UNIT 1
INTRODUCTION: MODERN CONCEPTS OF CHILDCARE

Introduction to Child Health Nursing:

- Child health nursing, often referred to as pediatric nursing, is a specialized field of nursing that focuses on providing comprehensive healthcare to infants, children, and adolescents from birth through adolescence.
- Child health nurses play a vital role in promoting, maintaining, and restoring the health and well-being of young patients, and they are an integral part of the healthcare team.
- This branch of nursing requires a profound understanding of child development, pediatric diseases, and age-specific healthcare interventions, emphasizing both physical and emotional well-being.
- Child health nursing is a fulfilling and challenging profession, contributing significantly to the health and future of our youngest generation.

DEFINITION:

Child Health Nursing is a specialty which focus on nursing care of children, both normal and sick.

HISTORICAL DEVELOPMENT OF CHILD HEALTH

HISTORICAL MILESTONES

Ancient Contributions

1. **Sushruta Samhita (225 BC, India):** Earliest citations of breast milk qualities and child hygiene.
2. **Hippocrates (370-460 BC, Greece):** Known as the "Father of Modern Medicine", contributed to understanding diseases in children.
3. **Kashyapa and Jeevaka (6th Century, India):** Pioneers in pediatric care, focusing on child diseases and care.
4. **Sushruta:** Referred to as the "Indian Hippocrates", wrote about child-rearing, infant feeding, and childhood diseases.
5. **Charak (Ancient India):** Court physician in Peshawar, authored texts on newborn care.

Middle Ages to Renaissance

1. **Rhazes (850-923 AD, Arab):** Authored the first book exclusively on children's diseases.
2. **1472 AD:** The first printed pediatric book, "Bagallarder's", in Italian.
3. **1545 AD:** Thomas Phare wrote the first English book on children's diseases.

Modern Pediatrics

1. **First Pediatric Hospitals:** Established in Paris (1802) and the Children's Hospital of Philadelphia in the USA.
2. **Establishment of Pediatrics as a Specialty (1860):** Dr. Abraham Jacob founded the first child clinic in New York, emphasizing pediatric diseases.
3. **First Department of Pediatrics (1888):** Established at Harvard Medical School, acknowledging the distinct nature of children's diseases from those of adults.

19th Century Onwards

- **Development of Antenatal and Pediatric Care**: Recognition and development of specialized care for children.
- **Public Awareness Initiatives**: The Lady Chelmsford All India League (1920) promoted child welfare through exhibitions, journals, and events.
- **First Creche in India (1923)**: Established to provide daycare for children.

PHILOSOPHY AND MODERN CONCEPT OF CHILD-CARE

Philosophy of Child Care

The nursing of infants, children, and adolescents aligns with the broader definition of nursing as outlined by the American Nurses Association (ANA, 2010). This includes the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through diagnosis and treatment, and advocacy in the care of individuals, families, and populations.

Philosophy of Family-Centered Care

Elements

1. **Constant Family Presence**: Recognizing the family as a constant factor in the child's life.
2. **Parent/Professional Collaboration**: Facilitating true collaboration, beyond just coordinating services.
3. **Respect for Diversity**: Honoring the racial, ethnic, religious, cultural, and socioeconomic diversity of families.
4. **Recognizing Family Strengths**: Acknowledging different coping mechanisms and strengths in families.
5. **Unbiased Information Sharing**: Continually providing parents with information to support informed decision-making.
6. **Developmental Needs**: Understanding and integrating the developmental needs of children and families into service systems.
7. **Continuous Services**: Offering ongoing services until they are no longer needed or desired by the family.
8. **Quality Professional Services**: Providing high-quality assessment, treatment, and recommendations.
9. **Comprehensive Interagency Services**: Including emotional and financial support for families, and educational, therapeutic, and medical support for children.
10. **Family-to-Family Support**: Encouraging networking and support among families.
11. **Right to Refuse Services**: Respecting the family's choice to refuse or postpone services.
12. **Family-Driven Service Design**: Creating services that meet family-identified priorities and needs.
13. **Accessible Services**: Designing services that are flexible and situated in natural environments for optimal family participation and child benefit.

Concepts of Enabling and Empowerment

1. **Enabling**: Professionals create opportunities for families to display and enhance their abilities to meet the needs of their children.
2. **Empowerment**: Interaction with families that fosters a sense of control and acknowledges positive changes through their own strengths and actions.

Philosophy of Atraumatic Care

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Definition

Atraumatic care involves therapeutic care that minimizes or eliminates psychological and physical distress experienced by children and families in the healthcare system.

This encompasses prevention, diagnosis, treatment, or palliation of conditions.

Components

Setting: Care provided in various settings such as home, hospital, or other healthcare facilities.

- **Personnel**: Involvement of all individuals directly providing therapeutic care.
- **Interventions**: Ranging from psychological approaches (preparing children for procedures) to physical interventions (accommodating parents in the child's room).
- **Psychological Distress**: Addressing feelings like anxiety, fear, anger, disappointment, sadness, shame, or guilt.
- **Physical Distress**: Managing issues from sleeplessness to sensory disturbances like pain or extreme temperatures.

Principles of Atraumatic Care

1. **Minimize Separation**: Prevent or reduce child's separation from the family to maintain emotional stability.
2. **Promote Sense of Control**: Enhance the child's sense of control over their situation.
3. **Minimize Injury and Pain**: Focus on preventing or reducing bodily harm and discomfort.

Examples of Atraumatic Care

- **During Hospitalization**: Fostering parent-child relationships.
- **Preparation for Treatment/Procedures**: Informing and readying the child for new experiences.
- **Pain Control**: Effective management of discomfort.
- **Privacy and Respect**: Upholding the child's dignity and personal space.
- **Play Activities**: Allowing expression of fear and aggression through play.
- **Providing Choices**: Empowering children by offering options.
- **Cultural Sensitivity**: Respecting and accommodating cultural differences.

MODERN CONCEPT OF CHILD CARE

The modern concept of child care has evolved significantly, recognizing children as distinct individuals with unique developmental needs, rather than viewing them as smaller versions of adults. This paradigm shift has been marked by several key developments:

1. **Specialization in Pediatrics**: The emergence of pediatrics as a distinct medical specialty, characterized by the establishment of pediatric departments in medical colleges and dedicated pediatric units in hospitals, underscores the recognition of the unique healthcare needs of children.
2. **Child-Centered Healthcare Facilities**: The creation of specialized facilities, such as pediatric units in general hospitals and institutions specifically for children, further highlights the focus on catering to the specialized healthcare requirements of the younger population.
3. **Shift in Healthcare Approach**: Modern child care emphasizes the prevention of diseases and the promotion of overall health, moving away from the traditional focus on merely treating illnesses. This preventive approach aims to safeguard children's health through proactive measures.
4. **Scientifically Grounded Practices**: Contemporary pediatrics is increasingly process-oriented, grounded in solid scientific principles, ensuring that healthcare practices for children are based on reliable evidence and ongoing research.

Old Approach	New Approach
Disease-centered care	Child-centered care within the family system
Neglect of the female child	Special care and emphasis on the female child, acknowledging her future role as a mother
Initiating care after pregnancy confirmation	Health education on planned parenthood; maternal health care starting before conception
Special care only for the sick child in the hospital	Comprehensive care from conception through developmental years; holistic, family-centered care
Focusing solely on the child's physical condition	Health promotion-oriented care, considering physical, emotional, and developmental aspects
Illness-oriented care	Preventive care and health promotion
Restrictive visiting hours; parents often separated	Encouraging parental presence; flexible visiting hours to support family involvement
Care focused on hygiene and treatment only	Warmth and love oriented; includes play, recreation, nutrition, and evidence-based practice
Routine, standardized care	Personalized care addressing the unique needs and circumstances of each child
Adherence to traditional practices	Adoption of modern, evidence-based practices in pediatric care

PEDIATRIC NURSING

Definition

Pediatric nursing specializes in the care of infants, children, and adolescents, aiming at their holistic well-being. It's dedicated to nurturing the physical, mental, and social health of the young, promoting optimal growth and development.

Current Concept of Pediatric Nursing (ACADEMIC)

1. **Advocate**: For child and family.
2. **Communicate**: For the child.
3. **Activate**: Child's activities.
4. **Disseminate**: Information related to child health programs.
5. **Educate**: The public about child health.
6. **Motivate**: People to participate in child care.
7. **Investigate**: Available resources.
8. **Collaborate Care**: Working together for comprehensive care.

Trends in Pediatric Nursing

- **Flexible Visiting Hours**: Allowing more freedom for family visits.
- **Rooming-In**: Enabling parents to stay with their hospitalized child.
- **Parents Support Group**: Providing a network for parental support.
- **School Teacher Involvement**: In the care of hospitalized children.
- **Play in School and Hospital**: Recognizing the importance of play in health and recovery.
- **Family-Centered Care**: Emphasizing care that involves the whole family.
- **Evidence-Based Practice**: Utilizing research-backed methods.
- **Prevention and Health Promotion**: Focusing on preventing disease and promoting health.

FACTORS RESPONSIBLE FOR GROWTH OF MODERN PEDIATRICS

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1. **Medical Advancements:** Innovations in medicine, including new antibiotics, have significantly contributed to the evolution of pediatrics.
2. **Scientific Progress:** Developments in fundamental sciences like physics, chemistry, and biology have enriched pediatric care practices.
3. **Public Health Focus:** A growing emphasis on public health and welfare has led to improved pediatric care.
4. **Enhanced Social Laws:** Legislative improvements have bolstered child welfare and protection.
5. **Healthcare Infrastructure:** The establishment of pediatric hospitals, Maternal and Child Health (MCH) clinics, and specialized centers reflects an enhanced infrastructure for child healthcare.
6. **Preventive Care:** There's a strong emphasis on disease prevention and health promotion, steering the focus towards preventive over curative care.
7. **Child Welfare Initiatives**: Various programs aimed at child welfare significantly contribute to the field.
8. **Societal Attitudes:** Changing societal perspectives towards children's unique needs and rights have positively influenced pediatric nursing practices.

CULTURAL AN D RELIGIOUS CONSIDERATUIONS IN CHILD -CARE

Cultural and Religious Considerations in Child Care:

Cultural and religious factors significantly influence how children are raised, cared for, and their overall well-being. Understanding these factors is crucial for healthcare professionals, particularly nurses, who are responsible for providing holistic and culturally competent care to children and their families.

Culture:

- Culture encompasses a complex array of values, beliefs, norms, traditions, and practices that are learned and shared within a group of people.
- Cultural diversity is a defining feature of societies worldwide, contributing to the rich tapestry of human experiences.
- These cultural elements can deeply shape children's identities, perceptions, and behaviors, often from a very young age.
- It is essential to recognize that cultural practices may vary significantly even within a single nation or community, emphasizing the importance of individualized care.

Religion:

- Religion represents a culturally influenced expression of spirituality and faith, playing a pivotal role in the lives of many children and their families.
- Support for a child's spiritual development can have profound impacts on their understanding of social relationships, ethical decision-making, and resilience.
- However, religious beliefs may also influence healthcare choices, potentially leading to challenges if certain practices conflict with recommended medical care.

Positive Cultural and Religious Practices Affecting Child Care:

- Many cultures prioritize the extended family system, providing a nurturing environment where multiple generations play an active role in raising and caring for children.

- Parent-child bonds are often strengthened through culturally ingrained practices, such as breastfeeding and close physical contact, promoting emotional security.
- Cultural customs, such as oil massages for infants, can have physical and emotional benefits for children.
- Some cultures encourage "rooming-in" to maintain close parent-child contact, fostering emotional attachment and security.
- Positive practices aim for comprehensive child development, encompassing cognitive, emotional, and spiritual dimensions.

Negative Cultural and Religious Practices Affecting Child Care:

- Regrettably, certain cultural and religious practices can have detrimental effects on child health and well-being.
- In some instances, cultural norms may discourage postnatal mothers from consuming regular diets, potentially compromising maternal and infant health.
- Harmful substances or practices, like giving honey or applying cow dung to newborns, may be rooted in tradition but can pose health risks.
- Separating mothers and newborns during the postnatal period, as seen in some cultures, can lead to adverse outcomes such as hypoglycemia, hypothermia, and poor mother-child bonding.
- Superstitions, such as applying kajal (eyeliner) to children's eyes for supposed eye improvement, may lack scientific basis and carry potential risks.
- Some cultural and religious groups may discourage essential healthcare interventions, like immunization, leaving children susceptible to preventable diseases.

Impact on Parenting Roles:

- Cultural norms often influence parenting roles and dynamics within the family.
- For example, in Indian culture, mothers typically assume the primary role of both disciplinarian and nurturer, while fathers may play a more background role.
- Gender bias can result in differential treatment of male and female children, with girls sometimes receiving less attention and care.
- Overprotective parenting, while well-intentioned, can potentially inhibit children's personality development and assertiveness.

The Nurse's Vital Role:

- Nurses and healthcare professionals must consider cultural and religious influences when providing care to children and their families.
- Providing culturally competent and holistic care requires sensitivity to individual beliefs, practices, and values.
- Establishing a therapeutic nurse-patient relationship is essential, and nurses should explore cultural and religious beliefs to tailor care accordingly.
- Nurses should offer guidance and education in a nonjudgmental and culturally sensitive manner, particularly when counseling children and families about health-promoting practices.

NATIONAL POLICY AND LEGISLATION RELATED TO CHILD HEALTH AND WELFARE

The National Policy for Children in India, adopted in August 1974, outlines a comprehensive framework to ensure the welfare and development of children.

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The policy is built around fifteen key principles:

1. **Comprehensive Health Program**: Ensuring all children are covered by health services for their physical, mental, and social development.
2. **Nutritional Services**: Implementing programs to remove dietary deficiencies among children.
3. **Health and Nutrition for Mothers**: Programs aimed at improving the health of expectant and nursing mothers, including nutrition and nutritional education.
4. **Free and Compulsory Education**: Guaranteeing free education for all children up to the age of 14 and providing informal education for preschoolers.
5. **Out-of-School Education**: Offering educational opportunities for those unable to access formal education.
6. **Games and Extracurricular Activities**: Promoting recreational activities in schools and community centers.
7. **Support for Weaker Sections**: Special programs to ensure equality of opportunity for children from disadvantaged backgrounds.
8. **Care for Socially Handicapped Children**: Education, training, and rehabilitation for children facing social challenges.
9. **Protection Against Neglect and Exploitation**: Safeguarding children from harm, cruelty, and exploitation.
10. **Ban on Hazardous Work**: Prohibiting children under 14 from engaging in dangerous occupations.
11. **Support for Special Needs Children**: Providing facilities for the treatment, education, and care of children with disabilities or special needs.
12. **Priority in Times of Distress**: Prioritizing children for protection and relief during natural disasters or emergencies.
13. **Assistance for Gifted Children**: Special programs to identify and support talented children from underprivileged sections.
14. **Children's Interest in Legal Disputes**: Ensuring children's interests are paramount in legal matters.
15. **Strengthening Family Ties**: Encouraging a supportive family, neighborhood, and community environment for children's growth.

LEGISLATION RELATED TO CHILD WELFARE IN INDIA

Child welfare legislation in India focuses on protecting, caring for, and rehabilitating children, including those in legal conflict. Grounded in the Constitution (Articles 24, 39, and 45) and aligned with the 1974 National Policy for Children and the UN Declaration on the Rights of Children, these laws address child labor, education, and overall welfare.

1. **The Children's Act, 1960**: For care and rehabilitation of neglected and delinquent children.
2. **Juvenile Justice Act, 1986**: Focuses on juvenile delinquents and neglected juveniles.
3. **Child Labor Act, 1986**: Prohibits child labor in hazardous occupations.
4. **Child Marriage Restraint Act, 1929**: Sets minimum age for marriage to prevent child marriage.
5. **Education for All Handicapped Children Act, 1975**: Guarantees free education for children with disabilities.
6. **Child Abuse and Treatment Act, 1974**: Addresses prevention and treatment of child abuse.

7. **Rehabilitation Act, 1973**: Supports rehabilitation services for people with disabilities.
8. **Parental Kidnapping Prevention Act, 1980**: Prevents parental abduction of children.
9. **Runaway Youth Act**: Assists homeless and runaway youths.
10. **Social Security Act**: Provides federal benefits, including support for dependent children.

1. THE CHILDREN'S ACT, 1960 (AMENDED IN 1977)

1. **Objective**: Provides for the care, maintenance, welfare, training, education, and rehabilitation of delinquent children.
2. **Scope**:
   a. **Neglected Child**: Defined as a child who is begging, homeless, destitute, an orphan, living in a brothel, illegitimate, or exposed to moral danger. Includes children of parents with leprosy, beggars, or unsound mind, and girls in moral danger.
   b. **Delinquent Child**: A child who commits an offence under the Indian Penal Code.
3. **Procedure**:
   a. Neglected or delinquent children can be taken into custody by the police, probation officer, or Superintendent of Observation Home.
   b. Such children must be produced before a juvenile court within 24 hours.
4. **Authority**: Juvenile court is authorized to try cases under this act, focusing on care, protection, and treatment of the child.

2. JUVENILE JUSTICE (CARE AND PROTECTION OF CHILDREN) ACT, 2000:

1. **Objective**: To provide a legal framework for the care, protection, treatment, and rehabilitation of children in conflict with the law or in need of care and protection.
2. **Key Definitions**:
   a. **Juvenile or Child**: A person under 18 years of age.
   b. **Neglected Juvenile**: A child who is destitute, suffering from a terminal disease without support, being abused, or exploited.
   c. **Delinquent Juvenile**: A child who has committed an offense.
3. **Provisions**:
   a. Prohibits the jailing of children under any circumstance.
   b. Minimizes children's contact with the police.
   c. Establishes a system for child adoption.
   d. Mandates the creation of children's homes for care and protection.
   e. Sets standards for juvenile justice administration.

3. THE CHILD LABOR (PROHIBITION AND REGULATION) ACT, 1986:

1. **Objective**: To prohibit child labor in hazardous occupations and regulate working conditions for children in non-hazardous jobs.
2. **Key Definitions**:
   a. **Child**: A person below 14 years of age.
   b. **Adolescent**: A person between 14 and 18 years of age.
3. **Provisions**:
   a. Bans child labor in specified hazardous occupations and processes.
   b. Limits working hours to a maximum of 6 hours per day with mandatory rest intervals.
   c. Prohibits night work for children.
   d. Requires employers to notify the police about the employment of children.

   e. Imposes penalties for violations, including imprisonment and fines.
4. **Penalties for Employing Children in Prohibited Occupations:**
5. **Imprisonment**: Minimum of three months, extendable to one year.
6. **Fine**: Not less than INR 10,000, extendable to INR 20,000.
7. **Or Both**: Imprisonment and fine.

Annexure A: List of Occupations Not Allowed for Children	Annexure B: List of Processes Prohibited for Children
• Transport of passengers, goods, or mails by railway. • Bidi making. • Cinder picking, clearing of ash pits in railway premises. • Carpet weaving. • Catering unit at railway stations. • Construction work related to railway stations or close to railway lines. • Selling of crackers and fireworks, working in slaughterhouses.	• Making matches and fireworks. • Cement manufacture. • Cloth printing and dyeing. • Mica cutting. • Shellac manufacture. • Soap manufacture. • Tanning. • Wool cleaning. • Building and construction. • Making slate pencils. • Manufacture of agate products. • Processes using heavy metals. • Hazardous processes including printing, cashew descaling and processing, and soldering of electronics.

4. THE CHILD MARRIAGE RESTRAINT ACT, 1929:

1. **Objective**: To prevent child marriages by setting minimum age limits for marriage.
2. **Key Definitions**:
   a. **Child Marriage**: A marriage where either party has not reached the legal minimum age.
   b. **Child**: A male under 21 years or a female under 18 years of age.
   c. **Minor**: A person under 18 years of age.
3. **Provisions**:
   a. Penalizes males between 18 and 21 years old and adults above 21 who enter into child marriages.
   b. Imposes penalties on guardians or parents who facilitate child marriages, including imprisonment and fines.

5. EDUCATION FOR ALL HANDICAPPED CHILDREN ACT, 1975 (UNITED STATES):

1. **Objective**: To ensure that children with disabilities have access to a free and appropriate public education in the least restrictive environment possible.
2. **Key Features**:
   a. Promotes the mainstreaming/inclusion of handicapped children in regular classrooms alongside non-handicapped children.
   b. Applies to children with a wide range of disabilities, including those with hearing loss, orthopedic, intellectual, emotional, or visual difficulties.
   c. Amended by the Individuals with Disabilities Education Improvement Act, 2005.

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6. The Child Abuse Prevention and Treatment Act (United States):

1. **Objective**: To prevent and treat child abuse and neglect through the establishment of programs, research, and policies.
2. **Key Definitions**:
   a. **Child**: A person under 18 years of age.
   b. **Child Abuse and Neglect**: Acts or failures to act by a parent or caretaker resulting in serious harm, sexual abuse, exploitation, or risk of serious harm.
   c. **Sexual Abuse**: Includes exploitation, rape, molestation, prostitution, or other forms of sexual exploitation of children.
3. **Major Provisions**:
   a. Provides state assistance for child abuse prevention and treatment programs.
   b. Authorizes government research into child abuse prevention.
   c. Established the National Center on Child Abuse and Neglect (NCCAN).
   d. Offers Basic State Grants for training and support programs aimed at preventing and treating child maltreatment.

NATIONAL PROGRAMS AND AGENCIES RELATED TO WELFARE SERVICES TO THE CHILDREN

India has implemented several national programs to improve child health and welfare, focusing on combating communicable diseases, improving environmental sanitation, addressing population growth, and enhancing nutrition. These programs include:

1. **National Health Policy, 2001**: Aims to set health goals including reducing infant and maternal mortality rates.
2. **Universal Immunization Programme**: Provides vaccines against major preventable diseases to children and pregnant women.
3. **Child Survival and Safe Motherhood Programme:** Focuses on reducing infant and maternal mortality through better healthcare services.
4. **Reproductive and Child Health Programme**: Integrates reproductive and child health services to reduce mortality and morbidity.
5. **The Diarrheal Disease Control Programme**: Aims to reduce child mortality and morbidity from diarrheal diseases.
6. **Nutritional Programmes**: Seeks to improve the nutritional status of children and women.

The Universal Immunization Programme (UIP)

- The Universal Immunization Programme (UIP) in India, formerly EPI, began in 1978.
- It aims to reduce childhood morbidity and mortality by immunizing against diseases like Diphtheria, Pertussis, Polio, Measles, Tuberculosis, and Tetanus.
- Targeting children under 2 and pregnant women, it continually expands to achieve universal coverage

Universal Immunization Programme (UIP) :

- **Started**: 1978 as EPI; renamed UIP in 1985.
- **Objective**: To provide immunization to all infants and pregnant women against major preventable diseases.
- **Coverage**: Nationwide by 1990.
- **Integration**: Became part of CSSM in 1992 and RCH in 1997.

National Immunization Schedule Summary:

- **At Birth**: BCG, OPV (Oral Polio Vaccine) Zero dose.

- **6, 10, 14 Weeks**: DPT (Diphtheria, Pertussis, Tetanus) doses 1 to 3 and corresponding OPV doses.
- **9 Months**: Measles vaccine.
- **16-24 Months**: DPT 1st booster, OPV booster.
- **5 Years**: DT (Diphtheria, Tetanus) 2nd booster.
- **10 and 16 Years**: TT (Tetanus Toxoid).

National Immunization Schedule presented in a tabular format for clarity:

Age	Immunization	Dose	Route
At birth	BCG	0.05 ml	ID
	OPV Zero dose	2 drops	Oral
	BCG (if not given at birth)	0.05 ml	ID
At 6 weeks	DPT - 1	0.5 ml	IM
	OPV - 1	2 drops	Oral
At 10 weeks	DPT - 2	0.5 ml	IM
	OPV - 2	2 drops	Oral
At 14 weeks	DPT - 3	0.5 ml	IM
	OPV - 3	2 drops	Oral
At 9 months	Measles	0.5 ml	SC
At 16-24 months	DPT 1st booster	0.5 ml	IM
	OPV booster	2 drops	Oral
At 5 years	DT- 2nd booster	0.5 ml	IM
At 10 years	TT	0.5 ml	IM
At 16 years	TT	0.5 ml	IM

- **ID**: Intradermal
- **IM**: Intramuscular
- **SC**: Subcutaneous
- **OPV**: Oral Polio Vaccine
- **DPT**: Diphtheria, Pertussis (Whooping Cough), and Tetanus
- **BCG**: Bacille Calmette-Guérin (Tuberculosis)
- **TT**: Tetanus Toxoid
- **DT**: Diphtheria and Tetanus

The Child Survival and Safe Motherhood Program (CSSM),

The Child Survival and Safe Motherhood Program (CSSM), initiated in 1992-93 with support from the World Bank and UNICEF, marked a significant expansion in India's healthcare approach to include comprehensive child survival and safe motherhood interventions. Implemented across India by 1996-97, the program aimed to reduce infant and maternal mortality rates through targeted health strategies.

Objectives of CSSM:

1. **Reduce infant mortality** to below 60 per 1000 live births.
2. **Reduce childhood mortality** to below 10 per 1000 children.
3. **Reduce maternal mortality** to below 2 per 100 live births.

Strategies and Interventions:

Child Survival Interventions:

- Essential newborn care

- Immunization
- Management of Diarrhea
- Management of Acute Respiratory Infections
- Vitamin A Prophylaxis

Safe Motherhood Interventions:

- Immunization of pregnant women
- Prevention and treatment of anemia
- Antenatal care and early identification of maternal complications
- Delivery by trained personnel
- Promotion of institutional delivery
- Management of obstetric emergencies
- Birth spacing

Strategies for Achieving Objectives:

1. **Establishment of First Referral Units (FRUs)** for emergency obstetric services, and emergency services for newborns, infants, and children.
2. **Training of Traditional Birth Attendants (TBAs)** and provision of disposable delivery kits for safe deliveries.
3. **Equipping subcenters** with necessary drugs and equipment for maternal and child health.
4. **Training health personnel** in essential obstetric and newborn care.
5. **Emphasis on Information, Education, and Communication (IEC)** to raise awareness about maternal and child health, aiming to reduce mortality and morbidity.

RCH Programme Components	Interventions
1. Family Planning	- Access to a variety of contraceptive methods
	- Counseling and services for family planning
2. Client Approach to Health Care	- Personalized health care plans
	- Quality health services tailored to individual needs
3. Prevention/Management of RTI/STD/AIDS	- Prevention programs for Reproductive Tract Infections (RTI), Sexually Transmitted Diseases (STD), and AIDS
	- Management and treatment services for RTI/STD/AIDS
4. Child Survival and Safe Motherhood	- Immunization
	- Essential newborn care
	- Nutrition services
	- Safe motherhood practices including antenatal, natal, and postnatal care

THE REPRODUCTIVE AND CHILD HEALTH (RCH)

The Reproductive and Child Health (RCH) Programme, initiated by the Government of India in 1997-98, aims to improve the health of women and children and meet the unmet needs for family welfare services. This programme integrates the Child Survival and Safe Motherhood (CSSM) programme with various RCH services. Here are the simplified notes on the RCH programme, focusing on maternal and child health interventions:

RCH Programme Overview:

- **Launched**: 15th October 1997, during the 9th plan period.
- **Objective**: To enhance the health status of women and children.
- **Approach**: Integrates CSSM with RCH services for comprehensive care.

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Maternal Health Interventions:

1. **Essential Obstetric Care**: Basic maternity care.
2. **Emergency Obstetric Care**: Immediate care for obstetric emergencies.
3. **Referral Transport**: Transportation for urgent medical attention.
4. **Medical Termination of Pregnancy (MTP)**: Safe abortion services.
5. **24-Hour Delivery Services**: At Primary Health Centres (PHCs) and Community Health Centres (CHCs).
6. **Prevention, Management of Reproductive Tract Infection**: Addressing reproductive health issues.
7. **Training for Traditional Birth Attendants**: Enhancing the skills of local birth attendants.
8. **RCH Camps**: Special health camps for reproductive and child health services.

Child Health Interventions:

1. **Universal Immunization Programme**: Vaccination against major childhood diseases.
2. **Control of Acute Respiratory Infections**: Management of respiratory conditions in children.
3. **Essential Newborn Care**: Basic care for newborns.
4. **Oral Rehydration Therapy**: For managing diarrhea in children.
5. **Prevention and Control of Vitamin A Deficiency**: Ensuring adequate Vitamin A intake.
6. **Exclusive Breastfeeding and Weaning**: Promoting breastfeeding and appropriate weaning practices.

Differential Approach:

- The programme categorizes districts based on the Crude Birth Rate and Female Literacy rate into three categories (A, B, C), with tailored interventions for each category to address specific needs effectively.

District-Level Interventions:

- **Category A**: 58 districts with specific needs.
- **Category B**: 184 districts with tailored interventions.
- **Category C**: 265 districts with customized strategies based on local needs.

General Interventions Across All Districts:

1. **Child Survival Interventions**: Immunization, Vitamin A prophylaxis, oral rehydration therapy, and pneumonia prevention.
2. **Safe Motherhood Interventions**: Antenatal check-ups, tetanus immunization, safe delivery practices, and anemia control.
3. **Implementation of Community Need Assessment Approach**: Replacing the Target Free Approach for better needs assessment.
4. **High-Quality Training**: For healthcare providers at all levels.
5. **IEC Activities**: Information, education, and communication campaigns.
6. **Special RCH Packages**: For urban slums and tribal areas.
7. **District Sub-Projects**: Local capacity enhancement projects.
8. **RTI/STD Clinics**: At district hospitals for treatment and prevention.
9. **Safe Abortion Facilities**: Available at Primary Health Centres (PHCs).
10. **Enhanced Community Participation**: Through Panchayats, NGOs, and Women's Groups focusing on adolescent health and reproductive hygiene.

Specific Interventions in Selected States/Districts:

1. **Screening and Treatment of RTI/STD**: To manage and prevent reproductive tract and sexually transmitted infections.

2. **Emergency Obstetric Care**: Access to urgent maternal care services.
3. **Essential Obstetric Care**: Provision of drugs and staff at PHCs for maternal health.
4. **Additional ANM at Subcenters**: In weaker districts for improved maternal and child health care.
5. **Improved Delivery Service and Emergency Care**: Supplying equipment kits, IUD insertions, and ANM kits at subcenters.
6. **Referral Transport for Pregnant Women**: During emergencies to nearest referral centers.

RCH Phase II (Started 1st April 2005):

- **Focus**: To reduce maternal and child morbidity and mortality, with an emphasis on rural healthcare.
- **Strategies**:
  1. **Essential Obstetric Care**: Promoting institutional deliveries and skilled attendance.
  2. **Emergency Obstetric Care**: Operationalizing first Referral Units and round-the-clock delivery services at PHCs and CHCs.
  3. **Strengthening Referral System**: Enhancing the efficiency of referral processes for emergencies.

NATIONAL DIARRHEAL DISEASE CONTROL PROGRAMME OVERVIEW:

- **Launched**: 1978 by WHO.
- **Objective**: Prevent child deaths due to diarrhea-induced dehydration.
- **Goals**:
  1. Reduce diarrheal mortality in children under 5 years by 70% by 2000 AD.
  2. Improve water and sanitation facilities.

Strategies for Diarrheal Control:

1. **Improved Case Management**:
   - Early use of oral rehydration therapy (ORT) for acute diarrhea.
   - Appropriate feeding during illness and recovery.
2. **Improved Maternal and Child Health Care**:
   - Emphasis on breastfeeding, weaning practices.
   - Focus on personal/domestic hygiene and maternal nutrition.
3. **Improved Water and Sanitation**:
   - Enhanced use and maintenance of drinking water and sanitation facilities.
   - Improved food hygiene practices.
4. **Detection and Control of Diarrhea Epidemics**:
   - Early identification and management of diarrhea outbreaks.

Integration with Other Programmes:

- In 1992-93, integrated into the Child Survival and Safe Motherhood (CSSM) programme.
- In 1997, CSSM was incorporated into the Reproductive and Child Health (RCH) programme.

NUTRITIONAL PROGRAMS IN INDIA:

1. **Vitamin A Prophylaxis Programme** (Launched in 1970):
   - Administers a massive dose of 2 lakh IU Vitamin A to children under 5 years, every 6 months.

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2. **Prophylaxis against Nutritional Anemia**:
   - Distributes iron and folic acid tablets to pregnant women and children (1-12 years) during the fourth five-year plan.
3. **Iodine Deficiency Disorder Control Programme**:
   - Aims to reduce iodine deficiency disorders with universal salt iodization policy since 1984.
4. **Special Nutrition Programme** (Started in 1970):
   - Provides supplementary food to children below 6 years, and pregnant and nursing mothers to improve nutritional status.
5. **Baalwadi Nutrition Programme** (Initiated in 1970):
   - Offers nutritional supplements and pre-primary education to children aged 3-6 years in rural areas.
6. **Integrated Child Development Services (ICDS) Scheme** (Began in 1975):
   - Includes supplementary nutrition, Vitamin A prophylaxis, and distribution of iron and folic acid tablets.
7. **Mid-Day Meal Programme** (Launched in 1961):
   - Aims to enhance school attendance and literacy by providing nutritious meals to school children.

Mid-Day Meal Programme Guidelines:

- The meal should supplement, not substitute, home diet.
- It should provide at least one-third of total energy and half of protein needs.
- The meal should be cost-effective, easy to prepare, and utilize locally available foods.
- The menu should vary frequently to maintain interest and nutritional value.

Food Stuff	Gm/day/child
Cereals and millets	75
Pulses	30
Oils and fats	8
Leafy Vegetable	30
Non-leafy vegetables	250
Salt	30
Sugar	30

AGENCIES RELATED TO CHILD WELFARE

Child welfare helps kids who need extra support because they face tough situations like poverty, disability, or not having enough care. It's about giving them the help they need to grow well and stay safe. This includes help for kids with working parents, those without homes, or kids with disabilities.

Child Welfare Agencies

'An administrative unit responsible for social work concerned with the welfare and vocational training of children is known as child welfare agency'. Child welfare agencies may be working at national or international level.

NATIONAL AGENCIES

The important national agencies working for child welfare in India are:

1. Indian Red Cross Society (IRCS)
2. Central Social Welfare Board
3. Indian Council for Child Welfare (ICCW)

4. All India Women's Conference (AIWC)

CHILD WELFARE AGENCIES IN INDIA:

1. **Indian Red Cross Society (IRCS)**
   - **Founded:** 1920
   - **Goal:** To reduce human suffering.
   - **Activities:** Disaster relief, promoting blood donation, providing medical supplies to healthcare and welfare centers, running maternity and child welfare centers, and offering Home Nursing and First Aid courses.
2. **Central Social Welfare Board**
   - **Established:** 1953 by the Government of India
   - **Nature:** Semi-government, autonomous organization
   - **Functions:** Surveying needs of voluntary welfare agencies, supporting their growth, providing financial aid, and starting family and child welfare services including craft training, social education, and running Baalwadis and play centers.
3. **Indian Council for Child Welfare (ICCW)**
   - **Founded:** 1952
   - **Affiliation:** International Union for Child Welfare
   - **Role:** Largest voluntary sector agency for child development services in India, promoting child welfare legislation, running Baalwadis, Creches, and Early Childhood Education Centers.
4. **All India Women's Conference (AIWC)**
   - **Founded:** 1927
   - **Objective:** Upliftment and betterment of women and children, advocating for social justice, integrity, and equal rights.
5. **Child Relief and You (CRY)**
   - **Founded:** 1979
   - **Guidance:** United Nations Chapter of Child Rights, 1989
   - **Mission:** Welfare of underprivileged children in India, ensuring their right to survival, protection, development, and participation.

Other Notable Organizations:

- Tuberculosis Association of India
- Barat Sevak Samaj
- Hindu Kusht Nivaran Sangh
- Kasturba Memorial Fund
- Family Planning Association of India (FPA)
- All India Blind Relief Society
- Saint John Ambulance Association

INTERNATIONAL AGENCIES FOR CHILD WELFARE

International efforts to support child welfare involve various organizations that work across borders to improve health, education, and living conditions for children globally. Here are some key international agencies:

1. **World Health Organization (WHO)**
   - **Type:** Non-political, specialized health agency
   - **Headquarters:** Geneva
   - **Established:** 7th April 1948, celebrated as "World Health Day"

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   - **Objective:** To achieve the highest level of health for all people, recognizing health as a fundamental human right, regardless of background. WHO focuses on combating infectious diseases and promoting general health globally.
2. **United Nations International Children's Emergency Fund (UNICEF)**
   - Focuses on providing emergency food, healthcare, and education to children and mothers in countries that have suffered from wars, disasters, or are underdeveloped.
3. **International Red Cross**
   - Known for its humanitarian efforts in disaster relief, health, and social care activities, particularly in conflict zones and areas affected by natural disasters.
4. **Food and Agriculture Organization (FAO)**
   - Works to defeat hunger and improve nutrition and food security by helping countries develop and manage their agriculture, forestry, and fisheries.

WORLD HEALTH ORGANIZATION (WHO)

The World Health Organization (WHO) is a non-political, specialized health agency with its headquarters in Geneva, established on April 7, 1948. This date is celebrated as "World Health Day," where annually, a theme is chosen to focus global attention on specific health issues to achieve set targets.

Objective: The main objective of WHO is the attainment of the highest level of health for all people, recognizing health as a fundamental human right irrespective of caste, creed, race, religion, political, and economic conditions. It focuses on combating diseases, especially infectious diseases, and promoting the general health of the global population.

Organizational Structure

WHO operates through three main bodies:

1. **World Health Assembly:** The supreme administrative body, responsible for formulating international health policies and programs, reviewing activities, sanctioning budgets, and electing Executive Board members.
2. **Executive Board:** Composed of health experts from member countries, this board strengthens decisions and policies approved by the World Health Assembly.
3. **Secretariat:** Offers technical and managerial support to member countries in their national health development programs.

Functions of WHO

WHO's functions include:

- Collecting international health statistics.
- Supporting health-related research.
- Publishing health literature and information.
- Directing and coordinating global health programs.
- Preventing and controlling communicable diseases.
- Providing epidemic warnings and surveillance.

Activities of WHO in India

In India, WHO's activities encompass:

- Malaria eradication.
- Control of TB and other communicable diseases.
- Supporting health laboratory services.
- Manufacturing vaccines.
- Providing health statistics.

- Enhancing public health administration.
- Focusing on reproductive and child health.
- Ensuring quality control of drugs.
- Assisting in medical and nursing education.

UNITED NATIONS INTERNATIONAL CHILDREN'S EMERGENCY FUND (UNICEF)

Introduction to UNICEF

UNICEF, founded in 1946, provides humanitarian aid and developmental assistance to children and mothers in over 190 countries through country offices and regional support, distributing essential supplies and collaborating with host governments

Working Mechanism of UNICEF

1. UNICEF operates in over 190 countries through 200 country offices, collaborating with host governments to develop programs.
2. Seven regional offices offer technical assistance to support UNICEF's initiatives worldwide.
3. The supply division in Copenhagen distributes vital resources such as vaccines, drugs, nutritional supplements, shelters, and educational materials.
4. Policy, program approval, and oversight are managed by a 36-member executive board.

SERVICES PROVIDED BY UNICEF

a) **Child Health:** UNICEF's involvement in child health includes:
- Production and distribution of vaccines and sera.
- Implementation of environmental sanitation programs.
- Provision of primary healthcare to mothers and children.
- Launch of immunization and family health services.
- Assurance of safe water and adequate sanitation.

b) **Nutrition:** Efforts in nutrition feature:
- Community development through applied nutrition programs.
- Support for agricultural extension and school health services.
- Assistance in dairy projects.
- Prevention of nutritional deficiencies with supplements like Vitamin A, iodized salt, iron, folic acid, and milk powder.

c) **Education:** In education, UNICEF:
- Collaborates with UNESCO to improve science teaching and strengthen science labs.
- Provides audio-visual aids and educational materials to schools, including nursing schools.

d) **Water Supply:** Activities include:
- Encouraging the use of groundwater.
- Assisting in well construction in rural areas.

e) **Social Welfare:** Contributions to social welfare involve:
- RCH (Reproductive and Child Health) Services.
- Promotion of the CSSM (Child Survival and Safe Motherhood) program.
- Support for primary healthcare.

GOBI Strategy: Recently, UNICEF has promoted four strategies under the "GOBI" framework for enhancing child health:
- Growth monitoring to detect and correct deviations from normal growth.
- Oral rehydration to reduce mortality from diarrhea.

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- Breastfeeding to provide a wholesome meal to infants.
- Immunization against six killer diseases for children under five.

3. INTERNATIONAL RED CROSS

- The Red Cross is an international humanitarian organization founded by Henry Dunant in 1864, headquartered in Geneva.
- It operates in over 90 countries, providing services to humanity in times of both war and peace.
- The main objective of the Red Cross is to alleviate suffering, offering services such as first aid, home nursing, health education, and maternal and child welfare.

4. FOOD AND AGRICULTURAL ORGANIZATION (FAO)

Established: 1945

Headquarters: Rome, Italy

Objectives of FAO:

1. **Improve Living Standards:** Assist nations in enhancing the living standards of their citizens.
2. **Nutritional Status:** Work towards improving the nutritional health of people across all countries.
3. **Agricultural Output:** Boost the production and efficiency of agriculture, fisheries, and forestry to meet global demands.
4. **Rural Population:** Focus on elevating the status and living conditions of rural populations.
5. **Food Production:** With an ever-increasing global population, the FAO emphasizes the need to escalate food production to meet nutritional needs.

OTHER INTERNATIONAL AGENCIES

In addition to the FAO, several other international agencies contribute to child welfare, development, and global improvement in various sectors:

1. **World Bank:** Focuses on long-term economic development and poverty reduction.
2. **Cooperative for American Relief Everywhere (CARE):** A major humanitarian agency providing disaster relief and fighting poverty.
3. **United States Agency for International Development (USAID):** Works to promote global development and humanitarian efforts.
4. **United Nations Fund for Population Activities (UNFPA):** Aims at improving reproductive health and achieving population balance.
5. **United Nations Development Programme (UNDP):** Works on development projects to improve living conditions worldwide.
6. **International Labor Organization (ILO):** Focuses on promoting rights at work, encouraging decent employment opportunities, and enhancing social protection.

INTERNATIONALLY ACCEPTED RIGHT OF THE CHILD

Children's Rights are fundamental human rights that apply to all individuals below the age of 18. These rights ensure protection, provision, and participation in matters concerning their well-being, education, health, and safety.

The origin of the Rights of Children can be summarized as follows:

- **Early 20th Century**: Awareness grew about children's rights and needs due to poor working conditions.
- **1924**: The League of Nations adopted the Geneva Declaration of the Rights of the Child.
- **1939**: World War II hindered progress as the League became powerless.
- **1946**: The newly formed United Nations began to focus on children's rights.
- **1948**: The Universal Declaration of Human Rights included children's rights, highlighting the need for special attention.
- **1950**: The UN Economic and Social Council started drafting a separate document for children's rights.
- **1957**: The Human Rights Commission adapted "Children's Rights."
- **1959**: After discussions among 78 countries, the UN General Assembly adopted the Declaration of the Rights of the Child, with India as a signatory

The Rights of Children include:

1. Right to affection, love, and understanding.
2. Right to social security, nutrition, housing, and medical care.
3. Right to free education.
4. Right to full opportunity for play and recreation.
5. Right to name and nationality.
6. Right to special care if handicapped.
7. Right to be among the first to receive relief in disasters.
8. Right to learn and become a useful member of society.
9. Right to be brought up in peace, understanding, tolerance, and universal brotherhood.
10. Right to enjoy these rights regardless of race, color, sex, religion, nationality, or social origin.

CHANGING TRENDS IN HOSTPITAL CARE, PREVENTION, PROMOTIVE AND CULATIVE ASPECT OF CHILD HEALTH

Changing Trends in Hospital Care

Hospitalization, particularly for children, is not just a medical journey but an emotional experience for the child and family. Over the last decade, there has been a significant evolution in the approach to child health care, characterized by several key trends. Understanding these trends is crucial for nurses to provide compassionate, effective care.

Family Centered Care

1. **Concept & Importance**: Emphasizes holistic care in an environment that nurtures family integrity, promoting psychological and physiological health for the entire family.
2. **Integration in Nursing**: Recognizes the pivotal role families play in addressing the psycho-social and developmental needs of hospitalized children.
3. **Parental Involvement**: Encourages active participation of parents in the care process, enhancing the child's psychological stability and expediting recovery.
4. **Philosophical Perspective** (Johnson, McGonial, Kauffmann): Views family as a constant in a child's life, advocating for supportive and empowering healthcare systems.
5. **Empowerment & Enabling**: Involves assisting family members to utilize and enhance their capabilities for the care of their children.
6. **Role of Nurses**: Facilitating informed decision-making by families through education and developing respectful, trusting relationships.

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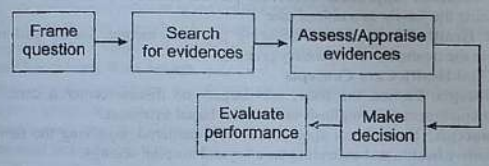
High Technology Care

1. **Technological Advancements**: The progression in medical technology, including early detection of disorders, challenges nurses to continuously update their skills and knowledge.

Evidence Based Practice

1. **Definition & Approach**: Combines best research evidence with clinical expertise and patient preferences.
2. **Application**: Ensures up-to-date care practices based on the latest research for specific health problems.
3. **Procedure**:
   - Frame the problem as a question.
   - Search for evidence.
   - Assess and appraise the evidence.
   - Evaluate performance.
   - Make informed decisions.



Atraumatic Care

1. **Definition**: Providing care that minimizes psychological and physical distress for children and families in healthcare settings.
2. **Principles**:
   - Minimize child's separation from family.
   - Promote comfort.
   - Minimize bodily injury and pain.

PROMOTIVE AND CURATIVE ASPECTS OF CHILD HEALTH CARE

Promotive Aspects of Child Health Care

Promotive health care focuses on enhancing the well-being and overall development of children, extending beyond mere prevention of diseases.

1. **Growth Monitoring**: Regular assessment of a child's growth to identify and address nutritional challenges, crucial in a country like India where malnutrition is prevalent.
2. **Oral Rehydration Therapy (ORT)**: Effective management of diarrheal diseases through simple solutions, which is vital considering the high incidence of such diseases in infants.
3. **Breastfeeding Promotion**: Addressing the decline in breastfeeding rates due to modern lifestyle changes. Workplace policies and societal awareness are key to promoting breastfeeding.
4. **Immunization**: Vaccinations play a crucial role in preventing common childhood illnesses and are a cornerstone of child health promotion.

5. **Female Literacy**: Empowering women through education is fundamental in improving child health outcomes, as educated mothers are more likely to access health services for their children and themselves.
6. **Comprehensive Antenatal, Intranatal, and Postnatal Care:** Includes providing adequate nutrition, safe delivery education, correct feeding practices, and preventive measures against communicable diseases.
7. **Overall Developmental Focus**: Emphasizing the importance of emotional, social, and psychological development, along with physical health.

Curative Aspects of Child Health Care

Curative care addresses existing health issues, aiming to restore health through effective treatment and care.

1. **Hospital Care**: Ensuring quality care in hospitals, including the treatment of congenital anomalies and hereditary disorders.
2. **Home and Community Care**: Providing comprehensive care that extends beyond hospital settings to homes and communities.
3. **Family-Centered Approach**: Involving parents actively in the care of their children, recognizing the family as a unit of care.
4. **Holistic Health Viewpoint**: Considering physical, mental, social, and psychological aspects in the treatment and recovery process.

Evolution in Child Health Care Concepts

1. **Old Concepts**: Earlier, the focus was largely on disease-centered care, with limited family involvement and emphasis on hospital-based treatment.
2. **New Concepts**: The modern approach is child-centered, involving the family, focusing on preventive health, and extending care beyond hospital settings.

PREVENTIVE PEDIATRICS

Preventive Pediatrics is a vital healthcare domain dedicated to safeguarding the health of children from infancy to adolescence. Its primary goal is to avert illnesses, injuries, and other health issues in children. This field employs various strategies and interventions to minimize the occurrence and severity of diseases, disabilities, and developmental challenges, ensuring a healthier future for children.

1. **Demographics in India:**
   a. Women of childbearing age (15-44 years) constitute 19%.
   b. Children under 15 years make up about 40% of the population.
2. **Importance:** Mothers and children are major consumers of health services due to their significant proportion in the population.
3. **Vulnerability of Children:** About 50% of all deaths in children occur in the first 5 years of life.
4. **Mother-Child Unit:** Integration of obstetrics and child health, extending care beyond hospital walls into the community.
5. **Link to Preventive and Social Medicine:** Emergence of "preventive pediatrics" as a crucial field.

CONCEPT OF PREVENTIVE PEDIATRIC

1. **Disease Prevention:**
   - Preventive pediatrics emphasizes measures to reduce the incidence of diseases in children.
   - This includes ensuring that children receive vaccinations and immunizations to protect them from common childhood illnesses.
2. **Health Promotion:**
   - It promotes actions and behaviors that foster and enhance good health in children.
   - This may involve educating parents and caregivers on nutrition, exercise, and healthy lifestyle choices for children.
3. **Regular Check-ups:**
   - Preventive pediatrics encourages regular well-child visits to healthcare providers.
   - These visits are essential for monitoring a child's growth, development, and overall health, allowing for early detection and intervention when health issues arise.
4. **Safety Measures:**
   - Safety is a paramount concern in preventive pediatrics.
   - It involves educating parents, caregivers, and children about safety measures at home, school, and in the community to prevent accidents and injuries.
5. **Mental and Emotional Well-being:**
   - This approach recognizes the significance of mental and emotional health in children.
   - It involves addressing issues such as stress, anxiety, and depression and providing support to promote emotional well-being.
6. **Developmental Screening:**
   - Preventive pediatrics includes regular developmental and behavioral screenings to identify any potential developmental or behavioral issues early.
   - Early intervention can make a significant difference in a child's development.
7. **Health Education:**
   - Preventive pediatrics provides parents, caregivers, and children with essential health-related information, including nutrition, hygiene, and safety practices.
8. **Family-Centered Care:**
   - It acknowledges the pivotal role of families in a child's health and development.
   - It engages families as active partners in their child's healthcare and well-being.
9. **Community Collaboration:**
   - Preventive pediatrics often involves collaboration with community organizations, schools, and healthcare providers to create environments that support healthy child development.
10. **Public Health Initiatives:**
    - This concept extends to public health initiatives that safeguard children's health, such as disease surveillance, outbreak management, and emergency preparedness.

Aims of Preventive Pediatrics

- **Disease Prevention:** Focusing on preventing diseases in children.
- **Promotion of Well-being:** Enhancing physical, mental, and social health to help children reach their full genetic potential.

Aspects of Preventive Pediatrics

- **Primary Health Care Strategy:** Adopted by children's hospitals includes:
  - Growth monitoring.

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- Oral rehydration.
- Immunization.
- Nutritional surveillance.
- Promotion of breastfeeding.
- Regular health checkups.
- Health supervision.
- Parental health education.
- Motor vehicle safety measures.
- Services for healthy mother and child.
- Fluoridation of drinking water.
- Fortification of essentials like salt and sugar.
- Iodization of salt.
- Control of infectious diseases.

Levels of Preventive Pediatrics

Three Levels of Care:

1. **Primary Care:**
   - Focuses on health promotion and illness prevention.
2. **Secondary Care:**
   - Involves early identification and treatment of diseases.
3. **Tertiary Care:**
   - Centers on disability limitation and rehabilitation for chronically ill children.

GOALS OF PREVENTIVE CARE OF CHILDREN

Goals of Primary Prevention

- **Promoting Normal Growth and Development:** Ensuring that children grow and develop physically, mentally, and emotionally in a healthy manner.
- **Developing the Parent-Child Relationship:** Strengthening the bond and interactions between parents and their children for better overall development.
- **Preventing Occurrence of Health Problems:** Implementing strategies to avoid the onset of health-related issues in children.
- **Developing Strengths and Resources:** Encouraging the development of children's inherent abilities and ensuring access to necessary resources for their growth.

Goals of Secondary Prevention

- **Promoting Accurate Diagnosis:** Ensuring that any existing health problems in children are correctly identified.
- **Facilitating Treatment of Existing Health Problems:** Providing appropriate medical care and interventions for diagnosed health issues.
- **Eliminating Existing Health Problems:** Working towards resolving current health conditions in children.

Goals of Tertiary Prevention

- **Restoring Function and Preventing Recurrence:** Aiding in the recovery of lost functions due to health problems and preventing the recurrence of these issues.
- **Preventing Complications of Existing Conditions:** Implementing measures to avoid the worsening or complications of current health conditions.

- **Promoting Adjustment to Chronic Conditions:** Supporting children and their families in adapting to life with chronic health conditions, ensuring they can lead fulfilling lives despite these challenges.

CLASSIFICATION OF PREVENTIVE PEDIATRICS

Preventive Pediatrics Categories

- **Antenatal Pediatrics:** Focuses on the fetus's health and development during pregnancy.
- **Postnatal Pediatrics:** Concerns the health and development of the child after birth.

Preventive Care During Fetal Life (Antenatal Pediatrics)

- **Objective:** Ensure the birth of a mature, live, and healthy baby.
- **Focus:** Health of mothers and prevention of fetal complications like low birth weight, fetal distress, neonatal asphyxia.
- **Techniques:** Utilizing amniocentesis, ultrasonography, fetoscopy, and chorion biopsy for fetal abnormality diagnosis.
- **Importance:** Good maternal nutrition, iron, and folic acid supplementation can prevent neonatal issues.

Preventive Care of Neonate

- **Reduction of Mortality:** Can reduce neonatal mortality by 50-60%.
- **Immediate Newborn Care:** Includes establishing a clear airway, Apgar scoring, cord care, eye and skin care, providing warmth, and protection from infection.
- **Neonatal Assessment:** Diagnosing abnormalities and assessing maturity.

Preventive Care of Infant, Toddler, and Preschoolers

Breastfeeding

- **Importance:** Vital for optimal growth and development of infants.
- **Exclusive Breastfeeding:** Recommended up to 6 months of age.
- **Colostrum:** First milk post-delivery, rich in antibodies and nutrients.
- **Initiation:** Baby should be breastfed within half an hour of normal delivery or as soon as the mother is conscious post-cesarean.
- **Baby-Friendly Hospital Initiative:** Encourages breastfeeding initiation within an hour of childbirth.
- **Monitoring:** Regular weight checks to ensure adequate nutrition.

Weaning

- **Timing:** Begins after 6 months when breast milk alone is insufficient.
- **Supplementary Foods:** Includes fruit juice, vegetable soup, mashed vegetables, pulses, cereals, eggs, soft cooked meat, and fish.

Nutritional Supplements

- **Micronutrient Supplementation:** To prevent nutritional deficiencies.
- **Specific Supplements:** Iron for anemia prevention and Vitamin A to prevent night blindness.
- **Integrated Child Development Scheme:** Provides supplementary nutrition to children under 6 years.

Monitoring of Growth and Development

- **Purpose:** Indicates health and nutritional status, helps identify deviations from normal growth.
- **Growth Measurements:** Body weight, height/length, head circumference, midarm circumference, chest circumference.

- **Developmental Assessment:** Monitoring functional maturation and achievement of developmental milestones.

IMMUNIZATION

Definition:

- Immunization, also known as vaccination, is the process of administering a vaccine to stimulate the immune system of an individual against specific infectious diseases.
- The vaccine typically contains weakened or killed pathogens or parts of pathogens (such as proteins or sugars) that resemble the disease-causing agent.
- When the vaccine is introduced into the body, the immune system recognizes these antigens as foreign invaders and mounts an immune response, which includes the production of antibodies and memory cells.
- This response prepares the immune system to recognize and fight off the pathogen if the individual is exposed to it in the future, thus preventing or reducing the severity of the disease.

Immunizing Agents Classification:

1. **Live attenuated vaccines:** These vaccines contain weakened forms of the pathogen that are still capable of replicating but typically cause only mild or asymptomatic infections. Examples include the measles, mumps, and rubella (MMR) vaccine and the oral polio vaccine (OPV).
2. **Inactivated vaccines:** These vaccines contain killed versions of the pathogen, which cannot replicate. Examples include the injectable polio vaccine (IPV) and the hepatitis A vaccine.
3. **Subunit, recombinant, polysaccharide, and conjugate vaccines:** These vaccines contain only specific parts of the pathogen, such as proteins, sugars (polysaccharides), or artificially created antigens. Examples include the hepatitis B vaccine, the human papillomavirus (HPV) vaccine, and the pneumococcal conjugate vaccine.
4. **Toxoid vaccines:** These vaccines contain inactivated toxins produced by the pathogen rather than the pathogen itself. Examples include the tetanus vaccine and the diphtheria vaccine.
5. **mRNA vaccines:** These vaccines use messenger RNA (mRNA) to instruct cells to produce a protein that resembles a part of the pathogen, triggering an immune response. Examples include the Pfizer-BioNTech and Moderna COVID-19 vaccines.

Examples of Vaccines:

Immunizing Agent	Type	Diseases Prevented
Diphtheria, Tetanus, and Pertussis (DTaP) Vaccine	Vaccine	Diphtheria, Tetanus (lockjaw), Pertussis (whooping cough)
Measles, Mumps, and Rubella (MMR) Vaccine	Vaccine	Measles, Mumps, Rubella (German measles)
Varicella (Chickenpox) Vaccine	Vaccine	Chickenpox
Haemophilus influenzae type b (Hib) Vaccine	Vaccine	Haemophilus influenzae type b infections (e.g., meningitis, pneumonia)
Pneumococcal Conjugate Vaccine (PCV)	Vaccine	Pneumococcal infections (e.g., pneumonia, meningitis)

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Hepatitis B Vaccine	Vaccine	Hepatitis B virus infection
Rotavirus Vaccine	Vaccine	Rotavirus infection (causing severe diarrhea)
Inactivated Polio Vaccine (IPV)	Vaccine	Poliovirus infection (causing polio)
Influenza Vaccine	Vaccine	Influenza (seasonal flu)
Meningococcal Vaccine	Vaccine	Meningococcal infections (e.g., meningitis)
Human Papillomavirus (HPV) Vaccine	Vaccine	Human Papillomavirus infection (preventing certain cancers)
Tetanus Toxoid	Toxoid	Tetanus (lockjaw)
Diphtheria Toxoid	Toxoid	Diphtheria
Hepatitis B Immunoglobulin	Immunoglobulin	Hepatitis B virus infection (for passive immunity)
Rabies Immunoglobulin	Immunoglobulin	Rabies virus infection (for passive immunity)
Tetanus Immunoglobulin	Immunoglobulin	Tetanus (lockjaw) (for passive immunity)

IMMUNIZATION PROGRAMS AND COLD CHAIN

Universal Immunization Program (UIP)

National Immunization Schedule

Age	Vaccines given
Birth	Bacillus Calmette Guerin (BCG), Oral Polio Vaccine (OPV)-0 dose, Hepatitis B birth dose
6 Weeks	OPV-1, Pentavalent-1, Rotavirus Vaccine (RVV)-1, Fractional dose of Inactivated Polio Vaccine (fIPV)-1, **Pneumococcal Conjugate Vaccine (PCV)-1***
10 weeks	OPV-2, Pentavalent-2, RVV-2
14 weeks	OPV-3, Pentavalent-3, fIPV-2, RVV-3, **PCV-2***
9-12 months	Measles & Rubella (MR)-1, **JE-1**** , **PCV-Booster***
16-24 months	MR-2, **JE-2****, Diphtheria, Pertussis & Tetanus (DPT)-Booster-1, OPV – Booster
5-6 years	DPT-Booster-2
10 years	Tetanus & adult Diphtheria (Td)
16 years	Td
Pregnant Mother	Td-1, Td-2 or Td-Booster***

* PCV in selected states/districts: Bihar, Himachal Pradesh, Madhya Pradesh, Uttar Pradesh (selected districts) and Rajasthan; in Haryana as state initiative
** JE in endemic districts only
*** One dose if previously vaccinated within 3 years

Vaccine	When to give	Dose	Route	Site
For Pregnant Women				
Tetanus Toxoid (TT)-1	Early in pregnancy	0.5 ml	Intra-muscular	Upper Arm
TT-2	4 weeks after TT-1*	0.5 ml	Intra-muscular	Upper Arm
TT-Booster	If received 2 TT doses in a pregnancy within the last 3 yrs*	0.5 ml	Intra-muscular	Upper Arm
For Infants				
BCG	At birth or as early as possible till one year of age	0.1ml (0.05ml until 1 month age)	Intra-dermal	Left Upper Arm
Hepatitis B-birth dose	At birth or as early as possible within 24 hours	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
OPV-0	At birth or as early as possible within the first 15 days	2 drops	Oral	Oral
OPV 1, 2 and 3	At 6 weeks, 10 weeks and 14 weeks (OPV can be given till 5 years of age)	2 drops	Oral	Oral
DPT 1, 2 and 3	At 6 weeks, 10 weeks and 14 weeks (DPT can be given up to 7 yrs of age)	0.5 ml	Intra-muscular	Antero-lateral side of mid thigh
Hepatitis B 1, 2 and 3	At 6 weeks, 10 weeks and 14 weeks (can be given till one year of age)	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Pentavalent**** 1, 2 and 3	At 6 weeks, 10 weeks and 14 weeks (can be given till one year of age)	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Measles-1	9 completed months–12 months. (Measles can be given till 5 years of age)	0.5 ml	Sub-cutaneous	Right Upper Arm
Japanese Encephalitis JE-1**	9 completed months–12 months.	0.5 ml	Sub-cutaneous	Left Upper Arm
Vitamin A (1st dose)	At 9 completed months with measles	1 ml (1 lakh IU)	Oral	Oral
For Children				
DPT booster-1	16–24 months	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Measles 2nd dose	16–24 months	0.5 ml	Sub-cutaneous	Right upper Arm
OPV Booster	16–24 months	2 drops	Oral	Oral
Japanese Encephalitis**	16–24 months	0.5 ml	Sub-cutaneous	Left upper Arm
Vitamin A*** (2nd to 9th dose)	16 months. Then, one dose every 6 months up to the age of 5 years.	2 ml (2 lakh IU)	Oral	Oral
DPT Booster-2	5–6 years	0.5 mL	Intra-muscular	Upper Arm
TT	10 years and 16 years	0.5 ml	Intra-muscular	Upper Arm

Note: *Give TT-2 or Booster doses before 36 weeks of pregnancy. However, give these even if more than 36 weeks have passed. Give TT to a woman in labour if she has not previously received TT.
**JE Vaccine has been introduced in select endemic districts after the campaign on targeting children in high risk districts.
*** The 2nd to 9th doses of Vitamin A can be administered to children 1–5 years old during biannual rounds, in collaboration with ICDS.
****Pentavalent vaccine has been introduced in place of DPT and Hepatitis B 1, 2 and 3 in select states.
Source: Immunization Handbook for Medical Officers, http://nihfw.org/pdf/NCHRC-Publications/Immunil-Handbook.pdf, accessed on 15 February 2014

Beneficiaries	Immunization	Dose	Route	Site
Infants:				
At birth	BCG	0.05 mL (if <1 month of age) 0.1 mL (if >1 month up to 1 year of age)	ID	Left upper arm
	OPV—zero dose	2 drops	Oral	Oral
	Hepatitis B	0.5 mL	IM	Anterolateral side of mid-thigh
At 6 weeks	OPV—1st booster	2 drops	Oral	Oral
	*IPV—1st booster	0.1 mL	ID	Right upper arm
	Pentavalent—1st booster	0.5 mL	IM	Anterolateral side of mid-thigh
	*Rotavirus vaccine—1st booster	5 drops	Oral	Oral
At 10 weeks	OPV—2nd booster	2 drops	Oral	Oral
	Pentavalent—2nd booster	0.5 mL	IM	Anterolateral side of mid-thigh
At 14 weeks	OPV—3rd booster	2 drops	Oral	Oral
	*IPV—2nd booster	0.1 mL	ID	Right upper arm
	Pentavalent—3rd booster	0.5 mL	IM	Anterolateral side of mid-thigh
	*Rotavirus vaccine—3rd booster	5 drops	Oral	Oral
At 9 months	Measles	0.5 mL	SC	Right upper arm
	*Japanese encephalitis—1st booster	0.5 mL	SC	Left upper arm
	Vitamin A—1st booster	1 lac		
Beneficiaries	**Immunization**	**Dose**	**Route**	**Site**
Toddlers:				
At 16–24 months	DPT—1st booster	0.5 mL	IM	Anterolateral side of mid-thigh
	MMR	0.5 mL	SC	Right upper arm
	OPV booster	2 drops	Oral	Oral
	*Japanese encephalitis—	0.5 mL	SC	Left upper arm

	2nd booster			
Preschool:				
At 5 years	DPT—2nd booster	0.5 mL	IM	Anterolateral side of mid-thigh
School age:				
At 10 years	TT	0.5 mL	IM	Upper arm
At 16 years	TT	0.5 mL	IM	Upper arm

COLD CHAIN

- "Cold chain" is a system of storage and transport of vaccines at optimum temperature (2-8°C) from manufacturer to the site of vaccination.
- This cold chain is needed because vaccines are sensitive to heat and they may lose their potency if not stored and transported at optimum temperature.
- Among all vaccines, oral polio vaccine is the most heat sensitive vaccine, requiring storage at -20°C.

Storage of Vaccines

Storage Condition	Vaccines
Freezer	• Oral Polio Vaccine (OPV) • Mumps • Measles • Rubella • Rotavirus
Cold Part of Refrigerator (Not Freezer)	• TT (Tetanus Toxoid) • Rabies • Polio • Haemophilus influenzae type B (Hib) • Hepatitis B • Measles • Typhoid • DPT (Diphtheria, Pertussis, Tetanus) • DT (Diphtheria, Tetanus) • BCG (Bacillus Calmette-Guérin) • TT (Tetanus Toxoid)
Room Temperature	• Certain types of Typhoid vaccines

EQUIPMENTS OF COLD CHAIN SYSTEM IN PREVENTIVE PEDIATRICS

a. Walk-in Cold Rooms
- **Location:** Regional levels.
- **Purpose:** Store vaccine supplies for up to 3 months.
- **Capacity:** Serve four to five districts.

b. Deep Freezers (300 L) and Ice Lined Refrigerators (ILRs) (300/240 L Capacity)
- **Distribution:** Supplied to all districts and walk-in cold rooms.
- **Deep Freezers:** Used for making ice packs and storing oral polio vaccine (OPV) and measles vaccines.
- **ILRs:** Store vaccines.

c. Cold Boxes
- **Distribution:** Supplied to all peripheral vaccination centers.
- **Sizes:** Typically 5 L and 20 L.
- **Capacity:** A 5-L box can hold a 1-month vaccine supply for a Primary Health Center.
- **Usage:** For vaccine transportation.
- **Packing:** Fully frozen ice packs placed at the bottom and sides; vaccines wrapped in polythene bags and placed inside.

d. Vaccine Carrier
- **Purpose:** Carry a small quantity of vaccines (16-20 vials) for outreach sessions.
- **Design:** Square box made of insulated material.
- **Ice Packs:** Four fully frozen ice packs line the sides.
- **Sealing:** Must be closed tightly.
- **Working Capacity:** Up to 48 hours.

e. Day Carrier
- **Design:** Square boxes with two ice packs.
- **Placement:** One ice pack at the bottom, another on top.
- **Capacity:** Carry small quantities of vaccines (6-8 vials) to nearby sessions.
- **Working Capacity:** Up to 12 hours.

f. Ice Packs
- **Composition:** Contain water without added salt.
- **Preparation:** Water filled to the marked level and frozen.

CARE OF UNDER-FIVE/UNDER-FIVE CLINICS/WELL BABY CLINICS

- The first 5 years of life form the foundation of child's physical and mental growth and development.
- The fact that 50% of deaths in India occur among under-five points the need of special attention toward this age group.
- So, the department of health established the under-five clinic program to address this problem. An under-five clinic combines the concept of prevention, treatment, health supervision, nutritional surveillance, and education into a system of health care and making these services available to a larger portion of children.

Care in Illness

Philosophy and Scope
- **Primary Aim:** To provide care and treatment for sick children.
- **Nurse's Role:** Trained nurses skillfully manage 70-90% of child care, emphasizing the importance of their role in these clinics.

Services Offered
- **Acute and Chronic Illness Management:** Addressing immediate and long-term health issues.
- **Dealing with Abnormalities:** Tackling physical, mental, congenital, and acquired conditions.
- **Growth and Development Disorders:** Inclusive of X-ray and laboratory services for comprehensive diagnosis, alongside referral services for specialized care.

Preventive Care

Immunization Program
- **Goal:** Shielding children from six major diseases - Diphtheria, Polio, Tetanus, Measles, Tuberculosis, and Whooping Cough.

- **Implementation:** Regular vaccination drives to ensure widespread immunization.

Nutritional Surveillance

- **Regular Weight Monitoring:** Monthly weight checks to track growth and identify nutritional issues early.
- **'Road to Health' Cards:** A tool for nurses to record a child's height and weight, aiding in the assessment of their nutritional status.

Health Checkups

- **Frequency:** Conducted every 3-6 months.
- **Child Health Cards:** These provide a checklist for examinations, helping in recognizing children who may need extra care.

Oral Rehydration Therapy

- **Context:** High frequency of diarrheal attacks in developing countries.
- **Solution:** Promoting the use of ORS packets to combat dehydration effectively.

Growth Monitoring

Regular Assessments

- **Schedule:** Monthly in the first year, every 2 months in the second year, and every 3 months until the age of 5-6 years.
- **Growth Charts:** These charts are crucial for detecting early signs of growth failure.

Family Planning

Central Element

- Represented by the red triangular area in the clinic symbol.
- **Counseling:** Providing mothers with family planning advice to ensure the health and well-being of the child.

Health Education

Comprehensive Approach

- **Encompassing Education:** The border around the clinic symbol signifies the all-encompassing nature of health education provided.
- **Topics Covered:** Nutrition, immunization, family planning, and care during illness.

PREVENTIVE MEASURES TOWARD ACCIDENTS

Introduction

- An accident or mishap is an unforeseen and unplanned circumstance, often occurring with lack of intention or necessity.
- It usually implies a generally negative outcome which may have been avoided or prevented, had circumstances leading to the accident been recognized.
- Every year, one million children under the age of 18 years are taken to accident and emergency units after being involved in accidents at home.
- Many of the accidents that happen in and around the home can be avoided by identifying and understanding potential accident risk in home.

Common Childhood Accidents

Following are the most common childhood accidents:

- Fall
- Burn
- Fracture and dislocation
- Sprain
- Cutandabrasions
- Animal bites

- Poisoning
- Drowning
- Motor vehicle accidents
- Foreign bodies
- Suffocation
- Crush injuries.

Types of Accidents

1. According to the location where accident occurs, they are of two types
   - Occurring outside home
   - Occurring in the home.
2. According to severity, accidents are of two types:
   - Majo
   - Minor.

Factors Affecting Accidents

- **Age:** Accidents are more common between 2 and 10 years of age.
- **Sex:** Boys between 10 and 14 years of age are more prone to accidents.
- **Personality:** Bright and alert children are more prone to accidents because they are eager to do new activities.
- **Ordinal position:** Elder and younger children are more protected but middle ones are neglected, so they are more prone to accidents.
- **Most Weather condition:** Accidents occur more in rainy season.
- **Time of day:** accidents occur in afternoon.
- **Place:** Accidents may occur in home or on roadside.

Causes of Accidents

The important causes of accidents among children are as follows:

- Curiosity among children.
- Lack of supervision, especially at home.
- Lack of playgrounds and overcrowded streets.
- Impulses of the moment, e.g., boys want to show off their bravery so they often indulge in risky acts.
- Lack of past experience.
- Inability to judge danger.

Effects of Accidents

- **Physical damage:** Even a minor accident can cause cut, fracture, scar, sprain, dislocation, etc.
- **Psychological damage:** The child thinks that people will feel that he is naughty and careless if he has too many bandages on body. He thinks himself a "wounded hero".

Common Childhood Accidents

- **Motor vehicles:** Both as passengers and as pedestrians, children may get injured.
- **Burns:** Children may get burnt from heating appliances like stoves, irons, heaters, etc. They may get burnt from:
- **Open fire:** Fireplaces, outdoor fires, matches, and lighters.
- **Hot liquids:** Bathwater, cooking fluid, tea, coffee, etc.
- **Electric circuit:** Defective wiring, unguarded outlets.
- **Strong acids and alkalis:** Ammonia, hydrochloric acid.

- Drowning: In bath tub, sink, wells, swimming pool, ponds, ditches, rivers, etc.
- Falls: From furniture, stairs, unguarded windows, terrace, etc.
- Poisoning: Drugs (like aspirin, sedatives, antihypertensives, and tranquilizers), insecticides, cleaning agents, kerosene, etc.
- Suffocation: Plastic bags, discarded refrigerators, etc. Foreign bodies: Nuts, especially peanuts, dried beans, pins, nails, screws, bolts, beads, etc.
- Cuts and punctures: Knife, scissors, large needles, broken glass, tools, etc.
- Crush injury: From wringers.

Prevention of Household and Outdoor Accidents in Toddlers

Hazards	Protection Measures
Drugs, Chemicals, Sharp Instruments	- Keep in locked, inaccessible cabinets or drawers. - Use stove and heater guards.
Burns and Scalds	- Keep matches out of reach. - Stoves and utensils away from edge; no hanging tablecloths.
Furniture	- Use safety locks and consistent discipline. - Use gates.
Car Doors	- Lock car doors. - Consistent discipline on the street.
Electricity	- Plastic plugs or tape over unused sockets. - Repair defective wiring. - Keep equipment out of reach.
Drowning and Bathroom Hazards	- Never leave a full tub unguarded. - Fence ponds and pools. - Consistent discipline at the beach.
Traffic	- Lock car doors. - Consistent discipline on the street.
Aspiration of Foreign Bodies	- Keep small objects in cupboards. - Ensure toys don't have small, removable parts.
Ingestion of Lead	- Repair and repaint defective walls with lead-free paint.

Prevention of Accidents in Children

Role of Parents and Caretakers

- **Early Responsibility:** Initially, parents and caretakers are fully responsible for a child's safety.
- **Growing Independence:** As the child gains independence, safety relies on self-protection habits and caretaker prudence.

Role of Health Professionals

- **Influence:** Physicians and nurses should discuss potential hazards and prevention methods with parents.
- **Education:** Offer guidance during well baby conferences and visits to sick children's parents.

Public and Private Safety Programs

- **Organizations:** National Safety Council, Children's Bureau, health departments, insurance companies, etc.
- **Methods:** Safety programs via advertising, articles, pamphlets, and media (radio, TV).

Home Safety

- **Home Visits:** Nurses visiting homes can conduct safety checks and offer tailored suggestions.
- **Awareness:** Remind parents about the poisonous nature of drugs and household chemicals.

Parental Guidance and Discipline

- **Positive Reinforcement:** Substitute constructive suggestions and safer toys instead of constant nagging.
- **Firm Discipline:** Ensure discipline is firm, prompt, and consistent for dangerous activities.
- **Physical Punishment:** Reserve for dangerous behaviors, not for merely annoying ones.

CHILD MORBIDITY AND MORTALITY RATES

Health: A Multidimensional Concept

1. **Physical Health:** Absence of physical pain, disability, or life-threatening conditions.
2. **Emotional Wellbeing:** Mental and emotional stability and health.
3. **Social Functioning:** Ability to function and interact effectively in a social setting.

Population Health Measurement

- **Aggregation:** Health status of a population is determined by aggregating individual data.
- **Indicators:** In the absence of absolute measures, certain indicators serve as proxies for health status.

Common Measures of Population Health

1. **Average Lifespan:** Reflects the general health conditions and medical advancements in a society.
2. **Prevalence of Preventable Diseases:** Indicates the effectiveness of preventive healthcare and public health policies.
3. **Mortality Rates:** Provides insights into the severity of health issues and effectiveness of health care systems.
4. **Availability of Health Services:** Demonstrates access to and quality of healthcare services.
5. **Child Morbidity and Mortality Rates:** Specifically reflect the health status of the younger population, indicating the quality of pediatric care, nutrition, and overall child welfare.

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MORBIDITY AND MORTALITY MEASURES

1. **Incidence Rate:**
   - **Formula:** $\frac{\text{Number of new cases of a disease during a specified time period}}{\text{Number of persons at risk during that period}} \times 1,000$
   - **Purpose:** This calculates the rate at which new cases of a disease occur in a population, indicating the risk of developing the disease within a given timeframe.
2. **Prevalence Rate:**
   - **Formula:** $\frac{\text{Number of existing cases of a disease at a specified time}}{\text{Total population at risk at that time}} \times 1,000$
   - **Purpose:** This shows the proportion of individuals in a population who have a specific disease at a given time, reflecting the disease's overall burden on the population.

Mortality Measure:

- **Death Rate:**
  - **Formula:** $\frac{\text{Total number of deaths in a population during a specified time period}}{\text{Total population during the same time period}} \times 1,000$
  - **Purpose:** This provides an overall measure of mortality within a population, offering insights into the general health and longevity of the population.

Other Mortality Indicators

1. **Maternal Mortality Rate (MMR)**
   - Measures deaths due to complications from pregnancy or childbirth.
2. **Perinatal Mortality Rate (PMR)**
   - Reflects the number of stillbirths and deaths in the first week of life.
3. **Neonatal Mortality Rate (NMR)**
   - Accounts for deaths within the first 28 days of life.
4. **Postneonatal Mortality Rate (PNMR)**
   - Represents deaths from 29 days to one year of age.
5. **Infant Mortality Rate (IMR)**
   - Measures deaths of infants under one year of age.
6. **Under-five Mortality Rate**
   - Indicates the number of deaths in children under five years of age

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Maternal Mortality Rate (MMR):

- **Definition:** MMR measures the risk of death for women due to pregnancy or childbirth complications, or within 42 days of pregnancy termination, per 1,000 live births in a given time frame.
- **Formula:**

$$\text{MMR} = \left(\frac{\text{Number of maternal deaths due to pregnancy or childbirth complications within a year}}{\text{Total number of live births in the same year}}\right) \times 1,000$$

Mortality in Infancy and Childhood

a. Perinatal Mortality Rate (PMR)

- **Definition:** PMR encompasses the total number of late fetal deaths (occurring after 28 weeks of gestation) and early neonatal deaths (within the first week after birth).
- **Formula:**

$$\text{PMR} = \left(\frac{\text{Late fetal deaths (28 weeks or more)} + \text{Early neonatal deaths (first week) in a year}}{\text{Live births in the same year}}\right) \times 1,000$$

b. Neonatal Mortality Rate (NMR)

- **Definition:** NMR measures the number of deaths within the neonatal period, defined as from birth to 28 days of life.
- **Formula:**

$$\text{NMR} = \left(\frac{\text{Number of deaths under 28 days of age in a year}}{\text{Total live births in the same year}}\right) \times 1,000$$

c. Postneonatal Mortality Rate (PNMR)

- **Definition:** PNMR accounts for the number of infant deaths occurring from 28 days to under 1 year of age.
- **Formula:**

$$\text{PNMR} = \left(\frac{\text{Number of deaths from 28 days to under 1 year of age in a year}}{\text{Total live births in the same year}}\right) \times 1,000$$

FACTORS AFFECTING INFANT MORTALITY RATE

Infant mortality rate (IMR) is influenced by a myriad of factors spanning biological, economic, cultural, and social domains. Understanding these factors is crucial for devising strategies to improve child health outcomes.

Biological Factors:

1. **Birth Weight:** Lower birth weights are associated with higher risks of infant mortality.
2. **Age of Mother:** Very young and older mothers tend to have higher risks of complications leading to increased infant mortality.
3. **Birth Order:** First and higher-order births might have higher risks due to various maternal and neonatal complications.
4. **Birth Spacing:** Short intervals between births can lead to increased mortality risks for infants.
5. **Multiple Births:** Twins or multiple births often have a higher risk due to complications and lower birth weights.
6. **Family Size:** Larger family sizes might contribute to resource constraints, affecting child health.
7. **High Fertility:** High fertility rates can strain healthcare and family resources, impacting infant survival.

Economic Factors: Economic conditions directly influence healthcare access, nutrition, and living conditions, all critical for infant survival.

Cultural and Social Factors:

1. **Breastfeeding:** Practices around breastfeeding significantly affect infant nutrition and immunity.
2. **Religion and Caste:** Cultural beliefs and practices can influence healthcare access and practices.
3. **Early Marriages:** Early marriages often lead to early pregnancies, associated with higher risks for infants.
4. **Sex of the Child:** In some cultures, gender biases may affect the care and resources allocated to children.
5. **Quality of Mothering:** Maternal care quality, including affection, care, and attention, plays a crucial role.
6. **Maternal Education:** Educated mothers are better equipped to seek and provide effective healthcare and nutrition.
7. **Quality of Healthcare:** Access to and the quality of prenatal, natal, and postnatal care significantly affect infant mortality rates.
8. **Broken Families:** Family structure can impact the care and resources available to infants.
9. **Illegitimacy:** Social stigma and resource constraints in such situations might affect child health.
10. **Brutal Habits and Customs:** Harmful traditional practices can endanger infant health.
11. **Indigenous Dai:** The reliance on traditional birth attendants (dais) can affect birth outcomes, depending on their skills and practices.
12. **Bad Environmental Sanitation:** Poor sanitation contributes to infectious diseases, significantly impacting infant mortality.

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DIFFERENCES BETWEEN CHILDREN AND ADULTS

- There are many differences between children and adult like; anatomical, physiological, cognitive, social and emotional differences
- Illness of children and adult are also based on given differences.

ANATOMICAL AND PHYSIOLOGICAL DIFFERENCE

Size:

- **Newborns**: The head comprises about one-fourth of the total body length, with the center of the body at the umbilicus. The relatively larger head size compared to the rest of the body is a notable feature.
- *Adults*: Proportional differences become more pronounced, with adult males typically developing broader shoulders and adult females having wider hips.

Shape:

- **Infants**: Exhibit round contours due to the distribution of fat and muscle, which changes with growth.
- **Adults**: The body shape diversifies significantly, influenced by genetic factors, hormones, and lifestyle.

Rate of Growth:

- **Brain and Skull**: Experience rapid growth early in life, with the brain reaching 25% of its adult size at birth, 90% by age 5, and about 95% by age 10.

GASTROINTESTINAL SYSTEM

The function of the GI tract as a protective barrier are as important as its functions of digestion and absorption but vary with age and maturity.

Feature	Children	Adults
Lower Esophageal Sphincter (Cardiac Sphincter)	Relaxed, leading to higher chances of vomiting during stomach contractions.	Mature and tight, reducing the risk of regurgitation.
Peristalsis	Rapid peristalsis, moving food quickly through the digestive tract.	Normal pattern of peristalsis with proper functioning and control.
Immaturity of the Gut	Functional and immunological immaturity, affecting digestion and pathogen defense.	Mature gut capable of handling a variety of foods and providing enhanced protection against pathogens.
Diet	Primarily liquid, leading to looser stools.	Solid or fibrous, resulting in harder stools.
Teeth	Temporary teeth present.	Permanent teeth adapted to a varied diet.
Liver Size	Proportionately large in newborns, playing a significant role in nutrient processing and detoxification.	Occupies a defined space under the diaphragm and is less palpable.

RESPIRATORY SYSTEM

Feature	Children	Adults
Lung Composition	Fetal lungs are filled with fluid.	Adult lungs are filled with air.

Lung Expansion After Birth	Expand immediately after birth.	Function voluntarily and are already air-filled.
Eustachian Tube	Short, straight, wide, and lies at an angle of 10 degrees from the horizontal plane.	Longer, and lies at an angle of 45 degrees, providing better drainage and protection.
Respiratory Rate	30 to 60 breaths per minute.	16 to 24 breaths per minute.
Proneness to Respiratory Tract Infections	More prone to infections due to lack of protective mechanisms against infectious microorganisms.	Less prone due to protection from cilia, mucus layer, and alveolar macrophages.
Tissue Delicacy	Respiratory tract tissues are delicate.	Tissues are more robust and less delicate.
Mucus Production	Tissues do not produce sufficient mucus.	Tissues produce a sufficient amount of mucus, aiding in trapping and clearing pathogens.

INTEGUMENTARY SYSTEM

The integumentary system consists of the skin, hair, nails, the subcutaneous tissues and glands. Children's skin is more delicate than adults. The skin barrier of integumentary system develop after one year of age.

Feature	Children	Adults
Apocrine Sweat Glands	Small and non-functional in pre-school children, beginning to function at around 8 years of age.	Fully developed and functional, characterized by odor.
Protective Skin Layer	The protective layer of skin is formed by sebaceous glands, known as vernix caseosa in newborns.	The presence of sebaceous glands contributes to typical skin issues like pimples and blackheads.
Fatty Layer	Gives the baby a plump look, contributing to their soft and rounded appearance.	In adults, the fatty layer contributes to the round contour around hips, thighs, and chest.
Skin Problems	Includes conditions like Leiner's disease and Sclerema neonatorum.	Adult skin problems do not typically include newborn-specific conditions but may involve acne, wrinkles, and other age-related changes.

CIRCULATORY SYSTEM

The circulatory system is made up of blood vessels and veins. This system carries oxygen, nutrients and hormones to cells and removes waste products like carbondioxide, but the fetal circulation is different from adult circulation.

Feature	Fetal Circulation	Adult Circulation
Oxygenation Site	Oxygenation of blood is carried out by the placenta.	Oxygenation of blood is carried out by the lungs.
Lung Function	Lungs are non-functioning in the fetus.	Lungs are fully functioning in adults.

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Arterial Blood	Arteries carry deoxygenated blood away from the fetal heart.	Arteries carry oxygenated blood away from the adult heart.
Venous Blood	Veins carry oxygenated blood back to the fetal heart.	Veins carry deoxygenated blood towards the adult heart.
Gas Exchange Site	Exchange of gases takes place in the placenta.	Exchange of gases takes place in the lungs.
Heart Pressure	Increased pressure on the right side of the fetal heart.	Increased pressure on the left side of the adult heart.

URINARY SYSTEM

Primary function of the urinary system in adult and children is to maintain body homeostasis, filter blood, regulating blood pressure, blood volume, osmolarity and composition of extracellular fluid but these functions are altered in the neonate in comparison to the adult.

Feature	Children	Adults
Kidney Maturity	Infant's kidneys are immature.	Kidneys are mature.
Filtering Capacity	Poor capacity to filter and concentrate urine.	Good capacity to filter and concentrate urine.
Nephron Development	Nephrons are not fully grown and not functioning properly.	Nephrons are fully developed and functioning.
Urination Control	Urination is not under voluntary control during infancy.	Urination is under voluntary control.
Renal Failure Progression	Chronic renal failure usually does not follow acute renal failure.	Chronic renal failure may follow acute renal failure if untreated.

HEMATOLOGICAL SYSTEM

Children and adult exhibit profound hematologic differences from one another because children mature at different rates.

Feature	Children (Neonates)	Adults
Blood Volume	85 ml/kg of body weight	60-70 ml/kg of body weight
RBC Characteristics	Macrocytic (larger size)	Normocytic (normal size)
Life Span of RBC	60-90 days	100-120 days

ENDOCRINE SYSTEM

Endocrine system consist of glands which secrets the hormones of glands into blood. These hormones are essential for child's growth and development. Problems faced by children due to immature endocrine system, are often quite different from adults.

Feature	Children	Adults
Development	Not developed properly.	Fully developed.
Adrenal Gland Function	Minimal function.	Function increases significantly at puberty and remains robust.
Risk of Hypocalcemia	High, due to functional immaturity of parathormone.	Low, as parathormone functions properly to regulate calcium levels.
Fluid and Electrolytes Balance	Risk of imbalance due to lack of homeostatic control.	Appropriate homeostatic control maintains fluid and electrolytes balance.

REPRODUCTIVE SYSTEM

After fertilization of egg, the reproductive organs starts to develop. A baby's gender is determined at conception and the different genitalia of male and female fetus develop from the same tissue in embryo. At puberty stage, organ become mature. The difference between children and adult is given ahead.

Feature	Children	Adults
Male Testes Size	1.5-2 cm long and 0.7-1 cm wide in male babies.	Size increases gradually and reaches maturity between 13-17 years of age.
Female Ovaries Size	10 mm in length and 2-4 mm in width in female babies.	In adult females, ovaries are matured and start functioning at 12-13 years of age.

MUSCULOSKELETAL SYSTEM

The musculoskeletal system helps the child and adult in sitting, standing, walking, etc. The musculoskeletal system in children is different than adult.

Feature	Children	Adults
Motor Development	Immature motor development.	Fully developed motor functions.
Skull Sutures	Not united; skull sutures are open, allowing for brain growth.	United; sutures have fused, and skull shape is fixed.
Protection of Brain	Brain is not fully protected due to the presence of the open fontanelle.	Brain is fully protected by ossified skull bones.
Bone Characteristics	Bones are softer and less brittle, allowing for growth and flexibility.	Bones are ossified, providing support, stability, and enabling movement.
Head Size	The head enlarges in proportion to brain growth as the sutures are separate.	Head size is stabilized as sutures have fused, marking the end of skull growth.

NEUROLOGICAL SYSTEM

Neurological system consists of brain, spinal cord and nerves. Brain helps to control body's functions and spinal cord and nerves are like a network that relays message to the part of body. Anatomy and physiology of this system is slightly different from adults.

Feature	Children	Adults
Blood-Brain Barrier	Immature, allowing for a higher susceptibility to infective neurological illnesses like meningitis.	Mature, providing better protection against neurological infections.
Prevalence of Neurological Illnesses	Higher prevalence of infective neurological illnesses.	Much less prevalence of such illnesses due to the mature blood-brain barrier.
Brain Weight	About 300-500 g in early childhood.	About 1300-1400 g in adulthood.
Proportion of Brain Weight to Total Body Weight	Approximately 10-11% of the total body weight in newborns.	About 2% of the total body weight in adults.

LYMPHOID AND IMMUNE SYSTEM

The immune system helps to protect body from infectious organism. It is made up of cells, tissues and organs that work together to protect body.

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Feature	Children	Adults
Immune Protection	Before birth, babies are protected by the mother's immune system.	The immune system is fully developed and provides direct protection against infections.
Response to Infection	Tends to respond with excessive swelling and hyperplasia.	More likely to contain infection locally, showing fewer systemic responses.
Developmental Changes	Immune system is developing and adapting post-birth.	Lymphatic system has undergone its growth and maturation, becoming more efficient in its response to pathogens.

PATHOLOGICAL DIFFERENCES

Children's immune system which protect body from infectious diseases is immature, due to which they are more prone to acquire disease as compared to adults.

Feature	Children	Adults
Fluid Balance	Loose fluid balance easily through vomiting and diarrhea.	Can maintain fluid and electrolyte balance more effectively.
Susceptibility to Diseases	More susceptible due to immature immune system.	Acquire immunity over time to fight against infections.
Response to Illness	Child's condition can deteriorate rapidly with illness.	Symptoms can be severe, but adults have better compensatory mechanisms initially.

PSYCHOLOGICAL DIFFERENCES

There are many psychological differences between children and adult.

Feature	Children and Adolescents	Adults
Developmental Stage	In developing stages psychologically.	Psychologically more mature.
Clinician's Attention	Require more attention from clinicians for observation.	Do not require as much attention.
Mind Diversion	Can be easily diverted.	Cannot be diverted as easily.

SOCIAL DIFFERENCES

Social development means attain the values, social ethics, knowledge and skills to build positive sense of their own identity and to learn role in society and family. Children can learn directly or indirectly from social relationship at different rates.

Feature	Children	Adults
Reaction to Strangers	Become anxious and fearful of strangers.	Generally, more comfortable and less fearful around strangers.
Attention-Seeking Behavior	May try to attract attention by coughing, snoring, or other noticeable behaviors.	Less likely to use overt behaviors to attract attention; more self-assured.
Dependence	Highly dependent on parents or caregivers for support and guidance.	Typically, self-dependent with well-defined social behaviors and circles.
Social Behavior	Developing social values and behaviors;	Social values, behaviors, and

and Stability	social circles are less defined.	circles are generally more defined and stable.

IMMUNOLOGICAL DIFFERENCES

Children develop fully functional innate immune pathogen sensing and killing systems in place by two years of age. Adult immune system has fully developed tolerance, rendering it prepared to defend against pathogens at all times until advancing age. The various immunological differences between children and adults:

Immune Parameter	Children	Adults
NK Cell Activity	Similar CD16 expression to adult cells but with lower cytotoxic capacity.	Lower number of NK cells than children.
CD4+ Cell Responses	Th2 bias, indicating a tendency towards a humoral immune response.	Balanced Th2 and Th1 responses, indicating a more regulated immune response between humoral and cell-mediated immunity.
Memory B Cell Formation	Decreased markers of memory B cells and impaired bone marrow homing markers.	Higher expression of memory B cell markers, suggesting a more robust ability to remember past infections.
IgG Subclass Response	IgG1 and IgG3 attain adult levels earlier; diminished response of IgG2 to polysaccharide antigens.	IgG2 effectively responds to polysaccharide antigens, indicating mature antibody responses.
Maternal Antibodies	Interfere with the development of B cell but not T cell responses in infants.	Do not interfere, allowing for the development of autonomous immune responses.
Interleukin Levels (IL)	Lower levels of IL-2, IL-4, and IL-6, which are critical for immune response and inflammation.	Markedly higher levels of IL-2, IL-4, and IL-6, indicating a more active and responsive immune system.

THE HOSPITAL ENVIRONMENT FOR SICK CHILDREN

- Hospitalization is a significant event in the life of a sick child and their family.
- It disrupts the child's regular growth, development, and daily routines.
- Being in an unfamiliar environment, away from the comfort of home, siblings, relatives and peers, can be a source of stress and anxiety for both the child and their family.

THE HOSPITAL ENVIRONMENT FOR SICK CHILDREN

Stressful Aspects of Hospitalization

1. **Social Environment**
   - Involves interactions with healthcare staff, other patients, and their families.
   - The new social setting can be overwhelming and unfamiliar.
2. **Physical Environment**
   - Comprises the hospital ward, equipment, and machinery.
   - Unfamiliar objects, sounds, and smells can be intimidating and disorienting.
3. **Change in Routine**
   - Hospital procedures, altered nutrition, and sleep disruptions contribute to stress.

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- Dietary changes and sleep disturbances due to hospital noise can lead to discomfort.

PREPARATION OF HOSPITAL ENVIRONMENT FOR THE CHILD

Actions to Alleviate Stress

1. **Nurses' Approach**
   - Warmth and concern from nurses can significantly aid in coping with hospitalization.
2. **Familiarization with Healthcare Team**
   - Introducing the child and family to the physician and health team members can build comfort and trust.
3. **Acquaintance with the Ward**
   - Orienting the family to the hospital setting and necessary locations can reduce anxiety.
4. **Familiarization with Equipment**
   - Explaining the purpose and sounds of medical equipment can demystify the hospital experience.
5. **Dietary Considerations**
   - Taking into account the child's food preferences when planning their diet.
6. **Creating a Calm Environment**
   - Ensuring a quiet atmosphere to promote better sleep and recovery.
7. **Parental Involvement**
   - Allowing parents to stay and be involved in the child's care offers emotional support and stability.
8. **Provision for Play and Recreation**
   - Integrating play areas and activities to keep the child engaged and positive.
9. **Pleasing Ward Setting**
   - Decorating with child-friendly themes and separating areas for painful procedures to minimize fear and anxiety among children.

IMPACT OF HOSPITALIZATION ON THE CHILD AND FAMILY

IMPACT ON PARENTS/RESPONSE OF PARENTS

1. **Increased Stress:** Stress factors include lack of information about the child's illness, fear of treatments and procedures, uncertainty about the child's future, and financial concerns.
2. **Emotional Reactions:** Parents often feel guilt, anxiety, fear, and disappointment. They may believe they are somehow responsible for the child's illness.
3. **Feelings of Helplessness**
   - Separation from their child can leave parents feeling unable to provide care, leading to helplessness.
4. **Potential Negative Behaviors**
   - In some cases, parents may exhibit anger or aggression towards healthcare staff, especially if they perceive any mistakes in the child's care.

IMPACT OF HOSPITALIZATION ON CHILD

The child's reaction to hospitalization varies based on age and developmental stage:

1. **Infants (Under 6 Months)**
   - Typically show less anxiety. However, emotional disturbances can arise from separation from parents and lack of sensory engagement.

2. **Older Infants (8-12 Months)**
   - Exhibit separation anxiety through excessive crying and clinging to parents.
3. **Toddlers**
   - Reactions include:
   - Protest: Crying, restlessness, and resistance to care.
   - Despair: Withdrawal, apathy, thumb-sucking, and regression.
   - Denial or Detachment: Adjustment to the hospital environment, seemingly losing the need for parental presence.
4. **Preschool Children**
   - Express stress and separation anxiety, may show regression and have nightmares.
5. **School-Age Children**
   - Experience fear, anxiety, anger, and guilt. Concerns about body image and physical changes may lead to behaviors like masturbation. They tend to exhibit less overt distress.
6. **Adolescents**
   - Struggle with hospital rules and dependency, leading to frustration. They may show rapid emotional swings and struggle with accepting restrictions.

Role of Nurse in Care of Hospitalized Children

Nurses play a crucial role in mitigating the stress of hospitalization for both the child and their family. Their responsibilities vary according to the age and developmental stage of the child.

CARE OF INFANTS

Parental Involvement

- **Engagement**: Nurses encourage parents to be actively involved in their infant's care, including medication administration, feeding, and comforting activities.
- **Benefits**: This strategy not only reduces the infant's separation anxiety but also equips parents with the necessary skills and confidence for post-hospital care.

CARE OF TODDLERS

1. **Preserving Trust**: Maintaining the toddler's trust in their parents and caregivers is crucial, avoiding feelings of abandonment.
2. **Expression of Emotions**: Nurses assist toddlers in expressing anger or frustration in constructive ways, recognizing their limited ability to communicate verbally.
3. **Parental Visits**: Facilitating frequent parental visits helps the child feel loved and secure, reinforcing emotional bonds.

IN PRESCHOOL CHILDREN

1. **Reducing Separation Anxiety**: Implementing rooming-in practices where parents stay with their child to minimize anxiety and provide constant support.
2. **Expressive Play**: Allowing children to express their feelings through play can significantly reduce the trauma associated with hospitalization.
3. **Encouraging Self-Care**: Nurses involve preschool children in their care to the extent possible, promoting autonomy and a sense of normalcy.

IN SCHOOLCHILDREN

1. **Addressing Perceptions**
   - **Understanding**: Nurses take time to understand and address schoolchildren's perceptions of hospitalization, often seen as a form of punishment.

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2. **Activity Encouragement**
   - **Engagement**: Motivating children to engage in activities like reading or watching TV helps combat boredom and maintain mental wellness.
3. **Privacy and Independence**
   - **Respect**: Acknowledging and respecting the child's growing need for privacy and independence is key.
4. **Expression of Concerns**
   - **Communication**: Encouraging open dialogue about fears and anxieties allows for therapeutic communication and support.

IN ADOLESCENTS

1. **Understanding Emotional Impact**
   - **Recognition**: Nurses recognize and address the significant emotional and psychological impacts of illness and hospitalization on adolescents.
2. **Participation in Treatment**
   - **Empowerment**: Helping adolescents understand their treatment plans and encouraging their participation fosters a sense of control and cooperation.
3. **Communication and Reóassurance**
   - **Support**: Providing clear information and reassurance to alleviate fear and anxiety is crucial for this age group.
4. **Encouraging Self-Care**
   - **Independence**: Promoting self-care practices among adolescents supports their need for independence and helps maintain self-esteem during hospitalization.

COMMUNICATION TECHNIQUES FOR CHILDREN

1. Communicating well with children improves your bond with them, and encourages them to listen to you.
2. Communication is the act of conveying meanings from one person to another through the use of mutually understood signs, symbols and semiotic rules.
3. Some children need a lot of encouragement and positive feedback to get talking. Others will be desperate to talk with you when you're busy doing something else.

Effective Communication Techniques with Children:

1. Responding to Baby's Gestures and Sounds
- Engage when the baby reaches out or makes sounds.
- Always make eye contact when the baby looks at you.
- Reply to baby's sounds to encourage their communication.

2. Encouraging Development of Communication Skills
- Give the child time to respond during conversations.
- Use questions to stimulate the child's thoughts and speech.

3. Building Language Skills
- Encourage them to express their likes and dislikes.
- Help them learn new words by discussing surroundings.
- Use easy words and sentences for better understanding.

4. Teaching Non-Verbal Communication
- Demonstrate the importance of non-verbal cues.
- Bend down to the child's height when communicating.

- Use subtle physical gestures to show attention and care.

5. Respecting and Recognizing Feelings
- Acknowledge and empathize with the child's emotions.
- Offer alternatives to express feelings in a positive way.

6. Developing a 'Feelings' Vocabulary
- Help children describe their feelings in words.
- Show understanding for all kinds of emotions.

7. Reading Together
- Foster a love for books and stories.
- Encourage involvement in the reading process.
- Talk about the emotions and actions of characters.

8. Encouraging Pretend Play
- Listen and talk during their pretend play.
- Use playtime for learning empathy and social skills.

9. Making Clear and Simple Requests
- Tailor requests to the child's age and understanding.
- Ensure the child is attentive and understands instructions.

10. Being a Good Role Model
- Show how to interact kindly with others.
- Teach by example the way to expect and receive respect.

For active listening, you should do the following:
1. Watch the child's facial expressions and body language. Listening is not just about hearing words, but also about trying to understand what's behind those words.
2. To let the child know you are listening, and to make sure you have really understood the important messages they are telling you, repeat back what the child has said and make eye-to-eye contact.
3. Try not to jump in, cut the child off, or put words in his mouth - even when he says something that sounds ridiculous or wrong or is having trouble finding the words.
4. Don't rush into problem-solving.

Help the child to develop listening skills by the following:
1. Let the child finish talking and then respond. This sets a good example of listening for the child.
2. Make the request simple and clear to match the child's age and ability.
3. Avoid criticism and blame.
4. Be a good role model.

GRIEF AND BEREAVEMENT

GRIEF

Definition of Grief
- A powerful emotional reaction to separation or loss.
- Loss can be due to declining health, impending death, death of a loved one, or loss of a valuable object.
- Time-limited and intensity decreases over time, typically resolving fully in a year or more.

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Mourning
- **Process:** Mourning is how grief is resolved.
- **Societal Aspect:** It represents the societal expression of post-bereavement behavior and practices.

BEREAVEMENT

- **Meaning:** The state of being deprived of someone due to death.
- **State:** Refers to being in the state of mourning.

Causes, Incidence, and Risk Factors
- **Triggers:** Losses triggering grief can include relationship breakups, loss of health, loss of friendship, illness or death of a loved one, including pets.

Stages of Grief (Elisabeth Kübler-Ross, 1969)
1. **Denial:** "This cannot happen to me."
2. **Anger:** "Why is this happening?"
3. **Bargaining:** "Make this not happen, and in return, I will..."
4. **Depression:** "I am too sad to do anything."
5. **Acceptance:** "I am at peace with what happened."

Stages of Grief in Children
1. **Disorganization:** Includes regression, temper tantrums, lack of concentration, and mood swings.
2. **Transition:** Features stress, chaotic behavior, feelings of hopelessness, helplessness, and despair, leading to depression or withdrawal.
3. **Reorganization:** Characterized by the fading of painful feelings, increased energy, and motivation to move forward.

Symptoms of Grief
1. **Physical Signs:**
   a. Insomnia.
   b. Tight muscles in the chest and throat.
   c. Interrupted sleep.
   d. Loss of appetite.
   e. Lethargy.
   f. Generalized weakness.
2. **Psychological Signs:**
   a. Preoccupation or ambivalence toward the lost object.
   b. Anger.
   c. Fantasies of the object not being lost.
   d. Guilt over inability to prevent loss.
3. **Social Signs:**
   a. Withdrawal from social activities.
   b. Decreased work productivity.

Factors Influencing Grief Response and Complicated Grief

Factors Influencing Grief Response
1. **Challenging Factors:**
   a. Strong dependency on the deceased.
   b. Existence of a love-hate relationship with the lost.
   c. Multiple recent losses.
   d. Loss of a child or young person.

e. Self-blame for the loss.

2. **Easing Factors:**
   a. Support from significant others.
   b. Prior preparation for the loss.

Length of Grief Process

- **Stages Approach:** Provides an orderly resolution of mourning.
- **Duration:** Varies by individual; can last years without being maladaptive.
- **Acute Phase:** Typically lasts 6-8 weeks, longer in older adults.

Complicated or Dysfunctional Grief

1. **Definition:** Known as abnormal, atypical, distorted, morbid, traumatic, and unresolved grief.
2. **Types:**
   a. **Chronic Grief:**
      i. Characterized by bitterness and idealization of the deceased.
      ii. Common in extremely close relationships, with limited external support.
   b. **Hypertrophic Grief:**
      i. Intense reactions to sudden, unexpected death.
      ii. Ineffective coping strategies, leading to anxiety and withdrawal.
      iii. Often long-term.
   c. **Delayed Grief:**
      i. Absence or inhibition of grief when mourning is expected.
      ii. Marked by prolonged denial, anger, and guilt.

Grief Response in Children by Age Group

Age Group	Concept of Death	Way of Expressing Grief
<2 Years	Cannot understand death	• Reduced activity • Quietness • Sleep problems
1-6 Years	Assumes loved one is in deep sleep; Death seen as temporary	• Weight loss • Many queries (e.g., about eating) • Difficulty in eating and sleeping • Bladder and bowel control issues
6-9 Years	Sees death as frightening and final; Thinks of it as a spirit or ghost	• Fear of loneliness • Temper tantrums • Specific questions about death
9-13 Years	Accepts death as inescapable; Aware that everyone will die eventually	• Curiosity about death • Fear about school • Aggressiveness • Feelings of loneliness or abandonment • Anger, guilt, and shame
Teenagers/ Adolescents	Responds to death like adults	• Anxiety about own death • Mood swings • Changes in eating habits • Sleeplessness • Lack of interest in activities

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		• Impulsive behavior • Guilt about being alive • Denial • Internal fear and emotion • Risky behaviors (e.g., smoking,alcohol,drugs,unprotected sex) • Suicidal thoughts

Grief Management in Children

Children see loss and death in different ways as they grow and develop. While helping these children, one should consider the child's age and emotional developmental stage.

Helping a grieving preschooler (3-5 years):

- Answer the child's question honestly and simply. Allow them to talk about loss, help them share their fears and worries.
- Provide simple routines.
- Give the child affection and nurturing, attempt to connect with them.
- Provide more opportunities for play.
- Be patient with regressive behaviors such as thumbsucking.
- Provide opportunities for expression of painful emotions through play, creative outlets, and talk.
- Teach them to recognize and name their feelings.

Helping a grieving elementary school-age child (6-9 years):

- Keep tasks simple. Try to keep the child busy in these simple tasks.
- Insist that children express their feelings in words and not by acting out. M
- Encourage them to let you know when they are worried or having a difficult time.

Helping grieving preteens and early adolescents:

- Accept their mood swings and physical symptoms.
- Encourage them to honestly recognize their painful feelings and find positive outlets in physical and creative activities.
- Try to understand the feelings behind their words and actions and respond with empathy.
- Do not force the teens to participate in activities that he or she feels uncomfortable while doing.
- Be truthful and factual in explaining the loss.
- Allow preteens to make choices that help in safe expression of feelings.

THE ROLE OF A CHILD HEALTH NURSE IN CARING FOR A HOSITALIZED CHILD

The role of a nurse in the care of hospitalized children is crucial in ensuring the physical, emotional, and psychological well-being of the child. Here's a summary of the nurse's role in caring for children of different age groups during hospitalization:

1. **Care of Infants:**
   - Encourage parental involvement in meeting the infant's needs, including medication administration, procedures, and feeding.
   - Minimize separation anxiety by involving parents in care activities.
   - Prepare parents for post-hospitalization care of the infant.

2. **Care of Toddlers:**
   - Preserve the toddler's trust in parents to reduce anxiety.
   - Assist the child in expressing anger and emotions.
   - Encourage frequent visits from parents to provide love and emotional support.
   - Accept any regressive behavior without punishment.
   - Depending on the child's condition, encourage play and physical activity to maintain a sense of autonomy and security.
3. **Care of Preschool Children:**
   - Recognize that preschoolers still feel secure in the presence of their parents.
   - Consider rooming-in to maximize parent-child contact.
   - Allow children to express their feelings through play.
   - Encourage participation in self-care activities if possible.
4. **Care of School-Aged Children:**
   - Understand that school-aged children may view hospitalization as punishment.
   - Address the challenge of immobilization, encourage activities like watching TV and reading.
   - Respect their sense of modesty and provide privacy during care.
   - Encourage active participation in treatment and self-care.
   - Allow children to express their fears, anxieties, and doubts through therapeutic communication.
5. **Care of Adolescents:**
   - Understand the emotional impact of illness on adolescents.
   - Encourage active participation in their treatment program.
   - Provide necessary information and communicate regularly to reduce fear and anxiety.
   - Reassure and support adolescents to help them regain self-esteem and independence.

PRINCIPLES OF PRE AND POSTOPERATIVE OF INFANTS AND CHILDREN

PREOPERATIVE CARE IN NURSING

The perioperative period, extending from hospitalization for surgery to discharge, is critical in patient care.

It encompasses preoperative, intraoperative, and postoperative phases, each requiring specific attention and care.

Preoperative Care

This phase involves preparing the patient both emotionally and physically for surgery.

1. **Emotional Preparation**
   - **Assessing Psychological State:** Identify and address any psychological issues that may increase surgical risk.
   - **Informing Patient and Family:** Detailed explanations about the surgery should be provided to the patient and their significant others.
   - **Managing Fears:** Recognize and address fears in children and their parents.
   - **Encouraging Expression:** Allow the patient and their family to express their reactions and feelings.
   - **Honest Communication:** Answer questions truthfully and refer unanswered questions to the physician.

   - **Orienting to Post-Surgery Settings:** Familiarize the patient and family with the recovery room, postoperative ward, and equipment.
   - **Preparation for Discharge:** Begin discharge planning in the preoperative phase.
   - **Effective Healthcare Team Communication:** Ensure clear communication among healthcare team members, the patient, and their family to prepare the patient for surgery effectively.
2. **Physical Preparation**
   - **Implementing Doctor's Orders:** Follow specific preoperative instructions, including administering enemas if ordered, to prepare the body for surgery.
   - **Dietary Restrictions:** Adhere to NPO (nil per os, nothing by mouth) guidelines from midnight before surgery to prevent complications during anesthesia.
   - **Pre-Surgery Bathing:** Bathe the child to reduce skin microorganisms and minimize postoperative infection risk.
   - **Preoperative Attire:** Dress the child in a clean hospital gown after bathing.
   - **Legal Consent:** Ensure legal guardians sign consent forms.
   - **Laboratory Reports:** Attach all relevant lab reports to the patient's file for reference in the operating theater (OT).
   - **Vital Signs Monitoring:** Check and record vital signs in the patient's file.
   - **Preoperative Medication:** Administer any prescribed preoperative medication.
   - **Patient Identification:** Ensure the child wears an identification band to the OT to prevent identification errors.
3. **Preoperative Teaching**
   1. Postoperative Practices: Educate children and parents about postoperative practices to prevent complications.
      - Turning: Instruct on turning in bed and early ambulation to stimulate circulation and respiratory function.
      - Deep Breathing: Teach the child to inhale slowly through the nose and exhale through pursed lips to prevent pneumonia and atelectasis.
      - Coughing: Encourage coughing to expel respiratory secretions and prevent pneumonia, using a pillow to minimize incision pain.
      - Extremity Exercises: Advise on active or passive extremity exercises to prevent circulatory issues like thrombophlebitis.

POSTOPERATIVE CARE IN NURSING

Physiological Stress

- **Impact**: Surgery subjects the body to significant physiological stress, affecting various systems and requiring careful management to ensure recovery.
- **Consideration**: Understanding the stress surgery places on the body helps in tailoring postoperative care to individual patient needs, promoting quicker and safer recovery.

Principles of Postoperative Care

1. **Recognizing Hypovolemia**
   - **Definition**: Hypovolemia refers to a state of decreased blood volume, which can result from blood loss during surgery.
   - **Importance**: Early recognition and treatment are crucial to prevent shock and ensure adequate organ perfusion.
2. **Maintaining Fluid and Electrolyte Balance**
   - **Rationale**: Surgical procedures and the stress response can disrupt the body's fluid and electrolyte balance.

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- **Strategy**: Careful monitoring and adjustment of fluid and electrolyte intake are essential to maintain homeostasis and support healing.

3. **Ensuring Oxygen Saturation**
   - **Goal**: To maintain adequate oxygen levels in the blood, which is vital for tissue repair and organ function.
   - **Method**: This may involve supplemental oxygen, monitoring via pulse oximetry, and encouraging deep breathing exercises to prevent respiratory complications.
4. **Managing Pain**
   - **Objective**: Effective pain management is essential for comfort, promoting mobility, and preventing complications such as deep vein thrombosis or pulmonary embolism.
   - **Approach**: This includes pharmacological interventions, such as analgesics and regional anesthesia, and non-pharmacological methods, like cold/heat therapy and relaxation techniques.
5. **Preventing Postoperative Complications**
   - **Focus**: Complications can range from infections and wound dehiscence to deep vein thrombosis and pulmonary embolism.
   - **Prevention**: Strategies include aseptic technique, early mobilization, respiratory exercises, and prophylactic anticoagulation, depending on the patient's risk factors.

Immediate Postoperative Care

1. **Preparation:** Ready operation bed for patient reception post-surgery.
2. **Monitoring in Recovery Room:** Monitor blood pressure, peripheral oxygen saturation, heart rate, respiration, and temperature.
3. **Airway Management:**
   - Position the child in a side-lying position.
   - Suction airway if necessary.
4. **Oxygen Administration:**
   - Administer oxygen if saturation is below 90%.
   - Assists in anesthetic gas transport and addresses increased metabolic rate post-surgery.
5. **Fluid Replacement:**
   - Essential for adequate hydration.
   - Maintain an intake and output chart.
6. **Safety Measures:**
   - Restrain the child to prevent injury and dislodging of IV tubes, drainage tubes and dressings.
7. **Pain Management:**
   - Administer prescribed analgesics.
   - Check drainage tubes.
8. **Guardian Presence:** Ensure guardians are present in the recovery room.
9. **Diet Management:** Keep patient nil per orally until consciousness is regained.

Care After 24 Hours of Surgery

1. **Continuous Monitoring:** Vital signs, hydration status, surgical site drainage, dressing condition, bowel sounds, and consciousness level.
2. **Medication Administration:** Administer antibiotics and analgesics as prescribed.

3. **Dressing and Aseptic Techniques:** Strict aseptic techniques for dressing the operative site.
4. **Fluid and Diet Management:**
   - Provide IV fluids until bowel sounds return.
   - Begin oral intake with sips of water after peristalsis onset.
5. **Personal Hygiene:** Maintain hygiene, ensure rest, sleep, and comfort.
6. **Preventing Complications:** Early ambulation and exercises to prevent atelectasis, deep vein thrombosis, pneumonia, pressure ulcers, constipation, etc.
7. **Diversion Therapy:** Engage the child in diversion activities.
8. **Discharge Planning:** Educate parents about home care, diet, medications, and follow-up.
9. **Information Sharing:** Provide complete details about investigations, treatments, surgical procedures, and follow-up care to parents.

CHILD HEALTH NURSING PROCEDURES

ADMINISTRATATION OF MEDICATION: ORAL, I/M AND I/V

Medication includes all substances used for diagnosing, curing, treating, relieving symptoms, or preventing diseases.

Drug Administration Purposes

- **Diagnostic**: To identify a disease or condition.
- **Prophylactic**: To prevent disease onset.
- **Therapeutic**: To treat and manage symptoms or cure diseases.
- **Importance**: The purpose behind drug administration informs the choice of drug, dosage, and administration route, tailoring treatments to individual patient needs.

Proper Drug Absorption

- **Definition**: The process by which drugs enter the bloodstream and reach the site of action.
- **Importance**: Essential for a drug's effectiveness; influenced by the administration method, ensuring the drug works as intended.

Increasing Prescription Medication in Children

- There's a notable rise in prescription medication use among children, both in India and worldwide.
- This trend underscores the need for careful consideration of drug safety, efficacy, and the development of pediatric-specific dosage forms.

Common Conditions

- Conditions such as asthma, diabetes, ADHD, and various psychological disorders are increasingly being treated with medication in children.
- The growing prevalence of these conditions highlights the importance of specialized pediatric care and medication management.

ADMINISTRATION METHODS

a. Main Routes

- **Oral (PO)**: The most common route, involving ingestion through the mouth.
- **Intramuscular (I/M)**: Injection into a muscle, offering quicker absorption than oral routes.
- **Intravenous (I/V)**: Direct injection into a vein, providing immediate drug effects.

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b. Considerations
- **Choice of Method**: Depends on the drug's properties, the desired speed of action, the patient's condition, and age-specific factors.
- **Efficiency of Drug Action**: Varies significantly with the administration route, affecting both the onset and duration of the drug's effects.

POLICIES AND PROCEDURES FOR ADMINISTERING MEDICATION TO CHILDREN

1. Permission and Medication Forms
- **Purpose**: To legally and ethically obtain consent from parents or guardians for the administration of specific medications, outlining the doses and times of administration.
- **Documentation**: Ensures accurate record-keeping of each medication's administration, including the time, dose, and any observed reactions or side effects, which is crucial for ongoing medical care and in case of any adverse reactions.

2. Safe Administration Procedures
- **Shaking Medicine Bottles**: Necessary for ensuring that medication is properly mixed, providing the correct dosage.
- **Accurate Measuring**: Utilizing precise measuring devices such as oral syringes, droppers, or medicine spoons to ensure the correct dose is administered.
- **Monitoring for Reactions**: Close observation post-administration to quickly identify and respond to any adverse reactions, such as rash, hives, difficulty breathing, or other signs of allergic reactions.

3. Equipment
- **Medication Tray**: Organizes medication and related supplies.
- **Syringes and Droppers**: For accurate measurement and administration of liquid medications.
- **Tablet Dividers and Crushers**: Facilitate the correct dosing of tablet forms, especially for children who may have difficulty swallowing pills.
- **Sterile Water**: For dissolving or diluting medications as needed.

ROUTES OF ADMINISTRATION: ADVANTAGES & DISADVANTAGES

a. Oral Administration
- **Advantages**: Most common and preferred due to its convenience and non-invasive nature. Suitable for self-administration and for medications intended for systemic effects.
- **Disadvantages**: Slower onset of action as the drug needs to pass through the digestive system. Risk of the active ingredients being destroyed by stomach acid or not being absorbed efficiently in the gastrointestinal tract.

b. Rectal Administration
- **Advantages**: Beneficial for patients who are unconscious, experiencing nausea, or unable to take medications orally. Bypasses the digestive system, which can be useful for certain drugs.
- **Disadvantages**: Absorption can be slow and less predictable. It may be uncomfortable for the patient, affecting compliance.

c. Topical Administration
- **Advantages**: Offers localized action with minimal systemic effects, reducing the risk of systemic side effects. Various forms (creams, ointments, patches) allow for flexibility in application.

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- **Disadvantages**: Limited absorption through the skin, making it unsuitable for drugs that require systemic action. Potential for skin irritation or allergic reactions.

d. Ophthalmic Administration
- **Advantages**: Directly targets eye conditions, allowing for rapid and focused treatment.
- **Disadvantages**: Requires precise application, which can be challenging, especially in children. Risk of contamination and infection if not administered properly.

e. Otic Administration
- **Advantages**: Directly treats ear conditions with minimal systemic absorption, reducing the risk of side effects.
- **Disadvantages**: Cold medication may cause discomfort or dizziness. Incorrect administration can lead to ineffective treatment or complications.

f. Nasal Administration
- **Advantages**: Provides rapid absorption and effect for systemic or localized conditions. User-friendly for some medications, avoiding the need for injections or pills.
- **Disadvantages**: Can cause irritation to the respiratory tract. Requires specific equipment and technique for proper administration.

Safety precautions
- **Storage**: Secure and clear labeling.
- **Inspection**: Keep in original containers.
- **Measurement**: Use accurate utensils.
- **Consultation**: Always discuss with parents and consult healthcare professionals for concerns.
- **Injections**: Administered by trained professionals only.

CALCULATION OF FLUID REQUIREMENT

The body's water content and its distribution across different compartments play a vital role in maintaining homeostasis. This note will break down these concepts in simple terms, focusing on their relevance to the fluid requirement calculation.

Total Body Water in Infants
- **Term Infant**: At birth, 75% of an infant's body weight is water.
- **Post-Neonatal Period**: After the neonatal period, this decreases to about two-thirds (approximately 66%) of their body weight.

Distribution of Total Body Water
1. **Intracellular Space**: Two-thirds (about 66%) of the body's water is located inside cells.
2. **Extracellular Fluid Space**: The remaining one-third (33%) is in the extracellular space.
3. **Intravascular Part**: Of the extracellular fluid, only 25% is within blood vessels, which is roughly 7-8% of the total body water.

Electrolyte Composition of Extracellular Fluid (ECF)
- **Sodium**: The sodium concentration in ECF is approximately 140 milliequivalents per liter (mEq/L).
- **Potassium**: The potassium level in ECF is lower, around 4-5 mEq/L.

Composition of Intracellular Fluid (ICF) and ECF

1. **Cations:**
   a. **ECF:** Predominantly sodium.
   b. **ICF:** Primarily potassium, with a concentration of about 140 mEq/L.
2. **Anions:**
   a. **ECF:** Mainly chloride and bicarbonate.
   b. **ICF:** Low in chloride; the majority are charges on proteins and other impermeant molecules.

Intracellular Chloride Concentration

- The chloride concentration within most cells is very low.

MAINTENANCE OF BASIC FLUID AND ELECTROLYTE THERAPY

1. Goal of Maintenance Therapy

- **Objective:** To maintain a zero balance (Intake = Output) in water and electrolyte levels.
- **Importance:** Ensures stability in patients by accurately replacing ongoing losses.

2. Application in Different Patient Conditions

- **Unstable Patients:** Frequent replacement based on precisely measured losses.
- **Stable Patients:** Use of estimated normal maintenance requirements.

3. Estimated Caloric Expenditure Method

- **Relevance:** Determines fluid and electrolyte requirements based on metabolic rate.
- **Popular Method:** Holliday and Segar's method is widely accepted for its simplicity and accuracy.

Holliday-Segar Method for Estimating Maintenance Fluid Requirements

Table: Holliday-Segar Method

Child's Weight	Maintenance Fluid Requirement
3 to 10 kg	100 ml/kg/day
11 to 20 kg	1000 ml + 50 ml/kg/day for each kg > 10 kg
> 20 kg	1500 ml + 20 ml/kg/day for each kg > 20 kg

Example Calculation of Maintenance Fluid Requirement:

- **9 kg Child:** 900 ml/day
- **19 kg Child:** 1000 ml + (9 kg × 50 ml) = 1450 ml/day
- **29 kg Child:** 1500 ml + (9 kg × 20 ml) = 1680 ml/day
- **70 kg Child:** 1500 ml + (50 kg × 20 ml) = 2500 ml/day

Water – Normal Requirements

1. **Insensible Water Loss (IWL)**
   - **Definition:** Water loss from skin and lungs, excluding sweat.
   - **Calculation:**
     - Skin Loss = 30 cc/100 Cal/day
     - Pulmonary Loss = 15 cc/100 Cal/day
     - Total IWL = 45 cc/100 Cal/day
2. **Renal Water Loss**
   - **Determinants:** Based on renal solute load and kidney's concentrating ability.
   - **Typical Value:** Approximately 50 cc/100 Cal/day.
3. **Stool Water Loss**
   - **Normal Condition:** About 5 cc/100 Cal/day.
   - **With Diarrhea:** Increases significantly and must be replaced accurately.

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Total Normal Maintenance Water Requirement

- **Total:** 100 cc/100 Cal/day (IWL + Renal + Stool)

Example: Maintenance Fluid Requirement for a 25 kg Child

- **Estimated Caloric Expenditure:** 1000 + (15 kg × 50 ml) = 1750 Cal/day
- **Maintenance Fluid Requirement:** 1750 cc/day or approximately 73 cc/hr

APPLICATION OF RESTRAINTS

Definition: A device that limits or prevents freedom of movement.

Purposes of restraints:

1. **Safety During Procedures:** Limit child's movements during potentially harmful procedures.
2. **Constant Immobilization:** Provide continuous immobilization.
3. **Human Contact:** Maximize human contact using hand restraints.
4. **Facilitate Examination:** Assist in child examinations or procedures.
5. **Child's Safety and Comfort:** Ensure the child's safety and comfort.

Principles of restraints:

1. **Necessity and Observation:** Use only when necessary and never as a substitute for observation.
2. **Not for Continuous Use:** Cannot be used continuously.
3. **Reason Explanation:** If used, specify and explain the reason to the child and parents.
4. **Frequent Checks:** Frequent monitoring for side effects.
5. **Quick Release Knots:** Any required knots should allow for quick release.

Types of restraints:

1. **Mummy Restraint:**
   - Immobilizes arms and legs.
   - Used during head and neck examinations, jugular vein punctures, gastric gavage, and chest examinations.
2. **Jacket Restraint:**
   - Used in infants and toddlers to keep them supine and prevent falls.
3. **Elbow Restraint:**
   - Keeps the elbow extended to prevent reaching the face.
   - Used after face and head surgeries, and during eczema and skin disorders.
4. **Extremity Restraint (Clove Hitch Restraint):**
   - Utilized during the introduction of the scalp vein.
   - Made of double cloth with pockets for tongue blades.
   - Tongue blades prevent bending of the elbow when applied.
5. **Mittens:**
   - **Purpose:** Used for infants to prevent self-injury by hands in cases of burns, facial injuries or operations, and eczema of the face or body.
   - **Age Group:** Mostly used in neonates and infants.
   - **Design:** Mittens cover all fingers, restricting finger movements.
   - **Application:** Wrap the hand with gauze or place it in a pouch-like bag and tie it securely at the wrist of the patient.

6. **Papoose/Cross Restraint:**
   1. **Purpose:** Used in procedures like exchange blood transfusion, head, chest, and abdomen examinations.
   2. **Description:**
      a. A device to immobilize children for dental procedures, blood drawing, and minor medical procedures.
      b. Child placed on a flat board, with wide fabric straps wrapped around the upper body, middle body, and legs.
7. **Abdominal Restraint (Binder):**
   - **Age Group:** Most commonly used among infants, toddlers, and pre-schoolers.
   - **Tightness:** Should not be too tight to avoid interference with respiration and bowel movement.
8. **Bed Cradle/Bed with Side Rails:**
   - **Purpose:** Small low bed for infants or younger children with high side rails to prevent falling.
   - **Age Group:** Used in infants, toddlers, and younger children.
   - **Supine Position:**
     - Holds the infant in a supine position on the bed.
     - Should not inhibit abdominal respiratory movements.

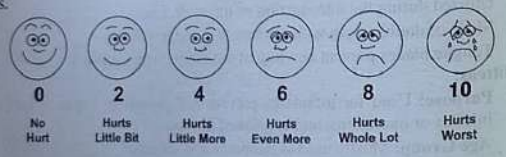
ASSESSMENT OF PAIN IN CHILDREN

Pain assessment in children is critical as it informs treatment and care strategies. It's important to understand that pain perception is subjective and can be influenced by both physical and psychological factors.

Pain Scales in Children

1. FACES Pain Rating Scale (Wong-Baker FACES)

- Suitable for children as young as 3 years old and for non-English speakers.
- Consists of 6 cartoon faces representing varying degrees of pain.
- Children choose the face that best represents their pain.
- The score is determined by multiplying the number below the chosen face by 2, for a maximum score of 10.
- It's important to explain that the scale measures pain intensity, not emotions like happiness.



2. FLACC Scale

- Used for children aged 2 months to 7 years.
- Observational tool that assesses five categories: Face, Legs, Activity, Cry, and Consolability.

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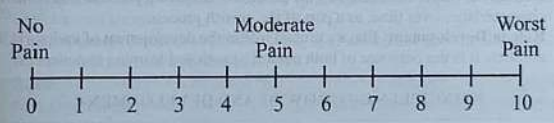
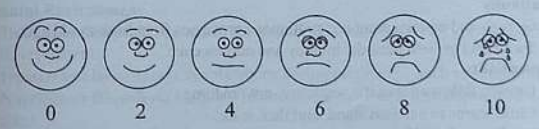
- Each category is scored from 0-2, with a total score ranging from 0-10.
- The total score indicates the level of pain.
- Behavior should be observed for several minutes, and the score should consider the child's psychological and environmental context.

Category	Score 0	Score 1	Score 2
Face	No expression or smile.	Occasional grimace/frown, withdrawn or disinterested.	Frequent/constant quivering chin, clenched jaw.
Leg	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No cry	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content and relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

3. Numerical/Visual Analogue Scale

- Appropriate for children over 3 years of age.
- Consists of a 10 cm line with "No Hurt" at one end and "Worst Hurt" at the other.
- Children indicate their pain intensity by placing a mark on the line.
- Variations include vertical scales, color-intensity scales, and slider scales.





UNIT 2
THE HEALTHY CHILD

INTRODUCTION TO GROWTH AND DEVELOPMENT IN CHILD HEALTH

Growth and development are intricately linked processes that occur throughout the human lifespan. They are both continuous and interdependent, encompassing physical, cognitive, emotional, and behavioral changes.

A. **Growth**
- **Definition**: Growth is the physical increase in size or mass of the body or its parts. It is a quantitative change in the body's structure.
- **Measurement**: Commonly measured in terms of height (inches or centimeters) and weight (pounds or kilograms).
- **Cellular Aspect**: Involves the multiplication and enlargement of cells, contributing to the overall size and mass of the body.

B. **Development**
- **Definition**: Development is the progressive increase in functional skills and abilities. It is a qualitative aspect of growth.
- **Areas of Development**: Includes a range of skills such as head support, speech, learning, and walking.
- **Relation to Physiology**: Closely linked with the maturation and myelination of the nervous system, affecting a child's ability to perform various physical and cognitive tasks.

C. **Maturation**
- **Definition**: Maturation refers to the process of acquiring personal and behavioral characteristics over time, as a part of the growth process.
- **Role in Development**: Plays a crucial role in the development of various skills and abilities. It is the outcome of both natural growth and learning experiences.

PRINCIPLES OF GROWTH AND DEVELOPMENT

1. **Continuity**
   - Growth and development are continuous processes from birth to old age.
   - Two rapid growth periods: infancy and adolescence.
2. **Sequentiality**
   - Growth follows a specific sequence, not random.
   - Child learns to sit, then stand, and then walk.
3. **Generality or Specificity**
   - Development proceeds from general to specific.
   - Progress from large muscle movements to smaller ones.
   - Example: Infant first grasps with the whole hand before using fingers.
4. **Differentiability**
   - Different body tissues grow at different rates.

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   - Brain growth is highest in the first year of life.
   - Gonadal growth occurs during puberty.
   - Lymphoid tissue proliferates between 4 and 8 years of age.
5. **Head-to-Foot Development**
   - Growth occurs from head to foot (cephalocaudal).
   - Head grows faster initially, then other body parts.
   - Child gains control of the head, then arms, and finally legs.
6. **Center-to-Outer Development**
   - Growth proceeds from the center of the body outward.
   - Trunk develops before arms and legs.
   - Child learns to move shoulders, then forearms, and finally fine finger movements.
7. **Development Depends on Maturation and Learning**
   - Development is a combination of maturation and learning.
   - General movements become specific as a child matures.
8. **Individual Differences**
   - Growth and development rates vary among individuals.
   - Boys and girls may develop at different rates.
   - Each body part has its own growth rate.

FACTORS AFFECTING GROWTH AND DEVELOPMENT

Growth and development of the child is influenced by many factors. These factors can act directly or indirectly.

A. **Heredity**
- **Parental Traits:** Characteristics inherited from parents like height, eye color, and potential for certain diseases.
- **Genetic Disorders:** Conditions caused by abnormalities in genes, like cystic fibrosis or sickle cell anemia.
- **Chromosomal Disorders:** Disorders due to chromosome abnormalities, such as Down syndrome (extra chromosome 21).
- **Race:** Genetic attributes linked to race can influence certain aspects of development.
- **Sex:** Determines genetic makeup (XX or XY chromosomes) and influences growth, development, and risk for certain diseases.

B. **Prenatal Environment**
- **Infectious Disease:** Illnesses in the mother, like rubella or HIV, can affect fetal development.
- **Obstetrical Disorders:** Complications during pregnancy, such as preeclampsia.
- **Nutritional Disorders:** Maternal malnutrition can lead to developmental issues in the fetus.
- **Maternal Hormones:** Hormonal imbalances in the mother can impact fetal development.
- **Metabolic Disorders:** Maternal conditions like diabetes can affect the fetus.
- **Drug Dependence:** Maternal use of drugs or alcohol can lead to developmental disorders in the fetus.

C. Postnatal Environment
- **Nutritional Factors:** Post-birth nutrition significantly impacts growth and development.
- **Chemical Exposure:** Exposure to pollutants or toxins can affect health and development.
- **Trauma:** Physical injuries during infancy or childhood can have lasting effects.
- **Infection:** Early childhood infections can impact physical and cognitive development.

D. Other Factors
- **Socioeconomic Factors:** Economic status can affect access to nutrition, healthcare, and education.
- **Seasonal Factors:** Variations in climate and environmental conditions can influence health and growth patterns.
- **Cultural Factors:** Cultural practices and beliefs can influence diet, healthcare access, and parenting styles.
- **Emotional Factors:** Emotional well-being and family dynamics play a role in psychological and emotional development.

GROWTH AND DEVELOPMENT FROM BIRTH TO ADOLESCENCE

Children progress through these stages:
1. Newborn (0-28 days)
2. Infant (up to 1 year)
3. Toddler (1-3 years)
4. Pre-schooler (3-5 years)
5. School-aged Child (5-15 years)
6. Adolescent

Growth and Development from Birth to 1 Year (Infant)

Developmental Milestones of Newborn

1. **Physical Growth:**
   a) **Weight:**
      - Normal: 2.5-3 kg.
      - Decreases by 10% in the first 10 days.
      - Doubles at six months.
      - Triples at 1 year.
      - Quadruples at 2 and half years.

   b) **Length:**
      - Average: 46-51 cm.
      - Increases 2.5 cm monthly for the first 6 months.

   c) **Head Circumference:**
      - Average: 33-35 cm.
      - Increases by 1.5-2 cm monthly for the first six months.

   d) **Chest Circumference:**
      - Average: 30-33 cm.

   e) **Vital Signs:**
      - Pulse: 120 to 160 beats/minute.

      - Respiratory Rate: 30-60 breaths/min.
      - Blood Pressure: Systolic 60-76, Diastolic 31-45.

2. **Reflexes:**
   - Moro's reflex, tonic neck reflex, rooting, sucking reflexes, swallowing, and extrusion reflex.
3. **Sensory Development:**
   - Sense of touch.
   - Blinking reflex.
   - Ability to visually track moving toys and bright objects.
   - Recognition of faces.
4. **Motor Development:**
   a) **Gross Motor:**
      a. Keeps head centered to watch faces while lying on back.
      b. Can turn head from side to side when prone.
      c. Less flexed position when prone.
      d. Head lag when pulled up from supine to sitting.

   b) **Fine Motor:**
      a. Grasp reflex present.
      b. Hand clenches on contact.
4. **Language Development:**
   a) Crying as the primary mode of communication.
   b) Begins to recognize familiar voices, especially parents.
   c) Shows response to different tones of voice (e.g., calming down with soothing tones).
   d) Starts cooing and making vowel sounds around 2 months.
   e) Begins to babble and imitates sounds around 4 to 6 months.
   f) Starts to understand basic words and simple commands towards the end of the first year.
5. **Social Development:**
   a) Eye contact: Initially, newborns focus on faces close to them, usually within 12 inches.
   b) Social smile: Begins to smile in response to human faces or voices around 6 to 8 weeks.
   c) Mimics facial expressions: Starts to imitate some facial expressions over the first few months.
   d) Enjoyment in social play: Shows pleasure during playing and interacting with caregivers.
   e) Stranger anxiety: May start showing anxiety or distress around unfamiliar people, typically emerging around 6 to 9 months.
   f) Develops attachment: Begins to show preference for primary caregivers and familiar people.

Developmental Milestones of Infants

2-4 Months:

1. **Physical Development:**
   - Weight gain: 140-200 grams/month
   - Length growth: 1-2 inches/month
   - Head circumference increases: 1-2 inches/month

- Posterior fontanelle closes at 6-8 weeks
- Tear production starts
- Drooling begins

2. **Motor Development:**
   - Gross Motor:
   - Can turn from side to back
   - Moro reflex fading
   - Decreased head lag when pulled to sitting
   - Supports weight on forearm when prone
   - Fine Motor:
   - Holds rattle
   - Plays with own fingers
   - Brings hands to midline
   - Reaches for objects
3. **Language Development:**
   - Smiles in response to a familiar person.
   - Discriminates between speech and non-speech sounds
   - Turns head towards loud sounds.
   - Less crying during wakefulness
   - Moves eyes towards sound stimuli.
   - Responds to different voice tones.
   - Pays attention to music.
   - Watches toys that make noise or play music
4. **Social Development:**
   - Laughs loudly
   - Sometimes smiles at mother
   - Recognizes familiar faces
   - Shows awareness of strange situations
5. **Sensory Development:**
   - Turns head toward voice and sound
   - Follows objects at 180 degrees

5-6 Months:

1. **Physical Development:**
   - Weight gain: 140-200 grams/week
   - Birth weight doubles by 5 months
   - Length growth: 1.5 cm/month
   - Eruption of teeth begins at 6 months
   - Drooling indicates saliva production
2. **Motor Development:**
   - Gross Motor:
   - No head lag when pulled to sitting
   - Steady head when sitting
   - Sits for a long period with back support
   - Twins from abdomen to back by 4 months, then abdomen by 6 months
   - Supports weight when held in standing position

- Fine Motor:
- Grasps objects
- Holds feet and pulls them to mouth
- Grasps objects voluntarily
- Starts holding a bottle by 6 months

3. **Sensory Development:**
   - Adjusts posture to see objects
   - Examines complex visual images
   - Responds to sound
4. **Language Development:**
   - Recognizes family members
   - Reacts to angry voices
   - Recognizes familiar spoken words.
   - Calmly listens to songs or music.
   - Moves eyes towards sounds.
   - Reacts to different tones of voices (e.g., anger, love).
5. **Social Development:**
   - Initiates social play by smiling
   - Recognizes parents
   - Begins to fear strangers
   - Mood swings from crying to laughing

7-8 Months:

1. **Physical Development:**
   - Weight gain: 80-140 grams/week
   - Length growth: 3-8 inches/month
   - Eruption of upper central incisors
   - Parachute reflex appears
2. **Motor Development:**
   - Gross Motor:
   - Lifts head in supine position
   - Most inborn reflexes extinguished
   - Bears weight on hands in prone position
   - Sits steadily unsupported by 8 months
   - Fine Motor:
   - Transfers objects between hands
   - Bangs objects held in hands
   - Beginning pincer grasp
   - Delights in picking up dropping toys
   - Uses thumb and index finger like pincers
3. **Sensory Development:**
   - Preferences in taste of food
   - Recognizes own name
   - Increased depth perception
   - Fixates on small objects

4. **Language Development:**
   - Recognizes own name.
   - Turns head in response to sounds
   - Recognizes common words.
   - Responds to recognized words and phrases with gestures (e.g., bye, hi).
   - Listens selectively to familiar words.
   - Responds to simple verbal commands (e.g., No, Stop, Come).
5. **Social Development:**
   - Shows fear
   - Dislikes face wash
   - Recognizes parents and family members
   - Extends arms to be picked up
   - Engages in social games with adults

9-10 Months:

1. **Physical Development:**
   - Weight gain: 85-140 grams/week
   - Length growth: 3-8 inches/month
   - Eruption of upper lateral incisors may begin
2. **Motor Development:**
   - Gross Motor:
   - Sits down on the floor
   - Crawls on hands and knees
   - Pulls self to stand and sitting by 10th month
   - Avoids lying down unless sleepy
   - Recovers balance when sitting
   - Fine Motor:
   - Picks up small objects
   - Rings a bell
   - Holds bottles and pacifiers
   - Good pincer grasp
   - Feeds self with fingers
3. **Sensory Development:**
   - Understands words like "no"
   - Recognizes familiar objects
   - Searches for lost toys
4. **Language Development:**
   - Vocalizes displeasure.
   - Searches for common objects or family members. - Vocalization changes with mood
   - Self-talks in mirror.
   - Enjoys hearing own sounds.
   - Produces vowel sounds and syllables (e.g., baba, dada).
   - Participates in talk when others are speaking.
   - Vocalizes syllables with specific meaning (e.g., dada, mama).
5. **Social Development:**

   - Rolls a ball on request
   - Responds to requests for affection
   - Develops attachment to primary caregiver
   - Cooperates with dressing
   - Enjoys playing with empty dishes

10-12 Months:

1. **Physical Development:**
   - Weight gain: 85-140 grams/week
   - Length growth: 3-8 inches/month
   - Head circumference equals chest circumference
   - Eruption of lower lateral incisors may begin
   - Birth weight triples by 1 year
   - Anterior fontanelle almost closed
2. **Motor Development:**
   - Gross Motor:
   - Stands alone
   - Sits down from standing
   - Walks by holding furniture
   - Improved competence in motor skills through practice
   - Takes a few steps with help at 12th month
   - Fine Motor:
   - May hold crayon and pencil
   - Makes marks on paper
   - Removes covers from boxes
   - Uses a pincer grasp well
   - Attempts to feed self with utensils
   - Enjoys eating with fingers
3. **Sensory Development:**
   - Discriminates simple geometric forms
   - Responds to sound and recognizes familiar sounds
   - Follows fast-moving objects with eyes
   - Engages in peek-a-boo and patty cake games
4. **Language Development:**
   - Imitates definite speech sounds.
   - Cries for different reasons (e.g., hunger, pain).
   - Coos during comfortable states.
   - Exhibits social smile.
   - Responds to his/her name.
   - Understands simple directions.
   - Differentiates cries from coos.
   - Produces babbling with syllable structure.
   - Vocalizes consonants (e.g., m, b, g).
   - Vocalizes monosyllables (e.g., ma, da, ba).
   - Vocalizes to toys.

- Produces varied sounds.
- Vocalizes syllables without specific meaning.
- Enjoys talking with toys.
- Says one word (e.g., hi, bye, no).
- Responds to simple questions.
- Says 3-5 words besides dada, mama.
- Comprehends meaning of words, phrases with gestures

5. **Social Development:**
   - Shows frustration with restrictions
   - Rolls a ball on request
   - Responds to requests for affection
   - Develops attachment to primary caregiver
   - Cooperates with dressing
   - Enjoys playing with empty dishes

Developmental Milestones of Toddler (1 to 2 Years)

Category	Milestones
Physical Development	• Weight gain: Around 227 g/month. • Height growth: 9-12 cm. • Anterior fontanel closes. • Legs may appear bowed.
Motor Development	• Gross Motor: • Creeps upstairs. • Stands without help. • Eats with a spoon. • Fine Motor: • Builds a tower of four blocks. • Holds cup. • Plays with food.
Language Development	• Recognizes names of body parts. • Responds to simple commands.
Social Development	• Use of words inconsistent. • Egocentric behavior. • Imitates parents and adults. • Enjoys solitary play. • Performs hugs and kisses.

2 to 3 Years

Category	Milestones
Physical Development	• Weight gain: 1.4-2.3 kg/year. • Height growth: 5 to 6.5 cm/year. • 10-14 deciduous teeth present. • Toilet training begins.
Motor Development	• Gross Motor: • Pulls and pushes toys. • Walks well alone.

	• Wild gait. • Jumps well. • Walks up and down stairs. • Fine Motor: • Turns pages. • Can open doors by turning knobs. • Can untie shoes. • Un-screws lids.
Language Development	• Continues to expand vocabulary. • Begins to form simple sentences.
Social Development	• Begins to play with others. • Shows more interest in interactive play. • Continues to imitate adult roles.

Growth and development of pre-school child (3-6 years)

1. This is the stage from 3 to 6 years age.
2. This is a curious period of new initiative and independence.
3. The rate of physical growth and change slows as compared to toddler and infant.
4. At this period, child's cognitive and social skills mature and develop rapidly.

Table: Developmental Milestones of Pre-Schoolers (3-6 Years)

3rd Year

Development Area	Milestones
Physical Development	• Weight gain: 1.8-2.7 kg/year. • Average weight: 14.6 kg. • Height increase: 3 inches/year. • Average height: 95 cm • Achieves night time control of bowel and bladder.
Motor Development	• Gross Motor: Rides a tricycle, walking, running, jumping. • Fine Motor: Undresses self, builds towers of 9-10 cubes, brushes teeth with help.
Cognitive Development	• Visual acuity is 20/20 • Learns by observation and imitation. • Egocentric. • Beginning to learn the concept of time. • Ability to follow directional commands. .

4th Year

Development Area	Milestones
Physical Development	• Similar weight and height increase as previous year. • Average weight: 16.7 kg. • Average height: 103 cm. • Development of amblyopia.
Motor Development	• Gross Motor: Skips and hops, uses scissors, catches balls. • Fine Motor: Draws stick figures, traces shapes.
Cognitive Development	• Social awareness develops. • Less self-centered.

	• Imaginative. • Understands time better.

5th Year

Development Area	Milestones
Physical Development	• Handedness established. • Average weight: 18.7 kg. • Average height: 111 cm. • Eruption of permanent teeth begins.
Motor Development	• Improved motor skills in skipping, jumping, cutting, and swimming. • Begins to tie shoelaces.
Cognitive Development	• Understanding of rules and culture. • Begins to understand conservation. • Describes events accurately. • Time orientation well understood.

6th Year

Development Area	Milestones
Physical Development	• Average weight: 20 kg. • Average height: 118 cm. • First permanent teeth erupt.
Motor Development	• Rides bicycle. • Good hand-eye coordination • Dresses self and combs hair. • Classifies objects.
Cognitive Development	• Personality qualities noticeable. • Responds to praise. • Sense of humor present. • Follows rules and commands.

Language Development

Age	Milestones
3rd Year	• Forms 3-4 word sentences. • Vocabulary: ~900 words. • Asks many questions. • Knows name and age. • Correct use of plurals. • Names body parts.
4th Year	• Vocabulary: 1500 words. • Longer sentences (4-5 words • Asks many questions. • Tells exaggerated stories. • Independent, yet shows mood swings.
5th Year	• Knows days, months, seasons. • Follows three commands in succession. • Describes pictures.

	• Fear is reduced. Tries to live by rules. • Trustworthy and responsible.
6th Year	• Total self-care. • Enjoys playing with peers. • Industrious and insistent on being first.

Psychosocial Development

Age	Milestones
3rd Year	• Feeds self. • Aware of family relationships. • Separates easily from mother. • Fears dark. • Jealous of younger siblings.
4th Year	• Has mood swings. • Takes pride in accomplishments. • Tends to be selfish and impatient.
5th Year	• Enjoys activities with friends. • Independent and responsible. • Better manners.
6th Year	• Cares for self. Industrious. • Insists on being first. Jealous of siblings.

Growth and Development of School-Age Children (6-12 Years)

6-8 Years

Development Area	Milestones
Physical Development	• Average weight: 18.5-26 kg. • Average height: 108-126 cm. • Heart rate: 80-100 beats/min. • Respiration: 18-22 breaths/min. • Blood pressure: 110/62 mm Hg.
Motor Development	• Gross Motor: Rides 2-wheel bikes, throws balls skillfully. • Fine Motor: Uses knife, fork, and spoon, ties shoe laces, copies a diamond.
Intellectual Development	• Increased attention span. • Enjoys helping, knows currency values. • Interested in magic and fantasy. • Attends third and fourth grades. • Understands time and problem-solving methods.
Language Development	• Ride bicycles, run, jump, climb. • Can follow a series of 3 commands. • Develops eye-hand coordination. • Understands right and left. • Able to repeat sentences of 10-12 words. • Oral vocabulary more than 6000 words.

Psychological Development	• Shares and cooperates. • Needs praise and recognition. • Attentive listener. • Demonstrates independence. • Jealous of younger siblings. • Fewer mood swings.

10-12 Years

Development Area	Milestones
Physical Development	• Loosing of temporary teeth. • Eruption of first permanent molars, incisors. • Average weight: Boys: 32-48 kg, Girls: 31-50 kg. • Average height: Boys: 140-160 cm, Girls: 144-160 cm. • Development of secondary sex characteristics.
Motor Development	• Rides bicycle, runs, jumps, climbs. • Performs tricks on bicycles, balances on one foot. • Fine motor skills well developed, uses both hands independently. • Catches fly balls, dresses self completely. • Graceful movements, handles eating utensils skillfully.
Intellectual Development	• Learns from experience, abstract thought. • Increased ability to read and use problem-solving methods. • Understands concept of time, ashamed of failures. • Interested in future, participates in discussion and debate. Collects and classifies objects, beginning of formal operations.
Language Development	• Able to use household tools. • Improved cursive writing, unassisted bathing. • Oral vocabulary more than 7200 words. • Can write long stories, makes stories from pictures. • Reading vocabulary approximately 45,000 words. • Follows suggestions better than commands. • Tells long stories, gives exact definitions of words.

Growth and development of Adolescents (12-18 Years)

Developmental Milestones in Adolescents

12-13 Years (Early Adolescence)

Development Area	Milestones
Physical Development	• Male: 45-61 kg, Female: 40-60 kg. • Male: 149-170 cm, Female: 147-165 cm. • Pulse: 56-90 beats/min. Respiration: 19-21 breaths/min. • Blood Pressure: 114/68 mm Hg. • Beginning development of sexual characteristics.
Motor Development	• Good hand-eye coordination. • Able to perform precise movements. • Adult-like use of hands and object manipulation.

Language Development	• Understands basic sentences. • Combines complex words into long sentences. • Able to change conversation topics effectively. • Understands and uses slang.
Intellectual Development	• Problem-solving skills. • Hypothesis creation. • Operational thinking. • Uses scientific methods.
Psychosocial Development	• Developing group identity. • Experiences mood swings. • Begins masturbation. • Loyalty to peer group. • Developing intimate relationships.
Moral Development	• Understanding general rules and culture. • Learning about norms and morals.

14-16 Years (Middle Adolescence)

Development Area	Milestones
Physical Development	• Male: 49-63 kg, Female: 43-64 kg. • Male: 158-182 cm, Female: 151-172 cm. • Pulse: 60-90 beats/min. • Respiration: 17-23 breaths/min. • Blood Pressure: 116/70 mm Hg. • Attainment of puberty.
Motor Development	• Adult-like motor functions. • Improved manual dexterity and coordination.
Language Development	• Ability to follow complicated instructions. • Skillful in switching between formal and informal talk. • Can narrate long and complex stories. • Participates in social issue debates.
Intellectual Development	• Technical skill development. • Concerned about education and vocational plans.
Psychosocial Development	• Perception as a unique individual. • Personal identity development. • Critical and argumentative. • Fewer but closer friends. • Developing interdependent relationship with parents. • Challenges parent's beliefs and values. • Engages in heterosexual relationships.
Moral Development	• Fixed rules for moral decision-making. • Following universal ethical principles. • Understanding of duty and harm principles.

17-21 Years (Late Adolescence)

Development Area	Milestones
Physical Development	• Male: 52-78 kg, Female: 45-68 kg. • Male: 161-183 cm, Female: 157-169 cm. • Pulse and Respiration: Same as adult. • Blood Pressure: 127/78 mm Hg. • Fully developed physical and sexual characteristics.
Motor Development	• Same as adult. • Enjoyment in all physical activities.
Language Development	• Adult-like communication. • Complex thought communication. • Capable of university-level study.
Intellectual Development	• Decision-making skills. • Ready for job market entry.
Psychosocial Development	• Striving for autonomy. Self-conscious and moody. Frequent behavior changes. Spending more time outside the family. Few close friends.
Moral Development	• Demonstrates moral convictions. • Legalistic and contractual thinking. • Maintains individual dignity.

B. SEXUAL MATURATION IN ADOLESCENTS

a. Boys

Age (Years)	Development
9-10	• Growth spurt continues. • Onset of sex hormone release.
10-11	• Growth of penis, testes, and scrotum. • Skin of the scrotum darkens.
11-12	• Enlargement of testes, scrotum, and penis. • Prostate gland begins to function. • Onset of pubic hair growth. • Erection during sleep.
12-13	• Testes begin to grow. • Rapid penis growth. • Appearance of underarm, chest, facial, and pubic hair. • Voice deepening.
13-14	• Increased muscle mass. • Beginning of sperm maturation. • Sperm capable of causing pregnancy.
14-15	• Growth spurt completes. • Thickening of facial and chest hair. • Development of chest and shoulder muscles. • Occurrence of acne.
15-16	• Same as 14-15 years.

16-17	• Same as 14-15 years.

b. Girls

Age (Years)	Development
8-9	• Growth spurt continues. • Onset of sex hormone release.
9-10	• Breast development begins. • Increase in subcutaneous fat in pelvis, breast, and upper arm.
10-11	• Continued breast development. • Onset of underarm and pubic hair growth.
11-12	• Breast tissue becomes round. • Pubic hair thickens and darkens, triangular distribution. • Growth of internal and external genitalia.
12-13	• Menarche (first menstrual period). • Ovulation begins. • Underarm hair growth increases. • Secretions of clear mucus during ovulation. • Capability of pregnancy.
13-14	• Growth spurt completes.
14-15	• Same as 13-14 years.

GROWTH AND DEVELOPMENTAL THEORIES

A. PIAGET'S THEORY

1. **Developmental Stages**
   - a) **Sensorimotor Stage (0-2 years)**
     - a. **Focus**: Learning about physical objects through sensory experiences and motor actions.
     - b. **Development of Realization**: Understanding that objects continue to exist even when they cannot be seen (object permanence).
   - b) **Preoperational Stage (2-7 years)**
     - a. **Focus:** Preoccupation with symbols, language, dreams, and fantasies.
     - b. **Cognitive Limitation:** Difficulty in understanding multiple aspects of a situation simultaneously.
   - c) **Concrete Operational Stage (7-11 years)**
     - a. **Focus**: Transition to abstract thinking, mastering numbers, relationships, and basic logical reasoning.
     - b. **Cognitive Skills**: Development of the ability to think logically about concrete objects and events.
   - d) **Formal Operational Stage (11-15 years)**
     - a. **Focus**: Capability for abstract and logical thinking.
     - b. **Cognitive Development**: Ability to think logically about abstract propositions and hypothetical situations.

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2. **Symbolic Representation**
   a) **Symbol Use:** The ability to use symbols is a critical stage, leading to language development and more complex cognitive processes.
3. **Cognitive Limitations in Young Children**
   a) **Single Aspect Focus:** Children under 7 years tend to focus on only one aspect of a situation, struggling to integrate multiple information sources or perspectives.
4. **Advanced Cognitive Functioning**
   a) **Understanding Beyond Appearances:** Recognizing that altered appearances (like wearing a mask) do not change the identity of a person requires advanced cognitive skills.
5. **Moral Development**
   a) **Theories by Piaget and Kohlberg:** These theories delve into how values are formed, influence behavior, and evolve through experiences.

B. KOHLBERG'S THEORY

1. **Level 1: Preconventional Morality (Egocentricity)**
   a) **Stage 0 (0-2 years):**
      - **Understanding of Good and Bad:** Perception of good as what is liked or wanted and bad as what is hurtful.
   b) **Stage 1 (2-3 years):**
      - **Punishment-Obedience Orientation:** Actions are deemed right if they avoid punishment.
   c) **Stage 2 (4-7 years):**
      - **Instrumental Hedonism and Concrete Reciprocity:** Right actions are those that satisfy personal needs or expectations of reciprocity.
2. **Level 2: Conventional Morality**
   a) **Stage 3 (7-9 years):**
      - **Orientation to Interpersonal Relationships:** Actions are guided by a desire to gain approval and acceptance from family, peers, and teachers.
3. **Level 3: Postconventional Morality (Adolescents and Adults)**
   - **Stage 4:**
     - **Higher Laws and Conscience Orientation:** Adolescents adopt culturally appropriate values, focusing on actions that benefit society and consider the greater good.
   - **Stage 5:**
     - **Universal Ethical Principle Orientation:** The highest level of moral development, where adolescents develop internalized standards and strive for self-actualization, guided by principles of universal ethics.

C. ERIKSON'S THEORY

1. **Trust vs. Mistrust (Birth to 1 Year - Infant)**
   a. **Key Task:** Developing trust in caregivers and the environment.
   b. **Outcome:** Mistrust develops if basic needs are not met.
2. **Autonomy vs. Shame (1-3 Years - Toddler)**
   a. **Key Task:** Developing autonomy, self-control, and independence.
   b. **Outcome:** Successful development leads to self-esteem; failure leads to feelings of shame and doubt.

3. **Initiative vs. Guilt (3-6 Years - Preschool Child)**
   a. **Key Task:** Engaging in active play and using imagination.
   b. **Outcome:** Overstepping limits may lead to feelings of guilt.
4. **Industry vs. Inferiority (6-12 Years - School Age Child)**
   c. **Key Task:** Channeling energy into concrete activities like school and hobbies.
   d. **Outcome:** A sense of accomplishment leads to industry; inability to achieve results in feelings of inferiority.
5. **Identity vs. Role Diffusion (12-15 Years - Beginning of Adolescence)**
   e. **Key Task:** Figuring out personal identity and one's place in the world.
   f. **Outcome:** Successful resolution leads to a stable identity; failure leads to role diffusion.
6. **Intimacy vs. Self-Absorption (Late Adolescence)**
   a. **Key Task:** Forming intimate relationships with others.
   b. **Outcome:** Failure to establish intimacy can result in psychological isolation.

Spiritual Development

Erikson's theory does not explicitly include spiritual development. However, James Fowler's "Stage Theory of Faith" (1974, 1980, 1983) provides an analogous framework for understanding spiritual development.

Fowler's theory suggests that an individual's faith and spirituality evolve in stages that parallel cognitive and emotional development.

This progression involves moving from simplistic, concrete understandings of faith to more complex and abstract interpretations, similar to the cognitive developmental stages proposed by Piaget.

D. FREUD THEORY

1. **Psychosexual Stages of Development:** Freud proposed that human development occurs in a series of psychosexual stages, each characterized by a primary erogenous zone and associated developmental tasks. These stages are:
   - **Oral Stage (0-18 months):** The focus is on the mouth, and the primary task is weaning from breastfeeding or bottle-feeding. Fixations or conflicts at this stage may lead to oral-related issues in adulthood, such as overeating or smoking.
   - **Anal Stage (18 months-3 years):** The anus is the primary focus, and the main task is toilet training. Conflict in this stage can lead to issues with control and orderliness in adulthood.
   - **Phallic Stage (3-6 years):** The genitals become the focus, and children develop feelings of attraction to the opposite-sex parent (Oedipus complex for boys, Electra complex for girls). Successful resolution leads to the development of the superego, the moral conscience.
   - **Latency Stage (6 years-puberty):** Sexual desires are repressed, and children focus on learning and socializing with peers.
   - **Genital Stage (puberty-adulthood):** The focus returns to the genitals, and individuals seek mature sexual relationships.
2. **Structural Model of Personality:** Freud proposed a structural model of personality consisting of three components:
   - **Id:** The primitive, unconscious part of the mind that seeks immediate gratification of instincts and desires.

- **Ego:** The conscious part of the mind that mediates between the id's impulses and the demands of reality. It operates on the reality principle and strives to find a balance between pleasure and social norms.
- **Superego:** The moral part of the mind that represents societal and parental values and acts as a conscience, often leading to feelings of guilt when moral standards are violated.

3. Defense Mechanisms: Freud identified various defense mechanisms that individuals use to cope with anxiety and protect the ego. These mechanisms include repression, denial, projection, displacement, and sublimation.

NEED OF NORMAL CHILDREN THROUGH THE STAGE OF DEVELOPEMENT AND PARENTAL GUIDANCE

Infants:

Needs of Infants:

- Continuation of breastfeeding.
- Essential newborn care.
- Full immunization.
- Protection from infection.
- Adequate rest and sleep (16 hours a day).
- Safe place to play.
- Safe and clean articles/toys for play.
- Accident prevention.
- Safety and tender loving care.
- Need for warmth.
- Clean food and safe drinking water.
- Constant supervision.
- Building a sense of trust with the primary caregiver.
- Regular visits to a pediatric hospital or clinic for checkups

Parental Guidance for Infants:

Toddlers (1-3 Years):

Needs of Toddlers (1-3 Years):

In the first 3 years of life, toddlers require:

1. A nutritious diet.
2. Guidance in learning skills.
3. Toilet training.
4. Love and acceptance.
5. Playmates, exercise, and games.
6. Oral and dental hygiene (to prevent baby bottle tooth decay).
7. A sense of security.
8. Prevention from infections and accidents.
9. Immunization and safety.

Parental Guidance for Toddlers:

1. Provide healthy snacks every 1-2 hours.
2. Regulate their meal timings.
3. Answer questions according to their understanding.
4. Recognize and address fears and anxieties.

5. Supervise during playtime.
6. Never leave a toddler alone near
7. Give praise for good behavior of toddlers.
8. Provide toilet training.
9. Go for regular health checkup.
10. Follow the immunization schedule.

Pre-Schooler

Needs of Pre-Schooler

Basic Needs:

1. Love and Affection.
2. Well-care and Good Nutrition.
3. Adult support.
4. Physical activity.
5. A suitable environment to support their creativity and aesthetical aspect.
6. Friendship and playing games with other children.
7. Self knowledge.
8. Freedom.
9. Self realization.
10. Needs to learn simple safety practices.

Parental Guidance for Preschoolers

Parenting preschoolers (ages 3-6 years) involves various responsibilities to ensure their safety, development, and well-being. Here are key guidelines for parents:

1. **Provide Love and Support:**
   - Offer abundant affection and emotional support.
   - Create a nurturing and secure environment.
2. **Teach Safety Rules:**
   - Instruct on simple safety measures for playing both indoors and outdoors.
   - Emphasize the importance of staying within safe boundaries.
3. **Encourage Play and Recreation:**
   - Promote involvement in play and recreational activities.
   - Ensure activities are age-appropriate and safe.
4. **Instill Socially Acceptable Behavior:**
   - Teach manners and the importance of polite behavior.
   - Encourage interactions that are respectful and considerate of others.
5. **Foster Creativity:**
   - Support and motivate artistic and creative pursuits.
   - Provide materials and opportunities for creative expression.
6. **Stranger Safety Education:**
   - Educate about the dangers of speaking to strangers.
   - Advise never to accept rides, toys, or gifts from unknown individuals.
7. **Teach Personal Information:**
   - Ensure the child knows their parents' full names, home address, and telephone number.
   - Teach them the importance of this information in emergencies.

School Age Children

1. **Needs of school age children are:**

- Well balanced diet
- Rest and sleep
- Playmates
- Love and security
- Safety and prevention
- Prevention from drug abuse
- Dental and personal hygiene
- Prevention from sexual abuse
- Prevention from accidents
- Sex education
- Health supervision

2. **Parental guidance of school age**
   - Teach the children their role in family.
   - Teach them about water safety and traffic safety rules.
   - Instruct the children to avoid teasing or playing roughly with animals.
   - Provide them love and security.
   - Give them emotional support.
   - Teach them the acceptable behavior.
   - Appreciate them for their good activities.

Adolescents

1. Needs of Adolescents

Basic needs of an adolescent are:

1) Balanced diet with high caloric intake, protein, calcium, iron, vitamins.
2) Need understanding and wise counseling to accept new body image.
3) Learn to be independent.
4) Develop healthy friendship.
5) Instructions about the dangers of drug and alcohol.
6) Emotional satisfaction.
7) Sex-education.
8) Love and trust.
9) A rich social life.
10) Vocational guidance.
11) An outlet for energy and self expression.
12) Independence and protection.
13) Prevention from sexual abuse.
14) Breast self examination.
15) Personal hygiene.
16) Menstrual hygiene.
17) Accident prevention.

2.Parental Guidance of adolecents

a) Provide stable, safe and loving home environment.
b) Develop a relationship that encourage child to talk to you.
c) Teach responsibilities for their belongings.
d) Create an atmosphere of honesty, mutual trust and respect.
e) Teach the importance of accepting limits.
f) Teach importance of think before acting.

g) Promote self care by regular rest and sleep, proper hygiene, balanced diet, and recreation.
h) Allow age appropriate independence and assertiveness.
i) Create socially acceptable behavior.
j) Teach the safety measures.

NUTRITIONAL NEEDS OF CHILDREN AND INFANTS

BREASTFEEDING

1. **Common Practice:** Breastfeeding involves feeding infants directly from the human female breasts.
2. **Health and Survival:** It's highly effective for child health and survival.
3. **Natural Food:** Breast milk is a natural, ready-made food for infants.
4. **Universal Recommendation:** Recommended for all infants, including those who are sick or premature.
5. **Benefits for Infant and Mother:** Enhances health for both the baby and the mother.
6. **Infection Prevention:** Helps in preventing infections in infants.
7. **Exclusive Breastfeeding:** Should be exclusive for the first 6 months of life.

Meaning of Breastfeeding

B - Best for baby.
R - Reduces incidence of allergies.
E - Economical, no waste.
A - Antibodies for greater immunity against infections.
S - Stool inoffensive, prevents constipation.
T - Temperature always correct and constant.
F - Fresh milk, never goes sour in the breast.
E - Emotional bonding.
E - Easy once established.
D - Digested easily within 2-3 hours.
I - Immediately available.
N - Nutritionally balanced.
G - Gastroenteritis greatly reduced.

Physiology of Lactation

1. **Mammogenesis:** Growth of ductal and lobulo-alveolar systems in preparation for breastfeeding.
2. **Lactogenesis:** Milk secretion begins around the 3rd or 4th postpartum day, influenced by prolactin and other hormones.
3. **Galactokinesis:** Ejection of milk dependent on baby's sucking and the contractile mechanism of the breast.
4. **Galactopoiesis:** Maintenance of lactation is reliant on prolactin and the act of breastfeeding itself.

Types of Breast Milk

1. **Colostrum:** First fluid secreted, rich in vitamins, white blood cells, and antibodies.
2. **Transitional Milk:** Lower protein breast milk replacing colostrum after 3-6 days post-delivery.
3. **Mature Milk:** Secreted after two weeks; thin, watery, high in fat and lactose, beneficial for brain development.

4. **Fore Milk:** Watery, rich in protein, sugar, vitamins, and minerals; quenches baby's thirst.
5. **Hind Milk:** Richer in fat, provides more energy and satisfies hunger; necessary for optimal growth.

Composition of Breast Milk

Composition	Details in Human Breast Milk
Protein Total	- 1% - Casein: 0.5% - Lacto-albumin: 0.5%
Amino Acids	- Cysteine: Sufficient for brain growth - Taurine: Adequate for brain development
Fat Total	- 4% - Balanced unsaturated and saturated fats for brain growth
Linoleic and Linolenic	- Sufficient levels
Cholesterol	- Present in the right amount for infant development
Lipase	- Enzyme present to digest fat
Lactose	- 3%: Sufficient for infant nutrition
Salts/Minerals	- Sodium: 6.5 mEq/L - Chloride: 12 mEq/L - Potassium: 14 mEq/L - Calcium: 350 mEq/L - Phosphate: 150 mEq/L
Iron	- Small amount, but well absorbed
Vitamin	- Adequate for infant growth, no extra supplementation needed

Technique of Breastfeeding

1. Position of Mother and Baby:

a) **Comfortable Positioning:**
   a. Ensure both mother and baby are comfortable.

b) **Sitting Position:**
   a. If sitting, the baby should be held inclined upright on the lap.
   b. Baby's head rests on the mother's forearm on the same side, close to her breast, with the head slightly extended.
   c. The mother may need to bend forward slightly.

c) **Lateral Position:**
   a. For night feeding or during illness, the baby can be fed in a lateral position.
   b. Place the baby along the mother's side, between her trunk and arm.

2. Attachment of Breast and Baby: The baby's mouth should be wide open, with the chin touching the breast for a good latch.

3. Breaking a Wind:

a) **Air Swallowing During Feeding:**
   a. Babies often swallow air while sucking.

b) **Technique:**
   a. To expel swallowed air, hold the baby upright against the chest and gently pat the back until the baby burps.
   b. Ideally, do this mid-feed to make room in the stomach for more milk.

Positions for Breastfeeding

Cradle Hold (Tummy to Tummy)

1. **Proper Sitting Posture:**
   - Sit straight with a pillow for support or sit on the bed's edge.
2. **Positioning the Baby:**
   - Cradle the baby in your arm, aligning his tummy against yours.
   - The baby's head should rest in the bend of your elbow.
   - Ensure the baby's ear, shoulders, and hips are in a straight line.
3. **Arranging Baby's Arm:**
   - Tuck the baby's lower arm away to keep the mouth near your breast.
4. **Breast Support:**
   - Support your breast with your free hand, keeping fingers underneath and away from the areola.
5. **Thumb Placement:**
   - Rest your thumb lightly on top of your breast, above the areola.
6. **Encouraging Latch-On:**
   - Lift your breast slightly and stroke your nipple on the baby's lower lip to trigger the rooting reflex.
   - When the baby's mouth opens wide, with the tongue down, like a big yawn, it's time to latch.
7. **Latching the Baby:**
   - Quickly pull the baby onto the breast when the mouth is open wide.
8. **Maintaining Posture:**
   - Keep your back straight without leaning over the baby.
   - Ensure the baby is brought up to your breast, not the breast to the baby.

Signs of Good Attachment

1. **Baby's Position:**
   - Mouth wide and close around the nipple.
   - Chin touches the breast.
   - Round and full cheeks, not dimpled.
2. **Sucking Pattern:**
   - Slower, longer sucks.
   - Strong, drawing sensation felt by the mother.

Frequency of Feeding

1. **Initial Schedule:**
   - First 24 hours: Feed at intervals not exceeding 5 hours.
   - First week: Establish a regular 3-4 hour feeding pattern.
2. **Duration of Feed:**
   - Start with at least 5 minutes at each breast.
   - Increase gradually to 15 minutes within the first week.
3. **Night Feed:**
   - Initially, include night feeding every 5 hours.

Advantages of Breastfeeding

1. **Optimal Nutrition:** Breast milk is the best nutrition for an infant.
2. **Health Benefits:** Provides numerous health benefits for both mother and baby.

Advantages of Breastfeeding for Baby

1. **Complete and Perfect Nutrition:**
   - Contains essential fats, cholesterol for brain and nerve tissue development.
   - More digestible fat than formula milk.
   - Provides a full range of vitamins and minerals.
   - Special immune-protective proteins present.
2. **Lower Risk of Infection:**
   - Lactoferrin in breast milk protects against microorganisms, viruses, and bacteria.
   - Lysozymes and milk leucocytes destroy microorganisms.
   - IgA immunoglobulin targets microorganisms.
   - Oligosaccharides promote friendly bacteria in the digestive system.
3. **Protection from Allergies:**
   - Immune protective proteins and IgA help shield from allergies and aid in immune system formation.
4. **Therapeutic Effect:**
   - Protects against diarrhea.
   - Reduces dehydration and negative consequences during illness.
   - Ideal calcium and phosphorus content protects from hypocalcemia.
   - Promotes recovery in sick children.
5. **Physiological Adaptation:**
   - Essential for healthful growth beyond six months.
   - Premature infants show higher development scores with breast milk.
6. **Economic Factors:**
   - Cost-effective and safe.
   - Reduces the incidence of illness and hospitalization, lowering economic burden.
7. **Emotional Bonding:**
   - Fosters mother-infant bonding.
   - Provides physiological and psychological benefits.

Advantages of Breastfeeding for Mother

1. **Prevents Hemorrhage:** Baby's sucking reduces post-delivery blood flow.
2. **Aids Weight Loss:** Helps mothers return to pre-pregnancy weight.
3. **Benefits for Brain Development:** Contains fatty acids crucial for brain, eyes, and nervous system.
4. **Natural Contraceptive:** Delays menstrual cycle, acting as a contraceptive.
5. **Convenience:** No preparation needed, always at the right temperature.
6. **Promotes Uterine Involution:** Helps the uterus return to its pre-pregnancy size.
7. **Cancer Protection:** Reduces the risk of breast and ovarian cancer.

EXCLUSIVE BREASTFEEDING

1. **Definition:** Feeding infants only breast milk, without any additional food or drinks, including water, until 6 months of age.
2. **WHO Recommendations:** Exclusively breastfeed for the first six months to ensure optimal growth, development, and health.
3. **Post 6 Months:** Introduce nutritious complementary foods while continuing breastfeeding up to two years or beyond.

SUPPLEMENTARY/ARTIFICIAL FEEDING

Definition: Feeding an infant with preparations other than human milk, commonly known as bottle feeding.

Indications

1. **Inadequate Breast Milk:** Rare.
2. **Lifestyle Changes:** Women's changing roles and socio-economic pressures.

Principles of Artificial Feeding

- **Energy Needs:** 100 kcal/kg body weight per day (~150 ml milk/kg body weight daily).
- **Protein Requirement:** About 2 g/kg body weight for the first 6 months; 1.5 g/kg by one year.
- **Carbohydrate Requirement:** 10 g/kg body weight daily.
- **Milk Feeding Post 4 Months:** Undiluted boiled milk.
- **Feeding Frequency:** 6-8 times a day for infants; 5 times for older babies.
- **Illness Consideration:** Increased caloric needs during illness like fever.

Artificial Formula Feeding

1. **Dried Milk:**
   a. Scientifically prepared, bacteria-free.
   b. Little danger from flies, doesn't sour.
   c. Usually vitamin-fortified.
   d. Expensive for many Indian families.
2. **Cow's Milk:**
   a. Affordable and widely used.
   b. Rich in protein, calcium, vitamin B12, iodine.
   c. Recommended undiluted from birth by pediatricians.
   d. WHO suggests dilution in first 2 months.
   e. Mix milk, water, sugar, boil, cool, pour into feeding bottle (3:1 or 4:1 ratio).
   f. Daily requirement: 150 ml/kg body weight.
3. **Buffalo Milk:**
   a. High in fat, protein, calcium, and calories.
   b. Should be skimmed and given in the same proportion as cow's milk for 2 months.

Composition of Cow's Milk vs. Human Breast Milk (Per Litre)

Constituent	Human Breast Milk	Cow's Milk
Protein (g)		
- Total Protein	11	33
- Casein	4	28
- Soluble Proteins	7	5
- Lactalbumin	3.5	1.5 to 1.8
- Beta-lactoglobulin	0	3.7
Non-Protein		
- Lactotransferrin	1 to 2	0.2 to 0.5
- Immunoglobulin	1 to 2	0.5
- Lysozyme	0.5	Traces
Carbohydrates (g)		
- Lactose	70	50

Other Substances		
- Linoleic Acid (g)	3.5	1
- Nitrogenous Substances (mg)	35	35
Minerals		
- Ca (Calcium) (mg)	62	50
- P (Phosphorus) (mg)	8	8
- Fe (Iron) (mg)	0.33	0.3 to 0.5
Vitamins		
- Vitamin C (mg)	60	20
- Vitamin D (IU)	50 IU	25 IU
Energy		
- Kilocalories (kcal)	640-720	650
- Kilojoules (kJ)	2670-3000	2717

Methods of Artificial Feeding

1. **Bottle Feeding**: Using commercial or evaporated milk formulas in bottles. It's a common practice in India, but improper cleaning can lead to gastrointestinal infections.
2. **Katori and Spoon Feeding**: Feeding using a bowl (Katori) and spoon.
3. **Cup Feeding**: Feeding the infant from a cup.
4. **Gavage or Nasogastric or Gastric Feeding**: Feeding through a tube inserted into the stomach via the nose or mouth.

Principles of Bottle Feeding

1. Sterilize bottles before use.
2. Wash and sterilize all feeding equipment.
3. Wash hands before preparing the feed.
4. Clean and disinfect the preparation area.
5. Ensure the teat hole is the right size for 20-30 drops per suck.
6. Avoid small or large teat holes to prevent swallowing air and subsequent discomfort.
7. Position infants on the right side post-feeding to prevent regurgitation.
8. Use partially drunk bottles within 1 hour or store in the fridge for up to 48 hours.
9. Avoid adding fresh formula to a partially used bottle.
10. Don't heat bottles in a microwave to prevent uneven heating and burns.
11. Never prop the bottle or leave the infant unattended during feeding.
12. Avoid prolonged bottle use, especially during sleep.

Techniques Of Bottle Feeding

1. **Sterilization**: Ensure that both the bottle and teat are sterilized or boiled properly and thoroughly to prevent bacterial contamination.
2. **Hand Hygiene**: Always wash hands with soap and water before handling the bottle or feeding the baby. This reduces the risk of transferring germs.
3. **Positioning the Baby**: Cradle the baby in a semi-upright position during feeding and support their head. This position helps prevent choking and facilitates easier swallowing.
4. **Medication Administration**: If the baby is prescribed medication, give it before feeding. Avoid mixing medicine in the feed to ensure proper dosage and effectiveness.
5. **Formula Preparation**: Do not add water to ready-to-feed formula. The formula should be used as directed to maintain its nutritional integrity.

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6. **Bottle Holding**: Hold the bottle properly at the right angle. This helps to control the flow of milk to the baby and reduces the risk of choking.
7. **Teat Insertion**: Wait for the baby to open their mouth and then gently insert the teat into the corner of the mouth. This encourages natural sucking reflexes.
8. **Teat Filling**: Ensure that the teat is filled completely with milk to prevent the baby from swallowing air, which can cause discomfort and gas.
9. **Burping**: Burp the baby during and after feeding to release any air swallowed during feeding, reducing discomfort and the risk of spitting up.
10. **Recognizing Fullness**: Stop feeding when the baby shows signs of being full, such as spitting out the teat, falling asleep, or lying quietly. Overfeeding can cause discomfort and digestive issues.
11. **Post-Feeding Position**: After feeding, place the baby in the right lateral position (lying on their right side). This position helps prevent regurgitation and aids in digestion

Katori and Spoon Feeding

Techniques of Katori and Spoon Feeding

1. **Cleanliness**: Wash hands and utensils with hot water and soap.
2. **Prepare Feed**: Ensure the feed is at the correct temperature when prepared.
3. **Diaper Check**: Change the baby's diaper if it's soiled.
4. **Positioning the Baby**: Position the baby semi-upright in your lap, in a cradle, or on a cot with a pillow under their head.
5. **Protective Cloth**: Tie a soft cloth around the baby's neck.
6. **Engagement**: Stay engaged and attentive during feeding.
7. **Slow Feeding**: Feed the baby slowly, allowing them to swallow the first bolus before continuing.
8. **Mouth Feeding**: Feed from the corner of the mouth and watch for signs of aspiration.
9. **Clean Area**: Ensure the feeding area is clean.
10. **Signs of Fullness**: Look for signs that the baby is full and never force them to finish all the prepared feed.
11. **Burping**: Burp the baby during and after the feed to release any swallowed air.
12. **Mouth Cleaning**: Gently clean the baby's mouth after the meal.

Gavage Feeding

Introduction

- Gavage feeding is a method used to deliver breast milk or formula directly into a baby's stomach using a tube.
- This is often necessary for babies who cannot consume enough nutrition through breastfeeding or bottle feeding.

Purposes

1. To feed babies who cannot obtain sufficient nutrition by breastfeeding.
2. For premature or very low birth weight babies who lack the strength to suck.
3. For babies with difficulties in coordinating sucking and swallowing.
4. For infants with throat, esophagus, or bowel problems.

Position for Gavage Feeding

1. The infant is placed in a supine position.
2. The head of the bed may be elevated, and the infant's arms are wrapped in a blanket.

Equipment Needed

- Sterile catheter/feeding tube (5-8 ft. for infants, 10-14 ft. for older children).

- Large syringe for milk or formula.
- Stethoscope.
- Non-allergic tape for marking insertion distance.
- Water-soluble lubricant jelly.
- Syringe barrel (10-50 ml size).
- Room temperature formula or milk.

Problems Associated with Artificial Feeding

- Aspiration risk.
- Obstructed nares.
- Mucus plugs.
- Purulent rhinitis.
- Epistaxis (nosebleeds).
- Infection risk.
- Potential stomach perforation.
- Overfeeding or underfeeding.
- Constipation from undigested protein.
- Malnutrition if feeds are over diluted.
- Gastroenteritis.
- Anemia.

COMPLEMENTARY FEEDING OR WEANING

Introduction

Weaning is the gradual introduction of an infant to solid foods, starting at around 6 months and usually completed by 12 to 18 months.

Principles of Weaning

1. The process should be gradual and pleasant.
2. Start with small amounts of complementary food, increasing gradually.
3. Introduce one new food at a time, usually at 4 to 5-day intervals.
4. Progress from liquid to semi-solid, then solid foods.
5. Observe the infant's likes and dislikes.
6. Avoid mixing new foods with formula in the bottle.
7. Emphasize food hygiene.
8. Feed in a relaxed environment.
9. Allow the infant to explore and play with feeding utensils.
10. Introduce a wide variety of foods.
11. Avoid low-calorie foods and encourage bite-sized, chewy foods.
12. Avoid force feeding, anxiety, and punishment.

Complementary Foods

- **First Foods:** Cow's milk, porridge, dal water. Start with one new food item per week.
- **Extra Protein Foods:** Pulses, groundnut mixed with cereal, boiled egg.
- **Protective Foods:** Mashed vegetables like carrots, peas, and green leafy vegetables; fruits like tomatoes, papayas, bananas, mangoes, grapes.
- **Weaning Foods:** Include liquids (vegetable soup, pulses, fruit juices), semi-solids (mashed banana, soft-cooked rice, mashed potato/egg, pulses), and solids (cooked rice, bread, biscuits, fruits).

Importance of Weaning

1. **Nutritional Needs:** As a child grows, breastfeeding alone becomes insufficient to meet their nutritional requirements, especially for iron and vitamin C.
2. **Digestive Development:** By the weaning age, babies develop the necessary enzymes to digest the complex structure of solid foods.
3. **Self-Dependency and Coordination:** Weaning is a crucial phase where babies start to eat independently, enhancing their hand-mouth coordination.
4. **Developmental Milestone:** Around 6 months, babies develop the ability to bite, marking an important developmental achievement.
5. **Learning Independence:** Weaning offers the child an opportunity to learn independence by using a cup and spoon for self-feeding.
6. **Chewing and Swallowing Solid Food:** It introduces and accustoms the infant to the process of chewing and swallowing solid foods.
7. **Family Involvement:** Weaning provides an opportunity for all family members to engage in feeding and interacting with the baby.

Problems Associated with Weaning

- Risk of Infection.
- Malnutrition.
- Allergies
- Safety Concerns.

BABY-FRIENDLY HOSPITAL INITIATIVE (BFHI)

- **Launch:** The Baby-Friendly Hospital Initiative (BFHI) was initiated in March 1992 by the World Health Organization (WHO) and UNICEF.
- **Objective:** Its primary goal is to encourage and promote exclusive breastfeeding, as bottle-feeding has been identified as a significant risk factor contributing to infant mortality.

Goals of BFHI

- **Improving Healthcare Workers' Approach:** The initiative focuses on enhancing the knowledge, attitudes, and practices of healthcare workers.
- **Empowerment with Skills:** Providing healthcare professionals with the necessary knowledge and skills to promote exclusive breastfeeding for infants up to the age of 6 months.

Ten Steps to Successful Breastfeeding

These steps are designed to support and encourage breastfeeding and include guidelines for healthcare facilities, such as:

Step 1: Written Breastfeeding Policy

- **Policy Display:** A policy including the ten steps for successful breastfeeding should be prominently displayed in maternal and child health areas of the hospital.
- **Language Accessibility:** The policy should be available in both English and the local language.

Step 2: Train Healthcare Staff

- **Practical Training:** Staff should receive practical training to implement the ten steps of breastfeeding.

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- **Skill Development**: Training should include skills for assisting nursing mothers in expressing breast milk, and correct positioning and attachment of the baby during breastfeeding.

Step 3: Inform Pregnant Women

- **Antenatal Education:** Inform and educate mothers during the antenatal period about the benefits of breastfeeding for both mother and baby.
- **Problem Management:** Address and manage issues like retracted, small, or cracked nipples during the antenatal period.

Step 4: Initiate Breastfeeding Early

- **Mother-Baby Bonding:** Establish bonding soon after delivery.
- **Early Breastfeeding:** Encourage mothers to start breastfeeding within half an hour of birth and advise against prelacteal feeds.

Step 5: Teaching Breastfeeding Techniques

- **Breastfeeding Art:** Teach mothers the art of breastfeeding, including position and feeding technique.
- **Lactation Maintenance:** Instruct on the correct technique of expressing breast milk manually or with a breast pump to maintain lactation.

Step 6: Exclusive Breastfeeding

- **Avoid Prelacteal Feeds:** No prelacteal feeds should be given to the newborn; only breast milk is recommended.
- **Supplementary Feeding:** If breast milk is unavailable, provide supplementary feeding as medically indicated.

Step 7: Practice Rooming-In

- **Mother-Infant Proximity:** Keep mother and newborn together to promote bonding and facilitate timely breastfeeding initiation.

Step 8: Breastfeeding on Demand

- **Responsive Feeding**: Mothers should breastfeed whenever the baby is hungry, rather than on a strict schedule.

Step 9: No Artificial Teats or Pacifiers

- **Risk of Infection and Non-nutritive Sucking:** Avoid giving pacifiers to babies.
- **Alternative Feeding Methods:** Use a Katori/spoon or paladai for feeding expressed breast milk or other medically indicated fluids, not a feeding bottle.

Step 10: Establish Breastfeeding Support Groups

- **Community Support:** Set up women breastfeeding support groups in the community.
- **Post-Discharge Follow-Up:** Provide follow-up support to breastfeeding mothers after hospital discharge.

TYPES AND VALUE OF PLAY AND SELECTION OF PLAY MATERIAL

Play is a vital part of children's development, contributing to their cognitive, behavioral, social, and psychomotor growth. It is a pleasurable activity without material gain, essential for promoting growth and fostering life skills.

Types of Play

1. **Associative Play**:
   - Focused on conversation and peer interactions.
   - Common in the preschool age group.

   - Children engage in similar activities with the same objects.
2. **Therapeutic Play**:
   - Used in hospitals to reduce stress and anxiety during hospitalization.
   - Aims to provide a family-centered approach to help children adjust to hospital care.
3. **Unoccupied Play Behavior**:
   - Involves minimal engagement in play activities.
   - Typical in infants.
   - Includes random movements, minimal social involvement.
4. **Onlooker Play**:
   - Involves observing others play without direct participation.
   - Common in younger children (2½ to 3½ years).
   - Includes social interactions such as conversations about the play.
5. **Solitary Independent Play**:
   - Children play alone, often with different toys.
   - Typically seen in children under 3 years.
6. **Natural Play**:
   - Includes social-affective play, sense pleasure play, and skill play, depending on the infant's ability.
   - Social-affective: Interaction with adults through smiling and cooing.
   - Sense pleasure: Exploring the environment through sensory experiences.
   - Skill play: Developing skills through imitation.
7. **Parallel Play**:
   - Independent play among a group.
   - Children play similarly but do not interact directly.
   - They may imitate each other's actions.

Advantages/Benefits of Play

1. **Physical Development**:
   - Stimulates brain development and maintains nerve cell connections.
   - Enhances both fine (e.g., writing, manipulating small tools) and gross motor skills (e.g., walking, running, coordination).
2. **Stimulating Imagination and Creativity**:
   - Fosters creativity, leading to inventive thinking in later life.
   - Encourages children to devise new ways to handle difficult tasks.
3. **Problem-Solving and Cognitive Skills**:
   - Improves concentration, time management, and problem-solving skills.
   - Helps children distinguish between fantasy and reality, and learn self-control and discipline.
   - Enhances decision-making abilities.
4. **Social Development**:
   - Develops conflict resolution skills and the ability to take turns.
   - Builds leadership and teamwork capabilities.
   - Teaches the importance of cooperation and polite interaction.
5. **Emotional Development**:
   - Provides an outlet for expressing emotions.
   - Teaches children to be good sports, handling both winning and losing gracefully.

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- Strengthens emotional and mental resilience.

6. **Linguistic Development**:
   - Enhances communication skills, particularly listening and speaking.
   - In role-playing, children practice using the appropriate tone and voice modulation.
7. **Cognitive Development**:
   - Improves focus, memory, concentration, and logical thinking.
   - Ensures comprehensive cognitive development.
8. **Therapeutic Value**:
   - Reduces stress and promotes feelings of safety and well-being.
   - Decreases depression, anxiety, aggression.
   - Improves appetite and sleep quality.
9. **Moral Values**:
   - Teaches good manners and the value of honesty.

Suitable Play Material According to Age

1. **Infants (0-1 Year)**
   - **4 weeks to 4 months**: Bright moving objects, hanging cradle toys, musical toys, balloons, rattles.
   - **4 to 6 months**: Soft squeeze toys, rattle toy animals, balloons.
   - **7 to 9 months**: Soft squeeze toys, sound toys, blocks, cubes, plastic rings, rattles.
   - **10 to 12 months**: Motion toys, water play, blocks, dolls, balls, musical toys, picture books, rocking horse, walker, transporting objects, pull and push toys.
2. **Toddlers (2-3 Years)**
   - Large crayons.
   - Washable dolls.
   - Blocks of assorted shapes.
   - Wooden puzzles.
   - Housekeeping toys.
   - Telephone toy.
   - Sandbox.
3. **Preschoolers (3-4 Years)**
   - Hammer with pegboard.
   - Jungle gym.
   - Ride-on vehicles (fire engine, tricycle, car).
   - Musical and rhythmic toys (drums).
   - Large brushes for painting.
   - Coloring books.
   - Lightweight bat and soft ball.
4. **Older Preschoolers (4-5 Years)**
   - Plastic blocks.
   - Wooden train with wheels.
   - Small cars and lorries.
   - Blackboard.
   - Toy bed.

   - Rocking board.
   - Sticks of different colors.
   - Xylophone and other musical toys.
5. **Early School Age (5-6 Years)**
   - Doll feeding sets.
   - Wheeled toys (animals and vehicles).
   - Cosmetic set.
   - Doll furniture.
   - Hand puppets.
   - Football, badminton.
   - Ping-pong.
   - Carom board.
   - Word building games (Scrabble).

Characteristics of Play Material

- Safe, washable, lightweight, and offers problem-solving opportunities.
- Realistic, simple, attractive, durable, easy to handle, and non-breakable.
- No sharp edges or small parts that could be swallowed or inhaled.
- Non-overstimulating and not frustrating.
- Free from toxic paints, non-inflammable, and not excessively noisy.
- Avoid oys with electrical plugs for younger children.

Factors to Consider When Selecting Toys

- Ensure toys are non-toxic.
- For children under three years, avoid toys with small or easily breakable parts.
- Smooth edges and no sharp objects.
- Consider different ways children may play with the toys.
- Remove strings and cords posing strangulation hazards.
- Regular safety checks; repair or remove broken toys.
- Consider local climate adaptability and suitability.

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UNIT 03

NURSING CARE OF NEONATE

Physical Characteristics of a Normal Newborn Baby and Nursing Car

1. **Neonate:** From birth to 4 weeks (28 days) of age, the baby is called neonate or newborn.
2. **Early neonatal period:** From birth to 7 days of life or 168 hours is early neonatal period.
3. **Late neonatal period:** From 7th day to 28th day of life is late neonatal period.
4. **Live birth:** Live birth is defined as complete expulsion or extraction from its mother of a product of conception, which after separation shows signs of life for at least 1 hour.
5. **Term baby:** Any neonate born between 37 to 42 weeks of gestation is known as term baby.
6. **Preterm:** Any neonate born before 37th week of gestation is called preterm.
7. **Post-term:** Any neonate born at or after 42 weeks of gestation is known as post-term.
8. **Perinatal period:** The period extending from 22nd week of gestation to 7 days after birth is known as perinatal periods

APPRAISAL OF NEWBORN

The appraisal of a newborn encompasses a thorough and systematic examination aimed at evaluating the infant's physical and neurological health immediately after birth and during the early stages of life.

Components of Newborn Assessment

1. Apgar Scoring

- **Purpose**: Quickly assesses the newborn's physical condition and immediate need for extra medical or emergency care.
- **Criteria**: Evaluates five vital signs - Appearance (skin color), Pulse (heart rate), Grimace (reflex irritability), Activity (muscle tone), and Respiration (breathing effort).
- **Timing**: Performed at 1 and 5 minutes after birth, with further assessments if the score is low.

2. Recording of Birth Weight: Birth weight is a critical indicator of a newborn's health. Deviations from the normal range (2.5-4 kg for full-term infants) can signal potential health issues or special care needs.

3. Examination of Umbilical Cord: Checks for the normal structure (two arteries and one vein) and signs of infection or abnormalities, which can affect the newborn's circulation and overall health.

4. Checking the Patency of Orifices: Ensures there are no obstructions or malformations that could affect vital functions. This includes:

- **Cleft lip and palate**: For feeding and speech development.
- **Nasal and ear passages**: For breathing and hearing capabilities.
- **Anus**: For excretion.
- **Genital abnormalities** (e.g., hypospadias, epispadias): For urinary health.
- **Spine and skin**: For signs of neural tube defects or other lesions.

Phases of Assessment

1. **Initial Assessment**
2. **Transitional Assessment**
3. **Assessment of Gestational Age**
4. **Physical Examination**
5. **Neurological Assessment**

INITIAL ASSESSMENT

The initial assessment of a newborn is a crucial step in identifying their immediate health status and determining the need for any urgent medical interventions.

Importance of Initial Assessment

- **Early Identification**: Quickly identifies newborns who require immediate medical intervention.
- **Infection Prevention**: Takes into account the newborn's vulnerability to infections, stressing the importance of a clean environment.
- **Bonding Process**: Facilitates early bonding between the mother and the newborn through rooming-in, enhancing the emotional well-being of both.

Apgar Scoring System

- **Development**: Created by Dr. Virginia Apgar in 1952, this scoring system is a fundamental tool for evaluating a newborn's health status immediately after birth.
- **Method**: Assesses five critical criteria - Appearance (skin color), Pulse (heart rate), Grimace response (reflex irritability), Activity (muscle tone), and Respiration (breathing rate and effort).
- **Scoring**: Each category is scored between 0 to 2, with a maximum total score of 10. A score of 7 to 10 is generally normal, 4 to 6 indicates moderate difficulty, and a score below 3 signals critical condition needing immediate attention.
- **Timing**: The baby is evaluated at 1 minute and again at 5 minutes after birth to gauge how well they are adapting outside the womb.

Scoring Details

- **Appearance (Skin Color)**: Full points are awarded if the baby's body is completely pink. Points are deducted for blue or pale extremities, indicative of immature circulation.
- **Pulse (Heart Rate)**: A normal heart rate (>100 beats per minute) scores full points, reflecting effective cardiovascular function.
- **Grimace Response (Reflexes)**: The baby's response to stimulation, such as a gentle pinch, indicates the functioning of the nervous system.
- **Activity (Muscle Tone)**: Good flexion and active movement score full points, showing healthy muscle tone.
- **Respiration (Breathing Rate and Effort)**: Strong, regular cries and breathing score top points, indicating healthy lung function.

Interpreting Apgar Scores

- Scores closer to 10 typically mean the newborn is in good health and adapting well.
- Scores between 4 to 6 or below necessitates immediate medical attention to address breathing difficulties, heart rate issues, or other concerns.
- Persistent low scores may lead to further assessments and interventions, possibly including ventilatory support.

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Follow-up on Low Scores

- Continual reassessment is crucial for newborns with low Apgar scores, ideally every 5 minutes for up to 20 minutes, to monitor improvements or further actions.

TRANSITIONAL ASSESSMENT

The transitional assessment of newborns is a crucial part of neonatal care, emphasizing the importance of observing and evaluating the baby during the first 6-8 hours after birth.

First Period of Reactivity

1. **Timing**: This phase occurs within the first 30-60 minutes of life.
2. **Characteristics**: The newborn is highly alert, active, and shows a strong suck reflex, making it an ideal time for initiating breastfeeding.
3. **Observations**:
   a. Early skin-to-skin contact is encouraged to promote mother-infant bonding, breastfeeding outcomes, and stabilize the newborn's cardiorespiratory status.
   b. The newborn may exhibit tachypnea (up to 80 breaths per minute) and tachycardia (up to 180 beats per minute).
   c. Mild to moderate chest retractions, nasal flaring, expiratory grunting, and periodic breathing may be observed alongside acrocyanosis, which is normal during this stage.

Period of Relative Inactivity

1. **Timing**: Occurs 2-3 hours post-birth.
2. **Characteristics**: The newborn enters a phase of decreased responsiveness, often sleeping deeply and showing less interest in feeding or external stimuli.
3. **Observations**:
   a. The heart rate stabilizes between 100-140 beats per minute, and the respiratory rate normalizes to 40-60 breaths per minute.
   b. The baby's skin should be centrally pink, with no respiratory distress evident.

Second Period of Reactivity

1. **Timing**: This period begins 4-8 hours after birth and can last several hours.
2. **Characteristics**: The newborn becomes alert and responsive once again, with a slight increase in heart and respiratory rates.
3. **Observations**: This phase allows for further opportunities for bonding, breastfeeding, and conducting more in-depth assessments as the baby is more responsive.

ASSESSMENT OF GESTATIONAL AGE

The assessment of gestational age in newborns is a critical practice in neonatal care, as it provides vital information about the newborn's development and health status. This assessment helps healthcare providers determine the appropriate care and interventions necessary for each baby, particularly when there are uncertainties about the pregnancy duration or when the newborn's size does not align with the expected gestational age. Below is a detailed explanation of how gestational age assessment is performed and its significance:

Importance of Gestational Age Assessment

1. **Determines Pregnancy Duration**: Accurately gauging the number of weeks of pregnancy informs subsequent care decisions.
2. **Identifies post-term or Pre-term Babies**: Understanding whether a baby is born pre-term, term, or post-term helps tailor the necessary medical care.
3. **Guides Care for Atypical Sizes**: A baby's size may not always reflect its gestational age; accurate assessment prevents misclassification and ensures appropriate care.

Methods of Assessment

1. **Dubowitz/Ballard Score**: A comprehensive tool that combines physical and neurological examinations to estimate a baby's gestational age with considerable accuracy.
2. **Physical Maturity Examination**: Conducted within the first 2 hours of birth, examining features that change visibly with gestational age, such as skin texture, presence of lanugo, plantar creases, breast tissue development, eye and ear formation, and genital development.
3. **Neuro-muscular Maturity Examination**: Performed within 24 hours after birth, assessing the baby's posture, limb flexibility, recoil of arms, and other reflexes that indicate neurological and muscular development.

Physical Maturity Indicators

1. **Skin**: Assessed for stickiness, smoothness, or peeling.
2. **Lanugo**: Presence and amount of soft, downy body hair.
3. **Plantar Creases**: Number and depth of creases on the soles of the feet.
4. **Breast Tissue**: Thickness and areola development.
5. **Eyes and Ears**: Fused or open eyes and the stiffness/cartilage amount in the ears.
6. **Genital Development**: Development of the scrotum and testes descent in males, and the size and covering of the labia in females.

Neuro-muscular Maturity Indicators

1. **Posture**: The natural positioning of arms and legs.
2. **Square Window Sign**: Flexibility of the hands towards the wrist.
3. **Arm Recoil**: The reflex "spring back" to flexed position after extension.
4. **Popliteal Angle**: The extent of knee extension.
5. **Scarf Sign**: The ease of moving elbows across the chest.
6. **Heel to Ear**: Flexibility in moving the feet close to the ears.

PHYSICAL EXAMINATION

A complete physical examination of a newborn is a critical step in ensuring their well-being, detecting any potential health issues, and guiding caregivers on the appropriate care measures. Below is a detailed explanation of the components and significance of this examination:

Anthropometric Measurements

1. **Weight**: Newborn weight is a crucial health indicator. A normal birth weight ranges between 2.5 to 4 kg. A weight loss of up to 10% in the first few days is normal, reflecting fluid loss, but should be closely monitored for healthy recovery.
2. **Head Circumference**: Measuring around 35 cm on average, head circumference is a vital indicator of brain development and growth. Significant deviations may suggest developmental issues.
3. **Length**: The measurement from the baby's head to the heel, averaging about 50 cm, helps assess the newborn's growth and development status.
4. **Chest Circumference**: Typically, 30-33 cm, indicating the size of the thoracic cavity and potential for healthy lung expansion.

Vital Signs

1. **Temperature**: Newborns need to maintain a stable body temperature within a narrow range for optimal enzyme functioning and metabolic processes.
2. **Heartbeat**: The heart rate varies with activity levels and sleep; deviations may indicate stress, congenital heart issues, or systemic problems.

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3. **Breathing Rate**: A rapid or slow breathing rate can signal respiratory distress or other underlying conditions.
4. **Blood Pressure**: Reflects the cardiovascular system's health. Abnormalities might indicate congenital heart defects or circulatory system issues.
5. **Oxygen Saturation**: Essential for ensuring adequate oxygenation of tissues; low levels may indicate respiratory or cardiac problems.

Head to Toe Examination

1. **Skin**: The skin's colour and texture provide clues to a newborn's circulation and oxygenation status, as well as potential infections or genetic conditions.
2. **Head**: Assessing the shape and the fontanels (soft spots) offers insight into the baby's brain growth and potential for conditions like hydrocephalus.
3. **Face**: Facial symmetry and features can reveal congenital conditions or syndromes.
4. **Eyes**: Checking for clarity, pupil response, and the red reflex helps identify infections, congenital cataracts, or retinal abnormalities.
5. **Mouth**: The presence of cleft lip/palate or other abnormalities can affect feeding and speech development.
6. **Ears**: Their form and position might hint at genetic conditions, while the response to sound checks auditory health.
7. **Nose**: Patency ensures the baby can breathe comfortably through the nose, critical for feeding.
8. **Neck**: Checking for masses or limited motion can reveal birth injuries or congenital muscular issues.
9. **Chest and Abdomen**: Observing breathing patterns and abdominal distension helps assess respiratory and gastrointestinal health.
10. **Genitalia and Anus**: Ensuring normal anatomy and patency is crucial for urinary and gastrointestinal functions.
11. **Limbs**: Assessing mobility, reflexes, and physical anomalies aids in detecting musculoskeletal or neurological conditions.

NEUROLOGICAL EXAMINATION COMPONENTS

1. **Mental Status**
   - Best examined between feeds to avoid excessive crying or sleepiness.
   - Observe spontaneous eye opening, facial and extremity movements, and response to stimulation.
2. **Cranial Nerves**
   - **CN II and III**: Tested by the pupillary reflex, consistent from 32 to 35 weeks of gestation.
   - **CN II and VII**: A 28-week infant will blink to light, indicating the function of these nerves.
   - **CN II, III, IV, and VI**: From 34 weeks, an infant can fix and follow an object.
   - **CN V**: Facial sensation tested with pinprick; observe for facial grimace or changes in sucking.
   - **CN VIII**: Hearing tested with a bell; newborn may respond subtly.
   - **CN V, VII, XII**: Sucking on a pacifier can evaluate these, along with CN IX and X during swallowing.
   - **CN XI**: Palpation of the sternocleidomastoid might be challenging but is assessable in certain positions.

3. **Motor Examination**
   - Observe resting posture for symmetry and passive tone.
   - Flexor tone development sequence: lower extremities first, progressing cephalically.
   - Movement quality evolves from writhing to "swatting" by term.
4. **Sensory Examination:** Limited to touch and pinprick in newborns; assess reaction to stimuli on the face.
5. **Reflexes**
   - **Dolls Eye Reflex**: Eyes lag behind when the head is moved, present from birth to 3–4 months.
   - **Blinking Reflex**: Triggered by bright light; remains uninhibited.
   - **Rooting Reflex**: Baby turns head towards stroking direction, lasts about 4 months.
   - **Tonic Neck Reflex**: Fencing position when the baby's head is turned, persists until 5-7 months.
   - **Sucking Reflex**: Develops around 32-36 weeks of gestation, essential for feeding.
   - **Gagging Reflex**: Triggered by posterior pharynx stimulation, present from birth.
   - **Extrusion Reflex**: Pushing solid food out with the tongue, disappears by 4 months.
   - **Moro (Startle) Reflex**: Response to loud sound or movement, lasts until about 2 months.
   - **Grasp Reflex**: Closing fingers upon palm stroking, persists until 5-6 months.
   - **Stepping/Toe Reflex**: Baby appears to take steps when feet touch a solid surface, lasts about 2 months.
   - **Babinski/Plantar Reflex**: Big toe moves upward on sole stroking, normal up to 2 years.

NURSING CARE OF A NORMAL NEWBORN/ESSENTIAL NEWBORN CARE

- The initial hour post-birth is crucial for a newborn's survival and future health.
- Typically, a healthy newborn at term (37 to 42 weeks) should have an average birth weight, cry immediately after birth, establish independent rhythmic sustained respiration, and quickly adapt to the new environment.
- Nursing professionals play a vital role in this critical period, providing care to prevent complications and ensure the newborn's survival.
- Essential newborn care, which applies to all newborns, includes immediate and routine care.

Immediate Care

1. **Maintenance of Temperature**
   - Receive the newborn in a prewarmed, clean, and dry towel or cloth on a warm dry surface.
   - Dry the newborn immediately and place under a radiant warmer.
   - Maintain skin-to-skin contact with the mother and postpone bathing for 24 hours.
   - Cover the newborn's head with a cap to prevent heat loss.
2. **Establish Open Airway**
   - Suction secretions if necessary, using a bulb syringe or clean cloth.
   - Keep the head slightly lower than the body to prevent aspiration.
3. **Identification of Newborn**: Ensure the newborn is identified before leaving the delivery room with identification tags.

4. **Vitamin K Administration**: Administer Vitamin K immediately after birth to prevent neonatal haemorrhage.
5. **Initiation of Breastfeeding**: Start breastfeeding as soon as the airway is clear and the baby is breathing normally, ideally within half an hour after delivery.

Routine Care of Newborn

1. **Warmth**: Keep the baby dry, wrapped, and by the mother's side to ensure warmth.
2. **Breastfeeding**: Encourage putting the newborn to the breast within half an hour of birth or as soon as possible.
3. **Skin Care**: Gently clean the skin of blood, mucus, meconium, and vernix-caseosa before handing the baby to the mother.
4. **Bat** Give the first bath in warm water once the newborn's temperature has stabilized.
5. **Care of Umbilical Cord**: Keep the cord stump clean and dry; avoid the application of antiseptics unless necessary.
6. **Care of Eyes**: Clean the eyes from the inner to the outer canthus with sterile cotton swabs soaked in sterile water or normal saline.
7. **Clothing of the Baby**: Dress the newborn in loose, soft, cotton clothes; avoid large buttons, synthetic, or nylon clothes.
8. **General Care**: Practice rooming in, gentle handling, aseptic techniques, sensory stimulation, and provide tender loving care.
9. **Observation**: Continuously monitor the newborn for any abnormalities or deviations from normal adaptations.
10. **Anthropometric Measurement**: Measure weight, length, head circumference, and chest circumference to ensure they fall within normal ranges.
11. **Immunization**: Newborns should receive BCG, OPV, and Hepatitis B vaccines according to local guidelines.

NEONATAL RESUSCITATION

Neonatal Resuscitation involves a series of actions to assist newborn babies who struggle with the transition from intrauterine to extra-uterine life.

Important Points:

1. **Vigorous Newborns**: Most newborns are active at birth.
2. **Assistance Requirement**: About 10% need help to start breathing.
3. **Extensive Resuscitation**: Less than 1% require in-depth resuscitation.
4. **Ventilation**: Provided when breathing is inadequate or stopped, to oxygenate blood.
5. **Chest Compressions**: Used when the heart is not functioning correctly or in cardiac arrest.

TABC of Neonatal Resuscitation:

1. **T (Temperature Maintenance)**:
   - Use radiant heat source.
   - Dry the baby.
   - Remove wet linen.
2. **A (Airway Establishment)**:
   - Position the infant.
   - Suction mouth and nose.
   - Insert an ET tube if necessary.

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3. **B (Breathing Initiation)**:
   - Tactile stimulation.
   - Provide Positive Pressure Ventilation (PPV) when needed.
4. **C (Circulation Maintenance)**:
   - Stimulate and maintain blood circulation.
   - Use chest compression or medications.

Indications for Resuscitation:

1. **Antepartum Factors** (During Pregnancy):
   - Maternal diabetes, infections.
   - Hydramnios, post-term gestation.
   - Maternal drug abuse.
2. **Intranatal Factors** (During Delivery):
   - Abnormal presentations, premature labor.
   - Early rupture of membranes, foul smelling amniotic fluid.
   - Precipitate labor, fetal bradycardia, distress.
   - Intra-uterine growth retardation, cord prolapse.
   - Meconium-stained amniotic fluid, narcotic use in mother.
3. **Postnatal Factors** (After Delivery):
   - Low Apgar score (0-3).
   - Suction pressure <100 mm hg.
   - Avoid deep suction.
   - Absence of respiration (Apnea).
   - Bluish skin discoloration, hypoxia.

Resuscitation Prerequisites:

1. **Resuscitation Place:**
   - Flat, warm, and clean surface
   - Room temperature 26-28°C
   - Radiant warmer/heater or a 200-watt bulb
   - Heat source on before delivery
   - 2 pre-warmed towels to receive the baby
2. **Equipment:**
   - Mechanical suction
   - Oxygen with flow-meter and tubing

General Measures:

1. **Avoid Hypothermia**
2. **Delivery Environment:**
   - Warm and free area
   - Newborn received with a pre-warmed towel
   - Rapidly dry head and skin
   - Discard wet linen
   - Wrap in pre-warmed towel
   - Place on a firm surface under a radiant warmer/on mother's bod

Positioning:

Supine Position (Sniffing Position):

- Head in a neutral or slightly extended position

- Small towel under the shoulders

Clear the Airway (Sniffing Position):

- Gentle suction using Dee Lee Trap
- Suction catheters (12 F and 14 F)
- Feeding tubes (6 F and 8 F) and 20 ml syringe
- Neonatal self-inflating resuscitation bags (500 ml)
- Face masks (term and preterm size)
- Intubation equipment: Laryngoscope with straight blade
- Resuscitation drugs and fluids: Inj. epinephrine, Inj. naloxone, normal saline, sterile water

Stimulation:

1. Flicking toes and soles twice
2. Rubbing the back
3. Gently tickling the ears
4. Complete all steps in 30 seconds; if no breathing, proceed to Bag Mask Ventilation

Bag Mask Ventilation:

1. Fit the mask over the nose and mouth
2. Squeeze the bag at 40-60 breaths/minute for 60 seconds
3. Check for chest rise; excessive pressure can cause pneumothorax
4. If no chest rise, check equipment, mask position, head position
5. Continue manual ventilation until spontaneous breathing

Provide Oxygen:

1. Connect oxygen after 2 minutes of ventilation
2. Stop resuscitation if no heart rate after 10 minutes or no spontaneous respiration after 20 minutes with effective ventilation

Chest Compression:

1. HR <60 beats/min despite ventilation
2. Thumb technique or Two-finger technique
3. Compression-ventilation ratio 3:1
4. Intubate the baby
5. Administer 100% oxygen during chest compressions
6. Stop briefly to check for spontaneous breathing
7. Check pulse to assess effectiveness
8. Administer epinephrine if HR remains <60/min
9. Discontinue when HR is 100/min and spontaneous breathing

Care after Successful Resuscitation:

1. Keep mother and newborn together
2. Skin-to-skin contact with mother
3. Encourage breastfeeding within one hour
4. Observe suckling for recovery

Endotracheal Tube Intubation:

- For no response to Bag Mask Ventilation, prolonged PPV, or suspected diaphragmatic hernia

Drugs for Stimulation:

1. Epinephrine (0.01-0.03 mg/kg IV) if HR <60 beats/min (3 doses)
2. Volume expanders and blood may be considered

3. Sodium bicarbonate for metabolic acidosis (not faster than 1 meq/kg/min)

NURSING MANAGEMENT OF LOW-BIRTH-WEIGHT BABY

Definition: Low Birth Weight (LBW) infants weigh less than 2500 grams at birth, regardless of gestational age.

Categories:

a. **Low-Birth Weight:** < 2500 gms.
b. **Very Low-Birth Weight:** < 1500 gms.
c. **Extremely Low-Birth Weight:** < 1000 gms.

Risk: Higher risk of complications due to impaired physical development and weak immune systems.

Incidence: High in developing countries (30-40%).

Etiology (Causes):

1. **Uterine Anomalies:** Malformation of the uterus, cervical incompetence.
2. **Obstetric History:** Past spontaneous abortions or preterm deliveries.
3. **Multiple Pregnancy:** Overdistension of the uterus leading to preterm labor.
4. **Maternal Diseases:** Pre-eclampsia, polyhydramnios, antepartum hemorrhage, placenta previa, abruptio placenta.
5. **Infections:** Genital tract infection.
6. **Chronic Diseases:** Diabetes, severe anemia, hypertension, heart conditions.
7. **Fetal Causes:** Congenital anomalies, placental insufficiency, Rh diseases.

Body Measurements of LBW Babies:

- **Weight:** < 2500 gms.
- **Length:** < 44 cms.
- **Head Circumference:** < 33 cms.
- **Chest Circumference:** 3 cms less than head circumference.
- **Arm Circumference:** < 9 cms

Classification:

1. **Preterm:** Normal growth potential, appropriate for gestational age (10 to 90 percentile).
2. **Small for Gestational Age (SGA) or IUGR:** Birth weight less than 10 percentile or less than 2 standard deviations for gestational age (UBCHENCO charts).

Clinical Manifestations of Preterm Babies:

1. Weight usually 2500 g or less
2. Length typically less than 44 cm
3. Head and abdomen relatively large
4. Soft skull bones with wide sutures and posterior fontanelle
5. Head circumference exceeds chest circumference
6. Pinna of ears are soft and flat.
7. Eyes are kept closed.
8. Skin is red, thin and shiny due to lack of subcutaneous fat.
9. Deep plantar creases are not visible before 34 weeks. 10. The testicles are undescended.
10. The labia minora are exposed because the labia majora are not in contact.
11. There is a tendency of herniation. 13. Nails are not grown right upto the finger tips.

Management and Care of Preterm Baby After Birth:

Immediate Management

1. **Umbilical Cord Clamping:** Quickly clamp to prevent hypervolemia and hyperbilirubinemia. Keep the cord length about 10-12 cm for possible exchange transfusion.
2. **Air Passage Clearance:** Clear mucus using a mucus sucker. Also, clear stomach contents.
3. **Oxygenation:** Provide oxygen through mask or nasal catheter, not exceeding 35% concentration. Use interrupted therapy as needed.
4. **Handling:** Wrap the baby in a sterile sheet, lay them on their side with the head slightly lowered.
5. **Vitamin K Administration:** Inject 1mg of aqueous vitamin K intramuscularly to prevent hemorrhagic complications.
6. **Gentle Handling:** Handle with extreme care. Delay bathing until the baby weighs 2 kg.
7. **Temperature Management:** Maintain the infant's body temperature, keeping rectal temperature between 96°F - 99°F (35.6° to 37°C).
8. **Use of Radiant Warmer:** Place smaller babies in a radiant warmer with a protective plastic cover, set at 36-37°C.
9. **Humidity Control:** Maintain surrounding humidity at least 50%. If room conditions aren't ideal, ensure the baby's cot is warm.
10. **Respiratory Support:** Provide necessary support, keep the air passage clear, and administer oxygen as needed. Some infants may need endotracheal intubation and mechanical ventilatio

Monitoring:

1. **Blood Gas Levels:** Regularly monitor blood gases.
2. **Oxygen Levels:** Use pulse oximeter to keep continuous O2 levels between 90-92%.
3. **Arterial Blood Gases (ABG):** Regularly monitor ABG.

Management and Care of Preterm Babies:

Infection Prevention

1. **Limited Visitors:** Restrict visitors to reduce infection risk.
2. **Healthcare Professionals' Health:** Those with infections should not enter the nursery.
3. **Hand Hygiene:** Wash hands properly with antiseptic soap.
4. **Sterile Attire:** Doctors and nurses should wear sterile gowns during examinations.
5. **Individual Belongings:** Assign separate belongings for each baby (clothes, feeding equipment, etc.).
6. **Separate Accommodation:** Place smaller babies in cubicles; bigger ones in separate cots.
7. **Cleaning Protocols:** Wet mop the ward daily with crude carbolic acid; oil the floor to minimize dust.
8. **Feed Preparation:** Ensure aseptic preparation, storage, and administration of feeds.
9. **Expressed Milk:** Mothers should express milk into sterile containers.
10. **Sterilization of Feeding Apparatus:** Boil and autoclave all feeding apparatus; boil rubber teats or polythene tubes for no more than 3 minutes.
11. **Feeding Before Diaper Change:** Feed the babies before changing napkins.
12. **Isolation for Infection:** Isolate any baby showing infection signs.
13. **Prophylactic Antibiotics:** Administer for babies born following premature rupture of membranes (e.g., Ampicillin, Amikacin).

Nutritional Care

1. **Maintain Nutritional Levels:** Ensure adequate nutrition for the infant.

2. **Early Feeding:** Begin feeding between 1-2 hours of birth.
3. **Feeding Frequency:** Adjust according to the degree of prematurity.
4. **Feeding Methods:** Use tube, pipette, dropper, or spoon based on the baby's sucking ability.
5. **Increased Amounts for Phototherapy:** Adjust feed amounts during phototherapy.
6. **Fluid Monitoring:** Monitor via body weight, urine output, urine specific gravity, and serum sodium.
7. **Post-Feeding Positioning:** Keep the baby on one side with the head slightly raised after feeding.
8. **Caloric Requirements:** Increase calories progressively (60, 100, 120-150 calories/kg/day).
9. **Feeding Frequency:** Provide small feeds at shorter intervals.
10. **Vitamin and Mineral Supplements:** Include additional vitamins and minerals after 2 weeks.
11. **Iron Supplementation:** Administer 1-2 mg/kg/day of elemental iron.

Nursing Care for LBW Infants

1. **Maintaining Body Temperature:** Use of warmers, monitoring room temperature.
2. **Feeding and Nutrition:** Frequent, small feeds; consideration for special formulas if breastfeeding isn't possible.
3. **Monitoring Growth and Development:** Regular weight and growth checks.
4. **Preventing Infections:** Strict hygiene, limited exposure to infections.
5. **Respiratory Support:** Monitoring breathing, providing oxygen support if necessary.
6. **Parental Education and Support:** Teaching parents about special care needs, growth monitoring, and nutrition.

Regular Health Checks: Scheduled follow-ups with pediatricians for vaccinations and health assessments

KANGAROO MOTHER CARE

- Kangaroo Mother Care (KMC) is an innovative method designed for the care of Low Birth Weight (LBW) babies.
- This approach has been recognized for its effectiveness in enhancing the health and well-being of these newborns.

The main benefits of KMC include:

1. **Effective Thermal Control:** By maintaining constant skin-to-skin contact, KMC helps in regulating the baby's body temperature.
2. **Promotion of Breastfeeding:** It encourages and facilitates exclusive breastfeeding.
3. **Infection Prevention:** Close contact and exclusive breastfeeding help in reducing the risk of infections.
4. **Bonding:** KMC strengthens the emotional bond between the mother and the baby. In KMC, the baby is continuously kept in skin-to-skin contact with the mother, and is exclusively breastfed.

COMPONENTS OF KANGAROO MOTHER CARE

1. **Kangaroo Position (Skin-to-Skin Contact):**
   a. **Description:** The baby is placed in direct skin-to-skin contact with the mother, in a strict vertical position between the mother's breasts and under her clothes.

b. **Benefits:**
- This position allows the mother to serve as a natural source of warmth and stimulation for the baby.
- It helps in maintaining the baby's temperature within normal ranges and stabilizes other physiological parameters like heart rate, respiratory rate, and oxygenation.

2. **Kangaroo Nutrition (Exclusive Breastfeeding):**
   a. **Importance:** KMC plays a crucial role in maintaining lactation.
   b. **Advantages:** It increases the prevalence, production, duration, and rate of exclusive breastfeeding.
      - it enhances the mother's competence in breastfeeding.
      - Research supports the positive impact of KMC on breastfeeding practices.
3. **Kangaroo Early Discharge and Regular Follow-up:**
   a. **Process:** Babies under KMC are discharged from the hospital earlier than usual and are advised to attend regular follow-ups.
      - Post-discharge Care: KMC continues at home post-discharge.
      - Outcomes: Recent studies have demonstrated that KMC significantly increases the survival chances of LBW babies and reduces their hospital stay

Advantages/Benefits of Kangaroo Mother Care (KMC)

1. **Benefits to the Baby**
   - **Effective Thermal Control:** Prolonged skin-to-skin contact provides excellent thermal regulation, reducing the risk of hypothermia in preterm/LBW infants.
   - **Physiological Stability:** KMC aids in stabilizing the baby's physiological functions.
   - **Reduced Apnea and Oxygen Requirements:** It significantly decreases instances of apnea and lowers the need for supplemental oxygen.
   - **Lower Infection Risk:** KMC minimizes the baby's exposure to infections, particularly in NICU settings.
   - **Early NICU Discharge:** Facilitates earlier discharge from the NICU, further reducing nosocomial infection risks.
   - **Induces Sound Sleep:** The baby experiences more restful and sound sleep during KMC.
2. **Benefits to the Mother**
   - **Enhanced Bonding:** Improves mother-infant bonding, crucial for the baby's emotional development.
   - **Reduced Stress:** Mothers experience less stress during KMC compared to when their baby is in an incubator.
   - **Increased Satisfaction:** Active involvement in baby care leads to greater maternal satisfaction and relaxation.
   - **Benefits to the Family**
   - **Economical:** KMC is cost-effective as it eliminates the need for expensive incubator care.
   - **Promotes Early Discharge:** Early discharge from the hospital is economically and emotionally beneficial for the family.
   - **Family Bonding:** Encourages bonding between the baby and the entire family involved in KMC.
   - **Reduction in Child Abandonment and Abuse:** KMC has been linked to lower instances of child abandonment and abuse.

3. **Benefits to the Nation**
   - **Decreased Mortality and Morbidity:** Contributes to reducing neonatal and infant mortality and morbidity, easing the burden on healthcare resources.
   - **Simple and Cost-Effective:** KMC is a straightforward, affordable care method that can be implemented even at home.
   - **Contributes to National Wealth:** Healthier, more intelligent babies, as a result of KMC, add to the nation's human resource wealth.

Eligibility Criteria for Kangaroo Mother Care (KMC)

1. **Eligibility for Mothers**
   - **General Eligibility:** All mothers are eligible to provide KMC, regardless of their age, parity, education, culture, or religion.
   - **Willingness and Health:** The mother must be willing and physically able to provide KMC. She should not be suffering from any serious illness that might impede her ability to offer KMC.
2. **Eligibility for Babies**
   - **Stable LBW Babies:** Generally, all stable Low Birth Weight (LBW) babies are eligible for KMC.
   - **Exclusion of Critically Ill Babies:** Babies who are very sick and require specialized care under a radiant warmer are initially not eligible. KMC can commence once the baby is hemodynamically stable.
3. **Specific Birth Weight Criteria**
   a) **Birth Weight ≥1800 g:**
      a. These babies are usually stable at birth, making them ideal candidates for KMC initiation shortly after birth.
   b) **Birth Weight 1,200-1,800 g:**
      a. Babies in this weight range often face significant challenges during the neonatal period.
      b. KMC may be delayed for a few days until the baby's condition stabilizes.
      c. These infants typically require care in a Neonatal Intensive Care Unit (NICU) where specialized services are available.
   c) **Birth Weight <1200 g:**
      a. These infants frequently experience serious complications related to prematurity, starting soon after birth.
      b. They greatly benefit from immediate transfer to institutions with advanced neonatal intensive care facilities.
      c. The initiation of KMC for these babies might be delayed for days or weeks, depending on the stabilization of their condition.

Procedure of Kangaroo Mother Care (KMC)

1. **Preparation for KMC**
   - **Counseling:** Educate and counsel the mother and family members to create a positive attitude towards KMC.
   - **Appropriate Clothing:** Provide the mother with a front-open gown or a similar light dress that facilitates easy and extended skin-to-skin contact.
   - **Dressing the Baby:** Dress the baby in a cap, socks, nappy, and a front-open sleeveless shirt.

2. **Kangaroo Positioning**
   - **Placement**: Position the baby upright between the mother's breasts.
   - **Head Position**: Turn the baby's head to one side and keep it slightly extended to ensure the airway remains open and to allow eye contact.
   - **Body Position**: Hips should be in a flexed and abducted 'frog position', with flexed arms.
   - **Alignment**: Align the baby's abdomen with the mother's epigastrium. The mother's breathing stimulates the baby, helping reduce apnea.
   - **Support**: Use a sling or binder to support the baby's bottom.
3. **Monitoring**
   - **Initial Stage Vigilance**: Careful monitoring is essential, especially in the beginning.
   - **Key Observation Points**: Monitor the baby's neck position (avoiding excessive flexion or extension), airway clearance, regular breathing, body color, and temperature.
4. **Feeding**
   - **Breastfeeding Guidance**: Instruct the mother on breastfeeding while the baby is in KMC position.
   - **Milk Production**: Keeping the baby close to the breast encourages milk production.
   - **Expressed Breast Milk**: Teach the mother to express milk while the baby is in KMC. The expressed milk can be fed using a paladai, spoon, katori, or nasogastric tube, depending on the baby's condition.
5. **Privacy**
   - **Sensitivity to Exposure**: Acknowledge that KMC may require some exposure on the mother's part.
   - **Respect and Privacy**: Hospital staff and family members should respect the mother's need for privacy during KMC.

Time of initiation and duration of kangaroo mother care (kmc)

1. **Time of Initiation**
   - **Stability of the Baby**: KMC should start as soon as the baby is stable.
   - **Severe Illnesses or Special Treatment**: Babies needing special care should be managed as per the unit protocol. KMC can commence once these treatments stabilize the baby.
   - **Feeding and Oxygen Therapy**: KMC is compatible with orogastric tube feeding or oxygen therapy.
2. **Duration of Kangaroo Mother Care**
   - **Gradual Start**: Begin with short sessions in the nursery, transitioning smoothly from conventional care to KMC.
   - **Avoid Short Sessions**: Sessions under 1 hour are not recommended as frequent handling can stress the baby.
   - **Increasing Duration**: Gradually extend the duration of skin-to-skin contact, aiming for up to 24 hours a day.
   - **Continuation at Home**: KMC should be continued at home after discharge from the hospital.

Discharge Criteria

1. **From Nursery to Ward**:
   - **Baby's Stable Condition**: Ensure the baby is stable.

   - **Weight Gain**: Monitor and confirm consistent weight gain.
   - **Mother's Confidence**: The mother should feel confident in caring for the baby.
2. **From Hospital**:
   - **General Health and No Infection**: The baby should be in good health without any sign of infection.
   - **Feeding Well**: Ensure the baby is feeding effectively.
   - **Consistent Weight Gain**: The baby should show a weight gain of at least 15-20 g/kg/day for three consecutive days.
   - **Body Temperature Maintenance**: The baby must be able to maintain its body temperature.
   - **Mother's Ability to Continue KMC at Home**: Confirm that the mother can and will continue KMC at home

Post-Discharge KMC

1. **Continuation**: KMC can be continued at home for as long as it is comfortable for both the mother and the baby.
2. **Desirability of KMC**: Ideally, KMC should be continued until the baby's gestational age reaches term and the weight is around 2,500 g.

NURSING MANAGEMENT OF COMMON NEONATAL DISORDERS

HYPERBILIRUBINEMIA

Hyperbilirubinemia, commonly known as jaundice in newborns, is a physiological condition often observed in the first month of life. Here's a detailed explanation:

Bilirubin Formation:

Bilirubin is a yellow compound formed during the normal breakdown of heme, a component of hemoglobin in red blood cells. This process is crucial for eliminating waste products that result from the destruction of old or abnormal red blood cells.

Types of Bilirubin:

1. **Conjugated Bilirubin**: This type is formed when bilirubin combines with glucuronic acid in the liver, creating bilirubindiglucuronide. It is water-soluble and can be excreted in bile.
2. **Unconjugated Bilirubin**: This form is not processed in the liver and remains fat-soluble.

Hyperbilirubinemia: Hyperbilirubinemia refers to the condition where there is an elevated level of bilirubin in the blood, leading to the yellow discoloration of the skin, eyes, and mucous membranes.

This is commonly observed in newborns.

Some Important Key

1. **Prevalence and Severity**: It's a common condition, affecting about 60% of term neonates and 80% in preterm neonates. In most cases, it's a harmless and transient issue.
2. **Cause of Discoloration**: The yellowish discoloration in jaundice can be due to elevated levels of either conjugated or unconjugated bilirubin.
3. **Visible Jaundice**: Jaundice becomes visible when the serum bilirubin level exceeds 5 mg/dl in newborn babies.
4. **Incidence in Newborns**: The incidence of neonatal jaundice is relatively high, especially in preterm infants due to their immature liver function and higher red blood cell turnover

Etiology:

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Unconjugated Hyperbilirubinemia:

1. **Hemolytic Causes**
   - **Intrinsic Hemolysis**:
   - **Membrane Conditions**: Such as spherocytosis and hereditary elliptocytosis.
   - **Enzyme Deficiencies**: Including glucose-6-phosphate dehydrogenase (G6PD) deficiency and pyruvate kinase deficiency.
   - **Globin Synthesis Defects**: Sickle cell disease and alpha-thalassemia (e.g., HbH disease).
2. **Extrinsic Hemolysis**:
   - **Systemic Conditions**: Like sepsis and arteriovenous malformations.
   - **Alloimmunity**: Evidenced by positive direct Coombs test in neonatal blood, indicating hemolytic disease of the newborn due to ABO incompatibility, Rh disease, anti-Kell, anti-Rhc, and other blood type mismatches.
   - **Non-Hemolytic Causes**
   - **Breastfeeding Jaundice**: Due to inadequate intake or breast milk composition.
   - **Breast Milk Jaundice**: Resulting from specific substances in breast milk.
   - **Others**: Including cephalohematoma, polycythemia, urinary tract infections, sepsis, hypothyroidism, Gilbert's syndrome, Crigler-Najjar syndrome, and high gastrointestinal obstruction like pyloric stenosis.

Conjugated Hyperbilirubinemia:

1. **Hepatic Causes**
   - **Infections**: Sepsis, hepatitis A and B, TORCH infections.
   - **Metabolic Disorders**: Galactosemia, alpha 1-antitrypsin deficiency, cystic fibrosis, Dubin-Johnson syndrome, Rotor syndrome.
   - **Others**: Drug-induced liver injury, total parenteral nutrition, idiopathic causes.
2. **Post-Hepatic Causes**
   - **Biliary Atresia**: Bile duct obstruction can lead to elevated conjugated bilirubin. This includes conditions like Alagille syndrome and choledochal cysts.

Type of Jaundice:

1. **Physiological Jaundice**
   - **Phase One**: In the first week, bilirubin levels rise rapidly (up to 12 mg/dL in term infants and 15 mg/dL in preterm infants).
   - **Phase Two**: Bilirubin levels then gradually decline over the next two weeks (longer in preterm and exclusively breastfed infants).
2. **Pathological Jaundice**
   - **Definition**: A significant elevation of serum total bilirubin (more than 5 mg/dl/day).
   - **Risks**: High levels of bilirubin can lead to serious complications like bilirubin encephalopathy (kernicterus), which is a neurological disorder.
3. **Understanding Jaundice in Newborns**
   - **Pathophysiology**: The underlying mechanism often involves a combination of increased production of bilirubin (due to high red blood cell turnover), reduced hepatic uptake, and impaired conjugation or excretion.
   - **Enterohepatic Circulation**: More active in newborns, contributing to higher bilirubin levels.
   - **Role of Liver Enzymes**: Immature liver enzymes like glucuronosyltransferase in newborns lead to inefficient conjugation of bilirubin.

Differences between physiological jaundice and pathological jaundice

Factor	Physiological Jaundice	Pathological Jaundice
Onset	Typically appears after the first 24 hours of life.	Can appear within the first 24 hours of life or after the first week.
Duration	- Term infants: Around 10 days. - Preterm infants: Up to two weeks.	Varies, but prompt evaluation and treatment are necessary.
Bilirubin Levels	- Gradual rise. - Peaks at 12 mg/dL in term infants, 15 mg/dL in preterm.	Rapid increase; more than 5 mg/dL per day.
Phase Two Bilirubin Levels	Declines to about 34 µmol/L (2 mg/dL) over two weeks.	Continuously high or rising, potentially reaching dangerous levels.
Other Symptoms	Usually, asymptomatic apart from yellowing of the skin and eyes.	May include poor feeding, lethargy, high-pitched crying, abnormal muscle tone.
Risk of Complications	Low. Usually resolves without intervention.	High. Can lead to complications like kernicterus if untreated.
Treatment	Monitoring and ensuring proper feeding is often sufficient.	May include phototherapy, exchange transfusion, or treating the underlying cause.
Cause	Normal breakdown of fetal red blood cells and immature liver function.	May be due to hemolysis, infection, genetic disorders, liver dysfunction, etc.

Clinical Manifestations

1. **Normal Stool and Urine Color**:
   - **Breastfed Babies**: Stools should be greenish-yellow.
   - **Bottle-fed Babies**: Stools typically are greenish-mustard color.
   - **Urine**: In healthy newborns, urine is generally colorless.
2. **Severe Cases**:
   - **Inability to Gain Weight**: Struggling with weight gain.
   - **Poor Feeding**: Difficulty or reduced frequency in feeding.
   - **Drowsiness**: Increased sleepiness or lethargy.
   - **Irritability**: Unusual fussiness or discomfort.
3. **Appearance of Jaundice**:
   - **Skin and Eyes**: Yellow discoloration of the skin and whites of the eyes.
   - **Cephalo-Caudal Progression**: Jaundice tends to spread from head to toe.
   - **Dermal Zones of Jaundice**: Different body parts correspond to different serum bilirubin levels.

Diagnosis of Neonatal Hyperbilirubinemia

1. **Clinical Evaluation**:
   - **Blanching Test**: Applying pressure to the skin to check for yellow tint.
   - **Observation of Symptoms**: Noting poor feeding, drowsiness, irritability.

2. **Laboratory Studies**:
   - **Serum Bilirubin Levels**: Total, conjugated, and unconjugated bilirubin.
   - **Complete Blood Count**: Includes reticulocyte count, to check for hemolysis.
   - **Blood Group Testing**: For mother and infant, to identify any incompatibility.
   - **Direct Coombs' Test**: To detect isoimmunization disorders.
   - **Other Tests**: Urine tests for galactosemia, hemoglobin electrophoresis, osmotic fragility tests, thyroid and liver function tests.
3. **Imaging Studies**:
   - **Radiology and Ultrasonography**: To detect conditions like intestinal obstruction or intraventricular hemorrhage.

Management

1. **Mild Jaundice:** Mild jaundice often resolves on its own within 2 weeks. Regular monitoring of bilirubin levels and the infant's overall health is important.
2. **Severe Jaundice:** Severe cases may require readmission to a hospital for close monitoring and treatment.
3. **Phototherapy (Light Therapy)**
4. **History**: Discovered by Cremer et al in 1958, it's a widely used treatment for neonatal jaundice.
5. **Mechanism**: Light therapy converts bilirubin into water-soluble isomers that can be excreted by the body.
6. **Types of Isomers Produced:**
   - Structural Isomers (e.g., Z-lumirubin) are less lipophilic and excreted in bile without needing liver processing.
   - Configurational Isomers (e.g., 4Z, 15 E-bilirubin) can revert back to their original form after excretion.
7. **Effective Wavelength**: Blue-green light (460-490 nm) is most effective.
8. **Photo Oxidation**: Light exposure also leads to the formation of colorless oxidation products excreted in urine.
9. **Care During Phototherapy**
   - **Undressing the Baby**: To maximize skin exposure to light.
   - **Eye Protection**: To shield the eyes from intense light.
   - **Regular Monitoring**: For signs of eye irritation or discharge.
   - **Feeding**: Normal feeding routines, with breastfeeding paused during phototherapy sessions.
   - **Positioning**: Turning the baby regularly to expose different skin areas.
   - **Distance from Light Source**: Keeping an optimal distance from the light.
   - **Skin Care**: Maintaining dry and clean skin, especially in the diaper area.
   - **Temperature Monitoring**: Ensuring the baby doesn't get too cold or too warm.
   - **Hydration**: Maintaining adequate fluid intake.
   - **Bilirubin Monitoring**: Regular checks of serum bilirubin levels.
10. **Exchange Blood Transfusion**
    - **Indication**: Used if phototherapy is insufficient, particularly in cases like Rh incompatibility with bilirubin levels > 20 mg%.
    - **Process**: The baby's blood is exchanged with donor blood to rapidly lower bilirubin levels.

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11. **Intravenous Immunoglobulin (IVIG):** For cases of rhesus or ABO incompatibility, to reduce the levels of maternal antibodies attacking the infant's red blood cells.
12. **Complications**
    - **Kernicterus**: A serious, potentially fatal complication of unconjugated hyperbilirubinemia, leading to brain damage if not promptly treated.

Neonatal Hypothermia

Definition by WHO: Hypothermia in newborns is defined as a body temperature below the normal range of 36.5°C to 37.5°C.

Grades of Hypothermia:

1. **Mild Hypothermia:** 36.0°C - 36.5°C.
2. **Moderate Hypothermia:** 32.0°C - 35.9°C.
3. **Severe Hypothermia:** Less than 32.0°C.

Dynamics of Neonatal Body Temperature

1. **Heat Loss Post-Birth:** Newborns experience a rapid decrease in body temperature immediately after birth, often losing 2-4°C within the first 10-20 minutes.
2. **Factors Influencing Temperature Change:** Birth weight, ambient temperature, and proximity to the mother can affect the rate of temperature change.
3. **Vulnerability to Hypothermia:** Infants, especially those under one year, are more prone to heat loss than adults due to their inability to generate sufficient body heat through mechanisms like shivering.
4. **NICU Admissions**: Hypothermia is a common condition observed in neonates admitted to Neonatal Intensive Care Units (NICU), stemming from multiple causes.

Modes of Heat Loss in Newborns

1. **Evaporation**: Loss of heat through the evaporation of amniotic fluid from the skin surface immediately after birth.
2. **Conduction**: Heat loss when coming into contact with colder surfaces like cloths, trays, or other objects.
3. **Convection:** Loss of heat due to air currents, where cold air replaces the warm air surrounding the baby. This can be exacerbated by open windows or fans.
4. **Radiation:** Heat transfer to colder solid objects nearby, such as walls.

Temperature Range for Newborns

- **Normal Axillary Temperature:** 36.5 - 37.4°C.
- **Cold Stress:** 36.0 - 36.4°C.
- **Moderate Hypothermia:** 32.0 - 35.9°C.
- **Severe Hypothermia:** Less than 32°C.

Signs and Symptoms of Neonatal Hypothermia

1. **Peripheral Vasoconstriction:**
   - Acrocyanosis (bluish coloration of hands and feet).
   - Cold extremities.
   - Decreased peripheral perfusion.
2. **Central Nervous System (CNS) Depression:**
   - Bradycardia (slow heart rate).
   - Lethargy (reduced activity and weak cry).
   - Poor feeding.
   - Apnea (temporary cessation of breathing).

3. **Increased Metabolism**:
   - Hypoglycemia (low blood sugar levels).
   - Hypoxia (low oxygen levels).
   - Metabolic acidosis.
4. **Increased Pulmonary Artery Pressure**:
   - Respiratory distress.
   - Tachypnea (rapid breathing).
5. **Chronic Signs**:
   - Weight loss.
   - Poor weight gain.

Management of Hypothermia in Newborns

1. Mild Hypothermia
   - Cover the neonate, focusing on head, chest, and feet.
   - Keep in a warm environment (skin-to-skin contact, warm room/bed, radiant heater, incubator).
   - Monitor temperature regularly until normalized.
2. Moderate Hypothermia
   - Warm room and bedding.
   - Use of an incubator or radiant warmer.
   - Continuous re-warming and regular temperature monitoring.
3. Severe Hypothermia
   - Warm the room (room heater, 200-watt bulbs).
   - Use air-heated incubator (35-36°C).
   - Monitor heart rate, temperature, and glucose level.
   - Reduce heat loss.
   - Administer IV dextrose and provide oxygen.
   - Administer vitamin K injection (dose dependent on term or preterm status).

Prevention of Neonatal Hypothermia

- Maintain delivery room temperature (28-32°C).
- Immediate drying and wrapping of the newborn post-delivery.
- Proper head covering and ensuring the head is dry.
- Keeping the baby alongside the mother.
- Delaying bathing (up to one week in winter, second day in summer for healthy newborns).
- Initiate breastfeeding soon after birth.
- Promote Kangaroo Mother Care (KMC), especially for low-birth-weight infants.

Hyperthermia

DEFINITION

Neonatal hyperthermia, an elevation in body temperature above the normal range.

Causes of Neonatal Hyperthermia

1. **Maternal Factors**:
   - Fever in the mother.
   - Epidural anesthesia during delivery.
2. **Environmental Factors**:

   - Overheating due to incubators or radiant warmers.
   - High ambient room temperature.
   - Excessive sunlight exposure or phototherapy.
3. **Other Causes**:
   - Infection.
   - Central nervous system (CNS) dysfunction.
   - Dehydration.
   - Excessive bundling or swaddling of the baby.

Clinical Features

1. **Elevated Axillary Temperature**: Above 37.5°C.
2. **Physical Signs**: Hot skin, flushing, and perspiration.
3. **Respiratory Changes**: Rapid breathing (> 60 breaths/min).
4. **Cardiac Signs**: Rapid heart rate (> 160 beats/min).
5. **Dehydration Indicators**: Sunken eyes, loss of skin elasticity, dry tongue, and mucous membranes.
6. **Behavioral Changes**: Lethargy, hypotonia (reduced muscle tone), poor feeding.
7. **Other Symptoms**: Irritability, weak cry.

Management of Neonatal Hyperthermia

1. **Remove Heat Sources**:
   - Move the baby away from direct heat sources.
   - Adjust room temperature to a normal range (25-28°C).
2. **Incubator Adjustments**: If the baby is in an incubator, gradually lower the air temperature.
3. **Clothing and Environment**:
   - Undress the baby fully or partially to allow natural cooling.
   - Avoid excessive bundling.
4. **Cooling Measures**:
   - Use cold sponging or sponge bath with lukewarm water (2°C lower than the baby's body temperature).
   - Avoid cold water, ice chips, or aggressive cooling methods.
5. **Hydration**:
   - Encourage frequent breastfeeding or give expressed breast milk.
   - Provide extra fluids intravenously or via tube feeding if necessary.
6. **Dehydration Management**:
   - Correct dehydration if present.
7. **Parental Education**:
   - Educate parents on appropriate dressing in cotton clothes, recognizing danger signs, and the importance of follow-up.
8. **Avoid Cooling Devices**:
   - Do not use fans, air conditioners, or exhaust fans for cooling.

METABOLIC DISORDERS

Metabolic disorders in children encompass a wide range of conditions that affect how the body processes nutrients.

Etiology of Metabolic Disorders in Children

1. **Genetic Factors**: The most common cause is inheriting defective genes from parents.

- Children often receive one normal and one defective gene. If both genes are defective, enzyme production is impaired, leading to a metabolic disorder.

2. **Environmental and Lifestyle Factors:** In some cases, factors like obesity can contribute to the development of metabolic disorders.

Types and Descriptions of Metabolic Disorders

1. **Galactosemia:** Caused by a deficiency in the enzyme needed to metabolize galactose, leading to a build-up of sugars.
2. **Glycogen Storage Disease:** Impairs the body's ability to metabolize stored glycogen. Children may have distinct physical features and difficulty maintaining blood glucose levels.
3. **Hereditary Fructose Intolerance:** Due to the inability to digest fructose, leading to its accumulation in the liver and kidneys.
4. **Pyruvate Metabolism Disorders:** Affects the body's ability to metabolize pyruvate, a key metabolite of glucose, impacting energy production.
5. **Homocystinuria:** Characterized by excess homocysteine due to reduced enzyme activity. Can affect growth and protein synthesis.
6. **Maple Syrup Urine Disease:** Named for the distinctive odor of urine and ear wax, this disorder involves the inability to break down certain amino acids.
7. **Phenylketonuria (PKU):** The lack of enzyme to process phenylalanine leads to its accumulation, causing distinct body odor and other symptoms.
8. **Tyrosinemia:** Results from the body's inability to fully break down the amino acid tyrosine.
9. **Mucopolysaccharidosis (Lysosomal Storage Disorders):** Involves the inability to break down long-chain sugar carbohydrates, affecting physical abilities and organ development.
10. **Mitochondrial Disorders:** A rising from defects in cell mitochondria, these disorders can lead to developmental delays and a range of syndromes like Leigh syndrome and Kearns-Sayre syndrome.
11. **Menkes Disease:** A disorder of copper metabolism causing deficiency in cells, leading to growth retardation.
12. **Sickle Cell Disease:** A genetic disorder affecting the hemoglobin in red blood cells, causing them to assume a sickle shape.

Clinical Manifestations

1. **Neonatal Period:**
   - Poor feeding, vomiting, hypotonia (reduced muscle tone).
   - Respiratory compromise or apnea.
   - Progressive encephalopathy and seizures.
   - Clinical presentation often resembling sepsis.
2. **Childhood:**
   - Unexplained vomiting, severe dehydration, stroke-like episodes.
   - Acute liver or renal failure, cardiomyopathy.
   - Unexplained encephalopathy and seizures.
3. **Other Common Features:**
   - Delayed growth milestones.
   - Abnormal excretions (urine, sweat, saliva).
   - Mental retardation, abnormal physical features.
   - Jaundice, kidney stones, liver toxicity, seizures.

- Failure to gain weight and height, weakness, lethargy, confusion.

Diagnosis

1. **Newborn Screening:**
   - Most metabolic disorders are identified during routine newborn screening.
2. **Post-Symptomatic Diagnosis:**
   - If missed during screening, diagnosis is made when symptoms manifest.
3. **Diagnostic Tests:**
   - **Blood Tests:** Checking acid-base balance, glucose, lactate, ammonia, ketones, free fatty acids, electrolytes, amino acids, hormones, and blood count.
   - **Urine Tests:** Analyzing pH, ketones, protein, glucose, reducing substances, and for amino and organic acids.
   - **Cerebrospinal Fluid (CSF) Analysis:** Glucose, protein, lactate, and amino acids.

Management

1. **Genetic Nature of Disorders:** These conditions are generally not curable due to their genetic basis.
2. **Management Strategies:**
   - **Acute Management:** Following resuscitation guidelines as needed.
   - **Fluid Management:** Intravenous or nasogastric fluids for dehydration and caloric needs.
   - **Treatment of Symptoms:** Managing hypoglycemia and seizures.
   - **Medications:** Chelating agents, replenishing deficient metabolites.
   - **Hemofiltration:** In cases of rapid deterioration.
   - **Dietary Modifications:** Eliminating intolerable food groups.
   - **Enzyme Replacement Therapy:** Using artificial enzymes.
   - Detoxification: Medications to remove accumulated toxic products

NEONATAL INFECTIONS/NEONATAL SEPSIS

Definition: Neonatal sepsis refers to a bloodstream infection (BSI) in an infant younger than 90 days, often involving severe complications like meningitis, pneumonia, pyelonephritis, or gastroenteritis.

Classification:

1. **Early-Onset Sepsis:** Occurs within the first three days of life. Most cases present within 24 hours.
2. **Late-Onset Sepsis:** Develops after three days of age.

Prevalence: A leading cause of morbidity and mortality among both term and preterm infants.

Etiology

1. **Early-Onset Sepsis:**
   a. Often derived from the mother's vaginal tract.
   b. Group B Streptococcus (GBS): The most common cause in many regions, including North America.
2. **Late-Onset Sepsis:**
   a. Usually acquired from the environment.
   b. Staphylococcus aureus: A prevalent cause.
   c. Nosocomial Infections: Often due to hospital-acquired bacteria.

3. **Worldwide Incidence**:
   a. Escherichia coli: Represents a significant portion of infections globally.
   b. Other organisms include Herpes Simplex Virus (HSV), Listeria monocytogenes, and various streptococcus strains.

Maternal Risk Factors

1. **Malnutrition.**
2. **Low Socioeconomic Status.**
3. **Substance Abuse.**
4. **Fever**: Suggestive of maternal infection.
5. **Newborn Metabolic Errors.**
6. **Asphyxia/Fetal Distress**: Indicating potential intrauterine stress.
7. **Prolonged Hospitalization**: Increasing exposure to nosocomial infections.

Clinical Presentation

1. **General Symptoms**: Varying degrees of respiratory distress, temperature instability, feeding difficulties, lethargy, or irritability.
2. **Gastrointestinal Symptoms**: Vomiting, diarrhea, abdominal distension.
3. **Cardiovascular Signs**: Tachycardia or bradycardia, poor peripheral perfusion.
4. **Neurological Signs**: Seizures, decreased tone, altered responsiveness.

Diagnosis

1. **Laboratory Tests**: Blood cultures, complete blood count (CBC), C-reactive protein (CRP), and other biomarkers.
2. **Lumbar Puncture**: If meningitis is suspected.
3. **Imaging Studies**: Chest X-ray for pneumonia, abdominal ultrasound for intestinal complications

Management of Neonatal Sepsis

1. **Initial Assessment and Stabilization**
   a) **Initial Evaluation:**
      a. Rapid assessment of the neonate's respiratory status, circulation, and temperature.
      b. Immediate stabilization measures including securing the airway, providing oxygen, and ensuring adequate perfusion.
   b) **Intravenous Access:**
      a. Establishing reliable IV access for fluid administration and medication.
   c) **Blood Cultures and Laboratory Tests:**
      a. Obtaining blood cultures before initiating antibiotics is crucial.
      b. Complete blood count (CBC), C-reactive protein (CRP), blood gas analysis, electrolytes, renal function tests, and coagulation profile.
2. **Antibiotic Therapy**
   a) **Empirical Antibiotics:**
      a. Prompt initiation of broad-spectrum antibiotics based on local antibiogram data.
      b. Common choices include a combination of ampicillin and gentamicin or a third-generation cephalosporin.
      c. Adjustments based on culture results and sensitivity patterns.
   b) **Duration of Therapy**: Typically, antibiotics are administered for 7-21 days, depending on the clinical response, organism isolated, and site of infection.
3. **Supportive Care**
   a) **Fluid Management:**

      a. Careful fluid resuscitation to correct dehydration or shock, while avoiding fluid overload.
      b. Electrolyte and acid-base balance management.
   b) **Nutritional Support**: Ensuring adequate nutrition, either parenterally or via enteral feeding as tolerated.
   c) **Respiratory Support**: Supplemental oxygen, non-invasive ventilation, or mechanical ventilation as needed.
   d) **Thermal Regulation**: Maintaining normothermia through environmental control and minimal handling.

NEONATAL SEIZURES

Definition:

Neonatal seizures are the most notable signs of neurological dysfunction in newborns, with a higher incidence in preterm infants (up to 20%). They are typically transient.

Classification:

- **Subtle Seizures:** Eyelid blinking, fluttering, buccal-lingual movements, apnea.
- **Clinic Seizures:** Involving one extremity or body side, with slow rhythmic movements.
- **Tonic Seizures:** Sustained muscle contraction, can be focal, multifocal, or generalized.
- **Myoclonic Seizures:** Rapid jerks, may indicate severe brain injury.

Etiology:

- Developmental problems (hydrocephalus, microcephaly, cerebral dysgenesis).
- Perinatal complications (asphyxia, birth injuries, intracranial hemorrhage).
- Infections (meningitis, septicemia, TORCH).
- Metabolic issues (hypocalcemia, hypoglycemia).
- Drug exposure (narcotics, theophylline).

Diagnostic Evaluation:

- **History:** Birth history, onset of seizures, maternal and family history.
- **Blood Tests:** For hypoglycemia and hypocalcemia.
- **CSF Analysis:** To detect infection or hemorrhage.
- **Imaging:** CT or MRI for brain anomalies.
- **EEG:** Vital for identifying seizures.

Management:

- **Electrolyte Correction:** For hypocalcemia and hypoglycemia.
- **Antiepileptic Drugs:** Phenobarbitone as first-line treatment.
- **Additional Medications:** Phenytoin, benzodiazepines, pyridoxine for refractory cases.
- **Monitoring:** Drug levels during acute phase, often discontinued if seizures cease.

Nursing Management:

- **Seizure Observation:** Monitor frequency, duration, and type.
- **Medication Administration:** Ensure correct dosing and monitor for side effects.
- **Family** Support: Educate and support parents in care and monitoring.
- **Follow-Up:** Arrange regular neurological and developmental evaluations.

NEONATAL RESPIRATORY DISTRESS SYNDROME (RDS)

DEFINITION

Neonatal Respiratory Distress Syndrome (RDS), also known as hyaline membrane disease, is a respiratory disorder mainly affecting premature newborns, characterized by progressive respiratory failure.

This condition is primarily caused by a deficiency in pulmonary surfactant, a substance essential for maintaining alveolar stability and gas exchange in the lungs.

Causes of Neonatal RDS

1. **Prematurity**: The primary cause, particularly in neonates born before 37 weeks of gestation. The incidence and severity increase with the degree of prematurity.
2. **Surfactant Deficiency**: Inadequate production of surfactant, a substance crucial for lung function, by immature alveolar cells in preterm infants.
3. **Fetal and Neonatal Stress Factors**:
   - Maternal diabetes.
   - Acidosis, hypothermia, and hypoxia in the neonate.
   - Elective cesarean delivery without labor.
   - Complications like maternal hypertension or vaginal bleeding.
4. **Structural Immaturity of Lungs**: Incomplete development of the pulmonary capillary bed and alveolar structures.
5. **Non-Pulmonary Factors**:
   - Congenital heart defects, sepsis, airway obstructions, intraventricular hemorrhage.
   - Hypoglycemia, acute blood loss.
6. **Intrauterine Factors**:
   - Fetal stress that compromises blood supply to fetal lungs.

Clinical Features of RDS

1. **Respiratory Signs**:
   - Expiratory grunting or whining.
   - Sternal, suprasternal, substernal, and intercostal retractions.
   - Inspiratory nasal flaring.
   - Tachypnea (rapid breathing, >60 breaths/min).
   - Cyanosis in room air, increasing oxygen need.
2. **Dehydration and Metabolic Signs**:
   - Sunken eyes, dry mucous membranes.
   - Lethargy, hypotonia, poor feeding.
   - Irritability, weak cry.
3. **Progression of Disease**:
   - Marked seesaw retractions, peripheral edema.
   - Decreasing muscle tone, dropping body temperature.
   - Short periods of apnea.
4. **Secondary Signs**:
   - Hypotension, edema of hands and feet.
   - Absent bowel sounds, decreased urine output.

Diagnostic Evaluation

1. **Prenatal Diagnosis**:

   - Amniotic fluid analysis for lung maturity (lecithin/sphingomyelin ratio, phosphatidylglycerol levels, lamellar body count).
2. **Laboratory Tests**:
   - Elevated $PaCO_2$, low PaO_2 and blood pH.
   - Low calcium and serum glucose levels.
3. **Imaging**:
   - Chest X-ray showing "ground glass" appearance, air bronchograms.
   - Pulmonary function studies indicating stiff lungs with reduced effective pulmonary blood flow.

Management of Neonatal RDS

Supportive Care

1. **Oxygen Therapy**: To maintain adequate oxygenation levels. PaO_2 should be kept between 60 to 80 mm Hg.
2. **Ventilatory Support**:
   - **Intermittent Mandatory Ventilation (IMV):** Allows spontaneous breathing along with ventilator support.
   - **Continuous Positive Airway Pressure (CPAP):** Maintains alveolar openness and improves oxygenation.
   - **Positive End-Expiratory Pressure (PEEP):** Prevents alveolar collapse.
3. **Monitoring**:
   - Regular monitoring of arterial blood gases, blood pH, oxygen saturation using pulse oximetry.
   - Observing for signs of respiratory distress and response to treatment.
4. **Fluid and Electrolyte Management**: To maintain hydration and correct metabolic imbalances.
5. **Nutritional Support**: IV fluids or enteral feeding, as appropriate.
6. **Temperature Regulation**: Ensuring the maintenance of normothermia.

Advanced Therapies

1. **Surfactant Replacement Therapy**:
   - Administered via endotracheal tube.
   - Particularly beneficial for very low birth weight (VLBW) infants.
   - Can be given prophylactically or as a rescue treatment.
2. **Extracorporeal Membrane Oxygenation (ECMO)**:
   - For infants with severe and reversible respiratory failure.
   - Acts as a heart-lung bypass to facilitate gas exchange.

Monitoring for Complications: Regular checks for potential complications like pneumothorax, patent ductus arteriosus (PDA), intraventricular hemorrhage, and bronchopulmonary dysplasia (BPD)

Retinopathy of Prematurity (ROP)

Retinopathy of Prematurity (ROP) is a significant concern in neonatal care, especially for premature infants. Here's an expanded overview covering its first description, prevalence, etiology, risk factors, pathogenesis, and management:

Definition: ROP involves the abnormal growth of blood vessels in the retina of premature babies, potentially leading to retinal detachment and vision loss

Overview of ROP

1. **First Description**: ROP was first described by Terry in 1942 in a prematurely born infant.
2. **Prevalence in India**: India accounts for about 20% of the global incidence of childhood blindness, with a notable proportion due to ROP.
3. **Incidence in Preterm Infants**: Out of 100 preterm infants, 20-40 may develop ROP, and 3-7 of these cases may result in blindness.

Etiology

1. **Retinal Development**: The retina's blood vessels start developing around the 16th week of pregnancy, growing from the optic nerve towards the retinal periphery.
2. **Premature Birth**: In premature babies, this vascular growth may be incomplete, especially at the retinal periphery, leading to areas with insufficient oxygen and nutrients.
3. **Abnormal Vessel Growth**: The oxygen-deprived peripheral retina sends out signals for nourishment, resulting in the growth of abnormal new vessels. These fragile vessels can bleed, leading to scarring and potential retinal detachment.

Risk Factors

1. **Prematurity**: The most significant risk factor.
2. **Low Birth Weight (LBW)**.
3. **Extended Assisted Ventilation**: Longer than one week.
4. **Surfactant Therapy**.
5. **High Blood Transfusion Volume**.
6. **Sepsis**.
7. **Elevated Arterial Oxygen Tension**: Oxygen therapy can contribute to the development of ROP.

Pathogenesis

Stage I: An initial injury
(like hypotension, hypoxia, or hyperoxia)
leads to vasoconstriction and reduced blood flow,
disrupting normal vascularization.
↓
Stage II: Resumption of normal vessel growth or development of abnormal new vessels.
These abnormal vessels are leaky, causing edema,
hemorrhage, and eventually leading to retinal detachment
through traction and fibrous tissue formation. make a table.

Diagnostic Evaluation

1. **Clinical Examination:** ROP is diagnosed through a clinical examination by an ophthalmologist with expertise in pediatric retinal diseases. This examination usually starts a few weeks after birth and continues regularly until the risk of ROP has subsided.
2. **Staging:** ROP is classified into several stages based on the appearance and severity of abnormal blood vessel growth in the retina. The classification system most commonly used is the International Classification of ROP (ICROP), which includes stages 1 to 5.
   - Stage 1: Mildly abnormal blood vessel growth.
   - Stage 2: Moderately abnormal blood vessel growth.
   - Stage 3: Severe abnormal blood vessel growth with the presence of a ridge.
   - Stage 4: Partial retinal detachment.
   - Stage 5: Total retinal detachment.

3. **Zone Classification:** ROP is also classified based on its location in the retina. There are three zones (I, II, and III), with Zone I being the most critical as it is closest to the center of the retina.
4. **Plus Disease:** Plus disease refers to the abnormal dilation and tortuosity of retinal blood vessels, especially in the posterior part of the eye. It is a critical sign of worsening ROP.
5. **Retinal Imaging:** In some cases, retinal imaging techniques such as fundus photography or digital retinal imaging may be used to document the progression of ROP and for telemedicine consultation.
6. **Timing of Examinations:** The timing and frequency of eye examinations depend on the infant's gestational age and weight. Generally, examinations are performed at regular intervals starting from about 4 to 6 weeks after birth, with more frequent exams for higher-risk infants

Management

1. **Prevention and Monitoring**: Early identification and regular eye examinations are crucial for at-risk preterm infants.
2. **Control of Oxygen Therapy**: Careful monitoring and regulation of oxygen levels to minimize the risk of ROP development.
3. **Laser Therapy**: Used for severe ROP to ablate the peripheral retina, reducing the growth of abnormal vessels.
4. **Anti-VEGF Therapy**: Intravitreal injections of anti-VEGF medications can be used in certain cases to halt abnormal blood vessel growth.
5. **Surgical Intervention**: In advanced cases, surgical procedures like vitrectomy or scleral buckling may be necessary to manage retinal detachment.
6. **Long-Term Follow-Up**: Regular ophthalmologic follow-up is essential for monitoring vision development and managing any long-term complications.

ORGANIZING OF NEONATAL CARE UNIT

Organizing a Neonatal Care Unit (NICU) is crucial for providing the necessary care to critically ill neonates, aiming to reduce neonatal mortality and morbidity. The structure and resources of a NICU depend on the level of care provided, which is typically categorized into three levels in India:

Levels of Neonatal Care

1. **Level I Care**
   - For neonates >1800gms or ≥34 weeks gestational age.
   - Basic care including warmth, asepsis, breastfeeding promotion.
   - Suitable for home care, subcenters, or primary health centers.
2. **Level II Care**
   - For neonates weighing 1200-1800 grams or 30-34 weeks gestation.
   - Managed by trained nurses and pediatricians.
   - Appropriate for first referral units, district hospitals, teaching institutions, and nursing homes.
3. **Level III Care**
   - For neonates <1200 grams or <30 weeks gestation.
   - Provided by skilled nurses and neonatologists.
   - Facilities include intensive care units with advanced equipment.

Indications for Admission to NICU

- Very Low Birth Weight Babies
- Birth Asphyxia
- Meconium Aspiration Syndrome
- Severe Jaundice
- Neonatal Sepsis
- Congenital Malformations
- Cyanotic Congenital Heart Disease
- Neonatal Convulsions
- Exchange Blood Transfusion
- Other critical conditions requiring intensive care

Aims of NICU

- Saving lives of sick newborns
- Improving conditions of critically ill neonates
- Preventing damage and reducing morbidity
- Monitoring high-risk newborns

Preparation and Basic Facilities of NICU

- Warm incubators (33-36°C)
- Adequate lighting
- Suction apparatus
- Oxygen line with centralized facilities
- Vital sign monitors
- Incubators, ventilators, infusion pumps
- Sterilized instruments and sanitary environment

Main Considerations for Organizing NICU

1. **Physical Facilities**
   - Located near labor rooms
   - Adequate space and lighting
   - Effective ventilation and temperature control
   - Acoustic setup to minimize noise
2. **Personnel**
   - Neonatal physicians, nurses, and specialists
   - Adequate staffing ratios for individualized care
3. **Equipment**
   - Resuscitation sets, open-air systems, incubators
   - Vital sign monitors, phototherapy units, oxygen hoods
   - Ventilators, pulse oximeters, and other specialized equipment
4. **Laboratory Facilities**
   - Attached micro-chemistry lab for immediate testing
5. **Documentation and Records**
   - Maintaining comprehensive records for each neonate
6. **Educational Programme**
   - Regular training for medical and nursing staff.

NEONATAL EQUIPMENT

1. **Environmental Equipment:**
   - **Incubators:** These are specialized devices that provide a controlled environment for premature or ill newborns. They maintain a constant temperature, humidity, and oxygen levels to keep the baby comfortable and safe.
   - **Radiant Warmers:** Radiant warmers are used to maintain a baby's body temperature. They emit radiant heat and are often used in combination with open bassinets to provide warmth to the baby.
2. **Monitors:**
   - **Blood Pressure Monitors:** These devices measure a newborn's blood pressure, which is crucial for monitoring their cardiovascular health. They can be non-invasive or invasive, depending on the specific needs of the baby.
   - **Cardiopulmonary Monitors:** Cardiopulmonary monitors track vital signs such as heart rate and respiratory rate. They are essential for continuous monitoring of a neonate's cardiovascular and respiratory systems.
   - **Pulse Oximeters:** Pulse oximeters measure the oxygen saturation level in a baby's blood. They are often placed on a baby's skin, typically on a finger or toe, to ensure they are receiving enough oxygen.
3. **Diagnostic Equipment:**
   - **X-ray:** X-ray machines are used to take images of the baby's internal structures, such as the chest or bones. They help diagnose conditions or injuries.
   - **Ultrasound:** Ultrasound machines use sound waves to create images of the baby's internal organs, allowing healthcare professionals to assess the baby's health and development.
   - **CT scan:** Computed Tomography (CT) scans provide detailed cross-sectional images of the baby's body, helping diagnose and monitor various medical conditions.
   - **MRI:** Magnetic Resonance Imaging (MRI) provides detailed images of the baby's brain, spine, and other internal structures. It is often used for more complex diagnostic needs.
4. **Treatment Equipment:**
   - **Phototherapy Lights:** These lights are used to treat jaundice in newborns by helping to break down excess bilirubin in the blood.
   - **IV Lines:** Intravenous (IV) lines are used to administer medications, fluids, and nutrition directly into a baby's bloodstream.
   - **CPAP (Continuous Positive Airway Pressure):** CPAP machines deliver a continuous flow of air to help keep a baby's airways open, especially useful for babies with breathing difficulties.
   - **ECMO (Extracorporeal Membrane Oxygenation):** ECMO is a life support system that temporarily takes over the functions of the heart and lungs for critically ill infants.
   - **Ventilators:** Ventilators are used to provide mechanical support for a baby's breathing when they are unable to breathe adequately on their own.

UNIT 4
INTEGRATED MANAGEMENT OF NEONATAL AN CHILDHOOD ILLNESSES (IMNCI)

DEFINITION

IMNCI (Integrated Management of Neonatal and Childhood Illness) is a comprehensive healthcare strategy developed by WHO and UNICEF to improve the health and survival of children under the age of five in resource-limited settings, through the integration of care for common childhood illnesses at both community and facility levels.

OR

Integrated Management of Childhood Illness (IMCI) is a strategy by WHO and UNICEF to reduce childhood morbidity and mortality in resource-limited settings. It involves assessment, treatment, and prevention of common illnesses in children under five, focusing on improving healthcare staff skills, health systems, and family/community health practices.

OBJECTIVES OF IMCI

1. Enhance the capacity of families to care for their children's health.
2. Promote appropriate health-seeking behavior among parents and communities.
3. Strengthen the healthcare system for effective delivery of child health services.
4. Ensure equitable access to healthcare for all children.
5. Improve the quality of pediatric care in hospitals and clinics.
6. Foster a supportive environment for child health and development at the community level.
7. Promote immunization and prevent common childhood diseases.
8. Integrate child health services with other health programs for comprehensive care.

COMPONENTS OF IMCI

1. **Improving Case Management Skills of Health Workers:**
   a. **11-day Basic Course for RHMS, PHNs, and MOHS:** The 11-day Basic Course for RHMS, PHNs, and MOHS in IMCI trains health workers like Rural Health Midwives, Public Health Nurses, and Medical Officers of Health in essential skills to assess, classify, and treat common childhood illnesses, equipping them to effectively implement IMCI guidelines.
   b. **5-day Facilitators Course:** This course is designed to train facilitators who can further educate and train healthcare workers in IMCI principles and practices. Facilitators play a crucial role in cascading IMCI training to a wider audience of healthcare providers.
   c. **5-day Follow-up Course for IMCI Supervisors:** IMCI Supervisors are trained to oversee and support the implementation of IMCI at the healthcare facility level. This course equips them with the necessary skills and knowledge to monitor healthcare workers' performance and ensure that IMCI guidelines are consistently followed.
2. **Improving Overall Health Systems:** IMCI recognizes that effective child healthcare extends beyond clinical skills. It involves strengthening the broader health system, including:
   a. Ensuring the availability of essential medicines and supplies.
   b. Improving health facility infrastructure and logistics to support IMCI implementation.

   c. Developing data collection and monitoring systems to track child health outcomes and the quality of care provided.
   d. Establishing referral systems to facilitate the transfer of severe cases to higher-level healthcare facilities when needed.
3. **Improving Family and Community Health Practices:** IMCI places a strong emphasis on engaging with families and communities to improve child health. This includes:
   a. Educating caregivers about recognizing danger signs in sick children and seeking timely care.
   b. Promoting practices like exclusive breastfeeding, appropriate nutrition, and immunization.
   c. Encouraging community health workers and volunteers to play an active role in advocating for and facilitating essential child health interventions at the community level.

STRATEGIES/PRINCIPLES OF IMCI

1. All sick children aged 2 months upto 5 years are examined for general danger signs and all Sick Young Infants from Birth upto 2 months are examined for very severe diseases and local bacterial infections which indicate immediate referral or admission to hospital.
2. The children and infants must be routinely assessed for major symptoms, nutritional and immunization status, feeding problems deworming status and other potential problems. For sick children, the main symptoms include: cough or difficulty in breathing, diarrhea, fever and ear infection.
3. Only a limited number of clinical signs are used based on the evidence of their sensitivity and specificity to detect disease.
4. A combination of individual signs leads to a child's classification within one or more symptom groups rather than diagnosis.
5. IMCI management procedures use limited number of essential drugs and encourage active participation of care-takers in the treatment of children.
6. Counseling of caretakers on home care, correct feeding and giving of fluids, and when to return to clinic is an essential component of IMCI.

GUIDELINES

1. IMCI guidelines focus on common childhood illnesses in resource-limited settings, excluding chronic and less common diseases or specialized care.
2. IMCI does not cover trauma or acute emergencies from accidents or injuries.
3. IMCI indirectly addresses common issues in HIV-affected children, with referral for complex cases.
4. IMCI was adapted to IMNCI in India, expanding to include neonatal care to address major causes of child mortality.

BASIS OF INTEGRATED MANAGEMENT OF NEONATE AND CHILDHOOD ILLNESS (IMNCI) GUIDELINES

1. **Target Age Group:** IMNCI guidelines primarily focus on children under the age of 5, as this age group is most susceptible to and affected by common childhood diseases. This age group accounts for the highest burden of childhood deaths due to these illnesses.
2. **Approach to Case Management:** IMNCI adopts an approach to case management that is:
   - **Evidence-Based:** The guidelines are developed based on the best available clinical research and scientific evidence. They emphasize the importance of using evidence

rather than relying on intuition or untested clinical experience when making medical decisions.

- **Syndromic:** IMNCI employs a syndromic approach, which means that it focuses on recognizing and addressing groups of symptoms and clinical signs that commonly occur together. This approach is particularly valuable in settings with limited access to laboratory support and clinical resources.
- **Rational, Effective, and Affordable:** IMNCI promotes the rational, effective, and cost-effective use of drugs and diagnostic tools. It aims to ensure that interventions are based on sound medical reasoning, and resources are used efficiently to provide high-quality care.

3. **Evidence-Based Medicine:** IMNCI emphasizes the importance of evidence-based medicine, which relies on clinical research and scientific evidence to guide medical decision-making. It discourages the use of intuition, anecdotal clinical experience, or untested pathophysiological reasoning when treating patients.
4. **Syndromic Approach:** In situations where there are limitations in laboratory support and clinical resources, the syndromic approach is considered a more practical and cost-effective way to manage patients. It involves a careful and systematic assessment of common symptoms and clinical signs to gather enough information for making rational and effective decisions regarding patient care.
5. **Guiding Health Workers:** IMNCI guidelines are designed to be used by healthcare workers to:
   - Determine the health problems a child may be facing.
   - Assess the severity of the child's condition.
   - Decide on appropriate actions for the child's care, which may include immediate referral, management with available resources, or care at home.

PROCESS

The Integrated Management of Neonate and Childhood Illness (IMNCI) process is structured to provide effective case management for infants and children aged from 1 week up to five years. Here is an overview of the key aspects of the IMNCI process:

1. **Case Detection:** IMNCI relies on the identification of cases through the observation of simple clinical signs. These signs are carefully selected to strike a balance between sensitivity (the ability to detect cases) and specificity (the ability to accurately identify the condition). The selection of clinical signs is based on expert clinical opinion and research findings.
2. **Empirical Treatment:** Once cases are detected, the IMNCI approach emphasizes the initiation of treatment based on clinical signs and symptoms, rather than waiting for a precise diagnosis. This approach ensures that children receive timely care and treatment, even when diagnostic resources are limited.
3. **Action-Oriented Classifications:** Treatments within IMNCI are categorized according to action-oriented classifications rather than exact diagnoses. These classifications cover the most likely diseases or conditions represented by each category. This pragmatic approach simplifies decision-making and treatment initiation.
4. **Applicability:** The IMNCI process is designed to be used by a range of healthcare professionals, including doctors, nurses, and other health professionals, who provide care to sick infants and children between the ages of 1 week and five years.
5. **First-Level Facilities:** IMNCI is typically implemented in first-level healthcare facilities, which can include clinics, health centers, or outpatient departments of hospitals. These

facilities serve as primary points of contact for sick children and infants in many communities.

6. **Assessment and Care:** IMNCI guidelines describe a structured process for healthcare providers to assess children who are brought to a clinic with an illness or for scheduled follow-up visits. The assessment includes checking for general danger signs, possible bacterial infections in young infants, common illnesses, malnutrition, anemia, and other health issues. Treatment is initiated based on the assessment findings.
7. **Illness Prevention:** In addition to treatment, the IMNCI guidelines also incorporate basic activities for illness prevention. This holistic approach includes educating caregivers about preventive measures, such as immunization, exclusive breastfeeding, and nutrition, to reduce the risk of common childhood diseases

INTEGRATED CASE MANAGEMENT PROCESS FOR SICK CHILDREN

1. **Assess the Child:**
   - Check for danger signs, possible bacterial infection, or jaundice.
   - Inquire about main symptoms.
   - Assess nutrition and immunization status if symptoms are reported.
   - Check for other problems.
2. **Classify the Child's Illness:**
   - Utilize a color-coded triage system to classify main symptoms and other nutrition or feeding status.
3. **Identify Urgent Pre-Referral Treatment:**
   - Determine treatments needed based on the child's classifications.
4. **Treatment of the Child:**
   - Administer urgent pre-referral treatments if needed.
   - Refer the child, explaining the necessity to the caretaker.
   - Calm the caretaker's fears, help resolve problems, and write a referral note.
   - Provide instructions and supplies for care during transit to the hospital.
5. **If No Urgent Referral Needed:**
   - Identify specific medical treatments and/or advice needed for the child's classifications.
   - Administer first dose of oral drugs in the clinic and/or advise the caretaker.
   - Teach the caretaker how to give oral drugs and treat local infections at home.
   - Provide immunizations if needed.
6. **Counsel the mother:**
   - Assess and address the child's feeding, including breastfeeding practices.
   - Advise about feeding and fluids during illness and when to return to a health facility.
   - Discuss the mother's health.
7. **Follow Up Care:**
   - Provide care when the child returns to the clinic.
   - Reassess for new problems if necessary.

THE INTEGRATED CASE MANAGEMENT PROCESS

1. The case management process is presented on a series of charts, which show the sequence of steps and how to perform them.
2. **The charts describe the following**
   - Assess the young infant or child

- Classify the illness
- Identify treatment
- Treat the infant or child
- Counsel the mother

STEPS:

1. **Assess the young infant or child:** Means taking a history and doing a physical examination.
2. **Classify the illness:**
   - "Classify the Illness" means making a decision on the severity of the illness.
   - Assigning a Color or "Classification", which corresponds to the severity of the disease.
   - Classifications are not specific disease diagnoses. Instead, they are color coded categories that are used to determine treatment.
3. **Identify treatment:** The charts recommend appropriate treatment for each color-coded classification.
4. **Treat the infant or child:**
   - "Treat" means giving treatment in clinic.
   - Prescribing drugs or other treatments to be given at home.
   - Also teaching the mother how to carry out the treatments.
5. **Counsel the mother:**
   - Assessing how the child is fed.
   - Telling her about the foods and fluids given to the child.
   - When to bring the child back to the clinic.
   - Give follow-up care.

IMNCI WALL CHARTS

The case management process is presented on two different set of charts. These charts are to be displayed prominently:

The following table presents a structured approach for case management in pediatric care, highlighting the processes at an outpatient health facility and home management.

Location	Process Steps	Actions and Considerations
Outpatient Health Facility	**Check for Danger Signs**	- Convulsions - Lethargy - Unconsciousness - Inability to drink or breastfeed - Vomiting
	Assess Main Symptoms	- Cough, difficulty in breathing - Diarrhea- Fever - Ear problems
	Assess Nutrition and Immunization Status	- Check growth and nutrition - Review immunization records - Identify feeding problems
	Check for Other Problems	- Identify any additional health concerns
	Classify Conditions and Identify Treatment	- Use a color-coded treatment chart: - **Pink**: Urgent referral - **Yellow**: Treat at outpatient facility - **Green**: Home management
Urgent Referral (Pink)	**Pre-referral Treatments and Advise Parents**	- Provide immediate necessary care - Educate parents about the condition and need for referral
	Refer Child	- Ensure safe and prompt referral to a specialized facility
Outpatient Treatment (Yellow)	**Treat Local Infection and Give Oral Drugs**	- Administer appropriate medications and care for infections
	Advise and Teach Caretaker	- Educate caretaker on condition, treatment, and care
	Follow Up	- Schedule and conduct follow-up visits to monitor progress
Referral Facility (Pink/Yellow)	**Emergency Triage, Diagnosis, Treatment, Monitoring**	- Comprehensive care including emergency response, diagnosis, treatment, and continuous monitoring
Home Management (Green)	**Caretaker is Counseled How To:**	- Give oral drugs- Treat local infections at home- Continue feeding and care

COMPONENTS OF THE IMNCI STRATEGY

The three components of the IMNCI Strategy:

1. **The strategy actually includes three main components:**
   - Improvements in the case-management skills of health staff through the guidelines on Integrated Management of Neonatal and Childhood illness. This has been discussed above.
   - Improvements in the overall health system required for effective management of childhood illness.
   - Improvements in family and community health care practices and involving them in health care process.
2. **Pre-service IMNCI:**
   - It is being included in the curriculum of medical colleges of the country.
   - This will help in providing the much-needed trained IMNCI manpower in the public and private sector.
3. **Facility based IMNCI (F – IMNCI):**
   - The F-IMNCI training would provide the optimum skills needed by the medical officers and Staff Nurses at the FRU's (First Referral Unit).
   - Thereby helps to address the acute shortage of Pediatricians at facilities.
   - It focuses on providing appropriate inpatient management of the major causes of neonatal and childhood mortality such as asphyxia, sepsis, low birth weight, pneumonia, diarrhea, malaria, meningitis and severe malnutrition in children at the FRU.
   - The master trainers at state and district level are pediatricians from tertiary hospitals and medical colleges.

UNIT 5

NURSING MANAGEMENT IN COMMON CHILDHOOD DISEASES

RESPIRATORY SYSTEM

INTRODUCTION TO ANATOMY

1. Respiration is the exchange of gases which occur between atmosphere, blood and cell.
2. Respiration is of two types, external respiration (between blood and lungs) and internal respiration (between blood and cells).
3. Respiration occurs in respiratory system which is divided into two parts:
   - Upper respiratory tract
   - Lower respiratory tract
4. Upper respiratory tract consists of nose, pharynx and larynx.
5. Lower respiratory tract bronchi, and lungs. consists of trachea,

UPPER RESPIRATORY TRACT

1. **Nose and mouth:**
   - The nose and mouth are part of respiratory system.
   - Main function of nose is filtering, cleaning of air, exchange of gases, warming, humidification of air.
2. **Pharynx**: It is the part of upper respiratory system.
   - The pharynx is the passageway for air and food.
   - It also helps to warm and humidify the air.
3. **Larynx**:
   - It is also known as voice box.
   - It extends from root of the tongue to the trachea.
   - The functions of larynx are speech, protection, way of air purge and humidifying, filtering and warming of air.

LOWER RESPIRATORY TRACT

1. Trachea:
- It is also known as 'windpipe'. Length is 10-16 cm, and is about 20 to 25 mm in diameter.
- The trachea has many reflex, mucociliary escalator, warming, humidiand filtering of air.

2. Lungs:
- These are the cone shaped structures, present in the thoracic cavity. They are 2 in number.
- They are suspended within the pleural cavity of the thorax.
- The main function of lungs is gas exchange.

3. Bronchi:
- The trachea branches into the left and right bronchi which then enters the left and right lungs respectively.

- Its function is warming and humidifying, coughing reflex, support and potency, removal of particulate matter, and control of air entry.

4. Bronchioles:
- They are the smallest branches of the airways.
- Bronchioles deliver air to tiny sacs called alveoli where oxygen and carbon dioxide are exchanged.

5. Alveoli:
- These are tiny balloon-shaped air sacs sit at the very end of the respiratory tree.
- They are arranged in clusters throughout the lungs.
- They help to exchange oxygen and carbon dioxide molecules to and from the bloodstream.

PRENATAL RESPIRATORY DEVELOPMENT

- In utero, placenta plays an important role in oxygenation.
- The exchange of gases is must to meet metabolic needs. So, the neonate must be able to inflate the lungs and establish continuous breathing.

POSTNATAL RESPIRATORY CHANGE

1. At birth, the baby's lungs are filled with fluid.
2. Compression of thorax during vaginal delivery forces out some lung fluid.
3. Baby takes first breath after 10 seconds of delivery.
   - It stimulates the central nervous system.
   - Inflation of the normal lung is completed within a few breaths.
   - Most alveoli are expanded within first few hours of life.

CONGENITAL DISORDERS

TRACHEOESOPHAGEAL FISTULA

1. In normal children the esophagus (the tube that connects the throat to the stomach) and the trachea (the tube connecting the throat to the windpipe and lungs) are separate.
2. Tracheoesophageal fistula is an abnormal connection in one or more places between the esophagus and the trachea.
3. TE fistula is a birth defect, which occurs in 1 in 5,000 births.

Etiology

1. There is no definite cause for congenital Tracheoesophageal Fistula (TEF).
2. There is an association of Congenital TEF with trisomy 18, 21, and 1
3. Other causes may include:
   - Use of decongestants that contain imidazoline derivatives by women during the first trimester of pregnancy has been linked to an increased risk for congenital TEF.
   - Heart problems (such as ventricular septal defect, tetralogy of Fallot, or patent ductus arteriosus).
   - Kidney and urinary tract problems (such as horseshoe or polycystic kidney, absent kidney, or hypospadias).
   - Other digestive tract problems (such as diaphragmatic hernia, duodenal atresia, or imperforate anus).
   - Muscular or skeletal problems.

- VACTERL syndrome (which involves Vertebral, Anal, Cardiac, TE fistula, Renal and Limb abnormalities).

Causes of acquired TEF may include:

- Iatrogenic injury
- Blunt chest or neck trauma
- Prolonged mechanical ventilation via endotracheal or tracheostomy tube
- Excessive tube cuff pressure in patients ventilated for lung disease.

Pathophysiology:

Embryonic Development (4th-5th Weeks)
Initial formation of the single tube for trachea and esophagus differentiation.
↓
Abnormal Wall Formation
Leads to congenital defects such as TEF and EA.
↓
Tracheoesophageal Fistula (TEF)
Causes aspiration and reflux, leading to potential respiratory issues.
↓
Esophageal Atresia (EA)
Results in feeding difficulties and risk of aspiration pneumonia.
↓
Clinical Effects
Aspiration can lead to pneumonia; reflux may cause esophagitis.
↓
TEF Recurrence
Recurrence of abnormal connection post-surgery.
↓
Causes of Recurrence
Includes surgical complications and infection impairing healing.
↓
Increased Esophageal Pressure
Contributes to the risk of TEF recurrence.
↓
Permanent TEF
A recurrent fistula becomes lined with mucosa, requiring further treatment.

Types

Types of Esophageal Atresia (EA) and Tracheoesophageal Fistula (TEF)

1. **Isolated EA (Gross type A, Vogt type 2):** Pure Esophageal Atresia without TEF.
2. **EA with Proximal TEF (Gross type B, Vogt type 3A):** Rare, with 0.8% prevalence, featuring a TEF between the upper esophageal pouch and the trachea.
3. **EA with Distal TEF (Gross type C, Vogt type 3B):** Most common type, present in 89% of cases, with a TEF between the lower esophageal pouch and the trachea.
4. **EA with Dual TEF (Gross type D, Vogt type 3C):** Both upper and lower TEFs present, rare at 1.4% prevalence.

5. **H-type TEF (no EA) (Gross type E):** TEF without EA, about 4% prevalence, diagnosed later due to less immediate symptoms, often presents with coughing, choking, and recurrent pneumonias.

Clinical manifestations

1. **Excessive oral secretions:** Drooling and substantial mucus, with excessive oral secretions.
2. **Choking upon feeding:** If suckling at the breast or bottle is allowed, the baby appears to choke and may have difficulty maintaining an airway; significant respiratory distress may result.
3. **Seal-bark cough:** Sonorous seal-bark cough that indicates concomitant tracheomalacia.
4. **Oral obstruction:** If an oral tube is placed to suction the stomach, it becomes blocked 10-11 cm from the lips.

Other symptoms may include:

1. Coughing while feeding
2. Frequent lung infections
3. Breathing problems
4. Coughing or choking trying to swallow
5. Cyanosis
6. excessive saliva
7. Vomiting
8. abdominal distention
9. feeding difficulties
10. reflux,
11. failure to thrive
12. respiratory distress,
13. frothy saliva, and pneumonia risk.

Diagnosis

The diagnosis of Tracheoesophageal Fistula (TEF) and Esophageal Atresia (EA) typically involves the following steps:

1. **Physical Examination:** Clinical assessment of the infant, including observation of symptoms such as choking, coughing, cyanosis, abdominal distention, and respiratory distress.
2. **Imaging Studies:** X-rays are commonly used to visualize the chest and abdomen, helping identify the presence of TEF and EA.
3. **Laboratory Tests:** Baseline laboratory tests are conducted, including a complete blood count (CBC), electrolyte levels, venous gas concentrations, blood urea nitrogen (BUN), serum creatinine levels, blood glucose level, and serum calcium level.
4. **Prenatal Ultrasonography:** During pregnancy, prenatal ultrasonography may reveal certain indicators of TEF and EA in the fetus, such as the size of the gastric bubble, polyhydramnios (excess amniotic fluid), and associated anomalies like VACTERL (vertebral defects, anorectal malformations, cardiovascular defects, tracheoesophageal defects, renal anomalies, and limb deformities). These findings may prompt further evaluation after birth.
5. **Echocardiography:** Early echocardiography is recommended for infants showing clinical signs of cardiovascular disease, as heart defects can be associated with TEF and EA.

27 09:02

6. **Chest Radiography:** Chest X-rays are essential and should be performed promptly if TEF or EA is suspected. They help visualize the presence of a tracheoesophageal fistula and other associated anomalies in the chest and abdomen.

Management of Tracheoesophageal Fistula (TEF)

Surgical Repair

1. **Gastrostomy Considerations:**
   - A gastrostomy may be performed, particularly if no distal TEF is present. This helps manage a small stomach and provides an alternative path for ventilation gases in ventilated babies.
2. **Distal TEF Ligation:**
   - If lung soiling continues due to a distal fistula, surgical ligation through a right-side thoracotomy, preferably via an extrapleural approach, is considered.
3. **Surgical Procedure for TEF Without EA:**
   - Typically repaired within the first one or two days of life.
   - The procedure involves:
     a. Small incision in the neck or back.
     b. Division and closure of the fistula.
     c. Removal of the fistulous pouch.
     d. Repair of the esophageal hole and any associated narrowing.
     e. Correction of tracheomalacia with posterior tracheopexy under bronchoscopy guidance.
     f. Rotation of the esophagus away from the trachea.
4. **Surgical Procedure for TEF With EA:**
   - Similar approach as for TEF without EA.
   - Additionally, the two ends of the esophagus are connected if feasible.
5. **Postoperative Outcomes:**
   - Children generally have positive outcomes post-surgery.
6. **Long-Term Follow-Up:**
   - Children with EA/TEF have a heightened risk of acid reflux, Barrett's esophagus, and other complications.
   - They should undergo routine endoscopic follow-ups for life to monitor and manage these risks.

Nursing Management

1. **Preoperative Care:**
   - Monitoring and maintaining the child's nutritional status and hydration.
   - Managing respiratory status and ensuring patency of the upper pouch suction.
   - Educating parents about the procedure and postoperative care.
2. **Postoperative Care:**
   - Monitoring for surgical complications, such as infection or anastomotic leaks.
   - Pain management and comfort measures.
   - Monitoring feeding tolerance when oral feeds are initiated.
   - Providing respiratory support as needed.
3. **Family Education:**
   - Instructing families on signs of complications, such as stridor, dysphagia, or respiratory distress.
   - Guidance on feeding and nutrition post-surgery.

   - Emphasizing the importance of regular follow-up appointments.
4. **Long-Term Care:**
   - Educating families about the potential long-term issues like gastroesophageal reflux and the need for ongoing monitoring and management.

DIAPHRAGMATIC HERNIA [DH]

Diaphragm and Its Function:

1. The diaphragm is a sheet of internal skeletal muscle that separates the thoracic cavity (heart and lungs) from the abdominal cavity.
2. It plays a vital role in respiration; when the diaphragm contracts, it increases the volume of the thoracic cavity, allowing air to be drawn into the lungs.

Diaphragmatic Hernia Definition:

1. Diaphragmatic hernia is a defect in the diaphragm that permits abdominal organs to move into the chest cavity.
2. This condition can be congenital (present at birth) or acquired later in life.

Etiology (Causes) of congenital DH:

1. Congenital diaphragmatic hernias are often idiopathic (unknown cause).
2. **Contributing factors include:**
   - Abnormal development of the fetal diaphragm.
   - Chromosomal or genetic abnormalities.
   - Environmental exposures during pregnancy.
   - Associated organ anomalies.
3. These hernias can lead to underdeveloped lungs due to abdominal organs displacing into the chest cavity.

Causes of Acquired Diaphragmatic Hernia (ADH):

1. Trauma, such as blunt injuries from accidents or falls.
2. Penetrating injuries from stab or gunshot wounds.
3. Surgical procedures on the abdomen or chest causing accidental diaphragm damage.
4. Falls impacting the diaphragm region.

Pathophysiology

Failure of Pleuroperitoneal Membranes to Close
The membranes fail to fully close, creating a potential for herniation.
↓
Continuous Connection Between Peritoneal and Pleural Cavities
This defect allows an open channel between the abdominal and thoracic cavities.
↓
Abdominal Organs Enter the Pleural Cavity
Organs such as intestines, stomach, or liver herniate into the thoracic cavity.
↓
Exert Pressure on Lungs and Heart
The herniated organs pressure the lungs and heart, affecting their function.
↓
Diaphragmatic Hernia
Diagnosed when abdominal organs herniate into the thoracic cavity, predominantly on the left side.

Types

There are three types of diaphragmatic hernia which include:

1. Bochdalek hernia
2. Morgagni hernia
3. Diaphragm eventration

1. **Bochdalek hernia:**
   a. It is also known as posterolateral diaphragmatic hernia.
   b. It is the most common type of congenital diaphragmatic hernia.
   c. In this the diaphragm abnormality is characterized by a hole in the posterolateral corner of the diaphragm which allows passage of the abdominal viscera into the chest cavity.
   d. This causes lung hypoplasia.
2. **Morgagni hernia:**
   a. This is rare type of hernia. In this type the defect is present in the anterior part of diaphragm or retrosternal portion.
   b. Results from a defect in the anterior midline.
   c. Herniation occurs through foramen of morgagni, located immediately adjacent to xiphoid process of the sternum.
3. **Diaphragm eventration:** It occurs when diaphragm is thinner, allowing the abdominal viscera to protrude upward into the chest cavity.

Clinical Manifestations

The symptoms are often seen after the baby is born. The most common symptoms include:

1. Difficulty in breathing.
2. Fast breathing.
3. Fast heart rate.
4. Cyanosis.
5. Abnormal chest development with one side being larger than the other.
6. Abdomen appears caved or concave.
7. Bowel sounds in the chest area (This occurs when the intestines move up into the chest cavity).

Diagnosis

1. Physical examination is done which reveals:
   a. abnormal chest movements
   b. difficulty breathing
   c. blue discoloration of the skin (cyanosis)
   d. absent breath sounds on one side of the chest
   e. bowel sounds in chest
   f. "half-empty" feeling abdomen Chest X-ray.
2. Arterial blood gas test (takes blood directly from an artery and tests for levels of oxygen, carbon dioxide, and acidity, or pH level).
3. Ultrasound scan (uses sound waves to produce images of the thoracic and abdominal cavities and their contents).
4. CT scan (allows for direct viewing of the abdominal organs).
5. MRI (for more focused evaluation of organs especially in a fetus).

Management:

Medical Management:

1. Most children with diaphragmatic hernia have underdeveloped lungs, making proper breathing difficult. They are placed on mechanical ventilators to support their breathing.
2. Some infants may require temporary support from an Extracorporeal Membrane Oxygenation (ECMO) machine, which acts as a heart-lung bypass machine to provide oxygenation.

Surgical Repair: Once the child's condition stabilizes with supportive measures, surgical repair of the diaphragmatic hernia is performed.

1. **Surgical Approaches:**
   - Options include transthoracic or transabdominal approach.
   - Video-assisted thoracoscopic or laparoscopic techniques are also utilized.
2. **Surgery Process:**
   - Abdominal organs (stomach, intestines) are moved back to the abdominal cavity from the chest.
   - The diaphragmatic hole is repaired.
   - Approaches include laparotomy, thoracoscopy (chest), or laparoscopy (abdomen).
3. **Approach Selection:**
   - Transthoracic approach is often preferred for right-sided hernias and in obese children for better exposure.
   - The choice depends on the specific case.
4. **Transabdominal Approach:**
   - Ideal for reducing hernia content and sac repair.
   - Suitable for bilateral and complicated hernias.
5. **Complications Management:**
   - In cases of strangulation, incarceration, or perforation with peritonitis, a transabdominal approach is necessary.
   - This is to inspect the entire abdominal cavity.
6. **Laparoscopic Repair:**
   - Considered safe and reliable.
   - Particularly effective for diagnosing and repairing non-complicated hernias of Morgagni.

Nursing management for infants with Diaphragmatic Hernia:

1. Preoperative Care:

- Monitor and stabilize the infant's respiratory status by ensuring proper oxygenation and ventilation support.
- Maintain strict infection control measures to prevent respiratory infections.
- Administer prescribed medications and treatments, including antibiotics if there is an associated infection.
- Provide emotional support and education to the parents regarding the surgical procedure, potential risks, and expected outcomes.

2. Intraoperative Care: Assist the surgical team in preparing the infant for surgery, ensuring sterile conditions in the operating room.

- Monitor vital signs and maintain the infant's stability during surgery.

3. Postoperative Care: Continuously monitor respiratory status, heart rate, blood pressure, and oxygen saturation in the postoperative period.

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- Assess and manage pain using appropriate pain relief measures.
- Maintain the infant on mechanical ventilation as needed, adjusting settings based on respiratory parameters.
- Provide intravenous fluids and nutrition according to the physician's orders, ensuring proper hydration and nutrition.
- Monitor for any signs of surgical complications, such as infection or bleeding.
- Educate parents on postoperative care, including wound care, medication administration, and feeding instructions.
- Promote parent-infant bonding and provide emotional support during the recovery period.

ACUTE NASOPHARYNGITIS (COMMON COLD)

Definition

Acute nasopharyngitis, commonly known as the common cold, is a viral infectious disease that affects the upper respiratory tract, including the nose and throat.

It manifests with symptoms such as a runny nose, sore throat, cough, and sneezing.

Incidence

The common cold is the most prevalent infectious disease among humans. Children are particularly susceptible, experiencing 6 to 8 colds annually, with higher incidence during the fall and winter.

Etiology

The disease is mainly caused by rhinoviruses. Other viruses like coronaviruses, adenoviruses, and respiratory syncytial virus (RSV) can also cause the common cold. It spreads through respiratory droplets or by touching contaminated surfaces and then touching the face.

Pathophysiology

Viral entry into the nasopharyngeal mucosa triggers an immune response, leading to increased nasal secretions and inflammation. This causes the nasal passages to swell, resulting in the typical symptoms of a cold.

Clinical Features

Symptoms usually emerge 1-3 days post-exposure and can include:

1. Nasal congestion and runny nose
2. Sore throat
3. Cough
4. Sneezing
5. Mild fever
6. General feeling of being unwell

Management

Management of the common cold is supportive and focuses on relieving symptoms. It may include:

1. Increased fluid intake
2. Rest
3. Over-the-counter pain relievers and fever reducers, such as acetaminophen or ibuprofen
4. Saline nasal drops or sprays
5. Humidifiers to moisten airways and ease congestion

Nursing Management (Nursing Diagnosis and Intervention)

Nursing care focuses on symptom management and educating families about the course of the disease and preventive measures.

1. Discomfort related to symptoms of the common cold. Educate caregivers on providing symptomatic relief through hydration, proper nutrition, and the safe use of over-the-counter medications.
2. Risk for fluid volume deficit related to fever and increased respiratory rate. Encourage the intake of fluids to prevent dehydration.
3. Knowledge deficit regarding disease transmission and prevention. Instruct caregivers and children on proper hand hygiene and the importance of avoiding close contact with individuals who are sick.

Preventive Measures

Prevention strategies include:

1. Frequent handwashing with soap and water.
2. Using alcohol-based hand sanitizers when soap and water are not available.
3. Teaching children to cover their mouths and noses with a tissue or their elbow when coughing or sneezing.
4. Avoiding close contact with people who are sick.
5. Cleaning and disinfecting frequently touched objects and surfaces.

TONSILLITIS

Definition

Tonsillitis is the inflammation of the tonsils, which are two oval-shaped pads of tissue at the back of the throat.

This condition leads to sore throat, difficulty swallowing, and other related symptoms.

Incidence

Tonsillitis is a common condition in children, particularly among those aged 5 to 15 years. The exact incidence varies globally but represents a significant reason for pediatric consultations and sore throat complaints in this age group.

Etiology

The cause of tonsillitis can be viral or bacterial, with the most common bacterial cause being Streptococcus pyogenes (group A streptococcus). Viral causes include adenovirus, influenza virus, Epstein-Barr virus, and others.

Pathophysiology

Tonsillitis occurs when the tonsils, part of the body's defense mechanism against pathogens, become infected by either a virus or bacteria. This leads to inflammation, swelling, and sometimes the formation of white or yellow pus-filled spots on the tonsils.

Clinical Features

1. Sore throat
2. Difficulty swallowing
3. Fever
4. Swollen, red tonsils with white or yellow patches
5. Swollen lymph nodes in the neck
6. Headache
7. Stomach ache, particularly in younger children
8. Coughing and sneezing
9. Fatigue

Management

1. **Medical Treatment**: Depending on whether the tonsillitis is viral or bacterial, treatment may involve rest, hydration, and pain relief methods such as acetaminophen or ibuprofen. If bacterial, antibiotics may be prescribed.
2. **Surgical Treatment**: In cases of recurrent tonsillitis or when complications arise, a tonsillectomy (removal of the tonsils) may be recommended.

Nursing Management (Nursing Diagnosis and Intervention)

1. **Nursing Diagnosis**: Pain related to inflammation and swelling of the tonsils.
   a. **Intervention**: Provide pain management education, such as the safe use of over-the-counter pain relievers and the importance of hydration.
2. **Nursing Diagnosis**: Risk for dehydration related to difficulty swallowing.
   a. **Intervention**: Encourage the intake of fluids, offering soothing warm broths or cold liquids, and monitor for signs of dehydration.
3. **Nursing Diagnosis**: Knowledge deficit regarding the prevention and transmission of the infection.
   a. **Intervention**: Educate caregivers and children on proper hygiene practices, the importance of completing antibiotic courses if prescribed, and when to seek further medical advice.

Preventive Measures

1. Encouraging frequent handwashing with soap and water.
2. Avoiding close contact with individuals who have sore throats or tonsillitis.
3. Teaching children to cover their mouth and nose when coughing or sneezing to prevent the spread of infection.
4. Maintaining a clean environment and disinfecting common surfaces.
5. Ensuring children are up to date with vaccinations, as some may protect against bacterial and viral causes of tonsillitis.

CROUP

Definition

Croup is a respiratory condition characterized by a distinctive barking cough, stridor (a harsh, grating sound during breathing), and hoarseness. It results from swelling around the voice box (larynx), windpipe (trachea), and bronchial tubes (bronchi). This condition primarily affects young children.

Incidence

Croup is most common in children between the ages of 6 months and 3 years, with a peak incidence in the second year of life. It tends to occur more frequently in the fall and winter months.

Etiology

The majority of croup cases are caused by viruses, with the parainfluenza virus being the most common culprit. Other viral causes include influenza virus, adenovirus, and respiratory syncytial virus (RSV).

Pathophysiology

Croup develops when a viral infection leads to inflammation and swelling of the larynx, trachea, and bronchi. This swelling narrows the airway, causing the symptoms of croup. The barking cough results from air passing through the constricted airway.

Clinical Features

- Barking cough

- Stridor (particularly when the child is upset or crying)
- Hoarseness
- Difficulty breathing
- Fever (in some cases)

Management

1. **Mild Croup**: Can often be managed at home with cool mist humidifiers, hydration, and keeping the child calm, as agitation can worsen symptoms.
2. **Moderate to Severe Croup**: May require medical intervention, including:
   a. Steroids (e.g., oral dexamethasone) to reduce airway inflammation.
   b. Nebulized epinephrine in severe cases to rapidly decrease swelling in the airway.
   c. Hospitalization for observation might be necessary for children with severe symptoms or those at risk of severe obstruction.

Nursing Management (Nursing Diagnosis and Intervention)

1. **Nursing Diagnosis**: Ineffective airway clearance related to inflammation of the larynx and trachea.
   a. **Intervention**: Monitor respiratory status, encourage rest, and administer prescribed medications to reduce inflammation. Teach parents the importance of cool air and proper hydration to soothe the child's airway.
2. **Nursing Diagnosis**: Anxiety (child and family) related to breathing difficulties.
   a. **Intervention**: Provide reassurance to both the child and family. Educate on the condition, its management, and when to seek further medical assistance. Use calming techniques to reduce the child's anxiety.
3. **Nursing Diagnosis**: Knowledge deficit regarding disease process and home care.
   a. **Intervention**: Educate caregivers on recognizing signs of respiratory distress, how to administer medications if prescribed, and the benefits of humidity and hydration.

Preventive Measures

- Encourage handwashing and good hygiene practices to reduce the spread of viruses.
- Avoid exposure to individuals with respiratory infections.
- Consider influenza vaccination for children older than 6 months to prevent flu-related croup.

BRONCHITIS IN CHILDREN

Definition: Inflammation of the bronchial tubes, leading to coughing and mucus production.

Incidence

- Common in children under 5 years due to developing immune systems and close contact environments like daycare.

Etiology

- Primarily caused by viral infections (e.g., common cold, influenza).
- Less commonly caused by bacterial infections.
- Environmental factors like tobacco smoke exposure can worsen symptoms.

Pathophysiology

- Inflammation causes bronchial tube swelling, narrowing, and obstruction.
- Results in difficulty clearing mucus, coughing, and potentially bronchospasm.

Clinical Features

- Persistent cough with possible mucus production (clear, white, yellow, green).

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- Wheezing and shortness of breath.
- Low-grade fever and chest discomfort.
- Fatigue and general feeling of being unwell.

Management

- Supportive care for mild cases: fluids, rest, and humidified air.
- Fever reducers and pain relievers for symptom management (acetaminophen, ibuprofen).
- Antibiotics for bacterial bronchitis.
- Bronchodilators for significant wheezing.

Nursing Management

1. **Nursing Diagnosis**: Ineffective airway clearance. Educate on the importance of hydration, humidified air, and proper coughing techniques.
2. **Nursing Diagnosis**: Risk for dehydration. Monitor fluid intake and encourage frequent, small amounts of fluids.
3. **Nursing Diagnosis**: Knowledge deficit regarding prevention and home care. Provide education on avoiding tobacco smoke exposure, hand hygiene, and recognizing when to seek further medical care.

Preventive Measures

- Encourage hand hygiene to reduce the spread of infections.
- Avoid exposure to tobacco smoke and other pollutants.
- Consider annual flu vaccination to prevent influenza-associated bronchitis.

BRONCHIOLITIS

Definition

Bronchiolitis is a common lung infection in infants and young children, characterized by the inflammation of the small airways (bronchioles) in the lung.

This leads to airway obstruction and difficulty breathing.

Incidence

It primarily affects infants and children under 2 years of age, with a peak incidence in babies aged 3 to 6 months. Bronchiolitis is most prevalent during the winter months.

Etiology

- The leading cause is the Respiratory Syncytial Virus (RSV).
- Other viral causes include rhinovirus, adenovirus, influenza, and human metapneumovirus.

Pathophysiology

- The virus invades the small airways, leading to inflammation, increased mucus production, and accumulation of cellular debris.
- This results in airway obstruction, reduced airflow, and difficulty in breathing.

Clinical Features

- Begins with symptoms similar to a common cold: runny nose, cough, and mild fever.
- Progresses to wheezing, difficulty breathing, and a distinctive high-pitched or wheezing sound when breathing out.
- In severe cases, signs of respiratory distress, such as rapid breathing, nasal flaring, and retractions (skin sucking in around the ribs during inhalation).

Management

- Supportive Care: Mainstay of treatment, including hydration, humidified oxygen for hypoxemia, and monitoring for signs of respiratory distress.

- Medication: No specific antiviral treatment for RSV. Bronchodilators and corticosteroids are not routinely recommended but may be considered in some cases based on clinical judgment.
- Hospitalization: Required for infants showing signs of severe disease, dehydration, or oxygen requirement.

Nursing Management

1. **Nursing Diagnosis**: Ineffective breathing pattern related to bronchial inflammation and obstruction.
   a. **Interventions**: Monitor respiratory rate and effort, provide oxygen therapy as prescribed, and ensure a calm environment to minimize oxygen demand.
2. **Nursing Diagnosis**: Risk for fluid volume deficit related to fever and rapid breathing.
   a. **Interventions**: Encourage oral fluid intake if possible, monitor for signs of dehydration, and administer IV fluids if necessary.
3. **Nursing Diagnosis**: Knowledge deficit in caregivers regarding disease process, home care, and prevention.
   a. **Interventions**: Educate caregivers on recognizing signs of respiratory distress, the importance of hydration, avoiding smoke exposure, and hand hygiene.

Preventive Measures

- Hand hygiene: Regular hand washing to prevent the spread of viruses.
- Avoid exposure: Keep infants away from people with cold symptoms or crowds during virus season.
- Breastfeeding: Provides immunity that helps protect infants from infections.
- Immunization: Palivizumab, a monoclonal antibody, may be recommended for high-risk infants to prevent severe RSV disease.

PHARYNGITIS

Definition

Pharyngitis is the inflammation of the pharynx, commonly known as a sore throat. It's a frequent condition that affects the back of the throat, causing pain, irritation, and difficulty swallowing.

Incidence

Pharyngitis is one of the most common conditions leading to doctor visits. It can occur at any age but is particularly prevalent in children and adolescents.

Etiology

- Viral infections are the most common cause, including rhinovirus, coronavirus, influenza, and Epstein-Barr virus.
- Bacterial infections, with Streptococcus pyogenes (group A strep) being the most common bacterial cause.
- Environmental factors such as dry air, pollution, and smoking can also contribute.

Pathophysiology

- The pathogen (viral or bacterial) causes an infection in the pharyngeal tissue, leading to inflammation and swelling.
- This results in pain, redness, and sometimes the formation of white patches or streaks on the throat.

Clinical Features

- Sore throat

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- Difficulty swallowing
- Red and swollen tonsils, sometimes with white patches or streaks
- Fever
- Swollen, tender lymph nodes in the neck
- Cough and hoarseness
- Headache

Management

- **Viral Pharyngitis**: Treatment focuses on symptomatic relief through hydration, rest, and over-the-counter pain relievers such as acetaminophen or ibuprofen.
- Bacterial Pharyngitis: Antibiotics are prescribed to treat the infection and prevent complications.
- Severe Cases: May require additional interventions, including corticosteroids to reduce swelling.

Nursing Management

a) **Nursing Diagnosis**: Pain related to inflammation and swelling of the pharynx.
   a. **Interventions**: Assist in administering prescribed pain relief, advise on the use of throat lozenges or sprays, and encourage warm saline gargles.

b) **Nursing Diagnosis**: Risk for dehydration related to difficulty swallowing.
   a. **Interventions**: Encourage intake of fluids and provide assistance as needed, offer soft foods or liquids if swallowing is painful.

c) **Nursing Diagnosis**: Knowledge deficit regarding infection control and medication management.
   a. **Interventions**: Educate patients and caregivers on the importance of completing antibiotic courses, good hygiene practices, and methods to prevent the spread of infection.

Preventive Measures

- Hand hygiene: Regular and thorough handwashing to reduce the spread of infections.
- Avoid close contact with individuals who have sore throats or cold symptoms.
- Do not share personal items such as utensils, towels, and toothbrushes.
- Maintain a healthy lifestyle to boost the immune system, including a balanced diet, regular exercise, and adequate sleep.

PNEUMONIA

Definition

Pneumonia is an infection that inflames the air sacs (alveoli) in one or both lungs. The air sacs may fill with fluid or pus, causing cough with phlegm or pus, fever, chills, and difficulty breathing.

Incidence

Pneumonia is a leading cause of hospitalization in children and adults worldwide. It is particularly common in young children under 5 years old and the elderly.

Etiology

- **Bacterial**: The most common cause in children and adults, with Streptococcus pneumoniae being the most frequent.
- **Viral**: Including respiratory syncytial virus (RSV) and influenza.
- **Fungal**: More common in individuals with weakened immune systems.

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Pathophysiology

- Pathogens enter the lungs and overcome the body's immune defenses, infecting the alveoli.
- The infection leads to inflammation and filling of the alveoli with fluid or pus, hindering gas exchange.

Clinical Features

- Cough with phlegm or pus
- Fever, sweating, and chills
- Difficulty breathing or shortness of breath
- Chest pain that worsens with breathing or coughing
- Fatigue and muscle pain
- In young children and infants, symptoms may also include lethargy, irritability, and difficulty feeding.

Management

- Mild Pneumonia: Often treated at home with rest, hydration, and oral antibiotics for bacterial cases.
- Severe Pneumonia: May require hospitalization for intravenous antibiotics, oxygen therapy, and possibly mechanical ventilation.
- Viral Pneumonia: Supportive care is the mainstay, as antibiotics are not effective against viruses.

Nursing Management

1. gas exchange related to alveolar-capillary membrane changes.
2. Monitor oxygen saturation and respiratory rate, administer oxygen as prescribed, and position the patient to maximize ventilation.
3. Ineffective airway clearance related to increased secretions.
4. Encourage effective coughing techniques, hydration to thin secretions, and administer expectorants if prescribed.
5. Risk for fluid volume deficit related to fever and increased respiratory rate.
6. Monitor fluid intake and output, encourage oral fluids, and administer intravenous fluids if necessary.

Preventive Measures

- **Vaccination**: Administer vaccines against common pathogens causing pneumonia, such as the pneumococcal vaccine, Haemophilus influenzae type b (Hib) vaccine, and annual flu shots.
- **Hygiene practices**: Regular handwashing and covering mouth and nose when coughing or sneezing to prevent the spread of pathogens.
- **Healthy lifestyle**: Maintaining a healthy diet, getting regular exercise, and ensuring adequate sleep to strengthen the immune system.
- **Avoid smoke exposure**: Tobacco smoke can increase the risk and severity of respiratory infections.

ASTHMA

Definition

Asthma is a chronic inflammatory disease of the airways characterized by reversible airflow obstruction and bronchospasm. Symptoms include episodes of wheezing, coughing, chest tightness, and shortness of breath.

Incidence

Asthma is one of the most common chronic diseases globally, affecting both children and adults. It is estimated that over 300 million people worldwide have asthma, with its prevalence increasing in many countries, especially among children.

Etiology

- **Genetic factors**: A family history of asthma or allergic conditions can increase the risk.
- **Environmental factors**: Exposure to allergens, tobacco smoke, chemical irritants in the workplace, and air pollution.
- **Respiratory infections**: Early childhood infections can contribute to developing asthma.
- **Allergies**: Including hay fever (allergic rhinitis), eczema, and allergic conjunctivitis.

Pathophysiology

Asthma results from the complex interaction between genetic predisposition and environmental exposures. This interaction leads to:

- Airway inflammation, causing swelling and narrowing.
- Increased production of thick mucus.
- Bronchial hyperresponsiveness (increased sensitivity to triggers).

Clinical Features

- Recurrent episodes of wheezing.
- Breathlessness.
- Chest tightness.
- Nighttime or early morning coughing.
- Episodes are often triggered by factors such as allergens, cold air, exercise, or stress.

Management

1. **Medications**: Long-term control medications (e.g., inhaled corticosteroids, long-acting beta agonists) and quick-relief inhalers (e.g., short-acting beta agonists) for acute symptoms.
2. **Avoidance of triggers**: Identifying and avoiding environmental triggers.
3. **Monitoring**: Regular monitoring of lung function and symptoms.
4. **Education**: Patient and family education on asthma management and action plans.

Nursing Management

1. Impaired gas exchange related to airflow obstruction.
2. Monitor respiratory status, encourage the use of control medications, and educate on proper inhaler technique.
3. Ineffective breathing pattern related to bronchospasm.
4. Teach breathing exercises and relaxation techniques to alleviate symptoms.
5. Knowledge deficit regarding asthma triggers and management.
6. Provide comprehensive education on asthma, including trigger avoidance, medication use, and the importance of an asthma action plan.

Preventive Measures

- Allergen control: Reduce exposure to known allergens (dust mites, pet dander, pollen, mold).
- Smoke-free environment: Avoid exposure to tobacco smoke and other pollutants.
- Healthy lifestyle: Maintain a healthy weight, eat a balanced diet, and exercise regularly, as approved by a healthcare provider.
- Vaccinations: Stay up-to-date with vaccinations, including the flu vaccine, as respiratory infections can trigger asthma exacerbations.

ENDOCRINNE SYSTEM

1. **Function:** The endocrine system is crucial for maintaining the internal environment's stability, playing a vital role in homeostasis.
2. **Composition:** It consists of glands, which are groups of epithelial cells with specialized secretory functions.

Types of Glands

1. **Exocrine Glands:**
   a. Discharge secretions onto the epithelial surface of an organ, either directly or through a duct.
   b. Vary in size, shape, and complexity.
2. **Endocrine Glands:**
   a. Release secretions directly into the bloodstream in the form of hormones.
   b. Capable of secreting one or more hormones.
   c. Known as "ductless glands" due to their direct hormone release into the blood.

Endocrine Glands and Hormones

- Endocrine glands secrete hormones directly into the blood, facilitating widespread and precise regulation of various body functions.

Endocrinal Disorders

a) **Pancreatic Gland Disorders:**
   - Diabetes Mellitus: A condition characterized by elevated blood glucose levels due to insulin deficiency or resistance.

b) **Thyroid Gland Disorders:**
   - Hypothyroidism: Reduced thyroid hormone production, leading to symptoms like fatigue, weight gain, and cold intolerance.
   - Hyperthyroidism: Excessive thyroid hormone production, causing symptoms like weight loss, increased heart rate, and anxiety.

c) **Adrenal Gland Disorders:**
   - Cushing's Disease: Excessive cortisol production, leading to obesity, high blood pressure, and altered metabolism.
   - Addison's Disease: Inadequate production of adrenal hormones, resulting in fatigue, low blood pressure, and electrolyte imbalances.

d) **Anterior Pituitary Disorders:**
   - Growth Hormone Deficiency: Leads to stunted growth in children and metabolic issues in adults.
   - Precocious Puberty: Abnormally early puberty onset due to increased secretion of sex hormones.

e) **Posterior Pituitary Disorders:**
   - Diabetes Insipidus: Characterized by the production of large amounts of dilute urine due to a deficiency of antidiuretic hormone (ADH)

DIABETES MELLITU

Diabetes Mellitus (DM) is a group of metabolic disorders characterized by high blood glucose levels.

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This condition results from insulin deficiency or a failure to meet the body's insulin needs, leading to hyperglycemia.

Definition: Juvenile Diabetes Mellitus, also known as Type 1 Diabetes, is an autoimmune condition where the pancreas produces little or no insulin, typically developing in childhood or adolescence. It leads to high blood sugar levels and requires lifelong insulin therapy, diet management, and regular exercise. The exact cause is unknown but involves genetic and environmental factors.

Types

b. Type I Diabetes Mellitus (IDDM)

Characteristics:

- Onset typically before 30 years of age.
- Rapid onset of hyperglycemia.
- Failure to respond to oral hyperglycemic agents.
- Tendency toward ketosis.
- Requirement for exogenous insulin.
- Usually seen in individuals with a lean body build, rarely obese.
- Clinical presentation: polyuria, polydipsia, polyphagia, weight loss.

Cause: Destruction of the beta cells of the pancreas, often following an autoimmune response triggered by a viral infection.

Complications: Prone to ketoacidosis when blood glucose levels are elevated.

c. Type II Diabetes Mellitus (NIDDM)

1. **Characteristics:**
   - Onset after age 30.
   - Often associated with obesity or abdominal adiposity.
   - Ability to produce some insulin.
   - Positive response to oral hypoglycemic agents.
2. **Cause:** A combination of insulin resistance and relative insulin deficiency. The exact mechanisms are unknown, but genetic factors play a significant role.

Gestational Diabetes

Characteristics:

- Develops during pregnancy.
- Associated with increased risk of fetal morbidity.
- Usually resolves after childbirth but increases the mother's risk for Type II DM later in life.

Cause: Hormones from the placenta causing insulin resistance.

Etiology

- **Type I DM:** Autoimmunity, environmental factors, beta cell destruction, genetic predisposition.
- **Type II DM:** Influenced by gestational diabetes, prediabetes, high triglycerides, alcohol intake, heredity, lack of exercise, impaired insulin secretion, insulin resistance, obesity.
- **Risk Factors:** Include family history, ethnicity, low HDL cholesterol, high triglycerides, hypertension, sedentary lifestyle, and conditions associated with insulin resistance.

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Pathophysiology

Insulin Deficiency
↓
Rise in Blood Sugar Levels
↓
Gluconeogenesis
↓
Perpetuating Hyperglycemia
↓
Hyperosmolar Diuresis
↓
Dehydration
↓
Electrolyte Loss through Polyuria
↓
Body Compensation with Polydipsia and Polyphagia
↓
Weight Loss Despite Increased Food Intake

Clinical Manifestations

- **Type I DM:** Hyperglycemia, polydipsia, polyuria, polyphagia, weight loss, fatigue.
- **Type II DM:** Hyperglycemia, obesity, polydipsia, polyuria, skin infections, blurred vision, fatigue, risk of non-ketotichyperglycemic state.
- **Prediabetes and Other Symptoms:** Weakness, tingling or numbness in extremities, dry skin, slow-healing sores, recurrent infections, nausea, vomiting, abdominal pain.

Diagnostic Evaluation of Diabetes Mellitus

1. **Blood Glucose Levels**
   - Fasting Plasma Glucose: Levels of 126 mg/dl or more indicate diabetes.
   - Random Plasma Glucose: Levels exceeding 200 mg/dl on more than one occasion.
2. **Oral Glucose Tolerance Test (OGTT)**
   - A 2-hour post-load value in the OGTT ≥ 200 mg/dl.
3. **Urine and Serum Analysis**
   - Presence of ketones in urine or serum.
4. **Lipid Profile**
   - Assessing total cholesterol, high-density lipoproteins (HDL), low-density lipoprotein (LDL), and triglycerides.
5. **Glycosylated Hemoglobin (HbA1c)**
   - Levels greater than 7.5 to 8.0 percent indicate poor blood glucose control over time.
6. **Glycosylated Albumin**
   - Elevated levels indicate poor glucose control.

Management of Diabetes Mellitus

Main Goal

- Normalize insulin activity and blood glucose levels to reduce vascular and neuropathic complications.

Treatment Approach

1. **Diet and Exercise**
2. **Insulin Therapy** for Type 1 DM and, if needed, for Type 2 DM.
3. **Oral Hypoglycemic Medications** for Type 2 DM.
4. **Blood Glucose Monitoring**
5. **Health Education**

Six Components of Management

1. **Insulin Therapy:**
   - Essential for Type 1 DM.
   - Various insulin preparations available, categorized by duration of action: rapid-acting, short-acting, intermediate-acting, long-acting, and very long-acting.
2. **Dietary Management:**
   - Individualized based on body weight, metabolic needs, and activity levels.
   - Emphasis on blood glucose control, blood pressure management, and weight reduction.
3. **Exercise:**
   - Regular exercise improves blood glucose control, reduces body weight, improves lipid levels, and decreases insulin resistance.
4. **Glucose Monitoring:**
   - Regular monitoring of blood glucose levels, especially around exercise and meals.
5. **Medication:**
   - Oral hypoglycemic agents for Type 2 DM, including sulfonylureas and biguanides.
6. **Health Education:**
   - Knowledge about nutrition, medication effects, disease progression, and self-management.

Complications of Insulin Therapy

1. **Local Allergy**
2. **Hypoglycemia**
3. **Lipodystrophy**
4. **Morning Hyperglycemia**
5. **Insulin Edema**
6. **Change in Vision**

Complications of Diabetes Mellitus

a. **Acute Complications**
   1. Hyperglycemic Hyperosmolar Non-Ketotic Syndrome (HHNS)
   2. Diabetic Ketoacidosis (DKA)
   3. Hypoglycemia
   4. Integumentary Complications
   5. Increased Susceptibility to Infections

b. **Chronic Complications**
   - Peripheral vascular disease, cerebrovascular disease, coronary artery disease, retinopathy, nephropathy, peripheral neuropathy, and autonomic neuropathy.

Nursing Diagnosis and Interventions

a. **Nursing Diagnosis**
   1. Altered nutrition.
   2. Fear related to insulin injection.

   3. Knowledge deficit.
   4. Activity intolerance.
   5. Risk for impaired skin integrity.
   6. Ineffective coping.

b. **Nursing Interventions**
   1. **Improving Nutrition:** Assessing dietary habits and providing guidance on individualized meal plans.
   2. **Teaching about Insulin Therapy:** Educating on self-administration, timing, and monitoring.
   3. **Prevention from Injury Secondary to Hypoglycemia:** Monitoring blood glucose levels and educating on hypoglycemia management.
   4. **Improving Activity Tolerance:** Encouraging regular exercise and monitoring physiological responses.

HYPOTHYROIDISM

Definition: Hypothyroidism is a medical condition characterized by a deficiency of thyroid hormone, resulting in a slowed metabolism. This hormone is crucial for regulating metabolic processes and energy consumption in the body.

Causes:

- Congenital factors: Absence or atrophy of the thyroid gland.
- Maternal factors: Iodine deficiency during pregnancy can lead to neurological deficits in infants, a condition known as cretinism.
- Autoimmune disorders: Such as Hashimoto's thyroiditis, where the immune system attacks the thyroid gland.
- Surgical removal or radiation treatment of the thyroid gland.
- Certain medications: Some drugs can interfere with thyroid hormone production.
- Pituitary or hypothalamic disease: Affecting the production of Thyroid-Stimulating Hormone (TSH).
- Chronic iodine deficiency: Leading to insufficient thyroid hormone production.
- External radiation: Exposure to radiation, particularly in the neck area, can damage the thyroid gland.

Incidence: Occurs in about 1 in 4000 infants.

Pathophysiology

1. **Primary Hypothyroidism:** Insufficient thyroid hormone (TH) production despite adequate Thyroid-Stimulating Hormone (TSH).
2. **Secondary Hypothyroidism:** Caused by low TSH/TRH levels, leading to insufficient TH stimulation.
3. **Symptoms:** Due to slowed metabolism and myxedema (non-pitting edema in connective tissues).

Classification

1. **Primary (Thyroprivic) Hypothyroidism:** Idiopathic, Goitrous (Hereditary, Hashimoto's, Iodine deficiency), Post-ablation, Drug-induced, Transient, Infiltrative diseases, Congenital.
2. **Secondary (Trophoprivic) Hypothyroidism:** Pituitary or hypothalamic disorders (e.g., autoimmune disease, tumor, hemorrhage).

Clinical Manifestations

- Hoarse voice
- Jaundice
- Protruded tongue
- Obesity
- Delayed teeth
- Hernia
- Difficulty feeding
- Rough skin
- Open posterior fontanelle
- Delayed milestones.
- Neonates may have cool
- Mottled skin, hypotonic
- Feeding difficulties
- A markedly open posterior fontanelle.

Diagnostic Evaluation

1. **Neonatal Screening:** TSH and T4 levels.
2. **Thyroid Nuclear Scan:** Reduced uptake.
3. **Growth Rate and Bone Age:** Abnormal and delayed.
4. **Blood Studies:** Decreased free T4, elevated TSH, thyroid antibodies in autoimmune thyroiditis

Management

1. **Goal:** Maintain normal thyroid function tests.
2. **Therapy:** Levothyroxine replacement.
3. **Dosage:** Varied according to age and neurological effects.

Complications

- Mental retardation, short stature, growth failure, delayed maturation in untreated cases.

Nursing Management

- **Assessment:** Clinical manifestations, growth patterns, behavioral and developmental assessment.
- **Nursing Diagnosis:** Delayed growth and development, deficient knowledge.

UNIT 6
CHILDHOOD EMERGENCIES

Introduction.

- **Vulnerability of Children:** Children are more susceptible to emergencies due to less developed organ systems and coping mechanisms.

Definition of Child Health Emergency

- Emergencies in children can arise from medical illnesses, accidents, injuries, etc., and require immediate attention to prevent worsening conditions.

ACCIDENTS

Definitions

- **General Definition:** An accident is an unexpected, unplanned event that may cause injury.
- **WHO Definition (1956):** An unpremeditated event resulting in recognizable damage.

Causes of Accidents

1. Ignorance and lack of supervision.
2. Inadequate safety knowledge.
3. Limited past experience.
4. Children's hyperactive and daring nature.
5. Inability to judge danger.
6. Overcrowded and unsafe play areas.
7. Carelessness of parents.
8. Routine changes affecting children's safety.

Prevention of Accidents:

Home Safety

1. **Childproofing:** Secure cabinets, use safety gates, cover electrical outlets, and secure heavy furniture to prevent tip-overs.
2. **Safe Sleep Environment:** Use cribs with appropriate standards, avoid loose bedding, and follow safe sleep practices to prevent sudden infant death syndrome (SIDS).
3. **Water Safety:** Supervise children near water bodies, including bathtubs. Install barriers around pools and teach children to swim.
4. **Prevent Falls:** Use window guards, keep floors free of tripping hazards, and supervise children on playgrounds.
5. **Kitchen Safety:** Keep children away from hot surfaces and appliances, store sharp objects and toxic substances out of reach.
6. **Fire Safety:** Install smoke detectors, practice fire drills, and keep fire extinguishers accessible.

Road and Vehicle Safety

1. **Car Seats and Booster Seats:** Use age- and size-appropriate car seats and booster seats, and ensure they are installed correctly.
2. **Pedestrian Safety:** Teach children about crossing streets safely, wearing reflective clothing, and being aware of their surroundings.

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3. **Bicycle Safety**: Encourage wearing helmets and protective gear, and teach road safety rules.

In a Pediatric Setting

1. **Safe Medical Practices**: Ensuring that medical equipment is child-proof and that medications are stored securely and administered correctly.
2. **Infection Control**: Regular handwashing, sanitizing toys and surfaces, and following protocols to prevent the spread of infection.
3. **Supervised Play Areas**: Creating safe play areas within pediatric facilities, free from small or sharp objects and with appropriate supervision.

Poison Prevention

1. **Safe Storage of Chemicals and Medications**: Store medicines, cleaning supplies, and potentially toxic substances in locked cabinets or out of children's reach.
2. **Education**: Teach children about the dangers of ingesting unknown substances.

Education and Training

1. **First Aid and CPR**: Parents and caregivers should be trained in first aid and CPR for emergencies.
2. **Safety Education**: Regularly educate children about safety practices in an age-appropriate manner.

General Safety

1. **Supervision**: Constant and attentive supervision is crucial, especially for younger children.
2. **Safe Clothing**: Dress children in appropriate clothing for their activities, avoiding loose-fitting clothes that can be caught in objects.

Regular Health Check-ups

1. **Pediatric Visits**: Regular visits to the pediatrician to ensure overall health and development.

Outdoor Safety

1. **Sun Protection**: Use sunscreen and protective clothing to prevent sunburn.
2. **Insect Protection**: Use insect repellent and protective clothing in areas with high insect activity.

POISONING IN CHILDREN

Definition

- **Poison:** A substance capable of causing illness or death when introduced or absorbed.
- Children often taste everything they find.
- Poisoning can occur through ingestion, inhalation, or skin contact.

Incidence and Etiology

1. Poisoning is common in young children.
2. Children under 5 years are most at risk.
3. High incidence of poisoning in grandparents' homes.

Risk Factors

1. Children aged 1 to 3 years.
2. Children from low socioeconomic backgrounds.
3. Residing in older houses, large families, or metropolitan areas.
4. Lack of supervision.

Common Poisons

1. **Medications:** Acetaminophen, Aspirin, Narcotics.
2. **Household Products:** Toilet cleaner, laundry pods, kerosene oil, caustic soda.
3. **Pesticides:** Glue, paint thinners, fertilizers, insecticides.
4. **Household Plants:** Daffodils, Dumb cane, Foxglove, Lilies, Oleander, Hydrangea.
5. **Personal Care Products:** Nail polish remover, perfumes.
6. **Batteries:** Watches, calculators, remotes.

Clinical Manifestations of Poisoning

1. **Signs Based on Poison Type:**
   - Mouth irritation, presence of pills in the mouth.
   - Dizziness, lethargy, cyanosis, burns.
2. **Gastrointestinal Symptoms:** Anorexia, vomiting, diarrhea, abdominal pain.
3. **Neurological Symptoms:** Convulsions, unconsciousness.

Medical Management of Poisoning

1. **GI Tract Decontamination:** Identify the poisonous substance and its dosage.
2. **Recognizable Poison Syndromes:** Conduct a full neurological assessment if poisoning is suspected.
3. **Resuscitation:** Address cardiac arrest, airway injury, decreased level of consciousness, oxygenation/ventilation needs.
4. **Removal of Poisonous Substance:** Detoxify the ingested poison.
5. **Eye Decontamination:** Irrigate eyes with normal saline or water for 30 minutes.
6. **Skin Decontamination:** Remove contaminated clothing, irrigate the body with normal saline. Avoid water in case of exposure to sodium and phosphorus; use mineral oil instead.
7. **Emesis (Inducing Vomiting):** Administer syrup of ipecac followed by water, but avoid if petroleum distillates or caustic chemicals are ingested, or if the child is unconscious.
8. **Gastric Lavage:** Perform with normal saline in cases of rapid absorption, unconsciousness, or failure to vomit after ipecac.
9. **Absorbent Administration:** Use activated charcoal with water or a cathartic.
10. **Emergency Management:** Follow instructions from poison control centre or healthcare provider.
11. **Supportive Care:** Based on the specific poison ingested and the child's condition.
12. **Management of Cutaneous/Ocular Exposure:** Remove contaminated clothing, flush with water, treat burns, and refer to an ophthalmologist.
13. **Antidote Therapy:** Utilize antidotes to reduce absorption of toxic components.

Nursing Management

1. **Initial Assessment**
   a) **Route of Exposure:**
      a. **Oral Ingestion:** Check for signs of swallowing foreign objects.
      b. **Topical Contact:** Inspect skin or eyes for contact with foreign bodies.
      c. **Inhalation:** Assess for breathing difficulties indicating inhaled objects.
   b) **Time Since Exposure:**
      a. Determine the time elapsed since exposure.
      b. Note any first aid already administered.

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c) **Child's Condition:**
   a. **Airway:** Ensure it is clear and unobstructed.
   b. **Breathing:** Assess breathing rate and ease.
   c. **Circulation:** Check heart rate and blood circulation.
   d. **Level of Consciousness:** Observe alertness and responsiveness.
   e. **Other Symptoms:** Look for any additional signs of distress.
d) **Type and Amount of Substance:**
   a. Identify the substance involved.
   b. Estimate the quantity of exposure, if possible.
e) **Child's Age and Weight:** Note the child's age and approximate weight for treatment considerations.
f) **Vital Signs and Consciousness Level:**
   a. Obtain and record vital signs.
   b. Note the level of consciousness.
g) **Signs of Chemical Burning:** Record any signs of chemical burns, especially on the lips.
h) **Examination of Vomitus:** Examine any vomitus for the presence of pills or other foreign objects.

2. **Prevention Measures**
   a) **Secure Storage of Poisonous Substances:** Store poisons under lock and key, out of children's reach.
   b) **Medication Safety:** Keep medications in secure locations, away from children.
   c) **Product Containers:**
      a. Retain original packaging for all products.
      b. Avoid using food or drink containers for storing poisonous substances.
   d) **Communication:** Never refer to medicine as "candy" to avoid confusion.
   e) **Supervision:** Never leave toddlers or young children unsupervised.
   f) **Emergency Preparedness:** Be prepared with a plan for emergency situations.

FOREIGN BODIES

1. **Higher Risk in Children**
   a) Children are particularly susceptible to foreign body aspiration. This is due to their natural curiosity and tendency to explore objects by putting them in their mouth.
   b) **Entry Points for Foreign Bodies**
      a. Foreign bodies can enter the body through various openings such as:
      b. **Nostrils:** Small objects easily fit into the nostrils.
      c. **Eyes:** Particles like dust or tiny objects can enter the eyes.
      d. **Ears:** Small items can be inserted into the ears.
2. **Risks of Delayed Removal**
   a) If a foreign body is not removed promptly, it can cause further injury. This happens when the object penetrates deeper into the body, possibly through the skin.
   b) **Infection Risks**

      a. Foreign bodies are often contaminated with dirt and bacteria. This contamination increases the risk of infection, especially with injuries involving penetrating objects.
   c) **Severity of the Condition**
      a. The seriousness of foreign body injuries can vary.
      b. **Minor Ailments:** Small splinters might cause minor lacerations.
      c. **Severe Cases:** Foreign bodies in the throat, or large embedded objects, can cause deep wounds and even be life-threatening for children.
3. **Commonly Aspirated Items by Children**
   a) Items that children often accidentally swallow or inhale include:
      a) Buttons
      b) Seeds
      c) Marbles
      d) Beads
      e) Food Particles
      f) Coins

FOREIGN BODY IN THE EYE:

1. The eyes are highly sensitive and vulnerable to foreign bodies.
2. Deep penetration by a foreign body can lead to:
   a. **Loss of Vision:** Permanent damage to sight.
   b. **Infection:** Risk of developing an eye infection.
   c. **Perforation of Eyeball:** A serious condition requiring immediate medical attention.

Signs and Symptoms of a Foreign Body in the Eye

1. **Pain:** Discomfort or pain in the affected eye.
2. **Inflammation:** Possible swelling or redness in the eye area.

Common Foreign Bodies in the Eye: Typical foreign bodies include:

1. **Dust Particles**
2. **Grit**
3. **Loose Eyelashes**

Location and Effects: These often stick to the outer surface of the eyelid, usually the upper lid, causing:

1. **Discomfort**
2. **Inflammation**

Removal in Adolescents vs. Infants

- Removal is relatively easier in adolescents.
- In infants, removal is more challenging due to their smaller eye size and difficulty in staying still.

Prevention and Management

1. **Prevent Future Incidents:** Educate about eye safety and proper eye care.
2. **Avoid Secondary Complications:** Never attempt to remove a foreign body from the colored part of the eye or if it's embedded in the eyeball.
3. **Avoiding Further Damage:** Seek professional medical help for removal to prevent further injury.

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FOREIGN BODY IN THE EAR:

Foreign bodies in the ear are common occurrences, especially in children. They can range from harmless objects to those causing significant discomfort and potential damage.

Signs and Symptoms

- **Pain or Discomfort:** Often the first indication of a foreign body.
- **Hearing Loss:** Partial or complete, depending on the size and location of the object.
- **Discharge:** Oozing of fluid if infection or irritation occurs.
- **Inflammation:** Redness or swelling in the ear canal.
- **Dizziness or Nausea:** In rare cases, if the foreign body affects the inner ear.

Common Objects Found in Ears

- Beads
- Small Toys or Toy Parts
- Food Particles (e.g., seeds)
- Insects
- Cotton Swabs Tips

Diagnostic Evaluation

1. **Visual Inspection:** Using an otoscope, a doctor can look into the ear to identify the foreign body.
2. **Audiometry Test:** If hearing loss is suspected.
3. **X-Ray or CT Scan:** In cases where the object is not easily visible or to assess deeper impact.

Management

1. **Do Not Probe:** Avoid inserting anything into the ear as it may push the object further in or cause damage.
2. **Medical Assistance:** Seek professional medical help for safe removal.
3. **Insect in Ear:** If an insect is in the ear, tilting the head and gently flushing the ear with warm (not hot) water can help float the insect out. Avoid this method if there's any ear injury or tympanic membrane perforation.
4. **Prevention Education:** Educate children and caregivers about the dangers of inserting objects into the ears.
5. **Follow-Up:** A follow-up visit may be necessary to ensure no residual damage or infection.

FOREIGN BODY IN THE NOSE:

Foreign bodies in the nose are a common occurrence, particularly among young children. They can cause discomfort and, in some cases, lead to complications if not addressed promptly.

Signs and Symptoms

- **Nasal Discharge:** One-sided, possibly foul-smelling if infection develops.
- **Blockage of Airflow:** Difficulty in breathing through one nostril.
- **Pain or Discomfort:** Especially in the nostril where the object is lodged.
- **Bleeding:** May occur if the foreign body causes irritation or injury inside the nose.
- **Sneezing:** Frequent sneezing as the body tries to expel the foreign object.

Common Objects Found in the Nose

- Small Toys or Toy Parts
- Food Pieces
- Beads
- Tissue Paper
- Small Household Items

Diagnostic Evaluation

1. **Physical Examination:** A doctor will visually inspect the nose, often using a nasal speculum for a better view.
2. **X-Ray:** Rarely required, but may be used if the object is not visible or to assess the depth of insertion.

Management

1. **Do Not Probe:** Avoid trying to remove the object with fingers or other tools, as this can push it further in.
2. **Professional Removal:** Seek medical attention for safe and effective removal.
3. **Blowing the Nose:** If the object is not deeply embedded, gently blowing the nose can help dislodge it. This should be done under medical supervision.
4. **Avoid Supine Position:** Keeping the head elevated can prevent the object from moving further back.
5. **Preventive Measures:** Educating children and caregivers on the risks of putting objects in the nose.

FOREIGN BODY IN THE THROAT:

Foreign bodies in the throat are a serious concern, especially in children, as they can lead to choking, obstruction of the airway, and other complications.

Signs and Symptoms

- **Difficulty Swallowing or Breathing:** Indicates blockage in the throat.
- **Coughing or Gagging:** Reflex actions to clear the throat.
- **Voice Changes:** Hoarseness or loss of voice if the vocal cords are affected.
- **Pain or Discomfort:** Felt in the throat or neck area.
- **Drooling:** Inability to swallow saliva.
- **Panic or Anxiety:** Especially in children who might be unable to explain their discomfort.

Common Objects Found in the Throat

- Food Items (e.g., large pieces of meat, bones)
- Toys or Small Household Items
- Coins
- Marbles
- Batteries (particularly dangerous due to chemical leakage)

Diagnostic Evaluation

1. **Physical Examination:** Checking for visible signs of obstruction.
2. **X-Ray or Imaging:** To locate the foreign body if not visible.
3. **Laryngoscopy:** A procedure to view the throat more clearly, especially for objects lodged near the vocal cords.

Management

1. **Heimlich Maneuver:** For individuals who are choking and cannot breathe, cough, or speak.
2. **Medical Intervention:** If the object is not expelled by coughing or the Heimlich Maneuver, immediate medical attention is required.
3. **Do Not Induce Vomiting:** This can cause further complications.
4. **Surgical Removal:** In some cases, removal may require surgical intervention.
5. **Prevention:** Educate about the dangers of swallowing non-food items, and supervise children during eating.

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HEMORRHAGE

Definition: Hemorrhage, also spelled as "haemorrhage" in some regions, refers to the excessive bleeding or the escape of blood from blood vessels, typically from damaged or ruptured blood vessels.

It can occur internally within the body (internal hemorrhage) or externally (external hemorrhage). Hemorrhages can vary in severity, from minor bleeding that stops on its own to life-threatening and severe bleeding that requires immediate medical attention.

Causes of Hemorrhage

1. **Traumatic Bleeding:** Resulting from injuries, such as:
   - **Abrasion:** Superficial damage, not penetrating below the epidermis.
   - **Excoriation:** Skin destruction, often with an underlying medical cause.
   - **Hematoma:** Blood collection under the skin due to vessel damage.
   - **Laceration:** Irregular wound from blunt impact.
   - **Incision:** Surgical cut in body tissue.
   - **Puncture Wound:** Penetration by a sharp object.
   - **Contusion:** Bruising from blunt trauma.
   - **Crushing Injury:** Damage from prolonged, intense force.
   - **Ballistic Trauma:** Injury from projectiles like bullets.
2. **Medical Conditions:**
   - **Intravascular Changes:** Like increased blood pressure or decreased clotting factors.
   - **Intramural Changes:** Changes within blood vessel walls, e.g., aneurysms.
   - **Extravascular Changes:** External factors, e.g., infections or tumors.

Grading of Hemorrhage

1. **Grade 0:** No bleeding.
2. **Grade 1:** Petechial bleeding (small red or purple spots).
3. **Grade 2:** Mild blood loss.
4. **Grade 3:** Gross blood loss that requires transfusion.
5. **Grade 4:** Debilitating blood loss associated with fatality.

Types of Hemorrhage

1. **According to the Vessels Involved**
   a) **Arterial Hemorrhage:**
      a. **Characteristics:** Bright red blood, spurting in rhythm with the heartbeat.
      b. **Severity:** Rapid blood loss, potentially more severe than venous bleeding.
   b) **Capillary Hemorrhage:**
      a. **Characteristics:** Darkish red blood oozing over the surface.
      b. **Duration:** Prolonged oozing over several hours, leading to considerable blood loss.
   c) **Venous Hemorrhage:**
      a. **Characteristics:** Dark red blood, steady flow without spurting.
      b. **Rate of Loss:** Slower compared to arterial bleeding.
2. **According to the Time of Wound**
   a) **Primary Hemorrhage:**
      a. **Occurrence:** Immediate bleeding upon vessel damage, e.g., cuts or surgical incisions.
   b) **Reactionary or Intermediate Hemorrhage:**

      a. **Timing:** Within the first 24 hours post-operation.
      b. **Likelihood:** More common in severe operations and after circulatory collapse recovery.
   c) **Secondary Hemorrhage:**
      a. **Cause:** Often due to bacterial infection or enzyme action.
      b. **Indication:** Blood on dressing, risk of larger vessel erosion.
3. **According to Clinical Classification**
   a) **Revealed Hemorrhage:**
      a. **Visibility:** Bleeding is externally visible.
   b) **Concealed Hemorrhage:**
      a. **Location:** Bleeding into body cavities, hollow organs, or tissues.
      b. **Indicators:** May become apparent through vomiting, rectal passage, or external bruising and swelling.

Clinical Manifestations of Hemorrhage

1. **Early Signs and Symptoms**
   - **Restlessness:** Due to discomfort or pain.
   - **Coldness:** Reduced blood flow leading to a drop in body temperature.
   - **Low Blood Pressure (BP):** Due to decreased blood volume.
   - **Anxiety:** A response to the stress of the situation.
   - **Slightly Increased Pulse:** Compensatory mechanism to maintain blood flow.
   - **Pallor:** Reduced blood flow leading to pale skin.
   - **Thirst:** Body's response to fluid loss.
2. **Severe Hemorrhage Symptoms**
   - **Rapid Thready Pulse:** Weak and fast heart rate.
   - **Extreme Pallor:** Very pale skin indicating significant blood loss.
   - **Low Blood Pressure:** Further drop due to severe blood loss.
   - **Extreme Thirst:** Intensified need for fluids.
   - **Air Hunger:** Difficulty breathing or feeling of suffocation.
   - **Temperature Drop to 97°:** Hypothermia due to blood loss.
   - **Diminished Urine Volume:** Due to decreased kidney perfusion.
   - **Blindness and Tinnitus:** Signs of severe systemic compromise.
   - **Coma Prior to Death:** Final stage of severe hemorrhage.
3. **For External Hemorrhage**
   - **Pad and Bandage:** This involves applying a pad (a piece of absorbent material) directly on the wound and securing it with a bandage. This exerts pressure on the wound, helping to control the bleeding.
   - **Digital Pressure:** Applying pressure with fingers on a blood vessel that supplies blood to the area of injury, particularly useful in controlling bleeding from neck wounds by pressing against blood vessels feeding the area.
   - **Elevation of Limb:** Lifting an injured limb above the heart level to reduce blood flow to the area, thus controlling bleeding, especially effective for venous (from veins) hemorrhage.
   - **Application of Tourniquet:** Tying a band tightly around a limb above the site of heavy bleeding to stop the blood flow. It's a last-resort method for uncontrollable bleeding, noting the time of application due to risks of tissue damage if used for too long.

- **Surgical Ligation**: Involves surgically tying off blood vessels to stop bleeding when other methods fail.
- **Coagulation**: Using various methods (like applying heat, chemicals, or electric current) to cause blood to clot in smaller vessels.

4. **For Internal Hemorrhage**
   - **Clearing Blood Clots**: Surgically or medically removing clots from an organ to restore its function.
   - **Vessel Contraction**: Using substances like adrenaline in saline or sodium bicarbonate solution to induce blood vessels to contract, reducing bleeding.
   - **Packing**: Placing adrenaline-soaked gauze inside the body to promote clotting and control internal bleeding.
   - **Surgical Ligature**: Similar to external ligation, but performed internally, such as tying off a ruptured spleen's blood vessels.
   - **Internal Pressure**: Employing devices like balloon catheters to apply pressure from within to stop bleeding, used in specific conditions like esophageal varices or after a prostatectomy.
5. **For Minor Bleeding (such as bruises)**
   - **Rest**: Avoid using the injured area to prevent further damage.
   - **Ice**: Applying cold reduces swelling and numbs the area, decreasing pain.
   - **Compression**: Wrapping the area with an elastic bandage to apply gentle pressure, helping to control swelling and bleeding.
   - **Elevation**: Keeping the injured area elevated above the heart level to reduce blood flow and swelling.

NURSING MANAGEMENT FOR HEMORRHAGE IN CHILDREN

1. **General Assessment and Monitoring**
   - **Vital Signs:** Assess heart rate, blood pressure, peripheral pulse, and respiration.
   - **Capillary Refill Time:** Check for circulation efficiency.
   - **Oxygen Saturation and Arterial Blood Gases:** Monitor for respiratory and metabolic status.
   - **Consciousness Level:** Observe for any changes in alertness.
   - **Skin:** Assess color and temperature.
   - **For External Hemorrhage**
2. **Initial Care:**
   - Clean the area with a clean cloth.
   - Apply pressure to reduce blood loss.
   - Position the child for comfort and pain reduction.
   - Elevate the affected limb.
   - Provide fluids for fluid and electrolyte balance.
   - Apply pressure again if bleeding continues.
   - Reassure the child and their parents.
3. **For Internal Hemorrhage**
   - Position the child comfortably.
   - Assess the hemorrhage site.
   - Avoid direct pressure on the area.
   - Do not give oral intake if GI bleeding is suspected.

- Turn the child's head for secretion removal.
- Maintain warmth with a thin blanket.
- Avoid applying ice or heat to chest or abdomen.
- Create a calm environment.
- Provide psychological support to the child and family.

BURNS

DEFINITION: A burn is a type of injury to the skin or other body tissues caused by exposure to heat, electricity, chemicals, friction, or radiation.

Burns are characterized by damage to the affected tissues, often resulting in pain, swelling, blistering, and potential complications depending on the severity of the burn.

Serious Burns

- **Partial-Thickness Burns:** 12% to 15% or more of body surface area.
- **Full-Thickness Burns:** Deeper and more severe.
- **Critical Areas:** Face, hands, feet, perineum, joint surfaces.
- **Electrical Burns:** Require special attention due to their unique damage.
- **Burns with Other Injuries:** Complicate treatment and recovery.
- **Non-Home Treatable Burns:** Any burn that requires professional medical care.

Incidence and Risk Factors

- **Third Leading Cause of Accidental Deaths:** Highest in children under age 6.
- **High-Risk Groups:** Lower socioeconomic status, single-parent families, but all children are at risk.

Causes of Burn

Hot Liquid Burns

1. **Common in Young Children:** Especially under age 3.
2. **Tap Water Temperature Risks:**
   a. **120°F (48.9°C):** Can cause full-thickness injury in 30 seconds.
   b. **155°F (68.3°C):** Causes full-thickness injury in 1 second in children.
3. **Situations Leading to Burns:**
   a. Child unsupervised in a tub with hot water.
   b. Placement in a tub of untested hot water.
   c. Spills of hot liquids like coffee or tea.
   d. Ingestion/aspiration of hot foods and liquids.

Flame Injury

1. **Scalds:** Leading cause of burn injury in children.
2. **Sources of Flame Burns:**
   a. House fires.
   b. Ignited clothing from climbing on stoves.
   c. Children playing with lighters (ages 3-10).
   d. Contact with gasoline.
   e. Automobile accidents with fire.
   f. Juvenile fire-setting behaviors.

Electrical Injury

1. **Common in Toddlers and Adolescents:**
   a. Playing with electrical outlets or appliances.
   b. Biting through extension cords.

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- **Partial-Thickness Burns:** 12% to 15% or more of body surface area.
- **Full-Thickness Burns:** Deeper and more severe.
- **Critical Areas:** Face, hands, feet, perineum, joint surfaces.
- **Electrical Burns:** Require special attention due to their unique damage.
- **Burns with Other Injuries:** Complicate treatment and recovery.
- **Non-Home Treatable Burns:** Any burn that requires professional medical care.

Incidence and Risk Factors

- **Third Leading Cause of Accidental Deaths:** Highest in children under age 6.
- **High-Risk Groups:** Lower socioeconomic status, single-parent families, but all children are at risk.

Causes of Burn

Hot Liquid Burns

1. **Common in Young Children:** Especially under age 3.
2. **Tap Water Temperature Risks:**
   a. **120°F (48.9°C):** Can cause full-thickness injury in 30 seconds.
   b. **155°F (68.3°C):** Causes full-thickness injury in 1 second in children.
3. **Situations Leading to Burns:**
   a. Child unsupervised in a tub with hot water.
   b. Placement in a tub of untested hot water.
   c. Spills of hot liquids like coffee or tea.
   d. Ingestion/aspiration of hot foods and liquids.

Flame Injury

1. **Scalds:** Leading cause of burn injury in children.
2. **Sources of Flame Burns:**
   a. House fires.
   b. Ignited clothing from climbing on stoves.
   c. Children playing with lighters (ages 3-10).
   d. Contact with gasoline.
   e. Automobile accidents with fire.
   f. Juvenile fire-setting behaviors.

Electrical Injury

1. **Common in Toddlers and Adolescents:**
   a. Playing with electrical outlets or appliances.
   b. Biting through extension cords.

c. Contact with high-tension wires or lightning.

Other Causes

1. **Chemical Burns:**
   a. Caustic acid or alkali ingestion.
   b. Contact with chemical agents.
2. **Neglect or Abuse-Related Burns:** Immersion and contact burns.
3. **Inhalation Burns:** From combustion products of synthetics.
4. **Radiation Burns:** Sunburn, radiation therapy.
5. **Contact Burns:** From hot surfaces like radiators or ovens.
6. **Fireworks Burns:** Due to misuse and lack of supervision.
7. **Friction Burns:** From exercise treadmills.

Pathophysiology of Burns

Burn Wound Formation: Contact with energy source
|
Blood Flow Increase: To area around the wound
|
Release of Vasoactive Substances: ↑ Capillary Permeability
|
Fluid Shift: Causes Edema and Hypovolemia
|
Response to Burn Injury: Depends on size
|
Localized for Smaller Burns
|
Systemic for Extensive Burns
|
Effect on Body Systems: Extensive Burns Affect All Major Systems

Clinical Manifestations

1. **Partial Thickness Burns**
   - **Symptoms:** Include redness, pain at the burn site, and the development of blisters filled with clear fluid.
   - **Healing:** These burns can heal on their own within days to weeks, thanks to the body's ability to regenerate the damaged skin layers without the need for skin grafts.
2. **Full Thickness Burns**
   - **Appearance**: The skin may look white, waxy, charred, or leathery.
   - **Sensation**: There may be numbness or a complete loss of sensation due to nerve damage.
   - **Healing**: These burns usually cannot heal by themselves and often require surgical interventions, such as skin grafting, to close the wound and minimize scarring.
   - **Scarring**: Can be extensive, potentially affecting the appearance and function of the affected area.

Systemic Changes Due to Burn Injuries

Vascular Alterations

- **Edema**: Burns can increase capillary permeability, leading to fluid and protein leakage into tissues, which causes swelling (edema).

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- **Circulatory Changes**: The body's response to fluid loss (hypovolemia) can alter blood pressure and cardiac output, potentially leading to shock.
- **Thrombosis Risk**: The risk of blood clot formation increases due to the hypercoagulable state triggered by the burn injury.

Systemic Response

- **Metabolic Rate**: Burns can cause an increase in the body's metabolic rate and oxygen needs.
- **Inflammatory Response**: The release of cytokines and other inflammatory mediators can lead to a systemic inflammatory response, which may escalate to sepsis, multiple organ dysfunction syndrome (MODS), or acute respiratory distress syndrome (ARDS) in severe cases.
- **Nutritional Needs**: The increased metabolic demands can lead to nutritional deficiencies and muscle wasting, emphasizing the need for adequate nutritional support during recovery.

Classification of Burn Depth

Classification	Former Classification	Areas Involved	Appearance	Sensitivity	Healing Time
Partial-thickness (Superficial)	1°	Epidermis, papillae of dermis	Bright red to pink, blanches to touch, serum-filled blisters	Sensitive to air, temperature, and touch; pressure may be painful	7-10 days
Partial-thickness (Deep)	2°	Epidermis, 1/2 to 7/8 of dermis, appendage usually present	Glistening, moist; blisters may be present; pink to light red to white; soft and pliable, blanching present	Pain from exposed nerve endings	14-21 days; may need grafting
Full-thickness	3°-4°	Epidermis, dermis, tissue, muscle, bone	Snowy white, grey, or brown; texture is firm and leathery, inelastic	No pain as nerve endings are destroyed, unless surrounded by partial-thickness burns	

Relative Percentage of Body Surface Area by Age

Area of Body	0-1 Years	1-4 Years	5-9 Years	10-15 Years	Adult
Head	19%	17%	13%	13%	7%
Neck	2%	2%	2%	2%	2%

Anterior Trunk	13%	13%	13%	13%	13%
Posterior Trunk	13%	13%	13%	13%	13%
Right Buttock	2%	2%	2%	2%	2%
Left Buttock	2%	2%	2%	2%	2%
Genitalia	1%	1%	1%	1%	1%
Right Upper Arm	4%	4%	4%	4%	4%
Left Upper Arm	4%	4%	4%	4%	4%
Right Lower Arm	3%	3%	3%	3%	3%
Left Lower Arm	3%	3%	3%	3%	3%
Right Hand	2%	2%	2%	2%	2%
Left Hand	2%	2%	2%	2%	2%
Right Thigh	5%	6%	8%	8%	9%
Left Thigh	5%	6%	8%	8%	9%
Right Lower Leg	5%	5%	6%	6%	7%
Left Lower Leg	5%	5%	6%	6%	7%
Right Foot	3%	3%	3%	3%	3%
Left Foot	3%	3%	3%	3%	3%

Assessment

1. **Rule of Nines**
   - **Adults:** Commonly used in adults but not exact for children.
   - **Children over 10:** May be acceptable.
   - **Lund and Browder Chart:** Recommended for hospital use due to age-based adjustments.
2. **Age-Related Surface Area Variations**
   - Proportion of body surface area varies by age; the head constitutes a greater surface area in younger children.
3. **Palm Method for Rough Estimate:** The child's hand (palm and fingers extended) represents approximately 1% of TBSA.

Diagnostic Evaluation

1. **Blood Tests:** Electrolytes, blood urea nitrogen, serum protein, albumin, arterial blood gases.
2. **Urine Analysis:** Specific gravity and hemochromogen.
3. **X-ray:** To assess additional injuries or complications.
4. **Wound Culture:** To detect and treat infections.

Schematic Classification of Burn Severity

1. **Minor Burn:**
   - ≤10% TBSA; first and second-degree burns.
2. **Moderate Burn:**
   - 10-20% TBSA; second-degree burns.
   - 2-5% TBSA; third-degree burns not involving critical areas.
3. **Major Burn:**
   - ≥20% TBSA; second-degree burns.
   - 10% TBSA; third-degree burns (5% in some child cases).

   - Involving hands, face, eyes, ears, feet, genitals, electrical burns, complicated by fractures or other trauma, or in poor-risk patients.

Medical Management

1. **Water-Based Treatment:** Ultrasound mist therapy for wound cleaning and stimulation.
2. **Intravenous (IV) Fluids:** To prevent dehydration.
3. **Analgesics:** Morphine for pain management.
4. **Burn Creams and Ointments:** Silver sulfadiazine for wound care.
5. **IV Antibiotics:** To prevent or treat infections.
6. **Tetanus Shot:** As a preventive measure.

Nursing Assessment

1. **Emergency Assessment**
   - Check airway, breathing, and circulation.
   - Assess the size and depth of burns and look for other injuries.
2. **Injury History:** Gather details about the incident, including the environment and supervision at the time of injury.
3. **Medical History:** Review past health issues, immunizations, and any allergies.
4. **Pain and Emotional Assessment:** Evaluate pain levels and provide comfort.
5. **Focused Assessment:** Monitor fluid balance and check the burn wound for signs of infection.
6. **Sepsis Vigilance:** Look for signs of sepsis and confirm with laboratory markers and cultures.

Nursing Management of Burns in Children

Minor Burns

1. **Initial Care**
   - Cleanse and debride the wound, apply appropriate topical treatments.
   - For chemical burns, irrigate with water for at least 20 minutes.
2. **Tetanus Immunization:** Follow standard protocols for tetanus prevention.
3. **Pain Management:** Administer IV morphine followed by oral pain relief as needed.
4. **Health Education:** Instruct caregivers on wound care and signs of infection.

Emergency Department Management

1. **Initial Steps**
   - Reassess airway, breathing, circulation, and address immediate trauma needs.
   - Begin fluid resuscitation and insert necessary catheters and tubes.
   - Conduct baseline lab studies and manage pain.
2. **Optimizing Gas Exchange**
   - Monitor for respiratory issues and provide humidified oxygen.
   - Be prepared for ventilation support and conduct necessary respiratory tests.
3. **Psychological Support:** Provide emotional support and encourage family involvement in care.
4. **Gastrointestinal Care**
   - Monitor for gastric distension and use NG tubes to prevent complications.
   - Administer medications like H2-blockers to prevent stress ulcers.
5. **Peripheral Perfusion:** Remove any constrictions and monitor circulation, preparing for escharotomy if needed.
6. **Fluid Balance:** Adjust fluid intake based on the child's needs and monitor for signs of fluid overload.

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DROWNING

Definition of Drowning

Drowning happens when a person can't breathe because their airway is underwater, which can lead to suffocation and death if not quickly addressed.

Categories of Drowning

- **Category A**: The child is awake and conscious.
- **Category B**: The child is drowsy, has trouble breathing, looks blue, and may be cold.
- **Category C**: The child shows very low reflexes, confusion, may have seizures, or be in a coma.

Stages of Drowning

1. **Surprise**: Fear and a vertical position in water with limited movement.
2. **Involuntary Breath Holding**: Unable to make sound or breathe.
3. **Unconsciousness**: Loss of consciousness due to oxygen shortage.
4. **Hypoxic Convulsions**: Blue skin due to lack of oxygen.
5. **Chemical Death**: Heart and breathing stop due to lack of oxygen to vital organs.

Pathophysiology of Drowning

1. Involves low oxygen, high carbon dioxide, slow heartbeat, and abnormal heart rhythms.
2. Struggling in water can cause acid buildup, fast heartbeat, and water inhalation.
3. Lack of oxygen and acid buildup lead to unconsciousness and possible death.
4. Different types of water (fresh or salt) affect the lungs differently.

Clinical Manifestations

1. Symptoms include difficulty breathing, blue skin, coughing up pink frothy sputum, abnormal lung sounds, and wheezing.
2. May also have heart issues, low body temperature, restlessness, seizures, vomiting, and bloating.

Assessment of Drowning Incidents

- Monitoring blood gases to check oxygen, carbon dioxide, and acid levels.
- Continuous monitoring is essential, including vital signs, blood gases, heart monitoring, brain pressure, electrolytes, fluid balance, and lung imaging.

Management of Drowning Incidents

- **Immediate Management**: Prioritize airway, breathing, and circulation. Start CPR immediately if needed and aim to prevent low oxygen, acid buildup, and low body temperature.
- **Medications**: May include sodium bicarbonate for acidosis, bronchodilators, diuretics for lung water, relaxants, and benzodiazepines for seizures.
- **Treating Low Blood Pressure and Low Body Temperature**: Use drugs to help heart function and various methods to warm up the body.
- **Supportive Therapy**: Focus on supporting the brain, heart, and lungs, possibly using mechanical ventilation.
- **Endotracheal Intubation**: Helps with oxygenation and prevents water from entering the lungs.
- **Nasogastric Intubation**: Prevents vomiting and aspiration.

PLS (AHA Guidelines)

The Advanced Life Support (ALS) protocol is a comprehensive approach to the management of cardiac arrest, emphasizing the importance of high-quality CPR and rapid, specific interventions

based on the identified cardiac rhythm. Here's an overview of the ALS process according to the details you've provided:

Identify Cardiac Arrest

- Confirm the absence of responsiveness and normal breathing.

Begin CPR

- **Compressions:** 30:2 ratio for a single rescuer and 15:2 for two rescuers.
- **Rate:** At least 100 compressions per minute but less than 120.
- **Depth:** Compressions should depress the chest by more than one-third of its depth.
- **Rotation:** Change the person performing compressions every 2 minutes to maintain quality.
- **Ventilation:** If possible, use supplemental oxygen and waveform capnography to guide ventilation.
- Continue CPR for 2-minute cycles.

Shockable Rhythms

- **Defibrillation:** Start at 2 joules/kg and increase to more than 4 joules/kg, with a maximum of 10 joules/kg for subsequent shocks.
- **Post-Defibrillation:** Immediately resume CPR for 2 minutes before re-assessing the rhythm.
- **IV/IO Access:** Establish as soon as possible for medication administration.
- **Epinephrine:** Administer 0.01 mg/kg (0.1 ml/kg of 1:10,000 concentration) every 3-5 minutes.
- **Amiodarone or Lidocaine:** Amiodarone 5 mg/kg (up to two repeats) or lidocaine 1 mg/kg as antiarrhythmic agents.

Non-Shockable Rhythms

- **CPR:** Immediately commence or continue CPR upon identification.
- **IV/IO Access:** Secure as promptly as feasible for drug delivery.
- **Epinephrine:** Give 0.01 mg/kg (0.1 ml/kg of 1:10,000) every 3-5 minutes during resuscitation efforts.

Search for and Treat Reversible Causes

Address the "Hs and Ts":

- **Hypovolemia**: Ensure adequate fluid volume.
- **Hypoxia:** Provide adequate oxygenation.
- **Hydrogen ion (acidosis)**: Correct acid-base imbalances.
- **Hypo/Hyperkalemia**: Address potassium level abnormalities.
- **Hypothermia**: Warm the patient if needed.
- **Tension Pneumothorax**: Decompress if present.
- **Cardiac Tamponade**: Consider pericardiocentesis if indicated.
- **Toxins**: Identify and treat poisoning or overdose.
- **Thrombosis:** Look for and manage pulmonary or coronary thrombosis.

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