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Annex No. 10 to the MU Directive on Habilitation Procedures and Professor Appointment Procedures

HABILITATION THESIS REVIEWER'S REPORT

Masaryk University	
Applicant	MUDr. Ondřej Volný, Ph.D.
Habilitation thesis	Diagnostics and Recanalization Treatment of Ischemic Stroke
Reviewer	Michael Mazya, MD, PhD, FESO Associate professor, Dept. of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden
Reviewer's home unit, institution	Head of Stroke Service, Consultant Neurologist Department of Neurology, Karolinska University Hospital, Stockholm, Sweden

It is my pleasure and a privilege to review the habilitation thesis of MUDr. Ondřej Volný, Ph.D. I have had the opportunity to follow his work over the past years and I am therefore well aware of his scientific achievements and expertise in the field of diagnostic imaging and treatment of acute ischemic stroke.

The candidate has a good publication record with 23 peer reviewed original result publications and 3 reviews in the NIH National Library of Medicine (PubMed). On 7 of these he appears as first author (including one as co-first), and on 1 as senior authorThe list of his publications includes papers in prestigious international journals, such as Lancet, Neurology, Neuroradiology and American Journal of Neuroradiology.

Dr Volný has established and maintans since several years a very fruitful collaboration with arguably the most innovative and leading clinical stroke research group in the world, at the Department of Clinical Neurosciences, University of Calgary, Canada, where he has spent considerable time as a researcher. This has led to 7 joint publications with field-leading scientists such as Profs Goyal, Hill, and Demchuk.

The thesis, following a brief but succinct introduction to the field, has main parts, covering the candidate's important contributions to (1) diagnostic stroke imaging and (2) reperfusion treatment in cerebral large artery occlusion. In the first section, the candidate gives a detailed and eloquent overview, based on his published works, on recent advances in computer tomographic imaging techniques and their interpretation in the setting of ischemic stroke. The component projects are highly clinically relevant and driven by unresolved clinical questions, pertaining to selection of patients for endovascular thrombectomy – a treatment which has

revolutionized stroke care, yet, being an invasive treatment of the brain, carrying risks. The studies reported by the candidate inform both clinical decision making at the individual patient level (e.g. question on treatment eligibility, prognosis, imaging finding reliability) and on an organisational level (e.g. which automated imaging interpretation systems available on the market today perform best, and thus be more suitable for procurement in a healthcare system).

The second main part of the thesis covers endovascular thrombectomy itself. The first listed publication on this topic, with the candidate as first author, is an important comparison of patient characteristics, logistics and outcomes of EVT performed in routine healthcare nationwide in the Czech Republic, versus data from previous randomized trials. Such studies are highly important to evalute real-world safety and eficacy of a treatment within specific national circumstances after its implementation. Encouragingly and impressively, the outcomes of EVT in severe stroke patients in the Czech Republic were shown to be on par with those in RCTs performed largely in countries such as the US, Canada, Australia and the Netherlands. In another project on the EVT topic, the candidate has addressed a highly pertinent clinical question faced by many patients and physicians globally today: what is the optimal acute treatment for stroke with a large cerebral artery occlusion, but with mild neurological symptoms? This was a methodologically robust study, pooling three prospectively collected patient cohorts, and using propensity score matching for mitigation of confounding effects. Albeit the study did not resolve the current controversy regarding to use or not to use EVT in mild stroke with large occlusions (as both EVT and medical treatment appear to give similar results), it is an important contribution to the state of the science on the topic.

Reviewer's questions for the habilitation thesis defence (number of questions up to the reviewer)

1. You are well-informed on the most recent developments in computer tomographic diagnostics in acute ischemic stroke. What is your view on the 5-10 year future of acute diagnostic imaging in ischemic stroke, in particular with a view to identify treatment candidates and individualise treatment strategies? Where is the field headed?

2. Alluding to question 1, do you envision that the “direct to angio” and “multimodal diagnostic CT first” approaches will complement each other in different patient groups, or do you see a different evolution of practice?

3. Do you have a perspective or opinion on the potential uses of spectral (dual-, multi-level or true continuous energy spectrum) CT in stroke?

4. What is your view on the differences in implementation and real-world use of endovascular thrombectomy in the Czech Republic and Canada? Are there any lessons to be learned from differences in practice (if such exist)?

Conclusion

The habilitation thesis entitled "Diagnostics and Recanalization Treatment of Ischemic Stroke" by MUDr. Ondřej Volný, Ph.D., **fulfils** requirements expected of a habilitation thesis in the field of Neurology.

Date: 2021-07-16 Signature: