

# Index

acetylcholine (ACh) 317-18 aging EEG sleep effects 205, 206, 208-9 medication side-effects 317 chronobiology and 226-7 long-term effects on sleep 184, pathways see cholinergic pathways CRH effects on sleep and 86-7 185, 196 dreaming and 380 for sleep problems 2 acetylcholinesterase inhibitors melatonin changes 123-4 see cholinesterase inhibitors amnesia sleep disturbances and 110, 226 forensic aspects 400, 401 acetylserotonin methyltransferase sleep-endocrine changes 83 medication associated 390, 392, 395 (ASMT) 120 see also elderly gene polymorphisms 124 amoxapine 312 agomelatine AMPA/kainate receptors 9 actigraphy bipolar depression 122 ADHD 242-3, 244 EEG sleep effects 205, 207, 211, 212 amphetamines 319, 344 autism spectrum disorders 262 long-term effects on sleep 193, 194 amygdala 295, 304 dementia 232 major depressive disorder 121-2, 134 anesthetics 320 acute stress disorder 151 seasonal affective disorder 123 animal models acyl-coenzyme A dehydrogenase, alcohol 342-3 C-2 to C-3 short chain depression 35-6, 38-40, 65 effects on sleep 321, 342 insomnia 74 (ACADS) gene 284 insomnia due to 145 stress-induced sleep changes 61-5 adenosine self-medication 1, 342 anorexia nervosa 124, 380 brain morphological changes and 38 alcoholism 342-3 depression and 56, 204 anthropometric measures, CBT for insomnia 349 medication effects 320 menopausal women 111 clock genes and 22 role in insomnia 53-4 antianxiety agents 4-5 dreams 375-6, 380-1 sleep control 33, 52-3, 71-2 hypnotic drug therapy 2, 346, 347 antibiotics 320 adenotonsillar hypertrophy 252-3 insomnia 160, 342 anticholinergic agents 318 adenotonsillectomy 253, 254, 409 alertness, increased daytime 316 anticonvulsants 320-1 adenyl cyclase type 1, 10 α-adrenergic antagonists borderline personality disorder 371 318, 334–5 ADHD see attention-deficit **PTSD 334** hyperactivity disorder α-agonists 233, 318 substance use disorders 346, 347 adjustment insomnia 144 alternating leg muscle activation 150 antidepressants 1-4 atypical depression 279 adrenaline 61 alveolar hypoventilation syndrome clock gene interactions 24, 26 congenital central 146 adrenocorticotropic hormone dementia 232, 233-4 idiopathic sleep related (ACTH) 74 EEG sleep effects 202-13 non-obstructive 146 changes during sleep 83 effects on dreaming 314, 318-19 depressed pregnant women 106 Alzheimer's disease (AD) 119 effects on sleep 3-4, 183-97, 312 depression 83, 84-5 circadian rhythm disorders 228 epigenetic effects 13-15, 16 effects on sleep 87 melatonin 123-4, 228 fatigued depressed patients 273, 276 insomnia 69 sleep disturbances 226 forensic issues 396 regulation by neuropeptides 91 sleep-related memory consolidation gene expression and 7-16 stress response 85 295, 298–9, 302, 303 hypersomnia and 277 advanced sleep phase syndrome sundowning see sundowning insomnia induced by 3, 168, see also dementia (ASPS) 133, 147 311, 318 late-life depression 175-6 amitriptyline 3, 312 affective disorders see mood disorders melatonin receptor effects 121 dementia 233 aggressive behavior 371 monoamines and 8-10, 15, 36-7



Index

narcolepsy 42 arylalkylamine N-acetyltransferase behavioral insomnia of childhood 144 neuroendocrine/neuroimmune (AANAT) 120, 130-1 behaviorally induced insufficient sleep interactions and 11-13, 16 gene variants 133 syndrome 147 neurotrophins and 10-11, 15-16 Asperger's syndrome 151, 261 benzodiazepine receptor agonists NREM sleep effects objective sleep measures 262 (BzRAs) see under NREM sleep see also autism spectrum disorders PTSD 333-4 substance use disorder 346, 347 atomoxetine 276-7 traumatic brain injury 362 REM sleep effects see under REM sleep attention-deficit/hyperactivity benzodiazepines (BZDs) 4-5, 319, 320 seasonal affective disorder 123 disorder (ADHD) 132, 242-7 antidepressant-treated patients 276 sedative effects 274, 275, 311, 318 adults 254-5 dementia 230, 234 for sleep problems 2-3 clinical implications of sleep effects on dreaming 314 substance use disorders 346, 347 forensic aspects 391, 395 problems 246 traumatic brain injury 355 diagnosis of sleep problems 246-7 **PTSD 334 DLMO 134** respiratory effects 314 antiepileptic drugs see anticonvulsants methods of studying sleep 242-3 substance use disorder 346, 347 antihistamines 274, 319, 321 obesity and 253 traumatic brain injury 362 antihypertensive agents 318 pathophysiologic mechanisms bereavement 60, 176 244-6, 252 antipsychotic agents (neuroleptics) beta-blockers 233, 318 primary sleep disorders and 252-7 dementia 230, 232, 234-5 RLS/PLMD and 243, 245, 255-7 biological clock 130-1 effects on sleep 159-60, 289-90, sleep problems 242, 243-4 aging 226-7 290 - 2sleep-related breathing disorders see also clock genes forensic issues 397 243, 245, 252-5 mechanisms of action 290 bipolar disorder 119 treatment of sleep problems 247 **PTSD 334** clock genes and 22-6 sedative effects 266-7, 292, 319 attentional bias, sleep-related memory DLMO 133-4 sleep in schizophrenia and 268 consolidation 304 hypersomnia 278, 279 for sleep problems 292 insomnia and 157-8 atypical antipsychotics sleep-related side effects 292 melatonin 122 dementia 235 substance use disorders 346, 347 effects on sleep 268, 291-2 BMAL1 gene 22, 23, 24 see also atypical antipsychotics PTSD 334 bodyweight, dysregulation in schizophrenia 266, 268 antisocial behavior 371 depression 31, 40-5 for sleep problems 4, 292 anxiety sleep-related side effects 292 borderline personality disorder insomnia and 158 substance use disorders 346 (BPD) 368-73 related behavior, animal model affective disorders and 368-71, 64, 86 autism 151, 261 372 - 3sleep patterns 60-1 melatonin 124 insomnia and 160, 372 traumatic brain injury 356, 361 objective sleep measures 262 nightmares and dreaming 371-2 anxiety disorders 151 autism spectrum disorders (ASD) 261-3 sleep EEG studies 368-71, 372-3 objective sleep measures 262 apolipoprotein E (APOE) genotype 355 brain damage subjective sleep studies 261-2 dreaming 380 appetite automatisms changes in mood disorders 96-7 see also traumatic brain injury causes 385, 386 control 95 brain-derived neurotrophic factor clinical assessment 400 sleep duration and 96 (BDNF) 10, 12, 15-16, 204 legal aspects 383-5 Arc gene 11, 16 sane and insane 383-5, 400 brain stem 354 arousal(s) autonomic function, PTSD 332 breast-feeding confusional 148, 386-7 effects on sleep 107-8, 114 Bad 10 disorders of (DOA) 386-7 postpartum biological rhythms disturbances in ADHD 245, 252 Baddeley's working memory model 297 and 108 PTSD 331-2 BALB/cJ mice 64 breathing disorders, sleep-related reaction, sundowning 229 see sleep-related breathing barbiturates 314 see also hyperarousal, hypoarousal disorders basal forebrain (BF) 32, 33, 38, arousal-promoting systems 69-71 brief maternal separation (BMS) 63-4 53, 54, 55 see also wakefulness-promoting systems bruxism, sleep-related 98, 149

417

Bcl-2 10



### Index

bulimia nervosa 380 psychiatric disorders first diagnosed delayed sleep phase type see delayed in 151 sleep phase syndrome bupropion 212, 312 RLS/PLMD 255-6 due to a drug or substance 148 dementia 232 sleep-disordered breathing 253-4 due to a medical condition 148 EEG sleep effects 205, 207, 208, 210 free-running type 147 fatigued depressed patients 276 Children's Sleep Habits Questionnaire irregular sleep-wake type 147 long-term effects on sleep 191, (CSHQ) 243 jet lag type 148 192, 196 chloraldurate 234 other (unspecified) 148 mechanism of action 36-7 schizophrenia 266 chlorpheniramine 319 narcolepsy 42 shift work sleep type 147-8 chlorpromazine 291, 292, 319 buspirone 312 traumatic brain injury 360 butyrophenones 291 cholinergic-monoaminergic sleep circadian rhythms 4 control system 31-2, 32-4 aging and 226-7 C-reactive protein 253 imbalance in depression 35-8, genetics 22-6 C57BL/6J mice 64 56, 204 menopause 112-13 medications affecting 319-20 menstrual cycle 103, 114 caffeine 52-3, 320, 344 see also reciprocal interaction model physiological markers 131 calcium, orexin-mediated release 73 postpartum women 108 cholinergic pathways caloric intake, regulation 95 pregnancy 106, 114 dementia 228, 229-30 regulation by melatonin orexin actions 72 cAMP-dependent protein 120-1, 131 REM sleep control 33-4, 72 kinase beta 10 seasonal influences 283-5 wakefulness regulation 32, 51, 70-1 cannabis 343-4 citalopram 312 cholinesterase inhibitors 230, 231, carbamazepine (CBZ) 371 EEG sleep effects 205, 206, 235, 318 209, 212 carbohydrate ingestion 285 chromatin 13 long-term effects on sleep 189, 190-1 casein kinase I (CKI) delta gene 133 chronic fatigue syndrome (CFS) 134-5 mechanisms of action 10 functional neuroimaging 274 Wistar-Kyoto rats 65 cataplexy 146 PTSD and 326-7 depression and 167 classification of sleep disorders 139-52 Prader-Willi syndrome 411 treatment 275-6 CLOCK genes 22, 23, 24 chronic obstructive pulmonary disease catathrenia 148-9 aging-related changes 123 (COPD) 184, 314 cell adhesion molecule L1 (CAM-L1) 11 as therapeutic targets 26 chronobiology, aging and 226-7 variants 22-6 central sleep apnea chronotherapeutics, psychiatric classification 145 clomipramine EEG sleep effects 205, 206, 24, 26 due to a drug or substance 145 due to Cheyne-Stokes breathing 145 208 - 9chronotherapy long-term effects on sleep 185, 186 due to high-altitude periodic bipolar disorder 134 Prader-Willi syndrome 409 breathing 145 delayed sleep phase syndrome 133 medication induced 314 dementia 232 clonazepam, dementia 231, 234 Prader-Willi syndrome 407, 408-9 chronotype, in schizophrenia 266 clonidine 318 primary 145 traumatic brain injury 360 circadian pacemaker 120, 130-1 clorgyline 206 cerebral glucose metabolism 53, circadian rhythm disorders 4 clovoxamine 191-2, 193 68, 155 dementia 228 clozapine 291 depression 22-4, 167, 168 Cheyne-Stokes breathing, central DLMO 132, 133 cocaine 14-15, 344 sleep apnea due to 145 melatonin treatment 132 cognitive behavioral therapy (CBT) children night eating syndrome 97 depression 276, 279 ADHD see attention-deficit/ seasonal affective disorder 285-6, fatigue 275–6 hyperactivity disorder late-life depression 175 autism spectrum disorders PTSD 335 circadian rhythm sleep disorders see autism spectrum disorders (CRSD) 140, 147-8 seasonal affective disorder 279 behavioral insomnia 144 ADHD 244, 247, 252 DLMO measurement 132-3 cognitive behavioral therapy for advanced sleep phase type idiopathic chronic sleep onset insomnia (CBT-I) 1, 154, see advanced sleep phase insomnia 132, 134 176, 348

syndrome

418

obstructive sleep apnea 146, 252-3

components 348



Index

depression 157, 168, 276 CpG dinucleotides 14 incomplete knowledge 7 substance use disorders 349 insomnia as risk factor 31, 156-7, 166 cramps, sleep-related leg 149 traumatic brain injury 362 low melatonin syndrome hypothesis CREB (cyclic AMP-response 121, 134 cognitive impairment, post-traumatic element-binding protein) 9, 10 melancholic 222-3, 223-4, 278, 279 melatonin 121-2, 167 CRH see corticotropin-releasing cognitive state of sleep 310 menopausal women 112-13 hormone monoamine hypothesis 8, 36-7 cognitive therapy 348-9 cytokines (CK) 11-12, 155 monoaminergic abnormalities 36-7 neuroendocrine/neuroimmune daytime sleepiness see excessive effects on sleep 283 daytime sleepiness interactions 11-13 stress, animal studies 61, 63 obstructive sleep apnea and debriefing, psychological 335 166-7, 168 concussion 353 declarative memory postpartum see postpartum conduct disorder, childhood 371 consolidation 300, 301, 302, 372 depression confusional arousals 148, 386-7 deficits in schizophrenia 302 pregnant women 104-5, 106 premenstrual see premenstrual continuous positive airway pressure delayed sleep phase syndrome dysphoric disorder (DSPS) 147 (CPAP) 167, 168, 177 process S deficiency theory 204 ADHD in adults 255 ADHD 244, 252 PTSD 328 dementia 231 chronic fatigue syndrome and 134-5 recurrent brief (RBD) 371 Prader-Willi syndrome 409, 411 depression 167 REM sleep changes 30-1, 56, 203, traumatic brain injury 362-3 **DLMO 133** 222 - 3psychiatric disorders 148 corticosterone, stress response REM sleep interruption 223-4 traumatic brain injury 361 61, 62, 85 with seasonal pattern see seasonal delta sleep see slow-wave sleep affective disorder corticotropin-releasing hormone sleep-disordered patients 166-7 (or factor) (CRH or CRF) delta sleep ratio sleep EEG 83, 84, 202-4 control of wakefulness 52 antidepressant drug effects 208, 209, sleep-endocrine changes 83-91 cytokine-mediated activation 11 211, 212 sleep-related memory consolidation depressed pregnant women 106 predicting antidepressant drug 295, 303-4 depression 84-5 efficacy 212, 213 sleep-wake regulation and 203-4 effects on sleep 85-7, 90, 91 dementia 226-35 sleepiness/hypersomnia 31, 42, 166, insomnia 69, 155 circadian rhythm disorders 228 168, 176, 177, 277-9 orexin responses 73-4 dreaming 380 smoking and 343 rat model of insomnia 74 non-pharmacologic treatment 232, traumatic brain injury 356, 361 stress response 61, 73-4, 85 233, 235 depression-associated insomnia corticotropin releasing hormone-1 pharmacotherapy 230, 232-5 29-31, 60-1, 151, 165-9 (CRH-1) receptor antagonists REM behavior disorder 230-1 antipsychotic drugs 292 restless legs syndrome 231-2 86, 88 bodyweight regulation and 40-5 sleep apnea syndrome 231 cortisol sleep disturbances 228-31 brain morphological changes changes during sleep 83, 84 sundowning see sundowning cytokines and 11 cholinergic-aminergic imbalance see also Alzheimer's disease depressed pregnant women 106 35-8 depression 83, 84-5 dementia with Lewy bodies (DLB) 230 elderly 174-6 effects on sleep 87-8 depression 119 modeling 38-40 glucose control 95 neurophysiology 29-45, 51-7, 167 antidepressant drug effects on sleep insomnia 52, 69, 155 orexin and 41-2, 74-5 183-94 leptin secretion and 85 atypical (AD) 277-8, 279, 285 reciprocal interaction model menopausal women 113 predictions 37-8 borderline personality disorder and menstrual cycle changes 103 REM sleep interruption 223-4 368-71, 372-3 neuropeptides regulating 86, 90, 91 similarities to primary insomnia clock genes and 22-6 night eating syndrome 97 DLMÖ 121, 134 51-4postpartum women 108 dream content 222-3, 375-6, 379 sleep architecture studies 30-1, 54-6, pregnant women 106 elderly population see late-life 83, 157, 166 sleep deprivation effects 104 sleep EEG and hormonal changes depression stress response 85 83-91 fatigue 31, 42, 166, 273, 274

HRT effects on sleep 113-14

hyperarousal theory 204

419

subjective complaints 165-6

treatment implications 157, 167-8

CPAP see continuous positive airway

pressure



## Index

desimipramine (desipramine) 312	neurochemistry of drug effects	electroconvulsive therapy (ECT) 279
EEG sleep effects 205, 206, 208–9 mechanisms of action 11, 12	318–19, 320, 321–2 psychiatric patients 375–81	emotional memory 295, 299–300 sleep-related consolidation 304
dexamethasone suppression test	psychological theories 330–1	endocrine relationships
(DST) 368 diabetes, type 2, 96	PTSD 328, 330–1, 375–6, 379–80 schizophrenia/psychosis analogy	see sleep-endocrine relationships
7.1	265, 375 stress adaptation hypothesis 223–4	
dim light melatonin onset (DLMO) 130, 131-5	see also nightmares	conservation strategies 275
clinical significance 132 major depressive disorder	drug(s) central sleep apnea due to 145	decreased see fatigue
121, 134	circadian rhythm sleep disorders	enuresis, sleep 148–9
measurement 131–2, 132–3, 135	due to 148	environmental sleep disorder 150
psychiatric and medical disorders 133–5	hypersomnia due to 147	epigenetic mechanisms 13-15, 16
seasonal affective disorder 123, 133	insomnia due to 145 parasomnias due to 149, 390–1, 395	epigenome 13
diphenhydramine 3, 274	sleep-related movement disorders	epinephrine (adrenaline) 61
-	due to 150	episodic buffer 297, 298–9, 302
dissociative disorder, sleep-related 148–9	withdrawal states 314, 322  see also medication side effects	dysfunction in schizophrenia 303
distraction techniques 275		episodic memory 296-7
DLMO see dim light melatonin onset	drug abuse 341–9 dreams 375–6, 380–1	Epworth Sleepiness Scale (ESS) 359
DNA 8	effects on sleep 321	erections, sleep-related (SRE) 390
epigenetic control 13–15	mood disorders 278	escitalopram 176
methylation 13–15	dual process theory, memory	estrogen 102, 111–12
domperidone 231	processing during sleep 300	estrone 112
donepezil 231, 318	duloxetine 312 EEG sleep effects 205, 207, 210	
dopamine (DA)	mechanisms of action 10	eszopiclone 5, 319 dementia 234
ADHD association with	dysthymia, antidepressant drug effects	depression 176
RLS/PLMD 257 hypothesis of RLS 256	on sleep 191	ethanol see alcohol
medications affecting 319	early morning awakening, REM sleep	excessive daytime sleepiness (EDS) 146
dopamine agonists 231, 256, 319	interruption 223–4	ADHD 245
dopaminergic (DA) system	eating 95–9	antidepressant-induced 3–4
orexin actions 73	mood disorders 96–7	assessment 277, 278–9 depression 31, 42, 166, 168, 176,
wakefulness regulation 51-2, 70	seasonal affective disorder 285 sleep disorders and 97–8	177, 277–9
dorsal raphe nucleus (DRN)	eating disorders	differential diagnosis 270–1, 272
32, 33–4, 69	dream content 375–6, 380	drug induced 310, 311, 313, 320–1
Down's syndrome 151-2	sleep related see sleep-related eating	infectious diseases 320
doxepin 3, 312	disorder	mood disorders 270, 277-9
EEG sleep effects 205, 206,	elderly	pharmacotherapy 42, 279 Prader–Willi syndrome 405–6, 413
208–9, 211 insomnia 3, 69	bereavement 60, 176 depression <i>see</i> late-life depression	psychosocial treatment 279
dreams	depression-associated insomnia	schizophrenia 266–7
assessment in PTSD 333	174–6	traumatic brain injury 359–60,
borderline personality disorder	hypothalamic-pituitary-	361, 362–3 see also hypersomnia
371-2	somatotrophin axis 89, 91 insomnia 174	
content collection methods 376, 377–8	objective vs. subjective sleep	exhibitionism, during sleepwalking 388–9
content scoring methods 378	measures 110	exploding head syndrome 148-9
depression 222-3, 375-6, 379	schizophrenia 266 sleep apnea 231	eye movement desensitization and
interruption see REM sleep and	sleep disturbances 226	reprocessing (EMDR) 335
dream interruption medications affecting 311–14, 320	sleep-endocrine changes 83, 84	falls 178, 233, 353–4
<i>3</i> , ,	see also aging	,



Index

fatal familial insomnia 152	gabapentin	traumatic brain injury 85, 355
fatigue assessment 273, 274–5	PTSD 334 substance use disorders 346, 347	growth hormone-releasing hormone (GHRH) 86, 88–9, 90, 91
definitions 271–2, 272–3	galanin 89, 90, 91	
depression 31, 42, 166, 273, 274	gender differences	growth hormone-releasing peptide-6 (GHRP-6) 89
differential diagnosis 270–1	antidepressant drug effects	growth hormone secretagogues
etiology 273–4 medications causing 233, 274	on sleep 213	(GHS) 89
mood disorders 270, 271-7	dream content 222, 380 hypothalamic–pituitary–	Gulf War syndrome 326–7
pharmacotherapy 276–7	somatotrophin axis 89, 91	hallucinations, sleep-related 148–9
psychosocial treatment 275–6 traumatic brain injury 359	objective vs. subjective sleep	•
see also chronic fatigue syndrome	measures 110 schizophrenia-related sleep	haloperidol 291
fear conditioning 61–2	disorders 267	Hamilton Rating Scale for Depression 173
fibroblast growth factor 2, 11	stress-induced sleep changes 63	hexarelin 89
fibromyalgia 152, 184	gene-environment diathesis,	high-altitude periodic breathing,
Fisher 344 (F344) rats 64	vulnerability to stress 62–3	central sleep apnea due to 145
Flinders Sensitive Line (FSL) rats 35–6	gene expression effects of antidepressants 7–16	hippocampus 39
fluoxetine 213, 312	epigenetic control 13–15	abnormalities 302
EEG sleep effects 205, 206, 209, 212	generalized anxiety disorder 151	antidepressant drug actions 10–11, 14–15
fatigue and 276	ghrelin 88	memory consolidation 295, 298, 302
hypersomnia and 277 long-term effects on sleep 188,	depression 85	histamine 319
189, 196	effects on sleep 89, 90, 91	histaminergic (HA) system
mechanisms of action 8, 10, 11,	night eating syndrome 97 sleep duration and 96	NREM sleep control 211-12
14–15, 10 respiratory stimulant effects 314	gigantocellular tegmental field	wakefulness regulation 52, 70
fluvoxamine 312	(FTG) 32, 34	histone acetyl transferases (HAT) 13–14
EEG sleep effects 205, 206, 209	Glasgow Coma Scale 353	histone deacetylase (HDAC) 13–15 inhibitors 14–15
long-term effects on sleep 189, 190–1	glucocorticoidreceptors 10, 12-13, 14, 16	histones 13
	glucocorticoids	acetylation 13–15
follicle-stimulating hormone (FSH) 102, 112–13	effects on sleep 87–8, 91, 233	H.M. (neurological patient) 295
foot tremor, hypnagogic 150	orexin responses 73 see also corticosterone, cortisol	hormone relationships see sleep-
footshock stress 61–2	glucose control 95	endocrine relationships
Ford Insomnia Response to Stress Test	during sleep 95–6	hormone replacement therapy (HRT)
(FIRST) 155	sleep duration and 96	113–14
forensic sleep medicine 383-401	glutamatergic systems 51	hot flashes 111, 112
automatisms 383–5	glycogen synthase kinase-β (GSK3b)	5-hydroxytryptamine (5-HT)
clinical assessment 400–1 malingering 391–400	gene 3, 23, 24–5	see serotonin
parasomnias 385–91	GPR50 receptor 121 gene polymorphism 122	hyperarousal major depression 204
forgetfulness, menopausal women 112	graded exercise therapy (GET) 276	pathophysiology 75
Fos protein 71, 72, 73		primary insomnia 53–4, 68, 69,
frontal lobe function	groaning, sleep related 148–9	154-5 PTSD 159, 331-2
memory retrieval 299	growth hormone (GH) changes during sleep 83, 84	see also arousal(s)
sleep deprivation and 295, 299	depression 83, 84–5	hypersomnia
GABAergic drugs 4–5, 71, 319	menopausal women 113	assessment 277, 278–9
GABAergic neurons	neuropeptides regulating 86, 87, 88, 90, 91	depression and 31, 177, 277-9 differential diagnosis 270-1, 272
depression-associated insomnia 56 NRFM sleep 54, 55, 71	therapy, Prader–Willi syndrome	due to a drug or substance 147
NREM sleep 54, 55, 71 REM sleep 33–4, 34–5, 54–6	407, 409–10	due to a medical condition 147



#### Index

hypersomnia (cont.) hypothalamus melatonin therapy 132 idiopathic, with and without long bodyweight regulation 40-1 neurobiology 51-7 sleep time 147 control of caloric intake 95 neurochemistry of drug induced mood disorders 271, 277-9 lateral see lateral hypothalamus 318, 320 not due to a sleep-related breathing peptides 2, 41-5 non-organic not otherwise specified 145 disorder 140, 146-7 REM sleep modulation 56 not due to a substance or known sleep inducing system 53 not due to a substance or known physiological condition, physiological condition 147 hypoventilation/hypoxemia due physiologic (organic), unspecified 147 unspecified 145 to a medical condition, post-traumatic 360 orexin and 74-5 sleep-related 146 recurrent 147 paradoxical 144 hypoventilation/hypoxemic seasonal affective disorder 31, perpetuating factors 156 disorders 146 physiologic (organic), unspecified 145 278, 285 precipitating factors 156 see also excessive daytime sleepiness imagery rehearsal therapy 335 predicting psychiatric illness 154-60 hypersomnolence, primary, imipramine 213, 312 predicting substance abuse 341 Prader-Willi syndrome 410-12 EEG sleep effects 205, 206, 208-9 predisposing factors 154-6 epigenetic effects 14 hypnagogic foot tremor 150 prevalence 1 long-term effects on sleep 183, primary see primary insomnia hypnic jerks 150 184, 185 psychophysiological 139-44 hypnotic drugs 4-5 PTSD 159, 328, 329, 330 immobilization stress 61, 62, 64 antidepressant-treated patients 276 secondary 139, 144-5 immune system, neuroendocrine dementia 234 traumatic brain injury 358-9, 362 interactions 11-13, 16 depression 157, 176 insulin 95, 97 forensic aspects 390-1, 395 infancy late-life depression and 178 benign sleep myoclonus of 150 insulin-like growth factor 1, 11, 16 mechanism of action 71 primary sleep apnea of 145 intensive care unit (ICU) 355 prescribing 1 stress during 63 substance use disorders 345-8 interferons (IFN) 12 infant care, effects on sleep 107-8 traumatic brain injury 362 interleukin-1 (IL-1) 11 infections 320 hypoarousal interleukin-6 (IL-6) 11-12 ADHD 245, 252 inflammation 11-12 interleukin-10 (IL-10) 12 Prader-Willi syndrome 411-12 insomnia 68-75 see also arousal(s) International Classification of Sleep 3P model 154-6 Disorders (ICSD-2) 139-52 hypocretin see orexin adjustment 144 animal model 74 intracranial pressure control 354 hypomania, hypersomnia after 278 antianxiety and hypnotic agents 4-5 iprindole 206 hypothalamic dysfunction antidepressant-induced 3, 168, depression 2 311, 318 iron 256, 257 Prader-Willi syndrome 405, 411, 412 antidepressant therapy 2-3, 190, 191 Janus protein kinase 10 traumatic brain injury 355 atypical antipsychotics 4, 292 jet lag disorder 148 hypothalamic-pituitary-adrenal behavioral, of childhood 144 childhood idiopathic chronic sleep (HPA) axis kaput gene polymorphism 255 changes during sleep 83 onset 132, 134 Kleine-Levin syndrome 147, 412 classification 139-45 depression 84-5, 85-8 comorbid 139 depression-associated insomnia L-dopa 314-16 defined 68, 154 and 167 laminin 11 depression-associated effects on sleep 85-8 lamotrigine 334 see depression-associated insomnia 53-4, 69, 85, 155 insomnia leptin secretion and 85 late-life depression 173-9 orexin responses to activation 73-4 depression risk 31, 156-7, 166 insomnia and 174-6 due to a drug or substance 145, 345 PTSD 328 insomnia treatments 176 due to a medical condition 145 rat model of insomnia 74 obstructive sleep apnea and 176-7 fatal familial 152 stress response 61, 62, 63, 85 other sleep disorders and 176-8 genetic factors 155 traumatic brain injury 85 sleep disturbance and 173-4 hypothetical model 75

idiopathic 144

late-life depression and 174-6

medications causing 274, 311, 313

422

somatotrophin (HPS) axis

hypothalamic-pituitary-

88-9, 91

treatments, residual insomnia 175-6

late luteal phase dysphoric disorder

(LLPDD) 103, 104



Index

lateral hypothalamus (LH) 32, 40-1,	malingering 391-400	melanopsin 226–7
42-3	mandibular repositioning appliances	melatonin 119-25
laterodorsal tegmentum/ pedunculopontine tegmentum (LDT/PPT) 32 MCH neurons 44 REM sleep control 33-4, 34-5, 72	(MRA) 168  mania 151  animal model 25–6  hypersomnia after 278  insomnia and 157–8	aging 123-4 Alzheimer's disease 123-4, 228 anorexia nervosa 124 antioxidant effects 124 autism 124
latitude, effects of 283-4, 285	maprotiline 206-7, 209-10, 312	bipolar depression 122 circadian rhythm 120, 130–1
leptin 85, 96, 97	marijuana 343–4	depressed pregnant women 106
Lewis (LEW) rats 64, 85	masochistic dreams, depression 222–3,	depression 121–2, 167
light circadian rhythm synchronization 130–1 exposure, nursing homes 232 hypersensitivity, bipolar disorder	224, 379 maternal deprivation (MD), neonatal rats 74 MCH see melanin-concentrating	dim light onset see dim light melatonin onset light therapy and 104 menopausal women 113 menstrual cycle changes 103, 114
133–4	hormone	postmenopausal depression 122 postpartum depression 109
non-visual perception 226–7	MeCP2 14-15	postpartum women 108
light therapy advanced sleep phase syndrome 133 Alzheimer's disease 124	medial temporal lobe 295 medical conditions 152	pregnant women 106 regulation of circadian rhythms 120–1, 131
bipolar disorder 134 delayed sleep phase syndrome 133 dementia 232 effects on biological rhythms 104 mood disorders 279 seasonal affective disorder 123, 279	circadian rhythm sleep disorders due to 148 hypersomnia due to 147 insomnia due to 145 mood disorder due to 270 narcolepsy due to 146–7 parasomnias due to 149	regulation of secretion 120, 130–1 schizophrenia 124–5 seasonal affective disorder 122–3, 286, 287 seasonal variations 283, 284 wake therapy effects 103–4
see also wake therapy limit cycle model 35 predictions for depression 37–8	sleep related hypoventilation/ hypoxemia due to 146 sleep-related movement disorders	melatonin receptors 120–1 aging and Alzheimer's disease 123 antidepressant actions 121
limit-setting sleep disorder 144	due to 149-50	melatonin therapy
lithium forensic issues 391, 397 mechanisms of action 10, 11, 10	medication side effects 309 disturbed dreams/nightmares 274, 311–14	ADHD and chronic sleep onset insomnia 134 advanced sleep phase syndrome 133
locomotor activity, high and low novelty-induced 64	forensic issues 390–1, 392, 395, 396, 397 neurochemistry 317, 322	bipolar disorder 134 chronic fatigue syndrome 134–5
locus coeruleus (LC) 32 REM sleep control 34 stress response 61 sundowning phenomenon and 229 wakefulness regulation 32, 51, 69–70	parasomnias 316–17, 390–1, 396 REM sleep behavior disorder 388 sleep and wakefulness 310–11 sleep disorders 314–17 sleep-related eating disorder	chronic whiplash syndrome 135 circadian rhythm disorders 132 delayed sleep phase syndrome 133 dementia 230, 234 REM behavior disorder 231 schizophrenia 268
long maternal separation (LMS) 63	98, 317 sleepiness 310, 311	seasonal affective disorder 133
long sleeper 150	traumatic brain injury 355	substance use disorders 346–8 see also agomelatine, ramelteon
long-term potentiation (LTP) 38-40	melanin-concentrating hormone	melperone 235
low melatonin syndrome hypothesis 121, 134	(MCH) 41, 42–5, 56 knockout mice 43, 44–5	memory 296–300
lucid dream therapy 335	neuronal pathways 41 REM sleep modulation 43,	encoding 299 loss <i>see</i> amnesia
luteinizing hormone (LH) 102, 112–13	44, 56	models 296-8
Maintenance of Wakefulness Test (MWT) 277, 359	melanin-concentrating hormone-1 (MCH-1) receptor antagonists 43-4	processes 298–9 retrieval 299 and sleep in dementia 228
major depressive disorder see depression	gene expression studies 44 knockout mice 43, 44	systems 296–8 tasks 299–300



#### Index

memory (cont.) microRNAs (miRNAs) 15 with seasonal pattern 278 to-be-remembered materials 299-300 sleep-related memory consolidation milnacipran 205, 207, 210, 211 see under specific types of memory 303 - 4mirtazapine 3, 312 sleepiness 270, 277-9 memory binding function 302 dementia 233 substance-induced 270 schizophrenia 302-3 EEG sleep effects 205, 207, 211, 212 see also bipolar disorder, memory consolidation, sleep-related long-term effects on sleep 193, 194, 196 depression, mania 295-6, 300-4 PTSD 334 mood stabilizers, sedative effects 275 borderline personality disorder 372 for sleep problems 2 healthy volunteers 300–2 Motivation and Energy Inventory mitogen activated protein (MAP) mental illness 302-4 scale 273 kinase pathway 10 methods of studying 299-300 motor vehicle accidents 413 MNESIS model 298 MK-677 89 movement disorders, sleep-related process 298-9 MNESIS model 298 140, 149-50 theories 300 moclobemide alcohol dependence 342-3 menopause 109-14 EEG sleep effects 205, 206, 209 due to a drug or substance 150 biological rhythms 112-13 effects on sleep 187, 188 due to a medical condition 149-50 HRT effects on sleep 113-14 unspecified 149 modafinil 42 mechanisms of sleep disturbance fatigued depressed patients 277 multiple sclerosis 111-13 Prader-Willi syndrome 412 objective sleep measures 110 fatigue 272-3, 274 seasonal affective disorder 279 glucocorticoid therapy 87, 91 objective vs. subjective sleep traumatic brain injury 363 measures 110 Multiple Sleep Latency Test (MSLT) subjective sleep problems 109-10 monoamine(s) 277, 359 antidepressant drug actions 8-10, menstrual cycle 101-4 myoclonus 15, 36-7biological rhythms 103, 114 benign sleep, of infancy 150 bodyweight regulation 40-1 challenge studies 103-4 excessive fragmentary 150 hypothesis of depression 8, 36-7 objective sleep measures 102 propriospinal, at sleep onset 150 see under specific monoamines related mood symptoms, napping sleep in 102 monoamine oxidase inhibitors dementia 227, 228, 232 subjective sleep measures 101-2 (MAOIs) 1, 312 depression with fatigue 275 atypical depression 279 menstrual-related hypersomnia 147 memory consolidation 301 EEG sleep effects 205, 206, 209 mental illness see psychiatric disorders long-term effects on sleep 183, narcolepsy 41-2 187-8, 195-6 antidepressant drug effects mental retardation on sleep 183, 186, 191 dreams 375-6, 380 monoaminergic pathways with cataplexy 146 sleep disturbances 151 orexin actions 72-3 depression 167, 168 sleep-wake regulation 32, 69-71 meta-chlorophenylpiperazine due to a medical condition 146-7 see also cholinergic-monoaminergic (mCPP) 211 insomnia of 75 sleep control system metabolism late-life depression and 177-8 monocyte chemoattractant protein-1 12 cerebral 53, 68, 155 post-traumatic 360 changes in mood disorders 96-7 Prader-Willi syndrome 411-12 mood disorders 270, 271 seasonal affective disorder 285 without cataplexy 146 atypical 277-8 sleep duration and 96 borderline personality disorder nefazodone 212, 312 see also glucose control and 368-71, 372-3 EEG sleep effects 205, 207, 210, 211 clock genes and 22-6 methadone 344, 344-5 long-term effects on sleep 192-4, differential diagnosis 151 195, 196 methyl CpG binding proteins (MBD) due to a medical condition 270 PTSD 194, 210, 333-4 13 - 14eating, metabolism and sleep neonatal rats, maternal deprivation 74 methylation, DNA 13-15 changes 96-7 fatigue 270, 271-7 neurasthenia 271 methyldopa 318 hypersomnia 271, 277-9 neurochemistry of sleep and methylphenidate 245, 344 night eating syndrome and 97-8 wakefulness 31-5 fatigued depressed patients 276-7 postpartum see postpartum traumatic brain injury 363 neuroendocrine system depression neuroimmune interactions in pregnant women 104-5, 106 methylprogesterone 314 depression 11-13, 16 PTSD 328 mianserin 205, 207, 210-11



Index

night eating syndrome 97	noradrenalin/serotonin (NA/5-HT)	obesity hypoventilation syndrome 407
sleep-related changes in depression 83-91	reuptake blockers 205, 207, 210	obstructive sleep apnea (OSA) 145-6
neuroimaging	noradrenergic and specific serotonergic antagonists (NaSSA) 194, 195	ADHD and 253 adult 145–6
depression and insomnia 156–7	norepinephrine (NE) (noradrenalin)	antidepressant drug effects
fatigue 274	abnormalities in depression 36–7	on sleep 184, 190
insomnia 68, 155 sleep deprivation 245-6	antidepressant drug actions 8-10,	dementia 231 depression and 166–7, 168, 177
	15, 36–7	late-life depression and 176–7
neuroleptic agents see antipsychotic agents	bodyweight regulation 40–1 medications affecting 318	mania and 157
neurological conditions 152	melatonin regulation 120	medications causing 314 pediatric 146, 252–3
neuromuscular and chest wall	NREM sleep control 211–12	Prader–Willi syndrome 407–8
disorders, sleep-related	primary insomnia 155 REM sleep control 34–5, 207–8	PTSD 332
hypoventilation/hypoxemia	stress response 61	traumatic brain injury 360, 362–3 see also sleep apnea
due to 146	transporters 8	
neuronal nets 12	wakefulness regulation 32, 51, 69–70	octreotide 89
neuropeptide EI (NEI) 44-5	nortriptyline 312	olanzapine 291, 292 NREM sleep effects 211
neuropeptide Y (NPY) 90-1	EEG sleep effects 205, 206, 208–9	sleep-related side effects 292
neuropeptides	long-term effects on sleep 184,	older adults see elderly
sleep-endocrine regulation 85-91	185, 196	opioids (opiates) 314, 344–5
see under specific peptides	Npas2 gene 23, 24	orexin (hypocretin) 2
neuropharmacology, mental illness 1–5	NREM sleep 29–30	depression-related insomnia
neuroplasticity, antidepressant drug actions 9, 10–11	antidepressant drug effects 205, 208–12	and 41-2, 74-5
	clinical significance 212–13	neuronal pathways 41 Prader–Willi syndrome 412
neurotrophins 10–11, 15–16	long-term studies 195, 196, 197	rat model of insomnia 74
nicotine 319–20, 343	pathophysiological mechanisms 211–12	REM sleep deprivation 65
Niemann Pick type C disease 146–7	depression 30, 31, 204	REM sleep modulation 41–2, 56 responses to stress/HPA activation
night eating syndrome (NES) 97–8  see also sleep-related eating disorder	neurochemistry 32–3	73–4
	parasomnias 148 regulatory control 54, 55, 71–2	role in insomnia 74–5
nightmare disorder 148	traumatic brain injury 356-8	sleep-wake regulation 52, 72-3 traumatic brain injury 355, 360
nightmares assessment in PTSD 333	see also slow-wave sleep	organic brain disorders, dreams
borderline personality disorder	nuclei reticulares thalami 228	375–6, 380
371-2	nucleosomes 13	over-the-counter medications 321
depression 224 infectious diseases 320	nucleus basalis Meynert (NBM) 228	oxaprotiline 206-7, 209-10
medications causing 274, 311-14,	nursing homes	pain, traumatic brain injury 355
315, 320 neurochemistry of drug-induced	rest–activity rhythms 227, 235	paliperone 291
318–19, 321–2	sleep hygiene 232	panic disorder 151
psychological theories 330-1	nutritional status, fatigue and 274	•
PTSD 328, 330–1, 379–80	nutritional supplements 321	paradoxical insomnia 144
nitric oxide synthase (NOS1) gene 256	obesity ADHD and 253	paradoxical sleep (PS) see REM sleep
nomifensine, EEG sleep effects 205,	fatigue and 274	parasomnias antidepressant-induced 4
207, 208, 210	menopausal women 111	classification 140, 148–9, 385
non-rapid eye movement sleep see NREM sleep	night eating syndrome 97 obstructive sleep apnea 252–3	definition 385
noradrenalin/dopamine (NA/DA)	Prader–Willi syndrome 407	disorders of arousal (DOA) 386–7 due to a medical condition 149
reuptake blockers	psychiatric disorders 96-7	due to drug or substance 149,
EEG sleep effects 205, 207, 208, 210	PTSD 332 sleep duration and 96	390–1, 395
sleep-related side effects 312	stop daration and 70	forensic issues 385–91, 395–400



#### Index

parasomnias (cont.) autism spectrum disorders 262-3 medications inducing 316-17, depression 30-1, 53, 56, 157, 166 390-1, 396 forensic context 401 primary insomnia 53 pharmacotherapy 317 REM sleep 148, 387-90 PTSD 159, 331-2 unspecified 149 schizophrenia 159, 267-8 traumatic brain injury 356-7 parity, postpartum biological rhythms see also sleep and 108 electroencephalography Parkinson's disease (PD) 235 pontine reticular formation (PRF) paroxetine 212, 213, 312 32, 33, 34, 44, 51 EEG sleep effects 205, 206, 209 traumatic injury 354 long-term effects on sleep post-traumatic hypersomnia (PTH) 360 188-90, 196 post-traumatic stress disorder (PTSD) mechanisms of action 11 151, 326-35 Pediatric Sleep Questionnaire 243 assessment 332-3 penile erections, sleep-related comorbidities 327, 328 dreams and nightmares 328, 330-1, (SRE) 390 375-6, 379-80 PER2 gene 22, 23 fear conditioned mouse model 61-2 variants 24, 133 management 333-5 PER3 gene 22, 23, 24 nefazodone therapy 194, 210, 333-4 variants 24, 133 neurobiological changes 328 objective sleep changes 159, 331-2 perceptual representation system pharmacotherapy 333-5 296-7 psychotherapy interventions 335 periodic limb movement disorder sleep changes 60-1, 159, 328-32 (PLMD) 149 sleep-related memory consolidation ADHD and 243, 245, 255-7 295, 303-4 children 255-6 subjective sleep changes 329, 330-1 drugs causing 314-16 traumatic brain injury 361 periodic limb movements during vulnerability factors 327-8 sleep (PLMS) postmenopausal depression 112-13, 122 alcohol dependence 342-3 postpartum depression antipsychotic drug-related 292 biological rhythms 109 autism spectrum disorders 262-3 dementia 231-2 longitudinal studies 105 sleep studies 108 late-life depression and 178 wake therapy 109 **PTSD 332** sleep-related eating disorder and 98 postpartum women 106-9 biological rhythms 108, 114 personality disorders 151 sleep 106-8 phase shift hypothesis (PSH) 133 Prader-Willi syndrome (PWS) 405-13 phenelzine 213, 312 abnormal ventilatory response EEG sleep effects 205, 206, 209 408 - 9long-term effects on sleep 183, excessive daytime sleepiness 187, 196 405-6, 413 phenothiazines 291 primary hypersomnolence 410-12 REM sleep abnormalities 410–11 phosphofructokinase M 10 sleep-disordered breathing 406-10 physical inactivity, fatigue and 274 treatment approaches 409-10, 412 pineal gland 120, 123, 130-1 pramipexole 231, 256 Pittsburgh sleep quality index prazosin 334-5 (PSQI) 332-3 prefrontal cortex 295 polysomnography (PSG) 29-30 pregnancy 104-6 ADHD 243-4

longitudinal studies of sleep and depression 105 mood disorders 104-5, 106 sleep during 104 premenstrual dysphoric disorder (PMDD) biological rhythm studies 103 challenge studies 103-4 light therapy 104 sleep studies 102 premenstrual syndrome (PMS) 102, 104 prenatal stress 64 primary insomnia (PI) 51-4, 68-9 classification 139-44 hypothetical model 75 sleep-endocrine changes 85 vs. depression-related insomnia 51-4, 56 see also insomnia procedural memory 296-7 consolidation 300-1, 372 deficits in schizophrenia 303 process S deficiency theory 204 progesterone 102, 111-12 prolactin (PRL) depressed pregnant women 106 depression 84-5 light therapy effects 104 menopausal women 113 menstrual cycle changes 103 postpartum depression 109 postpartum women 108 pregnant women 106 stress-induced secretion 65 traumatic brain injury 355 protein kinase C (PKC) 10 protriptyline 312 long-term effects on sleep 184, 185, 196 respiratory stimulant effects 314 psychiatric disorders 119 differential diagnosis 140, 151 DLMO 133-5 dreams 375-81 eating, metabolism and sleep changes 96-7 first diagnosed in childhood or adolescence 151 insomnia as predictor 154-60 night eating syndrome and 97-8 sleep disturbances 165 sleep-related eating disorder and 98 sleep-related memory consolidation 302 - 4biological rhythms 106, 114 traumatic brain injury 356, 361



Index

psychoactive medication side effects	deprivation 37, 42, 65	ribosomal S-6 kinase (Rsk) 10
see medication side effects	hypothalamic modulation 56	risperidone 268, 291
psychophysiological insomnia 139-44	limit cycle model 35 medications affecting 311–14	dementia 235
psychosis	melanin-concentrating hormone	sleep-related side effects 292
dreaming analogy 265, 375	and 43, 44, 56	ritanserin 211
sleep disorders 159-60, 265-6 see also schizophrenia	memory consolidation 300–1 neurochemistry 33–4	RNA interference 15
psychotherapy interventions, PTSD 335	orexin (hypocretin) and 41-2, 56	ropinirol 231, 256
PTSD see post-traumatic stress	parasomnias 148, 387–90	S100B 11
disorder	penile erections 390	schizophrenia 265-8
pulmonary parenchymal or vascular	Prader–Willi syndrome 410–11 PTSD 159, 331	antipsychotic drug effects on sleep
pathology, sleep-related	reciprocal interaction model 34–5,	268, 290–2
hypoventilation/hypoxemia	54–6, 311	clinical aspects of sleep 265–6
due to 146	regulatory mechanisms 54-6, 71-2	clock genes 22 dream content 375–6, 379
quetiapine 3	schizophrenia 159, 267	dreaming analogy 265, 375
effects on sleep 268, 292	stress adaptation hypothesis 223 stress-induced changes 61–2, 63, 64–5	eating/metabolic changes and 96-7
for sleep problems 4, 235, 292	traumatic brain injury 357–8, 362	melatonin 124-5, 268
substance use disorders 346, 347	REM sleep and dream interruption	objective sleep studies 267–8
quinone reductase 2(QR2), 124-5	376, 378	older patients 266 principles of pharmacotherapy 290
ramelteon	depression 223-4	sleep disorders 151, 159–60, 265–8,
Alzheimer's disease 124	normal healthy subjects 223	289, 290
substance use disorders 346, 347	REM sleep behavior disorder (RBD) 148	sleep-related memory consolidation
raphe nuclei 32, 52	antidepressant drug-induced 4	295, 298–9, 302–3
rapid eye movement sleep	causes 388	subjective sleep studies 266–7
see REM sleep	dementia 230–1 forensic issues 387–8	seasonal affective disorder (SAD)
reboxetine	medications inducing 317	119, 285–7 clock genes 24
EEG sleep effects 205, 206–7,	somnambulism and 389	DLMO 123, 133
209–10 effects on sleep 191, 192	reserpine 8, 204-6	hypersomnia 31, 278, 285
mechanisms of action 11	respiratory depression, drug	light therapy 123, 279 melatonin 122–3, 286, 287
reciprocal interaction model 34-5,	induced 314	nefazodone therapy 194
54-6, 311	respiratory effort related arousals	pathophysiology 285-7
predictions in depression 37–8	(RERAs) 145-6	psychosocial treatment 279
see also limit cycle model	rest-activity rhythms 227	sleep abnormalities 285–6
relaxation training 275	restless legs syndrome (RLS) 98, 149	seasonal effects on sleep 283–5 latitude and 283–4
REM-off cells 33-5, 54-6	ADHD and 243, 245, 255-7	
REM-on cells 33-5, 54-6	alcohol dependence 342–3 antipsychotic drug-related 292	sedation, drug-induced 311, 313, 320–1
REM sleep (paradoxical sleep; PS)	children 255-6	dementia 230
29–30 ADHD 243-4	dementia 231–2	fatigue and 274
ADHD 243–4 antidepressant drug effects 37,	depression and 167, 168	neurochemistry 318, 319 over-the-counter medications 321
204–8, 318–19	drugs causing 314–16 late-life depression and 178	schizophrenia 266–7, 292
clinical significance 212-13	pathophysiologic mechanisms 255–6	selective multiple reuptake inhibitors
long-term studies 183–97	restrictive lung disease 314	207, 210
pathophysiologic mechanisms 207–8	-	selective norepinephrine reuptake
autism spectrum disorders 262–3	resveratrol 124 Rett syndrome 14, 151	inhibitors (SNRIs)
borderline personality disorder	•	EEG sleep effects 205, 206–7, 209–10
369–70 depression	rhythmic masticatory muscle activity (RMMA) 98, 149	long-term effects on sleep 191, 192, 195, 196
changes 30-1, 56, 203, 222-3	rhythmic movement disorder, sleep	selective serotonin reuptake inhibitors
dysregulation 204	related 149, 151	(SSRIs) 1, 312

427

model predictions 37-8



#### Index

selective serotonin reuptake inhibitors depression 168 depression 83, 84, 202-4 (SSRIs) (cont.) menopausal women 111 menstrual cycle studies 102 primary insomnia 53, 68 atypical depression 279 mirtazapine therapy 2 EEG sleep effects 205, 206, 209 Prader-Willi syndrome 406-10 seasonal affective disorder 285 long-term effects on sleep 188-91, primary, of infancy 145 sleep-endocrine changes in 195-6 PTSD 332 depression and 83-91 mechanisms of action 8, 36 schizophrenia 266-7 traumatic brain injury 357 melatonin receptor effects 121 sleep-related eating disorder and 98 see also polysomnography **PTSD 333** traumatic brain injury 360, 361 sleep-endocrine relationships see also central sleep apnea, self-medication, sleep problems 1 depression 83-91 obstructive sleep apnea peptidergic regulation 85-91 semantic memory 296-7 sleep architecture studies traumatic brain injury 85, 355 sequential hypothesis of function see polysomnography, sleep women 101-15 of sleep 300 electroencephalography sleep hygiene 348 serial-parallel-independent (SPI) sleep continuity disturbances ADHD 247 memory model 296-7 antidepressant drug effects 205, dementia 232, 233, 235 208-12 depression with fatigue 275 serotonin (5-HT) dementia 228 inadequate 144 abnormalities in depression 36-7 depression 31 antidepressant drug actions 8-10, sleep interruption (SI) studies 38-40 traumatic brain injury 356 15, 36-7sleep logs 243, 345 bodyweight regulation 40 sleep deprivation cytokines and 12 sleep-onset association disorder 144 ADHD pathophysiology and 244-6 depression-associated insomnia animal studies 86 sleep paralysis and 167 brain areas affected 245-6 depression and 167 medications affecting 318-19 cortisol rhythm and 104 recurrent isolated 148 REM sleep 33, 34, 207-8 effects on memory 299 sleep-promoting systems 52, 53, 71-2 frontal lobe function and 295, 299 serotonin (5-HT)<sub>1A</sub> autoreceptors 36-7 hypoactivity in insomnia 54 mania and 157 serotonin (5-HT) $2_{A/C}$  receptors 211–12 memory consolidation studies sleep-related breathing disorders (SDB) 299-300 serotonin and noradrenalin reuptake ADHD 243, 245, 252-5 inhibitors (SNRIs) 8, 312 therapy 26 alcohol dependence 342 see also sleep restriction, wake children 253-4 serotonin receptors 8-9 therapy classification 140, 145 serotonin transporters 8-9 depression and 168, 176-7 sleep disorders growth hormone therapy 409-10 serotoninergic (5-HT) system ADHD and 252-7 medications inducing 314 NREM sleep control 211-12 antianxiety and hypnotic agents 4-5 menopausal women 111 orexin actions 72-3 antidepressants 2-3 Prader-Willi syndrome 406-10 role in insomnia 54, 56 atypical antipsychotics 4 PTSD 332 wakefulness regulation 32, 52, 69 classification 139-52 traumatic brain injury 360, 361 depression in 166-7 sertraline 312 treatment in depressed patients 177 eating and 97-8 EEG sleep effects 205, 206, 209, 212 medications inducing 314-17 sleep-related eating disorder (SRED) fatigued depressed patients 276 other, not due to substance or 98, 148-9 long-term effects on sleep 189, 190-1 known physiological condition medications inducing 98, 317 **PTSD 333** zolpidem associated 390-1, 392 sexsomnia 388-90 other physiological (organic) 150 sleep-related erections (SRE) 390 traumatic brain injury 354, 358-61 short sleeper 150 sleep-related movement disorders sleep duration, effects on appetite Sin3 14 see movement disorders, and metabolism 96 sleep-related sleep sleep electroencephalography (EEG) brain pathways 32 sleep restriction (SR) 29 - 30cognitive state 310 effects on appetite and metabolism 96 ADHD 243-4 medication effects 310-11 therapy for insomnia 348 antidepressant drug effects 183-97, neurochemistry 31-5 see also sleep deprivation, wake 202 - 13therapy sleep apnea borderline personality disorder classification 145-6 sleep starts 150 368-71, 372-3 dementia 231 dementia 228, 229



Index

sleep state misperception 144 stimulus control (SC) 348 temperature menopausal women 113 sleep talking 150 stress menstrual cycle changes 103 depression and 12, 16 sleep terrors 148 wake therapy effects 104 insomnia and 155-6 sleep-wake "flip-flop" switch 51, neuronal changes 10, 12 testosterone 84-5, 413 52, 53 primary insomnia and 69, 75 tetrahydrocannabinol (THC) 343-4 impairment 53-4 rat model of chronic neonatal 74 thalamo-cortical networks 32-3, 54 REM sleep and adaptation to 223 sleep-wake regulatory systems 51-3 resilience or vulnerability to 62-3 theophylline 231, 320 dysfunction in depression 203-4 system 52 neuropeptide-mediated 85-91 thioridazine 319 traumatic brain injury 356 neurotransmitters 69-72 3P model of insomnia 154-6 orexins 72-3 stress-activated protein kinase 10 thyroid-stimulating hormone (TSH) sleepiness see excessive daytime stress-induced sleep changes 60-5 depression 85, 106 sleepiness animal models 61-5 menstrual cycle changes 103 environmental influences 61-4 sleepwalking (somnambulism) 148 night eating syndrome 97 genetic influences 64-5 antipsychotic drug-induced 292 postpartum depression 109 mechanisms and mediators 65 confusional arousals and 386-7 pregnant women 106 menopausal women 113 diagnostic criteria 387, 400-1 psychological disorders 60-1 thyrotropin-releasing hormone forensic issues 385, 387, 395-400, stimulation test (TRH-ST) 368 400-1stress management training 275 malingering 395-400 tiagabine 334 stress response 11, 61 medications inducing 317, 390, HPA axis 61, 62, 63, 85 tianeptine 212, 213 392, 395 orexin release 73-4 EEG sleep effects 205, 207 sexual behavior during 388-90 substance use/abuse 341-9 sleep-related eating disorder TIMELESS (TIM) gene 22, 23, 24 and 391 assessment 345 toloxatone 206 central sleep apnea due to 145 slow-wave sleep (SWS) 29-30 circadian rhythm sleep disorders topiramate 334 antidepressant drug effects 205, due to 148 tranylcypromine 312 208-12 dreams 375-6, 380-1 EEG sleep effects 205, 206, 209 depression 30, 31, 56 hypersomnia due to 147 memory consolidation 300, 301 long-term effects on sleep 187, 188 insomnia due to 145, 345 schizophrenia 267 traumatic brain injury (TBI) 353-63 mood disorder due to 270 stress-induced changes 61-2, 63, causes 353-4 non-pharmacological treatment 348 64 - 5circadian rhythm sleep disorders 360 parasomnias due to 149, 390-1 traumatic brain injury 357 classification 353 pharmacotherapy 345-8 see also delta sleep ratio cognitive impairment 361-2 sleep disturbances 342-5 comorbid psychopathology smoking 343 sleep-related movement disorders cessation 320, 343 356, 361 due to 150 delayed DLMO 135 snoring 150, 253-4 suicidal patients 74 environmental factors 355-6 social defeat paradigm 62 etiology of sleep disturbances 354-6 summer 284 excessive daytime sleepiness 359-60, social zeitgebers 227, 228 sundowning 119, 123, 229-30 361, 362-3 somatoform disorders 151 suprachiasmatic nucleus (SCN) insomnia 358-9, 362 aging changes 123-4 medication side effects 355 somatostatin 88, 89, 91 circadian pacemaker 120, 130-1 minor 353 somnambulism see sleepwalking light information inputs 226-7 narcolepsy 360 melatonin actions 121 SPI model of memory 296-7 neuropsychiatric-sleep disorder regulation of melatonin secretion interactions 361-2 Sprague-Dawley (Sp-D) rats 64 120, 130-1pain 355 spring 284 sundowning phenomenon and 229 pathophysiology 354–5 polysomnographic sleep studies stimulants sympathetic activation 356 - 7effects on sleep 344 insomnia 68 post-traumatic hypersomnia 360 fatigued depressed patients 276-7 PTSD 328, 332 psychosocial stressors 356 Prader-Willi syndrome 412 T cells, autoreactive 12 sleep disorders 354, 358-61 traumatic brain injury 363 sleep-endocrine changes 85, 355 see also methylphenidate tail suspension test 35-6



#### Index

traumatic brain injury (TBI) (cont.) sleep-related breathing disorders 360, 361 treatment of sleep disorders 362-3 trazodone 3 dementia 232, 233-4 EEG sleep effects 205, 207, 210, 212 long-term effects on sleep 191, 193 PTSD 334 for sleep problems 2 substance use disorders 346, 347 tricyclic antidepressants (TCAs) 1, 312 EEG sleep effects 205, 206, 208-9, 212 long-term effects on sleep 183-7, 195-6 mechanisms of action 36 melatonin receptor effects 121 narcolepsy 42 for sleep problems 2-3 trimipramine 206, 213, 312 dementia 233 EEG sleep effects 205, 208-9 tryptophan 206, 412 tryptophan hydroxylase (TPH) 8-9 tumor necrosis factor-α (TNF- $\alpha$ ) 11, 12 upper airway resistance syndrome (UARS) 145-6 uvulopalatopharyngoplasty 409 vaginal dryness 112 varenicline 320 vasopressin, aging changes 123 venlafaxine 312

EEG sleep effects 205, 207, 210, 212 fatigued depressed patients 276 mechanisms of action 11 ventilatory control, abnormal, Prader-Willi syndrome 408-9 ventrolateral preoptic area (VLPO) 32, 33, 53, 54, 55, 71 verbal memory storage 297 viloxazine EEG sleep effects 205, 206-7, 209-10effects on sleep 191, 192 confusional arousals 386 during sleepwalking 401 visuo-spatial memory deficits in schizophrenia 302, 303 storage 297 VMAT2 8 wake/sleep imbalanced regulatory background (WIRB) 69, 74-5 wake/sleep regulatory mechanisms see sleep-wake regulatory systems wake therapy effects on biological rhythms 103 - 4effects on mood and sleep 103 postpartum depression 109 see also sleep deprivation, sleep restriction wakefulness, medication effects 310-11 wakefulness-promoting systems 51-3, 69-71

antidepressant drug effects 211-12 brain pathways 32 hyperactivity in insomnia 53-4 increased activity in depression 204 neurochemistry 31-5 orexin actions 72-3 weight loss, Prader-Willi syndrome 409 whiplash syndrome, chronic (CWS) 135 winter 283 Wistar-Kyoto rats 42, 65 Wistar rats, anxiety-related behavior 64 withdrawal states 314, 322 women sleep-endocrine relationships 101 - 15see also gender differences working memory 296-7 Baddeley's model 297 central executive 297, 299 deficits in schizophrenia 302-3 episodic buffer 297, 298-9, 302 zaleplon 5 zeitgebers 130, 227, 228 zimelidine 206, 209 ziprasidone 291-2 zolpidem 5 dementia 234 parasomnias due to 390-1, 392 zopiclone 5 dementia 234

traumatic brain injury 362