient with replacement surgeries • Prepare and provide health education on bone healing	**Nursing Management of Patients with Musculoskeletal Problems** • Review of anatomy and physiology of the musculoskeletal system • Nursing assessment: History and physical assessment, diagnostic tests • Musculoskeletal trauma: Dislocation, fracture, sprain, strain, contusion, amputation • Musculoskeletal infections and tumors: Osteomyelitis, benign and malignant tumor • Orthopedic modalities: Cast, splint, traction, crutch walking • Musculoskeletal inflammation: Bursitis, synovitis, arthritis • Special therapies, alternative therapies • Metabolic bone disorder: Osteoporosis, osteomalacia and Paget's disease • Spinal column defects and deformities—tumor, prolapsed intervertebral disk, Pott's spine • Rehabilitation, prosthesis • Replacement surgeries	• Lecture/discussion • Demonstration • Case discussion • Health education	• Nursing care plan • Prepare health teaching on care of patient with cast
XI	20 (T) 3 (L)	• Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of patients with communicable diseases • Demonstrate skill in barrier and reverse barrier techniques • Demonstrate skill in execution of different isolation protocols	**Nursing Management of Patients with Communicable Diseases** • Overview of infectious diseases, the infectious process • Nursing assessment: History and physical assessment, diagnostic tests • Tuberculosis • Diarrheal diseases, hepatitis A-E, Typhoid • Herpes, chickenpox, smallpox, Measles, mumps, influenza • Meningitis • Gas gangrene • Leprosy • Dengue, plague, malaria, chikungunya, swine flu, filariasis • Diphtheria, pertussis, tetanus, poliomyelitis • COVID-19 • Special infection control measures: Notification, isolation, quarantine, immunization	• Lecture, discussion, demonstration • Practice session • Case discussion/ seminar • Health education • Drug book/ presentation • Refer TB control and management module	• Prepares and submits protocol on various isolation techniques

Contents

VOLUME I

VOLUME II

5

Preoperative Nursing

LEARNING OBJECTIVES

After the completion of the chapter, the readers will be able to:

- Explain the essential steps involved in patient preparation during the preoperative phase to ensure safety and optimal surgical outcomes.
- Identify common preoperative assessments and interventions necessary for preparing patients physically and psychologically for surgery.
- Recognize signs, symptoms, and implications of latex allergy, and describe appropriate nursing precautions to prevent allergic reactions.
- Describe the nursing responsibilities related to preoperative care, including patient education, consent verification, and coordination with the surgical team.
- Outline the key components and organization of operating theater (OT) infrastructure, emphasizing infection control and patient safety.
- Demonstrate knowledge of maintaining aseptic techniques and sterile environments within the OT setting.
- Discuss the importance of effective communication and documentation during preoperative nursing care.
- Apply ethical and legal principles in preoperative nursing practice, ensuring patient rights and safety are upheld.

CHAPTER OUTLINE

- Introduction
- Organization and Physical Setup of the Operation Theater
- Principles of Operation Theater Attire
- Preoperative Phase
- Preoperative Investigations
- Preoperative Psychosocial Interventions
- Preoperative Teaching
- Prevention of Accidents and Hazards in OT
- Biomedical Waste Management Rules

KEY TERMS

Allergic reaction: An abnormal immune response to a substance, such as latex, that can range from mild to life-threatening.
Aseptic technique: Procedures used to maintain sterility and prevent contamination during patient care and surgery.
Informed consent: A legal process by which a patient voluntarily agrees to surgery after understanding its risks and benefits.
Latex allergy: An immune reaction to proteins found in natural rubber latex, which can cause mild to severe allergic responses.
Nursing responsibilities: Duties and tasks performed by nurses to ensure safe and effective preoperative care.
Operating theater (OT): A specially designed room equipped for performing surgical procedures under sterile conditions.
OT infrastructure: Physical facilities, equipment, and layout designed to support safe and efficient surgical procedures.
Patient education: Providing information to patients about surgical procedures, preparation, and postoperative care.
Patient identification: Confirming the correct identity of the patient prior to surgery to avoid errors.
Patient preparation: Activities and interventions performed to ready a patient for surgery, including assessment, education, and hygiene.
Preoperative assessment: Comprehensive evaluation of a patient's physical and psychological status before surgery.
Preoperative phase: The period before surgery focused on preparing the patient physically and mentally for the procedure.
Psychological preparation: Supportive measures to reduce patient anxiety and promote a positive surgical experience.
Sterile environment: An area free from all microorganisms to prevent infection during surgery.
Surgical checklist: A standardized list used to verify essential steps and safety measures before surgery.

CASE SCENARIO

Preoperative Phase

Scenario: Mr Kumar has arrived at the hospital one day before his scheduled laparoscopic cholecystectomy. He is visibly anxious about the surgery. The nurse is responsible for preparing him physically and emotionally, educating him about the procedure, and ensuring that all preoperative protocols are completed.

Key Nursing Responsibilities

- Complete preoperative assessment (vital signs, blood work, ECG reports, allergies, surgical consent)
- Ensure the patient remains NPO (nothing by mouth) for at least 6–8 hours before surgery
- Provide psychological support to reduce anxiety
- Educate the patient on breathing exercises, incentive spirometry use, and early mobilization after surgery
- Administer preoperative medications as prescribed
- Verify correct patient, procedure, and site according to surgical safety checklist
- Prepare the surgical site by skin cleaning or shaving as required

INTRODUCTION

Operation theater (OT) nursing is an integral part of nursing services in the hospital. Sometimes operation theater nursing is also considered critical nursing services area. Operation theater nursing is also known as "Perioperative nursing". Perioperative nursing is a specialty in which nurses play an important role to maintain a sterile environment for the patient and surgical team before, during and after surgery. The perioperative period is subdivided into three stages: (1) preoperative, (2) intraoperative and (3) postoperative.

Nursing care of surgical patient before, during and after surgery to maintain safe environment for the patient. During perioperative nursing, nurse must do the work with surgeon, technician, anesthetist and other OT nurses. Nurse also demonstrates the proper use of all equipment used in OT.

Operation room is a special equipped room in a hospital to perform surgical operations with proper sterile and aseptic techniques.

ORGANIZATION AND PHYSICAL SETUP OF THE OPERATION THEATER

The operation theater is designed in a hospital to carry out surgical operations for treatment, diagnostic, investigation and palliative procedure. The physical setup of the operation theater is based on:

- Size of hospital
- Patient turnovers
- Type of surgery
- Economy
- Safety and convenience

Operation theaters are also designed according to specialty so as to keep the different equipment in that according to surgery, such as neurosurgery, cardiac surgery, gastrosurgery.

Operation theater must be completely sterile. The people who work in operation theater are surgeons, anesthetics, theater nurse, OT technician, supportive workers, cardiographers and radiographers.

Operation theater complex must be built as an independent complex located away from the main traffic in the hospital. The OT complex must be connected with critical care unit, surgical wards and maternity ward. Also, OT has nearest supportive service departments such as Lab, X-ray room and central sterile services department. Physical setup of OT has been depicted in Figures 5.1 and 5.2.

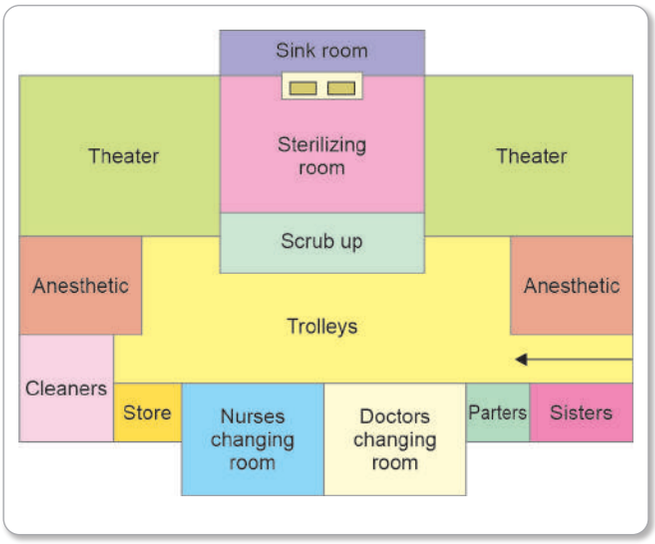


Fig. 5.1: Physical setup of operation theater

Fig. 5.2: Operation theater

Fig. 5.4: Operation theater corridor

Zones of OT Complex

Protective Zone

- Changing rooms (Fig. 5.3)
- Transfer corridor (Fig. 5.4)
- Admin rooms
- Record room
- Storeroom (Fig. 5.5)
- Postoperative/recovery room
- Sterile rooms

Fig. 5.5: Storeroom

Clean Zone

- Cleaning room
- Storeroom
- Pantry
- Emergency exit
- Service room
- CCTV control room
- Fire extinguisher

Aseptic Zone

- Operating room (OR)
- Washing (Hand) area (Fig. 5.6)

Fig. 5.3: Changing room

Fig. 5.6: Hand wash area

Disposal Zone

Corridor leads to disposal area.

Classification of OT

Minor OT

It is a single theater OT, includes, OR, scrub room, trolley preparation area, anesthesia trolley, changing room and limited ancillary accommodation.

For small surgeries like:

- Plastering
- Laparoscopy surgery

Major OT

- For major surgeries such as orthopedic, neurosurgery, cardiac surgery, gastro surgery.
- OT complex must be three or more OTs with anesthesia room, recovery room, sterile zone, reception, changing room.
- Major surgeries require general anesthesia for longer duration.
- Incision will be long and deep.

Outpatient OT

Situated in OPD area where minor surgeries and suturing can be done under local anesthesia for outpatient.

Inpatient OT

Located inside the hospital away from the common traffic and used for the patient to stay in the hospital before and after surgery.

Centralized OT

A common OT complex for all types of surgeries

Decentralized OT

The OT complex located in a hospital according to specialty area, like neuro OT is located in the same floor where neuro IPD is there.

Conventional OT

- Through mechanical ventilation, 20–24 air changes per hour (ACH) are delivered in the OT room and removed by exhaust fans.
- It is the most common type of ventilation use at general OT.

Ultraclean or Laminar Flow OT

- Laminar flow OTs are used for implant surgery to make sure there is no infection in the air.
- In this system, 80% of extremely clean air is recirculated on the top of operating area and 330 m/s airflow for a curtain of air.

Emergency OT

The OTs are connected with emergency department for causality surgeries. Here OTs are 24 hours available with facilities and staff.

Elective OT

- OTs are prepared for planned surgeries and surgeon and staff get ready on time for surgery.
- Patient is also prepared for surgery with all preoperative formalities.

Size of Operation Theater

Estimating the size of operation theater depends upon many factors.

- Number of surgical cases per day in the hospital.
- Average number of OT = $\frac{\text{Number of operative cases daily}}{\text{Number of cases can be done daily in one OR}}$
- Amount of work to be done in other department related to OT such as CSSD, surgical ward.
- Type of surgery major or minor.
- Number of emergency cases.

OT Design

Wall

- Laminated polyester, completely sealed wall, ceiling must be recommended. These surfaces can be disinfected easily with chemical solution.
- Tiles are not recommended anymore in OT as the plaster between the tiles can harbor bacteria.
- Corners of the wall should be covered with steel or aluminum plated to clean properly.
- Light blue or green is soothing color of OT wall.
- If tiles are used, it should be fixed six feet up from the floor and everyday must be disinfected.

Ceilings

- Ceilings must be similar in colors as wall.
- It should be hard, nonporous, waterproof and easy to clean.
- The ceilings are used for fixing operating light, other electrosurgical units and operating microscope.

Floors

- OT floors must be nonporous, smooth without cracks and breaks and without any danger.
- The corners of the floors must be rounded to prevent accumulation of dust and dirt.
- The floor must provide electrical conductivity between persons and equipment which connecting to the floor.
- Ceramic tile; tough vinyl, thick terrazzo must be used for flooring material.
- Floor should not be slippery.
- During the cleaning of floors, warning sign of 'wet floor' should be put to prevent any accident.

Doors

- Glass window doors are recommended for OT, prevent opening frequently during surgery.
- Swing doors or self-closing doors are used on OT to prevent touching after scrubbing.

Lighting

- The dome light is used in OT which is white fluorescent light which casts minimal shadow.
- Sufficient light should be there in the OT.
- The lights should be spark proof.
- It should be easy to clean.
- The light should not produce high heat which can cause injury to exposed tissues.
- The overhead operating light must be adjustable at every angle where surgeon or anesthetist requires.
- There should be always back up for power cut or power failure to provide sufficient light during an operation.
- Never use oil or liquid paraffin on operating light.
- Natural light is also recommended in OT.
- 25,000–125,000 lux of overhead light is recommended for visualizing internal organs.

Ventilation

- Proper ventilation is very essential in the OT to control temperature and humidity and dilute the microorganisms.
- There should be positive pressure in the OT of 5 cm from ceiling of OT downward and outward and pushes out air from the OT (Fig. 5.7).
- Ultraclean or Laminar flow is recommended where clean air is recirculated and then exhausted to outside. Through this system, microorganisms and anesthetic agents get diluted in it and are automatically removed.

Temperature and Humidity

- Temperature in the OT should be between 20°–24°C.

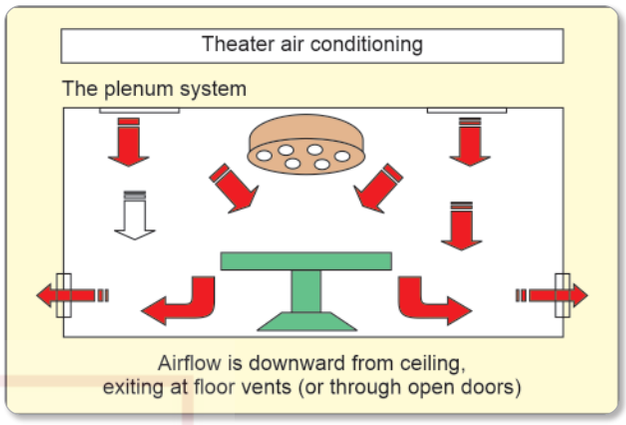


Fig. 5.7: Ventilation in operation theater

- Reactive humidity should be maintained 50–60%.
- Appropriate devices must be used for monitoring temperature and humidity.

Electrical Fixture

The electrical circuits supplying current into the OT must be guarded to prevent arcs and sparks. Power line must be 220 volts. Ceiling outlet must be there but it should be locked properly to avoid any accident. Wall outlet should be put 1.5 m above the floor, extension cords which are not explosion proof are never recommended to kept in the OT. Electricity network must be automatic with power backup (generator) with automatic change over facility. All the plugs must be explosion proof.

Subareas of OT

Changing Room

The OT staff has to change his/her clothes and wear OT clothes. The locker and lavatories are provided in that area for staff.

Holding Area

Before sending the patient in the OR, keep the patient in holding area for IV line insertion, preparation catheter or NG tube insertion, connection of monitors, vitals check, consent check again.

Anesthetic Room

It is used to keep anesthetic trolley, cleaning and testing of anesthesia equipment. It also stores the anesthesia equipment. The room consists of bench, many power outlets, anesthesia trolley, water supply and sink. The room is connected with corridor to immediately transfer the anesthesia trolley to OR.

Recovery Room (Postanesthesia Care Unit)

After surgery, the patient is received into the area called post anesthesia care unit or recovery room. Recovery room is well-equipped room with medication, handwashing area, storage supplies and monitors, ventilator and equipment available for cardiopulmonary resuscitation also.

Staff Room

The OT staff can rest and have food in that room. The room has TV facility; lockers and lavatory are attached with that room.

Storage

A proper area should be designated to keep OT equipment, anesthesia gas, cylinder manifold. The room should have conductive floor and must be a cleaned and cool room. The equipment in the room must be labeled properly. Ventilation should be adequate to pass the leaking gas out of the room.

Lab

Small lab is required in OT complex with refrigerator for common pathology tests.

Seminar Room

The OT staff cannot leave OT complex or cannot go outside of OT during duty hours and once they have changed the dress. For any seminar, discussion and case study, a seminar room is recommended in OT complex.

Scrub Area

This area is restricted area where the only surgeons, scrub nurse and technician enter before surgery for surgical handwashing. The doors in that room are sliding or self-closing doors. The elbow-operated or sensor-operated taps are fixed with deep sinks for hand wash.

Sterile Supply Store

Small OT sterile supply unit is also attached in OT complex. From this area, the sterile gloves, gown, drapes, sponges can be taken. From one side of the room the sterile article is kept and from another side it has to be removed.

Operation Room

Principles of operation room structure:

- Glass window must be there.
- Building should be low rise to get the advantage of natural light.
- Provision of emergency exit.
- Door should be sliding.
- All fixtures should be made of steel.
- Floors must be slip-resistant.
- The room should have:
  - One OT table
  - X-ray illuminators
  - Electric point
  - Overhead light
  - Oxygen and suction outlets
  - Table to keep sterile gown and gloves
  - Board for numbering of gauze pieces
  - Anesthesia machine
  - Cardiac monitors
- Scrub area for 2–3 persons in each OT must be connected with OT room.

Operating Room Team: Staffing

The team members in the operation theater are surgeon, anesthetist, nurses, technician and OT cleaners and helpers. They all work together for safe, efficient and effective surgical treatment of the patient. Operating room work zone and operating room team have been depicted in Figures 5.8 and 5.9.

Surgeon

- Review the medical history of the patient before surgery.
- Should confirm that all necessary equipment is ready before surgery.
- Inform the patient and relatives about benefits and risk associated with operation.
- Plan the surgery after all investigation, diagnostic tests and physical examination.
- After surgery, surgeon must document properly about surgery and instruction of postsurgical care.

Anesthetist

- Administer anesthesia to the patient before surgery.
- Continuous by monitor vital signs during surgery.
- Adjust anesthetic agents according to patient condition.
- Monitor the patient condition in first phase of recovery period.
- Monitor for any complications.

OT Technician

- Prepare the OT rooms before surgery and set up the trolley.
- Maintain the storage of surgical instruments, sterile gloves, gown, linen, etc.
- Coordinate with CSSD for delivery of sterile supply.
- Prepare the surgical instruments sets after wash for autoclaving.

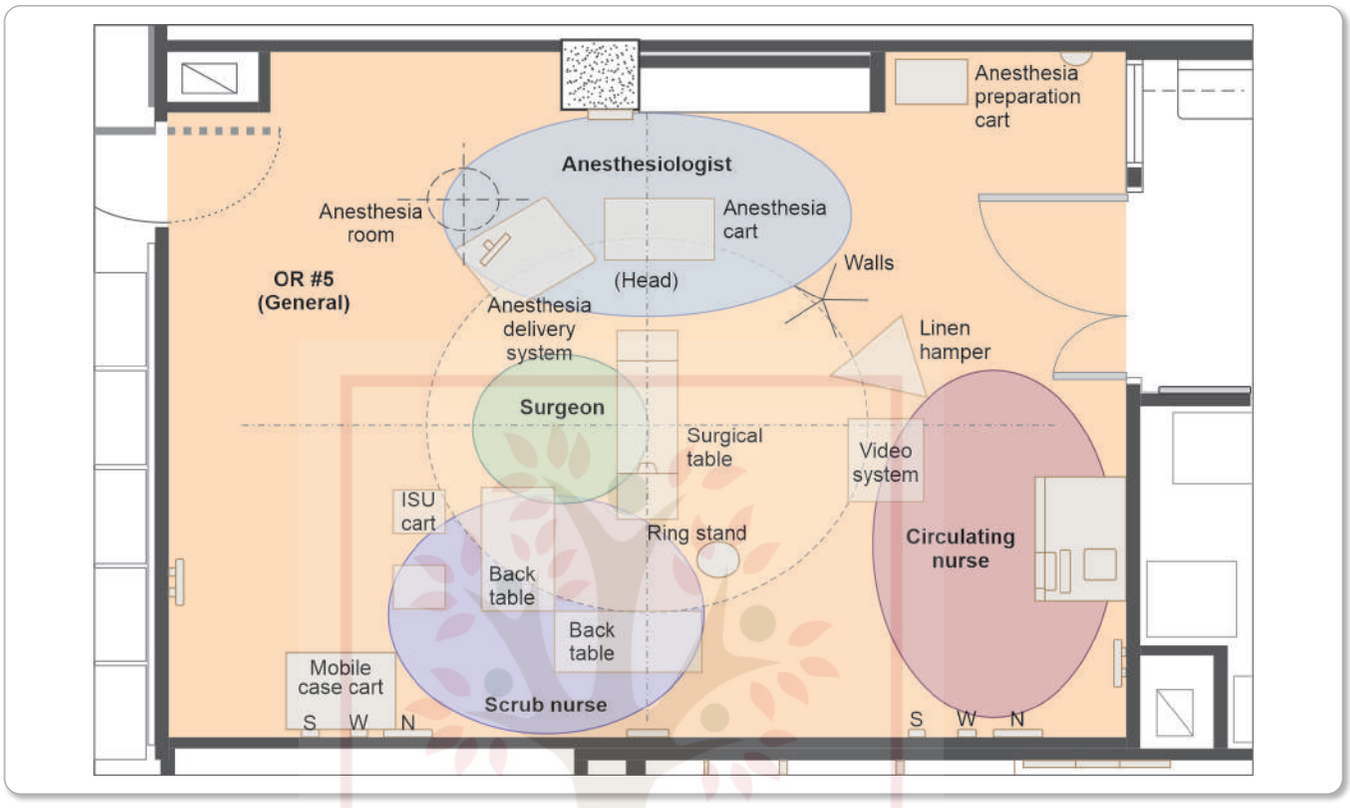


Fig. 5.8: Operating room work zones

OT Cleaner

- Clean the OT wall, floor and equipment.
- Responsible for complete cleanliness of OT.

OT Nursing Staff

Hierarchy of nursing staff in OT is shown in Figure 5.10.

Chief Nursing Officer

- Chief nursing officer (CNO) is a head of Nursing in healthcare organization and looks after the overall nursing department.
- Provides direction for nursing throughout the health system.
- Establishes a governance structure for all kind of nursing staff, to discuss challenges, issues, and concerns that affect patient care and management activities.
- Identifies systemwide nursing quality indicators.
- Provides strategic direction by establishing goals and clearly defined targets for nursing staff.
- Identifies, develops, and maintains strategic academic partnerships.
- *Regulate nurse credentialing* according to their competency.
- *Preparing nursing budget.*

Deputy Nursing Director

- Leads the nursing services in OT.
- Must have postgraduation in OT specialty or minimum 10 years of experience in OT.
- Manage administration work related to OT.
- Also responsible for nursing education and research at OT area.

Nursing Supervisor

- Plans OT activities according to surgery schedule.
- Prepares duty roster for circulatory and scrub nurse.
- Maintains storeroom record.
- Quality nursing care.
- In-service training to OT nursing staff.
- Conducts the classes on new researches and practice in OT related to nursing.

Scrub Nurse

- Assists surgeon during operation by passing surgical instruments, gauze pieces, sponges or any other items required.
- Counting the numbers of sutures, sponges, needles used in surgery.
- Scrub nurse must do surgical handwashing in scrub room and wear sterile gown, gloves, caps, eye cover.

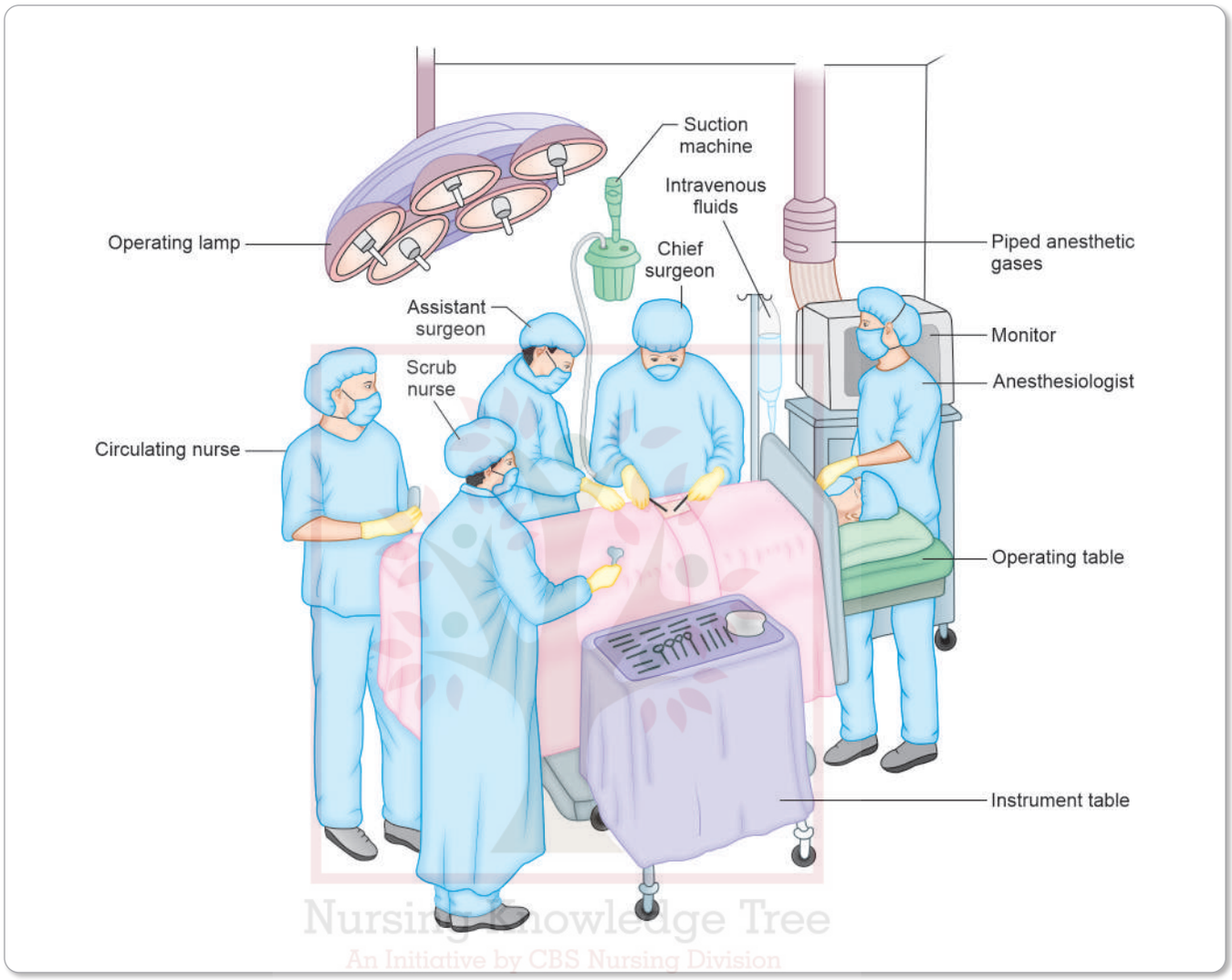


Fig. 5.9: Operating room team

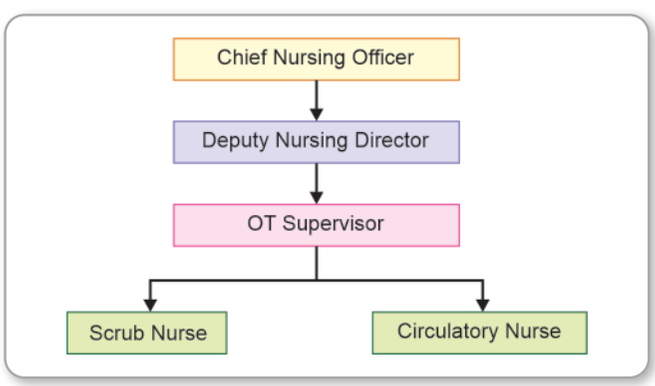


Fig. 5.10: Hierarchy of nursing staff in OT

Circulatory Nurse

- Starts the care of the patient when received in OT.
- Receives the patient in OT and take handover from floor/IPD staff.
- Coordinating with surgical team during surgery if they require anything.
- Maintains safe and comfortable environment for patient and team during surgery.

Must Know

Understanding Latex Allergy

In the preoperative phase, it is crucial for nurses to know about latex allergy, as it directly impacts patient safety and surgical outcomes. Here's why this knowledge is essential for nurses:

- **Preventing life-threatening reactions:** Latex allergy can trigger severe reactions, including anaphylaxis, which may occur rapidly upon exposure to latex-containing materials. In the surgical setting, exposure to latex can happen through gloves, catheters or other equipment. Recognizing and mitigating this risk is vital to prevent serious complications during surgery.
- **Comprehensive preoperative assessment:** Nurses play a pivotal role in conducting thorough preoperative assessments. Identifying a patient's latex allergy or sensitivity allows the healthcare team to implement necessary precautions, such as using latex-free products and preparing a latex-safe environment, thereby reducing the risk of allergic reactions.
- **Educating patients and staff:** Nurses are responsible for educating patients about their latex allergy, including advising them to inform all healthcare providers of their condition and to wear medical alert identification. Additionally, nurses must ensure that all staff members are aware of the patient's allergy to prevent inadvertent exposure.
- **Ensuring postoperative safety:** Postoperative care involves continued vigilance to prevent latex exposure. Nurses must ensure that recovery areas are latex-free and that any equipment used does not contain latex, maintaining patient safety throughout the perioperative period.

PRINCIPLES OF OPERATION THEATER ATTIRE

The human body is a major source of surgical site infection. The purpose of surgical attire is to promote patient and staff safety. All the team members should follow the policies and procedure for surgical attire to decrease number of microorganisms.

Preoperative Attire

In includes:

- Wear sterile gown
- Sterile glove
- Shoe cover
- Hair cap
- Mask
- Surgical hand scrub

Attire policy applies in restricted and semirestricted area. OT attire should not be worn by OT staff person with any acute infection, cold, cough, sneezing, skin infection. Any OT member who is having cuts, burn or skin abrasion should not scrub to prevent the risk of infection.

Handkerchiefs are never allowed into the OT room. Disposable tissues must be used. Nails must be cut short. No outside bags are allowed in OT room. Any type of jewelry and wrist watches, bracelets are restricted in OT.

Surgical Attire Practice

The surgical attire must be worn in semirestricted and restricted area of OT.

Surgical attire includes head cover, surgical mask, scrub, goggles or face shield, shoe cover, gloves and gown.

Head Cover

- Head cover must be disposable, lint-free, soft and non-porous, covers head and facial hair.
- In the sterile field, the first item of surgical attire is hair cap to prevent shedding of microorganisms from hair.
- In case of long hair, the hood or helmet must be used to cover.
- The caps should not be reused. If cloth hair cap is used, it must be washed daily.

Surgical Mask

- To prevent the contamination from microorganisms expelled from eyes, nose and mouth during procedure (Fig. 5.11).
- Mask also protects surgical team from any patient body fluid or blood splash or any secretions during surgery.
- For secure and comfortable fit of mask, the pliable metal or plastic nose band should be there to fix the mask.
- The mask should not be hung around the neck or put in the pocket It should be fixed or completely off.

Fig. 5.11: Mask

- The surgical mask should be changed for every patient.
- The upper strings of the mask should be tied over the ears, at the back of head and lower strings behind the neck.
- The mask should the worn during surgical scrub.
- While removing the mask, touch only the strings and wash hand after discarding.
- Explain wearing of mask with the help of diagram.

Goggles (Eye Cover)

- To protect the eyes from any secretions like blood, body fluid splash from patient during surgery, the surgical team must wear the eye goggles.
- It should be comfortable and should provide sufficient peripheral vision.
- Goggles must be worn only during the surgery and should to be removed carefully by not touching anybody fluid to skin.

Shoe Covers

- Usually shoe covers are not recommended in the OT as the OT foot wears are always separate and should never be used out of the OT area.
- Shoe covers might be used to protect any exposure if body fluids and blood on foot wears.
- Shoe covers must be worn outside the restricted area.
- While removing the shoe covers, surgical person must wear clean gloves.

Footwear

- Low heel soft material, open toe and open heel shoes are recommended in OT area.
- Rubber or leather footwear is recommended.
- Surgical personnel should wear the correct size and be comfortable and protective.
- The footwear designated for OT must be used in OT only, when going out of it should be covered with shoe cover.

Gown

- Before entering into the sterile (restricted) room, the surgical gown must be worn by surgical team.
- The gown is made of cotton material and it should be sterilized. The plastic apron should be warm under it to protect the dress.
- The gowns are wrap around, gowns tie up from back and the cuffs are with elastic or rib-knit fix under the sterile gloves.

Gowning Technique

- Immediately after surgical scrub, the sterile should be out. Put to prevent any contamination from skin to surgical site.
- The gown should be changed for every patient.
- The surgical team should take off the gown after operation in operation room only.

PROCEDURE

Steps of Gowning (Figs 5.12A to I and 5.13)

1. After the surgical hand wash, a surgical person should go to the OT room and the area where sterile gown packet is kept.
2. The circulatory nurse should open the outer layer of sterile gown packet.
3. Make sure there should be sufficient space to stand and stretch the hands while wearing gown.
4. Lift the folded gown upward.
5. Locate the neckband in the folded gown.
6. With the both hands, hold the inside shoulder part of the gown and let the gown unfold. But be sure it should not touch the floor.
7. Open the gown keeping the inside of the gown toward the body.
8. Never touch the outside part of the gown before putting sterile gloves.
9. Slip both arms in the sleeve simultaneously.
10. Check the gown for any holes and tears.
11. Ask the circulatory nurse to tie the belts of gown from the back.
12. For removing the gown—untie from the back and pulled downward from the shoulder.
13. Always turns the sleeves inside out and pulled off the arms.

Contd...

Figs 5.12A to I: Steps of gowning

Fig. 5.13: Operation theater attire

Gloves

- The sterile gloves are the last item of surgical attire to be worn.
- After surgical scrub, wearing sterile gown, the surgical gloves must be worn before handling sterile supplies or patient surgical area.
- Before opening the gloves, the circulatory nurse must check.
  - Expiry date.
  - Size of the gloves
  - Damage or wet
- Punctured or damaged gloves must be changed immediately.

Prewash Surgical Gloves

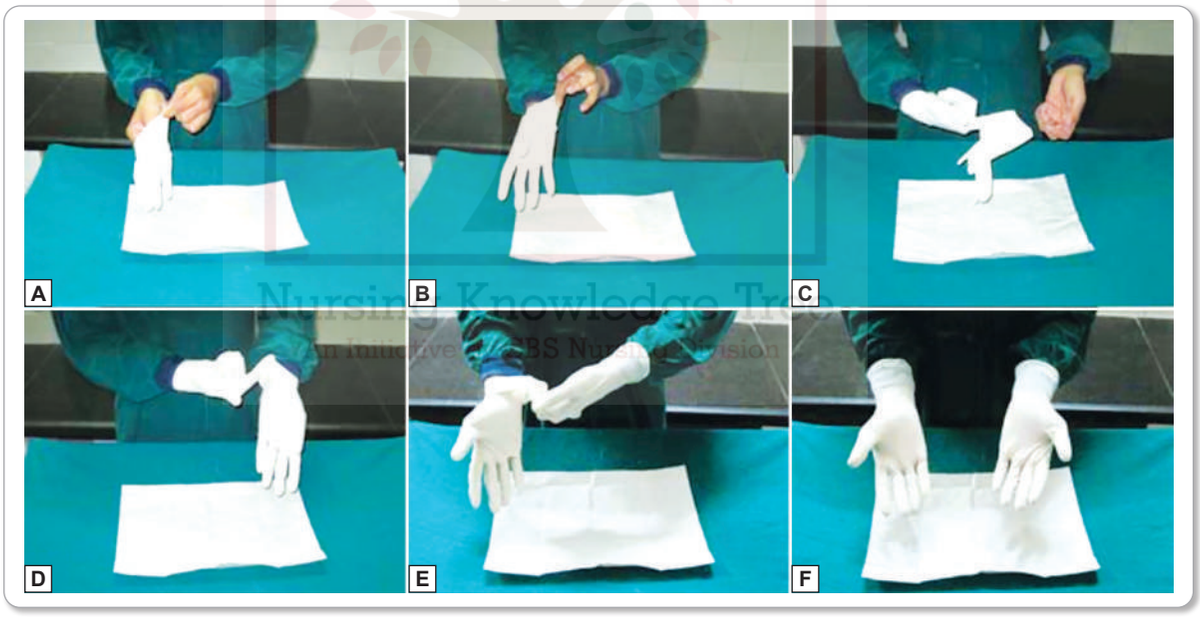
- Before the surgical scrub, the fingernails are kept short and clean. Long nails can puncture the gloves and dirty nails can cause surgical site infection.
- Also the long fingernails can cause injury to patient.
- Before surgical scrub, the jewelry (watch, necklace, bracelet, rings, and earrings) must be removed.
- No surgical staff is allowed with long nail, nail polish in OT.
- The scrub solution must be kept in closed container.
- The scrub solution should be discarded when it gets empty.

- If the container is scrubbed, it must be sterilized or decontaminated before use properly.
- Do not put water in the solution to make it more, it reduces the antimicrobial activity.
- The scrub solution must be:
  - Alcohol based
  - Fast acting
  - Strong antimicrobial activity
  - Nonirritating
- After hand wash, the hands should be dried properly before wearing gloves.
- Surgical scrub is acceptable without cleaning by brush or sponge.
- The surgical team should follow the instructions written on antimicrobial agent used for handwashing.

PROCEDURE

Steps of Gloving (Figs 5.14A to F)

1. Putting the sterile gloves is the last procedure of surgical attire.
2. After wearing the mask, hair cover and sterile gown, the sterile gloves must be put.
3. The circulatory nurse must tear the packet of sterile gloves and put the sterile gloves in sterile trolley of gowns.
4. With surgical scrubbed hands, first grasp the cuff of right gloves and pull it, do not touch the outer part of glove from left hand.
5. With the gloved (right) hand, pick the left hand glove from its fold.
6. In the same manner, insert the glove in left hand and pull it on.
7. After putting both the gloves, adjust the fingers of both hands in the gloves.



Figs 5.14A to F: Steps of gloving

8. Pull the cuff of the both gloves over the cuff of sterile gown.
9. Gloves should be removed first after operation (Figs 5.15A to F).
10. Turn the gloves inside out and roll off as they are removed.
11. Discard into the container.

Contd...

Figs 5.15A to F: Steps of removing gloves

Scrubbing Procedure

The procedure of removing microorganisms from hands and arms through mechanical washing and chemical antiseptic is called "Surgical Scrub".

Purposes

- Removes oil, dirt, debris and any lotion from hand
- Removes microorganisms
- Before gowning and gloving, keep the hands sterile
  - The surgical handwashing is done in scrub area connected to operating room with sliding or self-closing door.
  - The sink of handwashing must be deep and wide to prevent back splashing.
  - The taps are long or autosensation for on and off.
  - Nails should be short cut and clean.
  - All jewelry must be removed before surgical handwashing.
  - Head should be covered and mask should be worn over nose and mouth to prevent any contamination on sterile gloves.
  - Wall clock should be there to calculate the timing of handwashing.

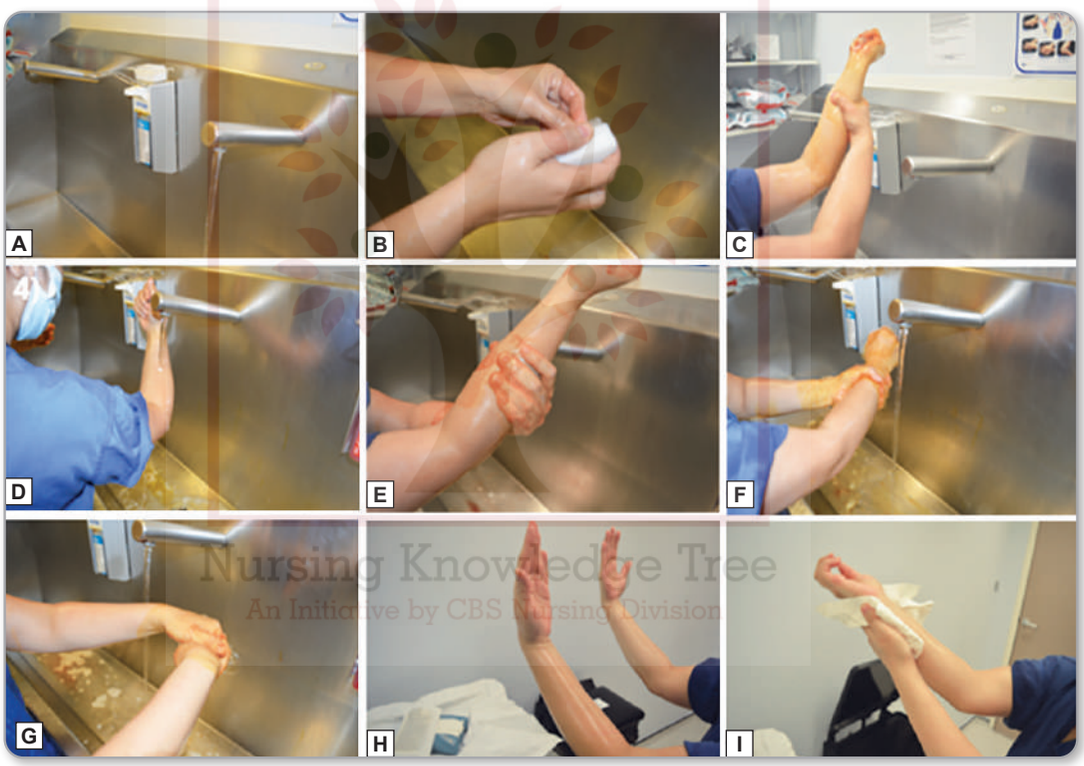
Principles of Surgical Scrub

- The time for surgical scrub is 3 minutes.
- Hands must be kept above elbow level.
- Use running water only.
- Rub the hands together for 1 minute after taking antiseptic lotion in hand.

PROCEDURE

Steps of Surgical Handwash (Figs 5.16A to I)

1. First wash hands and forearms with nonantimicrobial soap.
2. Wet arms and hands properly.
3. Take antiseptic hand soap or lotion (chlorohexidine/povidine-iodine) and rub the hands together for 1 minute.
4. Wash in between fingers.
5. Rinse it and then take again antiseptic lotion and wash till elbow for 1 minute.
6. Wash both hands one by one.
7. Rinse from fingertips to elbow.
8. Keep the hands above elbow level.
9. Keep the hands and arms dry by sterile technique.
10. Dry the hands and arms with sterile towel or sterile disposable paper towel.
11. Circulatory nurse should provide sterile paper towel from sterile gown pack's upper layer.
12. Surgeon or scrub nurse should not touch the gown pack or drip water on the sterile gown pack.
13. Circulatory nurse must provide two towels, one for right hand cleaning and one for left hand cleaning.



Figs 5.16A to I: Steps of surgical handwash

EVIDENCE-BASED PRACTICE

Association for perioperative Registered Nurses (AORN). For 2015, AORN has updated a number of guidelines. Here are the key points for the guidelines—most pertinent for infection preventionists working with perioperative personnel:

Patient Skin Antisepsis

- Patients should bathe or shower before surgery with either soap or an antiseptic. Preoperative patient bathing before surgery may reduce microbial skin contamination. Further research is needed to define optimal preoperative bathing procedures, including whether antiseptics are more effective than soaps (i.e., plain, antimicrobial), whether bathing the whole body or only the surgical site is more effective, the optimal timing of bathing before surgery, and the optimal number of baths or showers before surgery.
  National Institute for Health and Care Excellence (NICE) guidelines advise that the patient should shower or bathe with soap on the day of or the day before surgery.

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There is a growing body of evidence supporting the use of 2% CHG-impregnated cloth products for preoperative bathing. Based on the collective evidence, this practice remains unresolved issue and warrants additional generalizable, high-quality research to confirm the benefit of this product.

- Hair at the surgical site should be left in place. The collective evidence supports that hair at the surgical site should be left in place. When hair removal is necessary, clipping the hair may be associated with a lower risk of developing a surgical site infection (SSI) than hair removal with a razor.

  The limitations of the evidence include that some studies had an inadequate sample size (i.e., are underpowered) to determine the effect of hair removal on the development of SSI, the studies did not use a standardized definition of SSI, and the majority of the studies included in the systematic reviews are approximately 20 years old.
- Safe, effective preoperative antiseptics should be selected for the individual patient. The collective evidence indicates that there is no one antiseptic that is more effective than another for preventing SSI.

  The multidisciplinary team (e.g., perioperative registered nurses (RNs), physicians, and infection preventionists) should select antiseptic products for use at the healthcare organization based on a review of current research literature and FDA-approval status, in accordance with their product evaluation and selection process. The perioperative team should select a healthcare organization-approved antiseptic for the individual patient based on the patient assessment, the procedure type, and a review of the manufacturer's instructions for use and contraindications.
- Skin antiseptics should be applied according to the manufacturer's instructions for use. The collective evidence suggests that following the antiseptic manufacturer's instructions for use and applying preoperative patient skin antiseptics in a safe and effective manner may prevent patient harm (e.g., inadequate skin antisepsis, fire, chemical injury).
- Skin antiseptics must be stored in the original, single-use container. In November 2013, the FDA issued a drug safety communication requesting label changes and single-use packaging of over-the-counter topical antiseptic products to decrease risk of infection. As a result of reported outbreaks involving contaminated antiseptic products, the FDA requested that manufacturers package antiseptics for preoperative skin preparation in single-use containers, to be used only one time for one patient.
  - Scrub attire and cover apparel (e.g., lab coats) should be laundered in a healthcare-accredited laundry facility after each daily use and when contaminated. The collective body of evidence regarding healthcare-accredited laundering compared with home laundering of scrub attire is conflicting; however, there is evidence that indicates a risk for pathogenic organisms being carried on the scrub attire if laundered in the home. These organisms can potentially put the patient at risk of infection or contaminate the home or community of the perioperative team member. Healthcare-accredited laundry facilities are recommended because they meet industry standards. Home laundering is not monitored for quality, consistency or safety. Home washing machines may not have the adjustable parameters or controls required to achieve the necessary thermal measures (e.g., water temperature); mechanical measures (e.g., agitation); or chemical measures (e.g., capacity for additives to neutralize the alkalinity of the water, soap or detergent) to reduce microbial levels in soiled surgical attire. Scrub attire that is home laundered may not be protected from contaminants in the environment during transport to the practice setting. The collective evidence does not support wearing cover apparel to protect scrub attire from contamination, and there is evidence that lab coats worn as cover apparel can be contaminated with large number of pathogenic microorganisms. Researchers have found that cover apparel is not always discarded daily after use or laundered on a frequent basis.
  - When in the restricted areas, all nonscrubbed personnel should completely cover their arms with a long-sleeved scrub top or jacket. This is a change from the previous edition that recommended wearing long-sleeved jackets in the semirestricted and restricted areas. The collective body of evidence supports perioperative team members covering their arms to help contain skin squames. The risk of contaminating a sterile field or wound is greatest in the restricted area; however, facilities may choose to require that perioperative personnel wear long-sleeved jackets in both the semirestricted and restricted areas. Perioperative team members should wear scrub attire that covers their arms while performing preoperative patient skin antisepsis. Perioperative or sterile processing team members should wear scrub attire that covers their arms while performing preparation and packaging of items in the clean assembly section of the sterile processing area.
  - Jewelry that cannot be contained or confined within the scrub attire should not be worn in the semirestricted or restricted areas. The collective body of evidence supported the removal or containment of jewelry and showed that wearing earrings, watches, and rings increased bacterial counts on skin surfaces both when the jewelry is in place and after its removal.
  - Cell phones, tablets, and other personal communication or hand-held electronic equipment should be cleaned according to the manufacturer's instructions for use with a low-level disinfectant before and after being brought into the perioperative setting. The collective body of evidence showed that cell phones, tablets, and other personal hand-held devices are highly contaminated with microorganisms, some potentially pathogenic. All of the researchers recommended regular cleaning of these devices and implementing hand hygiene before and after use. Reducing the numbers of microorganisms present on the devices may protect patients from the risk of healthcare-associated infections resulting from the transfer of microorganisms from the devices or hands of healthcare workers to patients.

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- Scrub attire may be made of antimicrobial fabric. There is emerging evidence on the use of fabrics with antimicrobials incorporated into yarns during processing or during finishing to prevent bacteria and fungi from adhering to the fabric. Incorporating this technology into the material used for scrub attire and other garments worn by healthcare personnel may help to protect the patient from the risk of surgical site infections. This is an issue that warrants further research.

Cleaning Instruments

- Instruments should be cleaned and decontaminated as soon as possible after use. Cleaning instruments as soon as possible after use can help to prevent formation of biofilm and dried blood. When blood or other bioburden is allowed to dry on instruments, it can be more difficult to remove. The effectiveness of disinfection or sterilization can be compromised when thorough cleaning is not accomplished.
  Preparation for decontamination of instruments should begin at the point of use.
  Instruments should be kept free of gross soil during surgical procedures. During the procedure, the scrub person should remove gross soil from instruments by wiping the surfaces with a sterile surgical sponge moistened with sterile water. Saline should not be used to wipe instruments.
  During the procedure, the scrub person should irrigate instruments with lumens periodically with sterile water.
- The decontamination area heating, ventilation, and air conditioning system (HVAC) should be maintained within the HVAC design parameters at the rate that was applicable at the time of design or most recent renovation of the HVAC system. The HVAC system controls the air quality, temperature, humidity, and air pressure of the room in comparison to the surrounding areas. The HVAC system is designed in accordance with the American Society of Heating. Refrigerating and Airconditioning Engineers (ASHRAE) and local regulatory requirements to reduce the amount of environmental contaminants and to provide a comfortable environment for occupants in the area.
  The HVAC parameters recommended by ASHRAE for decontamination areas are: Two outdoor air changes per hour; six total air changes per hour; negative air pressure; and temperature between 72°F and 78°F (22°C and 26°C). Room temperature may be intentionally adjusted to accommodate the individual comfort needs of the occupants.
  A multidisciplinary team that includes infection preventionists, perioperative RNs, sterile processing personnel, representatives from facility maintenance, and other involved stakeholders representing the healthcare organization should develop and implement a systematic process for monitoring HVAC performance parameters in the decontamination area and a mechanism for resolving variances.
- Special precautions should be taken when processing intraocular ophthalmic instruments. Prevention of toxic anterior segment syndrome (TASS) requires thorough cleaning and rinsing of intraocular instruments and strict adherence to the manufacturer's written instructions for use (IFU) and professional guidelines. Most instances of TASS appear to be related to instrument processing. Factors associated with TASS include: Contaminated instruments; contaminated ultrasonic cleaners; detergent residues (soaps, enzymatic cleaners) remaining on instruments; insufficient rinsing of instruments; endotoxin residues on instruments; steam impurities during steam sterilization; use of glutaraldehyde during processing; dried debris and residues of ophthalmic viscoelastic material remaining on instruments; use of reusable cannulated instruments; and insufficiently dried lumens.
  Adequate time, an adequate number of personnel, and sufficient instrument inventory should be provided to permit thorough instrument cleaning and sterilization.
- Laryngoscope blades and their handles should be cleaned, decontaminated, dried, and stored in a manner that reduces patient and personnel risk for exposure to potentially pathogenic microorganisms. Laryngoscope blades and handles may be a potential source of contamination. Laryngoscope blades should be cleaned and high-level disinfected or sterilized according to the manufacturer's written IFU after each use. Laryngoscope blades are considered semicritical items that require a minimum of high-level disinfection. Laryngoscope handles should be cleaned and low-level disinfected after each use and may be high-level disinfected or sterilized according to the manufacturer's written IFU. Although the laryngoscope handles by itself is considered a noncritical device, the laryngoscope consists of two parts that are handled concurrently. Laryngoscope handles have a knurled surface that can accumulate bioburden. When the laryngoscope blade is folded closed, the tip of the blade is in contact with the handle.
- Special precautions should be taken to minimize the risk of transmission of prion diseases from contaminated instruments. A multidisciplinary team that includes infection preventionists, perioperative RNs, sterile processing personnel, surgeons, representatives from the clinical pathology laboratory, and other involved stakeholders should establish, document, and implement evidence-based policies and procedures to minimize the risk of prion disease transmission. These processes should be based on the patient's risk of having a prion disease; the level of infectivity of the tissue involved, as defined by the World Health Organization Tables on tissue Infectivity Distribution in Transmissible Spongiform Encephalopathies, and the intended use of the medical device.
  The current SHEA guideline for disinfection and sterilization of prion-contaminated medical instruments identify practices that will eliminate prion infectivity with a wide margin of safety. (Rutala WA, Weber DJ. Guideline for disinfection and sterilization of prion-contaminated medical instruments. Infect Control Hosp Epidemiol. 2010;31(2):107-117.)

High-Yield Points

(Implementation Guidelines for Management of Healthcare Waste in Healthcare Facilities as per Biomedical Waste Management Rules, 2016)

National Health Systems Resource Center, Technical Support Institution with National Health Mission, Ministry of Health and Family Welfare, Government of India, New Delhi-110067
http://cpcb.nic.in/cpcbold/wast/bioimedicalwast/Draft_Guidelines_for_Management_of_Health_Care_Wast (as_on_21.09.2017).pdf)

Updating of Information in Website

All bedded healthcare facilities as prescribed under BMWM Rules, 2016 shall develop a separate page/web link in its website for displaying the information pertaining to their hospital by 15/03/2020. The following information should be uploaded and updated time to time:

- Contact address and details of the healthcare facility:
- No. of beds:
- **Details of:**
  - Authorization under BMWM Rules, 2016:
  - Consent under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981:
- Quantity of biomedical waste generation (in kg/day):
- Mode of disposal of biomedical waste (through CBWTF or through captive treatment facility):
- Name and address of the CBWTF through which waste is disposed of (as applicable):
- In case, HCF is having captive treatment facility,
  - Biomedical waste treated (in kg/day)
  - Details of treatment equipment
  - Total nos. and capacity of each treatment equipment (in kg/day)
  - Operating parameters of the treatment equipment as per BMWM Rules, 2016
- Monthly records of biomedical waste generation (category wise):
- No. of trainings conducted on Biomedical Waste Management in the current year:
- Stats of immunization of Healthcare workers involved in handling of BMW.

PREOPERATIVE PHASE

The preoperative phase begins with the decision to have surgery and ends when the patient is wheeled into surgery. In emergency surgeries, this phase will be shorter such as in the cases of acute trauma or in some cases this, phase must be longer such as in cases where long period of preparation includes for surgery like preoperative tests or await the receipt of an organ for transplant, etc.

NURSING MANAGEMENT

Preoperative Nursing Management

Preoperative nursing management refers to the care and preparation given to a patient before surgery, ensuring their physical, emotional, and psychological needs are addressed. This phase is critical to the patient's overall surgical experience, as proper management can minimize the risk of complications, reduce anxiety, and promote optimal outcomes during and after the procedure.

Key Components of Preoperative Nursing Management

1. **Preoperative assessment:** The first step in preoperative nursing care involves a thorough assessment of the patient's physical and psychological status. This assessment includes:
   - **Health history:** Gathering information about the patient's medical history, including chronic conditions (e.g., diabetes, hypertension, asthma), previous surgeries, allergies, current medications, and lifestyle factors (e.g., smoking, alcohol use).
   - **Physical examination:** A detailed physical examination to identify any conditions that might influence the surgery or anesthesia, such as respiratory issues, cardiovascular health or signs of infection.
   - **Laboratory and diagnostic tests:** Nurses ensure that relevant diagnostic tests are performed, such as blood tests (e.g., CBC, electrolytes), ECG, chest X-ray, and others as ordered by the surgeon and anesthesiologist.
   - **Psychological assessment:** Assessing the patient's anxiety, fear or concerns about the surgery. Addressing emotional readiness is essential to reduce stress and improve patient outcomes.

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2. **Patient education and informed consent:**
   - **Informed consent:** It is essential that the patient understands the nature of the surgery, the potential risks, benefits, and alternatives. The nurse ensures that the informed consent form is signed by the patient, confirming that they comprehend the surgical procedure and any potential complications.
   - **Preoperative education:** Nurses play a key role in educating the patient about the surgical procedure, anesthesia, and postoperative care. This includes discussing what the patient can expect before, during, and after surgery. Education should include:
     - The importance of fasting before surgery (typically 8–12 hours to avoid aspiration).
     - What to expect regarding anesthesia and sedation.
     - How to manage postoperative pain and potential side effects.
     - Exercises, such as deep breathing and coughing techniques, to enhance recovery and prevent complications like pneumonia.
3. **Preparation for surgery:**
   - **Fasting and diet:** Most patients are required to fast for a certain number of hours before surgery (e.g., no solid food for 6–8 hours and no clear liquids 2–4 hours prior). This is crucial for reducing the risk of aspiration during anesthesia.
   - **Bowel preparation:** In some cases, bowel preparation may be necessary, especially for abdominal surgeries. This may involve laxatives or enemas to clear the bowel.
   - **Medication management:** The nurse reviews the patient's current medications, ensuring that they are instructed on which medications to take and which to withhold before surgery. For example, certain medications, such as anticoagulants, may need to be stopped to reduce the risk of bleeding.
   - **Preoperative antimicrobial prophylaxis:** For certain surgeries, antimicrobial prophylaxis may be administered to prevent postoperative infections. The nurse ensures that this is given at the appropriate time, usually within an hour before the incision.
   - **Physical preparation:**
     - **Skin preparation:** Preoperative bathing with antiseptic solutions may be required to reduce the risk of surgical site infections.
     - **Hair removal:** If needed, hair removal from the surgical area is done using safe methods (e.g., clippers) to prevent injury or infection.
     - **Monitoring vital signs:** Nurses take baseline vital signs (blood pressure, heart rate, temperature, oxygen saturation) to identify any abnormalities and facilitate comparisons after surgery.
4. **Emotional and psychological support:**
   - **Anxiety reduction:** Anxiety is a common concern before surgery, and nurses need to assess the level of anxiety and provide reassurance. Active listening, answering questions, and discussing any concerns the patient may have are important in reducing stress.
   - **Cultural sensitivity:** Nurses should be aware of cultural differences and respect the patient's preferences, beliefs, and values regarding the surgery, which could impact their emotional response to the procedure.
   - **Support systems:** Nurses should assess the support system available to the patient, such as family and friends, and encourage their involvement in the preoperative process to provide comfort and encouragement.
5. **Preoperative medication:**
   - **Sedatives and anxiolytics:** Sometimes, sedatives or anxiolytics are administered to reduce preoperative anxiety and prepare the patient for anesthesia. These are typically administered as prescribed by the healthcare provider.
   - **Pain management:** If the patient is experiencing pain preoperatively (such as with an injury or chronic pain), a pain management plan is discussed. This ensures that the patient's comfort is optimized before surgery.
   - **Antiemetics:** For patients at risk of nausea and vomiting postsurgery (e.g., those undergoing abdominal surgeries), antiemetic medications may be prescribed before the procedure.
6. **Documentation:**
   - Accurate documentation is essential throughout the preoperative period to ensure continuity of care and prevent errors. The nurse documents:
     - The patient's medical history and physical examination findings.
     - The details of patient education provided.
     - Informed consent and any special instructions or concerns.
     - Vital signs, weight, and other baseline assessments.
     - Any preoperative medications administered.

Postoperative Plan Considerations

- Although the focus is on preoperative care, the nurse also begins preparing for postoperative care. This includes ensuring that the patient has:
  - A clear plan for recovery, including expectations for pain management and mobility.
  - Information about what to expect once awake from anesthesia.
  - Details about the postoperative diet, activity restrictions, and when they can resume normal activities.

Preoperative nursing management plays a crucial role in the overall surgical experience and patient outcomes. Through a comprehensive assessment, patient education, physical and emotional preparation, and coordination of care, nurses help ensure that patients are physically and psychologically ready for surgery. This phase is essential for reducing the risk of complications, enhancing recovery, and providing a positive surgical experience.

Consent to an Operation

Signed consent from patient or patient's relatives is a legal permission for hospital and surgeon to do surgery or operation. Legal consent protects the patient and hospital both and ensures that patient and relatives make an informed decision.

The surgeon should explain the following to the patient and patient's relatives in simple way in their language:

- The purpose of operation
- Details of surgical procedure
- Risk and complication
- Result of operation
- Other options for treatment
- Preoperative advice on medication, diet and other risk factors

Anesthetist also has a responsibility to inform the patient about risk of anesthesia, side effects. Patient is having right to withdraw written consent prior to surgery.

Information on Consent Form/Letter

- Full name and surname of patient
- Demographic details—age, sex, marital status, date of birth and hospital registration number
- Name of surgery
- Name of anesthesia and its route
- Signature of patient
- Signature of guardian
- Signature of two witness
- For illiterate patient, name should be printed and thumb impression should be taken.
- No overwriting and cuts are permitted on consent language.
- A patient who is signing a consent must be over 18 years of age and mentally fit.

High-Yield Points

Who can sign	Who cannot sign
• Above 18 years of age • Conscious patient • Mentally fit	• Mentally ill • Below 18 years of age • Unconscious patient

Surgical Safety Checklist

Detailed Phases and Implementation

The Surgical Safety Checklist, developed by the World Health Organization (WHO), is a systematic approach to enhancing safety during surgery. It ensures that all critical steps are completed at key points before, during, and after surgery, promoting better communication among surgical teams and reducing preventable errors.

The checklist is divided into three distinct phases:

1. Before Anesthesia (Sign In)

This phase occurs **before** the administration of anesthesia, while the patient is still awake whenever possible. The objective is to confirm the patient's identity, surgical procedure, site, and readiness for anesthesia.

Steps to Perform

1. **Patient identity check:** Confirm the patient's full name, date of birth, and hospital ID band against the consent form.
2. **Surgical site and procedure confirmation:** Ensure the correct site is marked (if applicable) and the procedure is correctly listed.
3. **Consent verification:** Confirm that informed consent has been obtained and documented.
4. **Anesthesia safety check:**
   - Review patient allergies.
   - Check the airway risk (e.g., potential for difficult intubation).
   - Confirm the patient's risk of blood loss and availability of blood products if needed.
5. **Equipment check:** Verify the functionality of anesthesia machines and necessary monitoring equipment.

Team Responsibility

The anesthesia provider typically leads this process, with active participation from the surgical team and nurses.

2. Before Skin Incision (Time Out)

This phase is conducted **immediately before** the surgical incision is made. It focuses on team communication, final confirmation of details, and preparedness for surgery.

Steps to Perform

1. **Team introduction:** Each team member introduces themselves by name and role.
2. **Patient and procedure confirmation:** Reconfirm the patient's identity, procedure, and surgical site.
3. **Critical steps discussion:**
   - The surgeon outlines the critical steps of the surgery and expected challenges.
   - The anesthesia provider mentions any special considerations (e.g., patient-specific risks).
   - The nursing team confirms sterility and the availability of all necessary equipment and implants.

CONSENT FOR SURGERY/OPERATION/PROCEDURE(S)

1. I authorize the performance of the following operation / surgical procedure(s)
   to be performed upon_____
   by or under the direction of Drs _____
2. I UNDERSTAND THAT THE PHYSICIANS, ANESTHESIOLOGISTS, DENTISTS AND / OR PODIATRISTS WHO PARTICIPATE IN THE OPERATIONS OR PROCEDURE ARE INDEPENDENT CONTRACTORS AND ARE NOT EMPLOYEES OR AGENTS OF THE SURGERY CENTER, AS FULLY SET FORTH IN THE "ACKNOWLEDGEMENT OF UNDERSTANDING OF SERVICES PROVIDED BY INDEPENDENT CONTRACTORS" PROVIDED TO AND EXECUTED BY ME OR MY REPRESENTATIVE. _____
   Patient's Initials
3. My physician(s) has fully explained to me the condition requiring treatment and the nature, purpose, risk and benefits of the operation(s)/procedure(s), possible alternative methods of treatment, including non-treatment, and the possibility of complications. I was given the opportunity to ask questions and any such questions were answered to my satisfaction. No guarantee or assurance has been given by anyone as to the results that may be obtained. I am aware that the practice of medicine and surgery is not an exact science.
4. My consent is given with the understanding that any operation or procedure, including anesthesia, involves risks and hazards. The more common risks include; but are not limited to: infection, bleeding requiring blood transfusion(s), nerve injury, blood clots, heart attack, stroke, allergic reaction(s), damage to teeth or bridgework, and pneumonia. These risks can be serious and possibly fatal.
5. Surgical operations and special diagnostic or therapeutic procedures all involve RISKS OF COMPLICATIONS, SERIOUS INJURY or DEATH, from both known and unknown causes. Therefore, except in cases of emergency or exceptional circumstances, these operations and procedures will not be performed unless I have had an opportunity to discuss them with my physician. I have the right to consent to or refuse a proposed operation or special procedure.
6. I consent to the performance of operations or other procedures in addition to or different from those now contemplated whether or not arising from presently unforeseen conditions, including the implantation of medical devices, which the above named physician(s) or his/her associate(s) or assistant(s) may consider necessary or advisable in the course of the operation.
7. I understand the risks, benefits, and alternatives to the type and method of anesthesia or sedation recommended, and I consent to the administration of such anesthesia as may be considered necessary or advisable by the physician(s) for this surgery/procedure, with the exception of _____anesthesia.
8. I understand this surgery center is owned by physician/surgeon investors who also perform procedures at the surgery center, and that I may ask my physician/surgeon or the center administrator for further details.
9. I have been referred for my surgery/procedure to this surgery center by my surgeon.
10. I consent to the photographing or videotaping of the surgery or procedure(s) to be performed, including appropriate portions of my body for medical, scientific or educational purposes, provided that my identity is not revealed by the pictures or by descriptive texts accompanying them.
11. I consent to the presence of observers in the operating room, such as students, medical residents, medical equipment representatives or other appropriate parties approved by my surgeon(s).
12. I consent to the disposal of any human tissue or body part which may be removed during the surgery/procedure(s).
13. If complications arise, I agree to be admitted to the hospital of my surgeon's choice.
14. I have been advised that there is a possibility of damage to teeth during surgery and administration of anesthesia, particularly if the teeth are weak, loose, decayed or artificial, and I waive any claim for damage to teeth as a result thereof.
15. I understand that, unless instructed otherwise, I am required to have a responsible adult accompany me after my surgery/procedure(s) and that I will be released to that person's custody, and must rely upon him/her for my return home and supervision, as instructed.
16. I release the surgery center from any responsibility for loss of and/or damage to money, jewelry or other valuables I have brought to the surgery center.
17. I understand that if I am pregnant or if there is the possibility that I may be pregnant, I must inform the surgery center immediately since the scheduled surgery/procedure(s) could cause harm to my (unborn) child or myself.
18. If I am not the patient, I represent that I have the authority of the patient whom, because of age or other legal disability, is unable to consent to the matters above. I represent that (a) I have the full right to consent to the matters above; (b) I agree to release, indemnify, and hold harmless the surgery center, its employees, agents, medical staff, partners, and affiliates from any liability or cost arising out of my lack of adequate authority to provide the consent set forth herein.

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19. I understand that 77 Illinois Administrative Code, Chapter 1, Section 697.120, permits the surgery center to perform a blood test for HIV (the AIDS virus) on any patient during whose treatment a healthcare professional sustains a puncture, mucous membrane or open wound exposure to a patient's blood or other bodily fluids. A test for Hepatitis B and C may also be drawn.
20. I have not had anything to eat or drink since _____.
21. Advance Directives – Living Will – Healthcare Proxy

    I understand that Advance Directives and Living Wills are NOT honored at the surgery center, and in the event of an emergency or life threatening situation, advanced cardiac life support will be initiated in every instance and patients will be transported to a facility providing a higher level of care.
    [ ] I have provided the surgery center with my Advance Directive/Living Will/Healthcare Proxy.
    [ ] I have an Advance Directive/Living Will/Healthcare Proxy but did not provide it to the surgery center.
    [ ] I do not have an Advance Directive/Living Will/Healthcare Proxy.
    [ ] I wish to have information on how I can obtain an Advance Directive/Living Will/Healthcare Proxy.

MY SIGNATURE BELOW CONSTITUTES MY ACKNOWLEDGMENT THAT:

1. I have read, understand and agree to the foregoing.
2. The proposed surgery/procedure(s) have been satisfactorily explained to me and that I have all of the information that I desire.
3. I hereby give my authorization and consent, and
4. All blank spaces on this document have either been completed or crossed off if they do not apply prior to my signing.

_____	_____	_____
SIGNED	RELATIONSHIP TO PATIENT	DATE & TIME
_____	_____	
WITNESS	DATE/TIME	

SURGEON'S ATTESTATION: Prior to the procedure, I discussed the condition requiring treatment and the nature, purpose, risks, and benefits of the operation(s), surgery/procedure(s), possible alternative methods of treatment, including nontreatment, and the possibility of complications with my patient or the patient's authorized representatives. I provided my patient or his/her representative with the opportunity to ask questions and answered all questions to their apparent satisfaction. I have reviewed the surgical consent form and verified that the planned surgery/procedure is accurate.
Surgeon's initials:_____

TRANSLATOR'S STATEMENT: I have verbally translated this consent into (applicable language)_____for the benefit of the patient or his/her authorized representative who understands said language better than English. To the best of my ability, I believe the patient or his/her representative understands these statements, as witnessed by their signature on the consent form.
Translator's initials:_____

4. **Anticipated risks:**
   - Discuss the need for additional equipment (e.g., blood, special instruments).
   - Review plans for possible emergencies (e.g., large volume of blood loss).
5. **Antibiotic prophylaxis:** Confirm that antibiotics were given within the appropriate time window, if indicated.
6. **Imaging:** Ensure that essential imaging (like X-rays) is displayed and available.

Team Responsibility

All members participate equally; usually, a circulating nurse or the surgeon leads the "time out".

3. Before the Patient Leaves the Operating Room (Sign Out)

This phase occurs **after** the surgery is completed but **before** the patient is moved out of the operating room. Its purpose is to verify procedure completion, address any concerns, and ensure safe postoperative care.

Steps to Perform

1. **Procedure confirmation:** Confirm the procedure performed matches the planned procedure.
2. **Instrument and sponge count:** Nurses verify that all surgical instruments, sponges, and needles are accounted for.
3. **Specimen labeling:** Confirm that any specimens collected (e.g., tissue for biopsy) are correctly labeled and documented.
4. **Equipment issues:** Identify and record any problems with surgical instruments or equipment.
5. **Postoperative plan:**
   - Discuss recovery plans, special concerns (e.g., need for intensive care), and key instructions for the recovery team.
   - Verify any critical patient management steps (e.g., pain management, oxygen needs).

Team Responsibility

Typically led by the circulating nurse with confirmation from the surgeon and anesthesia provider.

Importance of Following the Checklist

By following the checklist systematically, surgical teams can:

- Prevent wrong-site, wrong-procedure, and wrong-patient errors.
- Reduce surgical site infections.
- Improve teamwork and communication.
- Lower the rate of surgical complications and deaths.

Key components of surgical safety checklist are shown in Table 5.1.

TABLE 5.1: Key components of surgical safety checklist

Sign in	Before anesthesia	Identity check, surgical site confirmation, allergy and airway risk check, equipment readiness
Time out	Before skin incision	Team introductions, final procedure confirmation, discuss critical events, confirm antibiotics, check imaging
Sign out	Before patient leaves OR	Confirm procedure done, count instruments/sponges, label specimens, discuss equipment issues and postoperative plan

Sample for Surgical Safety Checklist

Surgical Safety Checklist

Patient name: | Procedure: | Date:

Notes:

Before induction of anesthesia	Before skin incision	Before patient leaves operating room
Sign in	**Time out**	**Sign out**
☐ **Patient has confirmed:** • Identity • Site • Procedure • Consent	☐ Confirm all team members have introduced themselves by name and role	**Nurse verbally confirms with the team:** ☐ The name of the procedure recorded
☐ Site marked/not applicable	☐ **Surgeon, anesthesia professional and nurse verbally confirm:** • Patient • Site • Procedure	☐ That instrument, sponge and needle counts are correct (or not applicable)
☐ Anesthesia safety check completed	☐ **Anticipated critical events:** **Surgeon reviews:** What are the critical or unexpected steps, operative duration, anticipated blood loss?	☐ How the specimen is labeled (including patient name)
☐ Pulse oximeter on patient and functioning	☐ **Anesthesia team reviews:** Are there any patient-specific concerns?	☐ Whether there are any equipment problems to be addressed
Does patient have a: Known allergy? ☐ No ☐ Yes	☐ **Nursing team reviews:** Has sterility (including indicator results) been confirmed? Are there euipment issues or any concerns?	☐ Surgeon, anesthesia professional and nurse review the key concerns for recovery and management of this patient
Difficult airway/aspiration risk? ☐ No ☐ Yes, and equipment/ assistance available	**Has antibiotic prophylaxis been given within the last 60 minutes?** ☐ Yes ☐ Not applicable	
Risk of >500 mL blood loss (7 mL/kg in children)? ☐ No ☐ Yes, and adequate intravenous access and fluids planned	**Is essential imaging displayed?** ☐ Yes ☐ Not applicable	

Reception of Patient in OT

From the floor/ward/IPD the patient is transferred to the OT with nurse on stretcher. The OT nurse receives the patient in OT. An IPD nurse should handover the proper reports to the OR nurse. The following information OT nurse must check while handover:

- Patient identification
- Type of surgery
- Surgeon name
- Any present illness
- Any medication
- BP/Vital signs
- Condition of infusion line
- Last meal taken report
- Site of operation
- Whether the patient is diabetic or hypertensive
- Signed consent
- Premedication status

Standard Safety Measures

Following the standard safety measures in operation theater is very critical to prevent surgical site infection (SSI). The second common cause of hospital acquired infections is operating room environment, instruments and tools. Surgical personnel, sutures, and other material brought to table during an operation. By practicing aseptic technique (fumigation, disinfection and sterilization) in operation room can be controlled exogenous infection.

Cleanliness of OT complex is based on the various areas in complex. The count of microorganisms and pathogens diminishes from outer to inner (OT room) area.

- **Protective zone:** Outer most area, used for transfer, of patient, changing dress, transfer equipment, storerooms and record rooms.
- **Clean zone:** Connects with protective area. Used for emergency exists, service room, maintenance, storeroom. It connects protective zone to aseptic zone. OT personnel enter here after changing dress and foot wear.
- **Aseptic zone:** Covers the operation room and hand wash (sterile) area. This area requires fumigation.
- **Disposal zone:** It connects with OT room through corridor to take disposal after surgery to disposal zone.

Basic Care of Operation Theater

Three standard safety measures used for care and cleaning of OT complex:

1. Ventilation
2. Cleaning
3. Disinfection

Ventilation

- Delivery of positive pressure filtered air over the operating table.
- Temperature between 18°C and 24°C
- Humidity 55–80%
- Bacterial count of air should not exceed 35.5/m^3.
- Air from filter should not have more than 0.5/m^3 of bacteria particles.

Cleaning

- Cleaning removes dust, organic matter and any type of contaminants.
- Cleaning the walls, corners and floors, and keeping them dry reduces the risk of bacteria.
- Cleaning by brooms is not recommended in OT.
- Cleaning should be done by wet mops or vacuum cleaner.
- Ceiling fans should be avoided as they cause aerosol spread.
- Disinfectant and detergent reduce flora on floor by 80–95%.
- OT walls must be washed weekly with disinfectant.
- Any type of body fluid must be cleaned or decontaminated by chlorine solution.
- Cleaning of tables, racks, door handles, sinks must be done with disinfectant in concentration of 1:10.

Disinfection

- Ortho-phthalaldehyde (OPA) and glutaraldehyde-based agents are used for high level disinfection to kill microorganisms.
- Tuberculocidal agents are used to kill intermediate level virus and mycobacterium.
- Chemical germicides are used as low level disinfectant to kill some viruses.

Sterilization

Sterilization refers to complete elimination of all kinds of microorganisms (pathogenic and nonpathogenic) and spores from an object.

Methods of Sterilization

There are many types of sterilization processes used at operation theater.

Physical method	Chemical method
• Moist heat • Dry heat • Radiation	• Chemical solution • Chemical vapor

Moist Heat Sterilization

Boiling and autoclaving are two methods of moist heat sterilization. It is the most effective sterilization method which kills the microorganisms from the surface of equipment.

Boiling

- Boiling must be done at 100°C for 30–60 minutes in a boiler.
- Before putting the articles into the boiler, articles and instruments must be cleaned with soap and under running water.
- The boiler/sterilizer should be kept closed properly while boiling the article.
- All the rubber items such as catheters and glass items like syringes should be wrapped in gauze before putting into the sterilizer.
- Sharp instruments (needle, knives, scissors) are never put into the sterilizer with moist heat, heat destroys the sharpness of instrument.
- Sterilizer should be kept cleaned properly and water must be changed every 6 hours.

Advantage	Disadvantage
• Useful for small and few items • Economically not expensive • Easy to use	• Some virus and spores cannot be destroyed or killed by boiling

Autoclaving

- Autoclaving refers to cleaning of articles and equipment by steam pressure.
- This method is highly effective to destroy microorganisms including spores by steam under pressure.
- With a temperature of 121°C for 20–30 minutes, single exposure of steam is enough to sterilize the article.
- For short period of sterilization, the temperature is increased to 131°C and pressure is also increased.
- Porous clothes are used to wrap the instruments, steam penetrates the wrapper and sterilizes the articles.

Advantage	Disadvantage
• Economically not expensive • Different articles can be sterilized • Linen can be sterilized • Proper set of tray with equipment prepared can be sterilized together • Drums with dressings kit, gloves, sutures, sponges, syringes, needles can be sterilized	Sharp instruments get blunt when exposed to moist heat

Dry Heat Sterilization

- Dry heat is used for the sterilization of dry items for which the moist is prohibited such as oils, powders, ointment.
- Dry heat is also known as "hot air sterilization".
- It is less effective than the moist heat.
- In dry heat sterilization, the equipment articles are kept in high temperature for a long time.
- At 160°C temperature for 1–3 hours.
- Fine metal cannula, IP needles, glass syringes also get sterilized by dry heat sometimes.
- The items which are poor conductors of electricity are not sterilized by dry heat such as fabric and gauze.

Sterilization by Radiation

Radiation is a method of sterilization in which sterilization of articles is done by rays. There are two types of rays used for radiation.

1. Sunlight or ultraviolet rays
2. Gamma rays

Ultraviolet Rays

- The items which cannot be put into the sterilizer or are big in size, are exposed to direct sunlight or ultraviolet rays.
- The articles which cannot be and are sterilized by ultraviolet rays such as mattress, pillow, quilt, blanket, etc.
- Usually the items are kept in the ultraviolet rays for 6 or more hours.

Advantage	Disadvantage
• Free of cost • Available everywhere	• Rays do not penetrate inside the item • Cannot destroy 100% microorganisms • Cannot do in rainy season or cloudy weather

Gamma Rays

- As compared to ultraviolet rays, gamma rays are more powerful.
- Gamma rays are used for heat sensitive disposable such as syringes, sutures, drugs, ointments, and IV drip.

Advantage	Disadvantage
Gama rays can penetrate cover of the items	Expensive method

Chemical Method of Sterilization

Chemical sterilization is also known as cold sterilization. The articles which can be damaged by heat are sterilized by chemical methods. The various chemicals and its methods are used for different types of articles or equipment sterilization (Table 5.2).

TABLE 5.2: Various chemicals along with their properties

Chemical	Properties
Formalin	• 40% of formaldehyde • For 100 cubic feet room, 140 g of $KMnO_4$ crystals and 250 mL of formalin are mixed in a bowl • Gas produces from mixture (formaldehyde) • Close room for 24 hours • Exposure time 20–24 hours • Maintain humidity above 60%
Sulfur	• Irritant to eyes and skin mucous membrane • 200 g sulfur for 100 cubic feet room • Methylated spirit is poured over the sulfur to burn • Seal room for 24 hours
Bacillocid rasant	• Formaldehyde free disinfectant • Fumigation within 30–60 minutes

Chemical Solution

- The equipment is submerged into the disinfectant solution.
- Microorganisms are destroyed when chemical solution or disinfectant coagulates the protein content of microorganisms.
- Sharp instruments can be sterilized by this method.

Disinfectant	Use for
Cidex	Sharp instruments, rubberware, endoscope
Savlon	Glassware
Lysol	Sharp instruments

Implication of chemical solution: First clean the articles with soap and under running water. Remove blood, pus or saliva from the articles. Then place the articles in a covered tray or in a covered jar over a layer of gauze in the chemical disinfectant.

Keep the articles for the prescribed period in the room temperature. Before using the equipment after chemical disinfectant method, rinse them with normal saline or sterile water.

Fumigation/Chemical Vapor

Fumigation is the oldest process of sterilization. Chemical vapors are used to destroy the microorganisms suspended in the air. It is also known as gas sterilization. Fumigation destroys insects and rodents. Fumigation is used to disinfect patient room, ICU, operation theater cubicle. Different fumes are used for fumigation. Before the room is fumigated, the room should be sealed and tightly closed.

High-Yield Point

New toxic compound—Virkon (nonaldehyde) compound. It contains ozone, sodium dodecylbenzene sulfonate, sulfonic acid and inorganic buffer. It is used for soaking equipment, cleaning surfaces and cleaning hazardous spills.

PREOPERATIVE INVESTIGATIONS

Preoperative investigations enable the healthcare team to formulate an individualized care plan, ensuring patient safety and enhancing surgical outcomes.

Objectives of Preoperative Investigations

- **Assess baseline health:** Determine the patient's physiological and biochemical status to identify any abnormalities.
- **Identify risk factors:** Detect conditions that may increase the risk of surgical complications, such as anemia, electrolyte imbalances, or coagulopathies.
- **Guide anesthetic and surgical planning:** Provide information necessary for selecting appropriate anesthesia and surgical techniques.
- **Facilitate postoperative monitoring:** Establish baseline values for comparison during the postoperative period to detect any deviations promptly.

Common Preoperative Investigations

Laboratory Tests

- **Complete blood count (CBC):** Evaluates hemoglobin levels, white blood cell count, and platelet count to detect anemia, infection or bleeding disorders.

- **Electrolyte panel:** Assesses levels of sodium, potassium, chloride, and bicarbonate to identify imbalances that could affect cardiac and neurological function.
- **Renal function tests:** Measures blood urea nitrogen (BUN) and creatinine levels to assess kidney function.
- **Liver function tests:** Includes tests like ALT, AST, and bilirubin to evaluate hepatic function.
- **Coagulation profile:** Tests such as PT, aPTT, and INR to assess the blood's ability to clot, crucial for preventing excessive bleeding during surgery.
- **Blood glucose levels:** Important for diabetic patients or those at risk of hyperglycemia or hypoglycemia.
- **Blood type and crossmatch:** Determines the patient's blood type and prepares for potential transfusions.
- **Urinalysis:** Detects urinary tract infections, kidney disorders, or glucose presence, indicating diabetes.
- **Pregnancy test:** Conducted in women of childbearing age to rule out pregnancy before administering anesthesia or performing radiologic studies.

Imaging Studies

- **Chest X-ray:** Evaluates lung fields and heart size, especially in patients with respiratory or cardiac history.
- **Electrocardiogram (ECG):** Assesses cardiac rhythm and detects any arrhythmias or ischemic changes.
- **Echocardiography:** Provides detailed images of heart structures and function, useful in patients with known cardiac conditions.
- **Ultrasound:** Used for assessing abdominal organs, vascular structures, or guiding procedures like central line placement.

Specialized Tests

- **Pulmonary function tests (PFTs):** Evaluate lung capacity and function, particularly in patients with chronic respiratory diseases.
- **Arterial blood gas (ABG) analysis:** Measures oxygenation, ventilation, and acid-base status, critical in patients with respiratory or metabolic disorders.

Nursing Responsibilities in Preoperative Investigations

- **Preparation and education:** Inform patients about the purpose and procedure of each test, ensuring informed consent when necessary.
- **Specimen collection and handling:** Collect blood, urine, or other specimens following proper protocols to maintain sample integrity.
- **Monitoring and reporting:** Observe patients for any adverse reactions during or after investigations and promptly report abnormal findings to the surgical team.
- **Documentation:** Accurately record all investigations, results, and any interventions taken in the patient's medical records.

PREOPERATIVE PSYCHOSOCIAL INTERVENTIONS

The preoperative phase is not only a time for physical preparation but also a critical period for addressing the psychological and social needs of patients. Patients may experience anxiety, fear, and uncertainty about the upcoming surgery, which can impact their overall well-being and recovery. As future nurses, understanding and implementing psychosocial interventions is vital to provide holistic care and promote positive surgical outcomes.

Objectives of Preoperative Psychosocial Interventions

- **Alleviate anxiety and fear:** Help patients manage emotions related to surgery.
- **Enhance coping mechanisms:** Support patients in developing strategies to handle stress.
- **Promote patient engagement:** Encourage active participation in care and decision-making.
- **Strengthen support systems:** Involve family and friends in the care process.

Components of Preoperative Psychosocial Interventions

Emotional Assessment

- **Identify emotional states:** Assess for signs of anxiety, depression, or fear.
- **Evaluate coping styles:** Understand how patients have dealt with stress in the past.
- **Determine support needs:** Recognize the level of support required from healthcare providers and family.

Patient Education

- **Provide clear information:** Explain surgical procedures, risks, and expected outcomes in understandable terms.
- **Discuss postoperative care:** Inform about pain management, mobility, and recovery timelines.
- **Address misconceptions:** Correct any false beliefs or fears about surgery.

Stress Reduction Techniques

- **Relaxation exercises:** Teach deep breathing, progressive muscle relaxation, or guided imagery.
- **Mindfulness practices:** Encourage mindfulness meditation to focus on the present moment.
- **Distraction methods:** Suggest activities like listening to music or reading to divert attention from stress.

Family Involvement

- **Include loved ones:** Invite family members to participate in educational sessions.
- **Provide support resources:** Offer information on counseling or support groups for families.
- **Encourage open communication:** Facilitate discussions between patients and their support systems.

Cultural and Spiritual Considerations

- **Respect beliefs:** Acknowledge and incorporate patients' cultural and spiritual values into care plans.
- **Provide appropriate resources:** Connect patients with chaplaincy services or cultural liaisons as needed.

Preoperative psychosocial interventions are essential components of holistic nursing care. By addressing the emotional and social needs of patients, nurses can significantly improve surgical experiences and outcomes. As nursing students, developing skills in psychosocial assessment and intervention will prepare you to support patients effectively throughout the surgical process.

PREOPERATIVE TEACHING

Preoperative teaching is a fundamental nursing responsibility that involves educating patients about the surgical experience, including preoperative preparations, the surgical procedure itself, and postoperative care. The primary goal is to equip patients with the knowledge and skills necessary to participate actively in their care, reduce anxiety, and promote optimal recovery.

Objectives of Preoperative Teaching

- **Enhance patient understanding:** Provide clear information about the surgical procedure, anesthesia, and expected outcomes.
- **Reduce anxiety and fear:** Alleviate concerns by addressing questions and clarifying misconceptions.
- **Promote compliance:** Ensure adherence to preoperative instructions, such as fasting and medication adjustments.
- **Facilitate recovery:** Prepare patients for postoperative care requirements, including pain management and mobility.

Components of Preoperative Teaching

Preoperative Preparations

- **Fasting guidelines:** Instruct patients on when to stop eating and drinking before surgery to prevent aspiration during anesthesia.
- **Medication management:** Advise on which medications to continue or discontinue, including anticoagulants and herbal supplements.
- **Hygiene practices:** Educate on preoperative bathing or showering with antiseptic solutions to reduce infection risk.
- **Clothing and personal items:** Recommend wearing comfortable clothing and removing jewelry, makeup, and nail polish.

Understanding the Surgical Procedure

- **Procedure overview:** Explain the steps of the surgery, duration, and the roles of the surgical team.
- **Anesthesia information:** Discuss the type of anesthesia to be used and what to expect during induction and recovery.
- **Risks and benefits:** Provide balanced information about potential complications and the benefits of the procedure.

Postoperative Expectations

- **Pain management:** Describe pain control methods, including medications and nonpharmacological techniques.
- **Mobility and activity:** Outline plans for early ambulation and physical therapy to prevent complications.
- **Diet and nutrition:** Inform about dietary restrictions or advancements postsurgery.
- **Wound care:** Teach proper incision care and signs of infection to monitor.

Emotional and Psychological Support

Encourage patients to express fears and provide empathetic responses.

PREVENTION OF ACCIDENTS AND HAZARDS IN OT

Take precautions and practice safety measures in the operation theater, it is necessary for both patient and operation room team. Accident prevention is responsibility of

all members of PR team. OR team should be aware of any type of hazards.

The rooms in which combustible anesthetic agents or disinfecting agents are stored are hazardous location. Improper use of (spilling, excessive use) tincture of iodine, tincture of merthiolate is a source of danger.

Sources of Ignition

- Electrostatic spark
- Fixed or portable electrical equipment
- Open flames
- Heat above the temperature
- Oxygen cylinder not fixed
- Sharp object
- Faulty instrument
- Swinging doors
- Slippery wet floors
- Splints
- Faulty respirators

Injuries in OT

Various injuries in OT along with their possible causes are shown in Table 5.3.

TABLE 5.3: Various injuries in OT along with their possible causes

Injuries	Possible causes
Burn	• Faulty machine • Light without heat shields • Warm instruments • Electric blanket • Strong chemical • Injury of healthy part • Incorrect shoulder support
Fall	• Unconscious patient • No supervision • No belt
Position	• Nerve injuries due to crossed feet • Wrong picking of leg during lithotomy position
Tourniquet	• Long duration of tourniquet • Negligency
Electric shock	• Loose wires and switch boards • Fault in suction apparatus • Fault in diathermy • Anesthesia machine fault
Explosion	• Open flames • Oxygen cylinder leak
Mental injuries	• Irrelevant remark infront of patient • Telling wrong information • Neglect professional confidentiality
Medication error	• Neglect allergic reaction • Neglect entry in register • Faulty blood transfusion • Nonavailability of proper medication

Precautions

- Garments must be made of cotton only.
- Do not wear or accumulate static material (wool, nylon, silk and rayon).
- Do not wear shoe which has metal connected.
- Use only cotton blankets.
- Avoid moving near to anesthesia machine.
- Take precautions while moving anesthesia equipment.
- Floor should be conductive.
- Pillow and mattress should be carbon permeated.
- All switch and wires must be fixed properly.
- All equipment before transferring must be approved by an anesthetist.
- Never cover anesthesia machine or oxygen cylinder.
- Anesthesia equipment must be leak proof.
- Do not use oil or grease at any part of anesthesia machine.
- Do not smoke in hazardous area.
- Never touch oxygen cylinder with oily and greasy hands or gloves.
- Do not use electric hot plates.
- Apply all restraints for unconscious patient.
- Never leave unconscious or sedative patient alone.
- Restraints the patient while transporting.

BIOMEDICAL WASTE MANAGEMENT RULES

As per *WHO norms,* the healthcare waste includes all the waste generated by healthcare establishments, research facilities, and laboratories. In addition, it includes the waste originating from minor or scattered sources such as that produced in the course of healthcare undertaken in the home (dialysis, insulin injections, etc.). Biomedical waste means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological.

According to the Biomedical Waste Management Rules, 2016, "biomedical waste treatment and disposal facility" means any facility wherein treatment, disposal of biomedical waste or processes incidental to such treatment and disposal is carried out, and includes common biomedical waste treatment facilities and "operator of a common biomedical waste treatment facility" means a person who owns or controls a Common Biomedical Waste Treatment and Disposal Facility (CBWTF) for the collection, reception, storage, transport, treatment, disposal or any other form of handling of biomedical waste. *(Revised Guidelines for Common Biomedical Waste Treatment and Disposal Facilities, Central Pollution Control Board Delhi 21 December 2016)*

Hospital Waste

Biomedical Waste

According to the Biomedical Waste Management Rules, 2016 the biomedical waste generated from the healthcare facility is divided into four categories based on the segregation pathway and color code (Fig. 5.17 and Table 5.4). Classification of biomedical waste is shown in Figure 5.18.

1. Yellow Category
2. Red Category
3. White Category
4. Blue Category

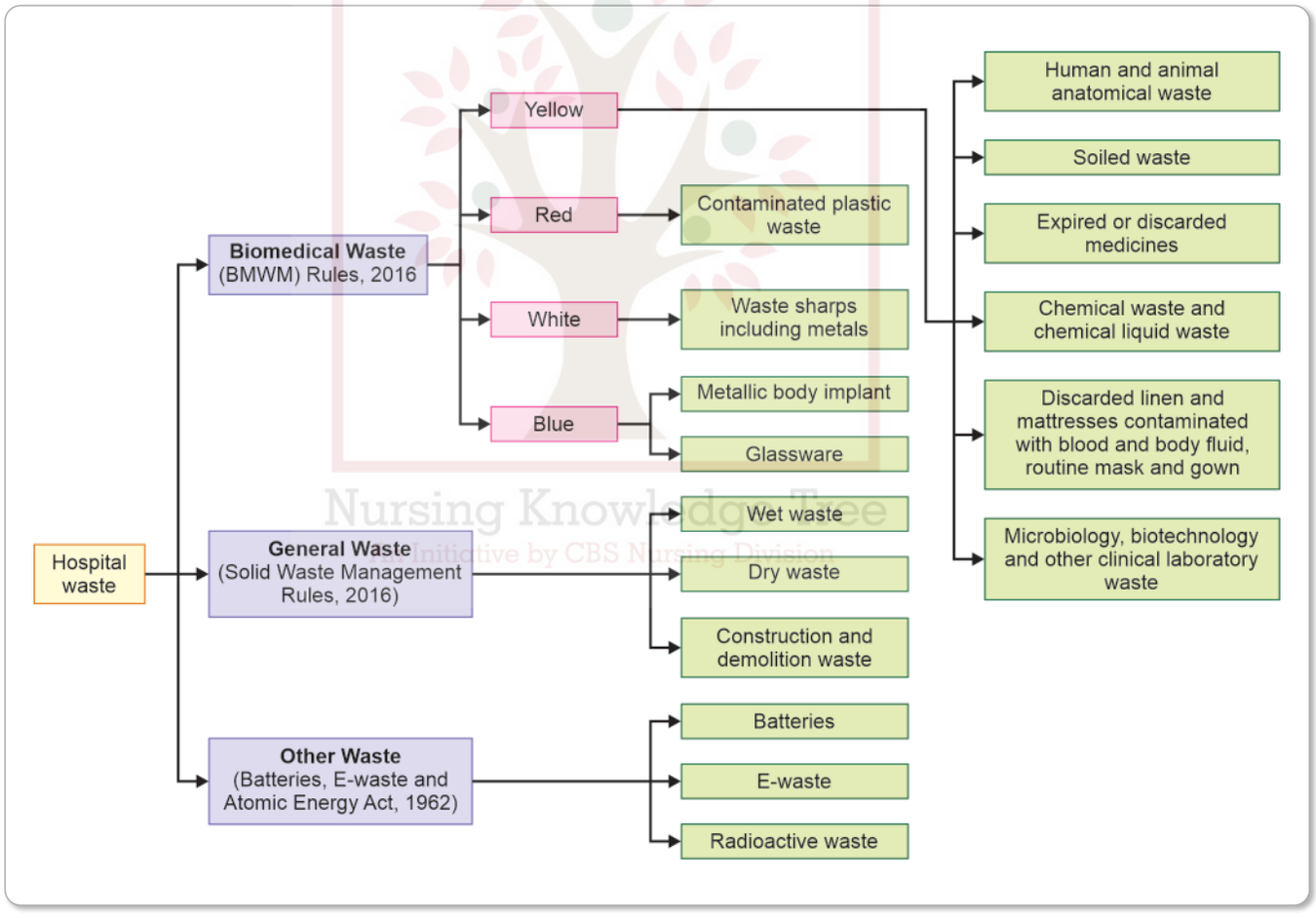

Fig. 5.17: Segregation of hospital waste

Source: National Health Systems Resource Center, Technical Support Institution with National Health Mission, Ministry of Health and Family Welfare, Government of India, New Delhi-110067
http://cpcb.nic.in/cpcbold/wast/bioimedicalwast/Draft_Guidelines_for_Management_of_Health_Care_Wast(as_on_21.09.2017).pdf)

TABLE 5.4: Categories of biomedical waste based on color code

Category	Types of waste
Yellow	**Human anatomical waste** Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).
	Animal anatomical waste Experimental animal carcasses, body parts, organ tissues including the waste generated from animals used in experiments and testing in colleges and veterinary hospitals
	Discarded or expired medicines Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampules and vials, etc.
	Chemical waste Chemicals used in production of biological and used or discarded disinfectants
	Chemical liquid waste Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, silver X-ray film developing liquid, discarded formalin, infected secretions, aspirated body fluids, liquid from laboratories and floor washing, cleaning, housekeeping and disinfecting activities, etc.
	Discarded linen, mattresses, beddings contaminated with blood or body fluid, routine mask and gown.
	Microbiology, biotechnology and other clinical laboratory waste (Pretreated) Microbiology, biotechnology and other clinical laboratory waste: blood bags, laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.
Red	**Wastes generated from disposable items** such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes without needles, fixed needle syringes with their needles cut, vacutainers and gloves
White	Waste sharps including metals Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades or any other contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps
Blue	**Broken or discarded and contaminated glass** including medicine vials and ampoules except those contaminated with cytotoxic wastes.

Source: National Health Systems Resource Center, Technical Support Institution with National Health Mission, Ministry of Health and Family Welfare, Government of India, New Delhi-110067
http://cpcb.nic.in/cpcbold/wast/bioimedicalwast/Draft_Guidelines_for_Management_of_Health_Care_Wast (as_on_21.09.2017).pdf)

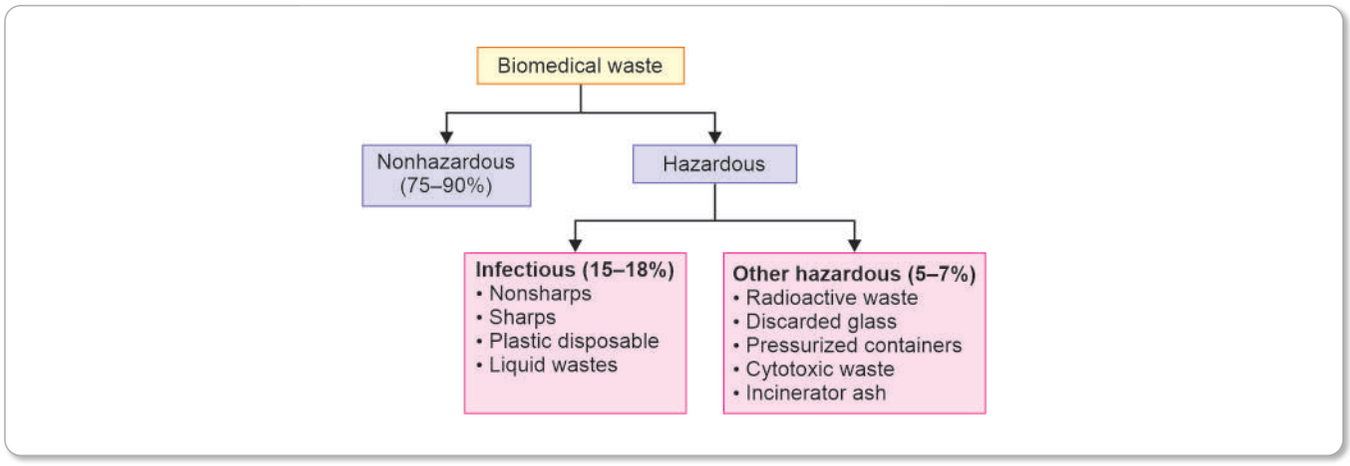

Fig. 5.18: Classification of biomedical waste

General Waste

General waste consists of all the waste which has not been in contact with body infectious, any chemical or biological secretions, blood and does not includes any waste sharps. This waste consists:

- Newspaper, paper and card boxes (dry waste)
- Plastic water bottles (dry waste)
- Aluminum cans of soft drinks (dry waste)
- Packaging materials (dry waste)
- Food Containers after emptying residual food (dry waste)
- Organic/biodegradable waste—mostly food waste (wet waste), construction and demolition wastes

From theses general wastes, the dry wastes and wet wastes should be collected separately.

General waste is around 85–90% of total waste generated from the healthcare facility. Management of waste is done by Solid Waste Management Rules, 2016 and Construction and Demolition Waste Management Rules, 2016, as applicable.

Other Wastes

Other wastes include electronic waste such as used batteries, and radioactive wastes and they have to be disposed as per the E-Waste (Management) Rules, 2016.

Steps of Management of Biomedical Waste

There are five steps of handling biomedical waste and it is the exclusive responsibility of healthcare facility to follow the steps.

1. Segregation
2. Collection
3. Pretreatment
4. Intramural transportation
5. Storage

The following critical points the healthcare facility should follow in managing biomedical waste:

- Biomedical waste should be segregated in designated color coded bin/container at the point of generation by the healthcare professionals who are generating the waste.
- Do not mix the Biomedical Waste and General Waste.
- The waste storage, transportation and disposal should be done within 48 hours to avoid any spread of infection from the waste.
- By 27/03/2019 is a phase out for use of chlorinated plastic bags (excluding blood bags) and gloves.
- No secondary handling or pilferage of waste shall be done at healthcare facility.
- The biomedical waste should be treated and disposed only through such CBWTF operator which is within 75 km of healthcare facility.
- Only medical laboratory and highly infectious waste must be pretreated at healthcare facility before sending for final treatment.
- Provide barcode labels on all color coded bags or containers containing segregated biomedical waste before such waste goes for final disposal through a CBWTF (Figs 5.19 and 5.20).

Step 1: Segregation

The segregation process of biomedical waste generated from a healthcare facility at the point of generation as per the color coding system.

- Waste must be segregated at the point of generation of source by the person who is providing treatment to the patient and in the process generating biomedical waste.
- For awareness of color coding, the posters and placards for biomedical waste segregation should be pasted in every department of healthcare facility.

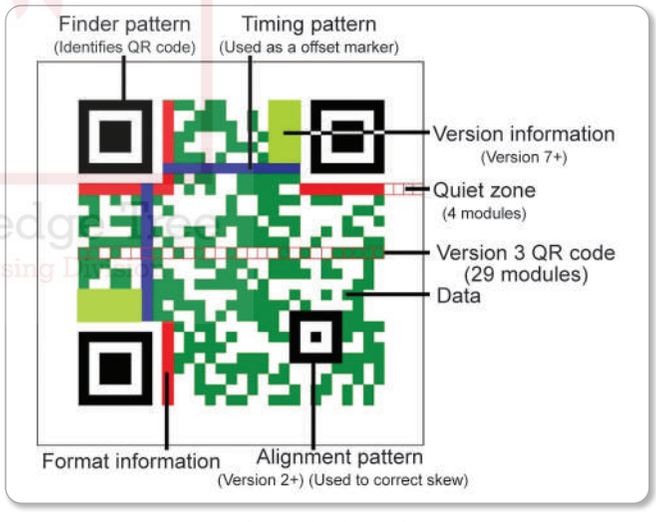

Fig. 5.19: QR code

Fig. 5.20: Barcode

- Adequate number of color coded bins and bags should be available in every department at the point of generation of biomedical waste.
- Healthcare professional must use Personnel Protective Equipment (PPE) while handling the biomedical waste.

Step 2: Collection

- Biomedical waste should be collected on daily basis from each department of the healthcare facility at a fixed interval of time.
- As per the BMWM Rules 2016, healthcare facility should dispose the waste within 48 hours.
- Every healthcare facility should fix the timings of collection from every area.
- The collection time for general waste should not be same at the time of collection of biomedical waste or should not be collected in the same trolley.
- The collection time should be fixed according to the area of care in the hospital, for example, in an IPD area where the morning routine begins with the changing of dressings, infectious waste after doctor's round could be collected midmorning to prevent soiled bandages remaining for long time.
- The collection time for general waste must be done immediately after the visiting hours, as visitors generate a lot of general waste.
- The staff who collects biomedical waste must wear the personal protective equipment.

Step 3: Treatment

Packaging

- The containers of biomedical waste bags and sharp objects should be filled to no more than three quarters full and should be sealed properly.
- Never staple the plastic bags, it should be tied with a plastic bag or tie.
- New or replacement bags should be available at each container so that immediately it can be replaced.
- The bags should have the biohazard symbol, labeled with details such as date, type of waste, waste quantity, senders name and receivers details and barcode details.
- Bar coded stickers must be pasted on each bag as per the guidelines of CPCB by 27 March, 2019.

Labeling

According to the CPCB guidelines and BMWM 2016 Rules, all the bags/containers/bins used for collection and storage of biomedical waste must be labeled with the Symbol of Biohazard or Cytotoxic Hazard and barcode labels for Effective Management of Biomedical Waste" (Fig. 5.21).

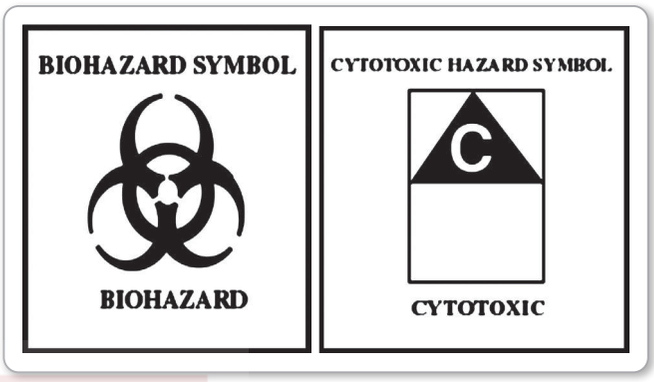

Fig. 5.21: Labels for transportation of BMW

Interim Storage

- The dirty utility rooms must be used for the waste which is needed to be stored on interim basis in the departments. If dirty utility rooms are not available in healthcare facility. Then waste should be stored in designated place away from patient and visitor traffic or low traffic area.
- No waste should be kept for longer duration or stored at patient care area and clinical procedures areas such as emergency room or operation theater.

Step 4: Transportation

Transportation Trolleys

The closed trolley must be used for in house transportation of Biomedical waste within the premises of the hospital. Waste collection trolleys are designated for the purpose of biomedical waste collection only. Patient trolleys or laundry trolleys should not be used for BMW transportation (Fig. 5.22).

Route of intramural transportation of biomedical waste

The key points for intramural transportation of biomedical waste are:

- Waste must be transported in the covered trolleys/carts.

Fig. 5.22: Transportation trolleys

- Choose the route for transportation which has low traffic flow of patients and visitors.
- Avoid transportation through high-risk areas.
- Supplies and waste must be transported through separate routes.
- Avoid spillage and scattering of waste.

Step 5: Storage

Central Waste Collection Room for Biomedical Waste

There should be a designated central waste collection room situated within the healthcare facility for storage of biomedical waste, till the waste is picked and transported for treatment and disposal at CBWTF. The critical points for construction of those rooms are as follows:

- The location must be away from the public/visitors access.
- According to the quantity of waste generated from the hospital, the space allocation should be decided.
- The planned space must be sufficient so as to store for 48 hour's waste.
- Central waste collection room must be roofed.
- Room should be under lock and key under the responsibility of a designated person.
- The entrance must be of concrete ramp for easy transportation of waste collection trolleys.
- Flooring should be of tiles to ease the cleaning of the area.
- Exhaust fans should be provided to take the bad odor of waste out of the room.
- Fire extinguisher and smoke detector must be fixed in that room.
- For cleaning and washing of this station and the containers, provision for water supply should be there.
- Sign boards must have a contact person name and the telephone number.
- The entrance must be labeled with "Entry for Authorized Personal Only" and Logo of Biomedical Waste Hazard.
- No general waste should be stored in the central waste collection area.

Record Keeping

- Every healthcare facility needs to maintain the records on daily basis.
- Record should be maintained category-wise and quantity of waste generated from the facility.
- For >30 bedded healthcare facility, a weighing machine should be kept for weighing the quantity of Biomedical Waste.
- Annual Report on biomedical waste management must be submitted to SPCB/PCC.
- Training on BMW Management including both induction and in service training records should be maintained.
- Annual health check-up of all the employees records should be maintained.
- Immunization of all the employees record should be maintained.
- Minutes of meeting of Biomedical Waste Management Committee should be kept in records.
- All incidents reports should be kept in records properly including preventive and corrective actions taken in relation to such accidents should be maintained.
- Records for any new biomedical treatment equipment installed, if any for the treatment of biomedical waste.
- Record of recyclable waste (plastic/glass) from healthcare facility must be handed over to the authorized recycler.
- The records related to the handling of BMW should be kept safe for 5 years by healthcare facilities.

SUMMARY

- The preoperative phase is critical for preparing the patient physically, mentally, and emotionally for surgery to ensure safety and positive outcomes.
- Patient preparation includes assessments, education, hygiene measures, and addressing any existing health concerns.
- Latex allergy is an important consideration; nurses must recognize symptoms and implement strict precautions to prevent allergic reactions.
- Nurses have vital responsibilities such as verifying informed consent, conducting preoperative assessments, providing patient education, and coordinating with the surgical team.
- Understanding the operating theater (OT) infrastructure helps nurses maintain a sterile environment and promote infection control.
- Aseptic technique and maintaining a sterile environment are essential to minimize the risk of surgical site infections.
- Effective communication, accurate patient identification, and use of surgical safety checklists are key components of preoperative nursing care.
- Psychological preparation helps reduce patient anxiety and improve cooperation during the surgical process.
- Overall, thorough preoperative nursing care supports patient safety, reduces complications, and contributes to successful surgical outcomes.

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STUDENT ASSIGNMENT

LONG ANSWER QUESTIONS

1. Explain the nursing responsibilities in preoperative phase.
2. Explain the methods of sterilization in OT.

SHORT ANSWER QUESTIONS

1. Write a short note on biomedical waste management in OT.
2. What is preoperative consent?
3. Write about preoperative patient assessment.

CASE-BASED QUESTIONS

Scenario: A 60-year-old male patient is scheduled for an elective knee replacement surgery. The patient has hypertension and is on medication for blood pressure control. He is anxious about the surgery and expresses concerns about postoperative pain and recovery. The nurse performs a preoperative assessment, and the patient's vital signs are within normal limits, though his blood pressure is slightly elevated (150/90 mm Hg). The nurse is preparing for the surgery and providing patient education.

1. **What is the most appropriate nursing intervention prior to this patient's surgery?**
   a. Administer the patient's prescribed antihypertensive medication as usual before surgery.
   b. Recommend postponing the surgery until the patient's blood pressure is normalized.
   c. Assess the patient's knowledge of the surgical procedure and provide further education.
   d. Prepare the patient for immediate postoperative pain management options.
2. **Which of the following actions is the most important for the nurse to take before the surgery?**
   a. Ensure the patient's informed consent for the surgery is signed and properly documented.
   b. Encourage the patient to take a shower with antimicrobial soap before the surgery.
   c. Administer preoperative sedatives as ordered.
   d. Start an intravenous line (IV) for fluid administration.

MULTIPLE CHOICE QUESTIONS

1. **What is the primary purpose of obtaining informed consent before surgery?**
   a. To allow the nurse to begin preoperative teaching
   b. To inform the family about the procedure
   c. To ensure the patient understands the procedure and voluntarily agrees
   d. To document the diagnosis in the patient's record
2. **A patient scheduled for surgery says, "I'm not sure I want to do this anymore". What should the nurse do first?**
   a. Tell the patient it is too late to cancel
   b. Reassure the patient everything will be fine
   c. Notify the surgeon immediately
   d. Ask the anesthesiologist to speak with the patient

3. **Which instruction is most important in preoperative teaching for a patient undergoing abdominal surgery?**
   a. Eat a light breakfast on the day of surgery
   b. Take all regular medications including blood thinners
   c. Perform deep breathing and coughing exercises
   d. Avoid speaking to other patients about surgery
4. **Why is the nurse instructed to verify that the patient has been NPO (nothing by mouth) before surgery?**
   a. To reduce anxiety
   b. To prevent aspiration during anesthesia
   c. To ensure the bladder is empty
   d. To reduce the risk of wound infection
5. **What is the most appropriate nursing action when preparing a surgical patient who is wearing nail polish and acrylic nails?**
   a. Allow the patient to keep them on
   b. Remove nail polish or an acrylic nail from at least one finger for pulse oximeter use
   c. Paint over them with hospital-approved color
   d. Ask the patient to choose which nail to remove

ANSWER KEY

Case-Based Questions:

1. c **2.** a

Multiple Choice Questions:

1. c **2.** c **3.** c **4.** b **5.** b

Textbook of

Adult Health Nursing-I

(Medical Surgical Nursing)

with Integrated Pathophysiology and Evidence-based Practice (Includes BCLS Module)

Learning Objectives at the beginning of every chapter help readers understand the purpose of the chapter.

LEARNING OBJECTIVES

After the completion of the chapter, the readers will be able to:

- Define the scope and significance of medical surgical nursing in healthcare delivery.
- Describe the historical evolution and current trends in medical surgical nursing.

Chapter Outline gives a glimpse of the content covered in the chapter.

CHAPTER OUTLINE

- Introduction
- Evolution of Medical and Surgical Nursing
- Indian Medicine
- History of Surgical Nursing
- Social Trends Influencing Development of Nursing

Key Terms are added in each chapter to help understand difficult scientific terms in an easy language.

KEY TERMS

Acute illness: A sudden and short-term health condition requiring prompt and often intensive care.
Chronic illness: A long-lasting health condition that typically requires ongoing treatment and self-management.
Clinical competence: The nurse's ability to apply knowledge, skills, and judgment to deliver safe and effective care.
Clinical decision-making: The process of selecting the best course of action based on clinical evidence and patient needs.

Additional information related to the respective topic is given in **High-Yield Points** boxes.

High-Yield Point

Sorbitol, a widely used sweetener in chewing gum, sweets and dietary products, acts as a laxative. A stick of sugar free gum contains 1.25 g of sorbitol. Consuming 20 g/day will cause diarrhea. Possible side effects are usually metioned only in the fine print on labels of products containing sorbitol (Bauditz, 2008).

Numerous **Tables** have been used in the chapters to facilitate learning.

TABLE 1.1: Leavells model of natural history of disease

Stimulus to the host	Host reaction		Recovery
Interconnection of agent, host and environment	Latent period (pre-symptomatic)	Symptoms, signs (clinical)	With or without defect, disability
Prepathogenesis	Period of pathogenesis		

The book is well illustrated with relevant colorful **Figures** to add value to the content.

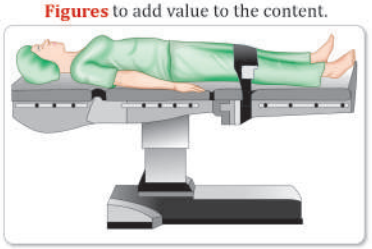
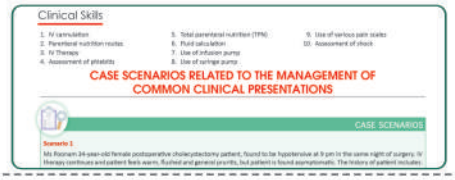
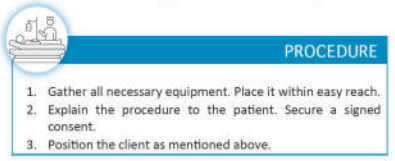


Fig. 6.41: Supine position

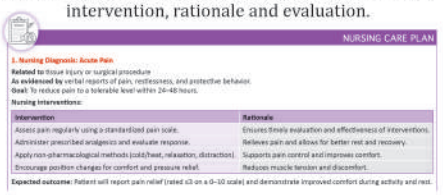
Each and every chapter starts with **Clinical Skills** covering respective system case presentations.



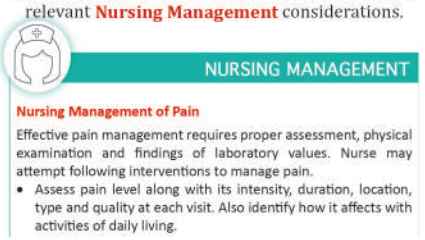
The book covers **Nursing Procedures** in separate boxes.



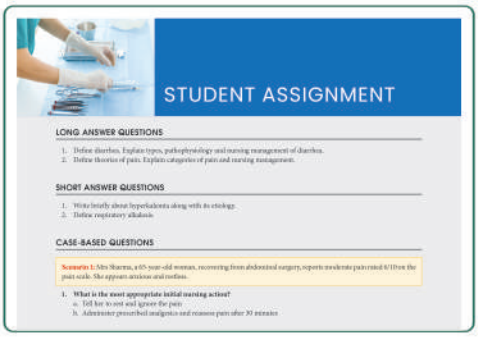
Nursing Care Plan for each disease condition has been covered in a tabular format covering its diagnosis, goal, intervention, rationale and evaluation.



Each disease/condition has been elaborated with its relevant **Nursing Management** considerations.



At the end of each chapter, **Student Assignment** section is given which contains frequently asked questions in exams to help students attain mastery over the subject.



About the Editor-in-Chief

Usha Ukande *PhD, MSN*
Former Principal
Choithram College of Nursing
Indore, Madhya Pradesh

About the Editor

Jaideep Herbert *PhD, MSN, BSN*
Chief Operating Officer
Vidyanta Skills Institute
Medical Simulation Center
Gurugram, Haryana

About the Authors

Jaideep Herbert
PhD, MSN, BSN
Chief Operating Officer
Vidyanta Skills Institute
Medical Simulation Center
Gurugram, Haryana

Shweta Pattnaik
PhD, MSN, BSN, RN, RM
Professor and HOD MSN Department
Choithram College of Nursing
Indore, Madhya Pradesh

Anil Sharma
PhD, MSN
Professor and Principal
Manikaka Topawala Institute of Nursing
CHARUSAT University, Anand, Gujarat

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CBS Publishers & Distributors Pvt. Ltd.
4819/XI, Prahlad Street, 24 Ansari Road, Daryaganj, New Delhi 110 002, India
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Authors
Jaideep Herbert
Shweta Pattnaik
Anil Sharma

Editor
Jaideep Herbert

Editor-in-Chief
Usha Ukande

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Editor-in-Chief

Usha Ukande PhD, MSN
Former Principal
Choithram College of Nursing
Indore, Madhya Pradesh

Editor

Jaideep Herbert PhD, MSN, BSN
Chief Operating Officer
Vidyanta Skills Institute, Medical Simulation Center
Gurugram, Haryana

Authors

Jaideep Herbert PhD, MSN, BSN
Chief Operating Officer
Vidyanta Skills Institute, Medical Simulation Center
Gurugram, Haryana

Shweta Pattnaik PhD, MSN, BSN, RN, RM
Professor and HOD MSN Department
Choithram College of Nursing
Indore, Madhya Pradesh

Anil Sharma PhD, MSN
Professor and Principal
Manikaka Topawala Institute of Nursing
CHARUSAT University
Anand, Gujarat

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20

Nursing Management of Disorders of Male Reproductive System

LEARNING OBJECTIVES

After the completion of the chapter, the readers will be able to:

- Revise the anatomy and physiology of male reproductive system.
- Recognize and understand various diagnostic tests used to investigate male reproductive system diseases.
- Understand the etiology with risk factors, signs and symptoms and diagnostic tests of male reproductive system disorders and deformities.
- Discuss the medical and nursing management of male reproductive system disorders and deformities.
- Understand various techniques of nursing assessment including history collection.
- Explain various surgical procedures, implemented for management of male reproductive system diseases.
- Illustrate pathology or pathophysiology of male reproductive system diseases.
- Sketch the various medications prescribed to treat male reproductive system diseases.
- Demonstrate the nursing care plan of male reproductive system disorders.

CHAPTER OUTLINE

- Introduction
- Anatomy and Physiology of Male Reproductive System
- Assessment of Male Reproductive System
- Erectile Dysfunction
- Ejaculation Disorders
- Prostatitis
- Disorders of Testes and Adjacent Structures
- Disorders of Penis
- Andropause
- Infertility
- Penile Cancer
- Contraception
- Male Reproductive System Data Collection
- Diseases of Male Breast
- Genital Herpes and Wart
- Sexually Transmitted Diseases

KEY TERMS

Anejaculation: The pathological inability to ejaculate despite having an erection is known as anejaculation.
Balanitis: Inflammation of the glans penis.
Benign prostatic hyperplasia (BPH): It is a condition characterized by block in the flow of urine when the prostate gland enlarges.
Contraception: The use of techniques or devices to prevent unintended pregnancy is referred to as birth control, contraception or fertility control.
Cryptorchidism: The absence of at least one testicle from the scrotum is known as cryptorchidism.
Delayed ejaculation: It is characterized by a significant delay in ejaculation or the inability to ejaculate.
Epididymitis: Inflammation of the epididymis.
Epispadias: It is characterized by the failure of the urethral tube to tubularize on the dorsal aspect.
Erectile dysfunction: The persistent or frequent inability to achieve and/or maintain a penile erection strong enough to gratify sexual desire.
Gynecomastia: The enlargement of the breast tissue in males due to hormonal imbalances.

Hydrocele: It is a collection of peritoneal fluid between the parietal and visceral layers of the tunica vaginalis, which directly encircles the testis.
Hypospadias: Birth defect in which urethral opening is not at the tip of the penis.
Infertility: A condition characterized by low sperm production or abnormal function of sperm, which can lead to inability of becoming parents.
Male breast cancer: Abnormal cancerous cell growth in male breast.
Orchitis: Inflammation of the testicles.
Paraphimosis: A condition in which foreskin of the penis gets stuck behind the head of the penis and cannot be pulled back.
Penile implant: Device placed inside the penis which allows erection.
Phimosis: Condition in which foreskin of the penis cannot be pulled back.
Premature ejaculation: Semen ejaculation happens sooner during intercourse.
Prostate cancer: Cancerous cell growth in the prostate gland.
Prostatectomy: Complete or partial removal of the prostate gland.
Prostatitis: Inflammation of the prostate gland.
Retrograde ejaculation: Semen enters the bladder instead of ejaculating out through the penis.
Testicular cancer: Cancerous cell growth in the testicles.
Testicular torsion: A condition in which spermatic cord becomes twisted and rotated which supplies blood to the testicles.
Varicocele: Enlargement of the veins inside the scrotum.

Clinical Skills

1. Assessment of male reproductive system
2. Male catheterization
3. Male catheter care
4. Preparation for prostate biopsy

CASE SCENARIOS RELATED TO NURSING MANAGEMENT OF DISORDERS OF MALE REPRODUCTIVE SYSTEM

CASE SCENARIO

Scenario 1

A 50-year-old Ramesh came to the emergency department with the complaint of weak urine stream, frequent urination, and leakage of urine. After performing cystourethroscopy, it was confirmed that the patient is suffering from benign prostate hyperplasia.

Questions:

- Take the history to find out the cause of BPH.
- Discuss the surgical management of BPH- pre, intra and postoperative phases.
- Prepare a nursing care plan based on initial assessment.

INTRODUCTION

The male reproductive system consists of various structures; the scrotum, testes, accessory ducts like spermatic ducts, accessory glands like sex glands, and penis. These organs work together to produce sperm and other components of semen. These organs also work together to deliver semen into the vagina for fertilization.

ANATOMY AND PHYSIOLOGY OF MALE REPRODUCTIVE SYSTEM

The structure of male reproductive system includes internal and external male genitalia as shown in Figure 20.1.

- External genitalia include scrotum, testes, epididymides and penis.

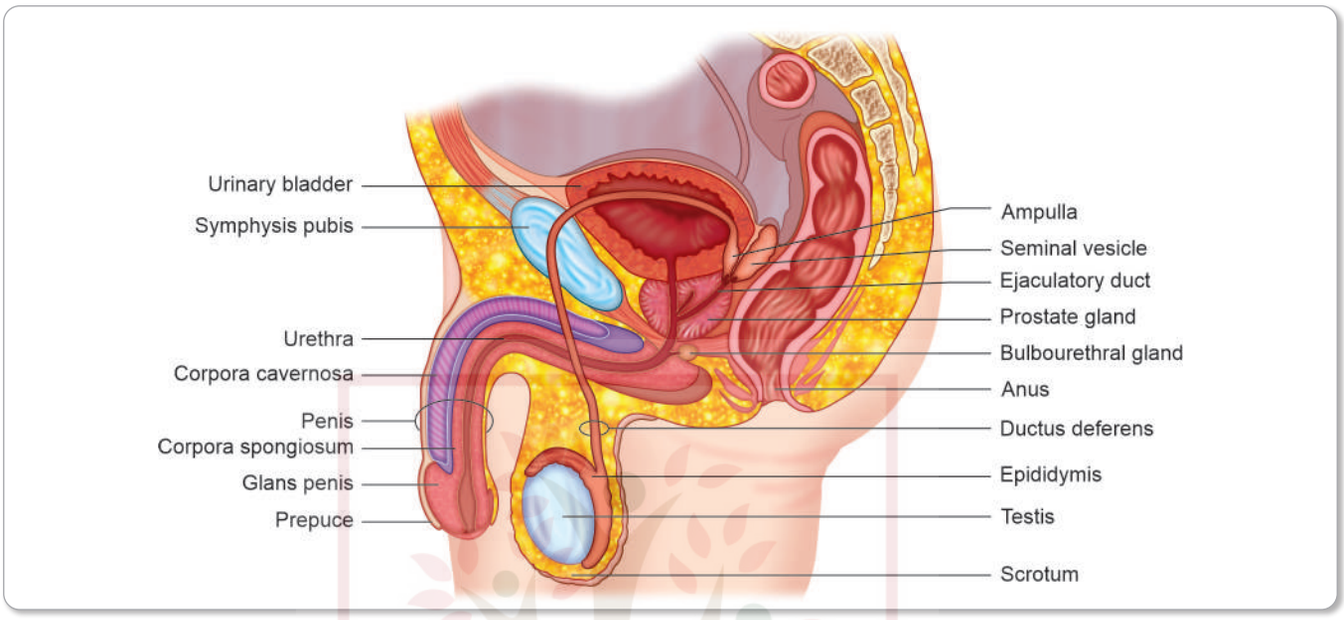


Fig. 20.1: Male reproductive system

- Internal genitalia include vas deferens, ejaculatory duct, prostatic and membranous sections of urethra, seminal vesicles and some accessory glands such as prostate gland and Cowper gland (also known as bulbourethral gland).

The scrotum is the supporting structure for the testes and it is a cutaneous outpouching of abdomen suspended from perineal region which hangs between the thighs. The testes or testicles are male reproductive organs and are located as paired oval glands about 5 cm in length and 2.5 cm in diameter and each weighs about 10–15 g. These testes have dual function to play; one is production of sperm (spermatogenesis) and secretion of male sex hormone known as testosterone (it induces and preserves the male sex characteristics). Each testis is found inside its own pouch on one side of the scrotum and is connected to the abdomen by a spermatic cord and cremaster muscle. The testes are encased in the scrotum, which keeps them at a slightly lower temperature than the rest of the body to facilitate spermatogenesis.

The **epididymis** is a sperm storage area which wraps around the superior and posterior lateral edge of the testes. After sperms are produced in the testes, they travel to the epididymis, where they develop before leaving the reproductive system. However, sperm can mature in the epididymis for a shorter period of time before leaving, which causes a delay in sperm passage due to the length of the epididymis. A pair of spermatic cords are attached from the testes to the abdominal cavity, supplied by nerves, blood vessels, lymphatic vessels and ductus deferens. The constituent of spermatic cord smoothly supports proper functioning of testes. Just prior to ejaculation, mature sperms from the epididymis travels to the ductus deferens, which is a muscular tube. Because of its slightly wider diameter and smooth muscle wall, the ductus deferens works to store mature sperm. As a result of this natural arrangement, the ductus deferens has good space to store sperms and uses peristalsis movement through its smooth wall to pass these stored sperms during ejaculation.

The **seminal vesicles located near ejaculatory duct, are basically exocrine glands and have important function to produce liquid part of semen**. The semen contains proteins, and fructose with mucus which keeps its pH alkaline. The important function of this alkaline pH is to help semen survive in acidic environment of vagina. The **ejaculatory duct** is a continuous duct structure from ductus deferens that reaches urethra. This ejaculatory duct expels the semen with sperm through urethra during ejaculation process.

The prostate is an exocrine gland having lots of important functions. Anatomically, **prostate** is a walnut-sized organ attached inferiorly with urinary bladder and surrounded with urethra. Same like seminal vesicles, the prostate also produces milky-white liquid portion of semen which contains protein, enzyme and various chemicals. Contents of this liquid help to protect sperm during ejaculation. Second function of prostate is to prevent flow of urine or semen by muscle contraction.

The penis is an external organ of reproductive system and anatomically it is a muscular cylindrical-shaped organ. It consists of urethra and its opening. During erection, the penis increases in size as the erectile tissues fill up with blood flow. The most important function of penis is to deliver the sperms into vagina during sexual intercourse and also excretion of urine *via* urethra.

ASSESSMENT OF MALE REPRODUCTIVE SYSTEM

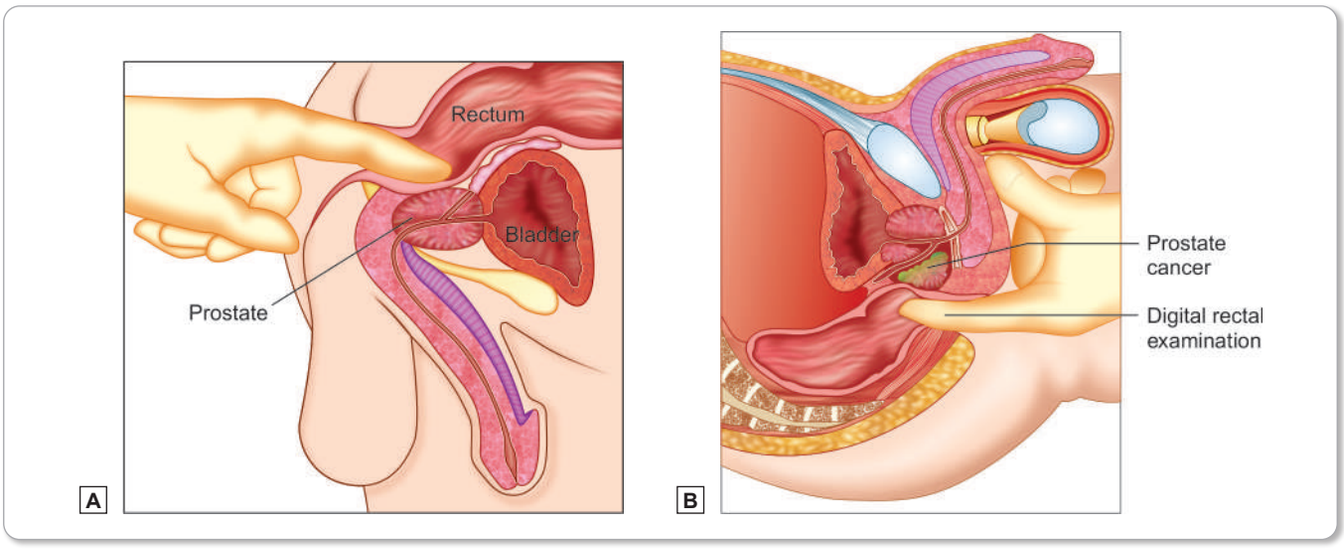
Assessment of reproductive system starts with history collection. As sexuality is a very complex phenomenon, which is influenced by many factors such as personal, social, cultural and religious. Here, it is very common that patient may not express completely, especially in Indian scenario.

- Assessment begins with an evaluation of urinary function and symptoms, if any.
- Patient will be asked about any changes experienced in urinary and sexual functions.
- Patient must be assessed for painful urination (dysuria), urination at night (nocturia) or blood in urine (hematuria) or blood in ejaculation (hematospermia).
- Assessment of sexual dysfunction history and present symptoms.
- Assess for presence of any other illnesses such as hypertension, diabetes mellitus, cardiac diseases, etc.
- Assess for history of any sexually transmitted diseases, any surgery or any contraception.
- Medication and drug history have to be assessed.

Physical Assessment

During physical examination, two important examinations have to be performed; one is digital rectal examination (DRE) and second is testicular examination.

- **Digital rectal examination (DRE) (Figs 20.2A and B):**
  - This is regularly recommended examination especially after 50 years of age.
  - It is performed to screen for prostate cancer.
  - It is performed as a skilled examination. Patient is asked to be in side-lying position with legs flexed toward the abdomen and then investigator uses a lubricated, gloved finger to place into the rectum to assess the size, shape, symmetry and consistency of the prostate.
  - By palpation method, tenderness at prostate and of any nodule can be assessed.
  - During procedure, patient is asked to take deep breath and exhale air slowly. This act will reduce discomfort when finger of investigator is placed in the rectum.
- **Testicular examination:**
  - Palpating and inspecting the male genitalia may reveal abnormalities or masses.
  - By palpating the scrotum, we may notice hydrocele, inguinal hernia, testicular torsion, orchitis, epididymitis or tumor of testes.
  - Inspection and palpation of penis may bring into notice about ulceration, discharge, curvature, nodules.
  - In case of uncircumcised patient, the foreskin should be retracted for proper visualization of glans penis.
  - Assessment will further allow introduction of testicular self-examination (TSE) for early detection of cancer.
- **Testicular self-examination:** The following steps should be followed (Fig. 20.3):
  - Look for any swelling on the scrotum by holding scrotum in both hands and standing in front of the mirror.



Figs 20.2A and B: Digital rectal examination

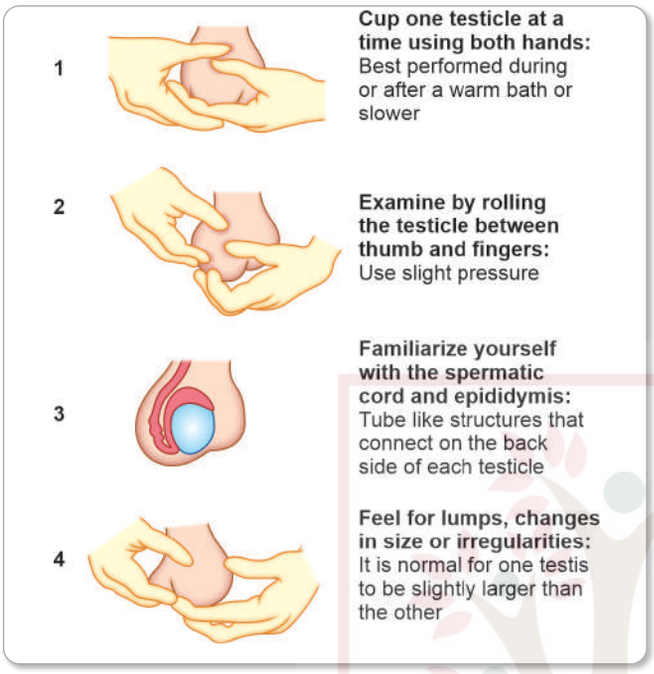


Fig. 20.3: Testicular self-examination

- Identify and monitor the weight and size of testes in every investigation or testing.
- With the help of hands, press around and notice any abnormal swelling or lumps. But also, you should understand that having up-and-down location of testes or big or smaller testes are bit normal and should not be taken seriously.
- Feel each testicle by keeping and holding with fingers and thumb, then understand its shape like its oval-shaped and smooth, but firm.

Diagnostic Assessment

Various kinds of diagnostic studies may be performed to detect exact diagnosis of reproductive disorders. The following can be used as most performed diagnostic tests in male reproductive system disorders:

- **Ultrasonography:** Transrectal ultrasound (TRUS) is advisable to patients whose DRE is positive. Here, a lubricated condom-covered rectal probe transducer is inserted into the rectum. Water is introduced into the condom to help transmit sound waves to the prostate. This method is also useful to detect nonpalpable prostate cancer.
- **Prostate-specific antigen test (PSA):** This test is a blood test used to screen for prostate cancer. It measures the amount of prostate-specific antigen (PSA) in blood. PSA is a protein produced by both cancerous and noncancerous tissue in the prostate. The blood level of PSA is often elevated in men with prostate cancer. The PSA test is only one tool used to screen for early signs of prostate cancer. PSA is measured by a simple blood test that does not require fasting or special preparation.
- **Test of male sexual functions:** If the patient is unsatisfied with the sexual interaction, a thorough history must be taken. A test called nocturnal penile tumescence test is performed, which is conducted in sleep laboratory to observe changes in penile circumference during sleep. This is performed for erectile dysfunction.
- **Prostate fluid or tissue analysis:** Here prostate tissue fluid or tissue may be taken for culture. Biopsy can also be performed to detect disease like inflammation.
- Histological examination like biopsy can be performed.

ERECTILE DYSFUNCTION

The popular term for such dysfunction is "impotence". In this condition, patient is not able to erect his penis for satisfactory sexual intercourse, which leads to inability to perform sex. In last few years, the number of such cases has increased and basic cause is sedentary lifestyle (Fig. 20.4).

The normal process of erection and ejaculation is a complex phenomenon, where both parasympathetic and sympathetic systems are involved.

Etiology

It has to be kept in mind clearly that once in a while if erection fails, it does not fall under erection dysfunction category. It is the case only when erection becomes a continuous problem or failure is ongoing. Normal erectile function can be affected

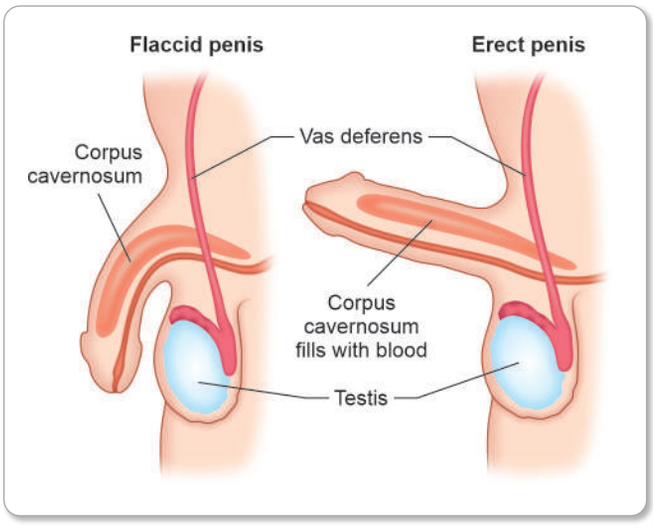


Fig. 20.4: Erectile dysfunction

by problems with blood flow, nerve supply or hormones. Further, the causes of ED can be either psychogenic or organic.

Organic causes are:

- Cardiac disease like CAD
- High cholesterol
- Hypertension
- Pituitary tumor
- Testosterone deficiency
- Hypo or hyperthyroidism
- Kidney failure
- Cirrhosis of liver
- Obesity
- Metabolic syndrome like diabetes mellitus
- Parkinson's disease
- Multiple sclerosis
- Tobacco use
- Peyronie's disease (development of scar tissue inside the penis)
- Alcoholism and other forms of substance abuse
- Treatments for prostate cancer or enlarged prostate
- Surgeries or injuries that affect the pelvic area or spinal cord.

Psychogenic causes can be:

- Anxiety
- Stress
- Depression, anxiety or other mental health conditions
- Fatigue
- Negative body image
- Absence of sexual desire
- Mistrust within a relationship
- Sleep disorders

Signs and Symptoms

Though ED itself is a great symptom, it brings some more symptoms, especially psychological symptoms like:

- Loss of self-confidence
- Reduced desire for sexual intercourse
- Stress
- Depression
- Guilt

Diagnostic Test

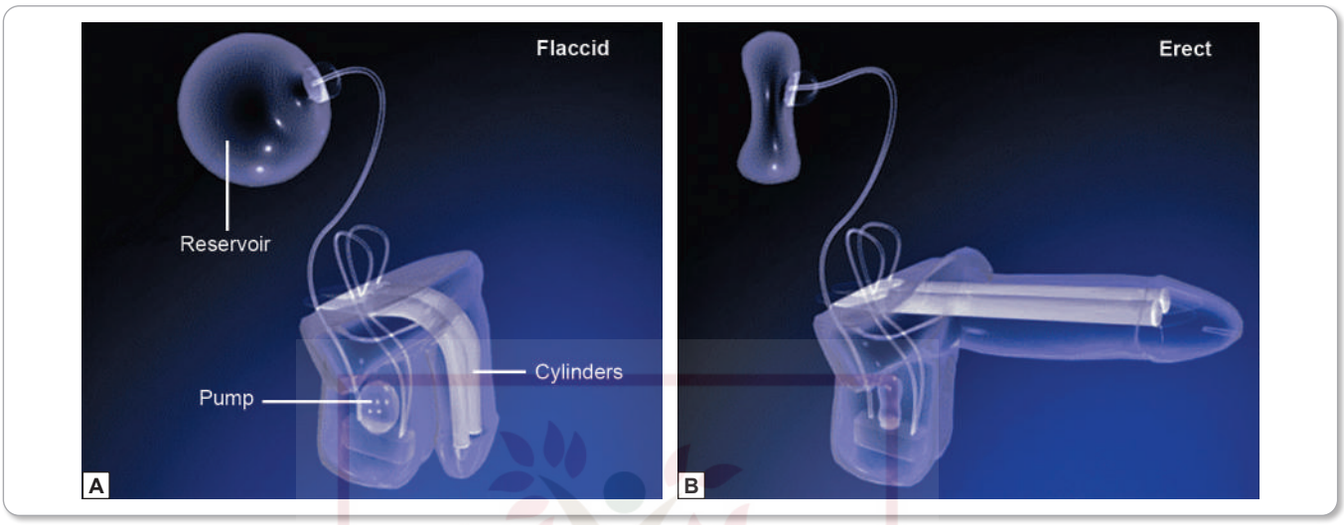
Physical examination and history of sexual function will almost confirm the diagnosis.

- Physical examination for sexual function and neurological examination.
- Nocturnal penile tumescence test to monitor penile circumference
- Doppler probe will measure arterial blood flow to penis.
- Nerve conduction test also needs to be performed to observe nerve functioning.

Treatment

Depending on the cause of ED, it can be treated with drugs, surgery or may be with combination of both.

- By treating associated disorders or adjustment of medications.
- Endocrine therapy to treat erectile dysfunction caused by hypothalamic-pituitary-gonadal dysfunction.
- Insufficient penile blood flow may be treated with vascular surgery.
- Psychological cause will be treated by other psychological therapies.
- **Drug therapy/pharmacological therapy:**
  - Phosphodiesterase type 5 inhibitors (PDE-5) like sildenafil (viagra), vardenafil and tadalafil are orally given as first-line therapy. These drugs lead to smooth muscle relaxation in blood vessels supplying the corpus cavernosum, which leads to increased blood flow and erection.
  - It is recommended having 1 hour before sexual intercourse (erection can last 1–2 hours).
  - Vasoactive agents like alprostadil, papaverine and Phentolamine can be injected directly into the penis, if patient is contraindicated for the PDE-5.
- **Penile implants:** This is a final option reserved for men who have not had any success with drug treatments and other noninvasive options. There are two types of implants used:
  1. **Inflatable implants:** This creates inflation during erection and remains deflated in nonerect condition. This type of implant is the most common. In the procedure, two-piece or three-piece inflated implants can be used. These both work on the same principle or their mechanism of action remains the same. Under the abdominal wall, the three-piece implants are placed along with pump and release valve. This pump and valve are placed inside the scrotum, whereas the three-piece implants are filled with fluid as reservoirs along with two cylindrical- shaped inflatable placed inside penis. In the erection state, the pump will pump the fluid from three-pieces to the inflatable cylinders, which cause erection and after ejaculation, fluid moves back to reservoirs (Figs 20.5A and B).
  2. **Semi-rigid rods:** Here, a semi-rigid rod implant is used, which always remains firm. For erection during sexual intercourse, this implanted penis will be bent away from the body (Fig. 20.6).



Figs 20.5A and B: Inflatable penile implants

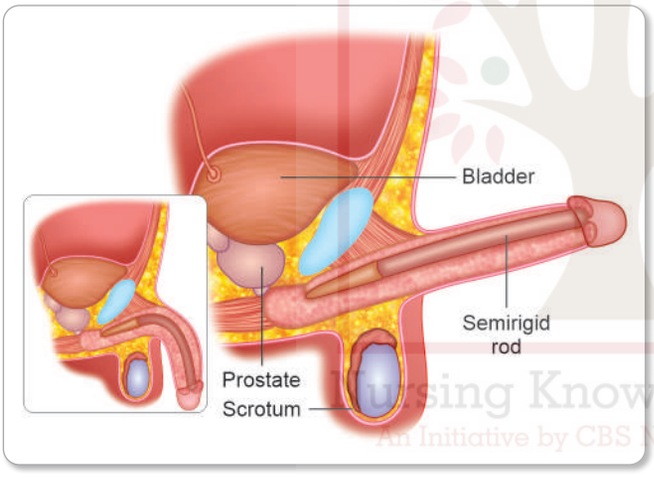


Fig. 20.6: Semirigid rod penile implant

- **Negative pressure device** is also known as vacuum device. Vacuum erection devices are a mechanical way of producing an erection. The penis is made rigid by the use of a vacuum pump sealed around it that draws up blood. The blood is then prevented from leaving the penis by the use of an accompanying band.
- **Yoga therapy** is also very helpful in managing this dysfunction.

EJACULATION DISORDERS

Ejaculation is a process which occurs at the end of sexual intercourse and during ejaculation, the semen expels into vagina through penis. The ejaculation process is regulated by brain.

The ejaculation disorder occurs when men cannot ejaculate semen from the penis during sexual intercourse. This is considered the most common form of disorder in male reproductive system and also considered the most common cause of male infertility.

Ejaculatory disorder can be classified into the following types:

Premature Ejaculation

As the name indicates, in this type of disorder, men ejaculate to early, probably within a minute of intercourse. Basically, this is not always considered a disorder because there are few pathological causes that define it.

Causes

There are very few pathological causes, but the majority of behavioral issues that may lead to this are:

- Anxiety or in any stressful situation
- Erectile dysfunction sometimes
- Neurological problem.

Treatment

The aim of treatment is to remove cause and psychotherapy is most effective method. Treatment may also need to prescribe medicines and physical therapy with an objective to help man last longer during sexual intercourse.

- Prescribing topical lidocaine-prilocaine cream helps to reduce sensitivity and allows men to stay longer by reducing sensitivity.
- Behavioral modification of men will make remarkable achievements because drugs will not be as effective in this case. Behavioral modification must include education about sexual intercourse along with proper psychological counseling to reduce fear and anxiety during intercourse.

Other than that, men should be educated about various techniques of altering stimulation or reducing stimulation before reaching sexual climax.

Delayed Ejaculation

This is opposite of premature ejaculation. When ejaculation is retarded beyond a reasonable period after sexual stimulation, it is delayed ejaculation. Though it occurs many times as normal occurrence but can be problematic if it occurs over a long period or it frustrates the sex partner. It may be general or situational, in which it may occur only with certain partners or situations.

Etiology

There are various causes of delayed ejaculation, ranging from side effects of few drugs, to some psychological problems. These causes can be:

- Heavy alcohol consumption
- Hypertension
- Some drugs such as diuretics/antipsychotic/seizure control drugs
- Depression/anxiety/poor self-esteem
- Congenital
- Pelvic nerve infections
- Complication of prostate surgery
- Neurological disorders
- Imbalanced hormones
- Improper sexual relationship

Treatment

The aim of the treatment is to reduce ejaculation in normal time limits and treatment depends on the cause. The following treatments can be administered:

- Prescribe antianxiety drugs
- Prescribe drugs for any underlying disease
- Treat complications of prostate surgery
- Treat neurological disorder
- Behavioral modification
- Encourage to stop or minimize alcohol consumption
- Lifestyle modifications also help to provide satisfactory result.

Retrograde Ejaculation

This is reverse kind of ejaculation where the sperm move back to urinary bladder instead of moving toward the vagina during ejaculation. Due to this, retrograde ejaculation is also known as dry ejaculation. This disorder causes infertility.

Etiology

This is a rare kind of disorder and the possible cause of it is due to nerve damage or muscular deformity, which promotes sperm moving backward then forward.

Treatment

Its treatment depends on the underlying cause.

Anejaculation

When men do not ejaculate at all, it is known as anejaculation. This can be a complication of some of systemic diseases like degenerative disorders of brain or diabetes.

- Anejaculation can be situational, which is sometimes because of behavioral issues such as stress/anxiety.
- Total anejaculation can occur when men may have sexual activity but no ejaculation takes place.
- Anejaculation can also be caused because of certain surgical procedures or head or spinal cord injuries where ejaculate nerve gets damaged and no more ejaculation occurs.
- Proper psychological counseling will help majority of patients.
- Penile vibratory stimulation technique can be prescribed for needy patients and this device uses vibrations to erect the penis and induce ejaculation as well.

PROSTATITIS

Prostatitis is defined as inflammation of prostate gland. Many times, it also occurs along with urinary tract symptoms and sexual discomfort (Fig. 20.7).

Prostatitis can be acute or chronic. The acute form results from infection by bacterial attack and occurs all of

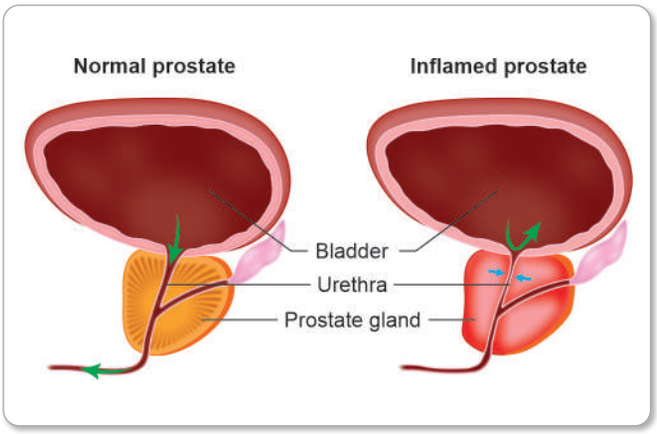


Fig. 20.7: Prostatitis

a sudden, whereas in chronic condition, it is the repeated attack of bacterial infection. This is also categorized into four types:

1. **Type-I:** Acute bacterial prostatitis
2. **Type-II:** Chronic bacterial prostatitis
3. **Type-III:** Chronic prostatitis/chronic pelvic pain syndrome
4. **Type-IV:** Asymptomatic inflammatory prostatitis.

Etiology

As stated earlier, it is caused by bacterial infection. Causes are listed as follows:

- Bacterial infection of *E. coli*, Klebsiella and Proteus species
- Other infections from fungi, mycoplasma
- Other conditions like BPH, urethral stricture

Some risk factors increase chances to have prostatitis:

- High in middle to young age
- Urinary bladder infection
- Pelvic trauma
- Urinary catheterization
- Chronic infections like HIV/AIDS
- Diagnostic prostate biopsy may introduce chances of infection to prostate.

Signs and Symptoms

Patient will experience the following symptoms:

- Perineal prostatic pain
- Dysuria
- Fever
- Severe lower urinary tract infections
- Difficulty in urinating
- Nocturia
- Urgent need to urinate
- Cloudy urine
- Blood in the urine
- Painful ejaculation
- Flu-like signs and symptoms if there is bacterial prostatitis

Diagnostic Test

Physical examination and history of signs and symptoms will guide further investigation:

- Urine analysis
- Prostatic fluid analysis
- DRE
- Blood test: CBC
- Ultrasonography
- CT/MRI scan (rare cases)

Treatment

The aim of treatment is to eradicate causative organism and bring back normal functions. Still, treatment depends on test results and type of prostatitis. If bacterial, then:

- Antibiotics such as trimethoprim-sulfamethoxazole or fluoroquinolone
- Low-dose antibiotic therapy with continuous therapy
- Alpha-adrenergic blocker therapy is prescribed to promote bladder and prostate relaxation.
- Anti-inflammatory medications are prescribed to manage pain.

Nursing Interventions

Along with medical treatment, the nurse should advise some important measures to follow or administer:

- Provide sitz baths
- Instruct patient to avoid alcohol, caffeine, and spicy foods
- Prostate massage has been shown to decrease symptoms in some patients with chronic nonbacterial prostatitis.
- Acupuncture has shown a decrease in symptoms for some people who suffer from prostatitis.
- Administer prescribed drugs.
- Educate patient and relatives about completing course of antibiotic.
- Ask to maintain balanced fluid intake (allowed to take but not as a result of forceful act).
- Ask patient not to sit for long periods to avoid discomfort

Benign Prostatic Hyperplasia

This is one of the most common diseases with increased age. Benign prostatic hyperplasia (BPH) is defined as enlargement or hypertrophy of prostatic cells which is noncancerous. BPH causes bothersome lower urinary tract symptoms which alter quality of life and sleep (Fig. 20.8).

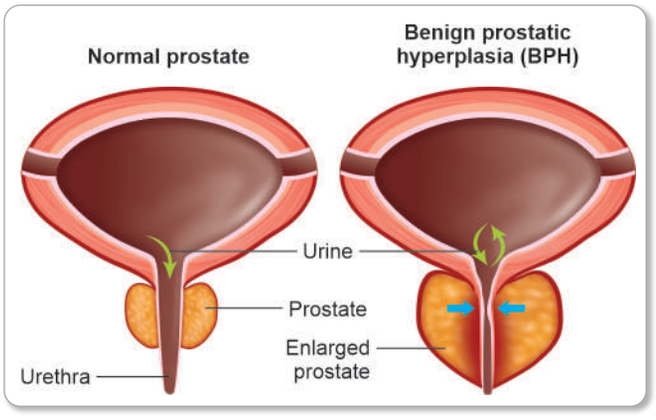


Fig. 20.8: Benign prostatic hyperplasia

Etiology

Although cause in BPH is unknown, it can occur after 45 years of age in anyone. There is a theory to explain cause of BPH as:

- Let us understand that DHT (Dihydrotestosterone) is a metabolite of testosterone and is considered a critical mediator of prostatic growth.
  - Now, when men have increased level of estrogen, then prostate tissue becomes more sensitive to estrogen than DHT, which leads to BPH.
- Along with this, there are various risk factors that may accelerate development of the disease such as:
  - Aging
  - Hereditary
  - Heavy alcohol consumption
  - Heavy smoking
  - Hypertension
  - Obesity
  - Diabetes
  - Reduced activity level
  - High animal and low fiber diet.

Pathophysiology

Pathophysiology of BPH has been depicted in Figure 20.9. The BPH is a noncancerous enlargement of the prostate gland, which commonly occurs in older men, usually after the age of 50. The condition affects urination by compressing the urethra, which passes through the prostate.

- **Hormonal influence with aging:**
  - As men age, there is a natural change in hormone levels, especially a decrease in testosterone and a relative increase in estrogen.
  - Another hormone called dihydrotestosterone (DHT), which is a form of testosterone, accumulates in the prostate.
- **Prostate cell overgrowth:**
  - DHT stimulates prostate cell growth, leading to enlargement of both the glandular and stromal (supportive) tissue.
  - The inner part of the prostate (called the transitional zone) begins to grow inward, surrounding the urethra.
- **Urethral compression:**
  - As the prostate enlarges, it squeezes the urethra, which is the tube that carries urine from the bladder out of the body.
  - This results in partial blockage of urine flow.
- **Bladder response:**
  - The bladder has to work harder to push urine through the narrowed urethra.
  - Over time, the bladder muscle becomes thicker, more sensitive, and irritable.
- **Urinary symptoms appear:** The patient may begin to experience difficulty starting urination, weak urine stream, frequent urination, urgency, dribbling or incomplete emptying of the bladder.
- **Possible complications:** If not treated, BPH can lead to urinary retention, bladder damage, urinary tract infections (UTIs) or even kidney damage due to backpressure.

As men grow older, hormonal changes cause the prostate to grow bigger. This growth presses on the urethra, making it hard to pass urine. The bladder struggles to push urine out, leading to urinary problems over time.

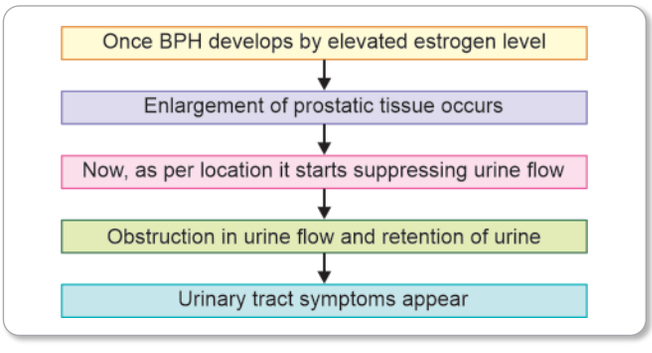


Fig. 20.9: Pathophysiology of BPH

Signs and Symptoms

In BPH, majority of symptoms occur with lower urinary tract symptoms which may include:

- Urine urgency and increased frequency
- Urine retention
- Nocturia
- Incomplete bladder emptying
- Hesitant to urinate
- Abdominal straining with urination
- Reduced volume and force of urinary system
- Urine dribbles out after urination
- Recurrent urinary tract infections
- Large residual volume leads to azotemia (accumulation of nitrogenous waste products)
- Kidney failure

Other symptoms may be:

- Fatigue
- Anorexia
- Pelvic discomfort
- Nausea and vomiting

Possible complications are:

- Urinary retention
- Urinary tract infections
- Kidney damage/kidney failure
- Prostatic cancer
- Urethral stricture
- Bladder stone
- Bladder damage

Diagnostic Test

Physical examination and health assessment along with history of lower urinary tract symptoms will lead the investigation in right path and further following tests may be administered to confirm the diagnosis of BPH.

- Urinalysis
- Prostate-specific antigen (PSA) blood test
- Urodynamic tests
- Cystoscopy
- Transrectal ultrasound
- Biopsy

Treatment

The goal of treatment is to improve urine flow by correcting urinary tract symptoms and improve quality of life and prevent complications. Following pattern of treatment may be followed as lifestyle modification, drug/pharmacological therapy, minimally invasive therapy and surgical treatment.

- **Lifestyle modification:** It will include cessation of some habits which may accelerate BPH.
  - Restricting fluid intake, especially while going out or before periods of sleep
  - Avoiding caffeinated beverages and alcohol
  - Bladder training will help the patient avoid awkward situations
  - Pelvic floor muscles exercises will give relief to the patient
- **Drug/pharmacological therapy** includes:
  - Alpha-adrenergic blockers and 5-alpha-reductase inhibitors will relax the smooth muscles of bladder neck and prostate and improve urination. These drugs include alfuzosin, terazosin, doxazosin and tamulosin.
  - Hormonal manipulation with antiandrogen agents, **5-alpha reductase inhibitors such as** finasteride (Proscar) and dutasteride (Avodart) are used to prevent conversion of testosterone to DHT and also reduce size of prostate.
  - **Combination medications such as** finasteride and doxazosin, dutasteride and tamsulosin (Jalyn)—a combination of both medications that is available in a single tablet—and alpha blockers and antimuscarinics are effective in decreasing symptoms of BPH.
- **Minimum invasive therapy:** Following therapy may be used as minimal invasive therapy:
  - **Transurethral microwave thermotherapy (TUMT):** A catheter, also known as an antenna, is inserted into the prostate through the urethra, microwaves are delivered to the enlarged prostate and heat is created that kills the swollen section of the prostate. Additionally, a connected cooling system prevents injury to other organs.
  - **Transurethral needle ablation (TNA):** In this procedure also, hot application is placed onto prostate tissues by utilizing radio frequency. In this procedure, through cystoscope, small needles are introduced and then radiofrequency passes through these needles to heat the enlarged portion or tissue of prostate. This application will destroy enlarged tissues of prostate and the shields save other parts from getting harmed by heat.
  - **Transurethral electrovaporization:** This procedure vaporizes the enlarged tissue of prostate by passing electric current. To transfer this electric current, a resectoscope has to be placed, which is a tube-like structure attached with electrodes at external end.
  - In some cases, heated water is also used to destroy enlarged prostate tissues *via* Water-induced thermo-therapy.
  - **Prostatic stent insertion:** The mechanism of action of this procedure is similar to angioplasty. Here the passage of urethra will be widened by passing stent and leaving it as permanent or temporary.
- **Surgical treatment:** If surgery is the choice of treatment, the patient must bring any rectified coagulation deficiencies and refuse anticoagulant medication because bleeding is a serious complication of prostate surgery. Following surgeries will be performed to treat moderate to severe form of BPH:
- **Transurethral resection of the prostate (TURP):** This is the most common procedure to treat BPH. Here, the enlarged prostate tissues will be cut down into small pieces by wire loop and then these small pieces will be carried to urinary bladder and then flushed out from body. This procedure takes place with the help of resectoscope. This procedure is one of the standard surgical treatments of BPH (Fig. 20.10).

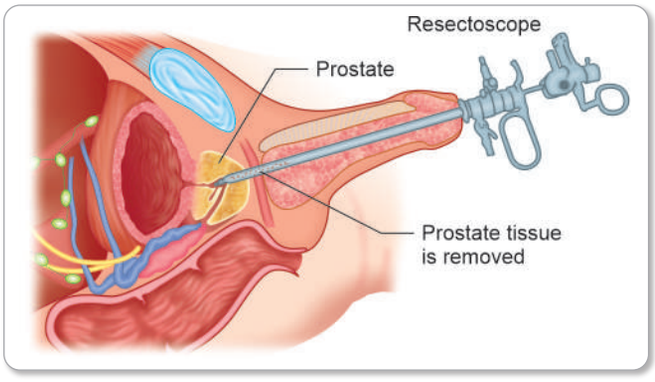


Fig. 20.10: Transurethral resection of the prostate

- **Laser surgery:** In this surgery, the high-energy laser is used to destroy enlarged tissues. These lasers are introduced through cystoscope.
- **Open prostatectomy:** In this surgical intervention, it is to be seen whether the whole or part of prostate is to be removed. This is end treatment, that means when BPH reaches a state from where complications begin and condition is very severe, this procedure is performed. Based on condition, three kinds of prostatectomy can be performed as: Retropubic prostatectomy, suprapubic prostatectomy, and perineal prostatectomy.

EVIDENCE-BASED PRACTICE

A study reveals that α-blockers and 5ARIs (5 α-reductase inhibitors) are effective at reducing symptoms in the short term for BPH patients. However, only the 5ARIs impact disease progression and maintain improvement in symptoms in the long term: Issa MM, Kraft KH. Journal of the American Academy of Nurse Practitioners, Volume 19, Issue 8 page no. 398-407, August 2007

NURSING MANAGEMENT

Nursing priorities are:
- Relieve urinary retention
- Promote comfort
- Prevent complication
- Provide psychological support
- Enhance knowledge of patient.

NURSING CARE PLAN

Benign Prostatic Hyperplasia

Assessment	Nursing diagnosis	Goal	Interventions	Rationale	Evaluation
Subjective data: Patient complains of limited urine outcome and dribbling.	Acute urinary retention related to enlarged prostate and restricted bladder contraction.	Patient should void in sufficient amount of urine with no bladder distension.	• Promote patient to void every 3–4 hours; urgency has to be noted. • Get information about stress incontinence when moving, coughing, sneezing, and weight lifting. • Monitor and record urinary stream; note size and force.	• May help to minimize retention. • If there is high urethral pressure, reduce bladder emptying. • To assess degree of obstruction • To understand disease progression. • To detect distention	Patient is voiding sufficient amount of urine.
Objective data: Noticed bladder distension, frequency, hesitancy and inability to empty bladder completely.			• Record each void with time and amount. • Palpate suprapubic area. • Promote or provide oral fluids up to 3000 mL/day. • Measure and record vital signs. • Measure and record intake and output. • Provide aseptic catheter care. • Administer sitz bath if prescribed. • Prepare patient for surgical intervention like TURP, if indicated.	• Increased circulating volume enhances renal perfusion and increases urine passage. • To know about any complication. • To measure fluid status. • To prevent from infection. • To promote muscle relaxation and reduce edema. • Preparing for surgery.	

Contd...

Assessment	Nursing diagnosis	Goal	Interventions	Rationale	Evaluation
Subjective data: Patient complains of sudden pain at lower abdomen. **Objective data:** Noticed bladder distension and altered muscle tone, grimacing and behavioral changes. Pain scored 6/10 on 10-point pain scale.	Acute pain related to mucosal irritation, renal colic and bladder distension.	To relieve pain and promote comfort	• Assess pain with its location, duration and intensity on 10-point pain scale. • Tape drainage tube to thigh and catheter to the abdomen. • Promote bed rest. • Provide additional comfort measures such as repositioning, back massage, deep-breathing exercise. • Administer sitz bath if prescribed. • Administer analgesic as prescribed.	• Provide pain information and assess effectiveness of intervention. • It helps to prevent stress on the bladder. • In early phase, bed rest required. • To promote relaxation and also help cope. • Sitz bath promotes muscle relaxation. • Helps to control pain.	Pain relieved and patient is comfortable.
Subjective data: Patient complains of threat to health status. **Objective data:** Behavior of patient gives cues of anxiety such as feelings of embarrassment or loss of dignity because of exposure of genital organs.	Anxiety related to threat to self-concept or change of health status and possibility of surgical intervention.	To eliminate anxiety level	• Be available to patient. • Provide psychological support. • Share successful stories of patients who earlier suffered from the same disease. • Promote rest. • Inform and educate about disease progression and its treatment. • Provide calm and safe environment to express feelings. • Clear all doubts for the patient. • Maintain healthy atmosphere along with patient and develop trust with care. • Should enhance coping mechanism as patient may feel isolated and helpless.	• Felt concerned. • Patient feels respected and accepted. • Example: Help patient to gain confidence and also assure that successful treatment is possible. • Reduces unnecessary stress. • Develops trust. • Important to establish therapeutic relationship. • Informing patient will involve him in treatment regimen. • Pleasant atmosphere will keep patient calm. • Patient will learn ways to cope.	Anxiety reduced and patient receives familiar environment.
Subjective data: Patient shows his inability to understand disease process and also about treatment regimen. **Objective data:** It is noticed that patient didn't understand the disease process and various cadres of treatment.	Knowledge and self-care deficit related to information misinterpretation and unfamiliar resources.	To improve understanding of patient about disease process and treatment modalities.	• Let patient know about his perception of disease process • Encourage patient to speak up about fears. • Educate patient that this is not a Sexually Transmitted Disease (STD). • Educate patient not to consume spicy foods, coffee, alcohol and also fast eating. • Educate about fertility issues. • Instruct and educate about regular follow-up.	• Understanding of disease symptoms will increase cooperation of patient in treatment plan. • Helps to maintain fearless environment. • To eliminate uncounted fear of patient. • These food or fluids may cause prostatic irritation. • To clear all unsaid doubts. • To maintain a therapeutic regimen.	Patient understood about disease process, diagnosis treatment, self-care and lifestyle modification to control and get cured of benign prostatic hyperplasia (BPH).

Prostate Cancer

When cancer develops in the prostate gland, it is known as prostatic cancer. Prostate cancer is the most common cancer among men after skin cancer, but it can often be treated successfully. Prostate cancer usually grows very slowly (in rare cases, it grows quickly), and finding and treating it before symptoms occur may not improve health or help them live longer.

Almost all prostate cancers are adenocarcinomas and other types of prostate cancer may include: Sarcomas, small cell carcinomas, neuroendocrine tumors (other than small cell carcinomas) or transitional cell carcinomas.

Etiology

Although the exact cause is unknown, on basic philosophy, prostate cancer is caused by changes in the DNA of a normal prostate cell. But, there are many risk factors identified which encourage prostate cancer. These are as follows:

- Increased age
- Hereditary
- Eating excessive amounts of red meat and high-fat diet
- Genes (inherited mutations of the *BRCA1* or *BRCA2* genes raise the risk)
- Obesity
- Heavy smoking
- Prostatitis
- Vasectomy
- Sexually transmitted disease

Signs and Symptoms

Early stage of prostatic cancer hardly produces any symptoms and later may reflect the following:

- Trouble in urinating
- Decreased force in the stream of urine
- Blood in semen
- Discomfort in the pelvic area
- Bone pain
- Erectile dysfunction
- Symptoms of metastases such as backache, hip pain, perineal and rectal discomfort, anemia, weight loss, weakness, nausea, oliguria or pathologic fracture.

Stages of Prostate Cancer

- **Stage A/stage-I:** This is the first stage of prostate cancer, which is totally curable if diagnosed early. However, diagnosis of the first stage prostate cancer is very difficult because no symptoms are reflected by patient.
- **Stage B/stage-II:** In second stage of prostate cancer, few symptoms suggest to go for further diagnosis and DRE will further suggest going for other investigations. Second stage can be identified if Gleason grade reflect score 7 or more. The Gleason grade is used to calculate prognosis of prostate cancer.
- **Stage C/stage-III:** In the third stage of prostate cancer; the cancer starts spreading from prostate to other organs but metastasis does not happen.
- **Stage D/stage-IV:** In fourth stage of prostate cancer, the metastasis process begins and reaches to other parts such as pelvis spine, lumber region, etc.

TNM Stages of Prostate Cancer

This is one of the most common ways to classify stages of prostate cancer. Here, TNM stands for **T**umor, **N**ode and **M**etastasis. Based on TNM, it can be as follows:

Tumor	• The size of tumor keeps prostate cancer in four types and these can be from T1 to T4 • Abbreviation **TX** indicates that the primary cancer cannot be assessed, T0 indicate that there is no cancer. • T1 to T4 further indicate as follows: ▪ **T1:** Tumor cannot be felt during examination or can be small to visualize through imaging studies ▪ **T2:** Tumor can be felt during DRE (Digital Rectal Examination) ▪ **T3:** Tumor grows outside the prostate probably to the seminal vesicles ▪ **T4:** Tumor spreads to the surrounding tissues such as rectum, bladder
Node	It will indicate whether cancer spreads to the lymph nodes or not and it can be indicated as follows: • **NX:** When lymph nodes cannot be assessed • **N0:** Cancer has not spread to any of nearby lymph nodes • **N1:** Cancer spreads to one or more nearby lymph nodes in the pelvis
Metastasis	It will indicate whether cancer spreads to different parts of body or not and it can be indicated as follows: • **M0:** Cancer has not spread to any organ or lymph node • **M1:** Cancer spreads to other parts of body and can be further classified as: ▪ **M1a:** Spread to lymph nodes outside the pelvis ▪ **M1b:** Cancer spreads to bones ▪ **M1c:** Spread to other organs such as lung, liver, brain

Diagnostic Tests

Physical examination and history will be initial part of diagnosis and then to confirm diagnosis of cancer, following investigations may be preferred:

- Digital rectal examination (DRE)
- PSA
- Ultrasonography
- Biopsy
- Urinalysis: PCA3 test examining the urine for the PCA3 gene only found in prostate cancer cells.

Treatment

Treatment is based on its severity and patient's life expectancy. Following treatment options are available:

Watchful Waiting or Continuous Monitoring

Prostate-specific antigen (PSA) blood levels are regularly checked, but there is no immediate action. The risk of side-effects sometimes outweighs the need for immediate treatment for this slow-developing cancer.

Radiation Therapy

Two major forms of radiation are used:

1. **Teletherapy** is the external-beam radiation therapy (28 treatments over 5 and half weeks for low-risk patient and more high risk patients receive higher dose of it) and
2. **Brachytherapy** is the internal radiation therapy where radioactive seeds are implanted into the prostate to deliver targeted radiation treatment. This is commonly used monotherapy treatment for early prostatic cancer.

Surgical Management

Radical prostatectomy (surgical removal of prostate): Traditional surgery requires a hospital stay of up to 10 days, with a recovery time of up to 3 months. Robotic- assisted surgery involves a shorter hospitalization and recovery period, but it can be more expensive. Erectile dysfunction or impotence is common side effect of it.

Hormone Therapy

Androgen deprivation therapy (ADT) or androgen suppression therapy, is a hormone treatment that reduces the effect of androgen. Androgens are male hormones that stimulate cancer growth. ADT can slow down and even stop cancer growth by reducing androgen levels. But it requires long time of administration.

Chemotherapy

There is clear benefit in terms of survival with chemotherapy treatment, which includes a docetaxel-based regimen for nonandrogen-dependent prostatic cancer.

Gene-based therapy is an emerging and promising adjuvant to conventional treatment strategies.

Cryotherapy (Cryosurgery)

It is used to ablate prostate cancer. Here, transperineal probes are inserted into the prostate under ultrasound guidance to freeze the tissue directly.

Other Treatments

- Vaccine treatment
- Bone-directed treatment

EVIDENCE-BASED PRACTICE

A prospective, nonrandomized controlled clinical trial conducted by Angenete E, Angerås U, Börjesson M, Ekelund J, Gellerstedt M, Thorsteinsdottir T, Steineck G, Haglind E revealed that a high level of physical activity preoperatively before prostatectomy was associated with reduced need for sick leave after radical prostatectomy compared to men with lower physical activity. *BMC Urology, Volume 16, Issue 1 page no. 50, August 2016*.

NURSING CARE PLAN

Prostatectomy

Assessment	Nursing diagnosis	Goal	Interventions	Rationale	Evaluation
Subjective data: Patient complains of changes in urine frequency, urgency.	Impaired urinary elimination related to surgical procedure and pressure of catheter.	Patient should void in normal amount of urine with no bladder distension	• Assess urine output and check for catheter and drainage system, especially during bladder irrigation. • Help the patient for maintaining position for voiding.	• Due to surgery, retention can occur. • Sense of voiding will develop. • To record and to look at after removal of catheter, if voiding issues are present.	Patient is voiding sufficient amount of urine.

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Assessment	Nursing diagnosis	Goal	Interventions	Rationale	Evaluation
Objective data: Noticed bladder fullness and frequency, hesitancy or obstruction.			• Document every urination in regard to time, amount of voiding, and size of stream after catheter is removed. **Note:** Reports of bladder fullness; inability to void, urgency. • Motivate patient to void in every 3–4 hours. • Measure and record residual volumes *via* suprapubic catheter. • Encourage fluid intake to 3000 mL as tolerated. • Instruct or demonstrate to patient about perineal exercises, such as tightening buttocks, stopping and starting urine stream. • Inform patient that "dribbling" is to be expected after catheter is removed and should resolve as recuperation progresses. • Maintain continuous bladder irrigation.	• Voiding with urgency helps in retention. • Monitor effects of bladder emptying. • Increased circulating volume enhances renal perfusion and this increases urine passage. • To reduce chances of incontinence. • It will help patient to deal with it. • To maintain patency of catheter.	
Subjective data: Patient complains of dry skin and reduced urination. **Objective data:** It is noticed that patient shows signs of dehydration like dry mucous membrane.	Risk for fluid volume deficit related to restricted intake and Post-obstructive diuresis.	To improve hydration status of the patient.	• Measure and record intake and output. • Frequently measure vital signs but avoid rectal method to measure temperature and record any alteration, if notice. • Record any change in behavior like restlessness. • Provide oral fluid, if not contraindicated and can administer approximately 3000 mL fluid/day. • Avoid excessive manipulation of catheter. • Monitor catheter for any drainage or bleeding. • Record as document about urine color, consistency and specific gravity. • Observe and record if there is any drainage or bleed from wound. • Administer IV fluid if prescribed.	• Inform about fluid and electrolyte balance. • To observe any sign of complication or dehydration. And rectal method may cause irritation to prostate bed. • May indicate reduced cerebral perfusion. • To flush kidney. • May cause bleeding • After 24 hours bleeding is not common. • Color or consistency will inform about any bleeding or other signs. • To detect any infection or other complication. • To maintain fluid balance.	Patient gets hydration status and risk of fluid volume deficit subsided.
Subjective data: Patient may complain of raised temperature or bleeding or pus at surgical site.	Risk for infection related to surgical incision.	To minimize risk of infection.	• Practice sterile catheter administration and aseptic catheter care has to be demonstrated. • Ambulate with drainage bag dependent.	• Helps to prevent infection. • Avoids backward reflux of urine, which may introduce bacteria into the bladder. • Vital signs are indicators of any infection, if arise.	Minimizes risk of infection after surgery.

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Assessment	Nursing diagnosis	Goal	Interventions	Rationale	Evaluation
Objective data: Laboratory result indicates about high level of WBC and increased ESR.			• Frequently measure vital signs and record any alteration if noted. • Nurse should check for any kind of drainage from wound or catheter. • Practice strict aseptic technique while changing dressing. • Apply ostomy-type skin barriers. • Administer antibiotics as prescribed.	• Any drain will indicate presence of leakage system or introduction of infection. • To prevent infection. • Surrounding skin will be protected by these skin barriers. • Antibiotics help to control infections.	
Subjective data: Patient complains of pain at surgical site. **Objective data:** Patient's facial expression suggests discomfort and pain measures 5/10 on 10-point pain scale.	Acute pain related to surgical procedure and pressure of bladder balloon or traction	To relieve pain and promote comfort.	• Assess pain characteristics such as location, duration, intensity and level on pain scale. • Demonstrate adequate catheter care and patency of catheter system. • Provide an adequate amount of fluid as much patient tolerates. • Patient should be well-informed about drainage system. • Frequently repositioning patient. • Introduce some relaxation or diversional techniques. • Administer sitz bath if patient tolerates. • Administer analgesic drugs as prescribed.	• Help to identify pain status and to plan care of pain. • Proper catheter care will decrease risk of bladder irritation. • Irritation of bladder mucosa will be reduced by providing adequate amount of fluid. • Reduce anxiety and promote patient cooperation. • Repositioning will help to reduce risk of pressure ulcer. • Relaxation or diversional techniques will divert patient's mind from pain. • Sitz bath promotes healing and improves tissue perfusion. • Drugs will help to control pain.	Pain relieved and patient feels comfortable.
Subjective data: Patient shows his/her inability to understand surgical procedure and outcome of it. **Objective data:** It is noticed that patient does not understand about surgical outcome and therapeutic needs with proposed lifestyle modification.	Knowledge and self-care deficit related to information misinterpretation and unfamiliar resources.	To improve understanding of patient about surgical outcome	• Let patient know about his/her perception of disease process including surgical intervention requirement. • Encourage patient to speak about fears. • Educate patient activity restriction like prolonged sitting, heavy weight lifting. • Educate patient to continue perineal exercise. • Educate about catheter care. • Instruct and educate about regular follow-up.	• Understanding of disease symptoms will increase cooperation of patient in treatment plan. • Helps to maintain fearless environment. • These activities will increase abdominal pressure and bladder pressure. • Helps to facilitate in urinary control. • So that unintentionally infection will not be introduced. • To maintain therapeutic regimen.	Patient understands about disease process, with surgical outcome and proposed lifestyle modifications with self-care.

Recommendation for RPR Test

Doctor may order an RPR test for several reasons.

- To screen for syphilis in people having symptoms of sexually transmitted infections.
- To screen people who are at risk of exposure to syphilis, such as having another STD or HIV infection, homosexual men having a sexual partner diagnosed with syphilis or indulged in high-risk sexual activity.
- To screen pregnant women for syphilis
- To monitor the treatment of syphilis

Way for Sample collection

A blood sample may be obtained with a simple procedure called a venipuncture for the RPR test. This can be done in the doctor's office or a lab. There is no need to fast or take any other special measures before this test. The test involves the following steps:

- Ask patient to sit in a comfortable chair or lie down on a cot.
- Tie rubber tubing around upper arm to help make patient's veins stand out. When vein is visualized, then swab the spot with rubbing alcohol to cleanse it and insert a needle into the vein. Tell the patient that needle may produce a sudden, sharp pain, but it typically doesn't last long.
- Once the blood sample is obtained, remove the needle from patient's vein, hold pressure on the puncture site for a few seconds, and offer a bandage.

Risks of the RPR test

Although venipuncture is minimally invasive and carries very few risks, some people complain of soreness, bleeding or bruising after the test. Apply an ice pack to the puncture wound to help relieve these symptoms. Some people may experience lightheadedness or dizziness during the test.

Interpreting RPR results

Negative: A negative (nonreactive) RPR test result is compatible with a person not having syphilis.

The result of this test can be "positive" or "negative". But there are some cases, where the results can be false positive or false negative.

A negative ("nonreactive") RPR test result suggests that a person is not having syphilis. However, the body does not always produce antibodies specifically in response to the syphilis bacteria, so the test is not always accurate. False-negative test result may occur in people with early- and late-stage syphilis. Because of that other tests are required to confirm the results.

A false-positive RPR (means positive results in the absence of syphilis) can be encountered in infectious mononucleosis, tuberculosis, leprosy, malaria, lupus erythematosus, vaccinia, and viral pneumonia. Pregnancy, autoimmune diseases, and narcotic addictions may give false-positive results. Also, this test may give false-positive results in pinta, yaws, bejel, and other treponemal diseases.

The RPR test is also used to monitor treatment response. Treatment response is generally indicated by a 4-fold (2-tube dilution) reduction in rapid plasma reagin (RPR) titer (e.g., from 1:32 to 1:8). For proper interpretation of RPR results, titers should be obtained using the same testing method and, preferably, at the same testing laboratory.

Failure of nontreponemal test titers to decline 4-fold within 6 months after therapy for primary or secondary syphilis may be indicative of treatment failure. Patients whose titers remain serofast should be reevaluated for HIV infection.

Alternatives

Another test often used to screen for syphilis is the venereal disease research laboratory (VDRL) slide test. However, the RPR test is generally preferred due to its ease of use.

Semen Analysis

Semen, also called seminal fluid, fluid that is emitted from the male reproductive tract and that contains sperm cells, which are capable of fertilizing the female's eggs. Semen also contains liquids that combine to form seminal plasma, which helps keep the sperm cells viable.

Semen analysis is a test of a man's sperm and semen. Also called seminogram, spermiogram, sperm count or male fertility test, its results show how many sperm are released, as well as how they are shaped and how well they move. A semen analysis measures three major factors of sperm health:

1. The number of sperm
2. The shape of the sperm
3. The movement of the sperm, also known as "sperm motility".

Reasons for Test

People may require a sperm analysis for different reasons.

- Some individuals or couples will request a sperm analysis if they are having difficulty conceiving. In couples that have been unable to conceive, some estimates suggest that there is a male factor present in 40–50% of trusted source cases.
- Up to 2% trusted source of men demonstrate issues with their sperm, resulting from one or a combination of:
  - Low sperm count in a sample of semen

  - Poor sperm movement, known as motility
  - Abnormal sperm size and shape, known as morphology
- People may also have a sperm analysis to check if a vasectomy was successful.

Preparation before Semen Analysis

It is very important to follow these instructions for accurate results and to get the best sample:

- Avoid ejaculation for 24–72 hours before the test.
- Avoid alcohol, caffeine, and drugs such as cocaine and marijuana 2–5 days before the test.
- Stop taking any herbal medications as instructed by healthcare provider.
- Avoid any hormone medications as instructed by healthcare provider.
- Avoid providing a sample when unwell or stressed
- Do not use lubricants when collecting the sample

Collection Method

There are four main ways to collect a semen sample:

1. **Masturbation:** The most common way to collect a sample is for a person to masturbate and ejaculate into a sterile cup. The doctor provides a private room for a person to do this. Masturbation is considered the preferred way to get a clean sample.
2. **Sex with a condom:** In some cases, a person can collect the semen sample at home. A doctor can provide a special condom that allows a person to collect a semen sample during sexual activity.
3. Sex with withdrawal before ejaculation
4. Ejaculation stimulated by electricity

Usually, a doctor will require a person to provide a semen sample while in the doctor's office. Otherwise, a doctor may recommend that the person ejaculates into a collection cup while at home. When collecting a sample at home, people must remember to keep it at room temperature and bring it to the laboratory within a short timescale after collection.

Test Interference

Some factors can negatively affect the test, including:

- Semen coming into contact with spermicide
- Taking the test when you're ill or stressed
- Lab technician error
- Contamination of the sample

Normal Result

Sperm shape: A normal result for sperm shape is that >50% of sperm are normally shaped. If a man has >50% of sperm that are abnormally shaped, this reduces his fertility. A laboratory may identify abnormalities in the sperm's head, midsection or tail. It is also possible the sperm could be immature and therefore, not able to effectively fertilize an egg.

Movement: For a normal result, >50% of sperm must move normally an hour after ejaculation. Sperm movement or motility, is important to fertility because sperm must travel to fertilize an egg. An automated system analyzes the sperm for movement and rates them on a scale of 0–4. A score of 0 means the sperm are not moving, and a score of 3 or 4 represents good movement.

pH: A pH level should be between 7.2 and 7.8 to achieve a normal result. A pH level higher than 8.0 could indicate the donor has an infection. A result less than 7.0 could indicate the specimen is contaminated or that the man's ejaculatory ducts are blocked.

Volume: The volume of semen for a normal result should be >2 milliliters. A low semen volume could indicate a low amount of sperm to fertilize an egg. An excess fluid volume could also mean the amount of sperm present is diluted.

Liquefaction: It should take 15–30 minutes before semen liquefies. While semen is initially thick, its ability to liquefy or turn to a watery consistency, helps sperm to move. If semen does not liquefy in 15–30 minutes, fertility could be affected.

Sperm count: The sperm count in a normal semen analysis should be between 20 million to over 200 million. This result is also known as sperm density. If this number is low, conceiving can be more difficult.

Appearance: The appearance should be whitish to gray and opalescent. Semen that has a red-brown tint could indicate the presence of blood, while a yellow tint could indicate jaundice or be a medication side effect.

Abnormalities in semen:

- **Aspermia:** Absence of semen
- **Azoospermia:** Absence of sperm
- **Hypospermia:** Low semen volume
- **Hyperspermia:** High semen volume
- **Oligozoospermia:** Very low sperm count
- **Asthenozoospermia:** Poor sperm motility
- **Teratozoospermia:** Sperms carry more morphological defects than usual
- **Necrozoospermia:** All sperm cells in the ejaculate are dead
- **Leucospermia:** A high level of white blood cells in semen

Abnormal Results Mean

Abnormal sperm will have trouble reaching and penetrating eggs, making conception difficult. Abnormal results could indicate the following:

- Infertility
- Infection
- Hormonal imbalance
- Disease, such as diabetes
- Gene defects
- Exposure to radiation

If results come back at abnormal levels, doctor will probably suggest additional tests. These tests include:

- Genetic tests
- Hormone testing
- Urinalysis after ejaculation
- **Testicle biopsy:** Taking a tissue sample from testicles
- Anti-sperm immune cells testing

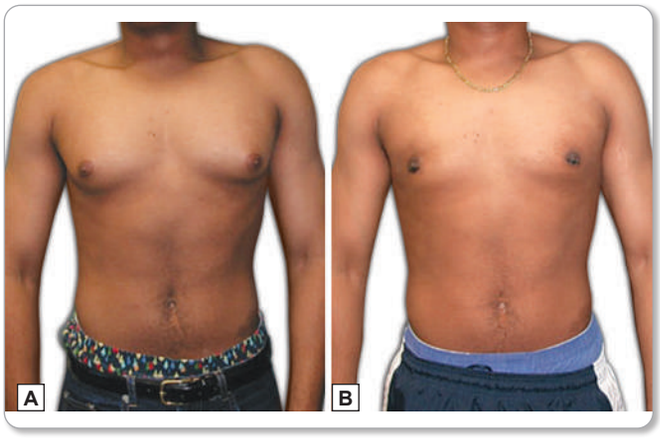
DISEASES OF MALE BREAST

Gynecomastia

Gynecomastia is a condition that occurs when male breast tissues are overdeveloped and give an appearance of female breasts. This problem will be caused by hormonal imbalance produced by testes. So, it occurs when there is any imbalance in the ratio of active androgen to estrogen in plasma or within the breast itself.

This is one of the most common breast disorders in men and is defined as a transient, noninflammatory enlargement of one or both male breasts. This is generally a temporary and benign condition.

Gynecomastia occurs in adults and when it develops in older age, it is known as senescent gynecomastia. Actually during puberty; often a transient relative disturbance or imbalance occurs between estrogen and testosterone and this imbalance causes gynecomastia (Figs 20.23A and B).



Figs 20.23A and B: Gynecomastia

Etiology

Gynecomastia is caused by hormonal imbalance as mentioned above if testosterone level goes down to estrogen level, gynecomastia will appear.

- When testosterone level goes down, male traits will be suppressed by female traits, as estrogen is a female hormone and estrogen is a cause of occurrence of female puberty changes. But some amount of estrogen is also released in males and when this amount increases, then gynecomastia will occur.
- Gynecomastia can also be caused by some pathological conditions such as hyperthyroidism, renal failure, cirrhosis or liver failure and also caused due to hormonal imbalance.
- Nutritional deficiency or malnutrition also reduces levels of testosterone.
- Test is tumor or tumor to pituitary or adrenal gland also may cause hormonal imbalance.
- Obesity causes a reduced level of testosterone.
- Some drugs also cause Gynecomastia as their side effect by altering hormonal balance such as corticosteroids, some antibiotics, opioids, antianxiety, etc.

Signs and Symptoms

The presence of gynecomastia can be visible with very prominent symptoms such as:

- Enlarged or swollen breasts
- Pain in the enlarged breast
- Tenderness
- Sometimes there is some discharge from the nipple of enlarged breast tissue.

Diagnostic Test

A complete physical examination will suggest increased breast tissues more than at least 5 mm in diameter. Following tests can be performed to know exact cause of it:

- Hormonal level through blood test
- Liver, kidney and thyroid function test
- Check for medical history

Treatment

Gynecomastia may get resolved on its own within 6 months, so first treatment is proper observation. Few more attempts can be as follows to treat gynecomastia:

- Stop taking medications which cause gynecomastia
- Treat underlying pathological disease which causes Gynecomastia

- Hormonal replacement therapy where testosterone hormone can be administered to those males who have less level of testosterone.
- *Tamoxifen (Soltamox), raloxifene (Evista) and aromatase inhibitors (Arimidex)* have some therapeutic effects to treat gynecomastia.

Surgical Intervention

Surgery is the only option available, if gynecomastia is not treated after observation or with treatment. During surgery, breast fat or breast gland, may be removed.

- **Liposuction** is the surgical option to remove breast fat only.
- **Mastectomy** is a known surgical intervention where breast tissue of gland will be removed.

Male Breast Cancer

The incidence rate of male breast cancer is 1 in 1000 and can happen to all age groups but prevalence is high at 60–70 years of age group. As shown in Figure 20.24 the breast has many parts, including ducts which carry milk to nipple and glands which formulate breast milk. These structures are also present in males as well but their functions are limited but these areas of breast are equally prone to develop breast cancer in men.

The majority of male breast cancers are benign, meaning they do not spread nonspread kind of cancer.

Based on cancer location and causes, it is divided into many types but can be generally as follows:

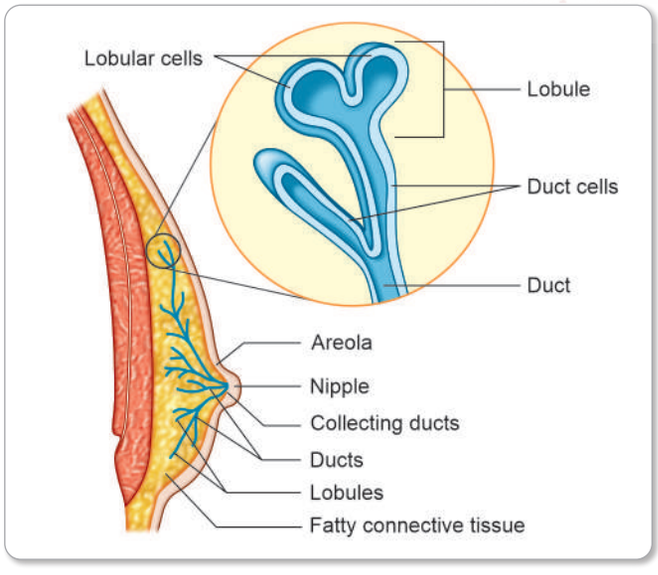


Fig. 20.24: Breast anatomy

- **Ductal carcinoma in situ:** Here cancer is located at duct lining of breast.
- **Infiltrating ductal carcinoma:** This is the most common type of male breast cancer and is located beyond the duct lining of breast.
- **Inflammatory breast cancer:** This is a kind of cancer where cancer exhibits inflammation symptoms such as swollen and painful breast.
- **Paget disease of the nipple:** In this kind of breast cancer, the tumor moves from duct lining to nipple.

Etiology

Basically the cause of male breast cancer is gene mutation. Causes can be listed as:

- Inherited a genetic mutation
- Radiation exposure such as treatment of Hodgkin's disease
- Increased level of estrogen
- Klinefelter's syndrome is a condition when a man gets one extra female X chromosome from his parents and can cause a high level of estrogen, which will produce more female traits including increased breast tissues.
- Liver disease such as liver failure or cirrhosis because in liver disease a hormone imbalance occurs.
- Genetics

Signs and Symptoms

The lump of male breast cancer can be easily inspected during physical examination. Following are some of the important signs and symptoms:

- Lump presence without pain
- Dimpling of breast
- Itching of the nipple
- Nipple shape altered
- Abnormal nipple discharge
- Nipple skin ulceration
- Swelling of lymph nodes near breast
- Breast tissue enlargement.

Diagnostic Test

As lump appearance can always be felt during physical examination, other physical symptoms can also be observed. Other investigations are:

- Clinical breast exam (CBE)
- Mammogram
- Ultrasonography/CT scan/MRI
- Blood chemistry studies
- Biopsy such as fine-needle aspiration (FNA) biopsy, core biopsy, excisional biopsy

Treatment

The goal of treatment is to improve quality of life of patient and make him free from disease. There are various approaches available but the most common is attempting surgery.

- **Modified radical mastectomy** will be the treatment of choice to get complete relief from disease. During this procedure, the entire breast, along with lymph nodes, is removed.
- Second surgical option is lumpectomy followed by radiation therapy.
- **Hormone therapy:** This therapy will be for stopping effect of estrogen because increasing effect of estrogen causes increase in number of cancer cells. Tamoxifen is used in hormonal therapy to stop estrogen effect.
- Chemotherapy will be used if hormone therapy does not work and postsurgery chemotherapy helps to prevent recurrence of cancer.
- **Radiation therapy** will help to relieve the symptoms and improve quality of life.
- **Targeted therapy** can also be prescribed with monoclonal antibodies.

GENITAL HERPES AND WART

Several viruses have the potential to infect the human reproductive system. The human reproductive system may experience major health difficulties as a result of infection. These viral diseases are generally incurable. They are raising the possibility of ongoing sexual transmission. Warts and genital herpes are both regarded as sexually transmitted infections (STI). Genital warts and genital herpes affect men and women equally. Herpes and vaginal warts can both appear in the intimate areas (genital area).

Genital herpes: Herpes Simplex-2 is the virus that causes genital herpes, which is an infection of the genital area (HSV-2). The type 2 herpes simplex virus is another name for it.

Genital wart: A genital wart is an infectious condition that looks like a cauliflower or a small, solid blister and is brought on by the human papillomavirus (HPV). One of the most prevalent types of sexually transmitted infections is genital wart.

Etiology and Risk Factors

- Human papillomavirus (HPV), which causes genital warts, and HSV-2, which causes genital herpes
- Immunosuppression
- Stress
- Intimate physical contact
- It can be transmitted by sexual contact and human bodily fluids, such as:
  - Secretion from the vagina
  - Semen
  - Saliva

Pathophysiology (Fig. 20.25)

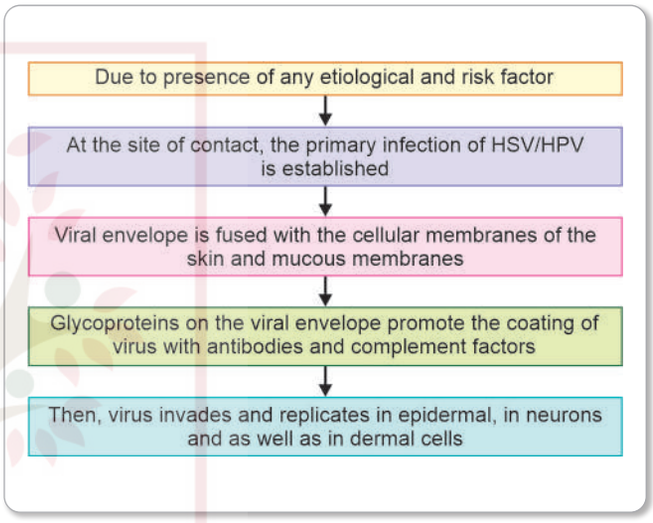


Fig. 20.25: Pathophysiology of genital warts and herpes

Clinical Manifestations

If infection is mild, many genital herpes patients may have asymptomatic characteristics and are unaware that they are afflicted. After first coming into contact with the virus, genital herpes symptoms may start to manifest 2 days later or up to 30 days later. Some infected people have reported chills, fever, malaise, and lymph node swelling. On the penis, scrotum, and buttocks, there will be fluid-filled blisters that are itchy, painful, and uncomfortable. These blisters could rupture, releasing infected fluid, and allow HSV to spread further. A prodromal tingling, burning or itching sensation indicates a risk of recurrences. For 7–14 days, more lesions may continue to develop.

Genital warts appear to harm the moist tissues of the genital region. It appears small cauliflower-like growths that are flesh-colored. The warts are frequently too small to be seen. Itching in the genital area with minimal to no pain. Warts hurt when they rub against the skin or clothing. Generally speaking, genital herpes causes more pain than genital warts.

Diagnostic Tests

The following are possible diagnostic tests for genital herpes and genital warts.

Asking the patient a few questions about their sexual history and any previous sexual infections could help us gather information that will help us diagnose the condition.

- **Physical examination:** Although genital herpes and warts both develop in the genital area, it can be difficult to distinguish between the two. However, a doctor can distinguish between the two by paying close attention to the characteristics of infectious growth.
- **Blood test:** This test examines a patient's blood sample to see whether HSV antibodies are present in order to identify a herpes infection.
- **Swab test/viral culture:** This test entails sending the lesions to the lab for analysis. In this test, a medical professional will use a swab to collect fluid and will also take a tissue or cell sample or scrape herpes sores.
- **Polymerase chain reaction (PCR) test:** Using a sample of blood and tissue from a sore or spinal fluid, this test copies the patient's DNA. The HSV can then be confirmed and its type identified by testing the DNA.
- **Test with vinegar solution:** Although a visual examination of the genital region is recommended to diagnose genital warts in men, some doctors will use a vinegar solution to find warts that are not elevated and obvious. Applying a vinegar solution to diseased genital areas causes them to turn white, making it easier to spot flat lesions that are difficult to view. However, this test is not error-free. Occasionally, healthy skin is mistaken for a wart.

Management

Prevention: In both cases of genital region disease, prevention is preferable to treatment.

- An effective HPV vaccination can guard against genital herpes infection.
- Sexual instruction for defensive sex.
- Good hygiene.
- Early identification

At the first indications of an epidemic, medication may be administered to lessen the severity of disease symptoms.

Antiviral medications may be useful for treating infection. Drugs can lessen pain and hasten the healing of wounds. It is possible that individuals were also given medication to reduce outbreaks in the future.

There is no specific drug that can be used to treat genital herpes. Only three main medications, which are frequently used to treat genital herpes symptoms, were recommended by doctors.

There are few medications available to eliminate warts. They should be typically applied directly on the lesion.

Name of drug	Route for administration
Famciclovir (Famvir)	Oral
Acyclovir (Zovirax)	Oral, in case of severity intravenous (IV)
Valacyclovir (Valtrex)	Oral

There are not many treatments available to get rid of warts. Usually, they ought to be applied directly to the lesion.

Trichloroacetic acid: This chemical can be used on the genitalia, palms, and soles. Trichloracetic acid causes burns to remove warts and may irritate the immediate area.

Imiquimod: This improves the patient's immune system's capacity to combat HPV. Imiquimod usage may result in redness and edema where it is applied.

Podofilox: Similar to Imiquimod, Podofilox is a topical prescription drug that kills the tissue of genital warts. Burning and itching could be brought on by podofilox.

Salicylic acid: When applied as a treatment to a wart, salicylic acid begins to remove the wart's outer layers. It may irritate the skin.

Surgical and other methods: In the event that medicine is ineffective, a surgeon may use one of the following techniques to remove warts:

Name of surgery	Action in surgery
Laser surgery	With the help of laser techniques, surgeon can remove warts.
Electrocautery	Burning with an electrical current.
Surgical removal	Surgical removal of infected skin from genital area.
Cryotherapy	Freezing warts with liquid nitrogen.

NURSING MANAGEMENT

Nursing Management of Genital Herpes and Wart

A nurse may play an important role to manage patient with sexually transmitted infection. A nurse can help to minimize the effects of infection with correct assessment and observation.

- Manage to pain
- Advise to patient to maintain genital hygiene and use loose-fitting underwear.
- Provide sitz bath.
- Advise to avoid sexual activities.
- Careful long-term follow-up advised along with sex partner.
- Regular exercise should be advised.
- Encourage to take a proper balanced diet and sound sleep.

SEXUALLY TRANSMITTED DISEASES

It is commonly known that sexual contact can transfer more than 30 microbes. Out of 30, eight have been associated with the highest incidence of STDs. Of these 8, only four infections—Chlamydia, gonorrhea, syphilis, and trichomoniasis—are currently treatable. The remaining four viral illnesses, including HIV, hepatitis B, herpes simplex virus (HSV or herpes), and human papillomavirus (HPV), are all fatal. The effects and symptoms of an untreatable viral infection can be altered or diminished with treatment.

A sexually transmitted disease (STD) is an illness that can spread from one person to another through sexual interaction. It is also referred to as a sexually transmitted infection or venereal disease (VD) (STI) (Table 20.3).

Incidence

Worldwide, more than a million STIs are contracted each day. Each year, new instances of one of the four STIs (chlamydia, gonorrhea, syphilis, and trichomoniasis) are reported in close to 376 million people. Additionally, it is discovered that the herpes simplex virus is believed to be present in the genitalia of more than 500 million humans (HSV). Types of STDs are given in Table 20.3.

Causes

- Engaging in sexual activity with a person who is infected with the STD.
- Engaging in unprotected oral, vaginal or anal sex with a person who is infected.

TABLE 20.3: Types of STDs

STDs	Causative factor	Clinical manifestation	Complication	Treatment
Chlamydia	Chlamydia trachomatis	• Generally, no noticeable symptoms • Pain in the lower abdomen	• Infections in prostate gland, testicles or urethra • PID • Infertility	Curable with antibiotics
Human papillomavirus (HPV)	Human papillomavirus	Warts on the genitals, mouth or throat.	• Oral cancer • Penile cancer • Rectal cancer	Noncurable
Syphilis	Treponema pallidum	• A small round sore, known as a chancre. It may develop on genitals, anus or mouth. It is painless but very infectious. • Later symptoms include: Rash, fatigue, fever, headaches, joint pain, weight loss, hair loss	• Vision loss • Hearing loss • Memory loss • Mental illness • Brain or spinal cord infections • Heart disease • Death	Curable with antibiotics
HIV	Human immune deficiency virus	At early stage, symptoms similar as flu: • Fever • Chills • Aches and pains • Sore throat • Headache • Nausea • Rashes	It damages the immune system and invites to other bacteria and virus to develop disease.	Noncurable
Gonorrhea	Neisseria gonorrhoeae. Also known as "the clap"	• A white, yellow or green-colored discharge from the penis. • Pain or discomfort during urination or sex • Frequent urination • Itching around the genitals	• Infections in prostate gland, testicles or urethra • PID • Infertility	Curable with antibiotics
Trichomoniasis	Also known as "trich". It is caused by a tiny protozoan organism	• Discharge from the penis • Burning or itching around the penis • Discomfort or pain during urination or sex • Frequent urination	• Infections in prostate gland, testicles or urethra • PID • Infertility	Curable with antibiotics

- Sharing needles with an infected person can also spread STDs.
- Breastfeeding.

Diagnostic Tests

Because STDs frequently have no outward symptoms, diagnosing STDs is crucial. However, even symptomless STDs have the potential to harm or spread to other people.

Diagnosing sexually transmitted diseases (STDs) involves identifying the specific bacteria, viruses, parasites or fungi that cause infections in the reproductive system. Early and accurate diagnosis is essential to begin the right treatment, prevent complications, and stop the spread of infection.

- **Physical examination:**
  - A complete inspection of the genital area, mouth, anus, and skin is performed.
  - The nurse or doctor may look for sores, rashes, discharge, swelling or redness.
- **Sample collection for laboratory testing:** Different types of samples are collected depending on the symptoms and suspected infection.
  - **Blood tests:**
    - Used to detect viral and bacterial infections.
    - Commonly used for:
      - HIV (Human Immunodeficiency Virus)
      - Syphilis
      - Hepatitis B and C
      - Herpes (sometimes)
  - **Urine tests:**
    - A midstream urine sample is collected to check for bacterial DNA or infection.
    - Commonly used for:
      - Chlamydia
      - Gonorrhea
  - **Swab tests:**
    - A sterile swab is used to collect a sample from:
      - Urethra (in males)
      - Cervix or vagina (in females)
      - Throat or rectum, if needed
    - Swabs are useful for:
      - Gonorrhea
      - Chlamydia
      - Trichomoniasis
      - Herpes (fluid from blisters)
- **Microscopy and culture:**
  - Direct microscopy is used to observe bacteria, fungi or parasites under a microscope.
  - Culture tests help grow the organism in a lab for exact identification.
    - Used in suspected gonorrhea, syphilis or candidiasis cases.
- **Rapid tests and point-of-care tests:**
  - These are quick tests that give results within minutes or hours.
  - Common for:
    - HIV
    - Syphilis
    - Hepatitis
  - Helpful in community health settings and during screening camps.
- **Polymerase chain reaction (PCR)/nucleic acid tests (NAT):**
  - Highly sensitive test that detects the genetic material of viruses or bacteria.
  - Common for:
    - HIV
    - HPV (Human Papillomavirus)
    - Chlamydia and Gonorrhea

Nurse's Role in STD Diagnosis

- Ensure privacy and confidentiality during testing.
- Educate the patient about the purpose of the tests.
- Assist in sample collection and ensure proper labeling and transport.
- Provide counseling and emotional support, especially if the patient is anxious.
- Encourage follow-up for results and further treatment if required.

Culture Test of Sores

- Test of urine
- **Blood test:** Most of the time, doctors are unable to identify STDs just based on symptoms. If doctor suspects about STD, he will likely recommend tests to check.

Management

Treatment

The treatment of sexually transmitted diseases (STDs) depends on the type of infection, its severity, and whether it is caused by bacteria, virus, parasite or fungus. The main goals of treatment are to eliminate the infection, relieve symptoms, prevent complications, and stop transmission to others.

Bacterial Infections

Bacterial STDs can usually be completely cured with antibiotics if treated early.

Infection	Common treatment
Chlamydia	Oral antibiotics like azithromycin or doxycycline
Gonorrhea	A combination of ceftriaxone injection and oral azithromycin
Syphilis	Benzathine penicillin G injection is the preferred treatment

Note

The full course of antibiotics must be completed even if symptoms go away early.

Viral Infections

Viral STDs cannot be cured, but medications can control symptoms, reduce outbreaks, and lower the risk of spreading the infection.

Infection	Common treatment
HIV/AIDS	Antiretroviral therapy (ART) – a lifelong combination of medicines to suppress the virus
Herpes (HSV)	Acyclovir, valacyclovir or famciclovir – to reduce pain and frequency of outbreaks
Hepatitis B	Antiviral medicines to protect the liver and slow disease progression
Human Papillomavirus (HPV)	No direct cure; treatment is done for genital warts or abnormal cervical cells

Parasitic and Fungal Infections

These are usually treated with antiparasitic or antifungal medications.

Infection	Common treatment
Trichomoniasis	Metronidazole or tinidazole (oral antibiotics)
Candidiasis (yeast infection)	Antifungal creams or oral fluconazole

General Guidelines for STD Treatment

- **Treat both partners:** The sexual partner(s) of the infected person must also be treated, even if they have no symptoms.
- **Avoid sexual activity:** Patients should abstain from sexual contact until treatment is complete and both partners are cured.
- **Follow-up testing:** Some STDs require repeat testing after treatment to confirm the infection is gone (e.g., syphilis, gonorrhea).
- **Education and counseling:** Patients must be informed about safe sex practices, condom use, and regular check-ups.
- **Vaccination:** Preventive vaccines are available for some STDs such as Hepatitis B and HPV.

Nurse's Role in STD Treatment

- Administer prescribed medications and observe for side effects.
- Provide confidential counseling and answer patient questions without judgment.
- Emphasize the importance of treatment adherence and partner notification.
- Encourage regular screening and safe sexual behavior.

Prevention

- Appropriate immunization, such as the HPV vaccine, helps protect against sexually transmitted infections.
- Sexual education promotes protected sex
- Condom use offers reliable defense against a variety of STDs.
- Genital hygiene should be appropriate.
- Early detection and intervention can prevent the spread of illnesses.
- Proper follow-up after therapy can stop STDs from reoccurring.
- The only surefire strategy to prevent STDs after a sexual partner has them is to avoid sexual contact.

Medical Treatment

Depending on the type of STD, different therapies are used. Before starting up again, it is crucial that both sexual partners have effective STD treatment. If not, one could spread an infection between the two. Antibiotics are typically effective in treating bacterial illnesses.

It is crucial to take all antibiotics exactly as directed. Even if they start to feel better before taking all of them, patients should be counseled to continue taking them.

Viral STDs are untreatable by antibiotics. Only antiviral medications are necessary because they can lessen the chance of spreading HIV to another person. In many circumstances, however, there are further treatment options available to relieve symptoms and lower the risk of transmission. While some viral infections can resolve on their own, the majority cannot be cured. Some STDs are brought on by neither viruses nor bacteria. These are brought on by other germs, such as trichomoniasis. In order to treat these STDs, one typically uses oral or topical drugs.

NURSING MANAGEMENT

Nursing Management in Sexually Transmitted Diseases (STDs)

Nurses play a vital role in the prevention, early detection, care, and education of patients with sexually transmitted diseases (STDs). Since many STDs affect a person both physically and emotionally, nursing care must be holistic, nonjudgmental and confidential.

- **Assessment and history taking:**
  - Collect a detailed sexual and medical history, maintaining privacy and respect.
  - Observe for symptoms such as genital discharge, sores, pain, itching, swelling or rash.
  - Ask about high-risk behaviors like unprotected sex or multiple partners.
  - Assess emotional state—fear, guilt or anxiety are common.
- **Infection control and hygiene:**
  - Teach the patient about proper personal hygiene, especially in the genital area.
  - Ensure the use of gloves and proper disposal of contaminated materials to prevent cross-infection.
  - Encourage the use of condoms to reduce the risk of transmission.
- **Medication administration and monitoring:**
  - Administer prescribed antibiotics, antivirals or antifungal drugs as ordered.
  - Educate the patient about the importance of completing the full course of medication.
  - Monitor for side effects or allergic reactions to medications.
  - Encourage the patient to report any new or worsening symptoms.
- **Emotional and psychological support:**
  - Provide a nonjudgmental and supportive environment.
  - Address feelings of shame, fear or isolation.
  - Refer for counseling or mental health support if the patient is emotionally distressed.
  - Offer guidance on informing sexual partners respectfully and responsibly.
- **Health education and lifestyle modification:**
  - Explain the nature of the infection, how it spreads, and how to prevent it.
  - Emphasize the importance of regular STD screening, even when no symptoms are present.
  - Promote safe sex practices, including correct condom use.
  - Educate about limiting the number of sexual partners and avoiding sex under the influence of drugs or alcohol.
- **Follow-up and partner management:**
  - Encourage the patient to return for follow-up tests to ensure the infection has cleared.
  - Guide the patient on the importance of partner notification and treatment to prevent reinfection.
  - Assist with referrals to sexual health clinics or public health services if needed.
- **Documentation and confidentiality:**
  - Record all findings, care provided, and patient responses clearly and accurately.
  - Maintain strict confidentiality to protect the patient's privacy and dignity.
  - Avoid any judgmental or biased behavior that may affect patient trust.

SUMMARY

The male reproductive system includes internal and external male genitalia wherein the external genitalia include scrotum, testes, epididymides and penis and the internal genitalia include vas deferens, ejaculatory duct, prostatic and membranous sections of urethra, seminal vesicles and some accessory glands such as prostate gland and cowper's gland also known as bulbourethral gland.

- **Disorders of male reproductive system:**
  - **Erectile dysfunctions (ED)** are often known as **impotence.**
  - **Penile implant** is surgical intervention to correct ED and involves **inflatable implants and semi-rigid rods.**
  - **Premature ejaculation** is a term used when men ejaculate so early, probably within a minute of intercourse.
  - **Delayed ejaculation** is opposite to premature ejaculation and happens when ejaculation is retarded beyond a reasonable period after sexual stimulation.
  - **Retrograde ejaculation** is a reverse kind of ejaculation where the sperms move back to urinary bladder instead of moving toward vagina during ejaculation.
  - **Anejaculation** is a condition in which men do not ejaculate at all.
  - **Prostatitis** is an inflammation of prostate gland.
  - **Benign prostatic hyperplasia (BPH)** is an enlargement or hypertrophy of prostatic cells which is noncancerous.
  - **Prostate cancer** is the most common cancer among men after skin cancer, but it can often be treated successfully.

- **Prostatectomy** is a surgical removal of the prostate.
- **Orchitis** is an inflammation of one or both testes.
- **Epididymitis** is an inflammation of epididymis.
- **Testicular torsion** is a condition in which testes/testicles rotate on spermatic cord.
- **Testicular cancer** is a rare kind of cancer.
- **Hydrocele** is a condition in which accumulation of excess fluid occurs in scrotum.
- **Varicocele** is an enlargement of the veins within the testicles.
- **Cryptorchidism** is known as undescended testes.
- **Phimosis** is a known condition in which patient is unable to retract the skin (foreskin or prepuce) covering the head (glans) of the penis.
- **Paraphimosis** is condition in which retracted foreskin cannot return to its normal position.
- **Balanitis** is an inflammation of the glans or the head, of the penis.
- **Hypospadias** is a birth defect, where the urethral opening is placed on the underside of penis.
- **Epispadias** is a congenital defect where the urethral opening is misplaced and instead of opening at tip of the penis, the urethra opens at top of the penis.
- **Infertility** is diagnosed when a couple has frequent unprotected sexual intercourse for a year or more than that but is not able to conceive pregnancy.
- **Contraception** is a method or process to reduce or remove risk of pregnancy or fertilization.
- **Gynecomastia** is an abnormal condition in which swelling of breast tissues occurs in men and gives the breast an appearance similar to that of as females.

- **Male breast cancer** prevalence is high in the 60–70 years of age group.
- **Diagnostic tests:**
  - History and physical examination
  - Digital rectal examination (DRE)
  - Testicular examination
  - Testicular self-examination
  - Ultrasonography
  - Prostate-specific antigen test (PSA)
  - Test of male sexual functions
  - Prostate fluid or tissue analysis
  - Histological examination like biopsy

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STUDENT ASSIGNMENT

LONG ANSWER QUESTIONS

1. What is prostate cancer? Explain the stages of prostate cancer with their nursing management.
2. Describe the causes, pathophysiology, signs and symptoms of hydrocele. Write the management in detail.
3. Discuss the causes of infertility. Explain treatment plan in detail.
4. Describe the benign prostate hyperplasia in detail and their treatment.
5. What is contraception? Explain the various methods of male contraceptives.
6. Plan a nursing care plan based on nursing priority for a patient undergoing prostate surgery prostatectomy.
7. Mention the possible surgical intervention and nursing care for male infertility.

SHORT ANSWER QUESTIONS

1. Write short note on:
   a. Cryptorchidism
   b. Phimosis
   c. Hypospadias
2. What is andropause?
3. Write about genital herpes and warts.
4. Write briefly about sexual transmitted disease (STD).
5. Write short note on testicular tumor.

CASE-BASED QUESTIONS

Scenario 1: A 17-year-old male arrives at the emergency department with sudden and severe pain in the left testicle. He also complains of nausea and vomiting. On assessment, the nurse notes that the affected testicle is swollen and elevated compared to the right side.

1. **What is the priority nursing action in this situation?**
   a. Apply a cold compress and observe for 2 hours
   b. Prepare the patient for immediate surgical evaluation
   c. Administer antibiotics as prescribed
   d. Encourage fluid intake and bed rest

Scenario 2: A 68-year-old man visits the outpatient clinic with complaints of difficulty starting urination, a weak urine stream, and frequent urination at night. He says he feels like he is not emptying his bladder completely.

2. **Based on the symptoms, which condition is most likely suspected?**
   a. Testicular cancer
   b. Benign prostatic hyperplasia (BPH)
   c. Urinary tract infection
   d. Prostatitis

MULTIPLE CHOICE QUESTIONS

1. **Which of the following organs falls under external genitalia?**
   a. Testes
   b. Prostate
   c. Vas deferens
   d. Cowper glands
2. **Which of the following is a commonly used physical examination, especially for elder males?**
   a. Testicular examination
   b. Digital rectal examination
   c. Inspection
   d. Palpitation
3. **Which of the following is a surgical intervention for erectile dysfunction?**
   a. Prostatectomy
   b. Cryosurgery
   c. Semi-rigid rods
   d. TURP
4. **Retrograde ejaculation is known for:**
   a. Absence of sperms
   b. Obstruction in flow of sperm
   c. Backflow of sperm toward bladder
   d. Delayed sperm ejaculation
5. **Which of the following is a minimally invasive therapy for BPH?**
   a. Transurethral needle ablation
   b. Transurethral resection of the prostate
   c. Prostatectomy
   d. Laser surgery
6. **In which stage of prostate cancer does the spreading of cancer start without metastasis?**
   a. Stage A
   b. Stage B
   c. Stage C
   d. Stage D
7. **When abnormal rotation of testes on spermatic cord occurs, it is known as:**
   a. Testicular varicose
   b. Testicular torsion
   c. Testicular varices
   d. Hydrocele
8. **Balanitis is known as:**
   a. Inflammation of testes
   b. Inflammation of penis
   c. Inflammation of bladder
   d. Inflammation of epididymis

ANSWER KEY

Case-Based Questions:

1. b **2.** b

Multiple Choice Questions:

1. a **2.** b **3.** c **4.** c **5.** b **6.** a **7.** b **8.** b

Textbook of

Adult Health Nursing–II

(Medical Surgical Nursing)

with Integrated Pathophysiology (Includes Geriatric Nursing and Palliative Care Module)

Learning Objectives at the beginning of every chapter help readers understand the purpose of the chapter.

LEARNING OBJECTIVES

After the completion of the chapter, the readers will be able to:

- Define the scope and significance of medical surgical nursing in healthcare delivery.
- Describe the historical evolution and current trends in medical surgical nursing.

Chapter Outline gives a glimpse of the content covered in the chapter.

CHAPTER OUTLINE

- Introduction
- Evolution of Medical and Surgical Nursing
- Indian Medicine
- History of Surgical Nursing
- Social Trends Influencing Development of Nursing

Key Terms are added in each chapter to help understand difficult scientific terms in an easy language.

KEY TERMS

Acute illness: A sudden and short-term health condition requiring prompt and often intensive care.
Chronic illness: A long-lasting health condition that typically requires ongoing treatment and self-management.
Clinical competence: The nurse's ability to apply knowledge, skills, and judgment to deliver safe and effective care.
Clinical decision-making: The process of selecting the best course of action based on clinical evidence and patient needs.

Additional information related to the respective topic is given in **High-Yield Points** boxes.

High-Yield Point

Sorbitol, a widely used sweetener in chewing gum, sweets and dietary products, acts as a laxative. A stick of sugar free gum contains 1.25 g of sorbitol. Consuming 20 g/day will cause diarrhea. Possible side effects are usually metioned only in the fine print on labels of products containing sorbitol (Bauditz, 2008).

Numerous **Tables** have been used in the chapters to facilitate learning.

TABLE 1.1: Leavells model of natural history of disease

Stimulus to the host	Host reaction		Recovery
Interconnection of agent, host and environment	Latent period (pre-symptomatic)	Symptoms, signs (clinical)	With or without defect, disability
Prepathogenesis	Period of pathogenesis		

The book is well illustrated with relevant colorful **Figures** to add value to the content.

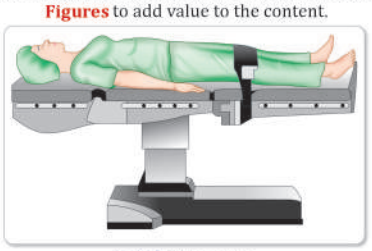
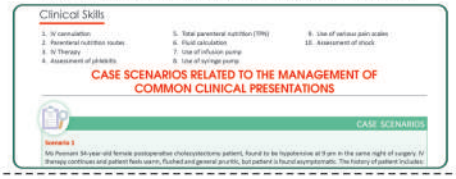


Fig. 6.41: Supine position

Each and every chapter starts with **Clinical Skills** covering respective system case presentations.

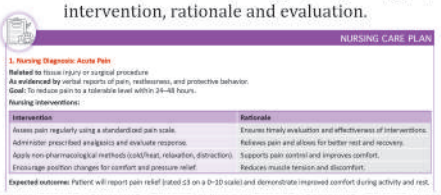


The book covers **Nursing Procedures** in separate boxes.

PROCEDURE

1. Gather all necessary equipment. Place it within easy reach.
2. Explain the procedure to the patient. Secure a signed consent.
3. Position the client as mentioned above.

Nursing Care Plan for each disease condition has been covered in a tabular format covering its diagnosis, goal, intervention, rationale and evaluation.



Each disease/condition has been covered with its relevant **Nursing Management** consideration.

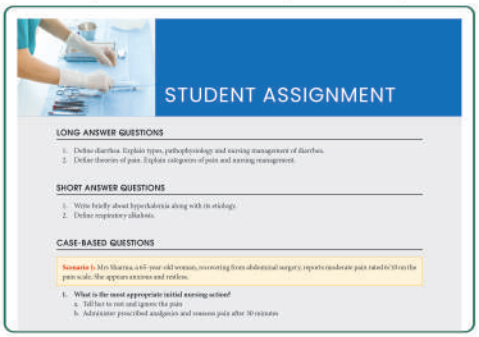
NURSING MANAGEMENT

Nursing Management of Pain

Effective pain management requires proper assessment, physical examination and findings of laboratory values. Nurse may attempt following interventions to manage pain.

- Assess pain level along with its intensity, duration, location, type and quality at each visit. Also identify how it affects with activities of daily living.

At the end of each chapter, **Student Assignment** section is given which contains frequently asked questions in exams to help students attain mastery over the subject.



About the Editor-in-Chief

Usha Ukande *PhD, MSN*
Former Principal
Choithram College of Nursing
Indore, Madhya Pradesh

About the Editor

Jaideep Herbert *PhD, MSN, BSN*
Chief Operating Officer
Vidyanta Skills Institute
Medical Simulation Center
Gurugram, Haryana

About the Authors

Jaideep Herbert
PhD, MSN, BSN
Chief Operating Officer
Vidyanta Skills Institute
Medical Simulation Center
Gurugram, Haryana

Shweta Pattnaik
PhD, MSN, BSN, RN, RM
Professor and HOD MSN Department
Choithram College of Nursing
Indore, Madhya Pradesh

Anil Sharma
PhD, MSN
Professor and Principal
Manikaka Topawala Institute of Nursing
CHARUSAT University, Anand, Gujarat

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