

INDEX

- Aaslid, Rune, 330–332
 ABCD₂ score, 359–361
 Abciximab in Emergent Stroke Treatment Trial II (AbESTT-II), 461–462
 Abercrombie, John, 48–49, 52, 142–144, 175
 Abernathy, John, 529–530
 Abu Ali Al-Hossein Ibn Sina (Avicenna), 10–11
 on stroke, 14–16
 Abu Bakr Muhammed Ibn Zakria AlRazi (Rhazes), 11–12, 14–15
 Ackerman, Robert Harold, 347, 479–481
 actors and directors, stroke in, 614
 acute chest syndrome, 220–221
 acute neonatal stroke, 383
 acute stroke-ready hospitals, 393–394
 Adamkiewicz, Albert Wojciech, 85–86, 240
 Adams, Francis, 8
 Adams, John Quincy, 611–612
 Adams, Raymond
 on basilar artery occlusion, 129–130
 Caplan and, 283–285
 Princeton Conferences and, 413–414
 on stroke and coma, 269–270, 399
 on transient ischemic attacks, 131–132
 Adams, Robert J., 332–333
 Addison, Thomas, 58
 Aesculapius, 3–4
 agraphia, early research on, 76–78
 Aicardi, Jean François Marie, 380–381, 383
 Akbar Mahomed, Frederick, 465–467
 Alajouanine, T., 241–242
 à la poupée technique, 56
 Alauddin Abu al Hassan Ali ibn Hazmi (Ibn AlNafis), 12–13
 Albers, Greg, 554–555
 Alberta Stroke Program Early CT Score (ASPECTS), 309–311
 Albuscus. *See* AlZahrawi, AlQasim Khalaf Ibn AlAbbas (Albuscus)
 Alcott, Louisa May, 614
 alexia, early research on, 76–78
 alirocumab, 475
 alkaptouria, 212
 Allyn, William, 226
 alteplase, 496–497
 AlZahrawi, AlQasim Khalaf Ibn AlAbbas (Albuscus), 12–13, 15–16
 Alzheimer, Alois, 122–124
 Amarenco, Pierre, 356, 359–361, 475
 American Society of Neuroimaging, 333–334
 Aminoff, Michael, 244
 AMPA antagonists, excitotoxicity and channel blockers, 483
Anatomical Plates of the Bones and Muscles Reduced from Albinus, for the Use of Students in Anatomy, and Artists (Hooper), 56–57
 anatomical research
 by Bright, 58–59
 by Carswell, 57–61
 by Cruveilhier, 45, 59
 early history of, 22–24
 Foix's contributions to, 251–258
 history of, 55–57
 by Hooper, 56–57
 print technology and, 56
Anatomie des centres nerveux (Dejerine-Klumpke), 73
Anatomie pathologique du corps humain (Cruveilhier), 376–381
 Ancient Greece
 medical culture in, 3–4
 particulate theory in, 211
 Anderson, Carl, 340–341
 Anderson, Craig, 582
 Anderson, William, 221–222
 Andrew, Maureen, 384–385
 aneurysms. *See* intracerebral aneurysm (ICA); subarachnoid hemorrhage (SAH)
 angioplasty
 carotid artery, 537–538, 541–546
 intracranial arteries, 546–549
 Angrist, A., 134–135
 animal rights movement, neurorehabilitation and, 519–522
 anterior cerebral artery (ACA)
 Foix's research on, 254–255
 Moyamoya syndrome and disease, 193–196
 anterior choroidal artery (AChA)
 anatomy, 84–90
 Foix's research on, 255–257
 anti-apoptotic agents, 481–482

- anticoagulants. *See also specific drugs, e.g., heparin*
 clinical trials involving, 415, 421–422
 direct oral anticoagulants, 442–446
 intracerebral hemorrhage and reversal of,
 583–584
 transient ischemic attacks and, 131–132
 Antiphospholipid Antibodies and Stroke Study
 (APASS), 207
 antiphospholipid antibodies and syndrome,
 206–207
 antiplatelet therapy
 glycoprotein IIb/IIIa antagonists, 461–462
 intracerebral hemorrhage and reversal of,
 583–584
 overview of, 455–462
 phosphodiesterase inhibitors, 456–458
 thienopyridines, 458–461
 Antiplatelet Trialist's Collaborative, 418–419
 antithrombotics
 clinical trials of, 413
 heparin and, 431–432
 aorta
 border zones, spinal cord ischemia and, 242–243
 spinal cord ischemia and, 240–242
The Aphorisms of Hippocrates, 3–4
 apixaban, 444–445
 apoplexy
 Areteus of Cappadocia on, 7–8
 in children, 374–375
 defined, 358
 early writings about, 14, 157–158
 Hippocrates's description of, 4–5
 history of research on, 42–53
 Morgagni's description of, 38–40
 Paul of Aegenia on, 8
 Arafat, Yasser, 612
*Archiv für pathologische Anatomie und Physiologie und
 für klinische Medizin (Archives of Pathological
 Anatomy and Physiology and of Clinical Medicine)*,
 95
 ARCOS (Auckland Regional Community Stroke
 Study), 366
 Areteus of Cappadocia, 7–8
 Aring, Charles D., 261, 263–264
 Aristotle, 211
 on stroke, 14
 ARISTOTLE trial, 444–445
 Ameson, Barry, 287
 arterial dissection, 188–192
 arterial systems and arteries. *See also specific arteries*
 anatomy, 84–87
 artery of Adamkiewicz, 85–86
 artery of Bernasconi and Cassinari, 87
 artery of Percheron, 86–87
 arterial tortuosity syndrome, 222–223
 arteriosclerosis
 Osler's work on, 100–101
 Virchow's research on, 96–97
 arteriovenous malformations, 167–169. *See also*
 cavernous malformations (cavernomas)
 carotid cavernous fistulas, 599–601
 Cushing on, 591–593
 Dandy on, 591–593
 developmental venous anomalies, 599
 early recognition and treatment, 590–591
 Olivecrona's work in, 593–595
 spinal cord infarction and arteriovenous fistulas,
 243–244
 surgical management of, 591–593, 597
 twentieth-century research on, 595–598
 arteritis, early research on, 84–85
 Arthur, Chester, 611–612
 artificial radioactivity, positron emission
 tomography (PET) and, 340–341
 aspirin
 anticoagulants vs., 439–440
 Antiplatelet Trialist's Collaborative, 418–419
 cilostazole and, 457–458
 clinical trials and controversy over, 415–418
 clopidogrel (Plavix) vs., 459–460
 clotting prevention by, 449
 dipyridamole and, 455–457
 hemostasis and, 202–203
 and myocardial infarction, 449
 as preventive for thrombosis, heart attack, and
 stroke, 447–453
 production of, 449–450
 stroke prevention and, 452–453
 TIAs and, 131–132
 Asplund, Kjell, 365–366
 Asymptomatic Carotid Atherosclerosis (ACAS) trial,
 332–333, 536–537
 Asymptomatic Carotid Surgery Trial (ACST), 537
 ATACH (Antihypertensive Treatment of Acute
 Cerebral Hemorrhage) trial, 582
 atherosclerosis, blood lipids and, 471–475
 Atherosclerosis Risk in Communities (ARIC)
 study, 365–369
 atrial fibrillation
 anticoagulants and, 421–422, 437–438, 444–445
 brain embolism and, 274
 electrocardiography and, 354
 Auer, Ludwig, 404
 authors, stroke in, 614
 Averroes. *See* Ibn Ahmad Ibn Rushd, Mohammed
 (Averroes)
 Avery, Oswald Theodore, 213
 Avicenna. *See* Abu Ali Al-Hossein Ibn Sina
 (Avicenna)
 Babinski, Joseph Jules Francois Félix, 67–68, 75, 299
 Babinski-Nageott syndrome, 67–68, 75, 127–128
 Bach, Johann Sebastian, 615
 Bacon, Francis, 26, 38
 Bailey, Percival, 167–169
 Baird, John Logie, 613

- Baker, A. B., 397
 Baker, Donald, 328–329
 Balance, Charles, 590–591
 Banker, Betty, 376–380
 Banks, Gordon, 287
 Banting, Fredrick G., 318, 469–470
 Barber, Philip, 309
 Barinagarmenteria, Fernando, 180–181, 183–185
 Barnard, Robin, 244
 Barnett, Henry Joseph Macaulay, 416–417, 422–423, 533–534
 Baron, Jean-Claude, 347–348, 479–481
 Barritt, D. W., 437–438
 Barrows, Lawrence, 438
 Barsan, Bill, 496–497
 Basch, Samuel Siegfried Karl Ritter, 465–467
 basilar artery occlusion, 129–132
 fibrinolytic infusion, 551–552
 warfarin and, 439
 Bastian, Henry Charlton, 239
 Bateson, William, 212
 Batjer, H. H., 595
 Bayer company, 449–450
 Bayle, Francois, 44, 109
 Beach, Kirk, 331
 Beatles, computed tomography and, 305–308
 Beck, Claude, 398
 Becker, D. P., 400–401
 Beecher, Henry, 397, 399
 Beevor, Charles Edward, 82–83
 Beevor's sign, 83
 Benedikt, Moritz, 69–70
 Benedikt syndrome, 127–128
 Berg, Paul, 213–214
 Bernasconi, Vittorio Luigi, 87
 Bertina, Roger, 203–204
 Bertrand, Ivan, 252
 Best, Charles H., 318, 429–430, 469–470
 beta-blockers, 467
 Bierman, William, 516
 Bigelow, W. G., 485–487
 Billau, Alfons, 494–495
 Binswanger, Otto, 122–124
 Binswanger disease, 122–124, 216–218
 Biuni, Francesco, 144, 562–563
 Bizzozero, Giulio, 202
 Black, James, 467
 Blackwell, Elizabeth, 612–613
 Blane, Gilbert, 144
 Bleich, Howard, 285
 Bloch, Felix, 313
 Bloch, Konrad, 471–472
 blood disorders
 antiphospholipid antibodies and syndrome, 206–207
 brain hemorrhage with, 208
 clinical research on, 201–203
 early studies, 200–201
 factor V Leiden, 203–204
 hyperhomocysteinemia, 205–206
 inherited thrombophilias, 203
 prothrombin gene mutation, 204
 blood-letting, practice of, 25–26
 blood lipids, 471–472
 blood pressure
 intracerebral hemorrhage and control of, 582
 stroke and, 465–467
 Boehringer-Ingelheim Pharmaceuticals, 456–457
 Bond, J. P., 355–356
 Bonetus, Theophilus, 38
 Bonita, Ruth, 366
 Booth, Edwin, 614
 border-zone ischemia, 112–113
 Borel, Cecil, 402–404
 Born, Gustav Victor Rudolf, 455–457
 Botticelli, Sandro, 22
 Bottomley, Paul, 319–320
 Bouchard, Charles, 158–159
 Boussier, Marie-Germaine, 179, 183–185, 216–218, 508–509
 Boyle, Robert, 32–33
 Boyle's law, 32–33
 brachial plexus palsy, 73–74
 brain, anatomy and vasculature of, 31–36
 Brain, Russel (Lord), 102
 Brain Attack Coalition (BAC), 393–394
 brain function, PET imaging studies, 347–348
 brain injury, diagnosis and management, neurocritical care and, 399–405
 brainstem. *See also specific conditions, e.g., lateral medullary infarction*
 early research on, 45–46, 75–79
 Foix's research on, 253–254
 posterior circulation research, 127–128
 vasculature, 87
 brain-time continuum, 479–481
 brain tumors, early research on, 60–61
 Bramwell, Byrom, 240–242
 BRAVO trial, glycoprotein IIb/IIIa antagonists, 462
 Bright, Richard, 58–59, 99–101, 142–144, 465–467
 Bright, William, 144
 Bright's disease, 58
 Brink, R. A., 435–436
 Brissaud, Édouard, 251
 British Doctors Study, 366
 Broderick, Joe, 163, 372, 422, 496–497
 Brooks, Barney, 570
 Brott, Tom, 163, 372, 422–423, 496–497, 545–546
 Brown, Michael S., 472–475
 Brownell, Gordon, 344–345
 Brozovic, Milica, 430–431
 Bruce, A. N., 101–103
 Bruckmann, Helmet, 495–496
 Brunel, Isambard Kingdom, 612
 Buchan, Alastair, 309, 479–481
 Buchner, Johann Andreas, 448

- Budd-Chiari syndrome, 110
 Bumke, O., 103
 Burrows, Gregory, 49–50
- Cairns, Hugh, 534
 calcium channel blockers
 excitotoxicity and, 482–483
 subarachnoid hemorrhage, 148–149
 Call, Greg, 196–197
 Call-Fleming syndrome, 196–197
 Canadian Cooperative Study Group trial, 416
 Canadian Pediatric Ischemic Stroke Registry,
 182–183, 384–385
 Candelise, Livia, 420–421
 candidate gene studies, stroke genetics and, 214–215
The Canon of Medicine (al-Qanun fi'l tibb) (Avicenna),
 10–11, 15–16
 Cantu, Carlos., 180–181
 Caplan, Louis R.
 carotid artery disease research and, 115–116
 Harvard Cooperative Stroke Registry and, 371
 lacunar infarct research and, 121–124, 271–272
 life and work of, 280–290
 thrombolytic therapy research and, 495–496
 vascular imaging and, 497–500
 cardiac computed tomography, 356
 cardiac magnetic resonance imaging, 356
 cardiopulmonary disease
 subarachnoid hemorrhage and, 149–150
 thrombolytic therapy and, 492–493
 cardiopulmonary resuscitation, neurocritical care
 and, 398
 cardiovascular disease
 anticoagulant therapy and, 437–438
 blood lipids and, 471–475
 hypertension and, 466–467
 imaging and function, 352–356
 intensive care units and mortality reduction in,
 398–399
 CARESS trial, 332–333
 “carotico-vertebral” stenosis, 129–130
 carotid angiography, 570–571
 carotid artery disease
 acute carotid stroke mechanisms, 114–115
 arterial dissection, 189–190
 chronic eye ischemia, 232–233
 diagnosis of, 530
 Fisher’s research on, 269, 273
 hemodynamic vs. embolic mechanisms, 113–114
 historical research on, 109–113
 mid-twentieth-century research on, 111–113
 pulse palpation and auscultation, 115–116
 stenosing and nonstenosing lesions,
 116–117
 surgical management of, 529–538
 Wepfer’s research on, 43
 carotid artery surgery
 asymptomatic patients, 536–537
 early history of, 529–533
 endarterectomy vs. stenting, 537–538
 intracranial aneurysms, 564
 ligature and clamping, 564–565
 recent developments in, 533–534
 severity of stenosis and, 534–536
 carotid bruit, early descriptions of, 65
 carotid cavernous fistula, 530, 599–601
 Carotid Revascularization Endarterectomy versus
 Stenting Trial (CREST), 537–538, 545–546
 Carrea, Raul, 531
 Carswell, Robert, 56–61
Case Histories (Rufus of Ephesus), 7
 Cas9 (CRISPR-associated protein 9), 214
 Casserio, 34
 Cassinari, Valentino, 87
 catastrophic antiphospholipid syndrome (CAPS),
 207
 Catherine the Great, 612
 CAVATAS stent trial, 545
 cavernous malformations (cavernomas), 169–170
 carotid cavernous fistula, 530
 research on, 598–599
 spinal cord infarction and, 245–246
 cellular intervention, neuroprotection and, 484–485
 cellular targets, neuroprotective interventions,
 481–482
 Celsus, Aurelius Cornelius, 6
 cerebellar hemorrhage, 134–135
 cerebral amyloid angiopathy (CAA), 151–152,
 163–164
 genetics, 223
 cerebral anemia, 102–103
 cerebral angiography (CA)
 arterial dissection, 190
 carotid artery imaging, 530
 cerebral vein and dural sinus thrombosis,
 177–179
 early developments in, 110–111
 fibromuscular dysplasia, 192–193
 pediatric stroke and, 380–385
 subarachnoid hemorrhage, 144–145
 cerebral autosomal dominant arteriopathy with
 subcortical infarct and leukoencephalopathy
 (CADASIL), 124, 216–218, 508–509
 cerebral autosomal recessive arteriopathy with
 subcortical infarct and leukoencephalopathy
 (CARASIL), 124, 218–219
 cerebral blood flow (CBF)
 energy metabolism and, 342–344
 Harvey’s discovery of, 25–29
 imaging studies, 338–349
 neuroprotection and improvement of, 484–485
 physiology of, 338–340
 posterior circulation research, 127–128
 spinal cord infarction and, 240
 cerebral embolism, Virchow’s research on, 96–97
 cerebral glucose utilization, PET research and, 344

- cerebral hemorrhage
 Aring and Merritt's research on, 263
 Fisher's research on, 272–273
- cerebral hyperemia, 102–103
- cerebral leukodystrophy, 219–220
- cerebral vein and dural sinus thrombosis (CVDST), 174–185
 cerebral angiography, 177–179
 computed tomography, 179
 diagnosis, 176–177
 early research on, 175–176
 imaging studies, 181–182
 ISCVT study on, 183–185
 recent research on, 182–183
- Cerebral Venous Sinus Thrombosis Study Group, 182–183
- cerebral venous thrombosis
 anticoagulant therapy for, 437–438
 blood disorders and, 200–201
 in children, 378–385
 decompressive hemicraniectomy, 511
 direct oral anticoagulant therapy, 511–512
 factor V Leiden, 203–204
 heparin in management of, 429–430, 506–509
 low-molecular-weight vs. unfractionated heparin, 510
 prothrombin gene mutation, 204
 thrombolytic and endovascular treatment, 510–511
 treatment of, 505–512
- Cerebri anatome cui accessit nervorum descriptio et usus* (*The Anatomy of the Brain and Nerves*), 34
- cerebrovascular accident (CVA), defined, 359
- cerebrovascular disease
 cardiac imaging and function and, 352–356
 in children, 380–385
 eye involvement in, 234–235
 PET imaging studies, 347–348
 Princeton Conferences and classification of, 414
 spinal cord infarction and, 238–246
 thrombolytic therapy in, 495–496
 visual loss and, 226–235, 268–269
- cervical artery dissection, 273–275
- CGS19755 NMDA antagonist, 482–483
- Chabriat, Hugues, 218
- Champlain, Samuel de, 612
- CHANCE trial (clopidogrel and aspirin), 459–460
- channel targets, neuroprotection and, 482–483
- Chao, W. H., 530
- Chaplin, Charlie, 614
- Charcot, Jean-Martin, 74–75, 81–82, 119
 on intracerebral hemorrhage, 158–159
 textbooks by, 103
- Chargaff, Erwin, 213, 430
- Charles, Arthur F., 429
- Charpentier, Emmanuelle, 214
- Cheyne, John, 46–47, 133, 142–144, 158–159
- Chiari, Hans, 110, 530
- Chiari malformations, 110
- childhood hemiplegia, 380–385. *See also* pediatric stroke
- Childs, T., 134–135
- Chimowitz, Mark, 421–424, 547–549
- Chinese Acute Stroke Trial (CAST), 419
- Chisholm, Shirley, 612
- cholesterol
 atherosclerosis and, 471–472
 lipoprotein metabolism and, 472
 statins and reduction of, 475
- chronic adhesive arachnoiditis, spinal cord infarction and, 245–246
- chronic eye ischemia, 232–233
- Chung, C.-S., 135–136
- Chung, M.-F., 239–240
- Churchill, Winston, 611–623
- cilostazole, 457–458
- Circle of Willis, 34
- circulation of blood
 cerebral blood flow imaging, 338–349
 Harvey's discovery of, 25–29
 posterior circulation research, 127–128
 spinal cord infarction and, 240
- Clarke, Emilia, 622–623
- Claude syndrome, 127–128
- clinical trials in stroke research. *See also specific trials*
 anticoagulant trials, 415, 421–422
 antiplatelet collaborative trials, 418–419
 aspirin trials, 415–418, 452–453
 evidence-based medicine and, 420–421
 heparin trials, 415, 429–430
 intracranial intervention procedures, 423–424
 neuroprotection trial protocols, 484–485
 overview of, 413–424
 Princeton conferences, 413–414
 surgical trials, 422–423
 thrombolytic trials, 422
 warfarin trials, 438–440
- clopidogrel (Plavix), 459–460
- Clopidogrel and Aspirin versus Aspirin Alone for the Prevention of Atherothrombotic Events (CHARISMA) trial, 459–460
- Clopidogrel versus Aspirin in Patients at Risk of Ischemic Events (CAPRIE) trial, 459–460
- Clot Lysis Evaluation of Accelerated Resolution of Intraventricular Hemorrhage (CLEAR-III) trial, 403
- CLOTBUST trial, 332–333
- clotting. *See also* blood disorders
 animal studies of, 435–436
 antiplatelet therapy, 455–462
 aspirin's inhibition of, 449
 clinical research on, 201–203
 early research on, 45, 95–96, 200–201
- coagulation
 animal studies of, 435–436
 clinical research on, 201–203

- coarctation of aorta, spinal cord lesions, 241–242
- Cochrane, Archie, 420–421
- Cochrane Stroke Group, 420–421
- Coga, Arthur, 33
- Cogswell, Mason, 563
- Cohn, Alfred, 353
- Colbert, Claudette, 614
- Cole, F., 162
- Cole, William, 44–45, 358–359
- collagen 4A1 (COL4A1) syndrome, 220
- collateral circulation
- carotid artery disease, 111–115
 - early research on, 34
- Collen, Désiré, 493–495
- Coller, Barry Spencer, 461–462
- Collins, Francis S., 214
- Collip, James B., 318, 469–470
- coma, stroke and, 271
- diagnosis and management, neurocritical care and, 399–405
- comprehensive stroke center (CSC), 393–394
- Compston, Alistaire, 83
- computed tomography (CT)
- brain injury assessment and, 399–401
 - cardiac CT, 356
 - cerebral vein and dural sinus thrombosis, 177–179, 181–182
 - EMI Mark I development, 307–308
 - evolution of, 308–309
 - history of, 304–311
 - intracerebral hemorrhage, 163
 - subarachnoid hemorrhage, 144–145
- computed tomography angiography (CTA), 132–137, 302–303
- arterial dissection, 190
 - development of, 309–311
- Conley, John, 530
- connective tissue, inherited disorders of, 222–223
- Connors, Buddy, 547
- constraint-induced movement therapy (CIMT), 519–522
- Cooke, John, 47–48
- COOLAID trial, 485–487
- Cooley, Denton, 532–533
- Cooper, Astley, 58, 238–239, 529–530, 563
- Cooperative Clinical Study of Anticoagulant Therapy in Cerebral Thromboses and Transient Ischemic Attacks, 415
- Cooperative Study of Intracranial Aneurysms and Subarachnoid Hemorrhage, 168–169, 595
- Cope, Freeman Winder, 313–316
- Cormack, Allan M., 305–308
- corticosteroid therapy, intracerebral hemorrhage, 577–578
- Coulter, John S., 516
- coumadin, synthesis of, 437–438, 442–446
- coumarin, isolation and synthesis, 436–437
- Courville, Cyril, 379–380
- Crafoord, Clarence, 429–430
- craniotomy
- arteriovenous malformations, 590–591
 - intracerebral hemorrhage, 579–580
- Craven, Lawrence L., 449
- Crawford, Broderick, 614
- Crick, Francis, 213
- CRISPER (clustered regularly interspaced short palindromic repeats), 214
- Crompton, M. R., 147–149
- Crowell, Robert, 348
- Cruveilhier, Jean, 45, 56, 59, 94–96, 120, 176–177, 376–381
- Cukor, George, 614
- cupping, practice of, 26
- Curie, Marie, 340–341, 355–356
- Curie, Pierre, 340–341, 355–356
- Cushing, Harvey, 60–61, 138–142, 167–169, 564, 566, 591–593
- Cushing-McKenzie clip, 566–569
- cyclic guanosine monophosphates (cGMP), vascular pathology and, 456–457
- dabigatran etexilate, 443–445
- Dahlbäck, B., 203–204
- Dalsgaard-Nielsen, T., 370
- Dalziel, John, 397
- Damadian, Raymond, 313–318
- Dana, Charles Loomis, 103, 133, 159
- Dandy, Walter, 167–169, 298–299, 304–305, 397, 566–568, 591–593, 595–599
- Darwin, Charles, 212
- data banks and registries of stroke research, 370–372
- Davalos, A., 497
- Davis, Steve, 422, 493, 497
- Dawber, Thomas, 364–365
- Deaver, George, 518
- DeBakey, Michael, 532–533
- Debrun, Gerard, 600–601
- Dechambre, Amedée, 120
- decompressive hemicraniectomy, 400–401
- arteriovenous malformations, 590–591
 - cerebral venous thrombosis, 511
 - intracerebral hemorrhage, 584–585
 - for malignant hemispheric stroke, 404
- deferroxamine, intracerebral hemorrhage management, 578
- defibrillation, neurocritical care and, 398
- A Definition of Irreversible Coma* (Adams, Schwab, Denny-Brown, and Beecher), 399
- De humani corporis fabrica* (Vesalius), 22–24
- Dejerine, Jules Joseph, 72–79, 239–240
- Dejerine-Klumpke's paralysis, 73–74
- Dejerine-Roussy syndrome, 74–76
- Dejerine-Sottas disease, 74–75
- Dejerine-Thomas olivopontocerebellar atrophy, 74–75
- Dejong, Russell, 612–613

- delayed cerebral infarction (DCI), 147–149
 Del Zoppo, Greg, 401–402, 495–496
 Demchuk, Andrew, 309
De medicina (Celsus), 6
 Denier, André, 355–356
 Dennis, Martin, 420–421
 Denny-Brown, Derek, 132, 283–285, 399
 2-deoxyglucose (DG), PET research and, 344
 Derdeyn, Colin, 423–424, 547–549
 Derouesné, Christian, 120–121
De sedibus et causis morborum per anatomen indagatis
 (Morgagni), 38–40, 55
 DESTINY trial, 404
 DeVeber, Gabrielle, 182–183, 383–384
 developmental venous anomalies (DVAs), 170–171,
 599
 De Vries, Linda, 384
 DeWitt, Dana, 288
 DeWood, Marcus, 493
 diabetes
 Areteus of Cappadocia on, 7–8
 early research, 467–469
 insulin and, 469–470
 Osler's work on, 100
 stroke and, 467–471
Diagnosis of Stupor and Coma (Plum and Posner), 399
 diaschisis theory, 347–348
 Di Chiro, Giovanni, 243–244
 Dickens, Charles, 614, 620–621
Die Infantile Cerebrallähmung (Infantile Cerebral
 Paralysis) (Freud), 378
 Diemer, N. H., 479–481
 diffusion-weighted imaging (DWI), 320–322
 Diggs, Lemuel, 220–221
 digital subtraction angiography (DSA), 145, 302–303
 dipyridamole, 456–457
 direct oral anticoagulants (DOACs), 442–446,
 511–512
 intracerebral hemorrhage and reversal of
 hematoma expansion, 583–584
 disconnection syndrome, early research on, 76–78
*Diseases of the Brain and Nervous System Together with
 a Concise Statement of the Diseased Appearance of
 the Brain and Its Membranes* (Bright), 58
Diseases of the Spinal Cord (Bramwell), 240–242
 diving medicine, ultrasound research and, 327
 DNA, genetics research and, 213
 “doctrine of signatures,” 447–449
 Doidge, Norman, 520–521
 Doll, Richard, 534
 Donaghy, Raymond M. P., 569–570
 Donnan, Geoffrey, 422, 493, 497
 dopaminergic agents, stroke rehabilitation, 525
 Doppler, Christian Andreas, 325–326
 Doppler effect, 325–326
 echocardiography and, 355–356
 Doppman, J. L., 243–244
 Dos Santos, Cid, 531
 Dott, Norman, 565–566
 Doudna, Jennifer, 214
 Douglas, Stuard, 420–421
 Drake, George Charles, 416–417, 534, 568–569
 Dreser, Heinrich, 449–450
 Drinker, Philip, 397
 Dupuytren, Guillaume, 59
 dural arteriovenous fistulas (DAVFs),
 151–152, 171
 dural venous sinus thrombosis, warfarin and, 440
 Durand-Fardel, Maxime, 120
 Duret, Henri, 65, 81–82, 129
 Duret hemorrhages, 81–82, 133–134
 Dussik, Friedrich, 326
 Dussik, Karl Theodore, 326
 Dutrochet, René, 211
 Duvernoy, Henry M., 87
 Duvernoy, Maurice, 87
 DWI or CTP Assessment with Clinical Mismatch in
 the Triage of Wake-Up and Late Presenting
 Strokes Undergoing Neurointervention with
 Trevi (DAWN) trial, 557–558
 Eastcott, H., 531
 Easton, J. Donald, 421–422
 Ebers Papyrus, 447, 562–563
 echocardiography, 355–356
 edaravone, 483–484
 Edelman, Robert, 321
 Edinburgh stroke group, 420–421
 Edison, Thomas, 304
 Edler, Inge, 355–356
 edoxaban, 444–445
 Ehlers, Hertha, 379–380
 Eichengrün, Arthur, 449–450
 Einhäupl, Karl Max, 179, 183–185, 507, 509
 Einthoven, Willem, 353
 Eisenhower, Dwight D., 437–438, 612
 electrocardiography, development of, 353–354
 electroencephalography, 598–599
 early research in, 327
 electrolyte abnormalities, subarachnoid
 hemorrhage, 149–150
 electrothrombosis, 573–574
 Eloy, Fernand, 458–459
 embolism
 anticoagulant therapy for, 437–438
 atrial fibrillation and, 274
 blood disorders and, 200–201
 carotid artery disease and, 111–114
 early research on, 50–51, 65–66
 embolic device filters, 544
 heparin efficacy in, 431–432
 Osler's work on, 100–101
 placental, 380–385
 strokes and, 114–115
 ultrasound detection of, 327
 Virchow's research on, 96–97

- emergency medicine, stroke management and, 497–500
- EMI Mark I CT, 307–308
- encephalitis subcorticalis chronica progressive (ESCP), 122–124
- Endo, Akira, 472–475
- endocrine abnormalities, subarachnoid hemorrhage, 149–150
- endovascular therapy (EVT)
 cerebral venous thrombosis and, 510–511
 early history, 551–552
 evolution of, 553–554
 intracerebral aneurysm, 570–574
 ischemic stroke, 551–558
 mechanical thrombectomy, 555–558
 randomized controlled trials involving, 552–553
 stent retrieval, 554–555
 treatment time window expansion, 557–558
- Endovascular Treatment for Small Core and Anterior Circulation Proximal Occlusion with Emphasis on Minimizing CT to Recanalization Times (ESCAPE) trial, 556–557
- energy metabolism, cerebral blood flow and, 342–344
- ENGAGE trial, 444–445
- Ensor, Frederick, 449
- epidemiology of stroke, 364–367
 early research on, 51–53
- epidural hemorrhage, early research on, 49
- EQUATOR website, 420–421
- Erichsen, John E., 240
- Escourolle, Raymond, 612–613
- ESCPE NA-1 trial, 484–485
- European Carotid Surgery Trial (ECST), 535
- European Cooperative Acute Stroke (ECASS) trials, 308–309, 422
 thrombolytic therapies, 497
- European Society of Neurosurgery and Cerebral Hemodynamics (ESNCH), 333–334
- European Stroke Prevention Studies (ESPS-1 and ESPS-2), 418, 457
- Evelyn, Kenneth, 266
- evidence-based medicine, 420–421
- evolocumab, 475
- evolution, genetics and, 212
- excitotoxicity, neuroprotection and, 482–483
- Experiments in Plant Hybridization* (Mendel), 212
- “Experiments upon the Blood and Lymph of the Terrapin, and the Origin of the Fibrin Formed in the Coagulation of the Blood” (Howell), 427–429
- Extending the Time for Thrombolysis in Emergency Neurological Deficits with Intra-Arterial Therapy (EXTEND-IA) trial, 556–557
- extracranial cervical vertebral arteries (ECVAs), 190
- extracranial to intracranial artery bypass (EC-IC bypass), 569–570
- eye, cerebrovascular disease and. *See also* visual loss, vascular disease and
 chronic eye ischemia, 232–233
 early research, 226
 Fisher and Hollenhorst’s research on, 228–230, 268–269, 275–276
 giant cell arteritis, 234–235
 Gowers’s research on, 226–229
 ischemic optic neuropathy, 234–235
 retinal vascular spasm, 233–234
 Russell’s research on, 230–232
- Fabricius, Johannes, 38, 42
- Fabry, Johannes, 221–222
- Fabry’s disease, 221–222
- factor VIII, 202–203
- factor V Leiden disease, 203–204
- factor Xa, new oral anticoagulants (NOACs) and, 443–445
- Fallopian, Gabriel, 34, 38
- familial hypercholesterolemia, 473–474
- family history, genetics, 150–151
- Fang, Henry, 414, 438
- al-Farabi, 10–11
- Fay, Temple, 401
- Feigin, Valery, 367
- Feldman, R. L., 547
- Fellini, Federico, 614, 621–622
- Ferbert, Andreas, 495–496
- Ferguson, Robert, 541–542
- Ferrand, J., 119–120
- Ferriero, Donna, 384
- Ferro, José, 182–185, 509
- fetal circulation, pediatric stroke and, 376–380
- fibrin, 201–203, 491
- fibrinogen, 200–201, 491
- fibrinolytic infusion, 551–552
- fibromuscular dysplasia (FMD), 192–193
- Fields, William Straus, 266, 272–275, 416–417, 532–533
- Fieschi, Cesare, 422, 497
- Fillmore, Millard, 611–612
- Fisher, C. Miller
 anticoagulant trials and, 415
 on arterial dissection, 189–190
 on basilar artery occlusion, 129–130
 Caplan and, 283–285, 288
 carotid artery disease research, 109, 111–113, 115–117, 530
 on cerebellar hemorrhage, 134–135
 on coma, 399
 on delayed cerebral infarction and vasoconstriction, 147–149
 early research by, 36
 Foix compared with, 258
 on hypertension and intracerebral hemorrhage, 160–162
 lacunar infarct research by, 120–121

- life and career of, 265–276
 Princeton Conferences and, 413–414
 on reversible cerebral vasoconstriction syndrome,
 196–197
 on thalamic hemorrhages, 135–136
 on transient ischemic attacks, 359–361
 on visual loss in vascular disease, 228–230
 warfarin research and, 438
- Fitch, T. S., 551–552
- Fizeau, Armand Hippolyte Louis, 325–326
- Flaenius, Rufus, 562–563
- Fleming, David, 529–530
- Fleming, Marie, 196–197
- Flemming, K. D., 169–170
- flow-directed embolization, arteriovenous
 malformations, 596–597
- fluid abnormalities, subarachnoid hemorrhage,
 149–150
- fluid-attenuated inversion recovery (FLAIR)
 imaging, 320–322
- 2-[¹⁸F] fluoro-2-deoxy-D-glucose (FDG) PET,
 344, 349
- focal ischemic stroke models, 479–481
 cellular targets, 481–482
- Foerster, O., 103
- Foix, Charles, 83–84, 101, 129, 251–258
- Foix-Alajuanine syndrome, 258
- Foix, Chavany, Marie syndrome, 258
- Ford, Frank, 378–379
- Ford, Gerald, 611–612
- Ford, Henry, 613
- For One without a Doctor (Man la Yahduruhu al-Tabib)*
 (Rhazes), 11–12
- 4VO stroke model, 479–481
- Foville, Achille Louis, 68–69
- Foville syndrome, 127–128
- Fowler, Joanna, 344
- Framingham Study, 364–365, 471–475
- Frankel, Mike, 496–497
- Franklin, D. L., 326
- Franklin, Rosalind Elsie, 213
- Fraser, J. S., 175–176
- free radical hypothesis, neuroprotection and,
 483–484
- Frei, E. H., 570–571
- fresh frozen plasma (FFP), intracerebral hemorrhage
 and reversal of hematoma expansion, 583–584
- Freud, Sigmund, 378
- Froin, George, 141
- frontal artery sign, 115–116
- Froriep, Robert, 95–96
- Fukutake, Toshio, 218–219
- Fulton, John, 339–340
- Furlan, Anthony, 232–233, 422, 495–496
- Fuster, Valentin, 116–117
- gadolinium compounds (Gd-DPTA), MRA and,
 321–322
- Gaines, Ken, 496–497
- Galen, 562–563
 Circle of Willis and, 34
 on circulation, 29
 Greco-Roman medical tradition and, 7
 humoral theory of, 25, 37
 on stroke, 14
- Galvani, Luigi, 353
- Garcin, Marie Mathieu Jean Raymond, 174,
 176–177, 241–242, 380–381
- Garland, Hugh, 241–242
- Garrod, Archibald E., 212
- Gaupp, J., 590–591
- Gautier, Jean-Claude, 230–232
- Geiger-Muller tube, 341–342
- Genentech, 495
- general paralysis of the insane (GPI), 122–124
- gene therapy, 213–214
- genetics. *See also specific genetic disorders*
 early research on, 211–214
 intracerebral aneurysm and, 150–151
 key developments in stroke genetics, 214–215
 stroke and, 211–223
- Gennarelli, Thomas A., 597
- genome-wide association studies (GWAS), stroke
 genetics and, 214–215
- genomics, 214
The Genuine Works of Hippocrates, 3–4
- Germany, ischemic stroke management in, 401–402
- Geschwind, Norman, 76–78, 283
- giant-cell arteritis, 234–235
- Gillilan, Lois Adele, 86
- Ginsberg, Myron, 481, 484–485
- Glasgow Coma Scale, 401–402
- glimepiride, 470
- glitazones, 470
- global ischemic stroke models, 479–481
 cellular targets, 481–482
 excitotoxicity and channel targets, 482–483
- glycoprotein IIb/IIIa antagonists, 461–462
- Golden, Gerry, 381
- Goldstein, Joseph, 472–475
- Gortner, Ross A., 435–436
- Gould, D. B., 220
- Gowers, William, 101–102, 109–110, 159, 226–229,
 239–240
- Goyal, Mayank, 554–555
- Grades of Recommendation Assessment,
 Development, and Evaluation (GRADE)
 System, 420–421
- gradient echo (GRE) sequencing, 320–322
- granulocyte-colony stimulating factor (G-CSF),
 525–526
- gray-scale imaging, development of, 328
- great spinal artery, 85–86
- Greco-Roman medical tradition, 6–8
- Greenberg, Steve, 163–164
- Griffith, Frederick, 213

- Grotta, Jim, 422, 496–497
 growth factors, stroke rehabilitation, 525
 Gruentzig, Andreas, 541
 Gruner, J., 241–242
 Gubler, Adolphe, 68–69
 Guglielmi, Guido, 573–574
 Guillain, Georges., 241–242
 Guillain-Barré syndrome, 399–400
 Gull, Withey, 144
 Guyatt, Gordon, 420–421
 “Guy’s Triumvirate,” 58
 Guyton, Arthur, 466–467
- Hackam, D. G., 116–117
 Hacke, Werner, 396–405, 422, 495–497, 500–501
 Hakim, Antoine, 479–481
 Haley, Clark, 422, 496–497
 Halliday, Allison, 422–423, 537
 Haly, Abbas, 14–15
 Hammond, William A., 103
Handbook on Diseases of the Nervous System (Beevor), 82–83
Handbuch der Physiologie (Handbook of Physiology) (Muller), 94–95
 Hankey, Greame, 420–421
 Hanley, Daniel F., 396, 402–405, 580–581
 Hardy, Godfrey Harold, 212
 Hardy-Weinberg equilibrium, 212
 Harrison, Tinsley R., 101
 Hart, Robert, 421–422
 Harvard Cooperative Stroke Registry, 371
 Harvey, William, 24, 612–613
 circulation research of, 25–29
 early life and training, 26–27
 Hayreh, Sohan S. S., 234–235
 HeADDFIRST trial, 404
 Hedges, Thomas Reed, Jr., 232–233
 Heiss, Wolf-Dieter, 348, 479–481
 hematology, pediatric stroke and, 384–385
 hematoma expansion, 163
 intracerebral hemorrhage and control of, 581–585
 hematoma resolution, intracerebral hemorrhage, 579–581
 hemicraniectomy. *See* decompressive hemicraniectomy
 hemorrhagic stroke
 early descriptions, 14–15, 57–62
 early research on, 60–61
 hemostatic agents, intracerebral hemorrhage, 582–583
 Hennerici, Michael., 130–131, 497
 heparin
 antidote development, 430
 clinical trials involving, 415, 429–430
 discovery and production of, 427–429
 efficacy of, 431–432
 history of research on, 427–433
 isolation and synthesis of, 436–437
 low-molecular-weight variant, 430–432, 510
 venous thrombosis and, 429–430, 506–509
 “Heparin and Thrombosis of Veins Following Injury” (Murray and Best), 429–430
 hepatotoxicity, direct oral anticoagulants and, 443–444
 Hereditary Cerebral Haemorrhage with Amyloidosis (HCHWA), 223
 Hereditary Endotheliopathy with Retinopathy, Nephropathy and Stroke (HERNS), 219–220
 hereditary vascular retinopathy (HRV), 219–220
 heredity, early research on, 211–214
 heroin, production of, 449–450
 Heros, Roberto C., 244, 596
 Herrick, James, 220–221
 Hertz, Hellmuth, 355–356
 Hess, Robert M., 145–147
 Heubner, C. F., 436–437
 Heubner, Johann Otto, 84–85, 376–377
 Heubner’s arteritis, 245
 Heyman, Albert, 414, 438
 Heynecker, Herb, 495
 Hier, Dan, 287
 Highly Effective Reperfusion Evaluated in Multiple Endovascular Stroke Trials (HERMES) collaboration, 556–557
 Hill, Leonard, 339–340
 Hill, Michael, 309, 484–485
 Hillemand, P., 253–255
 Hiller, Friedrich, 103
 Hippocrates, 6–8, 142–144, 157–158, 358, 478–479
Historia anatomica de puella sine cerebro nata (Wepfer), 43
 Hobbes, Thomas, 26
 Hobson, Robert, 422–423, 545–546
 Hodgkin, Dorothy, 613
 Hodgkin, Thomas, 57–62
 Hodgkin’s disease, 57–62
 Hoff, Julian T., 577–578
 Hoffman, E. J., 345–347
 Hoffmann, Felix, 449–450
 Hogan, Ben, 615–616
 Hollenhorst, Robert, 112, 230, 232–233
 Holt, Luther Emmett, 378
 Holt, T. Emmett, 429
 Holter, Norman Jeff, 354
 Homer, 3–4, 157–158
 homocysteine, atherothrombosis and, 205–206
 homocystinuria, 222–223
 Hooke, Robert, 33, 211
 Hooper, Robert, 56–57
 Hope, James, 56
 Horner’s syndrome, 232–233
 Horsley, Victor, 563–564
 Horton, Bayard Taylor, 235
 Hounsfield, Godfrey N., 305–308
 Hounsfield scale, 307–308

- Howell, William Henry, 427–429, 434–435
HTRA1 gene, CARASIL and, 218–219
 Hultquist, G. T., 111
 human extrinsic plasminogen activator, 494–495
 Human Genome Project, 214
 humoral theory, 25–26
 Hunt, James Ramsay, 110
 Hunt, William, 145–147
 Hunt and Hess SAH classification, 145–147
 Hunter, John, 45, 93–94, 144, 563
 Hunter, William, 93–94, 167–169
 Hutchinson, E. C., 129–130
 Hutchinson, Jonathan, 234–235
 Hutinel, V. H., 175–176
 hydrocephalus, 33
 subarachnoid hemorrhage and, 149–150
 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase inhibitor, hyperlipidemia and, 472–475
 hypercoagulation, blood disorders and, 200–201
 hyperhomocysteinemia, 205–206
 hyperlipidemia
 stroke risk and, 471–475
 treatment of, 472–475
 hypertension
 early research on, 99–101
 fibromuscular dysplasia, 192–193
 intracerebral hemorrhage and, 163–165
 stroke and, 465–467
 treatment of, 466–467
 hypertensive encephalopathy, early research on, 38–40
 hypotension, spinal cord ischemia and, 242–243
 hypothermia
 history of, 478–479
 neuroprotection and, 485–487
 stroke management and, 401
 Hypothermia after Cardiac Arrest trial, 401

 Iadecola, Constantino, 479–481
 Ibn Ahmad Ibn Rushd, Mohammed (Averroes), 12–13, 15–16
 Ibn AlNafis. *See* Alauddin Abu al Hassan Ali ibn Hazmi (Ibn AlNafis)
 Ibn Qayyam Al-Juzziyi, 10
 Ibsen, Bjørn, 397
 Ichord, Rebecca, 384
 ICTuS 2 trial, 485–487
 idarucizumab, 445
 Iles, Thomas, 31
 image-based stroke therapy, 499
 Imhotep, 562–563
 inborn errors of metabolism, 212
 induced hypothermia, traumatic brain injury and, 401
 infection, childhood hemiplegia and, 378–380
 inflammation, early research on, 94–96
 Ingram, Vernon, 220–221

 Ingvar, David H., 343, 479–481
 Ingvar, Martin, 479–481
 inherited thrombophilias, 203
 Institute of Applied Physiology and Medicine (IAPM), 327, 329
 insulin
 discovery of, 318, 469–470
 resistance, 470–471
 intensive care units (ICUs), neurocritical care and, 391–392, 396–399
 ischemic stroke in, 401–402
 INTERACT (Intensive Blood Pressure Reduction in Acute Cerebral Hemorrhage) trial, 582
 intermittent cerebral claudications, 110
 internal medicine
 early textbooks on, 99–101
 textbooks on, 101
 international normalized ratio (INR), anticoagulants and, 442–446
 International Pediatric Stroke Study (IPSS), 383–385
 International Stroke Genetics Consortium (ISGC), 215–216
 international stroke organizations and publications, 608–609
 International Stroke Trial (IST), 419
 International Study on Cerebral Vein and Dural Sinus Thrombosis (ISCVT), 183–185, 509
 interventional radiology, heparin use in, 432–433
 intervertebral disk material, spinal cord infarction and, 245
 intraarterial thrombolysis, 500–501
 intracerebral aneurysm (ICA)
 demography, epidemiology, family, and genetic information with, 150–151
 early research on, 144
 early treatment of, 563–568
 electrothrombosis, 573–574
 endovascular treatment, 570–574
 microneurosurgery, 569–570
 recognition of, 562–563
 surgery and clipping, 567–569
 twentieth-century research on, 138–142
 intracerebral hemorrhage (ICH)
 anticoagulant/antiplatelet reversal, 583–584
 blood pressure control, 582
 critical care of, 402–404
 decompressive hemicraniectomy, 584–585
 early research on, 38–40, 46–47, 157–158
 hematoma expansion control, 581–585
 hematoma resolution, 579–581
 hemostatic agents, 582–583
 hypertension and, 163–165, 466–467
 imaging studies, 163
 nineteenth- and early twentieth-century research on, 158–159
 Osler's work on, 100–101, 159
 parenchymal effects, 577–578
 treatment overview, 577–585

- intracerebral hemorrhage (ICH) (cont.)
 Wepfer's research on, 43–44, 158–159
- intracranial arteries
 angioplasty and stenting, 546–549
 Bayle's research on, 44
 dissections, 191–192
 early research on, 65–66
 Moyamoya syndrome and disease, 193–196
 surgery on, 529–538
 thrombolytic therapy for occlusion in, 495–496
 transcranial ultrasound of, 330–332
 Wepfer's research on, 43
- intracranial hemorrhage
 arteriovenous malformations and, 595–598
 bleeding disorders and, 208
 early research on, 49–50
 endovascular therapy, 552–553
- intracranial intervention procedures, clinical trials
 of, 423–424
- intracranial pressure (ICP) monitoring, 400–401
 intracerebral hemorrhage, 577–578
- intracranial venous occlusion, 151–152
- Intraoperative Computed Tomography–Guided
 Endoscopic Surgery for Brain Hemorrhage
 trial, 404
- intravenous thrombolysis, 308–309
 “The Invisible College,” 32
- Irons, Ernest, 220–221
- ischemic optic neuropathy, 234–235
- ischemic stroke
 cellular targets, 481–482
 early research on, 51–53
 endovascular treatment for, 551–558
 global vs. focal models, 479–481
 hypothermia and, 478–479, 485–487
 noncardioembolic ischemic stroke, 415
 pediatric stroke and, 382–383
 penumbra imaging of, 321–322, 348, 479–481
 transcranial Doppler ultrasound imaging of, 332
 treatment of, 401–402
- ISIS-2 clinical trial, 419
- Islam, medical contributions from, 10–14
- Isler, Werner, 381–382
- Itano, Harvey, 220–221
- Ito, U., 479–481
- Iyer, Sriram, 541–542
- Jackson, David, 398–399, 404–405
- Jeffray, James, 62
- Jellinger, Kurt, 163–164
- Jenner, Edward, 612–613
- Jennett, Bryan, 400–401, 579–580
- Johnson, Andrew, 611–612
- Johnson, Edward, 430–431
- Joint Study of Extracranial Arterial Occlusion, 533
- Joliot, Jean Frédéric, 340–341
- Joliot-Curie, Irène, 340–341
- Jones, Ronald, 505–506
- Jones, Terry, 347
- Jonson, Ben, 32
- Jordan, M. B., 437–438
- Jorpets, Erik, 429
- Joslin, Elliott Proctor, 467–469
- Joutel, Anne, 218
- Jovin, Tudor, 554–555
- Joyner, Claude, 329
- Joyner, C. R., Jr., 355–356
- Kadyi, Henryk, 85–86, 240
- Kalbag, R. M., 176–177
- Kallman, Heinz, 341–342
- Kang, S. S., 205–206
- Karp, Herb, 438
- Kase, Carlos, 365
- Kaste, Markku, 422, 497
- Kearns, Thomas, 232–233
- Kearns-Sayre syndrome, 222
- Kees, G., 568–569
- Kelly, Gene, 614
- Kelly, Grace, 614
- Kenealy, Lori, 521–522
- Kennedy, Sean, 399–400, 404–405
- Kerber, C. W., 171
- Kety, Seymour S., 342–344
- King, Edmund, 33
- Kirino, T., 479–481
- Kirkham, Fenella, 382–384
- Kirkland, Thomas, 45–46
- Kistler, Phillip, 147–149, 288, 497–500
- Kjellberg, Raymond, 400–401, 404
- Klumpke, Augusta Marie, 73–79
- Kolbe, Hermann, 448
- Kolisko, Alexander, 84–90
- Kornberg, Roger D., 214
- Kornyey, S., 134, 160
- Koroshetz, Walter, 497–500
- Korotkov, Nikolai, 100
- Krahn, A. D., 354
- Kraig, Richard, 479–481
- Kraus, Walter, 101
- Krause, Fedor, 590–591
- Krayenbühl, Hugo, 111, 177–179
- Krev interaction trapped 1 (*KRIT1*) gene, 169–170
- Krusen, Frank Hammond, 515–516
- Kubik, C., 129–132
- Kuhl, David, 344–345
- Kurland, Leonard, 370
- Kurosawa, Akira, 614
- Kurze, Theodore, 595–596
- Kussmaul, A., 109
- Kwiatkowski, Tom, 496–497
- lacunar infarcts (lacunes)
 early research on, 119–124
 Fisher's work on, 271–272
 neuroimaging of, 122

- pathology, 120–121
 white matter pathology, 122–124
 Laennec, René, 352–356
L'Anatomie pathologique du corps humain
 (Cruveilhier), 59–60
Lancet (journal), 26
 Landouzy, Louis Théophile Joseph, 74–75
 Landouzy-Dejerine syndrome, 74–75
 Landry, Jean Baptiste–Octave, 69
 Lane, Steven, 316–317
 Langhorne, Peter, 420–421
 Lapresle, Jean, 241–242
 Lassen, Niels A., 343, 347–348
 lateral medullary infarction, early research on, 64–68
 lateral tegmental hematomas, 134
 Lauterbur, Paul, 315–318
 Lawrence, Ernest, 341
 laws of heredity, 212
 lazarets, 483–484
 learned paralysis, stroke rehabilitation and, 523–524
 Le Blon, Jacob Christoph, 56
 leech therapy, 26
 Lenin, Vladimir, 610, 616–618
 Leonardo da Vinci, 22
 Lev, Michael, 310
 Levine, Steve, 496–497
 Levy, David, 496–497
 Lewandowsky, M., 103
 Lewis, Thomas, 354
Liber almansoris (Rhazes), 11–12
 Lidell, John A., 50–52, 158–159
 Lima, Almeida, 299–300
 Lindbergh, Anne Morrow, 614
 Lindbergh, John, 327
 Lindley, Rickard, 420–421
 Link, Karl Paul Gerhard, 435–437
 lipohyalinosis, 120–121, 271–272
 lipoprotein metabolism, 472
 lithography, anatomical atlases and, 56
 Locke, John, 32, 44–45, 358–359
 Loeb, C., 359–361
 Logue, Valentine, 244, 567–569
 Lombroso, Cesare, 380–381
 Long, Don, 402–404
 Louis, Pierre C. A., 57–61
 Lower, Richard, 32–34
 low-molecular-weight heparin, 510
 development of, 430–432
 Luessenhop, Alfred J., 570–571, 597
 Lundberg, Nils, 400–401
 lupus anticoagulant (LA), 206–207
 lupus erythematosus, 206–207
 Lyden, Pat, 422, 485–487, 496–497
 Lyme borreliosis, spinal cord infarction and, 245

 Macdonald, John A., 612
 Macewen, William, 579
 Mackenzie, Alexander, 612

 Maclagan, Thomas John, 448–449
 Macleod, Colin Munro, 213
 Macleod, J. J. R., 318, 469–470
 Maffrand, Jean-Pierre, 458–459
 magnetic resonance angiography (MRA), 132–137
 arterial dissection, 190
 discovery of, 321
 magnetic resonance imaging (MRI)
 arteriovenous malformations, 596–597
 cardiac, 356
 cerebral vein and dural sinus thrombosis, 181–182
 clinical applications, 319–320
 early research, 313–316
 evolution of, 309, 313–322
 first human scans, 316–317
 intracerebral hemorrhage, 163
 perfusion imaging and, 309–311, 321–322
 posterior circulation and, 132–137
 stroke and cerebrovascular disease and, 320–322
 Magnus, Wilhelm, 590–591
 Maimonides (Moses ben Maimon), 12–14
 Mallord, John, 319–320
 Malpighi, Marcello, 37–38, 200–201, 612–613
 man-in-the-barrel syndrome, 112–113
 Mansfield, Peter, 316–318
Manual of Diseases of the Nervous System (Gowers),
 226–229
 Marcet, A., 66–67
 Marfan syndrome, 222–223
 Marie, Pierre, 119–120, 251–253
 Markus, Hugh, 332–333
 Marlowe, Christopher, 32
 Marriott, Henry, 354
 Masur, Henry, 402–404
 MATCH trial, clopidogrel vs. aspirin in, 459–460
 Matteucci, Carlo, 353
 Mayfield, Frank. H., 568–569
 Mayfield-Kees clip, 568–569
 Mayo Clinic
 stroke data bank and registry at, 370
 stroke epidemiology research at, 367
 McCarty, Maclyn, 213
 McClintock, Barbara, 212–213
 McCormack, L. J., 192–193
 McCormick, William F., 169–171
 McCully, Kilmer, 205–206
 McDevitt, Ellen, 414
 McDonald, R. Loch, 147–149
 McKinney, William Markley, 327
 McKissock, Wylie, 134–135, 579
 McLean, Jay, 427–429
 McNealy, D. E., 399–400
 McNutt, Sarah J., 376–377
 mechanical thrombectomy, 432–433, 555–558
Medical Compendium in Seven Books (Paul of
 Aegenia), 8
 medical textbooks, early editions of, 103
 medulla, arterial supply, 85

- melodic intonation therapy (MIT), 524–525
 “Memoir on the Curability of Cerebral Softening”
 (Dechambre), 120
 Mendel, Gregor, 212
 Mendelow, Alexander David, 579–580
 Mendelssohn, Felix, 615
 meninges, spinal cord infarction and, 245
 MERCI (Mechanical Embolus Removal in
 Cerebral Ischemia) trial,
 553–554
 Merritt, H. Houston, 263, 370, 413–414, 612–613
 metabolic syndrome
 insulin resistance and, 470–471
 stroke risk and, 467–471
Metaphysics (Aristotle), 10–11
 metformin, 470
 methylenetetrahydrofolate reductase (MTHFR),
 homocysteine metabolism, 205–206
 Meyer, John Sterling, 493
 Michelangelo, 22
 microneurosurgery, intracerebral aneurysm,
 569–570
 microsurgical neuroanatomy, 88–89
 midbrain lesions, early research on, 69–70
 middle cerebral artery (MCA)
 dissection, 190–191
 Foix’s research on, 253–254
 Moyamoya syndrome and disease, 193–196
 occlusion, endovascular therapy for, 551–553
 pediatric occlusion, 380–385
 Middle Cerebral Artery Embolism Local
 Fibrinolytic Intervention Trial (MELT),
 552–553
 Middle East, medical contributions from, 10–14
 Middlemore, R., 226
 migraine, brain ischemia and, 274–275
 Millard, August, 68–69
 Millard Gubler syndrome, 68–69, 127–128
 Miller, J. D., 400–401
 Miller Fisher variant (Guillain-Barré syndrome), 258
 Millikan, Clark, 131–132, 413–415, 438
 Mills, Charles A., 103
 Mills, Edward, 269–270
 Milton, John, 26
 Minimally Invasive Surgery Plus rt-PA for ICH
 Evacuation (MISTIE) trials,
 403–404, 579–581
 Minkoff, Larry, 316–317
 Minot, George Richards, 467–469
 mirror neurons and mirror box therapy,
 523–524
 Mistichell, Domenico, 45–46
 Mitchell, N., 134–135
 mitochondrial myopathy, encephalopathy, lactic
 acidosis and stroke-like episodes (MELAS), 222
 mitochondrial pore inhibitors, 481–482
 MK-801 NMDA antagonist, 482–483
 mobile stroke unit (MSU), 394
 Moehring, Mark, 331
 Moersch, F. P., 188–189
 Mohr, Jay P., 112–115, 286, 288, 371, 421–424,
 497–500
 Molins, Mahels, 531
 MONICA (Monitoring of Trends and
 Determinants in Cardiovascular Disease) study
 (WHO), 365–366
 Moniz, Egas, 318
 aneurysm and hemorrhage research, 168–169,
 567–569
 cerebral angiography development and, 110–111,
 144–145, 305, 530
 thrombosis research, 177–179
 Monk, Thelonius, 615
 monogenic stroke conditions, 216
 Monroe-Kellie doctrine, 49–50
 Morawitz, Paul Oskar, 202
Morbid Anatomy of the Human Brain (Hooper),
 56–57
*Morbid Anatomy of the Human Uterus and Its
 Appendages* (Hooper), 56–57
 Morgagni, Giovanni Battista
 on anatomy, 55
 on aneurysm, 562–563
 on arterial dissection, 188–189
 on intracerebral aneurysm, 144
 on pathology, 37–41, 93
 on subarachnoid hemorrhage, 142–144
 Morgan, Thomas Hunt, 212–213
 Mori, Etsuo, 495–496, 551–552
 Mosso, Angelo, 339
 Motulsky, Arno G., 473
 Moyamoya syndrome and disease, 193–196
 Muhammad (prophet), 10–14
 Mullan, Sean, 600–601
 Mullani, N. A., 345–347
 Müller, Johannes Peter, 94–95, 200–201
 Müller, Paul Herman, 318
 Multicenter Randomized Clinical Trial of
 Endovascular Treatment for Acute Ischemic
 Stroke in the Netherlands (MR CLEAN),
 556–557
 multimodal computed tomography (MCT),
 309–311
 multiorgan system failure, critical care units and,
 398–399
 multiple sclerosis, early research on, 62
 Murphy, William, 468
 Murray, D. W. Gordon, 429–430
 muscle emboli, carotid cavernous fistula closure,
 600–601
Museum anatomicum (Sandifort), 55
 musicians, stroke in, 615
 myocardial infarction, aspirin and, 449
 myoclonus epilepsy ragged red fibre syndrome, 222
*My Stroke of Insight: A Brain Scientist’s Personal
 Journey* (Taylor), 612–613

- Nageott, Jean, 67–68, 75
 National Health and Nutrition Examination Survey (NHANES), 366
 National Institute of Neurological Diseases (NINDS)
 CT development and, 308–309
 Stroke Data Bank, 287–288, 371
 stroke scale, 497
 thrombolytic therapy trials, 496–497
 Nelson, Thomas, 101
 nephrology, early research on, 38
 nerinetide, neuroprotection trials with, 484–485
 neurocritical care. *See also* stroke centers
 birth of, 404–405
 brain injury diagnosis and management and, 399–405
 comatose patient, 399
 decompressive craniectomy for malignant hemispheric stroke, 404
 defibrillation and cardiopulmonary resuscitation, 398
 induced hypothermia, 401
 intracerebral hemorrhage, 402–404
 ischemic stroke treatment, 401–402
 overview, 396–405
 positive pressure mechanical ventilation, 397
 post-operative and respiratory units, 397
NeuroCritical Care (Hacke), 404–405
 NeuroFlo devis, 484–485
The Neurological Examination of the Comatose Patient (Fisher), 399
 neurology
 Dejerine's contributions to, 74–75
 early textbooks on, 101–103
 neuroplasticity, stroke rehabilitation and, 518–525
 neuroprotection
 cellular and vascular intervention, 484–485
 cellular targets, 481–482
 excitotoxicity and channel targets, 482–483
 free radicals and, 483–484
 global vs. focal ischemic stroke models, 479–481
 history of, 478–479
 hypothermia and, 485–487
 overview of, 478–484
 neurorehabilitation, 518–525
 neurosonology societies, 333–334
 Newell, David, 331–332
 Newkirk, Ingrid, 520–521
 new oral anticoagulants (NOACs), 443
 Newton, Isaac, 56
 Newton, T. H., 171
 Nexletol, cholesterol reduction and, 475
 Nicolesco, J., 253
 NINDS-SiGN GWASD study, 215–216
 NINDS stroke scale (NIHSS), 497
 Nishioka, H., 168–169
 Nissl, F., 122–124
 Nixon, Richard M., 612
 NMDA antagonists, excitotoxicity and channel targets, 482–483
 NMR Specialties company, 315–316
 Nobel Prize, controversies over, 318
 Nogueira, Raul, 554–555
 nonaneurysmal subarachnoid hemorrhage, 151–152
 noninvasive brain stimulation (NIBS), 522–523
 noradrenergic agents, stroke rehabilitation, 525
 Nordisk Insulin Laboratory, 470
 Norlén, Gösta, 595
 North American Consortium of Acute Brain Injury (NACABI), 403
 North American Symptomatic Carotid Surgery (NASCET) trial, 332–333, 422–423, 534–536
 NOTCH3 gene, CADASIL and, 218
 nuclear magnetic resonance (NMR), 313–316
 Nurses Study, 366
 Nymman, Gregor, 44
Observationes anatomicae ex cadaveribus eorum, quas sustulit apoplexia, cum exercitatione de eius loco affecto (Wepfer), 43
Observations on the Structure of the Intestinal Worms of the Human Body (Hooper), 56–57
Occlusion of the Internal Carotid Artery (Fisher), 112
Of the Causes and Signs of Acute and Chronic Disease (Aretus of Cappadocia), 7–8
 Ojemann, Robert, 116–117, 147–149, 189–190, 273–275
 Okazaki, H., 223
 Oldendorf, William, 306–307
 Olivecrona, Hebert, 568–569, 579, 593–595
 Olszewski, J., 122–124
 Ommaya, A. K., 243–244
On Apoplexy (Cooke), 47–48
On the Cerebral Circulation (Burrows), 49–50
 one-and-a-half syndrome, 275–276
On the Names of the Parts of the Human Body (Rufus of Ephesus), 7
On the Origin of Species by Means of Natural Selection (Darwin), 212
 ophthalmic artery, vascular disease and, 112
 ophthalmoscopy, development of, 226
 Oporinus, Johannes, 22–24
 Oppenheim, Gustav, 163–164, 223, 239–240
 Oppenheim, Herman, 103
 oral antihyperglycemics, 470
 Osler, William, 99–101, 159, 268, 377, 456
 Otis, Shirley, 495–496
 otitic hydrocephalus, 175–176
 Otsuka Pharmaceutical Company, 457–458
 Pacheco, Alex, 520–521
 Paracelsus, 447
 paralysis
 Aretus of Cappadocia on, 7–8
 Hippocrates's description of, 4–5

- paramedian pontine reticular formation (PPRF), 69
 Para-Operational Device (POD), 570–571
Paraphrase of Rhazes, 21–22
 paraplegia, Aretus of Cappadocia on, 7–8
 Paré, Ambroise, 529–530
 Parillo, Joseph, 402–404
 Parkinson, Dwight, 600
 particulate theory, in ancient Greece, 211
 Paslubinskas, A., 192–193
 Pasteur, Louis, 612–613
Pathological Anatomy: Illustrations of the Elementary Forms of Disease (Carswell), 57–61
 “Pathological Observations in Hypertensive Cerebral Hemorrhage” (Fisher), 160–162
 pathology
 atlases of, 55–56
 early research on, 37–41
 Patrono, Carl, 417–418
 Pauling, Linus Carl, 220–221
 Paul of Aegenia, 8
 Pavalakis, S. G., 222
 pediatric stroke, 374–385
 Penfield, Wilder, 266–267, 598–599
 Pennica, Diane, 495
 penumbra imaging, in ischemic stroke, 321–322, 348, 479–481
 Penumbra Pivotal Stroke Trial, 553–554
 Penumbra reperfusion catheter and separator, 553–554
 People for Ethical Treatment of Animals (PETA), 520
 Percheron, Gerard, 86–87
 perfusion imaging, 309–311, 321–322, 347–348
 thrombolytic therapy and, 499
 peri-hematoma edema, intracerebral hemorrhage, 577–578
 perimesencephalic hemorrhages, 151–152
 Perret, G., 168–169
 Perry, Luke, 614
 Pessin, Michael, 114–115, 288, 495–496
 Pestel, Maurice, 174, 176–177
 Peterson, Frederick, 377–378
 Petit, Jean Louis, 563
 Petito, Carol, 479–481
 Peto, Richard, 418–421
 Petty, William (Sir), 32
 Phelps, Michael, 345–347
 N-tert-butyl- α -phenylnitron (PBN), 483–484
 phlebitis
 Cruveilhier’s theory concerning, 59–60
 early research on, 94
 phosphodiesterase (PDE) inhibitors, 456–458
 physical medicine, and stroke rehabilitation
 evolution and expansion of, 518
 history of, 515–518
 melodic intonation therapy, 524–525
 mirror neurons and mirror box therapy, 523–524
 noninvasive brain stimulation (NIBS), 522–523
 pharmacological agents, 525
 polio epidemic and, 516–517
 robotics, 525
 stem cell therapy, 525–526
 whole-person approach to, 517–518
Physical Medicine: The Employment of Physical Agents for Diagnosis and Therapy (Krusen), 516
 physicians, stroke in, 612–613
The Physiology and Pathology of Cerebral Circulation: An Experimental Research (Hill), 339
The Physiology and Pathology of Circulation (Basch), 465–467
 Pickering, George, 230–232, 531
 Piepgras, David, 244
 pioglitazone, 470
 Piria, Raffaele, 448
 plaque formation, carotid artery disease, 116–117
 plasma exchange therapy, 399–400
 plasmin, 491
 platelet aggregation
 antiplatelet therapy, 455–462
 aspirin and, 415–418, 449
 Plum, Fred, 399–400, 479–481, 533–534
 pneumoencephalography, 298–299, 304–305, 566–568
 Poeck, Klaus, 495–496
 Poirier, Jacques, 120–121
 poliomyelitis epidemic, rehabilitation medicine and, 516–517
 political figures, stroke in, 610–612
 polymerase chain reaction (PCR), 213–214
 pons, arterial supply, 85
 pontine hematoma, 133–136
 pontine lesions, early research on, 68–69
 Poppin-Blalock clamp, 564–565
 positive pressure mechanical ventilation, 397
 positron emission tomography (PET)
 basic principles of, 341–342
 cerebral blood flow imaging, 338–349
 and cerebral glucose utilization, 344
 cerebrovascular disease and brain function imaging, 347–348
 early research on, 340–341
 evolution of scanners, 344–347
 2-[F18] fluoro-2-deoxy-D-glucose (FDG), 344, 349
 global and focal stroke models and, 479–481
 limitations of, 349
 and radioactive isotopes, 343
 “Positron Imaging in Ischemic Stroke Disease Using Compounds Labelled with Oxygen 15: Initial Results of Clinicophysiological Correlations” (Ackerman), 347
 Posner, Jerry, 399
 posterior cerebral artery (PCA), Foix’s research on, 253–254
 posterior circulation
 basilar artery occlusion, 129–130

- pathologic and imaging studies, late 20th century, 132–137
- transient ischemic attacks and, 131–132
- vascular lesions, 128–132
- vertebrobasilar disease, 127–128, 133–136
- posterior inferior cerebellar artery (PICA)
 syndrome, early research on, 65–66
- postoperative and respiratory critical care units, 397
- Poungvarin, N., 577–578
- power motion Doppler (PMD), 331
- Practice of Physic* (Willis), 34
- Pragmatic Ischemic Thrombectomy Evaluation (PISTE) trial, 556–557
- prasugrel (Efient), 460–461
- PRECISE stent, 544
- pregnancy
 cerebral vein and dural sinus thrombosis and, 174–185
- spinal cord infarction and, 245
- venous thrombosis in, 505–506
- “Preliminary Report on Postoperative Treatment with Heparin as a Preventive of Thrombosis” (Crafoord), 429–430
- presidents, stroke in, 611–612
- PREVAIL clinical trial, heparin efficacy in, 432
- Prieto, A., 400–401, 404
- primary stroke centers (PSCs), 393–394
- Princeton Conferences on Cerebrovascular Diseases, 413–414
- print technology, anatomic atlases and, 56
- PROACT trial, endovascular therapy, 552–553
- The Prognostics* (Hippocrates), 3–4
- Prokofiev, Sergei, 615
- Prolyse in Acute Cerebral Thromboembolism trials (PROACT I and II), 501
- pronethalol, 467
- prophetic traditions (sunnah), 10–14
- propranolol, 467
- proprotein convertase subtilisin/kexin type 9 (PCSK9), cholesterol reduction and, 475
- prostacyclin, aspirin and, 415–418
- prothrombin complex concentrates (PCCs), intracerebral hemorrhage and reversal of hematoma expansion, 583–584
- prothrombin gene mutation, 204
- prothrombin time test, 202–203
- pro-urokinase therapy, 501
- pseudotumour cerebri, cerebral vein and dural sinus thrombosis and, 180–181
- pseudoxanthoma elasticum, 222–223
- Puckett, Kirby, 615–616
- pulmonary embolism
 anticoagulant therapy for, 437–438
- urokinase and streptokinase therapy, 493
- pulmonary thrombosis
 heparin in management of, 429–430
- Virchow’s research on, 96–97
- pulse palpation and auscultation, carotid artery disease, 115–116
- Pulsinelli, Bill, 479–481
- Purcell, Edward, 313
- Purdon, Martin, J., 175–176
- Quain, Richard, 376–381
- Quick, Armand James, 202–203
- Quinke, Heinrich Irenaeus, 141
- Quran, 10–14
- Qureshi, Adnan, 582
- Rabi, Isidor, 313
- radioactive isotopes, PET research and, 343
- radionuclides, cerebral blood flow imaging, 338–349
- Radner, Stig, 300–301
- Raichle, Marcus, 345–347
- Ramachandran, V. S., 523–524
- ramollissements (softenings)
 brainstem circulation and, 129
- in early research, 48–53, 56–57
- hemorrhage and, 57–62
- lacunar infarcts and, 120
- Randomization of Endovascular Treatment with Stent-Retriever and/or Thromboaspiration versus Best Medical Therapy in Acute Ischemic Stroke Due to Large Vessel Occlusion Trial (RESILIENT), 556–557
- Randomized Trial of Unruptured Brain Arteriovenous Malformations (ARUBA), 597–598
- Raybaud, Charles, 383
- Raymond’s syndrome, 69
- Reaven, Gerald, 470–471
- rebleeding
 arteriovenous malformations, 597–598
- subarachnoid hemorrhage, 145–147
- ReCLAIM Trials, 485–487
- recombinant DNA, 213–214
- recombinant pro-urokinase (rpro-UK), endovascular therapy with, 552–553
- recombinant tissue plasminogen activator (rt-PA), 401–404, 483–484, 493–500
- recurrent artery of Heubner, 84–85
- regional cerebral blood volume/regional cerebral blood flow (rCVB/rCBF), 321–322
- rehabilitation. *See* physical medicine, and stroke rehabilitation
- Reid, John, 328–329, 355–356
- Reinhardt, Benno Ernst Heinrich, 95
- Reivich, M., 130–131
- RE-LY trial, 444–445
- renal artery, fibromuscular dysplasia, 192–193
- Reports of Medical Cases, Selected with a View to Illustrate the Symptoms and Cure of Diseases by a Reference to Morbid Anatomy* (Bright), 58
- respiratory critical care units, 397
- retinal vascular spasm, 233–234

- retinal vasculopathy, 219–220
 retinal vasculopathy and cerebral leukodystrophy (RVCL), 219–220
 Revascularization with Solitaire FR Device vs. Best Medical Therapy in the Treatment of Acute Stroke Due to Anterior Circulation Large Vessel Occlusion Presenting within Eight Hours of Symptom Onset (REVASCAT) trial, 556–557
 reversible cerebral vasoconstriction syndrome (RCVS), 196–197
 Revive stent retriever, 554–555
 rFVIIa, intracerebral hemorrhage, 582–583
 Rhazes. *See* Abu Bakr Muhammed Ibn Zakria AlRazi (Rhazes)
 rheumatic fever, 448–449
 Rhoton, Albert Loren, Jr., 88–89
 Rich, Charles, 189–190
 Richardson, E. P., 283–285
 Richardson, Ralph, 614
 Riella, Anthony, 383
 Rifkin, Daniel, 494
 Rigamonti, Danielle, 598–599
 Riives, J., 594
 Rijken, Dingeman, 494
 Ringelstein, Berndt, 495–496
 RING finger 213 (*RNF213*) gene, Moyamoya syndrome and disease, 195–196
 Rinkle, Gabriel, 150–151
 Ripley, H. R., 192–193
 RISC trial, 417–418
 risk factors for stroke, 364–367
 diabetes and metabolic syndrome, 467–471
 hyperlipidemia, 471–475
 hypertension, 465–467
 Riva-Rocci, Scipione, 100
 rivaroxaban, 444–445
 Rizzolatti, G., 523–524
 Roach, Steven, 383
 Rob, Charles., 531
 Roberson, Glenn, 147–149
 robotics, stroke rehabilitation and, 525
 ROCKET-AF trial, 444–445
 Roderick, L. M., 434–435
 Röentgen, Wilhelm Conrad, 304
 Rokitsansky, Carl von, 110
 Roosevelt, Franklin D., 466–467, 516–517, 611–623
 Ropper, Allan, 396, 399–400, 404–405
 Rosenblum, W. I., 162
 rosiglitazone, 470
 Ross Russell, Ralph, 179, 230–232
 Rostan, Léon, 48, 60–61
 Rothberger, Carl, 354
 Rothenberg, Steven, 570–571
 Rothwell, Peter, 420–421
 Roubin, Gary, 542–545
 Roussy, Gustave, 74–75, 252–253, 299
 Roy, Charles, 339
 Royal Society of London, 32
 Rufus of Ephesus, 7
 Rusk, Howard, 517–518
 Russel, David, 333–334
 Russell, W. Ritchie, 397
 Rutherford, Ernest, 341–342
 Sachs, A. L., 414
 Sachs, Bernard, 377–378
 Sackett, David, 420–421
 Safar, Peter, 398, 401
 Sahs, Adolph, 438
 SAINT trials 1 and 2, 483–484
 salicylic acid, 448
 Samson, Duke., 595
 Sandercock, Peter, 420–421
 Sandifort, Eduard, 55
 Sandok, Burton, 192–193
 Sanofi company, 458–459
 SAPPHIRE trial, carotid stenting, 544
 Sapporo criteria, antiphospholipid syndrome, 206–207
 Saryan, Leon, 315–316
 Satran, Richard, 244–246
 Saver, Jeff, 554–555
 Sayre, G., 188–189
 Schafer, Edward, 353
 Schaffer, A. J., 378–379
 Schalit, I., 254–255
 Scheel, L. D., 436–437
 Scheinberg, Peritz, 113–114, 414, 438
 schistomiasis, spinal cord infarction and, 245
 Schmidt, Alexander, 200–201
 Schmidt, Carl, 342–343
 Schoeffel, Eugen Wilhelm, 436
 Schoene, W. C., 122–124
 Schofield, Frank, 434
 Scholz, W., 223
 Schroeder, Collin, 437–438
 Schwab, Robert, 399
 scientific method, evolution of, 26
 scientists and inventors, stroke in, 613
 Scott, David A., 429
 Seelig, R., 400–401
 Seldinger, Sven-Ivar, 112–113, 145, 301–302, 530
 selective serotonin reuptake inhibitors (SSRI), stroke rehabilitation, 525
 Selhorst, John, 233–234
 Selim, Magdy, 578
Sémiologie des affections du système nerveux (Dejerine-Klumpke), 73
 Senator, H., 67
 Senefelder, Alois, 56
 Sepetka, Ivan, 573–574
Sepulchretum sive anatomia practica ex cadaveribus morbo denatis (Bonetus), 38
 Serbinenko, Fiódor Andreevitch, 570–571, 600–601
 Serres, Antoine Étienne Augustin, 48

- Servetus, Michael, 29
 Seshadri, Sudha, 365
 Shakespeare, William, 26, 32
 Sharman, Bill, 615–616
 Sharon, Ariel, 612
 Shaw, Louis, 397
 Sheehan, H. L., 175–176
 Shennan, T., 188–189
 Sherman, David, 421–422
 Sherrington, Charles, 339, 343
 Sherry, Sol, 492–493
 Shick, R., 131–132
 Sicard, Jean Athanase, 251, 253, 297–298
 sickle cell disease, stroke and,
 220–221, 332–333
 pediatric stroke, 380–385
 Siekert, Robert, 131–132
 Siesjö, Bo K., 343, 479–481
 Silver Spring monkeys, 519–522
 Simpson, Roy, 379
 Singer, S. J., 220–221
 Singhal, Aneesh, 196–197
 single photon emission computed tomography
 (SPECT), 344–345
 SITS-MOST Registry, 498
 Skinhoj, Erik, 343
 Slack, Warner, 285
 Smith, W. K., 435–436
 Snead, Sam, 615–616
 softening of brain, early research on,
 46–49
 Sokoloff, Louis, 344
 Solitaire stent, 554–555
 Solitaire with the Intention for Thrombectomy as
 Primary Endovascular Treatment for Acute
 Ischemic Stroke (SWIFT PRIME) trial,
 556–557
 Sottas, Jules, 74–75
 Spence, D. J., 116–117
 Spence, William T., 570–571
 Spencer, Merrill P., 327, 329
 Spencer's curve, 329
 Spenser, Edward, 26, 32
 Spetzler, Robert, 597
 sphygmomanometer, 100, 465–467
 Spielmeyer, W., 479–481
 Spiller, William Gibson, 239–240
 spinal cord, vasculature of, 85–86
 aorta and ischemia of, 240–242
 arteriovenous fistulas and malformations,
 243–244
 causes, 244–246
 hypotension and aortic border zones,
 242–243
 lesions, 60
 vascular disease and, 238–246
 Spinoza, Baruch, 26
 sports figures, stroke in, 615–616
 SPOTLIGHT (“Spot Sign” Selection of
 Intracerebral Hemorrhage to Guide
 Hemostatic Therapy) trial, 582–583
 Srinivasan, K., 180–181
 STAIR clinical trial guidelines, 484–485
 Stalin, Joseph, 611–623
 Stam, Jan, 507–509
 Stansfield, Fredrick Ross, 175–176, 505–506
 statins
 cholesterol reduction with, 475
 early research on, 472–475
 Steinheil, S. O., 167–169
 stem cell therapy, stroke rehabilitation and,
 525–526
 stenting
 carotid artery, 537–538, 541–546
 intracerebral aneurysms, 573–574
 intracranial arteries, 546–549
 stent retrieval, 554–555
 Wallstent development, 543
 Stenting versus Aggressive Medical Therapy for
 Intracranial Arterial Stenosis (SAMMPRIS),
 423–424, 547–549
 STICH (Surgical Trial in Intracerebral
 Haemorrhage), 579–580
 Stoker, Bram, 614
 Stone, Edward, 447–448
 Stopford, John Sebastian Bach, 85, 129
 STOP-IT (The Spot Sign for Predicting and
 Treating ICH Growth) trial, 582–583
 Strandness, Eugene, 328–329
 streptokinase thrombolytic therapy, 492–493
 stroke. *See also* pediatric stroke; surgical
 management, of stroke; *specific conditions, e.g.*,
 subarachnoid hemorrhage
 aspirin and prevention of, 452–453
 clinical features of, 14
 data banks and registries, 370–372
 defined, 358–359
 epidemiology and risk factors, 364–367
 etiology and localization, 14–15
 Hippocrates's description of, 4–5
 neuroprotection against, 478–484
 prominent patients, 610–623
 risk factors, 364–367, 465–471
 severity and prognosis, 16
 terminology, 358–361
 writings about, 14
 stroke centers, 393–394, 497–500. *See also*
 neurocritical care
 Stroke Data Bank, 287–288, 371
 stroke nurses, 393
 stroke organizations, journals, and books
 national and international organizations and
 publications, 608–609
 United States, 607–608
 Stroke Prevention by Aggressive Reduction in
 Cholesterol Levels (SPARCL) trial, 475

- Stroke Prevention in Sickle Cell (STOP) program, 332–333
- stroke units, establishment of, 391–392
- Strully, K. J., 531–532
- subarachnoid hemorrhage (SAH)
 cellular and vascular intervention in, 484–485
 delayed cerebral infarction and vasoconstriction, 147–149
 early research on, 46–47, 142–144
 Fisher's work on, 272–273
 Hippocrates's description of, 4–5
 imaging studies of, 144–145
 intracranial artery dissection, 191–192
 natural history and rebleeding, 145–147
 nonaneurysmal, 151–152
 Osler's work on, 100–101
 sequelae and complications, 149–150
 twentieth-century research on, 138–142
 Wepfer's research on, 43–44
- subclavian artery disease, 273
- subclavian steal syndrome, 130–131
- subcortical arteriosclerotic encephalopathy, 122–124
- Sudlow, Cathie, 420–421
- sulfonylureas, 470
- surfer's myelopathy, spinal cord infarction and, 245–246
- surgical management, of stroke, 422–423, 529–538
 intracerebral aneurysm, 567–569
 microneurosurgery, 569–570
- susceptibility weighted imaging (SWI), 320–322
- Sussman, B. J., 551–552
- Suzuki, Jiro, 193–196
- Swank, Roy, 266–267
- Swedish Aspirin Low-Dose Trial (SALT), 417–418
- Sweet, William, 344–345
- sweet clover disease, 435–436
- Sydenham, Thomas, 32, 44–45, 358–359
- Sydney criteria, antiphospholipid syndrome, 206–207
- Symon, Lindsay, 347–348, 479–481
- Symonds, Charles, 138–142, 175–176, 534
- systematic review, clinical stroke trials and, 418–419
- Tabulae anatomica sex* (Vesalius), 22–24
- Takemi, Taro, 354
- target windows
 endovascular therapy, 557–558
 ischemic stroke models and, 479–481
- Taub, Edward, 519–522
- Taveras, Juan Manuel, 301–302
- Taylor, Jill Bolte, 612–613
- Teasdale, Graham, 579–580
- tenecteplase (TNKase), 500
- Ter-Pogossian, M. M., 345–347
- Tesla, Nicola, 319–320
- A Text-book of Physiology for Medical Students and Physicians* (Howell), 427–429
- Textbook of Medicine* (Osler), 99–101
- thalamus
 hemorrhage, 135–136
 vasculature of, 86–87
- Thatcher, Margaret, 612
- therapeutic hypothermia (TH). *See* hypothermia
- thiazide compounds, hypertension management and, 466–467
- Thieffry, Stéphane, 380–381
- thienopyridines, 458–461
- Thomas, André, 74–75
- Thomson, John, 57–61
- thorotrast, research using, 111
- THRACE (Thrombectomie des artères cerebrales) trial, 556–557
- thrombectomy, 432–433, 555–558
- thrombi and thrombosis. *See also* cerebral vein and dural sinus thrombosis
 antiphospholipid antibodies and syndrome, 206–207
 antiplatelet therapy and, 455–462
 Aring and Merritt's research on, 263
 in children, 378–385
 Cole's early research on, 44–45
 factor V Leiden, 203–204
 heparin efficacy in, 431–432
 hyperhomocysteinemia, 205–206
 inherited thrombophilias, 203
 ischemic stroke management and, 401–402
 Virchow's research on, 96–97
- thrombin, 491
 coagulation and, 201–203
 new oral anticoagulants (NOACs) and, 443
- thrombo-endarterectomy, 531
- thrombolytic therapy (thrombolysis), 401–402, 491–501
 cerebral venous thrombosis and, 510–511
 clinical trials involving, 422
 emergency medicine and, 497–500
 endovascular devices and, 553–554
 image-based therapy, 499
 intraarterial thrombolysis, 500–501
 streptokinase, 492–493
 tenecteplase (TNKase), 500
 tissue plasminogen activator (tPA), 493–500
 vascular imaging and, 497–500
- 'The Thromboplastic Action of Cephalin' (McLean), 427–429
- thrombosis, carotid cavernous fistula closure, 600–601
- thromboxane A₂, 417–418
- Tibbul-Nabbi* (the Medicine of the Prophet), 10–14
- ticagrelor (Brilinta), 460–461
- ticlopidine (Ticlid), 458–459
- Tillett, William Smith, 492–493
- time-averaged maximum mean flow velocities (TAMM), 332–333
- time is brain algorithms, 497
- tissue factor research, 201–203

- tissue plasminogen activator (tPA)
 clinical trials of, 422
 endovascular therapy with, 552–553
 as thrombolytic therapy, 491, 493–500
- tissue window theory, neuroprotection and, 482
- Titian, 22
- TO-ACT, cerebral venous thrombosis therapy, 510–511
- Toni, D., 497
- Tonnellé, M. L., 176–177
- Toole, James F., 327, 332–333, 422–423, 438, 536–537
- Tournier-Lasserre, Élisabeth, 217
- Traité du ramollissement du cerveau* (Durand-Fardel), 120
- tranexamic acid, intracerebral hemorrhage and, 583
- Tranexamic Acid for Hyperacute Primary Intracerebral Hemorrhage (TICH-2) trial, 583
- transcranial direct current stimulation (tDCS), 522–523
- transcranial Doppler ultrasound (TCD)
 arterial stenting and, 544
 development of, 330–332
 pediatric stroke and, 382–383
 subarachnoid hemorrhage and, 149
- transcranial magnetic stimulation (TMS), stroke rehabilitation and, 522–523
- transesophageal echocardiography (TEE), 355–356
- transient ischemic attacks (TIAs)
 arterial dissection, 190–191
 carotid artery disease and, 113–114
 clinical trials involving, 415
 posterior circulation and, 131–132
 terminology of, 359–361
 warfarin for management of, 438–440
 Willis's description of, 35–36
- transient monocular blindness, carotid artery disease and, 113–114
- “Transient Monocular Blindness Associated with Hemiplegia” (Fisher), 112
- transtentorial herniation, 511
- transthoracic echocardiography (TTE), 355–356
- trauma
 arterial dissection, 190
 subarachnoid hemorrhage, 151–152
- traumatic brain injury (TBI)
 induced hypothermia, 401
 management of, 400–401
- Travers, Benjamin, 530, 599
- “Treatise on Diseases II and III” (Hippocrates), 157–158
- Trevo stent retriever, 554–555
- TREX1 gene, retinal vasculopathy and cerebral leukodystrophy, 219–220
- triphasic perfusion computed tomography, 310–311
- Troubles de la motilité* (Dejerine-Klumpke), 75–79
- “Tumour Detection by Nuclear Magnetic Resonance” (Damadian), 314–315
- Turan, Tanya, 423–424
- 2VO stroke models, 479–481
- Tyler, John, 611–612
- Über das farbige Licht der Doppelsterne und einiger anderer Gestirne des Himmels* (On the Coloured Light of the Binary Stars and Some Other Stars of the Heavens) (Doppler), 325–326
- ultrasound
 cerebrovascular imaging with, 325–334
 clinical trial diagnoses, 332–333
 duplex system, 328–329
 early principles and research, 325–326
 echocardiography and, 355–356
 neck vessel imaging using, 327–329
 training and standardization, 333–334
 transcranial ultrasound of intracranial arteries and brain, 330–332
- United States, stroke organizations, journals and books in, 607–608
- urokinase
 endovascular therapy with, 552–553
 intracerebral hemorrhage and, 403
- Vajpayee, Atal Bihari, 612
- Valsalva, Antonio, 37–38, 55
- Van Calcar, Jan Stephan, 21–22, 151–152
- Van Crevel, Hans, 507–508
- Vane, John, 416, 451–452
- van Gijn, Jan, 150–151, 420–421
- van Schoor, Raymond, 615–616
- varicella-zoster virus infection, spinal cord infarction and, 245–246
- Varolio, Costanzo, 44
- vascular anatomy. *See also* arterial systems and arteries
 arterial systems and single arteries, 84–87
 Beevor's work on, 83
 Duret's work in, 81–82
 Foix's work on, 83–84
 microsurgical neuroanatomy, 88–89
 posterior circulation and vascular lesions, 128–132
 twentieth-century research on, 81–89
- vascular Ehlers-Danlos syndrome, 222–223
- vascular intervention
 neuroprotection and, 484–485
 stroke management and, 497–500
- vasculitis, spinal cord infarction and, 245–246
- vasoconstriction
 pediatric stroke and, 380–385
 retinal vascular spasm, 233–234
 reversible cerebral vasoconstriction syndrome, 196–197
 subarachnoid hemorrhage, 147–149
- vasospasm, delayed cerebral infarction and, 147–149
- Velaquez, A. C., 570–571
- Velpeau, Alfred, 570
- venography, development of, 309–311

- venous lesions, 170–171
- venous thromboembolism (VTE)
 anticoagulant therapy for, 437–438
 blood disorders and, 200–201
 in children, 378–385
 decompressive hemicraniectomy, 511
 direct oral anticoagulant therapy, 511–512
 factor V Leiden, 203–204
 heparin in management of, 429–430, 506–509
 low-molecular-weight vs. unfractionated
 heparin, 510
 prothrombin gene mutation, 204
 thrombolytic and endovascular treatment,
 510–511
 treatment of, 505–512
- ventriculography, 298–299, 304–305
- Verdi, Giuseppe, 615
- vertebral artery dissection, 191
- vertebrobasilar disease
 early studies, 127–128
 hemorrhages, 133–136
 vascular lesions within posterior circulation,
 128–132
 warfarin and, 439
- vertical shift theory, 399–400
- Vesalius, Andreas
 anatomical research by, 21–24, 26–27, 55,
 127–128
 circulation research and work of, 37, 38
- Vesling, 34
- Vieusseux, Gaspard, 66–67
- Viñuela, Fernando, 573–574
- Virchow, Rudolph Ludwig Karl
 anatomical atlases, 45
 on arteriovenous malformations, 167–169
 on cerebral embolism, 96–97
 experimental pathology and, 94–97
 on phlebitis, 59–60
 on thrombosis and embolism,
 200–201, 491
- Virchow's triad, 200–201
- visual loss, vascular disease and, 226–235, 268–269.
See also eye, cerebrovascular disease and
- vitamin K antagonists. *See* anticoagulants
- Vitek, Jiri, 541–542
- Vitesse Intracranial Stent Study for Ischemic Stroke
 Therapy (VISSIT) trial, 549
- vivisection, Harvey's experiments in, 25–29
- Vollständiges Lehrbuch der Steindruckerey (A Complete
 Course of Lithography)* (Senefelder), 56
- Volpe, Joseph, 384
- Von Basch, Samuel, 100
- Von Dusch, T., 176–177
- Von Helmholtz, Hermann, 226
- Von Hösslin, R., 175–176
- von Humboldt, Alexander, 613
- Von Kummer, R., 497
- Vulpian, Edmé Félix Alfred, 72, 81–82
- Wallace, Alfred Russel, 212
- Wallenberg, Adolph, 64–68, 128–132, 465–467
- Wallenberg syndrome, 64–68, 127–128
- Waller, Augustus, 353
- Wallis, John, 32
- Wallstent, 545
 arterial stenting and, 543
- Walton, John, 479–481, 533–534
- Warach, Steven, 321
- Ward, A., 598–599
- Wardlaw, Joanna, 122, 420–421
- warfarin
 clinical trials of, 421–422
 dipyridamole and, 457
 early human trials of, 437–438
 intracerebral hemorrhage and reversal of,
 583–584
 research and development of, 434–440
 stroke management and, 438–440
 transient ischemic attacks and, 131–132
- Warfarin–Aspirin Recurrent Stroke Study
 (WARSS), 439
- Warfarin–Aspirin for Symptomatic Intracranial
 Disease (WASID) trial, 132, 439–440
- Warlow, Charles Picton, 420–421, 535
- Washington, George, 26
- Watson, James D., 213
- Waugh, John, 316–317
- WEAVE registry trial, 549
- Weber, G., 111
- Weber, Hermann David, 69–70
- Wechsler, Israel S., 103
- Weimar, Willem, 494–495
- Weinberg, Wilhelm, 212
- Weissmann, August, 212
- Welch, Francis, 226
- Wells, Ibert, 220–221
- Wepfer, Johann Jakob
 on anatomy, 34, 44–45
 on intracerebral hemorrhage, 43–44
 on posterior circulation, 127–128
 on ramollissements (softening), 52
 on subarachnoid hemorrhage, 142–144
- Wharton, Edith, 614
- Whipple, George, 468
- Whisnant, Jack, 131–132, 367, 370, 439
- Wieloch, Tadeus, 479–481
- Wiggers, Carl, 398
- Wilkins, Maurice, 213
- Williams, Daniel, 612–613
- Willis, Thomas, 24–29, 31–36, 37, 44–45, 376,
 478–479
- willow leaves, aspirin and, 447–449
- Wilmut, Ian, 213–214
- Wilson, S. A. Kinnier, 101–103, 162–163
- Wilson, Woodrow, 610–612, 618–619
- Wingspan stent system, 547–548
- Winstein, Carolee, 520

- Winterberg, Heinrich, 354
Winterkorn, Jacqueline Marjorie Schuker, 233–234
Wintermark, Max, 309–311
Wojak, J. C., 547
Wolf, Alfred, 344
Wolf, Philip, 365
Wolf, Steve, 520
Wolff, Harold, 413–414
Wong, Lawrence, 331
Wood, Ernest, 301–302
Woolf, A. L., 176–177
World Health Organization (WHO)
 aspirin controversy and, 416
 MONICA study by, 365–366
 stroke definition, 358–359
Wray, Shirley, 230–232
Wren, Christopher, 32–34
Wright, C. R., 449–450
Wright, Irving, 413–414
Ximelagatran, 443–444
X-ray imaging, of brain, early research
 using, 304
Yadav, Jay, 541–542, 544
Yaşargil, Mahmut Gazi, 569–570, 595–596
Yates, P. O., 129–130, 162
Yodh, S. B., 570–571
Zervas, Nicholas, 147–149, 399–400, 404–405
Zeumer, Herman, 495–496, 500–501, 551–552
Zimmerman, Harry, 241–242
Zoll, Paul, 398
Zülch, Klaus Joachim, 242–243