

Table S1. Role of new technologies and artificial intelligence in acute stroke patient management.

Time period	Process	New Technology	Tool Example	Impact / Sensitivity of Technology Application	References
Prehospital					
Stroke symptoms recognition and first aid call					
		Facial asymmetry detection		Current accuracies up to 87%	[22]
After first aid arrival					
		Standardization of clinical examination	FAST-ED	Improved diagnostic process	[24]
		Automated scoring of patient facial palsy	eFACE	Interclass correlation for eFACE scores: 0.96	[25]
		Decision making algorithms system		Increased documentation quality from 78.66% to 100%	[26]
		Mobile CT		Faster diagnosis	[27]
Team activation, consultation, and transfer					
		Telemedicine / teleradiology		Improved decision	[28–30]
		Real-time traffic information		Faster patient transport	[31]
		GPS location of the ambulance	STEMI application	Better stroke-team management	[32]
Prenotification – stroke team activation before patient arrival					
		Workflow application	ESN application	Workflow improvement: door-in-door-out time; 56 ± 34 min vs. 96 ± 45 min, door-to-groin puncture time; 50 ± 7 min vs. 120 ± 25 min, door-to-needle time; 55 ± 12 min vs. 78 ± 16 min ($p < 0.0001$)	[37]
Hospital					
Patient registration					
		Patient's ID information application		Reduction of wrong patient registration in hospital from 0.68% to 0.12% ($p < 0.001$)	[45]
Brain imaging					
		Time measurement application	Stroke Clock app.	Treatment decision time reduction (from 26.00 min to 16.73 min)	[39]
		One-stop management	Flat panel CT performed in operation room	Faster treatment initiation	[40,41]
		CBCT		Posterior fossa artefacts reduction	[42]
		AI	AI in CT scanner	Radiation dose reduction	[43]
		AI	AI in MR scanner	40–60% faster scanning	[43]
		AI	AI in scanner	Faster patient	[47]

		positioning / examination planning	
AI	AI in scanner	Contrast material doses reduction	[47]
ASPECT			
AI		AI non-inferiority compared to neuroradiologists ($p < 0.003$)	[53]
AI		Greater detection sensitivity with convolutional neural networks algorithms versus random forest learning (85% vs. 68%)	[55]
Artery occlusion detection			
AI	AI-occlusion detection on NCCT	Maximum sensitivity of 97.5%	[56]
AI	AI-occlusion detection on CTA	Sensitivity of 82%	[57]
Collateral score			
AI	Collateral score calculated from CTA	Sensitivity for identifying favorable collateral flow (collateral score 2-3) were 0.99	[61]
Perfusion maps			
AI	Neural network- derived perfusion maps	Similar performance to standard methods, but faster computation time	[72]
Differential diagnosis			
AI	Detection of intracranial hemorrhage on NCCT	Sensitivity 92-98%	[73]
AI-convolutional and recurrent neural networks	Detection of intracranial hemorrhage on NCCT	Sensitivity 98% - superior results to the junior radiology trainees	[74]
Prognosis			
AI-convolutional and recurrent neural networks	Final infarct prediction form baseline MR images	AUC > 0.87	[81–82]
AI	Unfavorable outcome prediction	Interclass correlation score > 0.72	[84]
AI	Hemorrhagic transformation severity prediction form MR PWI	Best accuracy 83.7%	[85]
Techniques of the treatment			
First pass effect			
Balloon guide catheter, BADDASS approach, longer stent retrievers, correct positioning of stent retrievers, the		Faster recanalization	[98–112]

push and fluff
technique, novel clot
extractor, Solumbra
technique, ARTS,
CAPTIVE, SAVE,
Protect plus.

Neurointerventional robotics

Robot-assisted
neurointervention

Tele-robotic-assisted
intervention

[8,9,133]

Intensive care, rehabilitation and medical control

Intensive care monitoring

AI

Prediction of cardiac
arrest or acute
respiratory failure

Improved prediction:
40%

[134]

Hospital / Home

Rehabilitation

Robots

Motor function
improvement of
paralyzed extremity

[135,136]

AI

Sofia

Language
conversation training

[138]

Home

Medical control

Mobile phone
applications

WeChat

Increased medication
compliance

[139]