

Ischemic stroke-risk factors and early neurological diagnosis

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Abstract

Ischemic stroke is most commonly caused by arterial occlusion due to thrombosis or embolism and remains a leading cause of death and long-term disability worldwide. The strongest prevention impact comes from identifying and controlling modifiable risk factors, especially hypertension, atrial fibrillation, diabetes, dyslipidemia, smoking, obesity, and physical inactivity. Early neurological diagnosis is time-critical because reperfusion therapies are highly time-dependent. Modern acute stroke pathways prioritize rapid clinical recognition (prehospital stroke scales), immediate neurological severity assessment (e.g., NIHSS), urgent brain imaging—most often non-contrast CT—and targeted laboratory tests, with parallel evaluation for intravenous thrombolysis and mechanical thrombectomy in eligible patients.

Keywords:

Ischemic stroke; risk factors; hypertension; atrial fibrillation; diabetes mellitus; dyslipidemia; smoking; obesity; carotid stenosis; thromboembolism; NIHSS; early diagnosis; non-contrast CT;

Ischemic stroke risk factors are classically divided into non-modifiable (age, sex, genetics/family history, prior stroke/TIA) and modifiable factors that can be treated or changed. Among modifiable risks, high blood pressure (hypertension) is consistently emphasized as the leading risk factor; other major contributors include diabetes mellitus, hyperlipidemia, cigarette smoking, obesity, and physical inactivity, which together drive atherosclerosis and small-vessel disease. Cardioembolic sources are also critical—especially atrial fibrillation (AFib), which increases stroke risk through formation of atrial thrombi that can embolize to

cerebral arteries; controlling blood pressure also reduces AFib-related risk. Additional clinically important risks include carotid atherosclerotic disease/stenosis, coronary disease, excessive alcohol intake, and certain prothrombotic conditions (patient-specific).

Early neurological diagnosis focuses on speed and structured assessment. In the prehospital phase, emergency systems use validated screening tools (e.g., FAST and similar scales) and rapid transport to stroke-capable hospitals. In the emergency department, severity is commonly documented using the NIH Stroke Scale (NIHSS) as part of standardized acute evaluation workflows. Imaging should be performed as quickly as possible; in most acute candidates for reperfusion therapy, guidelines emphasize urgent brain imaging, commonly non-contrast CT, to exclude hemorrhage and assess for major contraindications. Basic diagnostics run in parallel: vital signs and oxygenation, ECG, and key labs. Importantly, the guideline summary highlights that blood glucose must be checked before initiating IV alteplase in all patients (to avoid treating stroke mimics such as hypoglycemia).

For patients who may be eligible for mechanical thrombectomy, rapid identification of large vessel occlusion is essential; therefore, a noninvasive intracranial vascular study (such as CTA/MRA depending on protocol) is recommended during initial imaging evaluation, but it should not delay IV alteplase when alteplase is indicated. Overall, early diagnosis is not a single test—it is an integrated, time-sensitive pathway combining symptom recognition, neurological scoring, immediate imaging, and parallel decisions about reperfusion eligibility.

Conclusion

Ischemic stroke risk is strongly shaped by modifiable factors, with hypertension and cardioembolic disease (notably atrial fibrillation) among the most impactful targets for prevention. Early neurological diagnosis must be organized around time: rapid recognition, standardized severity scoring (NIHSS), immediate brain imaging (typically non-contrast CT), and parallel evaluation for thrombolysis and thrombectomy—while ensuring critical exclusions such as hypoglycemia. This combined prevention-and-pathway approach provides the best opportunity to reduce mortality and long-term disability after ischemic stroke.