Contents

Preface xi
Foreword xiii
Contributors xv
Acknowledgements xvii

Part 1 Chemotherapy 1

Commentary: Chemotherapy 3
Jamie Cargill

1. Principles of Chemotherapy 7
Angela Houlston

The history of the development of chemotherapy 7
Cell cycle 7
Growth fraction 8
Pharmacokinetics and pharmacodynamics 9
Protocol development and clinical trials 9
Considerations when planning chemotherapy treatments 10
Treatment approaches 11
References 13

2. Chemotherapy Agents 15
Angela Houlston

Classification of drugs 15
References 19

3. Administration of Chemotherapy 21
Angela Houlston

Safe practice with cytotoxic drugs: legislation 21
Consent 21
Safe handling 21
Reconstitution and preparation of chemotherapeutic agents 22
Personal Protective Equipment (PPE) 22
Work practices 23
Patient support 25
Setting for chemotherapy administration 25
Administration of chemotherapy 27
Routes of administration 28
Intrathecal route 31
The intramuscular and subcutaneous routes 32
References 33

4. Side Effects of Chemotherapy 35
Karen Selwood

Introduction 35
Gastrointestinal tract 36
Taste alteration 42
Nausea and vomiting 43
Pharmacological interventions 46
Anorexia/weight loss 48
Haematological problems 55
The compromised immune system 60
Viral infections 60
Cutaneous side effects 61
Conclusion 65
References 65

5. Oncological Emergencies 73
Karen Selwood

Introduction 73
Septic shock 73
Home care 74
Disseminated intravascular coagulation (DIC) 75
Anaphylaxis 77

Acute tumour lysis syndrome (ATLS) 77
Hyperuricaemia 79
Hyperkalaemia 80
Hyperphosphataemia and hypocalcaemia 81
Nursing implications of ATLS 81
Spinal cord compression 82
Conclusion 82
References 82

6. Future Trends **85**
Karen Selwood

Introduction 85
Treatment strategies 86
Targeted approaches 86
Proteasome 87
Gene therapy 87
Tumour vaccines 88
Hormone therapy 88
Combination therapy 88
New treatments for cancer – the nurse's role 88
References 89

Part 2 Haematopoietic Stem Cell Transplantation **91**

Commentary: Haematopoietic Stem Cell Transplantation **93**
Helen Webster

7. Background to the Haematopoietic Stem Cell Transplant (HSCT) Procedure **97**
Nikki Bennett-Rees and Sian Hopkins

History 97
Types of transplant 98
Diseases for which haematopoietic stem cell transplant is a treatment modality 99
Tissue typing 100
Adult unrelated donors 102
References 105

8. Preparation for Bone Marrow Transplant **107**
Nikki Bennett-Rees, Sian Hopkins and Joanna Stone

The family 107
Negotiation 109
Support 109
Preparation of children 110
Conditioning regimens 113
Preparation of a sibling donor 116
Ethical use of sibling donors 117
Saviour siblings 121
Preparation of non-donor siblings 122
References 122

9. Collection and Infusion of Bone Marrow, Peripheral Blood Stem Cells and Umbilical Cord Cells **125**
Nikki Bennett-Rees and Sian Hopkins

Collection of bone marrow 125
Complications of donation 126
Collection of peripheral blood stem cells (PBSC) 126
Venous access 128
Stem cell collection 129
Collection of umbilical cord blood cells 130
Issues surrounding umbilical cord banking 131
Bone marrow/stem cell infusion 131
References 133

10. Protective Isolation: Nursing Issues **135**
Nikki Bennett-Rees and Sian Hopkins

Introduction 135
Infection prophylaxis 136
Protective isolation 137
Dietary restrictions 138
Mouth care 139
Skin care 140
Infection screening 140
The effects of isolation 140
References 141

11. Complications of Stem Cell Transplant **143**
Nikki Bennett-Rees and Sian Hopkins

Introduction 143
Mucositis 143
Treatment and nursing implications 144
Pancytopenia 147
Haematological complications 147
Infection 150

Veno-occlusive disease 154
Graft versus host disease (GVHD) 156
Graft versus leukaemia (GVL) 159
References 160

12. Discharge Planning and Psychosocial Issues for the Family 163
Nikki Bennett-Rees and Sian Hopkins

Discharge planning 163
Psychosocial effects of stem cell transplant on the family 166
References 168

13. Staff Support in Stem Cell Transplant Units 169
Sian Hopkins

Educational needs of nurses in blood and bone marrow transplant units 170
References 171

14. Further Developments in Stem Cell Transplantation 173
Nikki Bennett-Rees, Sian Hopkins, Lesley Henderson and Jinhua Xu-Bayford

Gene therapy 173
What is gene therapy? 173
Gene therapy prospects for primary immunodeficiencies 174
What does the gene therapy process involve for the child? 174
Care of the child undergoing gene therapy for X-linked SCID 176
Care of the child undergoing gene therapy for ADA-SCID or CGD 177
Parental support 178
Risks and side effects of gene therapy 178
The future 179
References 179

Part 3 Surgery 181

Commentary: General Surgery 183
Charlie Rogers

Introduction 183
Diagnosis 183
Continuity of care 183
Pain 184
Central venous access 185
Conclusion 186
References 186

15. General Surgery 187
Rachel Hollis, Sharon Denton and Gill Chapman

Introduction 187
The challenge of surgical care in paediatric oncology 188
Surgery as a diagnostic tool 189
Surgery as a treatment modality 192
Preparing the child and the family for surgery 198
Post-operative nursing care 201
Discharge planning 206
Late effects of surgical treatment 206
Surgery in supportive care 208
Management of infection 212
Surgery to avoid the complications of radiotherapy 213
Future trends in surgery 214
References 214

Commentary: Neuro-oncology 219
Jennie Sacree

16. Neuro-oncology 223
Lindy May and Beth Ward

Introduction 223
Overview of brain tumours 223
Increased intracranial pressure and hydrocephalus 225
Tumour types 226
Investigations into brain tumours 227
Neurological assessment 228
Play therapy 232
The multidisciplinary team 232
Pre-operative care 233
Intra-operative care 233
Post-operative management 234
Long-term concerns: morbidity and mortality 236
Jack's journey through CNS tumour treatment 236
Ongoing needs of a child with a brain tumour 237

Adjuvant treatment: specifics of treating a child with a CNS tumour 239
Late effects of CNS tumours and acute rehabilitation needs 242
Rehabilitation needs 244
Second malignancy 244
Discharge planning 244
Relapse and chemotherapy clinical trials 245
Relapse: the child 245
Palliative care 245
The future of neuro-oncology 246
References 247

Commentary: Primary Bone Cancer in Young People 251
Lin Russell

17. Primary Bone Cancer in Young People 255
Chris Henry

Introduction 255
Types of tumours and their presentation 257
Treatment options 260
Limb conservation surgery 262
Amputation 265
Altered body image 268
Discharge planning 268
Late effects 269
Future trends 272
Impact of setting 273
References 275

Part 4 Radiotherapy 279

18. The Nature of Radiotherapy 281
Monica Hopkins

Introduction 281
Indications for the use of radiation in the care of children with cancer 282
The nature of radiation 282
Artificial production of radiation for clinical use 283
Radiation dose 284
Effect of ionising radiation on human tissue 284
Hazards to healthy tissue during radiotherapy 285
Conclusion 286
References 286

19. Administration of Radiotherapy 289
Monica Hopkins

Introduction 289
External beam therapy (teletherapy) 289
Brachytherapy 297
Use of unsealed sources (intravenous radioactive materials) 299
Administration of alternative radiotherapy techniques 302
What does the future hold for radiotherapy? 304
References 306

20. Tumours and Radiotherapy Treatment 311
Monica Hopkins and Cornelia Scott

Brain tumours 311
Adverse effects of radiotherapy in the treatment of brain tumours 312
Acute lymphoblastic leukaemia with CNS involvement 314
Tumours of the head and neck 315
Retinoblastoma 315
Non-Hodgkin's lymphoma 316
Hodgkin's lymphoma 316
Radiotherapy for abdominal tumours 317
Malignant mesenchymal tumours such as rhabdomyosarcoma 317
Wilms' tumour 317
Neuroblastoma 318
Pelvic irradiation 318
Extremity radiation 319
Conclusion 319
References 320

21. Acute and Sub-acute Side Effects of Radiotherapy 321
Monica Hopkins and Cornelia Scott

Introduction 321
Acute reactions in healthy tissue 321
Skin 322
The gastrointestinal tract 328
Mouth 328
Promotion of nutritional intake 331
Pain control 332

Small intestine 333
Bone marrow 334
Hair follicles 335
Fatigue 335
Brain 336
Pneumonitis 337
Cystitis 337
Conclusion 338
References 338

22. The Role of Radiotherapy in Palliative Care 343
Monica Hopkins

The decision to use radiotherapy in the palliative care of children 343
Radiotherapy in oncological emergencies 344
Radiotherapy in end of life symptom management 346
References 348

Part 5 Late Effect of Cancer Therapies 351

23. Overview of Long-Term Follow-Up 353
Susan Mehta

Future challenges 354
Long-term effects of cancer treatment 354
The nursing role 354
Health education 355
Conclusion 355
References 355

24. Potential Physical Issues Following Cancer Treatment 357
Ruth Elson and Susan Mehta

Endocrinopathies 357
Thyroid gland 358
Hypothalamic pituitary axis 359
Gonadal dysfunction 360
Fertility 363
Liver 365
Neurological impairment 366
Neuropsychological 368
Eyes 369
Craniofacial and dental 370
Skin 371
Musculoskeletal 371
Hearing 373
Gastrointestinal 374
Cardiac 375
Renal and bladder 376
Pulmonary 377
Second malignancies 378
References 379

25. The Role of the Nurse in Long-Term Follow-Up 383
Beverly Horne

Assessment, planning, implementation and evaluation of programmes of care 383
Support and advice 384
Liaison and education 384
Provision and facilitation of alternative models of care 385
Research and audit 386
Health promotion provision 387
Participation in specialist LTFU clinics 387
Conclusion 387
References 387

26. Health Promotion for Long-Term Follow-Up Patients 389
Beverly Horne

Smoking 390
Alcohol consumption 391
Recreational drug use 391
Nutrition, physical activity and achieving a healthy weight 391
Breast awareness 393
Testicular self-examination 393
Sexual health 393
Sun protection 394
Theoretical approaches and models 394
Conclusion 395
References 395

27. Quality of Life in Long-Term Survivors of Childhood Cancer 397
Anthony Penn

Defining quality of life in the health-care setting? 397
Physical function 398

Psychological function 398
Cognition 399
Social function 399
Education 400
Employment and insurance 400
Interpersonal relationships and marriage 401
Conclusion 401
References 402

Index 405