INDEX

Symbols	oculocardiac reflex 366
2-Chloro-1-phenylethanone (Mace) 127	sympathetic ophthalmia 267 traumatic optic neuropathy 396, 398
2-Chlorobenzalmalononitrile 127	Agent Orange 125
3-Quinuclidinyl benzilate 127	Agnew. Dr. D. Hayes 5
~ ~ · · · · · · · · · · · · · · · · · ·	Alcaine 293
\mathbf{A}	Alkalis
	burns from 116, 308
α_2 agonists 192, 193	examples of common alkali products 116
Abrasions	glaucoma and 188
conjunctival 139	Allen figures 48
corneal 90, 94, 98, 140 Acetaminophen	Allergies allergic reactions to local anesthesia 80
combined with codeine 92	anesthesia and 90, 94
hyphemia treatment 144	patient history 48
Acetazolamide	Alloderm 324, 326, 328, 330
intraocular pressure and 88, 89	Aluminum
Acetic acid 117	cause of posterior segment IOFB 248
Acetozolamide	Aluminum eye shields 28, 102, 104
hyphemia treatment 145	American Academy of Ophthalmology and Otolaryngology
Acetylcholine	establishment 5
local use of 89	textbooks in ocular pathology 9
Acids	American Board of Ophthalmology
burns from 116, 308	written examaminations given in Tokyo 13 American Civil War 4, 267, 442, 443, 446
examples of common acid-containing products 116, 117 glaucoma from 192	American College of Surgeons
Adamsite 127	Committee on Trauma 20
Adnexa	American Medical Association
anesthetic techniques 82, 93	recognition of ophthalmology as a full-time specialty 5
blast injuries 427	American National Standards Institute
conjunctival lacerations 52	eye protection standard 443
emphysema 52	American Ophthalmology Society
imaging 62	establishment 5
inferior floor fracture 52	American Optical
neuroanatomy 82	ballistic and laser protective spectacles 451
physical examination 51 Adnexal injuries	American Revolutionary War 2, 445 Amikacin
canalicular 302	posttraumatic endophthalmitis and 285
eyebrow injuries 302	Aminoglycoside
lacrimal sac and lacrimal gland injuries 305	open-globe injuries 216
lateral canthal injuries 304	Ammonia 117
Adrenergic antagonists	Amphotericin-B
glaucoma and 192, 193	posttraumatic endophthalmitis and 286
Advanced Cardiac Life Support 43, 78, 90, 308, 312, 333	Amplitude modulation CT (A-scans) 66
Advanced Trauma Life Support eyelid burns and 308, 312, 333	Analgesic therapy
ocular trauma scales and 98	preoperative preparation and 58 Anaphylaxis 90
preoperative assessment and 78	Anderson, Dr. William 15
stabilizations of the patient and 42	Anesthesia
Afferent pupillary defect. See also Pupil	complications 90, 94
eyelid burns and 317	eyelid lacerations and 293
penetrating injuries with a retained intraocular foreign body	field blocks 82, 93
and 232	forced duction testing 79, 80, 391
physical examination and 50	full stomach and 78, 86, 87
scleral rupture and 151	general 87, 94, 151, 293, 408, 413
traumatic optic neuropathy and 397, 399 Age considerations	local 80, 93, 293 Monitored anesthesia care (MAC) 86, 94
cataracts 459	nerve blocks 83, 93, 293
computed tomography 345, 377, 397	neutralization of gastric acid 79
eyelid lacerations 293, 295	ocular adnexa anesthetic techniques 82, 93
forced duction testing 391	postoperative pain and nausea management 91, 94
nutritional blindness 465	preoperative assessment 78, 93

recommended dosages of selected sedatives and analgesics	intraocular foreign body injuries 226
(exhibit) 87	percentage of ocular injuries 78, 442
sharp trauma of the anterior segment and 151	Arab-Israeli Yom Kippur War
subcutaneous regional infiltration 82, 93	percentage of ocular injuries 442, 443
topical 79, 93, 121, 130, 140, 141, 151, 389	protective lenses and 138
Anesthesia and Perioperative Care of the Combat Casualty 78	Army Medical Department
Anosmia	establishment 2
orbital fractures and 370	integrating the theater of operations with 26
Anterior chamber lenses 182	personnel control of resources 23
Anterior segment	Army Medical Museum
anterior vitreous 56	development into the Armed Forces Institute of Pat 9
blast injuries 427	establishment 5
blunt trauma 54, 138	Registry of Ophthalmic Pathology 9
chalcosis and 257	Army Medical School
complications of penetrating injuries with a retai 228, 236	establishment 5
composition of 138	Army School of Ophthalmology
depth of 54	establishment 9
direct inspection 53	Artificial eyes. <i>See also</i> Implants
eyelid burns and 314	development of 12
Hansen's disease and 467	Ash, Lt. Col. James 9
intraocular foreign bodies 163	Atkinson method 85
intraocular pressure 54	ATLS. See Advanced Trauma Life Support
iris 55	ATLS Manual 26
laser injuries 438	Atropine
lens 55	acetylcholine and 89
physical examination 53	hyphema treatment 144
sharp trauma 150	intraocular pressure and 94 local anesthesia and 81
siderosis findings 252 traumatic optic neuropathy 396	
Antibiotics. See also specific agents	nerve agents and 131
antibiotics. See uso specific agents antibiotic recommendations for posttraumatic	Aviation medicine, development of 7 Azathioprine
endophthalmitis 286	sympathetic ophthalmia and 274
corneal abrasions 140	Azithromycin
corneal foreign bodies 141	trachoma and 462
corneal lacerations 151, 159, 160, 161	tractiona and 102
endophthalmitis 219, 241, 416	В
enucleation or evisceration 416	D
eyelid and adnexal injuries 305	β-adrenergic antagonists 192, 193
eyelid burns 312, 315, 318, 320	Bacillus
eyelid lacerations 293	posttraumatic endophthalmitis and 241
laser injuries and 438	Bacillus cereus
methods for obtaining intraocular cultures and delivering	endophthalmitis and 229
intravitreal antibiotics (exhibit) 287	
	posttraumatic endophthalmitis and 282, 288
open-globe injuries 216	posttraumatic endophthalmitis and 282, 288 Bacitracin
	1
open-globe injuries 216	Bacitracin
open-globe injuries 216 orbital fractures 377	Bacitracin eyelid burns 312
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign	Bacitracin eyelid burns 312 eyelid lacerations 294
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328 Appleton, Col. Budd 15	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161 postoperative management and 165 Bicycle accidents traumatic optic neuropathy and 396, 397
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328 Appleton, Col. Budd 15 Apraclonidine hydrochloride	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161 postoperative management and 165 Bicycle accidents traumatic optic neuropathy and 396, 397 Biomicroscopes 53
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328 Appleton, Col. Budd 15 Apraclonidine hydrochloride hyphema treatment 145	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161 postoperative management and 165 Bicycle accidents traumatic optic neuropathy and 396, 397 Biomicroscopes 53 Bitot's spots
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328 Appleton, Col. Budd 15 Apraclonidine hydrochloride hyphema treatment 145 Aqueous shunts 193	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161 postoperative management and 165 Bicycle accidents traumatic optic neuropathy and 396, 397 Biomicroscopes 53 Bitot's spots nutritional blindness and 466
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328 Appleton, Col. Budd 15 Apraclonidine hydrochloride hyphema treatment 145 Aqueous shunts 193 Aqueous suppressants	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161 postoperative management and 165 Bicycle accidents traumatic optic neuropathy and 396, 397 Biomicroscopes 53 Bitot's spots nutritional blindness and 466 Black fly
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328 Appleton, Col. Budd 15 Apraclonidine hydrochloride hyphema treatment 145 Aqueous shunts 193 Aqueous suppressants glaucoma and 192, 193	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161 postoperative management and 165 Bicycle accidents traumatic optic neuropathy and 396, 397 Biomicroscopes 53 Bitot's spots nutritional blindness and 466 Black fly onchocerciasis and 463
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328 Appleton, Col. Budd 15 Apraclonidine hydrochloride hyphema treatment 145 Aqueous shunts 193 Aqueous suppressants glaucoma and 192, 193 Arab-Israeli Six-Day War	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161 postoperative management and 165 Bicycle accidents traumatic optic neuropathy and 396, 397 Biomicroscopes 53 Bitot's spots nutritional blindness and 466 Black fly onchocerciasis and 463 Blast injuries
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328 Appleton, Col. Budd 15 Apraclonidine hydrochloride hyphema treatment 145 Aqueous shunts 193 Aqueous suppressants glaucoma and 192, 193 Arab-Israeli Six-Day War associated wounds 112	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161 postoperative management and 165 Bicycle accidents traumatic optic neuropathy and 396, 397 Biomicroscopes 53 Bitot's spots nutritional blindness and 466 Black fly onchocerciasis and 463 Blast injuries blast mechanism 423
open-globe injuries 216 orbital fractures 377 penetrating injuries with a retained intraocular foreign body 231 posterior segment injuries 216, 219 postoperative management 165 posttraumatic endophthalmitis 284, 285, 287 Antiemetics for nausea and vomiting after ophthalm 92 Antifibrinolytic agents hyphema treatment 145 Antifungal agents posttraumatic endophthalmitis 286 APD. See Afferent pupillary defect Apligraf 324, 328 Appleton, Col. Budd 15 Apraclonidine hydrochloride hyphema treatment 145 Aqueous shunts 193 Aqueous suppressants glaucoma and 192, 193 Arab-Israeli Six-Day War	Bacitracin eyelid burns 312 eyelid lacerations 294 Ballistic and laser protective spectacle 451 Ballistic Laser Protective Spectacles 19, 439 Bannister, Dr. John M. 6 Battery-powered vitrectomy units 32, 33 Benzodiazepines monitored anesthesia care and 86, 94 Berman FB locator 12 Beta blockers corneal lacerations and 161 postoperative management and 165 Bicycle accidents traumatic optic neuropathy and 396, 397 Biomicroscopes 53 Bitot's spots nutritional blindness and 466 Black fly onchocerciasis and 463 Blast injuries

collapse of walls and buildings and 424 glass fragments and 427, 428 ocular injuries associated with explosive blasts 427 primary 424 prognosis 428 relationship between peak pressure and wind velocity (table) 424 secondary 424, 427, 428 sites of terrorist bombings 422 terrorist incidents: morbidity, mortality, and eye injury rates (table) 425	Body systems list 46 Boiling water, thermal injury and 117 Bone grafts. See also Skin grafts naso-orbital-ethmoid fractures 376 Bourke, Dr. James 6 Braille, Louis 266 Brass. See Chalcosis Bretylium tosylate 81 Brightness modulation CT (B-scans) 66, 67, 215, 219 British anti-Lewisite 130 British chain mail veils 448
tertiary 424, 428 thermal injuries 424, 428	Bronson magnets intraocular foreign body extraction 235
types of ocular injuries associated with terrorist explosions (exhibit) 427	Brown's syndrome 389 Bruch's membrane 202, 205, 270
Blepharoptosis	Buccal nerve 83
enucleation and eviceration and 417	Bupivacaine 79, 80, 81, 85, 93, 293
Blindness. See also Enucleation; Eviceration	Burns. See Chemical injuries; Eyelid burns
cataracts and 459	
centers established for blind soldiers 11 Hansen's disease and 468	C
leading causes of blindness in the Third World 458	C-DCR. See Conjunctivo-dacryocystorhinostomy
nutritional 465	Caldwell's views 62, 63, 355
onchocerciasis and 463	Canalization initializa
retrobulbar hemorrhage and 355 Third World prevalence 458	Canalicular injuries delay of treatment and 292
trachoma and 458, 460, 462	equipment required for canalicular repair (table) 304
Veterans Administration care for blind soldiers 9	eyelid burns 322, 332
vitamin A and 465	surgical repair 52, 302
Blink reflex 121	timing of repair 305
Blister agents. See Vesicants	Canthal injuries 304
BLPS. See Ballistic and laser protective spectacle; Ballistic Laser	Capsular disruption 172
Protective Spectacles	Capsular tears 175
Blunt injury of the posterior segment	Carbonic anhydrase inhibitors
fat embolism 206 management principles 209	glaucoma and 192, 193
primary repair of 212	postoperative management and 165 Cardinal positions of gaze 51
Purtscher's retinopathy 206	Carotid-cavernous sinus fistula
Terson's syndrome 207, 209	glaucoma and 189
whiplash maculopathy 209	Carroll-Girard screws
Blunt trauma	zygomaticomaxillary complex fractures and 374
computed tomography and 73	Carville, Dr. Maud 7
coup–contrecoup theory 172, 196	Cataracts
crystalline lens 172	aphakic spectacles 460
equatorial expansion model 172	"cataract camps" 459, 460
glaucoma and 186, 190 magnetic resonance imaging and 73	cause of blindness 459 contusion cataracts 172
traumatic optic neuropathy and 396, 402	corneoscleral laceration with 164
ultrasonography and 73, 75	extracapsular cataract extraction with posterior chamber
Blunt trauma of the anterior segment	intraocular lenses 459
associated injuries 138	intracapsular cataract extraction 459
conjunctiva 138	intraocular foreign bodies and 176
cornea 139	lens removal and 182
hyphema 138, 142, 144	management 459
iris 142	penetrating injuries with a retained IOFB and 228
physical examination findings 54 sequelae of (exhibit) 138	phacoemulsification with insertion of a foldable intraocular lens 459
Blunt trauma of the posterior segment	rehabilitation period 460
choroidal rupture 202	screening and assessment 459
common sites of 196	Soemmering ring 176
mechanism of injury 196	sunflower 176, 257
military implications 209	surgery during the revolutionary 2
remote trauma effects 206	sympathetic ophthalmia and 267
retinal breaks 199	traumatic 56, 172, 182, 428
retinal injury without breaks 197	Cefazolin 140
scleral rupture 205	eyelid lacerations and 294
speed of injury and 197	Ceftazidime

posttraumatic endophthalmitis and 285, 286	occupational hazards 116
Cellophane occlusion	ocular effects of categories of chemical warfare agents
eyelid burns 315, 318	(table) 129
Cells of Müller 256	ocular response to 118
Cellulose acetate eye shields 447, 448	pain control and 124
Cephalosporin	patient examination 122
1 1	1
open-globe injuries 216	patient history and 45
Cerebrospinal fluid	patient treatment and evaluation 121, 130
orbital fractures and 370, 371	Ralph's classification of ocular chemical injury (exhibit)
Cervical nerve 83	118, 119
Chalcosis	reepithelialization 118, 120, 121, 122, 124, 125
clinical course 259	rehabilitative phase 125
electrophysiology findings 258	second echelon treatment 313
findings in siderosis and chalcosis (table) 249	signs and symptoms 129
management 261	tear evaporation and 124
metal alloy types 257	thermal injuries 117
metallic intraocular foreign bodies and 229	Thoft's classification of ocular chemical injury (exhibit) 118, 120
ocular findings 257, 261	treatment factors 116
pathophysiology 259	vesicant agents 102
Chemical injuries	World War I and 8
acids and alkalis 116, 188, 308	Chlamydia trachomatis
acute phase 118, 120, 122	trachoma and 460
adverse sequelae limitation 124	Chlorambucil
Agent Orange 125	sympathetic ophthalmia and 274
antiglaucoma therapy 125	Chlorine gas 116, 125
blink reflex and 121	Chlorpromazine 92
4.4.	Chorioretinitis
blister agents 127 caused by common chemicals 116	caused by <i>Toxoplasma gondii</i> and <i>Toxocara canis</i> 10
	onchocerciasis and 464
chemical agents 116	
chemical agents (table) 127	Choriotel numbura
chemical spills 127	Choroidal rupture
chemical warfare agents 125	physical examination and 57
clinical course of 118	Choroidal ruptures
collagen synthesis and collagenase activity balance 124	accompanying retinal breaks 201
common sources of chemical injury (table) 117	description 202
conjunctival scarring and 124	pneumatic displacement techniques 202
early military use of chemical weapons 125	treatment 202
early reparative phase 120, 125	visual prognosis 202
emergency nature of 116	vitreous surgery and 202
evaluation and treatment summary (exhibit) 122	Church, Dr. Benjamin 2
example order sheet for a patient with ocular mustard injuries	Cicatrical ectropion 330
(example) 131	Cicatrical entropion 329
examples of common acid-containing products 116, 117	Cimetidine
examples of common alkali products 116, 117	gastric acid neutralization and 79
eyelid burns 308, 309, 315	Ciprofloxacin
facts to keep in mind when working with casualties of mustard	posttraumatic endophthalmitis and 286
agent (exhibit) 131	Civil War. See American Civil War
first echelon treatment 312	Civilian Consultant Service 7
glaucoma and 188, 192	Clindamycin
Hughes's classification of ocular chemical injury	open-globe injuries 216
(table) 118, 120	posttraumatic endophthalmitis and 286
immediate action for 121, 130	Clofazimine
immediate phase 118	Hansen's disease and 468
increase in 126	Closed-globe injury
infection control 124, 125	definition 100
inflammation control 120, 121	Cocaine
irrigation treatment 44, 121, 312	general anesthesia and 89
late reparative phase 121, 125	local anesthesia and 80
	topical anesthesia and 80, 93
limbal stem cell transplantation 125	1
long-term problems associated with 127	use in eye operations 5
mechanisms of injury 129	Codeine 91, 94
military chemical agents of ophthalmological interest	Color Atlas of Ophthalmic Surgery: Strabismus 391
(table) 128	Color vision testing
modern battlefield and 42	laser injuries and 435
mycotoxins 132	Combat Casualty Guidelines: Operation Desert Storm 26, 28
nerve agents 131	Combat Ocular Problems conference 450
neutralization kits 121	Computed tomography

axial images 63, 70	rupture of 150
blunt trauma and 73	siderosis findings 252
compared with magnetic resonance imaging 65, 352	simple lacerations 150, 159
computed tomography attenuation coefficients for v 63	stellate lacerations 161, 294
coronal images 63, 70	temporary keratoprosthesis 237
crystalline lens injuries 177	trachoma and 462
description 62	transplants 166, 238
drawbacks to 345, 350	traumatic keratopathy 140
extraocular muscle trauma 389	ultraviolet radiation keratitis 141
foreign bodies and 67, 70, 215, 216, 293, 345, 350, 358	Corneal abrasions 90, 94, 98, 140
helical scans 63, 70	Corneal edema 139, 177, 216, 220
intraocular foreign bodies 29	Corneal lacerations 150, 152, 159, 228, 313
magnetic resonance imaging and 70	Corneal ulcers 267
metallosis bulbi 251, 261	Corneoscleral lacerations 163, 164, 172, 428
optic nerve injuries 71, 73	Corticosteroids
orbital fractures 29, 70, 73, 377	chemical injuries and 124, 125
orbital trauma 344, 356	glaucoma and 189, 192
reconstruction software 63	hemorrhage and 355
reformatted views 345	laser injuries and 438
sharp trauma of the anterior segment 151	orbital trauma and 381
skilled operating technician requirement 350	posttraumatic endophthalmitis and 285
slowness of 350 spiral scans 63, 70, 345, 397	Purtscher's retinopathy and 207 sympathetic ophthalmia 273, 275
	7 1 1
three-dimensional reconstruction 345	traumatic optic neuropathy 399
traumatic optic neuropathy 397	CP 30 plactic larges 445 440 450
vegetable matter and 359 Conguestive and atheliopathy 54	CR-39 plastic lenses 445, 449, 450 Cranial nerves
Concussive endotheliopathy 54 Conformers	IV 387, 388
chemical injuries and 125	palsies of 387, 390, 391
enucleation and evisceration and 417, 418, 419	VI 387
Confrontation visual field test 49	blast injuries and 427
Conjunctiva	block techniques 83
abrasions 139	Hansen's disease and 467
description 138	V ₁ 370, 377
edema 139	V ₂ 365, 370, 374, 377
eyelid burns and 313	Cribriform plate injuries 78, 370, 375
lacerations 52, 139	Crimean War
subconjunctival hemorrhage and emphysema 139	percentage of ocular injuries 442
trachoma and 460, 462	Crosby, Dr. W.D. 6
Conjunctivo-dacryocystorhinostomy	Cruise type perforated metal visors 448
eyelid burns and 322, 332	Cryotherapy
lacrimal sac and lacrimal gland injuries and 305	retinal detachment and 219
Contact lenses	Crystalline lens
bandage 140, 141, 159, 160, 161, 165	anterior capsule injuries 175
corneal abrasion 140	associated head and facial trauma 177
infection and 140	blunt trauma 172
problems related to dust and sand 34	capsular disruption 172, 175
rigid lenses after surgery 165	capsulorrhexis 178, 179
wearing in the combat zone 25, 31	chalcosis and 257
Continental United States	contusion cataracts 172
evacuation to 31	dislocation 173, 174, 186, 190, 192
evaluation of eyelid burns 320	findings in siderosis and chalcosis (table) 249
treatment of eyelid burns 323, 333	indications for immediate surgery 178
CONUS. See Continental United States	injury statistics 172
Conventional radiography. See Plain skull films	irreversible opacity 172
Copper. See Chalcosis	laser injury 436
Cornea	lens absorption (involution) 175
chalcosis and 257	lens fixation choices 182
classification of corneal lacerations (exhibit) 150	lens removal pros and cons 181
complex lacerations 150, 161	lensectomy 177
corneal bloodstaining 144, 145, 177	lenticular glaucoma 176
description 139	manifestations of trauma to the crystalline lens (exhibit) 173
findings in siderosis and chalcosis (table) 249	patient history 177
Hansen's disease and 468	penetrating injuries 172, 175
Hansen's disease and 468 laser injuries and 434, 436	penetrating injuries with a retained IOFB and 228
Hansen's disease and 468	

postoperative complications 182	monitored anesthesia care and 87
removal of IOFBs and 238	Diethylcarbamazine
siderosis findings 252	onchocerciasis and 463, 464, 465
subluxation 173, 177, 186, 190	Dilating regimen
surgical management 178	chemical injuries and 122
9	
vossius ring 173	posterior segment examination 56
zonular dehiscence 174	Dimercaprol 130
zonular disruption 172, 186	Diphenhydramine 90
CSF. See Cerebrospinal Fluid	Diplopia
CT. See Computed tomography	brain tumors and 387
Cultures	extraocular muscle trauma and 386, 388, 390
methods for obtaining intraocular cultures and delivering	nonstrabismic 388
intravitreal antibiotics (exhibit) 287	orbital fractures and 362, 365, 368, 381
posttraumatic endophthalmitis and 285, 287	Dog bites 302
Cunningham, Dr. Francis 5	Dolasetron 92
Cutler-Beard technique	Double Maddox's rod test
*	
eyelid burns 326	extraocular muscle trauma and 388, 392
eyelid lacerations 300	Dr. Allen Greenwood's description of hospital cond 18
Cyanoacrylate tissue adhesive	Droperidol 92, 93
sharp trauma of the anterior segment and 158, 161	Duane's syndrome 387, 388
eyelid lacerations and 292, 295	Dugas, Dr. Louis 5
posterior segment injuries 218	Duke-Elder, Sir Stewart 266
Cyanogen chloride 127	Dye disappearance test
Cyclodialysis	eyelid burns 322
hyphema 142	Dyer, Dr Ezra 5
sympathetic ophthalmia and 267	Dysrhythmias
, , ,	
Cyclopentolate 142	allergic reactions to anesthesia and 90
Cycloplegic agents	retrobulbar blocks and 89
chemical injuries and 122, 124	<u>_</u>
corneal lacerations and 159	E
glaucoma and 192	
hyphema and 144	Ears
refraction and 388	blast injuries and 424
sharp trauma of the anterior segment and 159, 165	ECCE. See Extracapsular cataract extraction
ultraviolet radiation keratitis and 142	Ecchymosis
Cyclosporin	orbital fractures and 373
sympathetic ophthalmia and 274	Echelons of care
D	description xvi
D	eyelid burns 312
	Echography
Dacryocystorhinostomy	penetrating injuries with a retained intraocular foreign
eyelid burns and 322, 332	body 232
lacrimal sac and lacrimal gland injuries and 305	retinal detachments 229
Dalen-Fuchs nodules	Echothiophate 89
sympathetic ophthalmia and 268, 269, 270	Edema
Dantrolene 90, 94	conjunctival 139
Dapsone	corneal 139, 177, 216, 220
Hansen's disease and 468	cystoid macular 229
Davis, Dr. W.T. 9	postoperative complication 182
DCR. See Dacryocystorhinostomy	Ehmer, Dr. Arnuff F. 15
De Coursey, Maj. Gen. Elbert 9	Electrical burns
de Rosset, Dr. Moses 5	patient history and 45
de Schweinitz, Col. George E. 7	tissue destruction from 308
DEC. See Diethylcarbamazine	Electroretinograms
Deprivation amblyopia	chalcosis 258
hyphema and 144	siderosis and 254
Derby, Dr. George Strong 7	EMEDS teams. See Expeditionary Medical Supply teams
Dermis fat graft 415, 418. See also Skin grafts	Emergency War Surgery 26, 28
Descemet's membrane 139, 141, 153, 159, 257, 259	EMLA Cream 80
Desflurane 88	Emphysema
Desmarres eyelid retractors	orbital 365, 368, 377
sharp trauma of the anterior segment and 151	subconjunctival 139
Dexamethasone	Endophthalmitis. See also Posttraumatic endophthalmitis; Sterile
posttraumatic endophthalmitis and 288	endophthalmitis
traumatic optic neuropathy and 400	antibiotics and 219, 241, 416
Dextran 88	Bacillus cereus and 229
Diazepam	dirt and organic material and 235, 286
* F *	200, 200

early surgical intervention 221	preoperative planning 407
evisceration and 408, 413	process 413
mine-blast debris and 213	psychological effect of 407, 419
organisms most commonly isolated in (exhibit) 283	rehabilitation goals 407
penetrating injuries and 151, 241	surgical goals of enucleation and evisceration (exhibit) 409
penetrating injuries with a retained intraocular foreign body	sympathetic ophthalmia and 273
and 229, 234	Expansile gas
postoperative care and 219	retinal detachment and 241
wartime incidence 213	Expeditionary Medical Support teams xvi
Endophthalmitis Vitrectomy Study 285, 288	Extracapsular cataract extraction 459
Enflurane 88	Extraocular muscle trauma
Enophthalmos	alignment measurement 388
enucleation and evisceration and 417	differential diagnosis 387
orbital fractures and 366, 368	diplopia and 386
Entropion	direct trauma 386
eyelid burns and 328	etiology 386
Enucleation	evaluation 388
complications 417	imaging 389
description 408	management 390
goals 408	neurological injury 387
history of eye removal and prostheses 406	patient history 388
implants 407, 415	refraction and 388
inability to wear a prosthesis 418	spontaneous recovery from 390
indicators for 408	traumatic strabismus 386
no light perception and 216	Eye armor. See also Eye shields absence of a formally approved Army statement of the need
ocularist role 407, 408, 417	for 448
penetrating injuries with a retained intraocular foreign body and 236, 242	ballistic and laser protective spectacle (BLPS) 451
Persian Gulf War and 101, 110, 406	British chain mail veils 448
preoperative planning 407	causes of nonfatal wounds (table) 444
pressure patching 413	cellulose acetate eye shields 447, 448
process 408	CR-39 plastic lens 445, 449, 450
psychological effect of 407, 419	Cruise type perforated metal visors 448
rehabilitation goals 407	definition 442, 445
sizing spheres 412	elements in development 444
surgical goals of enucleation and evisceration (exhibit) 409	failure to interest civilian industry 449
sympathetic ophthalmia and 236, 266, 267, 272	Gargoyles 451
Vietnam War and 103, 110, 406	goggles for aviators 447
War of 1812 2	history of 445
World War I and 20	incidence of ametropia in three army divisions (table) 450
World War II and 103, 229	injection-molded polycarbonite 449
Epinephrine	Korean War and the interwar period 448
adjuvant anesthetic 79, 81, 93, 293, 408	laser injuries and 450
local anesthesia and 81	methacrylate lenses 447, 448
Epistaxis	military need for 112, 274
orbital fractures and 370	mind-sets of those to be protected and those in leadership
Equatorial expansion model 172	positions 444, 445
ERGs. See Electroretinograms	modern development 449
Erpf, Capt. Stanley F.	ocular threats and 444
artificial eye creation 12	polycarbonate ballistic protective
Erythromycin	eyewear 19, 99, 112, 138, 445, 448
eyelid burns and 315	pre-Colombian period to World War I 445
trachoma and 462	prescription polycarbonate lenses 450
Escherichia coli	protective combat goggles 13
eyelid burns and 314	SPECS 452
Ethmoidal nerve 83	sun-wind-dust goggles 447, 449
Ethnic considerations	tasks of the infantryman and 444
hyphema 144, 145	Vietnam War era 449
Evisceration	World War I and the interwar period 446
complications 417	World War II and the interwar period 447
cornea-sparing technique 414	protective combat goggles 13
description 408	Eye lane
first description of 407	after surgery 30
goals 413	Eye shields. See also Eye armor
implants 407, 415	corneal lacerations and 160
indications for 413	cellulose acetate eye shield 447
ocularist role 407, 408, 417	eyelid lacerations and 293

foreign body injuries and 212, 221, 231 Fox (aluminum) shields 28, 102, 104, 313, 438 globe protectors 82, 141 laser injuries and 438 metal 58, 78, 141, 144 postoperative management and 165 preoperative 216 Wilmer's eye shield 446	anesthesia 293 blast injuries and 428 Cutler-Beard technique 300 delay of treatment and 292 eyelid-margin involvement 295 globe examination and 51 history, examination, and ancillary testing 292 inadequate repair 292
Eyebrows Hansen's disease and 467 injuries to 302	lid-sharing techniques 298, 300, 305 options for repair (exhibit) 300 orbital trauma and 339, 341
Eyelashes	postoperative wound care 305
eyelid burns and 317, 331 Eyelid burns	preoperative preparation 293 pressure patches 300
canthal malpositions 329	skin grafts for 301, 305
causes 308 cellophane occlusion 315, 318	superficial 294 surgical management 293
chemical 308, 309	Tenzel flaps 298
coexisting inhalational burn injuries 308	timing of repair 292, 305
complications 312 concomitant facial, neck, and upper torso burns and 309, 312	types 293 Eyelids
conservative treatment 324	blast injuries 427
dye disappearance test 322 ectropic lids 322, 330	canalicular system injuries 52, 292, 293, 302, 305 complex injuries 300
electrical 308	functions 312
etiology 308	levator injuries 51, 300
evacuation needs 312 evaluation and treatment of 312	lower-eyelid malposition and laxity 417 motor nerve supply 83
extent and degree of 321	risk of eyelids that cannot close 312
eyelid malposition 328	total avulsion 302 trachoma and 459, 462
eyelid protraction disorders 330 eyelid retraction and 322	Eyewall
eyelid retraction disorders 330	definition 100
first degree 310, 311, 318 first echelon treatment and evaluation 312, 333	F
flow chart for acute management of 309	1
healing process 312	Facial nerve 83
history of injury and 308 long-term management 333	Far-near-near-far suture technique 301 Farnsworth panel D-15 hue test
lubricating ophthalmic ointments and 315	laser injuries and 436
moisture chambers and 315, 318	Farnsworth-Munsell 100 hue test
mucosal covering status 323 mucosal lining disorders 331	laser injuries and 436 Fascia lata 378
normal lid comparison 323	Fat embolism 206
organisms most commonly implicated in infection 314	Fat-suppression MRI protocols 65
posterior lamella repair 332 radiation 308, 309	Federal Bureau of Investigation criminal bombing statistics 422
reconstructive surgery 323	Fentanyl
second degree 310, 311, 315, 318	monitored anesthesia care and 86
second echelon treatment and evaluation 313 shape of the eye and 314	Field blocks 82, 93 First-degree burns
signs of possible complications (table) 314	causes 311
skin grafts for restoration of lost eyelid tissue (exhibit) 324	description 310, 311
status of remaining eyelids 321 tear drainage system abnormalities 332	treatment 318 Flap (horseshoe) or operculated retinal breaks 200
tear film status and 323	Flash blindness
temporary tarsorrhaphy and 315 thermal 308	lasers and 432, 434 Fluconazole
third degree 310, 315, 318	posttraumatic endophthalmitis and 286
third echelon treatment and evaluation 316	Flumazenil
transposition flaps 324, 325 types and degrees of 308	monitored anesthesia care and 86 Fluorescein angiography
upper-lid gold weights for eyelid closure 331	retinal injury 197, 199, 206
zone of coagulation 311	sympathetic ophthalmia 269
zone of hyperemia 311	Fluorescein dyes 53, 122, 140, 141, 292, 303, 323
zone of stasis 311	•
zone of stasis 311 Eyelid lacerations	Fluoroquinolone antibiotics 140 Foerster, Dr. Helen Campbell 9

	(C) (C) (C) (A) (A) (A) (C) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A
Force generation testing	ramifications of ophthalmic interventions 88
extrocular muscle trauma 390	rapid-sequence induction technique 87
Forced duction testing	sharp trauma of the anterior segment and 151
extraocular muscle trauma 386, 387, 389	shivering and 89
topical anesthesia and 79, 80	uses 87
Foreign bodies. See also Fragment injuries; Intraocular foreign	Gentamycin
bodies; Intraorbital foreign bodies	corneal abrasions 140
computed tomography and 67, 70, 215, 216	eyelid burns 312
computed tomography attenuation coefficiens for various	Geographical ophthalmology
foreign bodies (table)	cataracts 459
concussive endotheliopathy 54	description 458
corneal 141	Hansen's disease 467
eyelid burns and 317	medical care in the Third World 458
eyelid injuries and 292	nutritional blindness 465
magnetic resonance imaging and 351	onchocerciasis 463
microbial contamination 164	trachoma 460
orbital 339, 341	Georgia, Olympic Games bombing 422
orbital trauma and 338, 344	Gibson, Dr. William 2
patient history and 45	Glabellar flap
	•
plain skull film localization 62, 67, 215	eyelid burns 327, 329
posterior segment 56, 215	Glands of Krause and Wolfring 312, 313, 323
size considerations 212	Glasgow Coma Scale xvi, 98, 112
toxicity of metallic foreign bodies 164, 176, 192, 248	Glass fragments
ultrasonography localization 67, 215, 216	blast injuries and 427, 428
vegetable matter and 164, 213, 229, 357, 358, 359	Glaucoma
Fox (aluminum) shields 28, 102, 104, 313, 438	angle-closure 176, 186, 189, 468
Fractures	chemical injuries 188
inferior floor 52	description 186
orbital 29, 30, 70, 336	early occurrence following trauma 186
Fragment injuries. See also Blast injuries; Foreign bodies; Intraocu-	echothiophate treatment 89
lar foreign bodies; Penetrating injuries	episcleral venous pressure 188
as the principal cause of severe eye injuries in m 101	ghost cell 190
causes of nonfatal wounds (table) 444	hyphema and 187
eye armor and 444	inflammation and 186, 237
mechanism of injury and 110	intraocular pressure and 186
mortality of close-proximity shell injuries 212	late occurrence following trauma 189
most common weapons responsible for 212	lens removal and 181
Persian Gulf War and 98, 112	lenticular 176
predominance in nonfatal ocular trauma in wartime 101	nonocular stucture trauma and 189
Franco-Prussian War 267, 442	phacoanaphylactic 188
Frequency-doubled neodymium:yttrium-aluminum-garne 432	posttraumatic angle deformity (angle recession) 190, 192
Freund's adjuvant	pupillary-block 176, 186, 189, 192
sympathetic ophthalmia and 271, 272	return to duty 193
Friedenwald, Jonas 9	siderosis and 192, 253
Frontal nerve 83	steroid-induced 189
Frost or reverse-Frost sutures 294, 297, 304, 305, 318, 319	treatment 192
Fungal species	Globe
posttraumatic endophthalmitis and 283	blunt posterior globe rupture 215
posttradinate cridopritianinas and 200	clinical signs of globe rupture (table) 214
G	common sites for blunt rupture 214
· ·	deformation before rupture 214
Gargoyles 451	delayed closure of a ruptured globe 216
Gas hysteria 129	echography after repair of 233
Gastrointestinal tract	immediate globe closure with primary removal of IOFB 234
blast injuries and 424	immediate globe closure without primary removal of
Gelfilm 378	IOFB 234
General anesthesia	lacerations 214
emergence from 89	large projectiles and 215
enucleation and 408	MEOTS and 103
evisceration and 413	minute projectiles and 215
eyelid lacerations 293	penetrating injuries with a retained intraocular foreign body
induction 87	and 231
inhalational agents 88, 94	rupture from sharp laceration, blunt contusion, and secondary
maintaining 87	shock wave injury 221
monitored anesthesia care and 86	Globe protectors 82
nausea and vomiting and 89	Glue
oculocardiac reflex 89	eyelid lacerations and 292, 295

posterior segment injuries 218 sharp trauma of the anterior segment and 158, 161 Goggles. See Eye armor Gold weights for eyelid closure 331 Goldwaite, Col. Ralph H. 10 Gonioscopy anterior segment 54, 164 cornea 141 glaucoma 190	ophthalmology established as a full-time specialty 5 period between World Wars I and II 9 prevalence of ocular trauma 42 Revolutionary War 2 Spanish-American War 6 Vietnam War 13 War of 1812 2 World War I 6 World War II 11
siderosis 253	HLA. See Human leukocyte antigen
Gonococcal conjunctivitis 31 Greenwood, Col. Allan 7	Hoefle, Dr. F.B. 15 Holmium lasers
Greenwood, Dr. Allen	eyelid burns and 332
description of hospital conditions in France in 1918 18	Hornblass, Dr. Albert 15
1 1	Horner, Dr. William E. 2
Н	Horner's syndrome 80
	Horseshoe retinal breaks 200
Haab giant magnets 8	Hughes flaps
Haemophilus influenza	eyelid burns 325
orbital emphysema and 366	Hughes's classification of ocular chemical injury (table) 118, 120
orbital trauma and 381	Hull, Col. Forrest E. 12
Halloran, Dr. P.S. 6	Human fibrinogen
Halogenated hydrocarbons 88 Halothane 88	laceration repair 161 Human leukocyte antigen
Hansen's disease	sympathetic ophthalmia and 272
cause of 467	Hungarian Eye Injury Registry 110
classification 467	Hunt, Dr. William 5
description 467	Hyaluronidase 79, 81, 293
lepromatous form 467	Hydrochloric acid 117
management 468	Hydrofluoric acid 117
ocular leprosy 467	Hydrogen cyanide 127
tuberculoid pattern 467	Hydrogen peroxide 305
Hard palate grafts	Hydroxyapatite implants 415, 417
eyelid burns and 325, 326, 330, 331	Hydroxyzine 89
Hemianopsia 50 Hemorrhage	Hypertonic solutions 88 Hypertropia
as a sensitive indicator of deep orbital injury 358	extraocular muscle trauma 386
laser injuries and 435, 436	Hyphema
locations for 355	as most common injury 138
orbital 337, 355, 368	blast injuries and 428
penetrating injuries with a retained IOFB and 228	characteristics 142
subconjunctival 139	clot removal 145
subperiosteal 355	complications 144
surgery for 355	corneal bloodstaining 144, 145
treatment 355	deprivation amblyopia risk 144 "eight-ball" 187
vitreous 228, 229 Hemorrhagic chemosis	glaucoma and 187, 190
scleral rupture and 151	intraocular pressure and 144
Hemorrhagic retinopathy 91, 94	management 144
Herbert's pits	penetrating injuries with a retained IOFB and 228
trachoma and 462	pharmacological therapy 144
Hewes flap	postoperative care and 219
eyelid burns 325, 326	postoperative complications 182
Hewson, Dr. Addinell 5	rebleeding and 144
Hirschberg hand-held electromagnets 260	surgical evacuation 220
Historical background	surgical intervention 145
American Civil War 4	Hypo-ophthalmos orbital fractures and 366, 371
aviation medicine development 7 civilian trauma 138	Hypothermia
eye armor 445	intraocular pressure and 88
eye removal and prostheses 406	Hypotropia
incidence of wartime eye injuries 18, 138, 150, 406	orbital fractures and 386
incidence of wartime eye injuries (table) xv, 79	
Korean War 12	I
lessons learned from wars 18	
ocular injuries seen in wartime vs. in a peacetime emergency	ICCE. See Intracapsular cataract extraction
department (table) 25	Ice-cold compresses for pain management 91

Imaging of ocular and adnexal trauma	Haab giant magnets 8
blunt trauma 73	injury definition 100
computed tomography	intraocular foreign bodies in war (table) 226
62, 67, 70, 73, 151, 232, 284, 293, 344, 356, 358, 359, 377, 389, 397	location and frequency of 213
fluorescein angiography 197, 199, 206, 269	management of penetrating injuries with a retained 226
foreign bodies 67	metalurgy of intraocular foreign bodies (table) 250
magnetic resonance imaging	posttraumatic endophthalmitis and 284, 285
64, 70, 73, 151, 232, 293, 351, 356, 359, 389, 398, 417	primary removal of 234
orbital fractures 70	reactive and nonreactive components of intraocular foreign
penetrating injuries with a retained intraocular foreign	bodies (table) 251
body 232	size and shape considerations 227, 228
plain skull films	ultrasonography and 29, 67, 284
62, 70, 151, 215, 232, 251, 261, 284, 293, 353	vegetable matter and 164, 213, 229, 235
sharp trauma of the anterior segment 151	velocity and 248
specific traumatic injuries 67	war-induced versus occupational and accidental 227
ultrasonography	X-ray localization 8
0 . ·	
66, 67, 73, 75, 151, 215, 219, 233, 251, 261, 284, 293, 359	Intraocular lenses 165, 181, 459
vitreous fluorophotometry 197, 199	Intraocular pressure
Immunosuppressive therapy	chemical injuries and 122
posttraumatic endophthalmitis and 288	crystalline lens injuries and 172, 176, 177, 178, 182
sympathetic ophthalmia and 273	determination of 54
Implants	emergence from anesthesia and 89
appropriate volume of 407	eyelid burns and 317
dermis fat grafts 415, 418	general anesthesia and 87, 88
donor sclera-covering techniques 407, 415	glaucoma and 186
exposure and 418	hyphema and 144
history of development 415	hypothermia and 88
implant pegging 408, 417	inhalational anesthetics and 94
materials for 407, 415, 419	
	scleral rupture and 151
options 415	succinylcholine and 94
orbital trauma and 378	topical anesthesia and 93
porous 407, 412, 415, 419	ventilation status and 88
sizing spheres 412, 419	vomiting and 93
solid spherical 415	Intraorbital foreign bodies
In-the-bag lens fixation 182	as cause of orbital trauma 357
Indian-American War 446	combined traumas and 357
Indirect ophthalmoscopy	globe rupture and 358
posterior segment examination 56	imaging of 338, 344
Infection risk. See also specific bacteria	metal-on-metal contact and 357
preoperative preparation and 58	vegetable matter 357, 358, 359
Informed consent	IOFBs. See Intraocular foreign bodies; intraorbital foreign bodies
analgesic therapy and 58	Ionizing radiation injury. See Radiation burns
Infraorbital nerve 83, 91, 94	IOP. See Intraocular pressure
Infratrochlear nerve 83, 94	Iran-Iraq War
Inhalational agents	chemical agent use 126
general anesthesia 88, 94	intraocular foreign bodies and 213, 226, 235
Inhalational burn injuries 308, 424, 428	IRBP. See Interstitial retinoid binding protein
International Optic Nerve Trauma Study 399, 401	Ireland. Maj. Gen. Merritte W. 9
Interstitial retinoid binding protein	Iridectomy
sympathetic ophthalmia and 271	Hansen's disease and 468
Intracapsular cataract extraction 459	sympathetic ophthalmia and 267
Intracapsular fixation rings 179	Iridocyclitis
Intraocular foreign bodies. See also Foreign bodies; Intrafobital	glaucoma and 186
foreign bodies	syphilis as the cause of 8
anterior segment 163	Iridodialysis 142
cataracts and 176	Iridotomy 192
composition of (exhibit) 230	Iris
composition of intraocular foreign bodies 213, 227	blunt trauma 142
computed tomography for 29, 284	chalcosis and 257
delayed removal of 234	findings in siderosis and chalcosis (table) 249
early intervention to limit toxicity 220, 221	Hansen's disease and 468
endophthalmitis and 229, 234, 284	penetrating injuries with a retained IOFB and 228
enucleation and 229	physical examination of 55
external magnet extraction 235	postoperative complications 182
factor influencing damage from 248, 250	siderosis findings 252
final resting location of 248, 250	tears in the region of the 175
findings in siderosis and chalcosis (table) 249	Iron. See Siderosis

Iritis	suture recommendations (table) 297
blunt trauma and 142	sutures for corneal laceration repair (table) 152
glaucoma and 186	with tissue loss 161
syphilis as the cause of 8	with uveal prolapse 161, 163
Irritant chemical agents 127	Lacrimal nerve 83, 94
Isoflurane 88	Lacrimal sac and lacrimal gland injuries 305
Ivermectin	Lamellar autograft
onchocerciasis and 465	laceration repair 161
	Lancaster hand magnet 12
J	Lancaster red-green test
	extraocular muscle trauma and 388, 392
Jameson, Dr. Horatio 2	Landers-Foulks keratoprosthesis 238
JEDMED electromagnetic magnets	Landmines
intraocular foreign body extraction 236	in Yemen 42
Jones, Dr. John 2	nonmetallic intraocular foreign bodies and 227, 229
Jones I and II testing	Persian Gulf War and 36
eyelid burns and 321	Laser injuries
eyelid lacerations and 293	absorption of electromagnetic radiation in the eye (dia-
*/	gram) 433
K	accidental exposures 451
	amount of energy delivered and 432
Kenya, U.S. embassy bombing 422	diagnosis 435
Keratectomy	distance and 450
sympathetic ophthalmia and 267	eyelid burns 332
Keratitis	friendly laser sources 432, 438
Hansen's disease and 468	glare and dazzle 432
nutritional blindness and 466	laser absorption by fundus pigments (table) 434
onchocerciasis and 463	"laser" meaning 432
ultraviolet radiation and 141	laser physics 432
Keratoconjunctivitis 31	laser pointers and 432
Keratoconus 150	lasers operating at multiple wave-lengths and 444
Keratoprosthesis 237 Ketamine 88	lasers operating at multiple wavelengths and 432 mechanisms of bioeffects 433
	ocular bioeffects 433
Keyser, Dr. Peter D. 5	optical breakdown 433
King, Col. John H. 13 Korean War	patient history and 435
concomitant injuries associated with ocular trauma (table) 22	photochemical reaction 433
Consultant in Ophthalmology role 24	prevention 438
decrease in the percentage of wounded dying from their	Q-switched lasers 432, 433
wounds 443	return to duty and 439
fragmentation injuries 101	symptoms 434
helicopter evacuation 12	thermal effects 433
ocular research 13	treatment 438
ophthalmology residency training programs establis 12	vaporization 433
percentage of ocular injuries 442, 443	wavelengths of common U.S. Army lasers (table) 432
sympathetic ophthalmia and 267	Lauring. Dr. Lewis L. 15
KPs. See Keratoprostheses	Le Fort midface fractures 360, 375, 397
Kramer, Col. Kenyon	Leavitt, Dr. Richard M. 15
plan to purchase and ship operating telescopes and 33	Lebanon
Krimsky tests 51	US Marine Corps headquarters bombing 422
	Lebanon War
L	intraocular foreign body injuries 226
	percentage of ocular injuries 442
La Garde, Dr. Louis A. 6	Legal issues
La Piana, Dr. Francis G. 15	patient history and 46
Lacerations. See also Sharp trauma of the anterior segment	Lens. See Crystalline lens
canalicular 302, 305	Leprosy. See Hansen's disease
classifications of corneal lacerations (exhibit) 150	Leptospirosis 13
conjunctival 139	Letterman, Dr Jonathan
corneal 141, 150, 152, 159, 228, 313	battlefield evacuation system 4
corneoscleral 163, 164, 172, 228, 428	Levis, Dr. Richard 5
definition 100	Lewisite
extraocular muscles 392	as a type of vesicant 127
eyelids 51, 292, 339, 428	ocular effects of 129
factors that predict poor outcome 150	odor of 128
globe 214	treatment for 130
scleral 163, 164, 165, 172, 205, 212, 219, 313, 386	Lid-sharing techniques 298, 300, 305

Lidocaine 79, 80, 85, 89, 93, 293, 408 Life support	principles of 64 proton density–weighted images 65
stabilization of the patient 42	sharp trauma of the anterior segment and 151
the four phases of advanced trauma life support evaluation	T1-weighted images 65
and care (exhibit) 42 Light perception	T2-weighted images 65 time required for scans 353
physical examination and 48	vegetable matter and 359
scleral rupture and 151	Magnets
Limbal approach to surgery 178	intraocular foreign body extraction 235, 239, 260
Limbal stem cell transplantation	Malignancies
chemical injuries and 125	enucleation and 408
Lime 117	sympathetic ophthalmia and 267
Line of von Arlt 460, 461	Malignant hyperthermia 90, 94
Local anesthesia	Malingering 25, 48
adjuvant agents 81	Malocclusion
adverse reactions to 81	orbital fractures and 374, 377
agents for 80	Mandibular nerve 83
allergic reactions and 80	Mannitol
amide group 80, 90	hemorrhage and 355
description 80	intraocular pressure and 88, 89
effects 80	Marcus-Gunn pupil 49, 317
ester group 80	Mass casualty scenarios 43, 48
eyelid lacerations and 293	Maxillary nerve 83
monitored anesthesia care and 86	Mazzotti reaction
Lorazepam	onchocerciasis and 463, 465
monitored anesthesia care and 87	MEDCAP. See Medical Civil Action Program
Lowrey, Col. Austin, Jr. 13	Medical and Surgical History of the War of the Rebellion 5
Lubricating ophthalmic ointment	Medical Aspects of Chemical and Biological Warfare 116
eyelid burns 315, 318	Medical Civil Action Program 14
Lungs	Medical history 47
blast injuries and 424	Medical Mobilization Augmentation Readiness Team xvi
Lye 117	Medication history 47
Lyster, Dr. Theodore C. 6	Medpor
M	eyelid burns and 330
M	orbital trauma and 379
MAC Cas Manitored angethosis sare	Membrane peeling 220
MAC. See Monitored anesthesia care Mace 127	MEOTS. See Madigan Eye and Orbit Trauma Scale
Macular holes 201	Meperidine postoperative pain management 91, 94
Madigan Eye and Orbit Trauma Scale	recommended dosage 87
as a readiness-training tool 104	shivering after anesthesia and 89
categories 98, 99	Mepivacaine 79, 80, 81
motility 103	Metallosis bulbi
national and international support for 104	ancillary studies 251
triage training module 102, 104, 112	chalcosis 257, 261
Magnesium hydroxide 117	description 248, 261
Magnetic resonance imaging	diagnosis and location 250
advantages of 351	factors influencing damage from 248, 250
blunt trauma and 73	findings in siderosis and chalcosis (table) 249
compared with computed tomography 65, 352	management 260
dry wood and 351, 359	metalurgy of intraocular foreign bodies (table) 250
dynamic imaging 390	most common metals causing 248, 261
extraocular muscle trauma 389	process of 248
fat suppression 65, 390	reactive and nonreactive components of intraocular foreign
foreign bodies and 70, 293, 351	bodies (exhibit) 251
gaps between images 351	siderosis 251, 260
implants and 417	Methazolamide
intraocular foreign bodies and 30	hyphema treatment 145
limitations of 351	Methohexital 87
metallosis bulbi and 251	Methotrexate
"open" scanners 353	sympathetic ophthalmia and 274
orbital fractures 377	Methylprodnicolone
orbital trauma 351, 356	Methylprednisolone
penetrating injuries with a retained intraocular foreign body and 232	traumatic optic neuropathy and 400 Metoclopramide 79, 92, 93, 94
physical size of the magnet and the strength of the magnetic	Midazolam
provided size of the magnet and the strength of the magnetic	MINALORUM

Military Dermatology 116	signs and symptoms 376
Minocycline	soft-tissue reconstruction 375
Hansen's disease and 468	sources 375
Miotics	surgical management 376
glaucoma and 192	telecanthus and 375
Mitchell, Dr S. Weir 5	vision monitoring 375
MMARTS. See Medical Mobilization Augmentation Readiness	Nasociliary nerve 83
Team Moisture chamber	National Eye Trauma System Registry
eyelid burns 315, 318	peacetime operational injuries 212 retained intraocular foreign bodies 227
Monitored anesthesia care	traumatic cataract occurrence 172
description 86, 94	Nausea and vomiting
general anesthesia and 86	general anesthesia and 89
local anesthesia and 86	postoperative management 92
recommended dosages of selected sedatives and analgesics	Nd:YAG lasers 432
(exhibit) 87	neodymium:yttrium-aluminum-garnet lasers 432
Monoamine oxidase inhibitors	Nerve agents
cocaine and 80	action of 129, 131
epinephrine and 81	treatment 131
Monocanalicular stents 303	types 127, 129, 131
Mooren's ulcer 150	Nerve blocks 83, 93, 293
Morphine 87, 91, 94	NETS. See National Eye Trauma System Registry
Motility extraocular muscle trauma and 392	Neutralization kits for chemical injuries 121 Night blindness 465
eyelid burns and 317	Nitrogen mustard 127, 128
MEOTS and 103	Nitrous oxide 88
penetrating injuries with a retained intraocular foreign body	NLP. See No light perception
and 232	No light perception 216
physical examination and 50	agressive management of 48
zygomaticomaxillary complex fractures and 362	enucleation and 216, 236
MRI. SeeMagnetic resonance imaging	traumatic optic neuropathy 396, 397, 398
Munich Clinic	NOE fractures. See Naso-orbital-ethmoid fractures
intraocular foreign body injuries 227	Norris, Dr. William 5
Mustard Gas	Nose blowing
as a type of vesicant 127	orbital fractures and 365, 366, 377
example order sheet for a patient with ocular mustard injuries	Nutritional blindness
(exhibit) 131	causes 465
facts to keep in mind when working with casualties of mustard agent (exhibit) 131	clinical course 465
first use of 125	diagnosis 466 management 466
risk to medical personnel from 129	ocular manifestations 465
ocular effects of 129	World Health Organization classification of xerophthalmia
ocular morbidity from 102	(table) 465
odor of 128	
prolonged recovery from 9	0
Mustarde flaps	
eyelid burns 325, 326, 327	o-Ethyl S-[2-(diisopropylamino)ethyl] methylphosphonothiolate
eyelid lacerations 300	127, 131
Mycobacterium leprae	O'Brien's nerve block method 84
Hansen's disease and 467	Occlusive filters
Mycotoxins	traumatic strabismus and 390
action of 132	Occupational Health: The Soldier and the Industrial Base 116
ocular effects of 129 Mydriasis 142	O'Connor, Dr. Roderic P. 9
Wydfidsis 142	Octafluoropropane 88 Ocular system review 46
N	Ocular toxoplasmosis 13
14	Ocular trauma. See also Orbital trauma; specific types of trauma, i.e.
Nadbath nerve block method 84	Blast injuries
Naloxone	as a result of facial burns 308
monitored anesthesia care and 86	bilateral penetration injuries 221
Napalm	causes of nonfatal wounds (table) 444
burns from 12	cost to society of eye injuries 443
Narcotics 86, 91, 94	history and examination sequence (exhibit) 44
Naso-orbital-ethmoid fractures	imaging 62
bilateral nature of 375	increase in wartime eye-related injuries 226, 274
Le Fort levels 375	mass casualty scenarios 43, 48
open reduction with internal fixation 375	mechanisms of injury 212, 213

military perspective 227	computed tomography and 71, 73
need for prompt treatment 42	Orbit
occupational eye injuries 226	anatomy of 62, 337
ocular war injuries as a percentage of total war injuries	blast injuries 427
(table) 442	vascular supply 337
patient history 44, 150, 214, 230, 250, 388, 392, 435 patient stabilization 42, 214	Orbital fractures
patient stabilization 42, 214 peacetime injuries 443	blast injuries and 428 blowouts 360, 362, 366, 386
peacetime injuries 445 peacetime operational settings 212	computed tomography and 29, 70
percentage of intraocular foreign body injuries 226	craniofacial dysjunction 360
physical examination 48, 231, 250, 388, 392, 396, 435	"dirty" 377
preoperative preparation 58, 150, 407	dysesthesia of cranial nerve V ₂ 374
pressure to treat soldiers and return them to the field 43	enophthalmos 366, 368
prevalence 42, 78, 212, 226	epistaxis, cerebrospinal fluid rhinorrhea, and anosmia 370
risk to infantrymen 442, 444	extraocular muscle rounding 365
the four phases of advanced trauma life support evaluation	globe integrity and 377
and care (exhibit) 42	hemorrhage and 337, 355, 368
types of trauma 42, 212	horizontal diplopia 368
visual prognosis 150, 221	hypesthesia of cranial nerve V ₁ 370
Ocular Trauma Classification Group 98, 103, 110 Ocular Trauma Score 110, 111	hypesthesia of infraorbital cranial nerve V ₂ 365 hypo-ophthalmos 366
Oculocardiac reflex	hypo-ophthalmos and pulsatile exophthalmos 371
anesthesia and 89	hypotropia and 386
orbital fractures and 366	inferior or lateral rim step-off 374
Oculogastric reflex 92, 94	lateral canthal dystopia 374
Ofloxacin	Le Fort midface fractures 397, 360, 375
Hansen's disease and 468	low transverse maxillary fractures 360
Oklahoma, Oklahoma City bombing 422, 427	malar flattening and increased facial width 373
Onchocerca volvulus	management of 377
onchocerciasis 463	medial wall 368, 386
Onchocerciasis	naso-orbital-ethmoid 375
blindness and 463	nose blowing and 365, 366, 377
clinical course 463	oculocardiac reflex 366
dermatological manifestations 464	orbital emphysema 365, 368 orbital floor 360
description 463 management 465	orbital roof 369
Mazzotti reaction and 463, 465	plain skull films and 70
route of ocular entry 463	point tenderness and ecchymosis 373
Onchocerciasis Control Programme 465	pupillary abnormalities 366
Ondansetron 92, 93	pyramidal fractures 360
Open globe	restricted up-gaze and ptosis 369
antibiotic therapy 216	signs and symptoms 362
bandaging of eyelid burns and 313	supraorbital rim depression 370
eyelid lacerations and 292	surgery for 30
general anesthesia and 87, 93, 94	surgical management 366, 371
importance of early closure 166	traumatic optic neuropathy and 396, 397, 402
injury definition 100 lens dislocation and 174	trismus and malocclusion 374, 377 vertical diplopia 362
MEOTS and 103	white-eyed blowout 366
retrobulbar block and 85	zygomaticomaxillary complex 362, 371
shields for 313, 314	Orbital trauma
zones of injury 110	hemorrhage 337, 355, 358
Open reduction with internal fixation	imaging 344
naso-orbital-ethmoid fractures 375	medial wall and 341
zygomaticomaxillary complex fractures 374	midfacial buttresses 341
Operculated retinal breaks 200	midfacial buttresses (table) 342
Ophthalmia. See also Sympathetic ophthalmia silver nitrate	multidisciplinary team management 336
treatment	ocular trauma and 336
Ophthalmic artery 83	orbital anatomy 337
silver nitrate treatment. See also Sympathetic ophthalmia	orbital floor and 341, 342, 360
Ophthalmic Pathology: An Atlas and Textbook 9	return to duty and 381
Ophthalmoscope as best imaging modality for initial evaluation 62	surgical techniques 378 typical head-and-neck trauma teams 336
invention of 4	zygomatic arch and 342
Optic nerve injuries	ORIF. See Open reduction with internal fixation
avulsion from the sclera 205	Otitis media
blast injuries 428	neurological damage and 387

OTS. See Ocular Trauma Score	no light perception and 236
Oxycodone	occupational and domestic perspective 227
postoperative pain and nausea management 91, 94	pars plana vitrectomy and 227, 238
	patient history and physical examination 230
P	postoperative management 241
	potential complications 228
Pancoast, Dr. William Henry 5	prognosis 241
Parabulbar anesthesia 85	sources 227
Paracentesis	vitreoretinal surgery and 236, 242, 243
sympathetic ophthalmia and 267	watchful waiting and 236
Pars plana approach to surgery 180, 238, 438	decision tree 237
Pars planitis	Perfluorocarbon liquids 241
sympathetic ophthalmia and 272	Perforating injuries
Passmore, Col. Jack W. 15	definition 100
Patch graft	primary repair of 212
laceration repair 161	Peribular anesthesia 85
The Pathology of the Eye 3	Periorbital nerve compression 91, 94
Patient history	Perphenazine 92
age of the patient 45	Persian Gulf War
allergies 48	"borrowed" equipment 32
. 9	contact lens problems related to dust and sand 34
bypassing 45	corneal foreign bodies requiring slitlamp removal 101
chief complaint 44	
crystalline lens injuries 177	enucleation as a result of fragment injuries 101, 110, 406
extraocular muscle trauma and 388, 392	equipment problems 32
laser injuries 435	facilities problems 32
legal issues 46, 435	fragmentation injuries 36, 98, 101, 112, 406
mechanism and time course of the ocular injury 214	frequency and severity of eye injuries 34, 406
medical history 47	hospital construction 32, 34
medication history 47	insights from 36
metallosis bulbi 250	intraocular foreign body injuries 226
ocular system review 46	Iraqi medical evacuation and treatment systems 36
penetrating injuries with a retained intraocular foreign body	medical evacuation system 35
and 230	number of ophthalmologists 31, 34
pretrauma vision level 46	percentage of ocular injuries 442, 443
review of systems list (exhibit) 46	plastic landmine injuries 36
sharp trauma of the anterior segment and 150	rarity of isolated ocular injuries 36
surgical history 47	sand injuries 34
traumatic event details 45, 177 Patient stabilization 42	SCUD missile injuries 35
	suturing with inappropriate sutures 33
Pellucid marginal degeneration 150 Penetrating injuries. See also Sharp trauma of the anterior segment	sympathetic ophthalmia and 267 US mail for supplies 34
. 0 ,	Phacoanaphylactic endophthalmitis
anterior segment management 236 BBs 242	sympathetic ophthalmia and 270
crystalline lens 172, 175	Phacoantigenic uveitis
definition 100	sympathetic ophthalmia 270
glaucoma and 192	Phenylephrine 89
intraocular foreign bodies and 227	Phosgene 125, 127, 128
mortality of close-proximity shell injuries 212	Physical examination
phacoanaphylactic glaucoma and 188	adnexa 51
primary repair of 212	anterior segment 53
sympathetic ophthalmia and 266	chemical injuries and 122
Penetrating injuries with a retained intraocular foreign body	crystalline lens 177
anterior segment management 236	extraocular muscle trauma and 388, 392
diagnostic imaging 232	eyelid burns 313, 317
drawing of the retina to document the location and size of the	laser injuries 435
IOFBs 232	metallosis bulbi 250
enucleation and 236, 242	motility 50, 232, 317
external magnet extraction 235	penetrating injuries with a retained intraocular foreign body
immediate globe closure with primary removal of IOFB 234	and 231
immediate globe closure without primary removal of IOFB 234	pupil 49, 103, 122, 317, 388
indications for removal 229	traumatic optic neuropathy 396
inflammatory changes and physiological effects 229	visual acuity 48, 103, 122, 177, 231, 292, 396
intraocular complication management 240	visual field 49
management 234	Pigtail probes 303
medical evacuation and 227	Plain, Concise, Practical Remarks on the Treatment of Wounds and
metallosis bulbi 248	Fractures 2
multisystem trauma association 227	Plain skull films

appropriate plain film roentgenograms for eye imaging	microbiology 282
(table) 63	mixed infections and 284
crystalline lens injuries 177	organisms most commonly isolated in (exhibit) 283
drawbacks of 353	penetrating injuries and 151
foreign body localization 67, 215, 293, 353	percentage of endophthalmitis cases 282
metallosis bulbi 251, 261	postoperative endophthalmitis and 282, 284
orbital fractures and 70	prognosis 282
orbital trauma 353	signs and symptoms 284
penetrating injuries with a retained intraocular foreign	surgical considerations 288
body 232	Potassium hydroxide 117
posttraumatic endophthalmitis 284	Pralidoxime chloride 131
sharp trauma of the anterior segment 151	Prednisolone acetate
uses of 62	hyphema treatment 145
POE. See Postoperative endophthalmitis	postoperative management 165
Polycarbonate ballistic protective eyewear	posttraumatic endophthalmitis and 288
99, 112, 138, 445, 448, 449	traumatic iritis treatment 142
Polyglactin mesh 378	Prednisone
Porous polyethylene	posttraumatic endophthalmitis and 288
implants and 407, 412, 417, 419	sympathetic ophthalmia and 273
orbital trauma and 379	Preoperative preparation
Portable operating microscopes 28, 29, 32, 33	enucleation and evisceration 407
_	eyelid lacerations 293
Posterior segment	, , , , =o
blast injuries 427	goals of 58
blunt trauma 196	sharp trauma of the anterior segment and 150
chalcosis and 257	Pressure patches
choroidal rupture 57	corneal abrasions 140
complications of penetrating injuries with a retained intraocu-	enucleation and evisceration and 413, 415, 416
lar foreign body 228	laser injuries 438
dilating regimen 56	skin grafts 305
eyelid burns and 317	Prisms
Hansen's disease and 468	diplopia and 390
immediacy of treatment and 21	Procainamide 90
laser injuries 436	Procaine 80
nutritional blindness findings 466	Processed human pericardium
	*
onchocerciasis findings 464	laceration repair 161
primary repair of penetrating, performing, and blunt rupture	Prochlorperazine 92, 93
injuries 212	Promethazine 92, 93
scleral rupture 57	Proparacaine 79, 93
siderosis findings 254	Propofol
traumatic optic neuropathy 396	monitored anesthesia care and 86, 87, 94
Postoperative endophthalmitis	Proptosis
organisms most commonly isolated in (exhibit) 283	MEOTS and 103
posttraumatic endophthalmitis 282	Prostaglandin analogues
Postoperative Eye Guard 449	glaucoma and 193
Postoperative pain and nausea management	Prostheses. See Implants; Keratoprostheses
antinausea and antiemetic agents 92, 94	Proteus
	eyelid burns and 314
enucleation and evisceration 416	
ice-cold compresses 91	Proton density-weighted MRI 65
narcotics 91	Pseudoisochromatic color plate testing
orbital trauma and 381	laser injuries and 436
sharp trauma of the anterior segment 165	Pseudomonas
Posttraumatic endophthalmitis	eyelid burns and 314
ancillary testing 284	PTE. See Posttraumatic endophthalmitis
antibiotic recommendations for (exhibit) 286	Ptosis
antifungal treatment 286	eyelid burns and 315, 318, 321, 330
antiinflammatory and immunosuppressant therapy 288	Hansen's disease and 467
associated injuries 288	levator injury and 300
course after treatment 288	orbital fractures and 369
cultures and stains 285	
	Pulsatile exophthalmos
delay in diagnosis and 282, 284, 288	orbital fractures and 371
diagnosing 284	Punctal stenosis 332
dirt and organic material contamination and 282, 286	Punctate keratitis
management after initial repair 285	Hansen's disease and 468
management during the primary repair 285	nutritional blindness and 466
medical considerations 285	onchocerciasis and 463
methods for obtaining intraocular cultures and delivering	Pupil. See also Afferent pupillary defect
intravitreal antibiotics (exhibit) 287	extraocular muscle trauma and 388

eyelid lacerations and 292 management of a miotic pupil 238 MEOTS and 103 orbital fracture abnormalities 366 physical examination and 49 transpupillary fibrin membrane dissolution 238 Purtscher's retinopathy 206 Q Retinal infarction 91 Retinal ischemia 91, 94 Retinal pigment epithelium contusion injury 199 Quickert-Rathburn sutures eyelid burns and 328 Quinolone posttraumatic endophthalmitis and 285 Retinopathy 206 Retinopathy 206 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 siderosis and 256 sympathetic ophthalmia and 270 Retinopexy	
MEOTS and 103 orbital fracture abnormalities 366 physical examination and 49 transpupillary fibrin membrane dissolution 238 Purtscher's retinopathy 206 Q Q Q Quickert-Rathburn sutures eyelid burns and 328 Quinolone posttraumatic endophthalmitis and 285 silicon oils and 241 sympathetic ophthalmia and 266 ultrasonography for 29 Retinal dialysis 197, 199 Retinal infarction 91 Retinal ischemia 91, 94 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 siderosis and 256 sympathetic ophthalmia and 270 Retinopexy	
MEOTS and 103 orbital fracture abnormalities 366 physical examination and 49 transpupillary fibrin membrane dissolution 238 Purtscher's retinopathy 206 Q Q Q Quickert-Rathburn sutures eyelid burns and 328 Quinolone posttraumatic endophthalmitis and 285 silicon oils and 241 sympathetic ophthalmia and 266 ultrasonography for 29 Retinal dialysis 197, 199 Retinal infarction 91 Retinal ischemia 91, 94 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 siderosis and 256 sympathetic ophthalmia and 270 Retinopexy	
orbital fracture abnormalities 366 physical examination and 49 transpupillary fibrin membrane dissolution 238 Purtscher's retinopathy 206 Q Retinal infarction 91 Retinal ischemia 91, 94 Retinal pigment epithelium contusion injury 199 Quickert-Rathburn sutures eyelid burns and 328 Quinolone posttraumatic endophthalmitis and 285 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 siderosis and 256 sympathetic ophthalmia and 270 Retinopexy	
physical examination and 49 transpupillary fibrin membrane dissolution 238 Purtscher's retinopathy 206 Retinal dialysis 197, 199 Retinal infarction 91 Retinal ischemia 91, 94 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 eyelid burns and 328 Quinolone posttraumatic endophthalmitis and 285 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 siderosis and 256 sympathetic ophthalmia and 270 Retinopexy	
transpupillary fibrin membrane dissolution 238 Purtscher's retinopathy 206 Retinal dialysis 197, 199 Retinal infarction 91 Retinal ischemia 91, 94 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 eyelid burns and 328 Quinolone posttraumatic endophthalmitis and 285 Retinal dialysis 197, 199 Retinal di	
Purtscher's retinopathy 206 Retinal infarction 91 Retinal ischemia 91, 94 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 eyelid burns and 328 Quinolone posttraumatic endophthalmitis and 285 Retinal infarction 91 Retinal infarction 91 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 siderosis and 256 sympathetic ophthalmia and 270 Retinopexy	
Retinal ischemia 91, 94 Retinal pigment epithelium contusion injury 199 Quickert-Rathburn sutures eyelid burns and 328 Quinolone posttraumatic endophthalmitis and 285 Retinal ischemia 91, 94 Retinal ischemia 91, 94 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 siderosis and 256 sympathetic ophthalmia and 270 Retinopexy	
Quickert-Rathburn sutures eyelid burns and 328 Quinolone posttraumatic endophthalmitis and 285 Retinal pigment epithelium contusion injury 199 laser injuries and 433, 434, 437 siderosis and 256 sympathetic ophthalmia and 270 Retinopexy	
Quickert-Rathburn sutures laser injuries and 328 laser injuries and 256 sympathetic ophthalmia and 270 Retinopexy	
Quickert-Rathburn sutures laser injuries and 328 laser injuries and 256 sympathetic ophthalmia and 270 Retinopexy	
Quickert-Rathburn sutureslaser injuries and 433, 434, 437eyelid burns and 328siderosis and 256Quinolonesympathetic ophthalmia and 270posttraumatic endophthalmitis and 285Retinopexy	
eyelid burns and 328 siderosis and 256 Quinolone sympathetic ophthalmia and 270 posttraumatic endophthalmitis and 285 Retinopexy	
Quinolone sympathetic ophthalmia and 270 posttraumatic endophthalmitis and 285 Retinopexy	
posttraumatic endophthalmitis and 285 Retinopexy	
penetrating injuries with a retained int	raocular foreign body
R and 240	
Retinoscope, invention of 4	
Radiation burns Retinoscopy	
exposure sources 308 crystalline lens injuries and 177	
± * * * * * * * * * * * * * * * * * * *	2
long-term effects from 308 Retrobulbar blocks 84, 89, 151, 408, 41	5
secondary to therpeutic exposure 309 Retrobulbar hemorrhage 355	_
Ralph's classification of ocular chemical injury (exhibit) 118, 119 Rhegmatogenous retinal detachments 2.	28
Randolph, Lt. Col. M. Elliott 11 Rich, Dr. Hosea 2	
Random Es 48 Rifampin	
Ranitidine Hansen's disease and 468	
gastric acid neutralization and 79 Riot control agents 129	
Rare earth magnets 239 Robertson, Dr. Charles 5	
Rebleeding Roentgenography. See Plain skull films	
hyphema and 144 RPE. See Retinal pigment epithelium	
subperiosteal hemorrhage and 356 Rupture	
Red saturation definition 100	
traumatic optic neuropathy and 396, 402 Russo-Japanese War 267, 442	
Reepithelialization Rust rings 141, 176	
chemical injuries 118, 120, 121, 124, 125	
,	
Refraction	
extraocular muscle trauma and 388 S-antigen	
Dating	
Retina sympathetic ophthalmia and 271	
breaks due to vitreous traction 199, 228 Sarcoidosis	
breaks due to vitreous traction 199, 228 Sarcoidosis	<u>1</u>
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 Sarcoidosis sympathetic ophthalmia and 268, 272	2
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 Sarin 127, 131 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131	
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the Sarcoidosis sympathetic ophthalmia and 268, 27. Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born	
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks bon Scalds 311	
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma	
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98	abing 422
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in	abing 422
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98	abing 422
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in	abing 422
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 incarcerated 228 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks bom Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100	njuries 101
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term	njuries 101
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101	njuries 101
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110	njuries 101
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 functions 99	njuries 101
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 functions 99 initial vision and 110	njuries 101
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 functions 99 initial vision and 110 injury patterns 101	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 flad (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks bon Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 injury patterns 101 international classification system 102	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 functions 99 initial vision and 110 injury patterns 101	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 flad (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks bon Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 injury patterns 101 international classification system 102	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 siderosis and 254 vitrectomy and 220 Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 injury patterns 101 international classification system 10 laminated card for pocket reference 1 mechanism of injury and 110	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 incarcerated 228 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 siderosis and 254 vitrectomy and 220 Retinal detachment Sarcoidosis sympathetic ophthalmia and 268, 272 Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 injury patterns 101 international classification system 10 laminated card for pocket reference 1 mechanism of injury and 110 prognostic applications 99, 110	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 filap (horseshoe) or operculated breaks 200 Hansen's disease and 468 incarcerated 228 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 siderosis and 254 vitrectomy and 220 Retinal detachment expansile gases and 241 Sarcoidosis sympathetic ophthalmia and 268, 27. Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks born Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 injury patterns 101 international classification system 10 laminated card for pocket reference 1 mechanism of injury and 110 prognostic applications 99, 110 prognostic factors of visual outcome (to	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 incarcerated 228 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 siderosis and 254 vitrectomy and 250 Retinal detachment expansile gases and 241 immediacy of treatment and 21 Sarcoidosis sympathetic ophthalmia and 268, 27: Sarin 127, 131 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 functions 99 initial vision and 110 injury patterns 101 international classification system 10 laminated card for pocket reference 1 mechanism of injury and 110 prognostic factors of visual outcome (to rationale for using 98	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 incarcerated 228 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 siderosis and 254 vitrectomy and 220 Retinal detachment expansile gases and 241 immediacy of treatment and 21 laser injuries and 438 Sarcoidosis sympathetic ophthalmia and 268, 27: Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks bon Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 injury patterns 101 international classification system 10 laminated card for pocket reference 1 mechanism of injury and 110 prognostic applications 99, 110 prognostic factors of visual outcome (to rationale for using 98 readiness improvement and 103, 110	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 siderosis and 254 vitrectomy and 220 Retinal detachment expansile gases and 241 immediacy of treatment and 21 laser injuries and 438 neurosensory 202 Sarcoidosis sympathetic ophthalmia and 268, 27: Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks bon Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 injury patterns 101 international classification system 10 laminated card for pocket reference 1 mechanism of injury and 110 prognostic applications 99, 110 prognostic factors of visual outcome (trationale for using 98 readiness improvement and 103, 110 soldiers' ability to fight and 110, 112	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 siderosis and 254 vitrectomy and 220 Retinal detachment expansile gases and 241 immediacy of treatment and 21 laser injuries and 438 neurosensory 202 pathophysiology of posttraumatic retinal detachment 219 Sarcoidosis sympathetic ophthalmia and 268, 27: Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks bon Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 functions 99 initial vision and 110 injury patterns 101 international classification system 10 laminated card for pocket reference 1 mechanism of injury and 110 prognostic applications 99, 110 prognostic factors of visual outcome (to rationale for using 98 readiness improvement and 103, 110 soldiers' ability to fight and 110, 112 triage applications 102	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 siderosis and 254 vitrectomy and 220 Retinal detachment expansile gases and 241 immediacy of treatment and 21 laser injuries and 438 neurosensory 202 Sarcoidosis sympathetic ophthalmia and 268, 27: Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks bon Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 injury patterns 101 international classification system 10 laminated card for pocket reference 1 mechanism of injury and 110 prognostic applications 99, 110 prognostic factors of visual outcome (trationale for using 98 readiness improvement and 103, 110 soldiers' ability to fight and 110, 112	njuries 101 ns (table) 100
breaks due to vitreous traction 199, 228 breaks without apparent vitreous traction 201 chalcosis and 257 drawing of the retina to document the location and size of the IOFBs 232 epiretinal membrane cause 229 findings in siderosis and chalcosis (table) 249 flap (horseshoe) or operculated breaks 200 Hansen's disease and 468 injury without breaks 197 laser injuries and 434, 436 macular holes 201 membrane peeling and 220 onchocerciasis and 464 postoperative care and 219 Purtscher's retinopathy 206 siderosis and 254 vitrectomy and 220 Retinal detachment expansile gases and 241 immediacy of treatment and 21 laser injuries and 438 neurosensory 202 pathophysiology of posttraumatic retinal detachment 219 Sarcoidosis sympathetic ophthalmia and 268, 27: Sarin 127, 131 Saudi Arabia, U.S. Air Force barracks bon Scalds 311 Scales for ocular trauma benefits 98 characteristics of wartime ophthalmic in command perspective 110, 112 common trauma terms 98, 100 definitions of ocular traumatology term exclusions 101 extent of injury and 110 functions 99 initial vision and 110 injury patterns 101 international classification system 10 laminated card for pocket reference 1 mechanism of injury and 110 prognostic applications 99, 110 prognostic factors of visual outcome (to rationale for using 98 readiness improvement and 103, 110 soldiers' ability to fight and 110, 112 triage applications 102	njuries 101 ns (table) 100

Schirmer's test	retinal detachment and 241
eyelid burns 323	Silicone plastic sheets 379
Sclera	Skin grafts
donor sclera for implants 407, 415	allografts 324
Hansen's disease and 468	alloplastic 324
Scleral buckles 241	autologous 324
Scleral lacerations	
	buccal mucosal 331
corneoscleral 163, 164, 172	eyelid burns 312, 324, 328, 331
extraocular muscle trauma and 386	eyelid laceration 301, 305
eyelid burns and 313	pressure patching 305
factors associated with poor visual outcome 219	skin grafts for restoration of lost eyelid tissue (exhibit) 324
successful repair requirements 212	Skin-snip test
Scleral ruptures	onchocerciasis and 464
optic nerve avulsion from the sclera 205	Slitlamps
physical examination and 57	anterior segment examination 53, 54, 56, 163
predictive findings 151	corneal abrasions 140
presenting features 205	corneal foreign bodies 141, 163
Sclerosing keratitis	difficulty of obtaining 33
onchocerciasis and 463	eyelid burns and 317
Second-degree burns	penetrating injuries with a retained intraocular foreign body
causes 311	and 232
description 310, 311	Small Portable Expeditionary Aeromedical Rapid Response teams
second echelon treatment 315	xvi
treatment 318	Snellen visual acuity chart 48, 122
Seidel test 53, 159	SO. See Sympathetic ophthalmia
Sevoflurane 88	Socket conformers
Sexually transmitted diseases	enucleation and evisceration and 417, 418, 419
trachoma and 460	Socket contracture
Sharp trauma of the anterior segment	enucleation and evisceration and 418
ancillary tests 151	Sodium bicarbonate 79, 81
complex lacerations 150	Sodium citrate 79, 124, 125
corneal lacerations with uveal prolapse 161	Solar maculopathy 25
corneoscleral lacerations 163	Soman 127, 131
and the second s	
corneoscleral lacerations with cataracts 164	Sonography. See Ultrasonography
example instrument set for surgery of anterior segment trauma	SOOF lifts
(exhibit) 153	eyelid burns 328, 330
intraocular foreign bodies 163	Sorbitol 88
lacerations with tissue loss 161	Sowdah 464
management of simple corneal lacerations 159	Spaeth, Col. Edward B. 10
partial-thickness corneal lacerations 159	Spanish–American War 6, 446
patient evaluation and preoperative management 150	Spastic entropion 328
postoperative management 165	SPEARR teams. See Small Portable Expeditionary Aeromedical
primary repair of complex corneal lacerations 161	Rapid Response teams
prophylactic antibiotics 151	Special Protective Eyewear Cylindrical Surface 19
reconstruction after trauma 165	SPECS. See Special Protective Eyewear Cylindrical Surface
simple full-thickness lacerations 159	Spectacles
simple lacerations 150, 159	aphakic 460
surgical principles 152	
	ballistic and laser protective 451
Sheppard, Dr. John L. 6	laser injuries and 439
Shippen, Dr. William, Jr. 2	muscle trauma and 390
Sickle cell anemia	SPH. See Subperiosteal hemorrhage
subperiosteal hemorrhage and 355	Spivey, Dr. Bruce E. 15
Sickle cell disease	Staphylococcus
hyphema and 144, 145	eyelid burns and 314
Sickle cell trait	orbital emphysema and 366
hyphema and 144, 145	orbital trauma and 381
Siderosis	posttraumatic endophthalmitis and 241, 282, 283
clinical course 257	Stellate lacerations 161, 294
description 251	Sterile endophthalmitis
electrophysiology findings 254	chalcosis and 248, 257
findings in siderosis and chalcosis (table) 249	Sternberg, Gen. George M.
glaucoma 192	establishment of the Army Medical School 5
management 260	Steroids. See Corticosteroids
9	
metallic intraocular foreign bodies and 229	Stevens-Johnson syndrome 462
ocular findings 252, 261	Streptococcus
pathophysiology 255	eyelid burns and 314
Silicon oils	orbital emphysema and 366

orbital trauma and 381	rupture injuries of the posterior segment 216
posttraumatic endophthalmitis and 241	surgical goals of enucleation and evisceration (exhibit) 409
Subcutaneous regional infiltration 82, 93	suture placement 153, 157
Suborbicularis oculi fat lifts	suture removal 157
eyelid burns 328, 330	suture selection 152
Subperiosteal hemorrhage 355	suturing instruments 152
Subperiosteal midface elevation	sympathetic ophthalmia and 267
eyelid burns 328	timing of secondary surgical intervention 220
Succinylcholine	tissue adhesives 158, 218, 292, 295
disadvantages of 87	traumatic optic neuropathy 402
general anesthesia and 87	viscoelastic agents 152, 160, 161, 164, 165, 179
intraocular pressure and 94	visual prognosis 221
local anesthesia and 81	Sutures
malignant hyperthermia and 90	eyelid lacerations and 294, 297
Sulcus-fixated lenses 182	far-near-near-far technique 301
Sulfa-based medications	Frost or reverse-Frost 294, 297, 304, 305, 318
trachoma and 462	instruments for 152
Sulfur hexafloride 88	length of 155
Sulfuric acid 117	mattress suture technique 161
Sulfurous acid 117	"no-touch" passes 153
Sun-wind-dust goggles 447, 449	orbital trauma and 380
Superficial burns. See First degree burns	placement of 153
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Supraorbital nerve 83, 91, 93	reapproximation of anatomical landmarks 157
Supratrochlear nerve 83, 91, 93	recommended sutures for the repair of various orbital and
Suramin	adnexal injuries (exhibit) 30
onchocerciasis and 465	removal of 157
Surgical history 47	selecting 152
Surgical management. See also Postoperative pain and nausea	spacing of 155
management; Preoperative preparation; Theater of	suture placement principles (exhibit) 157
operations eye care	suture recommendations (table) 297
anterior approach (limbal incision) 178	sutures for corneal laceration repair (table) 152
aqueous shunts 193	through-and-through 153
argon laser trabeculoplasty 193	Swinging flashlight test
canalicular injuries 52, 302	traumatic optic neuropathy and 396
chalcosis 261	Symblepharon rings 125, 332
choroidal ruptures 202	Sympathetic ophthalmia
crystalling lens injuries 178	age considerations 267
enucleation 408	associated disorders 268
evisceration 413	autoimmunity role 271, 275
example instrument set for surgery of anterior segment trauma	bacterial antigens and 272
(exhibit) 153	clinical course and 269
extraocular muscle trauma 391	clinical features 267
eyelid lacerations 293	complications 269
forceps types 153	Dalen-Fuchs nodules and 268, 269, 270
glaucoma 192	description 266, 275
goals 216	differential diagnosis 272
Hansen's disease and 468	enucleation and 236, 266, 267, 272, 408
hemorrhage 355	epidemiology 266
implants 378	evisceration and 273
injury history and evaluation 214	histopathology 269
intracapsular fixation ring 179	history of 266
metallosis bulbi 260	human leukocyte antigen and 272
naso-orbital-ethmoid fractures 376	hypersensitivity reaction theories 271
open reduction with internal fixation 374	identification of IOFBs and 228
orbital fractures 366, 371, 374, 377	immunosuppressive therapy 273
orbital trauma 378	implications for military medicine 274
posterior approach (pars plana incision) 180, 238, 438	inducing suppurative inflammation in an injured eye and 260
posterior segment penetrating, perforating, and blunt rupture	latent period following ocular trauma 266, 267
injuries 212	"mutton fat" keratic precipitates 268
postoperative care 219, 380	pathogenesis 271
1 1	1 0
postoperative complications 182, 240	penetrating injuries and 229
postsurgical considerations 219	penetration injuries and 221
posttraumatic endophthalmitis 288	postoperative care and 219
primary intraocular lens placement 181	time limit for enucleation 273, 275
sharp trauma of the anterior segment 152	treatment 272
siderosis 260	Syphilis
step-by-step repair of penetrating, perforating, and blunt	as the cause of iritis or iridocyclitis 8

T	blast injuries and 424, 428
	chemical agents and 117
T1-weighted MRI 65	patient history and 45
T2-weighted MRI 65	sources 308, 309
Tabun 127, 131	Third World
Tanzania, U.S. embassy bombing 422	blindness prevalence 458
Tarsorrhaphy	first level of medical care 458, 459
non-margin-sharing 320	leading causes of blindness 458
temporary tarsorrhaphy for eyelid burns 315, 318, 320, 330	medical care delivery 458
Tear drainage system abnormalities 332	second level of medical care 458
Tear gas 116, 127	third level of medical care 459
Temporal nerve 83	Third-degree burns
Temporary keratoprosthesis 237	causes 311
Tenon's capsule	description 310, 312
enucleation and evisceration and	second echelon treatment 315
407, 408, 409, 412, 413, 415, 418, 419	treatment 318
muscle lacerations and 392	Thoft's classification of ocular chemical injury (table) 120
Tenzel flaps	Thurber, James 266
eyelid lacerations and 298, 300	Timolol maleate
Terrien's degeneration 150	hyphema treatment 145
Terson's syndrome 207	Tissue adhesives
Tetanus status	eyelid lacerations and 292, 295
	posterior segment injuries 218
eyelid burns and 308	sharp trauma of the anterior segment and 158
eyelid lacerations and 292	Tissue glues
Tetracaine 79, 80, 93, 293	eyelid lacerations and 292, 295
Tetracycline	posterior segment injuries 218
trachoma and 462	sharp trauma of the anterior segment and 158, 161
The Pathology of the Eye 9	Tissue patches 218
Theater of operations eye care	Tissue plasminogen activator
need for trained ophthalmologists 274, 275	choroidal ruptures and 202
assertiveness of ophthalmlogists 25	postoperative care and 219
complexity of injuries 25	transpupullary fibrin membrane dissolution 238
Consultant in Ophthalmology role 24	Tissue thromboplastin activator
contact lenses 25, 31	*
continuing education for ophthalmologists 26	laser injuries and 438
evacuation to CONUS 31, 320	Titanium mesh orbital floor plates
expertise of the ophthalmologist 19	orbital trauma and 379
eye clinic set 29	TO. See Theatre of operations eye care
eyelid burns 309	Tobramycin 140
first and second echelon care 26	Topical anesthesia
general principles 19	agents 79
immediacy of treatment 20	chemical injuries and 121, 130
maximizing the number of casualties who can return to active	corneal abrasions 140
duty 22	corneal foreign bodies 141
medical resources and 23	extraocular muscle trauma 389
military occupation specialty 31	sharp trauma of the anterior segment and 151
number of ophthalmologists needed 29, 31	uses 79
ocular injuries seen in wartime vs. in a peacetime emergency	TPA. See Tissue thromboplastin activator
department (table) 25	tPA. See Tissue plasminogen activator
ophthalmic surgeon as a member of a head and maxillofacial	Trabecular meshwork
trauma team 21, 99, 112	siderosis findings 253
outpatient clinic evaluation 30	Trachoma
"patch and ship" policy 26	blindness and 458, 460, 462
reassessing, updating, and integrating with other plans 26	classification scheme for 460
recommendations for initial care of ocular and adnexal injuries	clinical course 460, 462
at the 1st and 2nd echelons (exhibit) 27	description 460
registry of eye diseases and injury 25	diagnosis 462
specialist cooperation 26	eyelid repairs 459
specific principles 26	management 462
subspecialization and 19, 20	prevalence 460
support personnel needed 19	reinfections and 460
third and fourth echelon care 28	scarring patterns 460
treating members of allied forces and indigenous peoples 31	World Health Organization's simplified trachoma grading
watertight closure of the penetrated globe 28, 216	system (table) 461
Thermal burns	Transposition flaps
airway injuries and 308	eyelid burns and 324, 325
as most common ocular burns 308	Traumatic cyclodialysis 142

Traumatic iritis 142	V
Traumatic keratopathy 140	
Traumatic mydriasis 142	Vail, Col. Derrick T., Jr. 11
Traumatic optic neuropathy	Valsalva retinopathy 91, 206
anterior lesions 396	Valsalva's maneuver 58, 206, 337, 356
clinical features 397	Van Herick's technique 54
criteria governing surgical intervention in patients with (exhibit) 400	van Lint nerve block method 83 Vancomycin
degree of trauma and 397	corneal abrasions and 140
etiology 396	open-globe injuries 216
natural history 398	posttraumatic endophthalmitis and 285, 286
natural history of traumatic optic neuropathy (table) 398	Vascular pannus
neuroophthalmic evaluation 396	trachoma and 462
orbital fractures and 397	Vesicants
pathology 396	activity of 102, 129
posterior lesions 396	effects of 127, 129
prognosis 398	mechanisms of injury 129
reported outcomes using corticosteroids (table) 400	symptoms 129
spontaneous improvement 398, 399	treatment 130
surgical management 400	types 127, 129
treatment 399	use of 125, 127
Traumatic strabismus 386	Veterans Administration
Iri-Service Ocular Trauma Course 26 Irichiasis 331	blinded soldiers care 9
Trichothecene mycotoxins 132	Veterinarians
Tricyclic antidepressants	sympathetic ophthalmia and 266, 273 Vicryl mesh 378
cocaine and 80	Vietnam War
epinephrine and 81	Agent Orange 125
Trigeminal nerve 82	Consultant in Ophthalmology role 24
Trimalar fractures. See Zygomaticomaxillary complex fractures	endophthalmitis and mine-blast debris 213
Tripod fractures. See Zygomaticomaxillary complex fractures	enucleation 103, 275, 406
Trismus	fragmentation injuries 101
orbital fractures and 374, 377	general medicine doctors given on-the-job training in
Tuberculosis	ophthalmology 13
sympathetic ophthalmia and 268	Medical Civil Action Program 14
ŢŢ	mycotoxins and 132
U	percentage of ocular injuries 103, 442
Ultrasonography	percentage of soldiers suffering from ocular injuries who were
amplitude modulation (A-scans) 66	unable to return to duty 212
blunt trauma and 73, 75	sympathetic ophthalmia and 267 "yellow rain" 132
brightness modulation (B-scans) 66, 67, 215, 219	Viscoelastic agents
crystalline lens injuries 177	crystalline lens surgery 179
description 66	sharp trauma of the anterior segment and
foreign body localization 67, 215, 216, 293	152, 160, 161, 164, 165
intraocular foreign bodies 29	VISION 2020: Global Elimination of Avoidable Blindness
intraorbital foreign bodies 358	2020 463
metallosis bulbi 261	Visual acuity
penetrating injuries with a retained intraocular foreign body 233	eyelid burns and 313, 317
posterior capsule status 182	eyelid lacerations and 292
postoperative care and 219	laser injuries and 435
posttraumatic endophthalmitis 284	MEOTS and 103
retinal detachments 29 sharp trauma of the anterior segment 151	penetrating injuries with a retained intraocular foreign body
vitreous hemorrhages 438	and 231 physical examination and 48, 177
Ultraviolet radiation keratitis 141	traumatic optic neuropathy and 396
Uniformed Services University of the Health Sciences 26	Visual field examination 49
United States Eye Injury Registry 103, 110	Vitamin A
Urea 88	blindness and 465
USS Cole, terrorist ramming 423	World Health Organization recommendations for vitamin A
Uveitis	prophylaxis (table) 467
Hansen's disease and 468	Vitamin C
lens-induced 272	chemical injuries and 124
phacoantigenic 270	Vitrectomy
UVEX	cut rates 218
SPECS development 452	indications for 220

intraocular foreign bodies and 227 posttraumatic endophthalmitis and 285, 288 reducing the risk of intraocular membrane formation and 220 Vitreoretinal surgery categories of patients requiring 30 in the general hospital 19 metallosis bulbi and 260, 262 pars plana approach 238 penetrating injuries with a retained intraocular foreign body and 236, 242, 243 sympathetic ophthalmia and 267	intraocular foreign body injuries 226 ophthalmologists called up 6 percentage of ocular injuries 442 X-ray localization of intraocular foreign bodies 8 World War II artificial eye development 12 centers for blind soldiers 11 chemical agents and 125 Consultant in Ophthalmology role 24 decrease in the percentage of wounded dying from their wounds 443
Vitreous chalcosis and 258 findings in siderosis and chalcosis (table) 249 siderosis and 254	enucleation 103, 229 fragmentation injuries 101 intraocular foreign body injuries 226 Ophthalmology Branch of the Surgical Consultants Division
Vitreous fluorophotometry retinal injury 197 Vitreous hemorrhage	activation 11 percentage of ocular injuries 103, 442, 443 role of civilian specialists 11
laser injuries and 436, 438, 439	Worth four-dot test
Vogt-Koyanagi-Harada syndrome	extraocular muscle trauma and 388
sympathetic ophthalmia and 268, 272 Volkmann's contractures	Wound Data and Munitions Effectiveness in Vietnam 443
orbital fractures and 366	X
Vomiting. See Nausea and vomiting	
Vomiting gas 127	Xerophthalmia. See Nutritional blindness
Vossius ring 142, 173	Y
W	1
	"Yellow rain" 132
Walter Reed Army Medical Center	_
research unit established 13	Z
Walter Reed General Hospital	7. 1. (1
Department of Ophthalmology establishment 10	Z-plasties
War of 1812 2 Warren, Dr. John 2	eyelid burns 328, 331
Washington, Gen. George	Zimmerman, Lt. Col. Lorenz E. 9, 10
recommendation for the establishment of a hospital service 2	ZMC fractures. <i>See</i> Zygomaticomaxillary complex fractures Zygomatic arch
Waters's views 62, 63, 355	key orbital structure 342
Whiplash maculopathy 209	reduction of 375
White-eyed blowout 366	zygomaticomaxillary complex fractures and 371, 373, 374
WHO. See World Health Organization	Zygomatic nerve 83
Wilmer, Col. William Holland 7	Zygomaticofrontal suture
Wilmer's eye shield 446	zygomaticomaxillary complex fractures and 371, 373, 374
Wood's lamp	Zygomaticomaxillary complex fractures
corneal abrasions 140	commonality of 371
World Health Organization	signs and symptoms 371, 373
classification of xerophthalmia (table) 465	sources 371
estimates of blindness worldwide 458	surgical management 374
Hansen's disease treatment recommendations 468	vertical diplopia and 362, 365
promotion of awareness of Third World ophthalmology 468	Zygomaticotemporal suture
recommendations for vitamin A prophylaxis (table) 467	zygomaticomaxillary complex fractures and 371
SAFE strategy 463 simplified trachoma grading system (table) 461	
World Trade Center	
1993 bombing 422, 427	
September 11, 2001, bombing 422 World War I	
Army School of Ophthalmology established 9	
chemical agents 8, 125	
Civilian Consultant Service established 7	
development of aviation medicine 7	
Dr. Allen Greenwood's description of hospital conditions in	
France in 1918 18	
enucleation 20	
eye armor and 446	
fragmentation injuries 101	