

EARLY MANAGEMENT

Every stroke and every Transient Ischemic Attack (TIA) are generally considered medical emergencies. In every suspected case 112 should be dialed immediately to ensure immediate assistance. Any other attempt to obtain medical assistance will inevitably result in a potentially life-threatening delay of procedures.

Assessment and Acute Care

- Initial management:
Use the ABCDE approach plus FAST test **A**
- Assessment of blood glucose **A**
- Assessment of blood glucose **A**:
 - < 120 mmHg and signs of dehydration: Apply crystalloid fluids **B**
 - ≥ 220 mmHg: Decrease by 15 % through careful drug titration **O**
- Document case history data, onset of symptoms, possible contraindications for thrombolysis, and therapeutic interventions that have already been carried out; prepare a medication plan for the patient **A**.

TIA Management in General Medicine **B**

- TIA symptoms within the last 48 hours: Immediate admission to the stroke unit
- Symptoms longer than 14 days ago: Timely outpatient management may be sufficient
- Time window of 2-14 days: In the presence of many risk factors, high ABCD2 score (e.g. ≥ 4), atrial fibrillation (AF), occlusion of brain-supplying arteries or previous cardiovascular diseases → Admit to stroke unit
- Outpatient management: Workup and secondary prevention same as for patients with a completed stroke. Workup includes
 - Brain imaging (CCT or MRT)
 - Imaging of extracranial and intracranial vessels (primarily by ultrasound, MR/CT angiography for specific problems)
 - Cardiac diagnostics (12 lead ECG, ECG monitoring, echocardiography [transthoracic or transesophageal])
 - Laboratory exam (electrolytes, kidney levels, liver levels, blood count, coagulation, lipid status, glucose, HbA1c)

Palliative Care Resources

- Consider possible benefits and harm of hospitalization in the individual case.
- In case of patient and/or caregiver requesting palliative care: Discuss and initiate supportive measures and do without hospital admission.

TREATMENT OF PATIENTS AT HIGH RISK OF STROKE – PRIMARY AND SECONDARY PREVENTION

Nutrition

- Keep a varied diet and follow the recommendations of the Mediterranean or Nordic diets **B**.
- Reduce salt intake (especially in hypertension) **B**.

Physical Activity

- Encourage to participate in moderate-intensity physical activity and strength training several times a week **A**.
- If not able to be physically active: Practice as intensively as safely possible, try to be active every day and minimize the time spent sitting **A**.

Alcohol Consumption and Smoking

- Restrict alcohol consumption **B**
- Stop smoking completely **A**

Hypertension

- Antihypertensive drug therapy **A**
Target a long-term blood pressure of < 140/90 mmHg **B**.

Antithrombotic Treatment

- Primary prevention: Individuals with a very high overall cardiovascular risk of > 20 %/10 years (arriba[®]) → Acetylsalicylic acid (ASA) 100 mg/day **B**.
- Secondary prophylaxis: Platelet Aggregation Inhibition (PAI) therapy, i. e. ASA 100 mg/day (or clopidogrel 75 mg/day) **A**.
- In case of minor stroke or TIA with a high risk of recurrence: Combination of clopidogrel and aspirin for a maximum of 30 days **B**.
- In case of recurrent stroke under ongoing PAI or OAC therapy: Do not extend or intensify antithrombotic therapy. Generally reevaluate all vascular risk factors and treat as appropriate **O**.

Lipid Management

- Primary prevention: Risk calculators such as arriba[®] help when discussing the benefits and risks of lipid modifying therapy compared to non-treatment.
- Secondary prevention: Offer a statin **A**.
- Maximization of statin dose in cases of particularly high cardiovascular risk (e.g. acute coronary syndrome, presence of several high-risk factors)

Oral Anticoagulation (OAC) Therapy for Atrial Fibrillation (AF)

- Discuss stroke risk and possible side effects of OAC therapy based on validated risk scores (e.g. CHA2DS2-VASc), make shared decision on treatment **A**, offer OAC therapy **A**.
- Elderly multimorbid individuals and those on polypharmacy, particularly individuals with impaired renal function may benefit from vitamin K antagonist (VKA) therapy based on INR monitoring.
- There is no indication to initiate new oral anticoagulant (NOAC) therapy in patients on VKA therapy who are monitored regularly and treated without complications.

Persistent Foramen Ovale (PFO)

- Patients under 60 years of age with PFO and stroke in the past 6 months:
Offer PFO closure if
 - there is at least a moderate shunt and/or an atrial septal defect
 - and no alternative etiology was found despite extensive research
 - and the practitioners know the strengths and limitations of the underlying studies **A**.

OAC and PAI Therapy after Intracranial Hemorrhage

- Patients with high cardioembolic risk, i. e. AF or mechanical heart valves, may benefit from resumption of OAC or PAI therapy after intracranial hemorrhage.

Cryptogenic Stroke

- Stroke of undetermined etiology despite extensive evaluation:
Offer PAI for secondary prevention **A**.

Strength of the recommendations

- A** Based on high-quality scientific studies
- B** Based on other studies
- 0** Based on consensus statements or expert judgements

CHRONIC STROKE CARE

Therapy planning, goals and course of rehabilitation after stroke

- The decision on indication and duration of therapy depends on whether realistic and relevant goals are achievable in terms of function, activity and participation **B**.
- Support patients in defining their personal goals for therapy.
- Patient and therapist negotiate rehabilitation goals in detail **B**.
- Patients, their social environment and the rehabilitation team are continuously informed about the defined rehabilitation goals **B**.
- Therapy goals are regularly reviewed and adjusted **B**.

Therapy after Stroke

- Spasticity: Offer physical therapy **B** and strength training. **B**
- Assess and document fall risk; advise on the elimination of extrinsic risk factors.
- Aphasia: Offer high-frequency speech therapy (regardless of duration of condition and severity of speech deficits). **A**
- Offer visual acuity testing and visual field examination **A**.
- Neglect: Approach the neglected side in all the therapeutic disciplines **A**.
- Pain therapy: Multifactorial condition – treatment by an interdisciplinary and interprofessional team **B**.
- Neuropathic pain: Start amitriptyline, duloxetine, gabapentin or pregabalin **B**.
- Shoulder pain: Positioning **A**, electrostimulation **A**, taping **B**.
- Central Post Stroke Pain (CPSP): Explore **B**, treat individually **B**.
- Cognitive impairment: Offer neuropsychological management **B**, offer aids and tools **A**, multisensory stimulation or physical training **B**.
- Depressive disorder: (Re-) assess **B**, advise relatives and caregivers **B**, combine pharmacological and non-pharmacological measures **B**.
- Dysphagia: Assess **B**, consider swallowing rehabilitation **A**.
- If enteral nutrition is expected to be required for > 4 weeks: Offer PEG tube placement **A**.
- Urinary and fecal incontinence: Explore **B**; offer structured assessment, sonography, determine bladder post-void residual volume **B**, dipstick urinalysis **B**; pelvic floor exercises **A**, weight reduction, physical training **B**.
- Sexual dysfunction: Explore **B**; provide individual advice and information **B**.
Functional and activity limitations: Occupational therapy, training of Activities of Daily Living (ADL) **A**.
- Fitness to drive: Offer assessment of driving behavior **B**.
- Explore professional activity before stroke.
- Advise on financial assistance, welfare benefits and self-help groups.