

Revised Reprint

DC Dutta's

Textbook of

OBSTETRICS

10th Edition

Including Perinatology & Contraception

As per the Competency-based Medical Education Curriculum (NMC)

Hiralal Konar

Available complementary online
only with GENUINE book!

 40+ Video Lectures (duration 14 hrs),
Animations, Case Presentations,
MCQs and High Yield Topics
for NEET/NEt

Scan to
Download the App



diginerve 

A Jaypee Initiative

Your Guide at Every Step

Video Lectures | Notes | Self-Assessment



STUDY AUTHENTIC
Scratch the Hologram and
Scan the QR Code to Check the
Genuineness

Original Books Matter!!!
SAY NO TO PIRACY



Contents

1	Anatomy of Female Reproductive Organs	1
	■ External Genitalia 1; ■ Mons Veneris 2; ■ Labia Majora 2; ■ Labia Minora 2; ■ Clitoris 2; ■ Vestibule 2; ■ Perineum 3; ■ Internal Genitalia 3; ■ Vagina 3; ■ Uterus 4; ■ Fallopian Tube 6; ■ Ovary 7; ■ Muscles and Fascia in Relation to the Pelvic Organs 9; ■ Pelvic Floor 9; ■ Perineum 10; ■ Pelvic Fascia 11; ■ Pelvic Cellular Tissue 11; ■ Female Urethra 12; ■ Urinary Bladder 12; ■ Pelvic Ureter 12; ■ Breasts 13	
2	Fundamentals of Reproduction	16
	■ Gametogenesis 16; ■ Oogenesis 16; ■ Spermatogenesis 18; ■ Ovulation 18; ■ Fertilization 19; ■ Morula 20; ■ Blastocyst 20; ■ Implantation 21; ■ Trophoblast 21; ■ Decidua 22; ■ Chorion and Chorionic Villi 23; ■ Development of Inner Cell Mass 23	
3	Placenta and Fetal Membranes	26
	■ Placenta 26; ■ Development 26; ■ Placenta at Term 27; ■ Structures 27; ■ Placental Circulation 29; ■ Placental Aging 31; ■ Placental Function 32; ■ Fetal Membranes 34; ■ Amniotic Cavity and Amnion 34; ■ Amniotic Fluid 34; ■ Umbilical Cord 36	
4	The Fetus	38
	■ Fetal Physiology 39; ■ Fetal Circulation 40; ■ Changes in the Fetal Circulation at Birth 41	
5	Physiological Changes During Pregnancy	43
	■ Genital Organs 43; ■ Uterus 43; ■ Breasts 46; ■ Cutaneous Changes 46; ■ Weight Gain 47; ■ Body Water Metabolism 47; ■ Hematological Changes 48; ■ Cardiovascular System 49; ■ Metabolic Changes 50; ■ Systemic Changes 51	
6	Endocrinology in Relation to Reproduction	55
	■ Maturation of Graafian Follicles and Ovulation 55; ■ Maintenance of Corpus Luteum after Fertilization 55; ■ Placental Endocrinology 55; ■ Hormones of Placenta 55; ■ Protein Hormones 55; ■ Steroidal Hormones 57; ■ Diagnostic Value of Placental Hormones 58; ■ Changes in Endocrine Glands During Pregnancy 58; ■ Pituitary Gland 58; ■ Thyroid Gland 58; ■ Adrenal Cortex 59; ■ Parathyroid Gland 59; ■ Pancreas 59; ■ Hormonal Influences Necessary for Maintenance of Lactation 59	
7	Diagnosis of Pregnancy	61
	■ First Trimester (First 12 Weeks) 61; ■ Second Trimester (13–28 Weeks) 63; ■ Last Trimester (29–40 Weeks) 65; ■ Differential Diagnosis of Pregnancy 66; ■ Chronological Appearance of Specific Symptoms and Signs of Pregnancy 66; ■ Signs of Previous Childbirth 66; ■ Estimation of Gestational Age and Prediction of Expected Date of Delivery 67; ■ Estimation of Fetal Weight 67	
8	The Fetus-in-Utero	69
	■ Causes of Preponderance of Longitudinal Lie and Cephalic Presentation 71; ■ Methods of Obstetrical Examination 71	
9	Fetal Skull and Maternal Pelvis	76
	■ Fetal Skull 76; ■ Pelvis 79; ■ False Pelvis 79; ■ True Pelvis 80; ■ Inlet 80; ■ Cavity 82; ■ Outlet 82; ■ Midpelvis 83; ■ Physiological Enlargement of Pelvis during Pregnancy and Labor 85	

10	Antenatal Care, Preconceptional Counseling and Care	86
	<ul style="list-style-type: none"> ■ Procedure at the First Visit 86; ● History Taking 86; ● Examination 88; ■ Procedure at the Subsequent Visits 90; ■ Antenatal Advice 90; ■ Minor Ailments in Pregnancy 92; ■ Values of Antenatal Care 93; ■ Preconceptional Counseling and Care 94 	
11	Antenatal Assessment of Fetal Wellbeing	95
	<ul style="list-style-type: none"> ■ Clinical Evaluation of Fetal Wellbeing at Antenatal Clinic 95; ● First Visit 95; ● Subsequent Visits 95; ● Special Investigations 96; ● Early Pregnancy 96; ■ Antepartum Fetal Surveillance (Late Pregnancy) 96; ■ Other Investigations in Late Pregnancy 99 	
12	Prenatal Genetic Counseling, Screening and Diagnosis	102
	<ul style="list-style-type: none"> ■ Prenatal Genetic Screening 102; ● Prenatal Diagnosis 104; ■ Invasive Procedures for Prenatal Diagnosis 104; ● Chorionic Villus Sampling 104; ● Amniocentesis 105; ● Cordocentesis or Percutaneous Umbilical Blood Sampling 105; ■ Noninvasive Method of Prenatal Testing from Maternal Plasma/Blood 106; ● Fetal DNA 106 	
13	Normal Labor: Intrapartum Care for a Positive Child Birth Experience (WHO)	108
	<ul style="list-style-type: none"> ■ Labor 108; ● Onset 108; ● Contractile System of the Myometrium 109; ■ Physiology of Normal Labor 111; ■ Events in First Stage of Labor 113; ■ Events in Second Stage of Labor 115; ■ Events in Third Stage of Labor 116; ■ Mechanism of Normal Labor 117; ■ Anatomy of Labor 120; ■ Clinical Course of First Stage of Labor 121; ■ Clinical Course of Second Stage of Labor 124; ■ Clinical Course of Third Stage of Labor 125; ● Place of Delivery 126; ■ Management of Normal Labor 126; ■ Management of First Stage of Labor 127; ■ Management of Second Stage of Labor 129; ● Immediate Care of the Newborn 131; ■ Management of Third Stage of Labor 132; ● Active Management of Third Stage of Labor (AMTSL) 132; ● Labor Care Guide (WHO) 136 	
14	Normal Puerperium	139
	<ul style="list-style-type: none"> ■ Involution of the Uterus 139; ■ Involution of Other Pelvic Structures 140; ● Lochia 141; ■ General Physiological Changes 141; ■ Lactation 142; ● Physiology of Lactation 143; ■ Management of Normal Puerperium 144; ■ Management of Ailments 145; ■ Postnatal Care 147 	
15	Nausea and Vomiting in Pregnancy	149
	<ul style="list-style-type: none"> ■ Vomiting in Pregnancy 149; ■ Hyperemesis Gravidarum 149; ● Clinical Course 150; ● Management 151 	
16	Hemorrhage in Early Pregnancy	153
	<ul style="list-style-type: none"> ■ Spontaneous Abortion (Miscarriage) 153; ■ Threatened Miscarriage 155; ■ Inevitable Miscarriage 156; ■ Complete Miscarriage 156; ■ Incomplete Miscarriage 157; ■ Missed Miscarriage 157; ■ Septic Abortion 158; ● Management 159; ■ Recurrent Miscarriage 160; ■ Cervical Incompetence 162; ■ Induction of Abortion 166; ■ Medical Termination of Pregnancy (MTP) 166; ● Methods of Termination of Pregnancy 166; ● Recommendations 167; ● First Trimester Termination of Pregnancy 167; ● Midtrimester Termination of Pregnancy 168; ■ Ectopic Pregnancy 170; ● Tubal Pregnancy 170; ● Acute Ectopic Pregnancy 172; ● Unruptured Tubal Ectopic 172; ● Diagnosis of Ectopic Pregnancy 173; ■ Management of Ectopic Pregnancy 174; ● Interstitial 178; ● Abdominal 178; ● Ovarian 179; ● Cornual 179; ● Cervical 180; ● Pregnancy of Unknown Location 180; ● Cesarean Scar Pregnancy 180; ● Heterotopic Pregnancy 181; ■ Gestational Trophoblastic Diseases (GTD) 182; ● Hydatidiform Mole 182; ● Partial or Incomplete Mole 187; ● Placental Site Trophoblastic Tumor (PSTT) 188; ● Persistent Gestational Trophoblastic Disease 188 	
17	Multiple Pregnancy, Amniotic Fluid Disorders, Abnormalities of Placenta and Cord	190
	<ul style="list-style-type: none"> ■ Twins 190; ● Diagnosis 192; ● Complications 194; ● Prognosis 196; ● Complications of Monochorionic Twins 196; ■ Antenatal Management 197; ■ Management during Labor 198; ■ Triplets, Quadruplets, etc. 200; ■ Amniotic Fluid Disorders 202; ● Polyhydramnios 202; ● Etiology 202; ● Complications 203; ■ Management of Hydramnios 204; ● Acute Polyhydramnios 205; ● Oligohydramnios 205; ■ Abnormalities of Placenta and Cord 206; ● Placental Abnormalities 206; ● Cord Abnormalities 208 	

18	Hypertensive Disorders in Pregnancy	209
	<ul style="list-style-type: none"> ■ Pre-eclampsia (PE) 209; • Diagnostic Criteria 210; • Etiopathogenesis 210; • Pathophysiology 211; • Clinical Types 213; • Clinical Features 213; • Complications 215; • Screening Tests for Prediction and Prevention 215; • Prophylactic Measures for Prevention 216; • Management of Gestational Hypertension and Pre-eclampsia 217; ■ Acute Fulminant Pre-eclampsia 220; ■ Eclampsia 221; • Clinical Features 222; • Prognosis 222; • Management 222; ■ Chronic Hypertension in Pregnancy 226; ■ Essential Hypertension in Pregnancy 226; ■ Chronic Renal Diseases in Pregnancy 227; ■ Pregnancy after Renal Transplant 228 	
19	Antepartum Hemorrhage	230
	<ul style="list-style-type: none"> ■ Placenta Previa 230; • Etiology 230; • Clinical Features 232; • Differential Diagnosis 233; • Complications 233; • Prognosis 235; • Management 235; ■ Practical Guide for Cesarean Delivery 238; ■ Practical Approach to Lower Segment CD for Placenta Previa 238; ■ Practical Guide to Lower Segment Approach for Placenta Previa Accreta 238; ■ Abruptio Placentae 239; • Clinical Features 241; • Management 241; • Treatment in the Hospital 242; • Indeterminate Bleeding 244 	
20	Medical and Surgical Illnesses Complicating Pregnancy	246
	<ul style="list-style-type: none"> ■ Hematological Disorders in Pregnancy 246; • Anemia in Pregnancy 246; • Iron Deficiency Anemia 248; • Megaloblastic Anemia 253; • Dimorphic Anemia 255; • Aplastic Anemia 255; • Hemoglobinopathies 255; • Sickle Cell Hemoglobinopathies 256; • Thalassemia Syndromes 257; • Platelet Disorders 257; ■ Heart Disease in Pregnancy 259; • General Management 260; • Management during Labor 261; • Specific Heart Disease during Pregnancy and the Management 262; ■ Diabetes Mellitus and Pregnancy 265; • Gestational Diabetes Mellitus (GDM) 265; • Overt Diabetes 267; ■ Thyroid Dysfunction and Pregnancy 273; ■ Jaundice in Pregnancy 275; ■ Viral Hepatitis 275; ■ Epilepsy in Pregnancy 277; ■ Asthma in Pregnancy 278; ■ Systemic Lupus Erythematosus (SLE) 280; ■ Tuberculosis in Pregnancy 280; ■ Syphilis in Pregnancy 281; ■ Parasitic and Protozoal Infestations in Pregnancy 283; ■ Pyelonephritis in Pregnancy 284; • Asymptomatic Bacteriuria (ASB) 285; ■ Viral Infections in Pregnancy 286; ■ Human Immunodeficiency Virus (HIV) Infection and Acquired Immunodeficiency Syndrome (AIDS) 288; ■ COVID-19 in Pregnancy 291; ■ Surgical Illness during Pregnancy 291; ■ Acute Pain in Abdomen during Pregnancy 292; ■ Headache in Pregnancy 293; ■ Acute Fatty Liver in Pregnancy 293 	
21	Gynecological Disorders in Pregnancy	294
	<ul style="list-style-type: none"> ■ Abnormal Vaginal Discharge 294; ■ Congenital Malformation of the Uterus and Vagina 294; ■ Carcinoma Cervix with Pregnancy 295; • Treatment 295; ■ Leiomyomas with Pregnancy 296; • Treatment 296; ■ Ovarian Tumor in Pregnancy 296; ■ Retroverted Gravid Uterus 297; ■ Morbid Anatomic Changes 298; • Treatment 298; ■ Genital Prolapse in Pregnancy 298; • Treatment 298 	
22	Preterm Labor and Birth, Preterm Rupture of the Membranes, Prolonged Pregnancy, Intrauterine Fetal Death	300
	<ul style="list-style-type: none"> ■ Preterm Labor and Birth 300; • Etiology 300; • Management of Preterm Labor and Birth 302; • Prevention of Preterm Labor 302; • Measures to Arrest Preterm Labor 302; ■ Management in Labor 302; ■ Prelabor Rupture of the Membranes (PROM) 304; • Management 305; ■ Prolonged and Post-term Pregnancy 306; • Diagnosis 307; • Management 308; ■ Intrauterine Fetal Death (IUFD) 310; • Etiology 310; • Diagnosis 311; • Recommended Evaluation for a Stillbirth 311; • Management 311 	
23	Complicated Pregnancy	314
	<ul style="list-style-type: none"> ■ Pregnancy with Prior Cesarean Delivery (CD) 314; • Integrity of the Scar 314; • Evidences of Scar Rupture (or Scar Dehiscence) during Labor 315; • Management of a Pregnancy with Prior CD 316; • Vaginal Birth after Previous (CD) 316; ■ Red Cell Alloimmunization 318; • Fetal Affection by the Rh Antibody 320; ■ Manifestations of Hemolytic Disease of the Fetus and Newborn (HDFN) 320; • Prevention of Rh-D Alloimmunization 321; ■ Antenatal Investigation Protocol of Rh-negative Mothers 323; ■ Plan of Delivery 324; • Prognosis 326; ■ Exchange Transfusion in the Newborn 326; ■ Grand Multipara 326; ■ Elderly Primigravida 327; ■ Bad Obstetric History (BOH) 328; • Investigations and Management 328; ■ Obesity in Pregnancy 329 	

24	Contracted Pelvis	331
	■ Asymmetrical or Obliquely Contracted Pelvis 333; ■ Mechanism of Labor in Contracted Pelvis with Vertex Presentation 333; ■ Diagnosis of Contracted Pelvis 334; ■ Disproportion 336; ● Diagnosis of Cephalopelvic Disproportion (CPD) at the Brim 336; ■ Effects of Contracted Pelvis on Pregnancy and Labor 337; ■ Management of Contracted Pelvis (Inlet Contraction) 338; ■ Trial Labor 338; ■ Midpelvic and Outlet Disproportion 339	
25	Abnormal Uterine Action	340
	■ Uterine Inertia (Hypotonic Uterine Dysfunction) 341; ■ Incoordinate Uterine Action 342; ■ Precipitate Labor 344; ■ Tonic Uterine Contraction and Retraction 344	
26	Complicated Labor: Malposition, Malpresentation and Cord Prolapse	347
	■ Occiput Posterior (OP) Position 347; ● Diagnosis 348; ● Mechanism of Labor 349; ● Course of Labor 351; ● Management of Labor 351; ● Arrested Occiput Posterior Position 352; ■ Deep Transverse Arrest (DTA) 353; ■ Manual Rotation for Occiput Posterior Position 353; ■ Breech Presentation 355; ■ Varieties 355; ● Etiology of Breech Presentation 355; ● Diagnosis of Breech Presentation 356; ● Mechanism of Labor in Breech Presentation 356; ● Complications of Vaginal Breech Delivery 358; ● Antenatal Management 359; ● Management of Vaginal Breech Delivery 361; ● Assisted Breech Delivery 361; ● Management of Complicated Breech Delivery 365; ■ Face Presentation 367; ● Mechanism of Labor 368; ● Diagnosis 368; ● Management 370; ● Vaginal Delivery 370; ■ Brow Presentation 371; ■ Transverse Lie 371; ● Diagnosis 372; ● Clinical Course of Labor 372; ■ Management of Shoulder Presentation 374; ■ Unstable Lie 374; ■ Compound Presentation 374; ■ Cord Prolapse 375; ● Management 376	
27	Prolonged Labor, Obstructed Labor, Dystocia Caused by Fetal Anomalies	378
	■ Prolonged Labor 378; ● Treatment 380; ■ Obstructed Labor 381; ● Treatment 382; ● Shoulder Dystocia 383; ■ Dystocia Caused by Fetal Anomalies 383; ● Hydrocephalus 383; ■ Neural Tube Defects (NTD) 384; ● Anencephaly 384; ■ Conjoined Twins 385	
28	Complications of the Third Stage of Labor	386
	■ Postpartum Hemorrhage (PPH) 386; ■ Primary Postpartum Hemorrhage 386; ● Causes 386; ● Prevention 387; ● Management of Third-stage Bleeding 388; ● Steps of Manual Removal of Placenta 388; ● Management of True Postpartum Hemorrhage 389; ● Actual Management 390; ■ Secondary Postpartum Hemorrhage 393; ■ Retained Placenta 394; ● Management 394; ■ Inversion of the Uterus 396	
29	Injuries to the Birth Canal	398
	■ Vulva 398; ■ Perineum 398; ● Management 398; ■ Vagina 399; ■ Cervix 400; ■ Pelvic Hematoma 400; ■ Rupture of the Uterus 401; ● Etiology 402; ● Pathology 403; ● Diagnosis 404; ● Management 405; ■ Visceral Injuries 405	
30	Abnormalities of the Puerperium	407
	■ Puerperal Pyrexia 407; ■ Puerperal Sepsis 407; ● Pathology 408; ● Clinical Features 408; ● Investigations of Puerperal Pyrexia 409; ● Treatment 410; ■ Subinvolution 411; ■ Urinary Complications in Puerperium 411; ■ Breast Complications 412; ■ Puerperal Venous Thrombosis 413; ● Prophylaxis and Management 414; ■ Pulmonary Embolism 415; ■ Obstetric Palsies 416; ■ Puerperal Emergencies 416; ■ Psychiatric Disorders during Puerperium 417; ■ Psychological Response to Perinatal Deaths and Management 418	
31	The Term Newborn Infant	419
	■ Physical Features of the Newborn 419; ■ Immediate Care of the Newborn 421; ■ Infant Feeding 422; ● Breastfeeding 423; ● Artificial Feeding 427; ● Childhood Immunization Program 428	
32	Low Birth Weight Baby	429
	■ Preterm Baby 430; ● Complications of a Preterm Neonate 430; ● Management 432; ● Care of a Preterm Neonate 432; ■ Fetal Growth Restriction (FGR) 434; ● Management 437	

33	Diseases of the Fetus and the Newborn	441
	<ul style="list-style-type: none">■ Perinatal Asphyxia 441; ● Fetal Respiration 441; ● Clinical Features 442; ● Management 443;■ Respiratory Distress in the Newborn 445; ■ Transient Tachypnea of the Newborn (TTN) 448; ■ Meconium Aspiration Syndrome (MAS) 448; ■ Jaundice of the Newborn 449; ● Management of Jaundice in the Newborn 451; ■ Hemolytic Disease of the Newborn 452; ● ABO Group Incompatibility 452; ■ Bleeding Disorders in the Newborn 453; ■ Anemia in the Newborn 453; ■ Seizures in the Newborn 454; ■ Birth Injuries of the Newborn 455; ● Injuries to the Head 455; ● Intracranial Hemorrhage 456; ● Other Injuries 457;■ Perinatal Infections 458; ● Mode of Infection 458; ● Ophthalmia Neonatorum 459; ● Skin Infections 460; ● Necrotizing Enterocolitis 461; ● Mucocutaneous Candidiasis 461; ■ Congenital Malformations and Prenatal Diagnosis 463; ● Down's Syndrome (Trisomy 21) 463; ■ Surgical Emergencies 463; ■ Nonimmune Fetal Hydrops 465	
34	Pharmacotherapeutics in Obstetrics	467
	<ul style="list-style-type: none">■ Oxytocics in Obstetrics 467; ● Oxytocin 467; ● Methods of Administration 468; ● Ergot Derivatives 470; ● Prostaglandins (PGs) 470; ■ Antihypertensive Therapy 473; ■ Diuretics 473; ■ Tocolytic Agents 473; ■ Anticonvulsants 474; ■ Anticoagulants 474; ■ Maternal Drug Intake and Breastfeeding 475; ■ Fetal Hazards of Maternal Medication during Pregnancy 477; ● Teratology and Prescribing in Pregnancy 477;■ Analgesia and Anesthesia in Obstetrics 479; ● Anatomical and Physiological Considerations 479; ● Analgesia during Labor and Delivery 480; ● Inhalation Methods 481; ● Regional (Neuraxial) Anesthesia 482; ● Infiltration Analgesia 484; ● General Anesthesia for Cesarean Section 484	
35	Induction of Labor	487
	<ul style="list-style-type: none">■ Methods of Induction of Labor 488; ● Medical Induction 488; ● Surgical Induction 490; ● Low Rupture of the Membranes (LRM) 491; ● Stripping the Membranes 491; ■ Combined Method 492	
36	Population Dynamics and Control of Conception	496
	<ul style="list-style-type: none">■ Control of Contraception 496; ● Family Planning 496; ● Contraception 497; ■ Methods of Contraceptions 497; ● Temporary Methods 497; ● Intrauterine Contraceptive Devices 497; ■ Steroidal Contraceptions 504; ● Combined Oral Contraceptives (Pills) 504; ● Centchroman (Chhaya/Saheli) 509; ● Progestogen-only Contraceptions 509; ● Emergency Contraception (CE) 511; ● Summary of Oral Contraceptives 512; ■ Drug Interaction and Hormonal Contraception 513; ■ Sterilization 513; ● Couple Counseling 513; ● Male Sterilization 514; ● Female Sterilization 515; ■ Barrier Methods 518; ● Condom (Male) 519; ● Female Condom (Femidom) 519; ● Diaphragm 519; ● Vaginal Contraceptives 520; ● Fertility Awareness Method 520; ● Contraceptive Counseling and Prescription 521; ● Prescription 521; ■ Ongoing Trials and Selective Availability 522; ● Transcervical Sterilization 522	
37	Operative Obstetrics	523
	<ul style="list-style-type: none">■ Dilatation and Evacuation (D & E) 523; ● One-stage Operation 523; ● Two-stage Operation 524; ● Management of Uterine Perforation 525; ■ Suction Evacuation 525; ■ Vacuum Aspiration 526; ■ Episiotomy 527; ● Types 527; ● Steps, Postoperative Care 528; ● Complications 529; ■ Operative Vaginal Delivery 529; ● Forceps 530; ● Types of Forceps Operation 530; ● Low Forceps Operation 532; Outlet Forceps Operation 535; Midforceps Operation 535; ● Difficulties in Forceps Operation 535; ● Kielland's Forceps 536; ● Complications of Forceps Operation 537; ■ Ventouse 537; ■ Version 540; ● External Cephalic Version 540; ● Internal Version 542; ■ Cesarean Delivery (CD) 542; ● Indications 543; ● Lower Segment CS 544; ● Postoperative Care 547; ● Classical Cesarean Section 548; ● Complications of CS: Intraoperative, Postoperative 549; ■ Destructive Operations 550; ● Craniotomy 550; ● Cleidotomy 552; ● Postoperative Care 552; ■ Symphysiotomy 552	
38	Safe Motherhood, Epidemiology of Obstetrics	554
	<ul style="list-style-type: none">■ Safe Motherhood 554; ■ Clinical Causes of Maternal Deaths 554; ■ Country Targets 555; ■ Sustainable Development Goals (SDGs) 556; ■ Reproductive and Child Health (RCH) Care 557; ■ Epidemiology of Obstetrics 558; ● Maternal Mortality 558; ● Maternal Near Miss 561; ● Maternal Morbidity 561; ● Perinatal Mortality 561; ● Important Causes of Perinatal Mortality and Main Interventions 563; ● Stillbirths 563; ● Neonatal Deaths 563	

39	Special Topics in Obstetrics	565
	<ul style="list-style-type: none"> ■ Intrapartum Fetal Evaluation 565; • Methods of Fetal Evaluation 565; ■ Nonreassuring Fetal Status (NRFS) 570; • Management 570; ■ Shock in Obstetrics 572; • Pathophysiology 572; • General Changes 572; • Classification of Shock 574; ■ Management of Shock 575; • Endotoxic Shock 576; ■ Acute Kidney Injury (AKI) 578; • Causes 578; • Management in Obstetrics 579; ■ Blood Coagulation Disorders in Obstetrics 580; • Normal Blood Coagulation 582; • Pathology of Acquired Coagulopathy 582; • Investigations 583; • Treatment 584; ■ High-risk Pregnancy 585; • Management of High-risk Cases 587; ■ Immunology in Obstetrics 588; ■ Critical Care in Obstetrics 590 	
40	Current Topics in Obstetrics	592
	<ul style="list-style-type: none"> ■ Medical Ethics 592; ■ Effective Clinical Communication 592; ■ Pregnancy Following Assisted Reproductive Technology (ART) 593; ■ Antibiotic Prophylaxis in Cesarean Section 594; ■ Day-care Obstetrics 594; ■ Legal and Ethical Issues in Obstetric Practice 594; ■ The Preconception Counseling Prenatal Diagnostic Techniques 595; ■ Audit in Obstetrics 595; ■ Umbilical Cord Blood Stem Cells in Transplantation and Regenerative Medicine 596; • Stem Cells and Therapies in Obstetrics 596 	
41	Imaging in Obstetrics (USG, MRI, CT, Radiology), Amniocentesis and Guides to Clinical Tests	598
	<ul style="list-style-type: none"> ■ Ultrasound in Obstetrics 598; • Three-dimensional Ultrasonography 599; • First Trimester Ultrasonography 599; • Midtrimester Ultrasonography 601; • Third Trimester Ultrasonography 602; • Intrapartum Sonography 603; ■ Magnetic Resonance Imaging (MRI) 603; ■ Computed Tomography (CT) in Obstetrics 604; ■ Radiology in Obstetrics 604; ■ Amniocentesis 605; ■ Guides to Clinical Tests 606; ■ Tests for Blood Coagulation Disorders 607; • Collection of Blood Sample 607; • Samples for Blood Sugar Estimation 608; ■ Cervical and Vaginal Cytology 608 	
42	Practical Obstetrics	609
	<ul style="list-style-type: none"> ■ Obstetrics Instruments 609; ■ Drugs 620; ■ Specimens 622; ■ Imaging Studies 627; ■ Suture Materials 629 	

13

CHAPTER



Normal Labor

Intrapartum Care for a Positive Child Birth Experience (WHO)

CHAPTER OUTLINE

- ❖ **Labor**
 - Onset
 - Contractile System of the Myometrium
- ❖ **Physiology of Normal Labor**
- ❖ **Events in First Stage of Labor**
- ❖ **Events in Second Stage of Labor**
- ❖ **Events in Third Stage of Labor**
- ❖ **Mechanism of Normal Labor**
- ❖ **Anatomy of Labor**
- ❖ **Clinical Course of First Stage of Labor**
- ❖ **Clinical Course of Second Stage of Labor**
- ❖ **Clinical Course of Third Stage of Labor**
 - Place of Delivery
- ❖ **Management of Normal Labor**
- ❖ **Management of First Stage of Labor**
- ❖ **Management of Second Stage of Labor**
 - Immediate Care of the Newborn
- ❖ **Management of Third Stage of Labor**
 - Active Management of Third Stage of Labor (AMTSL)
 - Labor Care Guide (WHO)

LABOR

DEFINITION: Series of events that take place in the genital organs in an effort to expel the viable products of conception (fetus, placenta and the membranes) out of the womb through the vagina into the outer world is called 'labor'. It may occur prior to 37 completed weeks, when it is called the preterm labor. Labor is characterized by the presence of regular uterine contractions with effacement and dilatation of the cervix with fetal descent. A parturient is a patient in labor and parturition is the process of giving birth. **Delivery** is the expulsion or extraction of a viable fetus out of the womb. It is not synonymous with labor; delivery can take place without labor as in elective cesarean section. Delivery may be vaginal, either spontaneous or aided, or it may be abdominal.

NORMAL LABOR (EUTOCIA): Labor is called normal if it fulfils the following criteria:

1. Spontaneous in onset and at term
2. With vertex presentation
3. Without undue prolongation
4. Natural termination with minimal aids
5. Without having any complications affecting the health of the mother and/or the baby.

ABNORMAL LABOR (DYSTOCIA): Any deviation from the definition of normal labor is called abnormal labor. Thus, labor in a case with presentation other than vertex or having some complications even with vertex presentation affecting the course of labor or modifying the nature of termination or adversely affecting the maternal and/or fetal prognosis is called abnormal labor.

DATE OF ONSET OF LABOR: It is very much unpredictable to foretell precisely the exact date of onset of labor. It is

not only varies from case to case but even in different pregnancies of the same individual. Calculation based on Naegele's formula can only give a rough guide. **Based on the formula, labor starts approximately on the expected date in 4%, 1 week on either side in 50%, 2 weeks earlier and 1 week later in 80%, at 42 weeks in 10%, and at 43 weeks plus in 4%.**

CAUSES OF ONSET OF LABOR

The precise mechanism of initiation of human labor is still obscure. Endocrine, biochemical and mechanical stretch pathways as obtained from animal experiments, however, put forth the following hypotheses.

- **Uterine distension:** Stretching effect on the myometrium by the growing fetus and liquor amnii can explain the onset of labor at least in twins or polyhydramnios. **Uterine stretch** increases gap junction proteins, receptors for oxytocin and specific Contraction Associated Proteins (CAPs).
- **Fetoplacental contribution:** Cascade of events activate **fetal hypothalamic-pituitary-adrenal axis** prior to onset of labor → increased CRH → increased release of ACTH → fetal adrenals → increased cortisol secretion → accelerated production of estrogen and prostaglandins from the placenta (**Fig. 13.1**).
- **Estrogen:** The probable mechanisms are:
 - **Increases** the release of oxytocin from maternal pituitary.
 - **Promotes** the synthesis of myometrial receptors for oxytocin (by 100–200 folds), prostaglandins and increase in gap junctions in myometrial cells.
 - **Accelerates** lysosomal disintegration in the decidua and amnion cells resulting in increased prostaglandin (PGF2α) synthesis.

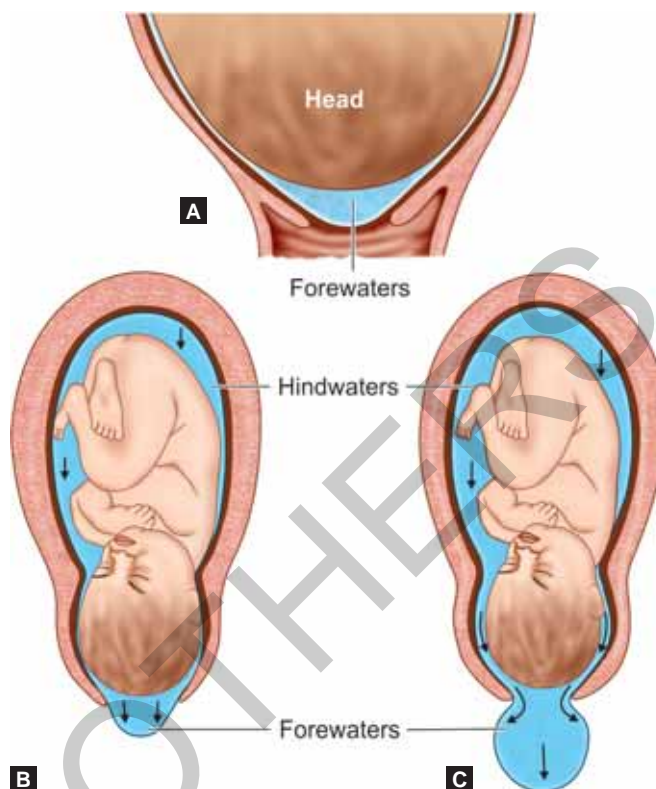
contact with the pelvic brim) being spherical, may well fit with the wall of the lower uterine segment. Thus, the amniotic cavity is divided into two compartments (Figs. 13.5A to C). The part above the girdle of contact contains the fetus with bulk of the liquor called **hindwaters**, and the one below it containing small amount of liquor called **forewaters**. With the onset of labor, the membranes attached to the lower uterine segment are detached and with the rise of intrauterine pressure during contractions there is herniation of the membranes through the cervical canal. **There is ball-valve like action** by the well-flexed head. Uterine contractions generate hydrostatic pressure in the forewaters that in turn dilate the cervical canal like a wedge. When the bag of forewaters is absent (PROM) the pressure of the presenting part pushes the cervix centrifugally.

- ♦ **Vis-a-tergo:** The final phase of dilatation and retraction of the cervix is achieved by downward thrust of the presenting part of the fetus and upward pull of the cervix over the lower segment. This phenomenon is lacking in transverse lie where a thin cervical rim fails to disappear.

EFFACEMENT OR TAKING UP OF CERVIX: Effacement

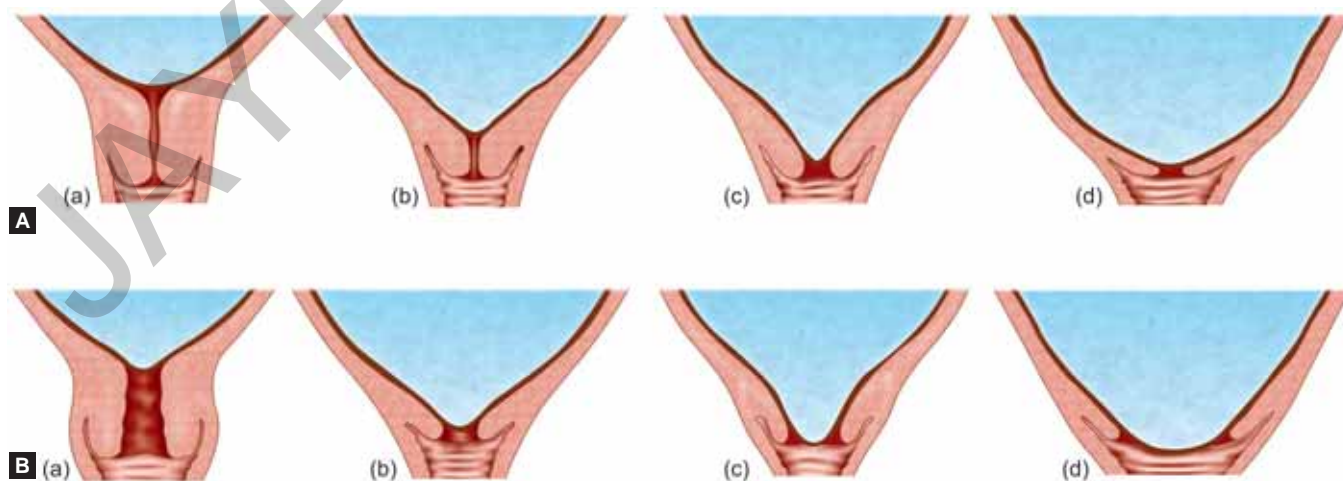
is the process by which the muscular fibers of the cervix are pulled upward and merges with the fibers of the lower uterine segment. The cervix becomes thin during first stage of labor or even before that in primigravidae. In **primigravidae**, effacement precedes dilatation of the cervix, whereas in **multiparae**, both occur simultaneously (Figs. 13.6A and B). Expulsion of mucus plug is caused by effacement.

LOWER UTERINE SEGMENT: Before the onset of labor, there is no complete anatomical or functional division of the uterus. During labor the demarcation of an active upper segment and a relatively passive lower segment

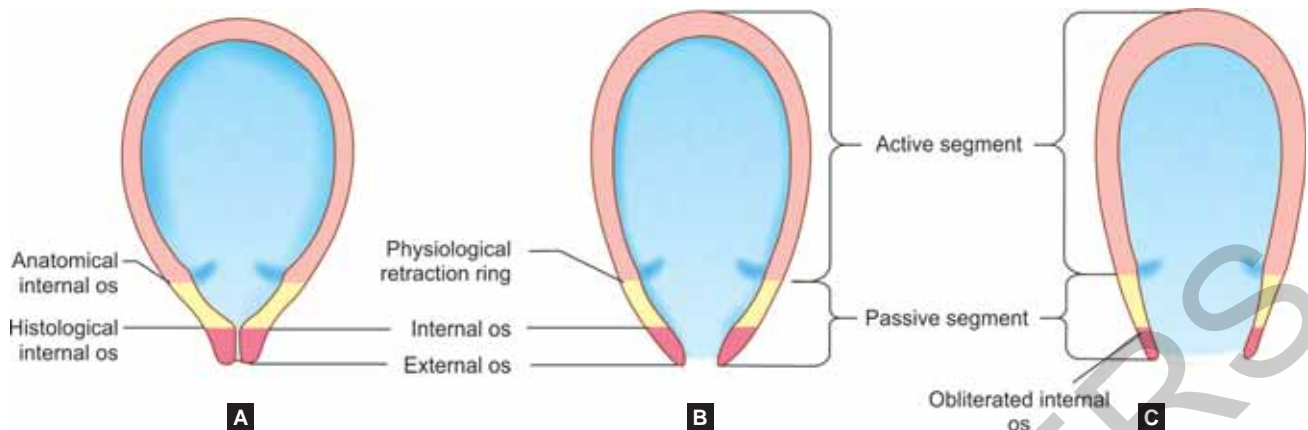


Figs. 13.5A to C: (A) Formation of bag of membranes and forewaters; (B) Well-fitting presenting part dividing the forewaters from hindwater; (C) Ill-fitting presenting part allows the hindwaters to force into the bag of membranes during contraction which may lead to its early rupture.

is more pronounced. The wall of the upper segment becomes progressively thickened with progressive thinning of the lower segment (Figs. 13.7A to C). This is pronounced in late first stage, especially after rupture of the membranes and attains its maximum in second stage. A distinct ridge is produced at the junction of the two, called **physiological retraction ring** which should not be



Figs. 13.6A and B: Diagrammatic representation of the dilatation and 'taking up' of the cervix in—(A) Primigravida; (B) Multipara: (A)—(a) cervix before labor; (b and c) progressive 'taking up' of the cervix without much dilatation; (d) cervix completely taken up with external os still remaining undilated; (B)—(a) cervix before labor, to note the patulous cervix; (b and c) progressive and simultaneous dilatation and 'taking up' of the cervix; (d) taking up and dilatation of the external os occur simultaneously.



Figs. 13.7A to C: Sequence of development of the active and passive segments of the uterus: (A) Uterus at term; (B) In early labor; (C) Late second stage.

Table 13.1: Lower Segment (LS) of uterus and the clinical significance.

Anatomical features	Clinical significance
<ul style="list-style-type: none"> ■ LS is developed from the isthmus of the (nonpregnant) uterus, which is bounded above anatomical and below by histological internal os. ■ In labor, LS is bounded above by the physiological retraction ring and below by the fibromuscular junction of cervix and uterus. ■ This segment is formed maximally during labor and the peritoneum is loosely attached anteriorly. ■ It measures 7.5–10 cm when fully formed and becomes cylindrical during the second stage of labor (Figs. 13.7B and C). ■ The wall becomes gradually thin due to: (i) Relaxation of the muscle fibers to allow elongation, (ii) the muscle fibers are drawn up by the muscle fibers of the upper uterine segment by contraction and retraction during labor and (iii) descent of the presenting part causes further stretching and thinning out of wall. ■ This segment has got poor retractile property compared to the upper segment. 	<ul style="list-style-type: none"> ■ The phenomenon of receptive relaxation enables expulsion of the fetus by formation of complete birth canal along with the fully dilated cervix (Fig. 13.17). ■ Implantation of placenta in lower segment is known as placenta previa. ■ It is through this segment that cesarean section is performed. ■ Poor decidual reaction in this segment facilitates morbid adherent placenta, once the placenta is implanted here. ■ In obstructed labor, the lower segment is very much stretched and thinned out and ultimately gives way (ruptures) especially in multiparae. ■ It is entirely the passive segment of the uterus. Because of poor retractile property, there is chance of postpartum hemorrhage if placenta is implanted over the area.

confused with the **pathological retraction ring**—a feature of obstructed labor (p. 344). Lower segment of uterus is characterized by following features (**Table 13.1**).

EVENTS IN SECOND STAGE OF LABOR

The second stage begins with the complete dilatation of the cervix and ends with the expulsion of the fetus. **This stage is concerned with the descent and delivery of the fetus through the birth canal.**

Second stage has two phases:

1. **Propulsive**—from full dilatation until head touches the pelvic floor.
2. **Expulsive**—since the time mother has irresistible desire to 'bear down' and push until the baby is delivered.

With the full dilatation of the cervix, the membranes usually rupture and there is escape of good amount of liquor amnii. The volume of the uterine cavity is thereby reduced. Simultaneously, uterine contraction and retraction become stronger. The uterus becomes

elongated during contraction, while the anteroposterior and transverse diameters are reduced. **The elongation is partly due to the contractions of the circular muscle fibers of the uterus to keep the fetal axis straight.**

Delivery of the fetus is accomplished by the downward thrust offered by uterine contractions supplemented by voluntary contraction of abdominal muscles (**Fig. 13.8**) against the resistance offered by bony and soft tissues of the birth canal. There is always a tendency to push the fetus back into the uterine cavity by the elastic recoil of the tissue of the vagina and the pelvic floor. **This is effectively counterbalanced by the power of retraction.** Thus, with increasing contraction and retraction, the upper segment becomes more and more thicker with corresponding thinning of lower segment. **Endowed with power of retraction, the fetus is gradually expelled from the uterus against the resistance offered by the pelvic floor.** After the expulsion of the fetus, the uterine cavity is permanently reduced in size only to accommodate the afterbirths.

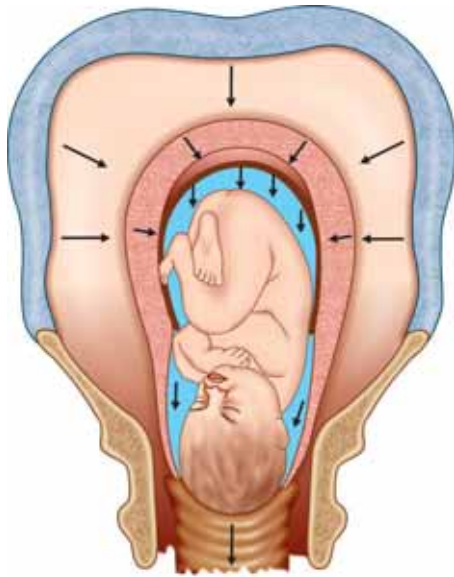


Fig. 13.8: Diagram showing the expulsive forces in the second stage. Increased intra-abdominal pressure augments the downward expulsive force of uterine contraction.

The expulsive force of uterine contractions is added by voluntary contraction of the abdominal muscles called '**bearing down**' efforts. For details, p. 124.

EVENTS IN THIRD STAGE OF LABOR

The third stage of labor comprises the phase of **placental separation**; its descent to the lower segment and finally its **expulsion** with the membranes.

PLACENTAL SEPARATION: At the beginning of labor, the placental attachment roughly corresponds to an area of 20 cm (8") in diameter. There is no appreciable diminution of the surface area of the placental attachment during first stage. During the second stage, there is slight but progressive diminution of the area following

successive retractions, which attains its peak immediately following the birth of the baby.

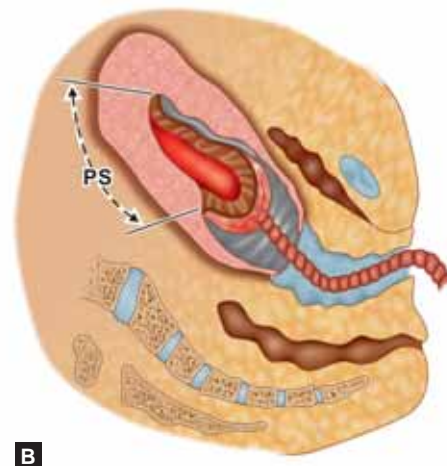
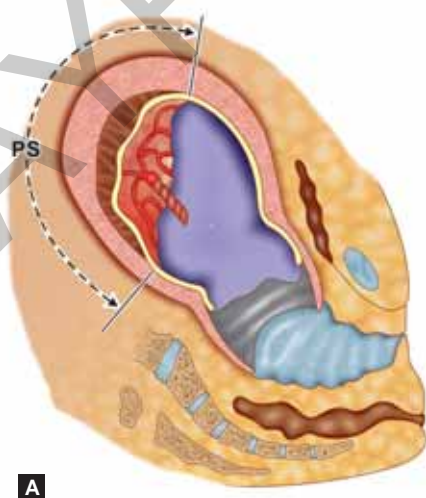
After the birth of the baby, the uterus measures about 20 cm (8") vertically and 10 cm (4") antero-posteriorly, the shape becomes discoid. The wall of the upper segment is much thickened while thin and flabby lower segment is thrown into folds. The cavity is much reduced to accommodate only the afterbirths.

Mechanism of separation: Marked retraction reduces effectively the surface area at the placental site to about its half. But as the placenta is inelastic, it cannot keep pace with such an extent of diminution resulting in its buckling (Figs. 13.9A and B). A shearing force is instituted between the placenta and the placental site which brings about its ultimate separation. The plane of separation runs through deep spongy layer of decidua basalis so that a variable thickness of decidua covers the maternal surface of the separated placenta. There are two ways of separation of placenta (Figs. 13.10A and B).

(1) **Central separation (Schultze):** Detachment of placenta from its uterine attachment starts at the center resulting in opening up of few uterine sinuses and accumulation of blood behind the placenta (retroplacental hematoma). With increasing contraction, more and more detachment occurs facilitated by weight of the placenta and retroplacental blood until whole of the placenta gets detached.

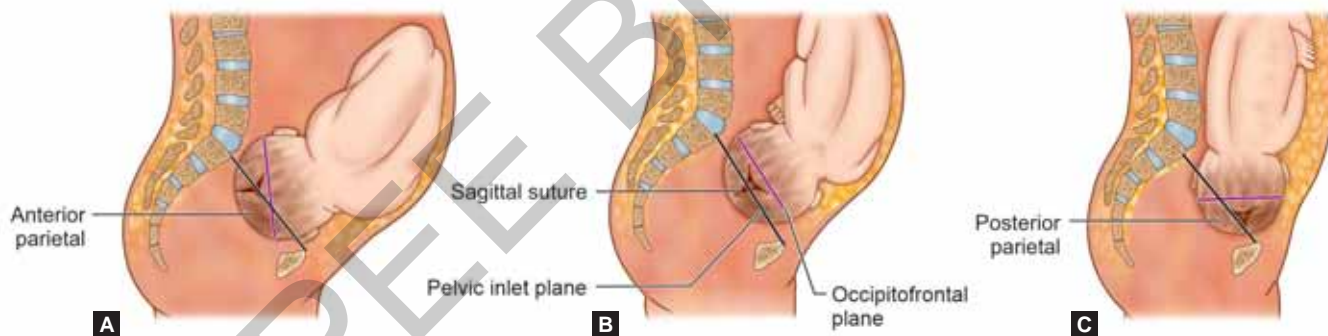
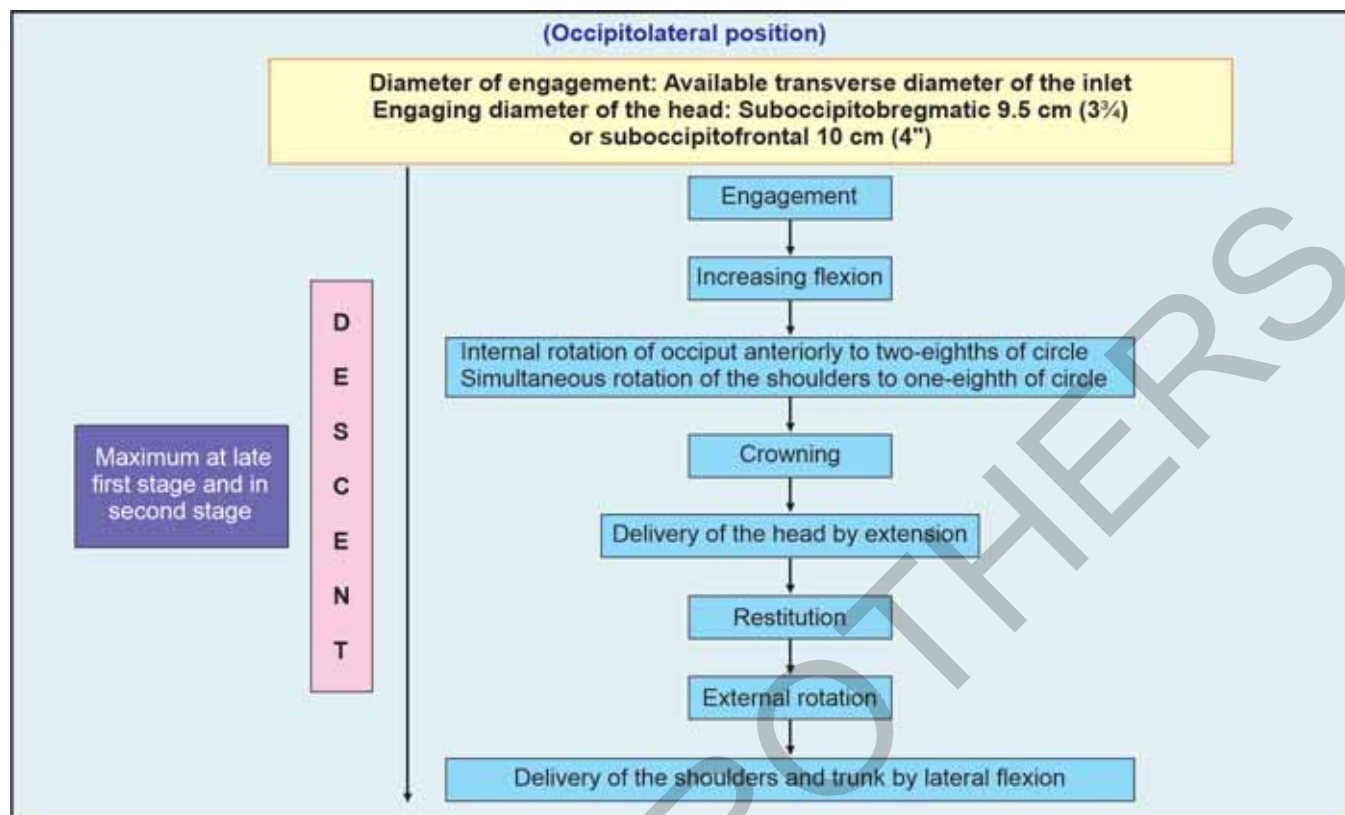
(2) **Marginal separation (Mathews-Duncan):** Separation starts at the margin as it is mostly unsupported. With progressive uterine contraction, more and more areas of the placenta get separated. Marginal separation is found more frequently.

SEPARATION OF THE MEMBRANES: The membranes, which are attached loosely in the active part, are thrown into multiple folds. Those attached to the lower segment are already separated during its stretching. The separation is facilitated partly by uterine contraction and



Figs. 13.9A and B: Diagram showing area of placental site: (A) Before the delivery of the baby; (B) After the delivery of the baby. **Note:** The reduction of the surface area of the placental site resulting in buckling of the placenta. (PS: Placental Surface)

Flowchart 13.2: Summary of mechanism of labor.



Figs. 13.12A to C: Head brim relation prior to engagement: (A) Anterior parietal presentation; (B) Head in synclitism; (C) Posterior parietal presentation.

Box 13.1: Advantages of asynclitism.

- Engagement of head with asynclitism, the two parietal eminences cross the brim one at a time. This helps lesser diameter (super subparietal: 8.5 cm), to cross the pelvic brim instead of larger biparietal diameter (9.5 cm) for engagement in synclitism.
- Asynclitism is beneficial in the mechanism of engagement of head.
- Marked and persistent asynclitism is abnormal and indicates cephalopelvic disproportion.

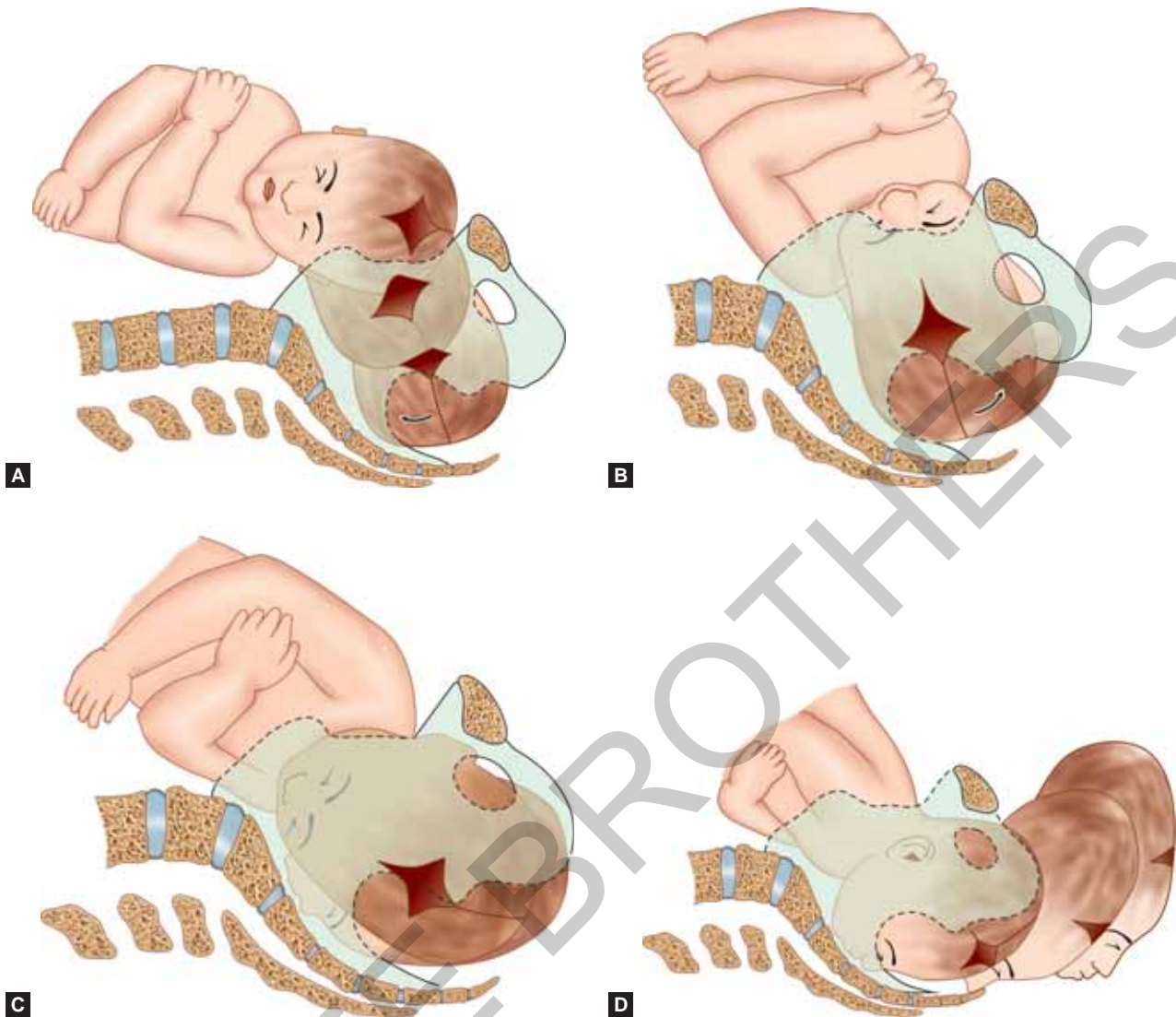
When the sagittal suture lies anteriorly, the posterior parietal bone becomes the leading presenting part and is called **posterior asynclitism or posterior parietal presentation (Lizman obliquity)**. This is more frequently found in primigravidae because of good uterine tone and a tight abdominal wall.

In others, the sagittal suture lies more posteriorly with the result that the anterior parietal bone becomes the leading presenting part and is then called **anterior**

parietal presentation or anterior asynclitism (Negele's obliquity). It is more commonly found in multiparae.

Mild degrees of asynclitism are common but severe degrees indicate cephalopelvic disproportion (Box 13.1).

Posterior lateral flexion of the head occurs to glide the anterior parietal bone past the symphysis pubis in posterior parietal presentation. Lateral flexion in the reverse direction occurs to glide the posterior parietal



Figs. 13.15A to D: Lateral view showing mechanism of labor in left occipitolateral position: (A and B) Posterior parietal presentation, posterior lateral flexion of the head and engagement; (C and D) Internal rotation of the head with movement of the shoulders; descent and delivery of the head by extension.

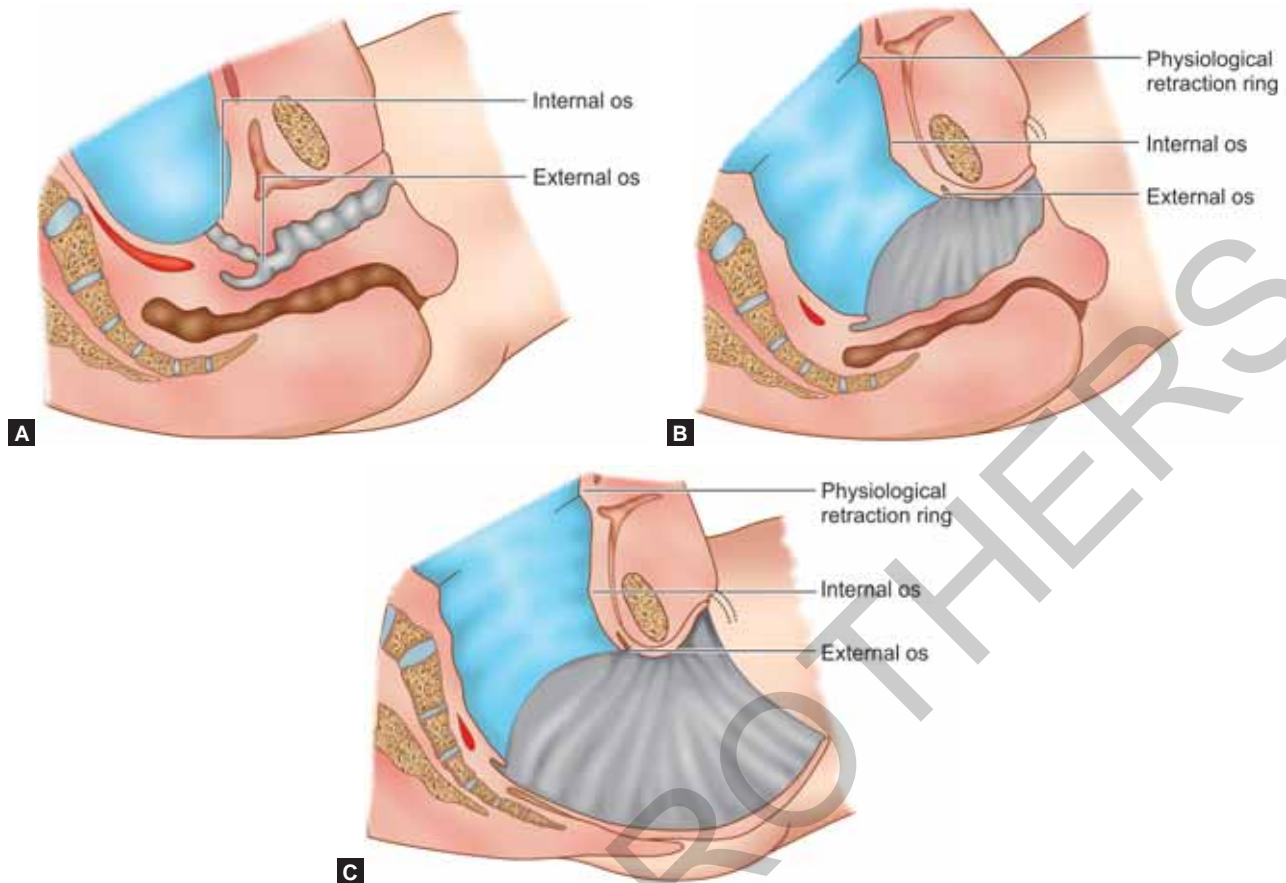


Figs. 13.16A and B: Delivery of the shoulders by lateral flexion: (A) Anterior shoulder; (B) Posterior shoulder.

CLINICAL COURSE OF FIRST STAGE OF LABOR

The first symptom to appear is intermittent painful uterine contractions followed by expulsion of blood-stained mucus (show) per vaginam. Only few drops of blood mixed with mucus is expelled and any excess should be considered abnormal.

PAIN: Pains are felt more anteriorly with simultaneous hardening of the uterus. Initially, pains are not strong enough to cause discomfort and come at varying intervals of 15–30 minutes with duration of about 30 seconds. But gradually the interval becomes shortened with increasing intensity and duration so that in late first stage the contraction comes at intervals of 3–5 minutes and lasts



Figs. 13.17A to C: (A) The relative position of the bladder, urethra and the genital organs at the beginning of labor; (B) Formation of birth canal with the cervix fully dilated. **Note the forward displacement of the urethra and bladder neck behind the pubis;** (C) Marked stretching with downward and backward displacement of the posterior wall of the canal as the head descends down.

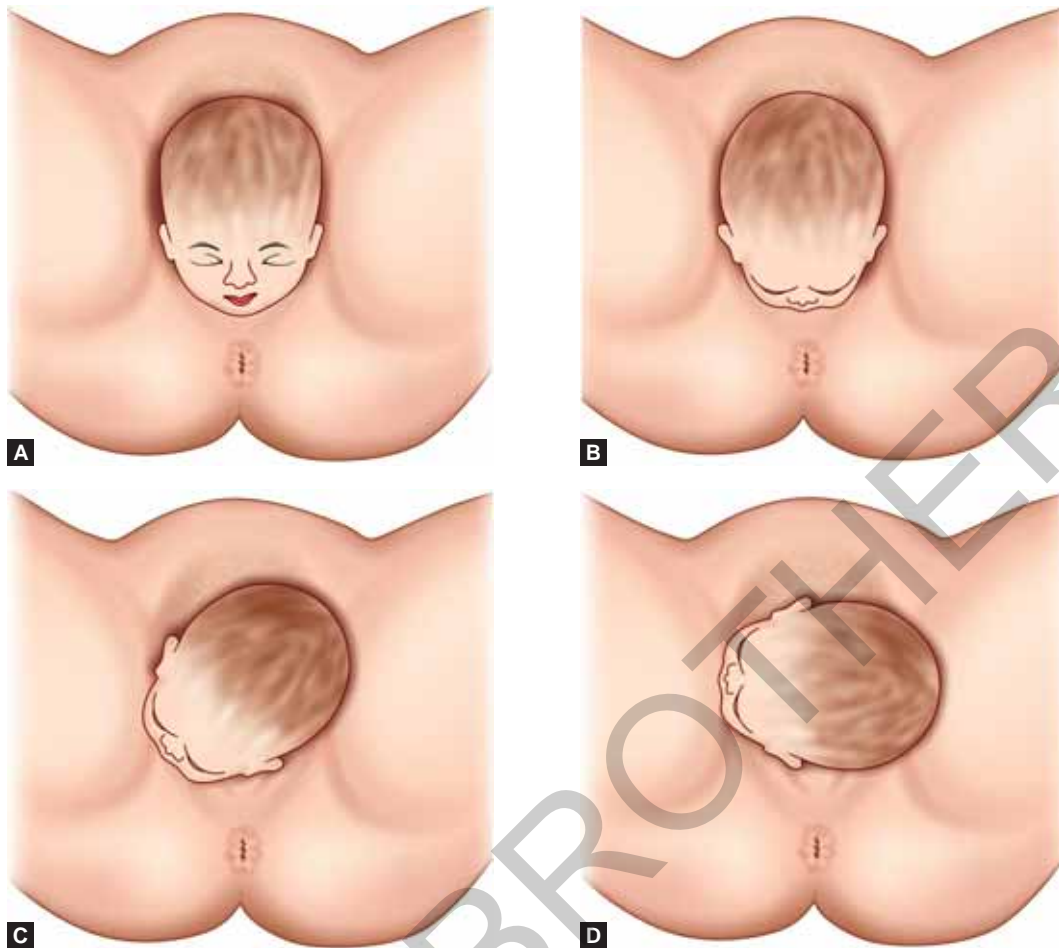
for about 45 seconds. The relation of pain with uterine contraction is of great clinical significance. **In normal labor**, pains are usually felt shortly after the uterine contractions begin and pass off before complete relaxation of the uterus. **Clinically pains are said to be good** if they come at intervals of 3–5 minutes and at the height of contraction the uterine wall cannot be indented by the fingers.

DILATATION AND EFFACEMENT OF THE CERVIX: Progressive anatomical changes in the cervix, such as dilatation and effacement, are recorded following each vaginal examination. **Cervical dilatation relates** with dilatation of the external os and **effacement is determined by** the length of the cervical canal in the vagina. In primigravidae, the cervix may be completely effaced, feeling like a paper although not dilated enough to admit a fingertip. It may be mistaken for one that is fully dilated. While in multiparae, dilatation and taking up occur simultaneously which are more abrupt following rupture of the membranes. **The anterior lip of the cervix is the last to be effaced.** The first stage is said to be completed only when the cervix is completely retracted over the presenting part during contractions.

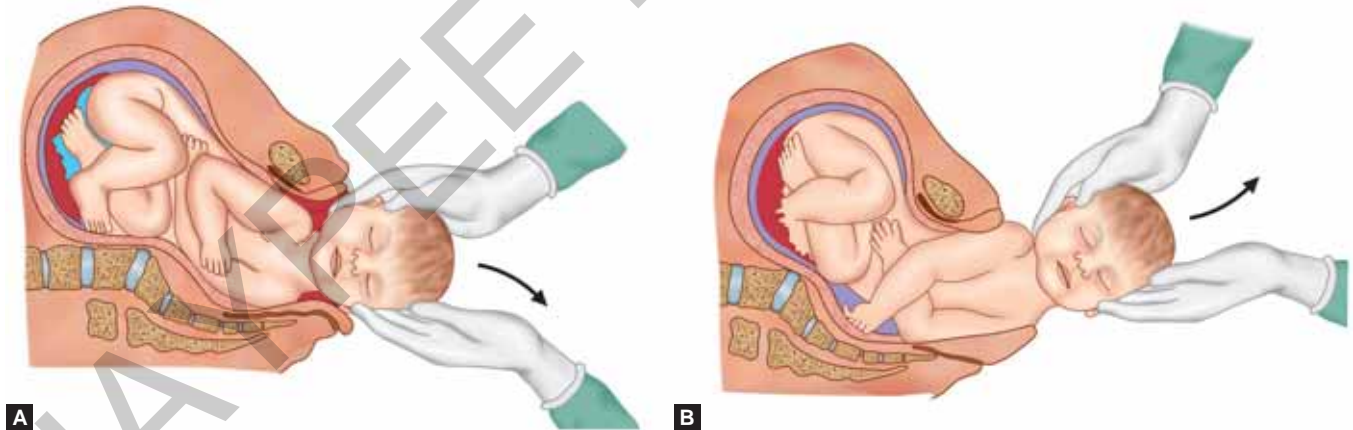
Cervical dilatation is expressed either in terms of fingers—1, 2, 3 or fully dilated or better in terms of centimeters (10 cm when fully dilated). It is usually measured with fingers but recorded in centimeters. One finger equals to 1.6 cm on average. Simultaneously, effacement of the cervix is expressed in terms of percentage, i.e., 25%, 50% or 100% (cervix less than 0.25 cm thick). **The term 'rim' is used** when the depth of the cervical tissue surrounding the os is about 0.5–1 cm.

Partograph (Fig. 35.6): Friedman (1954) first devised it. Partograph is a composite graphical record of cervical dilatation and descent of head against duration of labor in hours. It also gives information about fetal and maternal condition, which are all recorded on a single sheet of paper (for details, p. 494). **Cervical dilatation is a sigmoid curve and the first stage of labor has got two phases—(1) latent phase and (2) active phase (Fig. 13.18).**

First stage of labor (Friedman 1971) is divided into a relatively flat latent phase and a rapidly progressive active phase (**Fig. 13.18**). The active phase has three compartments. **Presently active phase is refined to start with 5 cm (WHO) or 6 cm (ACOG, SFMM).**



Figs. 13.26A to D: (A) Head is born by extension; (B) Head drops down with the face close to the anus; (C) Restitution; (D) External rotation.

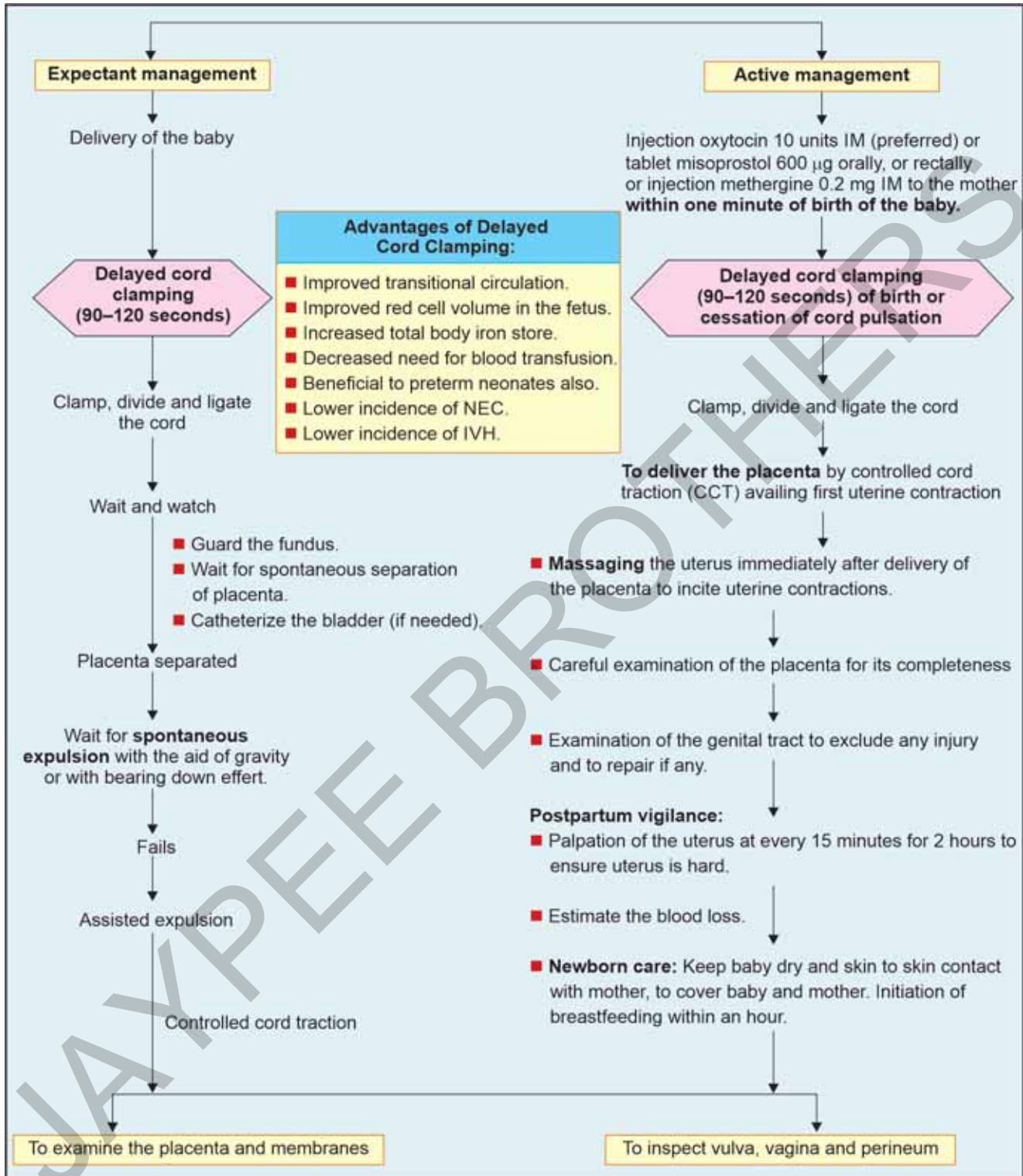


Figs. 13.27A and B: Assisted delivery of the shoulders: (A) Anterior shoulder; (B) Posterior shoulder.

IMMEDIATE CARE OF THE NEWBORN

- **Soon after the delivery of the baby**, it should be placed on a tray covered with clean dry linen with the head slightly downward (15°). It facilitates drainage of the mucus accumulated in the tracheobronchial tree by gravity. The tray is placed between the legs of the mother and **should be at a lower level than the uterus** to facilitate gravitation of blood from the placenta to the infant.
- **Air passage (oropharynx) may be cleared** of mucus and liquor. Bulb syringe or suction catheter aspiration may be used.
- **Apgar rating** at 1 minute and at 5 minutes is to be recorded.
- **Clamping and ligature of the cord:** The cord is clamped by two Kocher's forceps, the near one is placed 6–10 cm away from the umbilicus and is cut in between. Two separate cord ligatures are applied with sterile cotton threads 1 cm apart using reef-knot,

Flowchart 13.3: Scheme of management of third stage of labor.



fundus and the thumb in front using the uterus as a sort of piston (Fig. 13.29). **Pressure must be given only when the uterus becomes hard.** If it is not, then make it hard by gentle rubbing. The pressure is to be withdrawn as soon as the placenta passes through the introitus. **If the baby is macerated or premature, this method is preferable to cord traction** as the tensile strength of the cord is much reduced in both the instances.

The cord may be accidentally torn which is not likely to cause any problem. The sterile gloved hand should be introduced, and the placenta is to be grasped and extracted.

- **The uterus is massaged** to stimulate uterine contractions and to make it hard. This also facilitates expulsion of retained clots if any.
- **Examination of the placenta membranes and cord:** The placenta is placed on a tray and is washed

MANAGEMENT OF FOURTH STAGE: Pulse, blood pressure, tone of the uterus (well retracted) and any abnormal vaginal bleeding are to be watched at least for 1 hour after delivery. When fully satisfied that the

general condition is good, pulse and blood pressure are steady, the uterus is well retracted and there is no abnormal vaginal bleeding, the patient is sent to the ward.

SUMMARY

First Stage of Labor

First stage of labor starts from the onset of true labor pain and **ends with** full dilatation of the cervix. **Its average duration** is about 12 hours in primigravidae and 6 hours (WHO-10 hours) in multiparae. **First stage consists of latent phase** (up to 5 cm of cervical dilatation) and **active phase** (up to 10 cm). The stage is chiefly concerned with dilatation and effacement of the cervix.

This stage is clinically manifested by progressive uterine contraction, dilatation and 'effacement' of the cervix and ultimate rupture of the membranes. **Maternal and fetal conditions** remain unaffected except during uterine contraction. **Management consists of:** (1) Noninterference with watchful expectancy. (2) Women is given **encouragement, emotional support and adequate pain relief** during the entire course of labor. (3) To monitor carefully the progress of labor, maternal condition and fetal behavior so as to detect any deviation from the normal. (4) **Partograph is maintained.**

Second Stage of Labor

The **second stage of labor starts** from full dilatation of the cervix and **ends with** expulsion of the fetus. **Its average duration** is 2 hours (WHO-3 hours) in primigravidae and 30 minutes (WHO-2 hours) in multiparae. **This stage concerns** with the descent and delivery of the fetus through the birth canal. **This stage is** clinically manifested by increased frequency and intensity of uterine contractions with appearance of 'bearing-down' efforts which result in expulsion of the fetus. The mother may show features of exhaustion. The **principles in management are:** (1) To assist the natural expulsion of the fetus slowly and steadily. (2) To prevent perineal injuries. **During conduction of delivery,** head is delivered slowly in between contractions. Flexion is maintained so that smaller diameter of the head stretches the perineum. Thus, timely performed episiotomy (selective), prevents perineal laceration. Shoulders are delivered slowly with next contraction. **Immediate care of the newborn** includes clearing of the air passage and eyes, delayed clamping and ligaturing of the umbilical cord and Apgar scoring.

Third Stage of Labor

The third stage begins after the expulsion of the fetus and ends with expulsion of the placenta and membranes. Its **average duration is 15 minutes.** This stage concerns with placental separation and its expulsion. **The separation is** achieved by marked reduction in the uterine surface area of the placental site following delivery due to retraction. **The placenta being** inelastic, shears off its attachment through the deep spongy decidual layer. There are **two ways of separation**—central (Schultze) and marginal (Mathews-Duncan). **The bleeding is** controlled by effective myometrial contraction and retraction (living ligature) and by thrombosis. **The expulsion may occur** through 'bearing-down' efforts or more commonly with assistance. **The management is** either by employing watchful expectancy or **by active management (WHO)** in cases where oxytocin 10 units IV (slowly) or IM/methergine 0.2 mg IV is administered within 1 minute following the delivery of the baby.

Tablet misoprostol 600 µg, can be given orally or rectally in cases with home delivery. It can be given by a community health worker. Placenta is delivered by CCT soon following delivery of the baby. Uterine massage may be given to make it hard. The placenta and the membranes should be examined following their expulsion.

Fourth Stage of Labor

It is the stage of observation for at least 1 hour after the delivery of the baby, placenta and the membranes to ensure that both the mother and the baby are well.

POINTS

- **Labor** involves a series of changes in the genital organs associated with regular painful uterine contractions with effacement and dilatation of the cervix. **Delivery** is not synonymous with labor as it can take place without labor. Normal labor should fulfil some defined criteria.
- **Onset of labor** is difficult to understand. Role of estrogen, progesterone, prostaglandins, oxytocin, and the fetus have been explained.
- **Active phase of labor** begins when the cervix is 5 cm dilated. Management of latent phase (observation) and active phase of labor are different.
- **Labor events** are conventionally divided into two phases (latent phase and active phase) and three stages.
- **Main events in the first stage of labor** are: (a) **dilatation** and (b) **effacement** of the cervix. **Second stage** events are: (a) **descent** and (b) **delivery** of the fetus. **Second stage** is characterized by two phases: (a) **propulsive** and (b) **expulsive (bear down)** to deliver the fetus. **Third stage events** are **separation** of placenta and **expulsion** of placenta.
- **Lower uterine segment** is formed mainly during the first stage of labor. Clinical importance of lower uterine segment is very much.
- **Mechanism of normal labor** involves a series of movements on the head in the process of adaptation during its passage through the pelvis.

Contd...

DC Dutta's Textbook of OBSTETRICS

Salient Features

- This tenth edition reflects the authoritative resource on comprehensive obstetric and perinatal care.
- The language throughout the text is crisp, lucid and unambiguous.
- Information is consistent and uniform across all the chapters.
- Enriched with numerous colored boxes, tables, flowcharts, illustrations, line drawings, MR images, ultrasonograms, skiagrams and key points for quick revision and fast learning without going through the text.
- All the chapters have been thoroughly updated and restructured to reflect the contemporary obstetric care with quality.
- Focuses on evidence-based knowledge. Core knowledge (must-know area) has been highlighted.
- Standardized headings with different styles are for quick pick-up, comfortable reading, and easy reproduction.
- Guidelines and recommendations of professional and academic organizations have been highlighted. These highlighted matters are the must know for the individual topics discussed. They are the answers to the questions which the students are frequently tested on.
- The Kernel and the Beyond Series are an extra addition. Its contents are structured to meet the one-to-one understanding of the topics for the examination point of view. It would meet the requirements for the undergraduates, postgraduates and nursing students.
- The QR codes used in several topics in the book highlight the extra reading matters for advanced learning. This is an approach to encourage and prepare the postgraduate students for their various examinations.
- Indispensable for trainee residents, and different postgraduate entrance examinations in India and overseas.
- Equally informative to nursing students, midwives, homeopathic and ayurvedic students, as well as general practitioners and practicing obstetricians.

Reviews

Every chapter of this comprehensive text is easy to navigate and read with its standardized headings, subheadings, tables, boxes, flowcharts and key points. This is an excellent textbook superbly written. It should be in each and every library and in the possession of all the medical students, midwives and practicing clinicians.

—**Sir Sabaratnam Arulkumaran** DSc PhD FRCOG FRCS

Professor Emeritus, St George's University, London, Past President-FIGO, RCOG, BMA

All the editions of Dutta's Obstetrics, since 1983 till date, have strongly supported the progress of knowledge and understanding in the field of obstetrics. The tenth edition is a remarkable one in all aspects. This book has always been the Bible to all the medical and nursing students as well as the clinicians.

—**Himadri Bal** MD Professor, Dr DY Patil Medical College, Pune, Maharashtra, India

The presentation of Dutta's Obstetrics is simple, readable and easy to understand. The book has always been up-to-date with the progress of science. Guidelines of different international bodies are highlighted. It is an excellent educational resource to all the medical students, practicing obstetricians and the midwives.

—**The Journal of Obstetrics and Gynecology of India. August 2016; 66(4):303-4.**

Dutta's Textbook is indeed a formidable work. It is beautifully illustrated with the comprehensive and concise text matter. It is an immensely useful study resource for all.

—**Colm O'Herlihy** MD

Professor, National Maternity Hospital, Dublin, Ireland

I consider this textbook as the *Bhagavad Gita* for all the medical students, practicing obstetricians and the midwives. It is my companion since the MBBS days. All the editions of Dutta's adorn a place of pride in the library of my clinic.

—**Jyoti Gupta** MD President-BOGS

The text is superbly illustrated with diagrams, graphs, images, sketches and beautiful photographs. The presentation is lucid and easy to read and understand. It is of immense benefit to the students—both the medical and midwifery.

—**Michael P O'Connell** MD

Consultant, Coombe Women and Infants University Hospital, Dublin, Ireland



If any reader wishes to share feedback, suggestions, updates, and errata, please scan the QR code and fill the google form.

Printed in India

**Available at all medical bookstores
or buy online at www.jaypeebrothers.com**



JAYPEE BROTHERS
Medical Publishers (P) Ltd.
EMCA House, 23/23-B, Ansari Road,
Daryaganj, New Delhi - 110 002, INDIA
www.jaypeebrothers.com

Join us on [facebook.com/JaypeeMedicalPublishers](https://www.facebook.com/JaypeeMedicalPublishers)

Shelving Recommendation
OBSTETRICS & GYNECOLOGY

ISBN 978-93-5696-331-3

