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Lübeck, 30.03.2020

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The executive committees of the German Society of Neurosurgery (DGNC) and the Professional Association of German Neurosurgeons (BDNC) have joined in supporting the position paper of the German Society of Surgery and herein define the spectrum of non-elective surgical interventions in the area of Neurosurgery.

The German Society of Surgery (DGCH) supports all efforts which slow the spread of the Coronavirus SARS-CoV-2 in order to secure resources in our health care system needed to treat severe cases.

#### These include:

- 1). The separation of in-hospital and out-patient facilities as well as personnel in COVID and Non-COVID treatment units in accordance with the recommendations of the Robert-Koch-Institut (RKI).
- 2). The temporary postponing of elective surgery in accordance with the federal and local authorities in order to secure necessary Intensive Care Unit beds and respirator capacity for severe Corona cases. A system of triage as it is currently found in Italy or Spain should be avoided so that personnel can be re-allocated as needed.

Both measures place the surgical disciplines and their leading Physicians before significant challenges. Questions of determining which operations and which facilities are to be effected by the practice of postponing surgery as well as how long these procedures can be responsibly postponed for have quickly risen.

Emergent treatment is not and should not be effected by the new measures.

The question of how long elective procedures can be postponed for depends on the underlying diagnosis and the planned surgical procedure. Due to the broad spectrum of surgical disciplines and indications, there is no standard answer to this question, and the time frames will likely range from a few days to several months.

Moreover, the mortality risk associated with postponing a surgical procedure should not be higher than that of a severe case of COVID-19 requiring hospitalization.

It is not possible to define the urgency of a surgical procedure based on the question of an immediate life-threatening condition alone.

Whereas some cases can be postponed for longer periods of time, the majority of cases is characterized by progression of an underlying condition (cancer, organ failure, vascular disease, complications of a disease or accident). The extent of the time frames in which these conditions can progress is dependent on the underlying condition. Prolonged presence of a state of disease can also cause irreversible permanent damages. Planning of surgical treatment is therefore often time-sensitive and is based on several criteria, which in part are defined in the recommendations of individual surgical societies.

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3). The decision to operate urgently or to postpone the procedure can therefore only be determined by board certified specialists of the individual surgical disciplines in order to assess the risk associated with postponing surgery on an individual basis.

The risk profile of individual patients is affected on the one hand by the realistic risk of the surgical procedure planned, also under consideration of the current state of the medical system, and on the other hand by the risk of postponing intervention (also under consideration, that this may be possible under significantly better conditions in 6-8 weeks). These conditions are to be re-evaluated in short intervals in order to adapt the risk-benefit analysis of postponing surgical intervention on a case by case basis.

The executive boards of both the German Society of Neurosurgery (DGNC) as well as the BDNC define in the following section all neurosurgical procedures within the different sub-specialities considered as non-elective. The provided list represents a guideline in the context of the current Covid-19 pandemic and may change depending on the context and evolvement of the current situation. Finally, a board-certified neurosurgeon must determine on an individual case-to-case basis whether a procedure should be performed as non-elective.

## **Neuro-oncology**

- Malignant primary brain tumors
- Brain metastases of any primary tumor type
- Benign or low-grade tumors with marked parenchymal compression or progressive neurological deficits
- Pituitary tumors with cranial nerve deficits, visual impairment or endocrine deficiency that cannot be managed conservatively (see special precautions / Stanford protocol)

#### Neurovascular

- Subarachnoid hemorrhage
- Malignant cerebral infarction (malignant middle cerebral artery infarction)
- Space-occupying intracerebral hematoma
- Hemorrhage due to arterio-venous malformations
- Higher grade dural AV fistulas
- Procedures including revascularization in patients with evidence of relevant vascular occlusive disease
- Unstable aneurysms

#### **Spine**

- Intraspinal pathologies with signs of spinal cord compression
- Degenerative spine conditions with acute onset of motor deficits and/or vegetative dysfunction
- Progressive myelopathy of cervical and/or thoracic spine
- Vertebral body fractures with therapy-refractory and severe pain, instability and/or signs of myelon compression
- Spinal metastases as well as primary tumors with therapy-refractory severe pain, instability and/or compression of the myelon
- Infectious conditions of the spine and adjacent structures with abscess formation, instability and/or myelon compression

#### Pediatric neurosurgery

- Myelomeningocele

#### **Functional neurosurgery**

- Pain syndromes that do not respond to non-invasive therapeutic modalities (neuralgia, neuropathy)
- Battery depletion in DBS patients
- Signs of infection of implanted devices (e.g. DBS hardware-related infections)

# **Hydrocephalus**

- Progressive increase of intracranial pressure with signs and symptoms suggestive of elevated intracranial pressure
- Infection of implanted shunt material/shunt dysfunction

## Traumatic brain injury

- Acute traumatic brain injury with SDH and/or EDH
- Any scenario where intracranial pressure cannot be controlled by means of conservative management
- Chronic subdural hematoma with neurological symptoms

# Peripheral nerves

- Acute injuries with the necessity of re-adaption
- Transplant surgery in a given critical time window
- Benign nerve tumors with motor deficits and/or vegetative dysfunction
- Suspicion of malignant peripheral nerve tumors

The German Society of Neurosurgery (DGNC) will be closely following the developments of the current pandemic situation as well as its' consequences for the health care system and will continue to provide recommendations.

We thank you for your cooperation and support in these times of crisis.

We wish you, your families and your teams all the best. Take care of yourselves and stay healthy!

Prof. Dr. med. V. Tronnier

President of the

German Neurosurgical Society

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