

INDEX

duration of stay in ICU, 106 acetylcholine cholinergic deficiency in impact on nursing staff, 107 delirium, 52-3, 55-9 independent predictor of acetylcholine deficiency, 59-62 mortality, 95-8 acetylcholinesterase inhibitors, link with dementia/ Alzheimer's disease, 99-100 Activities of Daily Living (ADLs), persistent delirium, 95 100 poor functional recovery, 100-4 acute brain syndrome, 11 psychological trauma, 104-6 acute confusional state, 6, 11-12, PTSD, 104-6 severity and duration of 1Ω delirium, 94-5 admission delirium status of patients, stress on families and 17-18 caregivers, 106-7 adverse effects aetiology of delirium haloperidol, 165-8 and motoric subtypes, 39-41 pharmacological treatments, 175 - 6and motoric subtype, 35 adverse outcomes of delirium, delirium risk in the elderly, 94-108 55-9, 72-3 anxiety, 104-6 akathisia side effect of haloperidol, 166 cause of death, 95-8 cognitive impairment, 99-100 alcohol withdrawal costs of delirium, 107 treatment guidelines, 151 depression, 104-6 use of benzodiazepines, 173-4 discharge to long-term care, 104 alpha 2 agonists, 172-3 duration of stay in hospital, 106 Alzheimer's disease, 62, 65



Index 217

link with delirium, 99-100 Blessed Dementia Rating Scale, risk factor for delirium, 55-9 amino acids blood-brain barrier, 62, 64 role in dementia brain pathophysiology, 63-5 acute brain failure in delirium, anticholinergic drugs precipitating factor for adverse outcomes related to delirium, 85-7 delirium, 2-3 clinical monitoring, 110-11 antipsychotic drugs haloperidol, 160-70 final common neural pathway history of development, theory, 46 156 - 8monitoring brain function, 2 mode of action, 158-60 risk factors for delirium, 55-9 use in delirium treatment. brain insults 155-6role in delirium APACHE (Acute Physiology and Chronic Health Evaluation) pathophysiology, 47 score, 20-1 apolipoprotein E4 (ApoE4) cardiac surgery patients, 64 genotype, 65 incidence of delirium, 24 arousal aspect of consciousness, risk factors for delirium, 90-1 110-11 caregivers attention stress on, 106-7 inability to shift, 112-14 case studies attention testing, 112-14 delirium diagnosed as atypical antipsychotics, 170-1 dementia, 75-6 diagnosis of terminal delirium, Barrough, Philip, 6 198-9 Barthel Index, 100 duration of delirium, 22-4 benzodiazepines identify and treat the cause, and delirium, 53-5, 83-5, 89, 154 - 5173 - 4importance of patient history, and PTSD, 105 154-5, 198-9 use in alcohol withdrawal, mental capacity, 183-4 173 - 4motoric subtypes of delirium, use in ICU patients, 148 30 - 4



218 Index

case studies (cont.) CNS dysfunction, 59-62 multiple precipitating factors, cognition aspect of consciousness, 110-11 need for adequate pain relief, cognitive decline risk factor for delirium, 72-3, 75-6 146-8 need for delirium screening, cognitive failure, 191 cognitive impairment patient's delirium experience, (pre-existing) risk factor for delirium, 55-9 xi-xvi posterior cerebral artery cognitive outcomes with infarction, 48-9 delirium, 99-100 use of physical restraints, cognitive reserve, 76-7 186 - 7Cognitive Test for Delirium, 116 vulnerability to delirium, 82 coma/koma, 12 catechol-O-methyltransferase Confusion Assessment Method (COMT), 65 (CAM), 119-21 Celsus, 3-5 Confusion Assessment Method for the ICU (CAM-ICU), cerebral blood flow, 52 chemical restraints, 187-9 18-22, 36, 116, 121-4, 126-7 alternatives to, 189 confusion mentale (France), 12 chlordiazepoxide, 174 consciousness chlorpromazine, 156-8 arousal and cognition, 110-11 cholinergic deficiency in dysfunction in delirium, 5-6 delirium, 52-3, 55 cortisol cirrhotic patients, 55 role in delirium classification systems pathophysiology, 63 DSM-IV, 7-9 costs of delirium, 107 ICD-10, 7 C-reactive protein, 59 CT scan (computed tomography clinical monitoring of the brain, 110 - 11scan), 48 arousal, 110-11 cytokine production in infection, 59-62 cognition, 110-11 level of consciousness, 110-11 mental status, 110-11 dantrolene, 168 clonidine, 150, 172 De Medicina, 3-5 definitions of delirium clozapine, 158, 170



Index 219

acute brain failure, 1-2 clinical monitoring of the historical descriptions, 3-7 brain, 110-11 dehydration risk factor for clinical screening tools, 115-31 delirium, 73 Cognitive Test for Delirium, 116 delirio (Italy), 12 comatose unresponsive delirium patient, 131 as acute brain failure, 1-2 comparing CAM-ICU and medical emergency, 2-3 ICDSC, 126-7 Confusion Assessment Method responsibility for research, 22 delirium in ICU (CAM), 119-21 education about screening, Confusion Assessment Method for the ICU (CAM-ICU), 116, questions still to be answered, 121-4, 126-7 constraints on delirium 202 what we do know, 202 screening, 136-7 what we don't know, 202 developing a screening tool for delirium tremens, 12 ICU, 116-17 treatment guidelines, 151 implementing delirium dementia screening, 135-7 and delirium, 55-9 importance of screening, 109 delirium mistaken for, 75-6 inattentive responsive patient, education level risk factor. 133-4 76 - 7Intensive Care Delirium link with delirium, 99-100 Screening Checklist with delirium, 52 (ICDSC), 116, 124-7 wrongly applied diagnosis, mental status, 112-14 75 - 6Mini Mental State Examination deprivation of liberty, 182 (MMSE), 117 detection rate for delirium, Montreal Cognitive 15 - 17Assessment, 119 dexmedetomidine, 149, 172-3 Neelon and Champagne diagnosing delirium in critical (NEECHAM) scale, 117, 127 care, 109-37 negative screening in attention testing, 112-14 hallucinating patient, 134-5 awake responsive patient, 132 Nursing Delirium Scale awake unresponsive patient, 132 (Nu-DESC), 117, 131



220 Index

diagnosing delirium in critical	excess in delirium, 52-3
care (cont.)	production, 64
sedation scores, 112	drugs
variety of delirium screening	precipitating factors for
tools, 116	delirium, 83–7
when we are unable to assess,	DSM-IV-TR (Diagnostic and
134	Statistical Manual of Mental
diagnosis of delirium, 27-43	Disorders, text revision)
aetiology and motoric subtype,	criteria for delirium, 7-9
39-41	duration and severity of delirium
difficulty of detection, 28	94-5
hypoactive delirium, 28	duration of delirium, 22–4
importance in palliative care, 35	
importance of patient history,	education
75-6	about screening for delirium,
low rates of detection, 27	203-5
motoric subtypes, 28-42	publicizing delirium, 206-7
prevalence of motoric	staff education about delirium
subtypes, 35	145
psychomotor behaviour, 30-4	education level
psychotic symptoms, 41	and cognitive reserve, 76-7
quiet, lethargic patient, 28	risk factor in delirium, 76-7
subsyndromal delirium, 42-3	risk factor in dementia, 76-7
wrong diagnosis of dementia,	elderly people
75–6	risk of delirium, 55-9
diagnostic criteria for delirium	electroencephalography (EEG),
DSM-IV-TR, 7–9	51-2
ICD-10, 7	end-of-life care, 191-201
diazepam, 174	communication with relatives,
digoxin, 86	198-9
discharge to home or nursing	distress caused by delirium,
home, 104	196-7
donepezil, 174	importance of patient
dopamine	documentation, 198-9
as precipitating factor in	importance of treating
delirium, 87	delirium, 191-2



Index 221

referral for uncontrolled symptoms, 193-5 reversible delirium, 192 when to call in the experts, 193-5, see also palliative care. environment risk factors for delirium, 87-8 European Association for Palliative Care, 199-200 European Delirium Association, 206-7 exercise protective effect for delirium, 89 families stress on, 106-7 fentanyl, 85 final common neural pathway theory, 46 flumazenil, 55 France terminology for delirium, 12 functional recovery and delirium, 100-4furosemide, 86 future developments, 202-7 education about screening for delirium, 203-5 pharmacological treatments, 206 publicizing delirium, 206-7 questions still to be answered, 202

incidence of delirium, 191-2

palliative sedation, 199-200

research priorities, 205-6 sedation techniques, 206 GABA (γ-aminobutyric acid) activity in delirium, 53-5 genetic factors in delirium. 65 - 6Glasgow Coma Score, 25, 89 glucocorticoids and the stress response, 63 haloperidol, 160-70 adverse effects, 165-8 akathisia side effect, 166 discovery of, 157 dosage for delirious patients, extrapyramidal side effects, 165 mode of action, 158-62 neuroleptic malignant syndrome side effect, 166-8 properties, 158-60 reasons for use in delirium, 162 - 3risks associated with, 165-8 routes of administration. 160-2study of delirium outcomes, 168 - 70torsades de pointes side effect, 165 use in alcohol withdrawal, 151 hepatic encephalopathy, 11, 55, 65

Hippocrates, 3-7

research collaboration, 206-7



222 Index

historical descriptions of delirium status on admission. delirium, 3-7 17 - 18detection rate, 15-17 hospital duration of stay, 106 palliative care patients, 25 Hospital Elder Life Program special patient groups, 24-5 (HELP), 142 trauma patients, 24-5 hospital environment variations between screening risk factors for delirium, 87-8 tools, 18-22 hyperactive delirium subtype, variations between studies, 17 30 - 4inflammatory response, 46-7, outcomes, 35 59-62 prevalence of, 35 Informant Questionnaire on hypoactive delirium subtype, 28, Cognitive Decline in the 30 - 4Elderly, 75 outcomes, 35 Inouye, Sharon, 16, 77-83, 139-41 insulin-like growth factor 1 prevalence of, 35 (IGF-1), 65 hypoxia role in delirium, 47 Intensive Care Delirium Screening Checklist ICD-10 (International (ICDSC), 18-22, 116, 124-7 Classification of Diseases) interleukin 8, 59 criteria for delirium, 7 isosorbide dinitrate, 86 ICD-10-DR (diagnostic criteria for clinical research), 12 terminology for delirium, 12 ICU psychosis, 9 ICU syndrome, 11 Jackson, John Hughlings, 5 immobilization Janssen, Paul, 157 risk factor for delirium, 65-6, Katz Index, 100 immune response to infection, ketamine, 148 59-62 koma/coma, 12 immune system role in delirium, 65-6 lipopolysaccharide, 61 Lipowski, Zbigniew J., 6, 12, 28, inattention testing, 112-14 incidence of delirium, 14-15 42. cardiac surgery patients, 24 lorazepam and delirium, 83-4



> Index 223

magnetic resonance imaging case studies, 30-4 (MRI), 49 definition of subtypes, 38-9 mechanisms of delirium. hyperactive subtype, 30-4 see pathophysiology hypoactive subtype, 30-4 medical emergency incidence in critical care, delirium as. 2-3 36_8 melatonin, 89 mixed delirium subtype, 30-4 mental capacity, 180-90 prevalence of, 35 and use of restraints, 180-2 psychotic symptoms, 41 assessment, 183-4 Richmond Agitation-Sedation deprivation of liberty, 182 Scale (RASS) definitions, lack of capacity, 183-4 36 - 8protecting vulnerable patients, subtype classification tools, 183 - 438-9 multiple organ failure, 59-62 Mental Capacity Act (UK), 181, Multiple Organ Failure Scale, 90 185 mental status, 112-14 meperidine and delirium, 85 metabolic derangements role in delirium, 47 metabolic encephalopathy, 11 microglial activation, 61 midazolam and delirium, 83-4, 90 Mini Mental State Examination (MMSE), 90, 117 mixed delirium subtype, 30-4 166-8 mobilization of patients, 145-6 Montreal Cognitive Assessment, 46 - 7morphine and delirium, 85 mortality associated with delirium, 95-8 norepinephrine motoric subtypes of delirium, 3, production, 64 28-42 and aetiology, 39-41 and outcome, 42



224 Index

cholinergic deliciency, 52-3,
55-9
cytokine production in
infection, 59-62
direct brain insults, 47
dopamine excess, 52-3
effects of acetylcholine
deficiency, 59-62
effects of immobilization,
65-6
electroencephalography
(EEG), 51-2
energy deprivation in the
brain, 47
final common neural pathway
theory, 46
GABA (γ-aminobutyric acid)
activity, 53-5
genetic factors, 65-6
glucocorticoids and the stress
response, 63
hypoxia, 47
immune response to infection,
59-62
immunological effects, 65-6
inflammatory response, 46-7,
59-62
metabolic derangements, 47
multiple organ failure, 59-62
neuroimaging studies, 47,
48-9
neuronal ageing hypothesis,
46-7
neurotransmitter imbalances,
46-7, 52-5, 63-6
oxidative stress, 46-7



> Index 225

range of theories, 45 haloperidol, 160-70 risk factors for delerium, 55-9 role of amino acids, 63-5 156 - 8role of cortisol, 63 role of norepinephrine, 52-3 role of serotonin (5-hydroxytryptamine), 52-3 search for a serum biomarker, septic brain, 59-62 83-5 serum anticholinergic activity propofol, 173 (SAA), 55 spreading depression effect, 46-7 stress response and 155 - 6glucocorticoids, 63 patient's delirium experience, 186-7 xi-xvi persistent delirium, 91, 95 pharmacological treatment, 155-76 acetylcholinesterase inhibitors, 174 adverse effects, 175-6 alpha 2 agonists, 172-3 atypical antipsychotics, 170-1 benzodiazepines and delirium, 83-4, 173-4 clonidine, 172 dexmedetomidine, 172-3 donepezil, 174 drugs as precipitating factor in delirium, 83-7 145-6 extrapyramidal side effects, 165, 170-1 future developments, 206

history of antipsychotic drugs, lack of studies, 176 mode of action of antipsychotics, 158-60 olanzapine, 170-1 ondansetron, 175 opioid drugs and delirium, risperidone, 170-1 sodium valproate, 174-5 use of antipsychotic drugs, phenylalanine, 63-4 physical restraints, 87-8, 91-2, alternatives to, 189 and PTSD, 105 posterior cerebral artery infarction, 48-9 precipitating/predisposing factors for delirium, 80-92 prevalence of delirium, 17-18 preventative approach to delirium, 91-2 prevention of delirium, 139-51 alcohol withdrawal, 151 control of sedation, 148-50 delirium care bundle, 143 early mobilization of patients, education of staff, 145 Hospital Elder Life Program (HELP), 142



226 Index

prevention of delirium (cont.) restraints pain relief, 146-8 alternatives to, 189 specialized or targeted care, and mental capacity, 180-2 143-4 chemical, 184-5, 187-9 studies, 139-41 deprivation of liberty, 182 use drugs that prevent legal and ethical issues, 184-5 delirium, 150 physical, 88, 91-2, 105, 186-7, ward dedicated to elderly care, 188-9 143 - 4Richmond Agitation-Sedation prochlorperazine, 85 Scale (RASS), 36-8, 112, 148 Procopius, 5 risk factors for delirium, 68-92 Alzheimer's disease, 55-9 prognosis for delirium, 6-7 promethazine, 157 blood transfusions, 89-90 propofol, 148, 173 cardiac surgery patients, 90-1 psychiatrist cognitive decline, 72-3, 75-6 role in delirium treatment, 176-7 cognitive impairment psychological outcomes with (pre-existing), 55-9 delirium, 104-6 degree of vulnerability, 82 psychotic symptoms dehydration, 73 and motoric subtypes, 41 dementia, 55-9 PTSD (post-traumatic stress drugs as precipitating factors, disorder), 104-6 83-7 publicizing delirium elderly people, 55-9 research collaboration, 206-7 hospital environment, 87-8 hospitalized patients, 77-80 quetiapine, 170 immobilization, 65-6, 73 lack of education, 76-7 Ramsay scale, 148 lack of environmental remifentanil, 149 orientation cues, 87-8 research lack of exercise, 89 collaboration, 206-7 need to screen critically ill future priorities, 205-6 patients, 69 responsibility for delirium older age, 72-3 research, 22 pain, 85 types of delirium studies, preventative approach, 91-2 69-70 sensory deprivation, 87-8



Index 227

sleep problems, 88-9 developing a screening tool for statistics from delirium studies, ICU, 116-17 variations in incidence rates. 70 - 2trauma patients, 89-90 18-22 types of clinical studies, 69-70 variety of delirium assessment visual or hearing deficit, 87-8 tools, 116 risk model in hospitalized sedation patients, 77-80 palliative, 199-200 risperidone, 170-1 sedation control, 148-50 rivastigmine, 174 sedation scores, 112 sedation techniques screening for delirium future developments, 206 importance of, 109 septic brain, 59-62 screening patients septic encephalopathy, 11, 59 serotonin (5-hydroxytryptamine), awake responsive patient, role in delirium, 52-3 awake unresponsive patient, serum anticholinergic activity comatose unresponsive (SAA), 55 patient, 131 severity and duration of delirium, constraints on delirium 94 - 5screening, 136-7 sleep problems implementing delirium and delirium, 88-9 screening, 135-7 sodium valproate, 174-5 inattentive responsive patient, somatostatin, 65 133-4 staff negative screening in education about delirium, 145 hallucinating patient, 134-5 statistics from delirium studies, when we are unable to assess, 134 stato confusionale acuto (Italy), screening programmes education about screening, stemetil, 85 203-5 stress response and screening tools, 18-22, 115-31 glucocorticoids, 63 comparing CAM-ICU and stroke, 62 ICDSC, 126-7 subsyndromal delirium, 42-3



228 Index

terminal agitation, 191 identify and treat the cause, terminal restlessness, 191 153-5 terminology for delirium importance of patient history, France, 12 153-5 Italy, 12 multiple precipitating factors, lack of standardization, 9-12 153-5 terms used in critical care. pharmacological treatment, 9 - 12155-76 theophylline, 86 role of the psychiatrist, 176-7 thiamine, 174 tryptophan availability torsades de pointes and serotonin production, side effect of haloperidol, 165 63 - 5toxic confusional state, 11 tumour necrosis factor trauma patients (TNF), 61 incidence of delirium, 24-5 tyrosine, 63-4 risk factors for delirium, 89-90 treatment of delirium in critical valine, 64 care, 153-79 vulnerability to delirium, 82 basic steps, 177 hyperactive delirium, 177-8 Wernicke's encephalopathy, hypoactive delirium, 178-9 174