Acute Stroke Care

Third Edition

You have just encountered a possible stroke patient. You ask yourself: What should I do first? How do I know it is a stroke? Is it too late to reverse the damage?

This book provides integral assistance in answering these critical questions. All content is arranged in chronological order, covering all considerations in assessing and treating patients in the emergency room, stroke unit, and rehabilitation facilities.

This new edition offers readers the latest information on stroke treatment, and features brand new chapters on stroke radiology, endovascular therapy, the uncommon causes of stroke, cerebral venous thrombosis, stroke prevention, and the transition to outpatient care. The comprehensive set of appendices contains useful reference information, including dosage algorithms, conversion factors, and stroke scales.

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Preface to the Third Edition

Stroke is a classical acute medical emergency that needs to be dealt with promptly and effectively to minimize patient morbidity. This book helps answer the critical questions faced by any physician encountering a patient with suspected stroke. It provides practical advice on the care of stroke patients in a range of acute settings. The content is arranged in chronological order, covering the things to consider in assessing and treating the patient in the emergency department, the stroke unit, and then on transfer to a rehabilitation facility. All types of stroke are covered. A comprehensive set of appendices contains useful reference information, including dosing algorithms, medical complications, and stroke scales.

Changes in this third edition include:

- Content moved from appendices to new full chapter:
  - Stroke radiology
- New chapters:
  - Endovascular therapy
  - Less common causes of stroke
  - Cerebral venous sinus thrombosis
  - Transition to outpatient stroke care
- Expanded chapters:
  - Ischemic stroke etiology and secondary prevention – covers information on what a stroke specialist should consider in managing post-acute-stroke patients
  - Subarachnoid hemorrhage – many vascular neurologists will manage these patients
  - Organization of stroke care

Abbreviations

ACA	anterior cerebral artery
ACC	American College of Cardiology
ACE	angiotensin-converting enzyme
ADC	apparent diffusion coefficient
AF	atrial fibrillation
AHA	American Heart Association
AIS	acute ischemic stroke
APA	antiplatelet agent
aPTT	activated partial thromboplastin time
ARB	angiotensin II receptor blocker
ARR	absolute risk reduction
ASA	American Stroke Association
ASCVD	atherosclerotic cardiovascular disease
ASPECTS	Alberta Stroke Programme Early CT Score
AVM	arteriovenous malformation
BAO	basilar artery occlusion
BHF	British Heart Foundation
BHI	breath-holding index
bid	twice a day (*bis in die*)
BP	blood pressure
CAA	cerebral amyloid angiopathy
CAS	carotid artery stenting

CBC	complete blood count
CBF	cerebral blood flow
CBV	cerebral blood volume
CEA	carotid endarterectomy
CI	confidence interval
CN	cranial nerve
CNS	central nervous system
CPP	cerebral perfusion pressure
CRP	C-reactive protein
CS	conscious sedation
CSF	cerebrospinal fluid
CT	computed tomography
CTA	CT angiography
CTP	CT perfusion
CTV	CT venography
CUS	carotid ultrasound
CVST	cerebral venous sinus thrombosis
DAPT	dual antiplatelet therapy
DBP	diastolic blood pressure
DCI	delayed cerebral ischemia
DIC	disseminated intravascular coagulation
DOAC	direct oral anticoagulant
DSA	digital subtraction angiography
DTI	diffusion tensor imaging
DVT	deep venous thrombosis
DWI	diffusion-weighted imaging
ECASS	European Cooperative Acute Stroke Study
ECG	electrocardiogram
ED	emergency department
EEG	electroencephalogram
EIC	early ischemic change
EMA	European Medicines Agency

EMS	emergency medical services
ESR	erythrocyte sedimentation rate
EU	European Union
EVD	external ventricular drain
EVT	endovascular thrombectomy
FDA	Food and Drug Administration (USA)
FEIBA	factor eight inhibitor bypassing agent
FFP	fresh frozen plasma
FLAIR	fluid-attenuated inversion recovery
GA	general anesthesia
GCS	Glasgow Coma Scale
GFR	glomerular filtration rate
GI	gastrointestinal
GRE	gradient echo
GU	genitourinary
HCTZ	hydrochlorothiazide
HDL	high-density lipoprotein
HI	hemorrhagic infarction
HIT	heparin-induced thrombocytopenia
HITS	high-intensity transient signal
HITTS	heparin-induced thrombocytopenia with thrombotic syndrome
HIV	human immunodeficiency virus
HU	Hounsfield unit
IA	intra-arterial
ICA	internal carotid artery
ICH	intracerebral hemorrhage
ICP	intracranial pressure
ICU	intensive care unit
IgG	immunoglobulin G
IgM	immunoglobulin M
IM	intramuscular

INR	international normalized ratio
IV	intravenous
IVH	intraventricular hemorrhage
IVT	intravenous thrombolysis
LACI	lacunar infarction
LDL	low-density lipoprotein
LKW	last known well
LMN	lower motor neuron
LMWH	low-molecular-weight heparin
LOC	level of consciousness
LTAC	long-term acute care
LVO	large-vessel occlusion
MAP	mean arterial pressure
MB	microbubble
MCA	middle cerebral artery
MI	myocardial infarction
MPGR	multiplanar gradient recalled
MRA	magnetic resonance angiogram
MRC	Medical Research Council
MRI	magnetic resonance imaging
mRS	modified Rankin scale
MRSA	methicillin-resistant *Staphylococcus aureus*
MRV	magnetic resonance venography
MSSA	methicillin-sensitive *Staphylococcus aureus*
MSU	mobile stroke unit
MTE	mean time to enhancement
mTICI	modified Thrombolysis in Cerebral Infarction scale
MTT	mean transit time
NCCT	non-contrast CT
NEI	negative enhancement integral
NF-1	neurofibromatosis type 1
NIH	National Institutes of Health

NIHSS	National Institutes of Health Stroke Scale
NINDS	National Institute of Neurological Disorders and Stroke
NNH	number needed to harm
NNT	number needed to treat
NPO	nothing by mouth (*nil per os*)
NSAID	non-steroidal anti-inflammatory drug
NSTEMI	non-ST-elevation myocardial infarction
OOB	out of bed
OR	odds ratio
OT	occupational therapy
PACI	partial anterior circulation infarction
PCA	posterior cerebral artery
PCC	prothrombin complex concentrate
PEG	percutaneous endoscopic gastrostomy
PET	positron-emission tomography
PFO	patent foramen ovale
PH	parenchymal hemorrhage
PO	by mouth (*per os*)
POCI	posterior circulation infarction
PSD	post-stroke depression
PT	physical therapy
PT	prothrombin time
PTT	partial thromboplastin time
PWI	perfusion-weighted imaging
qd	every day (*quaque die*)
RCT	randomized controlled trial
RCVS	reversible cerebral vasoconstriction syndrome
RLS	right-to-left shunt
RRR	relative risk reduction
SAH	subarachnoid hemorrhage
SBP	systolic blood pressure
SC	subcutaneous

SIADH	syndrome of inappropriate antidiuretic hormone secretion
SLE	systemic lupus erythematosus
SLP	speech and language pathologist
SNF	skilled nursing facility
SPECT	single-photon emission computed tomography
SSRI	selective serotonin reuptake inhibitor
ST	speech therapy
STEMI	ST-elevation myocardial infarction
SWI	susceptibility-weighted imaging
TACI	total anterior circulation infarction
TCD	transcranial Doppler ultrasound
TED	thromboembolic deterrent
TEE	transesophageal echocardiogram
TIA	transient ischemic attack
T_{max}	maximum of the tissue residue function
TNK	tenecteplase
tPA	tissue plasminogen activator
tRNA	transfer RNA (ribonucleic acid)
TTE	transthoracic echocardiogram
TTP	time to peak
UFH	unfractionated heparin
UTI	urinary tract infection
VTE	venous thromboembolism
VZV	varicella-zoster virus
WBC	white blood cells
WFNS	World Federation of Neurological Surgeons