

Subject Index

- AAOP, *see* American Association of Orofacial Pain
- ACC, *see* Anterior cingulate cortex
- American Association of Orofacial Pain (AAOP), facial pain classification 3–6
- Anterior cingulate cortex (ACC)
 - cingulotomy for cancer facial pain 176, 177
 - deep brain stimulation 151
- Atypical facial pain, clinical features 13, 14
- Auriculotemporal, percutaneous electrical nerve stimulation nerve 53, 54

- Basal ganglia, anatomy 31
- Burchiel classification, facial pain 3, 6, 7, 9

- Cancer facial pain
 - mechanisms 170, 171
 - pain pathways 171, 172
 - prevalence 170
 - surgical management
 - intrathecal/intraventricular drug delivery 178
 - neuroablation
 - anterior cingulotomy 176, 177
 - Gasserian gangliolysis 175, 176
 - hypophysectomy 177
 - nucleus caudalis dorsal root entry zone ablation 176
 - peripheral neurectomy 175
 - stereotactic mesencephalotomy 176
 - neurostimulation
 - deep brain stimulation 178
 - spinal cord stimulation 177, 178
 - trigeminal branch stimulation 177
 - tumor reduction 174, 175
 - types of pain 173, 174
- Central neuropathic pain, clinical features 14
- Centromedian parafascicular complex (CMPf),
 - deep brain stimulation 149, 150, 152–154
- Cervical spinal cord stimulation, *see* Spinal cord stimulation
- Classification, facial pain
 - American Association of Orofacial Pain 3–6
 - Burchiel classification 3, 6, 7, 9
 - Cruccu classification 7
 - headache syndromes 12, 13
 - ICD-11 3, 4
 - International Association for the Study of Chronic Pain 3, 4
 - International Classification of Headache Disorders 2, 3, 5, 6
 - non-specific pain syndromes 13, 14
 - overview 1, 2, 135
 - prospects 15
- Cluster headache, *see* Headache
- CMPf, *see* Centromedian parafascicular complex
- Cruccu classification, facial pain 7

- DBS, *see* Deep brain stimulation
- Deep brain stimulation (DBS)
- cancer facial pain management 178
 - cluster headache 142
 - historical perspective for facial pain 143–145
 - indications 145, 147, 148, 152
 - patient selection 145, 146
 - principles 142, 143
 - programming parameters 157
 - prospects 157, 158
 - safety 156, 157
 - surgical technique
 - Bristol technique 155, 156
 - conventional technique 155
 - targets
 - anterior cingulate cortex 151
 - centromedian parafascicular complex 149, 150, 152–154
 - hypothalamus 150, 151
 - nucleus accumbens 151, 152
 - periaqueductal grey 143–146, 149, 152, 153
 - periventricular grey 144, 146, 149, 152, 153
 - synergistic targets 152–154
 - ventral posterolateral nucleus 146
 - ventral posteromedial nucleus 146
 - trigeminal neuralgia 142
- Facial pain
- cancer pain, *see* Cancer facial pain
 - classification, *see* Classification, facial pain
 - overview 1, 2
- Gasserian gangliolysis, cancer facial pain management 175, 176
- Gasserian ganglion stimulation (GGS)
- adverse effects 102
 - mechanism of action 99, 100
 - overview 97, 98
 - patient selection 100
 - prospects 103
 - rationale 98, 99
 - trigeminal neuropathic pain relief efficacy 100–102
- Geniculate neuralgia, clinical features 10, 11
- GGS, *see* Gasserian ganglion stimulation
- Glossopharyngeal neuralgia, clinical features 11
- Headache
- classification of pain 12, 13
 - cluster headache
 - clinical features 12, 107, 108
 - conservative management 108
 - deep brain stimulation 142
 - high-frequency peripheral nerve stimulation 88, 89
 - sphenopalatine ganglion stimulation 108–111
 - incidence 182
 - migraine, sphenopalatine ganglion stimulation 111, 112
 - percutaneous electrical nerve stimulation
 - efficacy 55–58
 - nummular headache 53, 54
 - transcutaneous electrical nerve stimulation
 - prophylaxis 39, 40
 - short-term treatment 39
 - trigeminal branch stimulation 64, 65
- High-frequency peripheral nerve stimulation
- case reports
 - cluster headache 88, 89
 - occipital neuralgia 89, 90
 - post-herpetic neuralgia 90
 - trigeminal neuropathy 91, 92
 - historical perspective 85, 86
 - mechanism of action 86–88
 - prospects 93
- Hypothalamus, deep brain stimulation 150, 151
- IASP, *see* International Association for the Study of Chronic Pain
- IC, *see* Insular cortex
- ICD-11, facial pain classification 3, 4, 126
- ICHD, *see* International Classification of Headache Disorders
- Implantable pulse generator, *see* Peripheral nerve stimulation; Trigeminal branch stimulation
- Inferior alveolar nerve, percutaneous electrical nerve stimulation 52, 53
- Infraorbital nerve, percutaneous electrical nerve stimulation 51, 52
- Insular cortex (IC), anatomy 31
- International Association for the Study of Chronic Pain (IASP), classification of chronic pain 3, 4

- International Classification of Headache Disorders (ICHD), facial pain classification 2, 3, 5, 6
- Intrathecal/intraventricular drug delivery
 - cancer facial pain management 178
 - cervical route
 - administration modes 191
 - cerebrospinal fluid flow and medication diffusion 183, 184
 - cervical convergence 183
 - complications 190
 - drugs 190, 191
 - technique 187, 189, 190
 - cisternal route 187
 - historical perspective 182
 - indications 184
 - intracerebroventricular route
 - adverse effects 186, 187
 - clinical studies 184
 - complications 186
 - drugs 184, 185
 - techniques 185, 186
 - intraventricular route rationale
 - anatomic pathways 183
 - central opioid receptors 182, 183
 - overview 181, 182
- M1, *see* Primary motor cortex
- Mandibular nerve, anatomy 21
- Maxillary nerve, anatomy 21
- MCS, *see* Motor cortex stimulation
- Meissner corpuscle 20
- Mental nerve, percutaneous electrical nerve stimulation 53
- Mesencephalic nucleus, anatomy 24
- Migraine, *see* Headache
- Motor cortex stimulation (MCS)
 - facial pain studies 165–168
 - historical perspective 162, 163
 - pathophysiology 163, 164
 - patient selection 164
 - prospects for study 168
 - technique 164, 165
- Muscle spindle 21
- NAC, *see* Nucleus accumbens
- Nervus intermedius neuralgia, clinical features 10, 11
- Nucleus accumbens (NAC), deep brain stimulation 151, 152
- Nucleus caudalis, dorsal root entry zone
 - ablation for cancer facial pain 176
- Occipital nerve, percutaneous electrical nerve stimulation 50, 51
- Occipital nerve stimulation (ONS)
 - historical perspective 69
 - intraoperative testing 70
 - leads
 - number 70
 - selection 69
 - overview 68, 69
 - patient positioning 70
 - permanent implant
 - follow-up 72
 - lead placement 71, 72
 - preoperative workup 71
 - postoperative care 70, 71
- Occipital neuralgia
 - clinical features 12
 - high-frequency peripheral nerve stimulation 89, 90
- ONS, *see* Occipital nerve stimulation
- Paratrigeminal neuralgia, clinical features 11, 12
- PENS, *see* Percutaneous electrical nerve stimulation
- Percutaneous electrical nerve stimulation (PENS)
 - auriculotemporal nerve 53, 54
 - devices 47, 48
 - efficacy for facial pain and headache 55–58
 - focal pain management 53, 54
 - inferior alveolar nerve 52, 53
 - infraorbital nerve 51, 52
 - mechanism of action 48, 49
 - mental nerve 53
 - nummular headache 53, 54
 - occipital nerve 50, 51
 - principles 46, 47
 - supraorbital nerve 51
 - supratrochlear nerve 51, 52
 - techniques for facial pain 49, 50
- Periaqueductal grey, *see* Deep brain stimulation

- Peripheral nerve stimulation (PNS), *see also*
 Gasserian ganglion stimulation;
 High-frequency peripheral nerve
 stimulation; Occipital nerve stimulation;
 Percutaneous electrical nerve stimulation;
 Trigeminal branch stimulation; Wireless
 peripheral nerve stimulation
 historical perspective 45, 46
 nomenclature 46
- Periventricular grey, *see* Deep brain
 stimulation
- Persistent idiopathic facial pain (PIFP)
 clinical features 14
 sphenopalatine ganglion stimulation 112
- PIFP, *see* Persistent idiopathic facial pain
- PNS, *see* Peripheral nerve stimulation
- Postherpetic neuralgia, *see* Trigeminal
 neuralgia
- Post-traumatic trigeminal neuropathy, clinical
 features 9
- Primary motor cortex (M1), anatomy 30, 31
- Primary somatosensory cortex (S1), anatomy
 29, 30
- Pulvinar, anatomy 29
- Raeder syndrome, *see* Paratrigeminal neuralgia
- Repetitive transcranial magnetic stimulation
 (rTMS)
 principles 126, 127
 prospects for study 130, 131
 theta burst stimulation 130
- Reticular nucleus, anatomy 28, 29
- rTMS, *see* Repetitive transcranial magnetic
 stimulation
- Ruffini corpuscle 20
- S1, *see* Primary somatosensory cortex
- SCS, *see* Spinal cord stimulation
- Sluder's Neuralgia, *see* Sphenopalatine
 neuralgia
- Sphenopalatine ganglion stimulation
 blood brain barrier permeability effects 113
 headache management
 cluster headache 108–111
 migraine 111, 112
 overview 105, 106
 persistent idiopathic facial pain
 management 112
 safety 113, 114
 SPG Microstimulator System 106, 107
- Sphenopalatine neuralgia, clinical features 12,
 13
- Spinal cord stimulation (SCS)
 cancer facial pain management 177, 178
 cervical spine anatomy 134, 135
 facial pain studies 137, 138
 overview 133, 134
 technique 135–137
- Spinal trigeminal nucleus, anatomy 24, 25
- SUNCT syndrome, clinical features 13
- Superior laryngeal neuralgia, clinical features
 11
- Supraorbital nerve, percutaneous electrical
 nerve stimulation 51
- Supratrochlear nerve, percutaneous electrical
 nerve stimulation 51, 52
- tDCS, *see* Transcranial direct current
 stimulation
- Temporomandibular joint disorder (TMD),
 transcutaneous electrical nerve stimulation
 38, 39
 transcranial direct current stimulation 119
 trigeminal branch stimulation 65
- Tendon organ 21
- TENS, *see* Transcutaneous electrical nerve
 stimulation
- Thalamus
 anatomy 28, 29
 deep brain stimulation, *see* Deep brain
 stimulation
- Theta burst stimulation, *see* Repetitive
 transcranial magnetic stimulation
- TMD, *see* Temporomandibular joint disorder
- TNP, *see* Trigeminal neuropathic pain
- Transcranial direct current stimulation (tDCS)
 chronic pain studies
 general conditions 118
 temporomandibular joint disorder 119
 trigeminal neuralgia 119
 mechanism of action 117, 118, 128, 129
 principles 116, 117
 prospects 120, 121, 130, 131
- Transcutaneous electrical nerve stimulation
 (TENS)
 adverse effects 40
 contraindications for facial pain
 management 36, 37
 headache
 short-term treatment 39

- prophylaxis 39, 40
 - mechanism of action
 - high-frequency mechanism 41, 42
 - low-frequency mechanism 41–43
 - overview 35, 36
 - postherpetic neuralgia 40
 - technique 36
 - temporomandibular joint disorder 38, 39
 - trigeminal neuralgia 37, 38
- Trigeminal branch stimulation
 - cancer facial pain management 177
 - headache 64, 65
 - indications and patient selection 61
 - outcomes 63–66
 - postherpetic neuralgia 64
 - technique 61–63
 - temporomandibular joint disorder 65
- Trigeminal nerve, *see also* Gasserian ganglion
 - stimulation
 - anatomy
 - branches 21
 - ganglion 22
 - nucleus 24–26
 - root 23, 24
 - skin dermis 19–21
 - ascending nociceptive pathways 26–28
 - pain matrix interactions 32
- Trigeminal neuralgia
 - Burchiel classification 3, 6, 7, 9
 - Crucchi classification 7
 - deep brain stimulation 142
 - motor cortex stimulation 165, 166
 - postherpetic neuralgia
 - clinical features 9
 - high-frequency peripheral nerve stimulation 90
 - transcutaneous electrical nerve stimulation 40
 - secondary trigeminal neuralgia 10
 - spinal cord stimulation 137, 138
 - transcranial direct current stimulation 119
 - transcutaneous electrical nerve stimulation
 - 37, 38
 - type I 8
 - type II 8, 9
- Trigeminal neuropathic pain (TNP)
 - Gasserian ganglion stimulation, *see* Gasserian ganglion stimulation
 - high-frequency peripheral nerve stimulation 91, 92
- Vater-Pacini corpuscle 21
- Ventral anterior nucleus, anatomy 29
- Ventral lateral nucleus, anatomy 29
- Ventral posterolateral nucleus (VPL)
 - anatomy 29
 - deep brain stimulation 146
- Ventral posteromedial nucleus (VPM)
 - anatomy 29
 - deep brain stimulation 146
- VPL, *see* Ventral posterolateral nucleus
- VPM, *see* Ventral posteromedial nucleus
- Wireless peripheral nerve stimulation
 - adverse events 82
 - efficacy for craniofacial pain management 80–82
 - prospects 83
 - technique 77–80
 - traditional peripheral nerve stimulation
 - limitations 76, 77