

ABBREVIATIONS AND ACRONYMS

A

AAT: acute acoustic trauma
 ABC: Activities-specific Balance Confidence; airway, breathing, circulation
 AFB: Air Force base
 AFTH: Air Force Theater Hospital; Air Force theater hospital
 AIS: Abbreviated Injury Scale
 AKA: above-knee amputation
 ALARACT: all-army action
 ALCAR: acetyl-L-carnitine
 ALRT: acute lung rescue team
 AO/ASIF: Arbeitsgemeinschaft für Osteosynthesefragen/ Association of the Study of Internal Fixation
 AP: anteroposterior
 APD: afferent pupillary defect
 ARG: amphibious ready group
 ATH: air transportable hospital
 ATLS: Advanced Trauma Life Support; Advanced Trauma Life-saving

B

BAHA: bone-anchored hearing appliance
 BC: ballistic coefficient
 BiCROS: binaural amplification with contralateral routing of signal
 BPPV: benign paroxysmal positional vertigo

C

CAD/CAM: computer-aided design and computer-aided modeling
 CAPD: central auditory process disorder
 CAREN: computer-assisted rehabilitation environment
 CASEVAC: casualty evacuation
 CASF: contingency aeromedical staging facility
 CBA: combat body armor
 CCA: common carotid artery
 CCATT: Critical Care Air Transport Team; critical care air transport team
 CFR: case fatality rate
 CHL: conductive hearing loss
 CJTH: Craig Joint Theater Hospital
 CLS: combat lifesaver
 CMF: craniomaxillofacial
 CONUS: continental United States
 CPG: clinical practice guideline
 CROS: contralateral routing of signal
 CRTS: casualty receiving and treatment ship
 CSF: cerebrospinal fluid
 CSH: combat support hospital
 CT: computed tomography
 CTA: computed tomography angiography

D

DCOE: Defense Centers of Excellence
 DGI: Dynamic Gait Index
 DHA: Defense Health Agency
 DHI: Dizziness Handicap Inventory
 DICOM: digital imaging and communications in medicine
 DOW: died of wounds
 DVA: dynamic visual acuity
 DVAT: Dynamic Visual Acuity Test

E

EAC: external auditory canal
 ECMO: extracorporeal membranous oxygenation
 EMDG: Expeditionary Medical Group
 EMEDS: expeditionary medical support
 EMG: electromyogram; electromyography
 EMT-B: Emergency Medical Technician-Basic
 ENoG: electroneurography
 ENT: ear, nose, and throat; ear-nose-throat
 EOD: explosive ordinance disposal
 EPW: enemy prisoner of war
 E-SAPI: enhanced small arms protective insert
 ETT: endotracheal tube

F

FAST: Focused Assessment with Sonography for Trauma
 FDA: US Food and Drug Administration
 FEV: forced expiratory volume
 FGA: Functional Gait Assessment
 FOB: forward operating base
 FSOT: frontal sinus outflow tract
 FST: forward surgical team
 FTSG: full-thickness skin graft

G

GCS: Glasgow Coma Scale
 GERD: gastroesophageal reflux disease
 GST: Gage Stabilization Test
 GSW: gunshot wound
 GWOT: Global War on Terror

H

H&N, H/N: head and neck
 HB: House-Brackmann
 HFN: head, face, or neck
 HiMAT: High-Level Mobility Assessment Tool
 HIV: human immunodeficiency virus
 HMMWV: "Humvee" or High Mobility Multipurpose Wheeled Vehicle
 HNI: head and neck injury
 HPN-07: 2,4-disulfonyl α -phenyl tertiary butyl nitrene
 HRCT: high-resolution computed tomography
 HSC: Health Services Command
 HVPNT: high-velocity penetrating neck trauma

I

I&D: irrigation and debridement
 ICA: internal carotid artery
 ICD: *International Classification of Diseases*
 ICD-10: *International Classification of Diseases*, Tenth Edition/Revision
 ICU: intensive care unit
 IED: improvised explosive device
 IHS: International Headache Society
 IJ: internal jugular
 IMF: intermaxillary fixation
 INHI: inhalational injury
 IOP: intraocular pressure
 IOTV: improved outer tactical vest
 ISS: Injury Severity Score
 IT: intertympanic
 IV: intravenous

J

J-FAINT: Joint Facial and Invasive Neck Trauma [project]
JTAPIC: Joint Trauma Analysis and Prevention of Injury in Combat [program]
JTTR: Joint Theater Trauma Registry
JTTS: Joint Theater Trauma System

K

KE: kinetic energy
KIA: killed in action

L

LAC: laceration
LP: light perception
LRMC: Landstuhl Regional Medical Center
LTR: laryngotracheal reconstruction

M

MACE: Military Acute Concussion Evaluation
MASCAL: mass casualty
MASH: Mobile Army Surgical Hospital
MCTA: multislice helical computed tomography angiography
MDCTA: multidetector row computed tomography angiography
MEDEVAC: medical evacuation
MFI: maxillofacial injury
MFST: mobile field surgical team
MHNT: Multidisciplinary Head and Neck Team
MHS: Military Health System
MMF: mandibulomaxillary fixation
MOS: medical occupational specialty
MRA: magnetic resonance imaging-angiography
MRAP: mine-resistant ambush-protected
MRC: Medical Research Council
MRI: magnetic resonance imaging
MSLTP: multistage laryngotracheoplasty
mTBI, MTBI: mild traumatic brain injury
MTF: medical treatment facility
MUST: medical unit, self-contained
MVA: motor vehicle accident

N

NAC: *N*-acetylcysteine
NATO: North Atlantic Treaty Organization
NIJ: National Institute of Justice
NLP: no light perception
NM: nasomaxillary
NMCCTR: Navy-Marine Corps Combat Trauma Registry
NOE: naso-orbital-ethmoid; nasoorbitoethmoid
NPO: nil per os (nothing by mouth)

O

OEF: Operation Enduring Freedom
OHC: outer hair cell
OIF: Operation Iraqi Freedom
OR: operating room
ORIF: open reduction internal fixation
OTV: outer tactical vest

P

PASGT: Personnel Armor System for Ground Troops
PBI: primary blast injury
PC: prehospital cricothyroidotomy
PEG: percutaneous endoscopic gastrostomy
PGS: posterior glottic stenosis

PLA: poly-L-lactic acid
PLF: perilymph fistula
PMFF: paramedian forehead flap
PNT: penetrating neck trauma
PPI: proton pump inhibitor
psi: pounds per square inch
PTS: permanent threshold shift

R

RIF: rigid internal fixation
RLN: recurrent laryngeal nerve
RPG: rocket-propelled grenade
RPSD: radical primary surgical debridement
RSI: rapid sequence intubation

S

SCM: sternocleidomastoid muscle
SEAL: SEa, Air, Land
SLM: stereolithography model
SNHL: sensorineural hearing loss
SP/AP: summating potential/action potential
SPEARR: small portable expeditionary rapid response [team]
SPL: sound pressure level
SSD: single-sided deafness
STSG: split-thickness skin graft

T

TACEVAC: tactical evacuation
TALOS: tactical assault light operator suit
TBI: traumatic brain injury
TBSA: total burn surface area
TCCC: Tactical Combat Casualty Care
3D: three-dimensional
3D-CT: three-dimensional computed tomography
TM: tympanic membrane
TRAC²ES: US Transportation Command Regulating and Command and Control Evacuation System
TTS: temporary threshold shift

U

UK: United Kingdom
US: United States
USAF: US Air Force
USMC: US Marine Corps
USN: US Navy

V

VA: Department of Veterans Affairs
VAC: vacuum-assisted closure
VOR: vestibuloocular reflex
VSP: virtual surgical planning

W

WWII: World War II

Z

ZF: zygomaticofrontal
Z-F: zygomatic-frontal
ZM: zygomaticomaxillary
ZMC: zygomaticomaxillary complex
ZT: zygomaticotemporal

INDEX

A

Abbreviated Injury Scale, 68
 ABC assessment, 117
 Abdominal examination, 127
 Acetyl-L-carnitine, 242
 Acid injuries, 305
Acinetobacter infections, 164, 203
 Activities-specific Balance Confidence Scale, 607, 609
 Acute dizziness, 244–246
 Acute lung rescue teams, 162, 164
 Adnexal injury
 examination of, 293
 orbital trauma, 305
 Advanced Trauma Life Support, 116, 147, 203, 401
 Aeromedical evacuation, 41
 Afferent pupillary defect, 293
 Afghanistan. *See* Operation Enduring Freedom
 AFTH. *See* US Air Force theater hospitals
 Aguilar, Major Demetrio, 11
 Air ambulances, 41–42
 Air Force theater hospitals, 49–50, 52, 78, 173, 178
 Air transportable hospitals, 78
 Aircraft carrier battle groups, 39
 Airway-breathing-circulation assessment, 117
 Airway management
 assessment, 117–118
 causes of airway obstruction, 133
 classification of traumatic airways, 671–672
 combat theater hospital management, 135–141
 complex laryngotracheal injuries, 139–140
 epidemiology and incidence of traumatic airway obstruction, 132–133
 gunshot wounds to the face and neck, 141
 impact on casualty survival, 66
 indications for, 135
 laryngotracheal trauma, 139–140, 377–379
 major maxillofacial trauma, 136–139
 mass casualties, 175–177
 neck injuries, 362
 prehospital management of airway obstruction, 133–134
 soft tissue injuries and, 203
 thermal injuries, 140, 257–258
 AIS. *See* Abbreviated Injury Scale
 Alkaline injuries, 305–306
 AlloDerm Regenerative Tissue Matrix, 459
 Alloplastic prostheses, 511
 Alopecia, 260–261
 ALRTs. *See* Acute lung rescue teams
 AM-111, 242
 American College of Surgeons Advanced Trauma Life Support, 116, 147, 203
 Amphibious ready groups, 38
 Anatomy
 bony orbit, 291
 eyelids, 290
 facial buttress, 291
 globe, 290
 hemorrhage control and, 146–147
 mid-face fractures, 316–317
 naso-orbito-ethmoid complex, 291
 neck, 190–191

orbital, 290–291
 paranasal sinuses, 282
 pharyngoesophageal injuries and, 400–401
 salivary gland and duct, 228–220
 vascular injuries and, 412–413
 Anterior segment examination, 293–294
 Antibiotic use
 laryngotracheal trauma, 385
 mandible fractures, 333
 temporal bone fractures, 274–276
 Antireflux medications, 385
 APD. *See* Afferent pupillary defect
 Arch bars, 333
 ARG. *See* Amphibious ready groups
 Arnholt, Lieutenant Colonel Jonathan “Luke,” 16
 Arytenoid injuries, 376
 Assault rifles, 97–100
 Assessment. *See* Trauma assessment
 Astragaloside IV, 242
 ATH. *See* Air transportable hospitals
 ATLS. *See* Advanced Trauma Life Support
 Aural soft-tissue trauma, 246–248
 Auricle injuries, 260
 Autologous fat transfer, 459–460
 Automatic grenade launchers, 97–98
 Ayala, Lieutenant Colonel Carlos, 11, 16

B

Bagram Air Base, Afghanistan, 43, 116
 Bakamjian flap, 465–467
 Balad Air Base, Iraq, 25
 Balance disorders, 607
 Ballistics
 coefficient, 94
 external, 94–95
 head and neck trauma, 104–105
 internal, 93–94
 kinetic energy of, 93–96, 105
 physiology of high-velocity trauma, 105
 small arms weapons, 93
 terminal, 95
 Barnett, Lieutenant Colonel Richard J., 11, 16
 Barrera, Lieutenant Colonel Jose E., 11, 17
 Barton, Lieutenant Colonel Chester P., III, 10, 17
 Basilar skull fracture, 595–597
 Battalion aid stations, 37
 Benign paroxysmal positional vertigo, 246, 607–608
 Blast injuries
 delayed otological trauma, 494–497
 explosive devices, 90–92
 Bleeding. *See* Hemorrhage
 Blood products availability, 66–67
 Blunt injuries
 laryngotracheal trauma, 375–376
 neck injuries, 365
 Body armor
 adapting existing technologies to wartime injuries, 72
 Civil War through World War I, 62
 current US military protection, 62–63
 Defense Health Agency, 73
 evidence-based review, 67–71

- impact of, 104
- improved protection of face and eyes, 72
- improving hemorrhage control, 72
- "Iron Man" suit, 72–73
- Joint Trauma Analysis and Prevention of Injury in Combat Program, 71–72
- law enforcement, 63–64
- National Institute of Justice body armor classification, 64
- novel materials, 73
- survival of casualties, 64–67
- Body examination, 127–128
- Bone fractures. *See* Fractures
- Bone grafts, 513
- Bony orbit anatomy, 291
- Boston, Lieutenant Colonel Mark, 11
- Bothwell, Lieutenant Colonel Nici Eddy, 6, 17–18
- Botulinum toxin injections, 232
- BPPV. *See* Benign paroxysmal positional vertigo
- Brain death, 124
- Brain injuries. *See also* Traumatic brain injuries
 - penetrating, 121–122
- Breathing assessment, 118
- Brennan, Colonel Joseph A., 8–11, 645
- Brooke Army Medical Center, Fort Sam Houston, Texas, 43
- Brow injuries, 260
- Bruns, Lieutenant Colonel Alan, 5
- Burn alopecia, 260
- Burns. *See* Thermal injuries

C

- CAB assessment, 117
- CAPD. *See* Central auditory process disorder
- Carbines, 97–98
- Case presentations
 - complex reconstructive in theater, 350–354
 - cranial nerve injuries, 221–224, 487–489
 - delayed otological trauma, 500–504
 - demographics of head and neck injuries, 54–58
 - foreign body injuries, 430–436
 - hemorrhage control, 152–154
 - laryngotracheal trauma, 387–391, 559–568
 - mandible fractures, 335–341
 - mandibular bony defects, 526–528
 - mass casualties, 179–183
 - midface bony defects, 515–518
 - midface fractures, 321–326
 - orbital trauma, 307–313
 - otological trauma, 249–251, 597–601
 - paranasal sinus fractures, 285–287, 539–541
 - pathophysiology of head and neck injuries, 107–111
 - penetrating and blunt neck injuries, 365–369
 - pharyngoesophageal injuries, 407–408, 584–585
 - preoperative planning, 194–197, 446–451
 - salivary gland and duct injuries, 233–237
 - soft tissue injuries, 475
 - surgical technique, 652–654
 - temporal bone fractures, 276–278
 - vascular injuries, 416–421
 - vestibular trauma, 613–615
 - wound infection, 205–210
- CASEVAC. *See* Casualty evacuation
- Casey, General George, 4–5
- CASF. *See* Contingency Aeromedical Staging Facility
- Cassler, Colonel John, 8
- Casualty evacuation, 41
- Casualty receiving and treatment ship, 38–39

- CCATT. *See* Critical care air transportation teams
- Central auditory process disorder, 623
- Cerebellar tests, 611
- Cerebrospinal fluid leak
 - paranasal sinus fractures and, 535–539
 - temporal bone fractures and, 274–276
- Cervical proprioception, 611
- Cervical spine injuries, 126
- Cervicofacial advancement flap, 467
- Chemical injuries, 305–307
- Chest examination, 127
- Children
 - foreign body injuries, 428
 - laryngotracheal trauma, 386
 - thermal injuries, 256
- Cholesteatoma, 497
- Christiansen, Major Nathan, 11, 18
- Ciprodex, 241
- Ciprofloxacin, 243
- Circulation-airway-breathing assessment, 117
- Circulation assessment, 118–119
- Civil War
 - body armor, 62
 - mechanisms of combat wounds, 89
 - medical evacuation system, 28
- CJTH. *See* Craig Joint Theater Hospital, Afghanistan
- Clarkson, Patrick, 161
- Closed head injuries, 92–93
- "Clothesline" injuries, 376
- CLS. *See* Combat lifesavers
- Combat
 - lifesavers, 64–65
 - medic training, 65
 - support hospitals, 37, 39–40, 78, 348–350
 - theater hospitals, 135–141
- Committee on Tactical Combat Casualty Care, 67
- Composite grafting, 459
- Computed tomography angiography. *See also* Radiography
 - facial and neck trauma, 166–167
 - foreign body injuries, 425–426
 - head and neck injuries, 80–81
 - laryngotracheal trauma, 377
 - neck injuries, 363–364
 - paranasal sinus fractures, 533–535
 - penetrating brain injuries, 121
 - preoperative planning for acute head and neck surgery, 192–193
 - three dimensional imaging, 442–446
 - vascular injuries, 414, 416
- Computed tomography imaging
 - cranial nerve injuries, 215
 - facial nerve injury, 484
 - laryngotracheal trauma, 377
 - orbital trauma, 292, 294
 - paranasal sinus fractures, 282
 - penetrating brain injuries, 120–121
 - pharyngoesophageal injuries, 402–404
 - salivary gland and duct injuries, 228, 230
 - temporal bone fractures, 270–271
- Computer-aided design/modeling, 442, 445–446
- Concussions
 - Military Acute Concussion Evaluation, 92
- Conductive hearing loss, 497, 499
- Conjunctival adhesions, 307
- Contingency Aeromedical Staging Facility, 43
- Coppit, Colonel George, 5
- Corticosteroids, 385
- Craig Joint Theater Hospital, Afghanistan, 43, 116, 194–197

Cranial nerve injuries
 associated nerve injuries from neck trauma, 486
 case presentations, 221–224, 487–489
 cranial nerves, 214–220
 electrodiagnostic testing, 215
 evaluation, 214–215
 eye care, 215
 facial nerves, 217, 483–486
 imaging, 215
 interposition grafting, 216–217
 intratemporal injuries, 217
 lower cranial nerves, 217
 nerve exploration, 215–216
 trigeminal nerve injury, 482–483
 vestibular trauma and, 609
 Craniomaxillofacial trauma, 646–647
 Cricoid injuries, 376
 Cricothyroidotomy, 362
 Cricotracheal resection, 555
 Critical care air transportation teams, 38, 67, 162–164
 CRTS. *See* Casualty receiving and treatment ship
 CSH. *See* Combat support hospitals
 CT. *See* Computed tomography imaging
 CTA. *See* Computed tomography angiography

D

DeBakey, Colonel Michael, 33
 Defense Health Agency, 73, 639–640
 Delayed otological trauma, 492–504
 Delayed repair
 case presentations, 446–451
 laryngotracheal trauma, 544–568
 mandible fractures, 333–335, 337–339
 maxillary-mandibular reconstruction, 445–446
 orbital reconstruction, 443–444
 otological trauma, 590–601
 paranasal sinus fractures, 532–541
 pharyngoesophageal injuries, 576–585
 preoperative planning for delayed surgery, 192–193
 soft-tissue injuries, 454–475
 virtual surgical planning, 442–443
 zygomaticomaxillary complex fractures, 444–445
 Deltopectoral flap, 465–467
 Dexamethasone, 243
 DHA. *See* Defense Health Agency
 DICOM. *See* Digital imaging and communications in medicine
 Digital imaging and communications in medicine, 442
 Disability assessment, 119–120
 Dix-Hallpike maneuver, 607
 Dizziness, 244–246, 606, 608
 Doctor, Major Vishal, 11
 DUSTOFF Association, 34–35

E

Edwin Smith papyrus, 160
 Electrodiagnostic testing, 215
 Electromyography, 215, 273, 485
 Electroneurography, 215, 272, 483, 485
 Eller, Lieutenant Colonel Robert L., 10, 18
 EMEDS. *See* Expeditionary medical support
 EMG. *See* Electromyography
 En-route care, 39, 41
 Endoscopy
 laryngotracheal trauma management, 379–383, 553
 Endotracheal tubes, 79–80, 138
 ENoG. *See* Electroneurography
 Enucleation, 302–303

EOD. *See* Explosive ordinance disposal
 Epidural hematomas, 122–123
 Esquivel, Lieutenant Colonel Carlos, 10
 ETT. *See* Endotracheal tubes
 Evacuation. *See* Medical evacuation
 Examination. *See* Physical examination; Trauma assessment
 Expeditionary medical support, 38, 40, 78
 Explosive devices
 blast injuries, 90–92
 closed head injuries, 92–93
 improvised explosive devices, 78–79, 81
 taxonomy of injuries from, 91
 Explosive ordinance disposal, 427
 Exposure assessment, 120
 External ballistics, 94–95
 Extremities examination, 127–128
 Eyes
 burns, 259–260
 cranial nerve injuries and, 215
 examination of, 124
 eyelid anatomy, 290

F

Face. *See* Head and neck injuries; Maxillofacial trauma
 Face examination, 124–126
 Facial buttress, 291
 Facial fractures. *See also* Maxillofacial trauma; Mid-face fractures
 timing of repair, 164–165
 Facial nerve
 decompression of, 217
 House-Brackmann Scale grading scale for injuries, 272, 482
 injuries, 271–273, 483–486
 FAST. *See* Focused Abdominal Sonography for Trauma
 Fat transfer, autologous, 459–460
 Faulkner, Colonel Jeffrey A., 4–6, 18
 Focused Abdominal Sonography for Trauma, 120
 Foreign body injuries
 anatomical considerations, 424
 case presentations, 430–436
 clinical examination, 425
 deployed setting factors in management decisions, 427
 emergency management, 424–425
 investigations, 425–426
 laryngotracheal evaluation, 426
 nonoperative management, 426–428
 operative management, 426–428
 orbital trauma, 301–302, 428
 pediatric injuries, 428
 penetrating neck trauma, 424–426
 postoperative care, 427–428
 Forward resuscitative surgical systems, 39
 Forward surgical teams, 37–38, 104
 Fractures
 basilar skull, 595–597
 facial, 164–165
 hyoid, 384
 mandible, 330–341
 midface, 296–298, 316–326
 naso-orbito-ethmoid, 300–301
 orbital, 294–296
 orbital blowout, 295
 orbital rim, 295
 panfacial, 667
 paranasal sinuses, 282–287, 532–541
 skull, 121
 temporal bone, 268–278
 zygomaticomaxillary complex, 298–300, 444–445

Free bone grafts, 513
 Free tissue transfer, 513–514
 Frontal sinus outflow tract, 282
 FSOT. *See* Frontal sinus outflow tract
 FST. *See* Forward surgical teams
 FTSG. *See* Full-thickness skin graft
 Full-thickness skin graft, 259, 261
 Functional Gait Assessment, 610

G

Gait analysis, 610
 Gastroesophageal reflux disease, 547
 Gaze stabilization test, 610
 GCS. *See* Glasgow Coma Scale
 GERD. *See* Gastroesophageal reflux disease
 Gibbons, Lieutenant Colonel Mark, 5
 Gillies, Harold, 330
 Glasgow Coma Scale, 118, 123–124
 Globe
 anatomy, 290
 closed injury, 303–305
 open injury, 302–303
 Glossopharyngeal nerve, 217–218
 Glottic webs, 551–552
 Gore-Tex, 384–385
 Gottschalk, Lieutenant Colonel Douglas, 10
 Green, Major General Charles, 8, 11
 Grenade launchers, 97–98
 Gunning, Thomas, 161
 Gunshot wounds
 airway management, 141
 casualties, 88–89
 examination of, 425
 management of, 426
 transcervical zone I wound through the larynx, 194–195

H

Halo sign, 125–126
 Hart, Captain A. Kristina E., 18–19
 Hayes, Colonel David K., 4–6, 19
 Head and neck injuries. *See also* Case presentations; specific injuries
 airborne intensive care units and, 67
 airway management, 66
 ballistics of, 104–105
 blood products availability, 66–67
 closed head injuries from explosive devices, 92–93
 combat medic training and, 65
 complex reconstruction in theater, 344–354
 dedicated surgical teams, 78–82
 demographics of, 48–49
 examination of, 120–127
 forward placement of surgeons and, 67
 infectious diseases associated with, 71
 joint medical training and, 65–66
 lessons learned from conflicts in Iraq and Afghanistan, 70
 lethal triad, 67
 pathophysiology of, 104
 pretreatment, 49–50, 104
 process improvement, 67
 role of otolaryngology, 79–82
 sites of injury, 50–51
 squad-level care, 64–65
 survival factors, 64–67
 survival rates, 53–54
 zone injuries, 146–147, 190, 194–197, 63–364
 Head Impulse Test, 609–610

Hearing loss
 biology of, 591
 conductive, 497, 499
 otological trauma and, 241–244
 sensorineural, 241–244, 269–270, 273–274, 501, 504
 temporal bone fractures and, 273–274
 Heavy machine guns, 97–100
 Helicopter evacuations, 31–35, 41–42
 Helmand Province, Afghanistan, 42
 Hemorrhage control
 anatomical considerations, 146–147
 case presentations, 152–154
 initial survey and management, 147–149
 intracranial, 122–123
 intraocular, 305
 management of, 66, 72, 147–150
 mass casualties and, 177–178
 neck injuries, 362–363
 retro-orbital, 304–305
 surgical management of the neck, 149–150
 vascular anastomosis, 151–152
 vertebral arteries, 147
 vessel management, 150
 Hemostatic agents, 649–650
 Henry, Lieutenant Colonel Lakeisha, 11, 19
 High-Level Mobility Assessment Tool, 610
 High-resolution computed tomography imaging, 270–271
 HNIs. *See* Head and neck injuries
 Hoffer, Captain Michael E., 19–20
 Holt, Colonel G. Richard, 5, 20
 Hospital ships, 40–41
 House-Brackmann Scale, 272, 482
 HRCT. *See* High-resolution computed tomography imaging
 Human Research protection Plan, 647
 Humanitarian efforts, 647
 Hyoid injuries, 376, 384
 Hypoglossal nerve, 219–220

I

IEDs. *See* Improvised explosive devices
 IMF. *See* Intermaxillary fixation
 Improved outer tactical vest, 62–63
 Improvised explosive devices, 78–79, 81, 88–91, 104–105, 310–313
 Infectious diseases
 Acinetobacter, 164
 head and neck injuries and, 71
 wound infection management, 203–204
 Inhalational injuries, 257–258
 INHIs. *See* Inhalational injuries
 Injectable fillers, 460–461
 Injury assessment. *See* Trauma assessment
 Injury Severity Score, 68
 Insurgent weapons, 98–100
 Integra, 458–459
 Intermaxillary fixation, 175, 333
 Internal ballistics, 93–94
 Intracranial bleeding, 122–123
 Intraocular
 hemorrhage, 305
 pressure, 293
 Intratemporal injuries, 217
 Intubation-related injury, 544–545, 549
 IOP. *See* Intraocular pressure
 IOTV. *See* Improved outer tactical vest
 Iraq. *See* Operation Iraqi Freedom
 “Iron Man” suit, 72–73
 ISS. *See* Injury Severity Score

J

- J-FAINT. *See* Joint Facial and Invasive Neck Trauma
- Jacobson's neurectomy, 231
- Joint Base Balad, Iraq, 42–43
- Joint Facial and Invasive Neck Trauma, 69, 374
- Joint medical training, 65–66
- Joint Theater Trauma Registry, 51, 68–69, 204, 359, 647
- Joint Trauma Analysis and Prevention of Injury in Combat Program, 71–72
- JTAPIC. *See* Joint Trauma Analysis and Prevention of Injury in Combat Program
- JTTR. *See* Joint Theater Trauma Registry

K

- Kalashnikov
 - AK-47, 98–99
 - RPK light machine guns, 100
- Kazanjian, Varistad, 330
- Keels
 - laryngotracheal trauma management, 384–385
- Kerr, Major Julie, 6
- KIA. *See* Killed in action
- Killed in action
 - kill rates, 89
- Kinetic energy, 93–96, 105
- Kirkland, Richard, 32
- Klem, Colonel Christopher, 6, 20
- Knives, 105
- Korean War
 - evacuation system, 31–34
 - mechanisms of combat wounds, 89

L

- Laboratory work-up, 192
- Lambdoid tracheal stenosis, 557
- Landstuhl Regional Medical Center, Germany, 42, 43, 163–164, 178
- Laryngotracheal trauma
 - access to, 383
 - acute intubation-related injury, 544
 - addressing tissue loss, 384
 - airway management, 139–140, 377–379
 - biomechanics of, 375–377
 - blunt injuries, 375–376
 - case presentations, 387–391, 559–568
 - classifying injuries, 377–379
 - Cotton scale of stenosis, 552
 - definitive management of, 379–385
 - delayed management of, 544–568
 - diagnosis of, 377–379
 - electromyography, 548
 - endoscopic interventions, 381–383
 - external interventions, 383–385
 - foreign bodies, 426
 - framework stabilization, 383–384
 - Fuhrman's modification of the Schaefer classification, 378
 - glottic webs, 551–552
 - granulation tissue, 557
 - high velocity penetrating injury, 388–390
 - imaging, 377, 548
 - immediate airway management, 379
 - incidence of, 374–375
 - injuries affecting arytenoid position, 549–550
 - intubation-related injury, 544–545, 549
 - keels, 384–385
 - lambdoid tracheal stenosis, 557

- laryngeal burns, 386
- laser welding, 383
- late intubation-related injury, 544–545
- low velocity penetrating injury, 387–388
- managing hyoid fractures, 384
- McCaffrey grading, 552–553
- medical interventions, 385
- musculomembranous vocal fold injuries, 549
- pathophysiology of, 549–550
- patient history, 546–647
- pediatric patients, 386
- penetrating injuries, 376–377
- pharyngoesophageal injury, 384
- physical examination, 547
- posterior glottic stenosis, 550
- pulmonary testing, 547–548
- repair of, 670
- signs and symptoms, 377
- stents, 384–385
- subglottic stenosis, 550, 552–557
- suprastomal collapse, 558
- suturing, 381–383
- tissue glues, 383
- tracheal stenosis, 552–557
- tracheomalacia, 557–558
- tracheotomy-related injury, 545
- transcutaneous laryngeal suture placement, 383
- Laryngotracheoplasty, 555–557
- Laser welding
 - laryngotracheal trauma, 383
- Law enforcement body armor, 63–64
- Le Fort, Rene, 161
- Le Fort fractures, 296–298, 318
- Lethal triad, 67
- Letterman, Major Jonathan, 28
- Leupeptin, 242
- Liening, Lieutenant Colonel Doug, 4
- Lip reconstruction, 464–465
- Littlefield, Lieutenant Colonel Philip D., 5–6, 20
- Local tissue
 - flaps, 511
 - tissue transposition, 455–456
- Lopez, Lieutenant Colonel Manuel, 9, 20
- Lower lip reconstruction

M

- MACE. *See* Military Acute Concussion Evaluation
- Machine guns, 97–100
- Maddox, Captain Michael, 20–21
- Magdycz, Colonel Bill, 5
- Magnetic resonance
 - angiography, 414
 - imaging, 228–230, 244
- Mandible fractures
 - antibiotic coverage, 333
 - case presentations, 335–341
 - delayed repair, 333–335, 337–339
 - factors affecting treatment decisions, 331–332
 - immediate repair, 333–337, 339–341
 - intermaxillary fixation with arch bars, 333
 - preoperative planning for delayed surgery, 445–446
 - reconstruction, 347–348, 445–446
 - stabilizing the mandible, 333
 - treatment of, 332–333, 664–667
- Mandibular bony defects
 - case presentations, 526–528
 - donor site selection, 525

- late stabilization, 524
- primary reconstruction, 525
- secondary reconstruction, 525–526
- wound bed preparation, 524
- Mandibulomaxillary fixation, 297–298
- MASHs. *See* Mobile Army surgical hospitals
- Mass casualties
 - airway management, 175–177
 - case presentations, 179–183
 - difference in treatment between Iraq and Afghanistan, 178
 - evacuations, 173
 - hemorrhage control, 177–178
 - incidence of, 173–174
 - neural control at the skull base, 177–178
 - outcomes of, 179
 - pattern of head and neck injuries, 172–173
 - role of the head and neck surgeon, 175–178
 - timing of surgery, 174–175
 - triage, 174
 - vascular control, 177–178
- Mausier Gewehr 98, 99
- Maxillofacial trauma
 - acute surgery for, 660
 - airway management, 136–139
 - bony repair, 664–667
 - casualty evacuation from theater, 162–164
 - guidelines for in-theater treatment, 165
 - history of surgical repair, 160–162
 - indications for surgery, 162–167
 - laryngotracheal repair, 670
 - management of, 646–647
 - maxillary reconstruction, 347–348
 - mechanism of injuries, 162
 - most common procedures, 660
 - neck and skull base exploration, 669–670
 - preoperative planning, 445–446, 660
 - soft-tissue repair, 660–664
 - surgical procedures, 660–672
 - timing of facial fracture repair, 164–165
- MEDEVAC. *See* Medical evacuation
- Medical devices, 650
- Medical evacuation
 - casualty survival, 67
 - Civil War system, 28
 - defined, 41
 - Korean War system, 31–34
 - mass casualties, 173
 - maxillofacial trauma injuries and, 162–164
 - platforms and medical facilities, 41–43
 - roles of care, 36–41
 - tactical evacuation care, 133
 - terminology, 41
 - Vietnam War system, 34–36
 - World War I system, 28–29
 - World War II system, 29–31
- Medical treatment facilities, 37–38
- Meniere's disease, 612
- Methylprednisolone, 242–244
- MFST. *See* Mobile field surgical teams
- MHNTs. *See* Multidisciplinary Head and Neck Teams
- MHS. *See* US Military Health System
- Microvascular flap transfer, 470
- Midface bony defects
 - alloplastic prostheses, 511
 - anatomical considerations, 508
 - case presentations, 515–518
 - classification of, 508–509
 - combat trauma considerations, 509–511
 - free bone grafts and tissue transfer, 513–514
 - local tissue flaps, 511
 - pedicled flaps, 511–513
 - reconstructive goals, 509
 - reconstructive ladder, 511–514
- Midface fractures
 - anatomical considerations, 316–317
 - case presentations, 321–326
 - evaluation of, 318–319
 - Le Fort, 296–298
 - management of, 297–298
 - pathophysiology, 317–318
 - treatment of, 319–321
- Military Acute Concussion Evaluation, 92
- Military Health System, 638–640
- Military medicine
 - beginning of, 636–638
 - future medical care in the combat zone, 638–640
- Miller, Major Lee, 10, 21
- Mobile Army surgical hospitals, 30, 33
- Mobile field surgical teams, 38
- Moore, Major Brian, 11
- Morgan, Major Justin E., 11, 21–22
- Motility examination, 293
- Motor vehicle accidents
 - laryngotracheal trauma, 375
 - orbital trauma, 307–310
- Mouth injuries, 260
- MRI. *See* Magnetic resonance imaging
- MTF. *See* Medical treatment facilities
- Muller, Maurice, 162
- Multidisciplinary Head and Neck Teams, 644–645
- Multiple projectile weapons, 106
- Musculomembranous vocal fold injuries, 549

N

- N-acetylcysteine, 242–243, 245, 624
- NAC. *See* N-acetylcysteine
- Naso-orbito-ethmoid complex
 - anatomy, 291
 - fractures, 300–301
- National Institute of Justice
 - body armor classification, 64
- Navy-Marine Corps Combat Trauma Registry, 359
- Neck examination, 126–127
- Neck injuries. *See also* Head and neck injuries
 - airway management, 362
 - anatomical considerations, 190–191, 360–361
 - bleeding control, 362–363
 - blunt, 365
 - burns, 261–262
 - case presentations, 365–369
 - evolution of in-theater surgical management, 358
 - foreign bodies, 424–426
 - incidence of, 358–359
 - mechanism of, 359
 - mortality, 360
 - neck zones, 361
 - penetrating, 358–365, 424–426, 645–646
 - surgical decision-making, 363–365
 - zone injuries, 146–147, 190, 194–197, 363–364
- Neel, Major General Spurgeon, Jr., 34, 35
- Nerve injuries. *See* specific nerve by name
- Neurologic examination, 124
- NIJ. *See* National Institute of Justice
- NMCCTR. *See* Navy-Marine Corps Combat Trauma Registry
- Nose injuries, 260–261

O

- OEF. *See* Operation Enduring Freedom
- OIF. *See* Operation Iraqi Freedom
- Open reduction internal fixation, 174–175, 203, 347
- Operation Enduring Freedom
- advances in head and neck surgery, 644–645
 - casualties, 88
 - deployed otolaryngologists, 5–6, 10–11, 14
 - evacuation platforms and medical facilities, 41–43
 - head and neck injuries, 49
 - laryngotracheal trauma, 374–375
 - mechanisms of combat wounds, 89
 - medical evacuation terminology, 41
 - percent survivability, 635
 - recollections from the front, 16–24, 676–678
 - roles of care, 36–41
 - traumatic airway obstruction, 132
 - treatment of mass casualties, 178
- Operation Iraqi Freedom
- advances in head and neck surgery, 644–645
 - casualties, 88
 - deployed otolaryngologists, 4–5, 9–10, 14
 - ear-nose-throat clinic sign, Balad Air Base, Iraq, 1
 - evacuation platforms and medical facilities, 41–43
 - head and neck injuries, 48
 - laryngotracheal trauma, 374–375
 - mechanisms of combat wounds, 89
 - medical evacuation terminology, 41
 - percent survivability, 635
 - recollections from the front, 16–24, 676–678
 - roles of care, 36–41
 - traumatic airway obstruction, 132
 - treatment of mass casualties, 178
- Operation New Dawn
- casualties, 88
 - percent survivability, 635
- Orbital blowout fracture, 295
- Orbital rim fracture, 295
- Orbital trauma
- adnexal injury, 305
 - anatomical considerations, 290–291
 - case presentations, 307–313
 - chemical injuries, 305–307
 - closed globe injury, 303–305
 - enucleation, 302–303
 - foreign bodies, 301–302, 428
 - imaging, 292
 - implants, 303
 - improvised explosive device, 310–313
 - midface fractures, 296–298
 - motor vehicle accidents, 307–310
 - naso-orbito-ethmoid fractures, 300–301
 - open globe injury, 302–303
 - orbital fractures, 294–296
 - patient evaluation, 292–294
 - physical examination, 292–294
 - preoperative planning for delayed surgery, 443–444
 - soft tissue injury, 305
 - sympathetic ophthalmia, 307
 - zygomaticomaxillary complex fractures, 298–300
- ORIF. *See* Open reduction internal fixation
- Oscillopsia, 245
- Otolaryngology
- Air Force personnel deployed in Operation Iraqi Freedom and Operation Enduring Freedom, 9–11
 - Army personnel deployed in Operation Iraqi Freedom and Operation Enduring Freedom, 4–6

- Navy personnel deployed in Operation Iraqi Freedom and Operation Enduring Freedom, 14
 - role in head and neck injuries, 79–82
- Otological trauma
- acoustic trauma from blast, 592–593
 - acute acoustic trauma, 590–593
 - auditory rehabilitation, 593–595
 - aural soft-tissue trauma, 246–248
 - basilar skull fracture, 595–597
 - biology of noise-induced hearing loss, 591
 - blast injuries, 494–497
 - case presentations, 249–251, 500–504, 597–601
 - clinical studies of acute acoustic trauma therapy, 591–592
 - delayed treatment of, 492–504, 590–601
 - dizziness, 244–246
 - management of, 498–500, 647, 670–671
 - pathology of blast/impulse noise, 493–494
 - sensorineural hearing loss, 241–244
 - surgical outcomes, 497–498
 - temporal bone trauma, 246–248
 - tinnitus, 241–244
 - tympanic membrane perforation, 240–241
- OTV. *See* Outer tactical vest
- Outer tactical vest, 62
- Overholt, Captain Edwin L., 31–32

P

- Panfacial fractures, 667
- Paramedian forehead flap, 467–468
- Paranasal sinus fractures
- anatomical considerations, 282, 532–533
 - case presentations, 285–287, 539–541
 - cerebrospinal fluid leak, 535–539
 - delayed management of, 532–541
 - diagnosis of, 282
 - diagnostic studies, 533–534
 - initial evaluation, 533
 - management of, 283–285, 534–538
 - postoperative care, 539
 - treatment algorithm, 283–285
- Park, Lieutenant Colonel Greg, 11
- Parotid gland, 228, 231
- PASGT. *See* Personnel Armor System for Ground Troops
- Patient assessment. *See* Trauma assessment
- Pectoralis major flap, 470
- Pediatrics
- foreign body injuries, 428
 - laryngotracheal trauma, 386
 - thermal injuries, 256
- Pedicled flaps, 511–513
- Pelvic examination, 127
- Penetrating wounds
- brain injuries, 121–122
 - laryngotracheal trauma, 376–377
 - neck injuries, 358–365, 424–426, 645–646
 - penetrating missile categories, 105–106
- Perilymph fistula, 612
- Personnel Armor System for Ground Troops, 62
- Pharyngoesophageal injuries
- acute management, 404–405
 - anatomical considerations, 400–401
 - case presentations, 407–408, 584–585
 - delayed treatment of, 576–585
 - diagnostic studies, 402–404
 - indications for immediate neck exploration, 401
 - initial evaluation, 401–402
 - management of, 384

- outcomes, 406–407
- postoperative care, 406
- reconstruction, 579–581
- strictures, 576–577
- signs and symptoms of, 401
- tracheoesophageal fistulas, 577–579
- treatment outcomes, 581–583
- Physical examination
 - abdomen, 127
 - chest, 127
 - extremities, 127–128
 - eyes, 124
 - face, 124–126
 - head and neck, 120–127
 - laryngotracheal trauma, 547
 - neck, 126–127
 - orbital trauma, 292–294
 - pelvis, 127
 - preoperative planning, 191–192
 - salivary gland and duct, 229–230
 - scalp injuries, 120–121
 - trauma assessment, 127–128
- Platysma muscle, 360
- Posterior glottic stenosis, 550
- Posterior ocular damage, 304
- Posterior segment examination, 294
- Prednisone, 243
- Preoperative planning
 - case presentations, 194–197
 - history, 191–192
 - laboratory work-up, 192
 - neck anatomy, 190–191
 - physical examination, 191–192
 - radiographic work-up, 192–193
 - zones of injury, 190–191
- Primary trauma assessment
 - adjuncts to the primary survey, 120
 - airway, 117–118
 - breathing, 118
 - circulation, 118–119
 - disability, 119–120
 - exposure, 120
 - team approach, 116
- Projectile weapons, 95–96, 106
- Projectile wounds, 106
- PROLENE, 384
- Proton pump inhibitors, 385
- Pupil examination, 293

R

- Radiography. *See also* Computed tomography angiography
 - preoperative planning, 192–193
- Ramsey, Colonel Mitchell J., 6, 22
- Ramstein Air Base, Germany, 42, 43
- Recurrent laryngeal nerve, 218–219
- Reese, Captain Charles A., 22
- Retro-orbital hemorrhage, 304–305
- RIF. *See* Rigid internal fixation
- Rifles, 97–100
- Rigid endoscopy, 379–381
- Rigid internal fixation, 81–82
- RLN. *See* Recurrent laryngeal nerve
- Roles of care, 36–41
- Romberg Test, 611
- Roofe, Colonel Scott B., 5, 22–23
- Ross, Lieutenant Colonel Eugene, 4
- RPG-7, 100

S

- Sabatini, Major Peter R., 11, 23
- Salivary gland and duct
 - anatomy, 228–229
 - blunt vs penetrating trauma, 230
 - case presentations, 233–237
 - diagnostic studies, 229–230
 - injury complications, 232–233
 - management, 231
 - parotid gland, 228, 231
 - physical examination, 229–230
 - sublingual glands, 229
 - submandibular glands, 232, 228–229
- Scalp injuries
 - examination of, 120–121
 - thermal injuries, 261
- Scar revision, 455
- Schaefer classification, 378
- Schmalback, Lieutenant Colonel Cecelia E., 11, 23
- Secondary trauma assessment
 - body examination, 127–128
 - head and neck, 120–127
- Sensorineural hearing loss, 241–244, 269–270, 273–274, 501, 504
- Sharpened Romberg Test, 611
- Sherman classification, 106
- Shock trauma platoons, 37
- Simonov SKS, 99
- Single projectile weapons, 106
- Skin grafts, 259–262, 456–458
- Skull fractures, 121
- Small arms weapons
 - ballistics, 93
 - external ballistics, 94–95
 - internal ballistics, 93–94
 - muzzle velocity, caliber, and energy of, 93
 - projectile design, 95–96
 - terminal ballistics, 95
 - tissue composition and wounding, 96–97
- Small portable expeditionary aeromedical rapid response teams, 38
- Small wound management, 345
- Smith, Edwin, 160
- SNHL. *See* Sensorineural hearing loss
- Snizek, Colonel Joseph C., 5–6, 23
- Sniper weapon systems, 98
- Soft tissue injuries
 - airway management, 203
 - autologous fat transfer, 459–460
 - case presentations, 475
 - composite grafting, 459
 - delayed repair, 454–475
 - direct scar revision, 455
 - flap coverage, 464–470
 - infection management, 203–204
 - injectable fillers, 460–461
 - local tissue transposition, 455–456
 - nature of wounding, 471
 - orbital trauma, 305
 - reconstructive options for large defects, 345–347
 - secondary flap release, 461–464
 - secondary reconstruction techniques and procedures, 455–470
 - skin grafting, 456–458
 - thermal injuries, 258–259
 - timing of reconstruction, 472–473
 - tissue expansion, 461–362
 - tissue substitutes, 458–459
 - treatment of, 473–475

- wound healing, 471
- wound management, 202–203
- Sorensen, Colonel Doug, 6
- SPEAR. *See* Small portable expeditionary aeromedical rapid response teams
- Spinal accessory nerve, 219
- Spinal examination, 127
- Spinal injuries, 126
- Split-thickness skin graft, 258–261
- Squad-level care, 64–65
- Src-protein kinase inhibitors, 242
- Stents
 - laryngotracheal trauma management, 384–385
- Stereolithography models, 445
- Sternocleidomastoid muscle, 360
- Streit, Colonel Paul H., 31
- STSG. *See* Split-thickness skin graft
- Subdural hematomas, 122
- Subglottic stenosis, 552–557
- Sublingual glands, 229
- Submandibular glands, 228–229, 232
- Superior canal dehiscence, 611–612
- Supraglottic stenosis, 550
- Suprastomal collapse, 558
- Surgery
 - advances in head and neck surgery, 644–645
 - bed space and, 349
 - case presentations, 652–654
 - complex reconstruction in theater, 344–354
 - craniomaxillofacial trauma, 646–647
 - decision-making for neck injuries, 363–365
 - equipment, 348–349
 - evolution of in-theater surgical management, 358
 - follow-up, 350
 - hemorrhage management, 149–150
 - history of maxillofacial trauma repair, 160–162
 - immediate surgical care, 645
 - indications for, 162–167
 - location of, 349
 - maxillary-mandibular reconstruction, 445–446
 - maxillofacial trauma, 660–672
 - orbital reconstruction, 443–444
 - penetrating neck trauma, 645–646
 - preoperative planning, 190–197, 442–451
 - procedures for, 52–53
 - rehabilitation, 350
 - technical innovation, 648–650
 - technique and medical management, 645–648
 - timing during mass casualties, 174–175
 - timing of, 349
 - virtual surgical planning, 442–443, 648–649
 - zygomaticomaxillary complex fractures, 444–445
- Surgical companies, 39
- Survival rates, 53–54
- Symblepharon, 307
- Sympathetic ophthalmia, 307
- T**
- TACEVAC. *See* Tactical evacuation care
- Tactical Assault Light Operator Suit, 72–73
- Tactical Combat Casualty Care, 37, 117, 133–134, 648
- Tactical evacuation care, 133
- TALOS. *See* Tactical Assault Light Operator Suit
- Task Force MED East, 116
- Task Force Smith, 31
- TBI. *See* Traumatic brain injuries
- TBSA. *See* Total burn surface area
- TCCC. *See* Tactical Combat Casualty Care
- Tellez, Colonel Guillermo J., 10, 11, 23–24
- Temporal bone fractures
 - acute management of wartime injuries, 276
 - antibiotic therapy, 274–276
 - case presentations, 276–278
 - cerebrospinal fluid leak, 274–276
 - facial nerve injury, 271–273
 - fracture classification, 269–270
 - hearing loss, 273–274
 - House-Brackmann Scale, 272
 - initial evaluation, 268–269
 - management of, 271–276
 - radiographic evaluation, 270–271
- Temporal bone trauma, 246–248
- Temporalis flap, 469–470
- Temporary threshold shift, 493
- Temporoparietal fascial flap, 468–469
- Terminal ballistics, 95
- Thermal injuries
 - airway management, 140, 257–258
 - auricle reconstruction, 260
 - brow reconstruction, 260
 - definitive reconstruction, 259–262
 - eyelid reconstruction, 259–260
 - initial management, 257–259
 - laryngeal burns, 386
 - mouth reconstruction, 260
 - neck reconstruction, 261–262
 - nose reconstruction, 260–261
 - pediatric burns, 256
 - scalp reconstruction, 261
 - soft tissue management, 258–259
- Thomas, Colonel Richard W. “Tom,” 4
- Three dimensional imaging, 442–446
- Thyroid cartilage injuries, 375–376
- Tinnitus, 241–244
- Tissue
 - expansion, 461–462
 - flaps, 511
 - glues, 383
 - substitutes, 458–459
 - transfers, 513–514
 - transposition, 455–456
- TM. *See* Tympanic membrane rupture
- Tonkinson, Lieutenant Colonel Brian, 5–6
- Total burn surface area, 257, 259
- Tracheal stenosis, 552–557
- Tracheoesophageal fistulas, 577–579
- Tracheomalacia, 557–558
- Tracheotomy-related injury, 545
- Transcutaneous laryngeal suture placement, 383
- Trauma assessment. *See also* Physical examination
 - primary, 116–120
 - secondary, 120–128
 - team approach, 116
- Traumatic brain injuries
 - battlefield assessment, 624
 - causes of, 620
 - classes of, 621
 - definition of, 620
 - Glasgow Coma Scale, 118, 123–124
 - Military Acute Concussion Evaluation, 92
 - symptoms of, 621–623
 - treatment of, 624
- Triage, mass casualties, 174
- Trigeminal nerve injury, 482–483

TTS. *See* Temporary threshold shift
Tympanic membrane perforation, 240–241, 495
Tympanic membrane rupture, 91–92
Tympanoplasty, 497–498

U

US Air Force
Contingency Aeromedical Staging Facility, 43
lead-up to deployments, 8–9
otolaryngologists deployed in Operation Iraqi Freedom and Operation Enduring Freedom, 9–11
roles of care, 38, 40
US Air Force theater hospitals, 49–50, 52, 78, 173, 178
US Army
medical battlefield rules, 634
otolaryngologists deployed in Operation Iraqi Freedom and Operation Enduring Freedom, 4–6
roles of care, 37–40
US Army Ambulance Service, 29
US Department of Defense
healthcare expenditures, 639
US Marine Corps
roles of care, 39
US Military Health System, 638–640
US military weapons, 97–98
US Navy
otolaryngologists deployed in Operation Iraqi Freedom and Operation Enduring Freedom, 14
roles of care, 38–41

V

Vagus nerves, 218–219
Vascular anastomosis
bypass, 151
complications, 152
grafts for arterial reconstruction, 151
ligation, 151–152
primary repair, 151
Vascular injuries
anatomical considerations, 412–413
case presentations, 416–421
diagnosis of, 413–414
epidemiology, 413
evaluation of, 414–415
historical perspective, 412
ligation techniques, 415
management of, 414–416
repair techniques, 415
repeat imaging, 416
types of, 413
Vertebral artery injuries, 147, 415–416
Vestibular trauma
audiovestibular laboratory measures, 607
case presentations, 613–615
classes of dizziness, 606
cranial nerve examination, 609
diagnosis of balance disorders, 607
management of, 647, 670–671
measures and evaluation, 607–611
Meniere's disease, 612
perilymph fistula, 612
physical therapy, 612–613
superior canal dehiscence, 611–612
treatment modalities, 611–613
Vestibuloocular reflex testing, 609–610

Vietnam War
mechanisms of combat wounds, 89
medical evacuation system, 34–36
outcomes of mass casualty events, 179
Virtual surgical planning, 442–443, 648–649
Visual acuity, 293
Visual field examination, 293
Vocal fold injuries, 549
VSP. *See* Virtual surgical planning

W

Weaponry
casualties in OIF, OEF, and OND, 88
explosive devices, 90–93
gunshot wounds, 89
historical mechanisms of combat wounds, 89
improvised explosive devices, 78–79, 81
insurgent weapons, 98–100
knives, 105
penetrating missiles, 105–106
projectiles, 106
small arms weapons, 93–97
US military weapons, 97–98
Wiseman, Colonel Joseph, 9
World War I
body armor, 62
mechanisms of combat wounds, 89
medical evacuation system, 28–29
outcomes of mass casualty events, 179
World War II
mechanisms of combat wounds, 89
medical evacuation system, 29–31
outcomes of mass casualty events, 179
Wound infection
case presentations, 205–210
soft tissue injuries and, 203–204
Wound types, 344

X

Xydakis, Lieutenant Colonel Michael, 9

Y

Yu, Colonel Kenneth C.Y., 11, 24

Z

Z-plasty, 455–457
Zygomaticomaxillary complex fractures, 298–300, 444–445