

# TABLE OF CONTENTS

<b>Pain and Sedation I</b> .....	<b>1</b>
PAIN AND SEDATION I PANEL .....	3

## Pain and Analgesia

*By Gilles L. Fraser, Pharm.D., MCCM; and David J. Gagnon, Pharm.D., BCCCP*

Introduction .....	7
Management .....	10
Special Populations and Issues .....	16
Outcomes Measures and Quality Improvement Metrics .....	17
Facilitating Bedside Application .....	18
Conclusion .....	18
References .....	19
Self-Assessment Questions .....	22

## Agitation in Mechanically Ventilated ICU Patients

*By Joshua T. Swan, Pharm.D., MPH, BCPS*

Introduction .....	27
Clinical Practice Guidelines .....	27
Etiologies of Agitation Among Critically Ill Patients .....	28
Measurement of Agitation and Sedation .....	28
Indications for Sedation .....	28
Defining Treatment Goals for Level of Sedation .....	31
Evaluation of Effectiveness .....	31
Initial Management of Agitation .....	33
Pharmacologic Agents for Agitation .....	34
Delivery of Sedation .....	42
Evaluation of Safety During Treatment of Agitation .....	44
Coordinating Sedation with Respiratory Evaluation .....	45
Non-benzodiazepine-Based Sedation vs. Benzodiazepines for Sedation of Adult Critically Ill Patients .....	46
Economic Evaluation of Sedation Strategies .....	46
Conclusion .....	47
References .....	48
Self-Assessment Questions .....	52

<b>Pain and Sedation II</b> .....	<b>57</b>
PAIN AND SEDATION II PANEL .....	59

## Delirium and Sleep in Critically Ill Adults

*By Mona K. Patel, Pharm.D.; and John W. Devlin, Pharm.D., FCCP, FCCM*

Introduction to Delirium .....	63
Description of Delirium .....	63
Impact of Delirium on Patient Outcome .....	64
Pathophysiology of Delirium in the ICU .....	64
Recognition of Delirium in the ICU .....	65
Risk Factors for Delirium .....	65
Delirium Prevention .....	68
Delirium Treatment .....	68
Introduction to Sleep .....	71
Factors That Disrupt Sleep in the ICU .....	73
Interventions to Improve Sleep in the ICU .....	75

Conclusion .....	76
References .....	79
Self-Assessment Questions .....	84

## Pain, Agitation, and Delirium Monitoring/ Pathway Development

*By Joanna L. Stollings, Pharm.D., FCCM, BCPS, BCCCP*

Introduction .....	89
Pain Monitoring .....	89
Sedation-Agitation Monitoring .....	90
Delirium Monitoring .....	92
Differences Between the CAM-ICU and the ICDSC .....	95
Recognition of Hypoactive Delirium .....	95
ABCDEF Bundle .....	95
Conclusion .....	103
References .....	104
Self-Assessment Questions .....	106

<b>Support and Prevention III</b> .....	<b>111</b>
SUPPORT AND PREVENTION I PANEL .....	113

## Prophylaxis of Stress Ulcer and Deep Venous Thrombosis

*By Mitchell S. Buckley, Pharm.D., FCCP, FASHP, FCCM, BCCCP; and Justin Muir, Pharm.D.*

Introduction .....	117
Stress-Related Mucosal Disease .....	117
SUP Options .....	120
Optimal SUP .....	121
Venous Thromboembolism .....	124
Nonpharmacologic VTE Prophylaxis .....	125
Pharmacologic Agents Used for VTE Prophylaxis .....	126
Adverse Effects Associated with Pharmacologic VTE Prophylaxis .....	130
VTE Prophylaxis Recommendations in Select Patient Populations .....	132
Conclusion .....	133
References .....	134
Self-Assessment Questions .....	137

## Perioperative Management: Cardiac and Vascular Surgery

*By James C. Coons, Pharm.D., BCPS-AQ Cardiology; and Matthew R. Wanek, Pharm.D., BCPS, BCCCP*

Introduction .....	143
Perioperative Management in Cardiac Surgery .....	143
Management of Mechanical Circulatory Support .....	146
Perioperative Management in Vascular Surgery .....	151
Perioperative Complications and Considerations .....	152
Conclusion .....	164
References .....	165
Self-Assessment Questions .....	169

## Perioperative Management: Transplantation and Neurosurgery

By Heather Personett, Pharm.D., BCPS, BCCCP; and Hira Shafeeq, Pharm.D., BCPS

Considerations in Solid Organ Transplantation .....	175
Coagulation and Thrombotic Complications .....	177
Considerations in Neurosurgery .....	181
Conclusion .....	190
References .....	190
Self-Assessment Questions .....	193