

## **Standards of Practice in Acute Ischemic Stroke Intervention – (AISI)**

### **Purpose**

This is a document which provides recommendations based on expert opinions and best available evidence, in relation to the optimal conditions for the safe practice of Acute Ischemic Stroke Intervention – (AISI)

### **Art. 1**

Acute Ischemic Stroke Intervention – (AISI) involves percutaneous and endovascular procedures to treat ischemic stroke in adults and in rare cases in children.

Commonly utilised Acute Ischemic Stroke Intervention – (AISI) techniques include:

- Re-canalisation techniques – Thrombectomy, including all “clot removal” techniques e.g. stent-trombectomy and trombo-aspiration etc.
- Devices implantation (stents, etc.)
- Image guided administration of drugs

### **Site conditions**

### **Art. 2**

The practice of Acute Ischemic Stroke Intervention – (AISI) should ideally take place in healthcare institutions that routinely provide services and treatments to patients with neurological disorders – ENI Centres (See: “Standards of Practice in Interventional neuroradiology: ‘Neuroradiology’ (2017) 59:541-544).

However if a centre fulfilling these conditions is not available, a center treating only ischemic stroke in adults can be established under the following conditions:

- there is no centre with full endovascular neurointervention (ENI) available within reasonable distance (<100 km) or time (<1hr transportation time)

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- The institution where such a centre (treating only AISI) is to be established, must have a minimum workload of 150 stroke treatments (thrombolysis) a year

For those centres established under these conditions the following standards of practice apply:

The center treating ischemic stroke using interventions should work in cooperation with a comprehensive endovascular neurointerventional centre - ENI Centre - (mortality&morbidity rounds, tele-consultations in difficult cases, cover on holidays etc. etc.)

Facilities that must be available on site 24/7 include:

- Inpatient hospital beds.
- Intensive Care Unit.
- A dedicated radiology service, with competence in neuroimaging, having full access to state of the art CT & MR- facilities and a suitable angiography room (as defined below in Art.3.)
- A team of trained Acute Stroke Neuro-interventionists
- A dedicated "Stroke unit" and a "Stroke team"
- Ideally a department of Neurosurgery, or if that is not possible a written agreement with a department of Neurosurgery in a nearby hospital (<30 min transportation time).

## **Art. 3**

A suitable interventional angiographic suite implies the ability to routinely accommodate general anaesthesia under aseptic conditions similar to an operating theatre.

Optimally, procedures should be carried out under the image guidance of a bi-plane digital angiography unit with three-dimensional image reconstruction including flat panel-CT capabilities.

As a very minimum, each suite should comprise of a single plane high resolution flat panel digital subtraction angiography unit with road mapping capabilities.

Radiation protection measures in accordance with national and European regulations should be in place with designated individuals responsible for carrying out the necessary checks and audits.

## **Art. 4**

A suitable Ischemic stroke interventional center (as defined in Art. 3.) should be able to provide the services defined in Art. 1, on a full-time basis, 24/7, all year around.

## **Art. 5**

There need to be a minimum workload met (for individual operators and the institution overall) in order for a center to be recognized in the practice of AISI. These numbers should reach a minimum number of 80 thrombectomy cases per year for the institution. If this level is not reached, the entire operation of acute ischemic stroke interventional treatment should be abandoned.

## **Art. 6**

Ischemic stroke Intervention should ideally be practiced in Neuro-interventional teams with the possibility to exchange of experience and knowledge. Research should be possible and encouraged. A suitably trained clinician should be able to perform procedures as defined in Art. 1, with the support of other Neurointerventionists. The solitary practice of Acute Stroke Interventional therapy is strongly discouraged.

## **Operational guidelines**

### **Art. 7**

It is recommended that Interventionists involved in AISI carry out outpatient clinics for follow-up and have admitting privileges either in units/beds dedicated to Interventional Neuroradiology or in other appropriate inpatient facilities.

A sufficient number of inpatient beds should be available in Stroke Units to accommodate interventionally treated stroke patients at any time.

The Acute Stroke interventionist, in collaboration with the stroke team, should have shared responsibility for pre- and post-operative patient care with input from the appropriate specialities. This should include pre-operative examination

and consultation, documented informed consent, operative and post-operative management as well as follow up consultation in outpatients.

## **Art. 8**

In order for a Centre to provide a comprehensive service as defined in Art. 1, the following overall medical staff should be available in the Centre:

- A minimum three clinicians with particular training and qualification in Acute ischemic stroke intervention.
- Anaesthetists with experience in caring for patients undergoing Acute ischemic stroke intervention.

## **Art. 9**

With regards to individual procedures, it is recommended that the following staff roles are present for each case:

- A lead Acute ischemic stroke interventionist
- A second scrubbed individual (i.e. a supporting Acute ischemic stroke interventionist or a scrub nurse or a radiographer)
- A radiographer
- A nurse or nurse assistant
- An anaesthesiology team present

## **Art. 10.**

Treatment of AIS using AISI techniques is a novel method that involves the consumption of significant human and material resources and carries the risk of severe complications. Accurate documentation of medical and technical details as well as patient outcome and follow up results is inevitable to ensure the highest benefit of such complex and demanding procedures. To secure such documentation and data management, the AISI team must also include:

- A dedicated individual, preferably a stroke nurse, with the responsibility of continuous data recording and database management
- All technical and clinical data of AISI procedures, patient outcomes and follow up must be entered into an electronic database either locally or (preferably) nationally or internationally
- To ensure that the results in the individual centre match the most recent requirements by international standards, the database should be regularly audited by local and national/international expert groups.

## **References:**

Jansen O, Szikora I, Brückman H et al: Standards of Practice in Interventional neuroradiology:

Neuroradiology (2017) 59:541-544

Training Guidelines for Endovascular Stroke Intervention: An International multi-society consensus document.

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