

Contents

Chapter 1. Cell Biology, Embryology and the Placenta	1
The Cell	1
The Nucleus	1
The Cytoplasm	1
The Cell Membrane	2
Transport Through the Cell Membrane	2
The Genetic Code	3
Mitosis and Meiosis	5
Sex Chromosomes	6
Chromosome Abnormalities	6
Genetics — Single and Multiple Gene Defects	7
Single Gene Defects	7
Multiple Gene Defects	8
Fertilisation	8
Cleavage of the Embryo: the Morula and the Blastocyst . .	10
Implantation of the Blastocyst and Early Development of the Placenta and Embryo	11
Multiple Pregnancy	12
Development of the Placenta	14
Further Development of the Embryo	16
The Placenta	19
Structure of the Mature Placenta	19
Structure of the Chorionic Villi	20
Placental Synthesis	21
Oestrogens	22
Progesterone	22
Human Placental Lactogen	23
Human Chorionic Gonadotrophin	23
Placental Transfer	23
Chemical Properties Affecting Placental Transfer	23
Placental Perfusion	24
Placental Transfer of Individual Substances	25
Water	25
Oxygen and Carbon Dioxide	25
Glucose	26
Amino Acids	27

Other Nutrients	27
The Membranes and Amniotic Fluid	27
Formation of the Membranes	27
The Amnion	27
The Chorion	28
Formation of Amniotic Fluid (Liquor)	28
Volume and Composition of Amniotic Fluid	28
Chapter 2. Anatomy	30
The Vulva	30
Labia Majora	30
Labia Minora	30
The Clitoris	31
Vestibule and Bartholin's Glands	32
The Vagina	32
The Uterus	33
The Pregnant Uterus	33
Growth of the Uterus	34
Blood Supply	34
The Fallopian Tubes	35
The Ovaries	35
The Female Urological System	35
The Ureter	35
The Bladder	36
The Urethra	36
Micturition	37
Continence	37
The Perineum	37
Urogenital Triangle	38
Urogenital Diaphragm (Triangular Ligament)	38
Muscles of the Perineum	38
Perineal Body	38
Superficial Perineal Pouch	38
Deep Perineal Pouch	39
Peritoneum and Ligaments of the Pelvis	39
Broad Ligament	39
Round Ligament	40
Ligaments Formed from Pelvic Fascia	40
Blood Supply to the Female Pelvis	40
Lymphatic Drainage of the Female Pelvis	40
Nerve Supply to the Female Pelvis	41
The Pelvic Skeleton	43
The Innominate (Hip) Bone	43
Structures Attached to the Pelvic Bones	44
Foramina and Canals in the Pelvis	44
General Features of the Bony Pelvis	46
The Fetal Skull	46

Microstructure and Function of the Non-pregnant	
Reproductive Tract	48
The Mucosa of the Fallopian Tube	48
Muscular Activity of the Fallopian Tube	48
The Endometrium	49
Activity of the Myometrium During the Reproductive	
Cycle	49
The Cervix	50
The Vagina	50
Embryology of the Female Genital System	50
The Ovary	50
The Uterus and Fallopian Tubes	51
The Vagina	51
The External Genitalia	52
The Anterior Abdominal Wall	52
Muscles of the Anterior Abdominal Wall	53
 Chapter 3. General Physiology and Biochemistry	 55
The Cardiovascular System	55
The Heart	55
Blood Pressure	55
Blood-flow in Individual Organs	56
Blood Volume and Composition	56
Haematinic Factors in Pregnancy	56
Iron	56
Folate	57
Vitamin B ₁₂	57
Coagulation and Fibrinolysis During Pregnancy	58
The Fetal Circulation	58
Cardiovascular System	58
Fetal Blood	59
The Lung	59
Measurement of Lung Function	59
Changes in Lung Function During Pregnancy	60
The Fetal Lung	61
The First Breath — Commencement of Breathing at	
Birth	62
Acid-Base Balance	63
Clinical Abnormalities of Acid-Base Balance	63
The Kidney	64
The Gut and Nutrition	65
Appetite	65
Changes in Specific Areas of the Maternal Gastro-	
intestinal System During Pregnancy	65
Gums, Teeth and Saliva	65
Oesophagus and Stomach	65
The Intestines	65

The Liver and Gall Bladder	66
The Fetal Gut	66
Maternal Nutrition During Pregnancy	66
Maternal Weight Gain During Pregnancy	66
Fetal Weight Gain During Pregnancy	67
Metabolism	67
Carbohydrate Metabolism	67
Lipid Metabolism	69
Endocrine Control of Energy Metabolism	69
Pancreatic Islets	69
Insulin	69
Glucagon	71
Control of Insulin and Glucagon	71
Hormones and Metabolism	71
Maternal and Fetal Metabolism During Pregnancy	71
Carbohydrates	71
Protein	72
Lipids	72
Amino Acids	72
Vitamins	72
Calcium	72
Immunology	73
General Immunology	73
Non-specific Factors	73
Specific Immunity	73
Humoral Immunity	73
Cellular Immunity	75
Changes in the Immune System in Pregnancy	77
Transfer of Antibodies to the Fetus	78
Development of the Immune System in the Fetus	78
Immunological Aspects of Amniotic Fluid	78
Immunological Aspects of Breast Feeding	78
Immunology of Haemolytic Disease of the Newborn ...	79
 Chapter 4. Endocrinology	 80
Some Basic Concepts in Endocrinology	80
The Hypothalamus	81
Functional Anatomy	81
Hypothalamic Control of the Pituitary	81
The Anterior Pituitary	84
Anatomy and Embryology	84
Micro-anatomy	85
Growth Hormone, ACTH and TSH	85
Gonadotrophins and Prolactin	86
Gonadotrophins (LH and FSH)	86
Prolactin	89
The Posterior Pituitary	89

The Breast and Lactation	91
Anatomy	91
Development of the Breast	91
Histology of the Lactating Mammary Gland	91
Hormonal Control of Breast Growth and Lactation	92
Composition of Milk	92
Sex Steroids	92
Biosynthesis	93
Urinary Excretion	93
Oestrogens	93
Progesterone	97
Testosterone	97
The Ovary	98
Development of Primordial Follicles	98
Further Development of the Oocyte	99
The Corpus Luteum	100
Hormone Production by the Ovary	100
Control of Follicle Growth	101
Mechanism of Ovulation	102
The Menopausal Ovary	103
The Testis	103
Embryology of the Testis	103
Spermatogenesis	103
Sertoli Cell Function	104
Sperm Transport	104
Leydig Cell Function	105
Thyroid Gland	105
Anatomy	106
Chemistry and Metabolism	106
Action of Thyroid Hormones	107
Control of Thyroid Hormone Secretion	108
Development of Fetal Thyroid Function	109
The Maternal Thyroid in Pregnancy	109
The Adrenal Cortex	109
Control of Glucocorticoid Secretion	110
Control of Mineralocorticoid Secretion	110
Control of Sex Steroid Secretion	110
Actions of Glucocorticoids	111
The Maternal Adrenal Cortex During Pregnancy	111
The Adrenal Medulla	112
Hormones Involved in Calcium Homeostasis	113
Puberty and the Menopause	114
Puberty	114
The Menopause	114
Hormonal Patterns Preceding the Menopause	114
Hormonal Patterns After the Menopause	115
Initiation of Labour	115
The Pineal Gland	116

Chapter 5. Pathology	117
Inflammation	117
Acute Inflammation	117
Chronic Inflammation	118
Examples	119
Amyloid Disease	119
Wound Healing	119
Tensile Strength and Elasticity of a Healing Wound	120
Local Factors in Wound Healing	120
Systemic Factors in Wound Healing	121
Wound Healing in Tissues-Other than Skin	121
The Metabolic Response to Injury	122
Catabolic Response	122
Fluid Conservation	122
Mobilisation of Energy Resources	122
Shock	123
Hypovolaemic Shock	123
Endotoxic Shock	123
Tumours	124
Simple (Benign) and Malignant Tumours	124
Tumour Histology	124
Spread of Malignant Tumours	125
Incidence of Tumours	125
Precancerous States and Chemical Carcinogens	125
Viruses as a Cause of Tumours	126
Immunity and Cancer	127
Tumour Products	127
Tumour Classification	128
Hamartomas	128
Epithelial Tumours	128
Mesenchymal Tumours	129
Teratomas	129
Some Characteristics of Tumours in Special Sites	129
Anterior Pituitary	129
Pheochromocytoma	130
Conn's Tumour	130
Carcinoid Tumour (Argentaffinoma)	130
Bone	130
Breast Carcinoma	130
Carcinoma of the Colon and Rectum	131
Carcinoma of the Bladder	131
Carcinoma of the Prostate	131
Tumours of the Testis	131
Thrombosis and Embolism	132
Causes of Thrombosis	133
Atherosclerosis	133
Deep Venous Thrombosis.....	133
Pulmonary Embolism	133

Other Forms of Emboli	134
Deposition of Salts and Pigments	134
Urinary Calculi	134
Gall-stones	134
Haemosiderosis and Haemochromatosis	134
Effects of Radiation	135
Radiotherapy of Tumours	135
 Chapter 6. Microbiology	 137
Bacteria	137
<i>Staphylococcus aureus</i> (<i>pyogenes</i>)	138
Streptococci	138
Gram-negative Intestinal Bacilli	138
Pneumococcus (<i>Diplococcus pneumoniae</i>)	139
Neisseria	139
Clostridia	139
Tuberculosis	139
Syphilis	140
Actinomycosis	140
Viruses	140
Some Common Viral Diseases	142
Enterovirus Infections	142
Respiratory Virus Infection	142
Virus Hepatitis	142
Herpesvirus Infections	143
Rubella	144
Rickettsial Organisms	144
Mycoplasmas	145
Fungal Infections	145
Protozoal Infections	145
Some Characteristics of Infections at Special Sites	146
Wound Infections	146
Urinary Infections	146
Food Poisoning	146
 Chapter 7. Pharmacology	 147
Introduction	147
Sedative, Hypnotic and Anxiolytic Agents	147
Antipsychotic Agents	148
Antidepressive Agents	149
Analgesic Agents	149
Antacid Agents	150
Laxative Agents	150
Anti-emetic Agents	151
Diuretic Agents	151

Antihypertensive Agents	151
Drugs Affecting Blood Coagulation	153
Anticoagulants	153
Heparin	153
Coumarins and Indanediones	153
Activators of the Fibrinolytic System	154
Antifibrinolytics	154
Chemotherapy of Infection	154
Antibiotics	154
Antiviral Agents	155
Antifungal Agents	155
Pharmacology of Sex Steroids	155
Oestrogens	158
Progestogens	159
Drugs Affecting Contraction of the Uterus	160
Mechanism of Myometrial Contraction	160
Drugs Causing Uterine Contractions	161
Oxytocin	161
Ergometrine	161
Prostaglandins	161
Drugs Which Relax the Uterus (Tocolytics)	162
β -Adrenergic Receptor Stimulants	162
Aminophylline	162
Antiprostaglandins	163
Other Tocolytic Agents	163
Anticancer Drugs (Cytotoxic Agents)	163
General Anaesthetic Agents	165
Local Anaesthetic Agents	165
Some General Aspects of Pharmacology in Pregnancy	167
 Appendix. Statistics	 169
 Subject Index	 171