

COMMENTARY TO HABILITATION THESIS¹

The habilitation thesis titled Healthcare Associated Infections (HAI) in Brain and Spine Diseases is presented as a commentary on four publications which evaluated the effectiveness of the Preventive Multimodal Nosocomial Infection Protocol implemented in 2001 at the Neurointensive Care Unit of the Neurocentre at the Regional Hospital Liberec.

The first habilitation thesis constitutes the most extensive part of the research. A prospective clinical trial evaluated the efficacy of a set preventive multimodal protocol in 3646 patients with primary brain disease, over a lengthy time span from 2001 to 2010. The study showed that this prevention programme led to a significant decrease in the incidence of HAI, in our case from 9.1 % to 4.7 % of patients. At the same time, the research confirmed a very low incidence of MDR (Multidrug resistant) bacteria, with 1.9 % of patients having ESBL (Extended spectrum β -lactamases) and 1.5 % of patients having MRSA (Methicilin-rezistentní *Staphylococcus aureus*). These results show that a proactive approach in setting and maintaining a comprehensive preventive multimodal protocol is of major importance for the incidence of HAI and MDR bacteria in neurointensive care.

The remaining three habilitation papers focused on SSIs (Surgical Site Infection) in patients following spine surgery who had postoperative care in the Neurointensive Care Unit. These prospective studies covered the spine in its entirety from the cervical to the lumbar region. The first of these studies looked at elective thoracic and lumbar spine surgery, and it was shown that this is one of the riskiest areas of spine surgery in terms of SSIs, and that significant predictors of SSIs include non-infectious complications in the surgical wound and warm seasons. Part of this first work included monitoring the rationalization of prophylactic antibiotic policy, which already led to the implementation of antibiotic administration only before and during surgery in a large number of patients (95.8 %) between 2006 and 2010. A follow-up study evaluated SSIs after elective cervical spine surgery. The results of this work confirmed that this is the lowest risk area in terms of SSI incidence (0.25 % of patients), with the posterior surgical approach being riskier than the anterior approach. The last area of research focused on transoral cervical spine surgery. From an SSI perspective, these are high-risk operations that require an individualized perioperative approach. The main contribution

¹ The commentary must correspond to standard expectations in the field and must include a brief characteristic of the investigated matter, objectives of the work, employed methodologies, obtained results and, in case of co-authored works, a passage characterising the applicant's contribution in terms of both quality and content.

of this work is the finding that non-infectious complications in the surgical wound may not lead to SSI in the transoral approach and that the posterior surgical approach is also riskier compared to the transoral approach. The reason for dividing the study into three separate units is the different risk of SSI in different sections of the spine, and our aim was to identify the area at highest risk. Research on SSIs after spine surgery has confirmed that these complications have a high degree of preventability, that a proactive approach of preventive procedures is essential to eliminate them, and that the quality of surgical wound care is of the highest priority. The entire SSI post-spine surgery research became a pillar in defending the prestigious European Centre of Excellence in Spine Surgery certification from the Spine Society of Europe in infection control in 2023.

The present habilitation thesis presents our long-term research in the field of HAI prevention in neurointensive care. Our results demonstrate that our team was able to effectively set up and implement a comprehensive multimodal prevention programme based on all essential principles, hygiene and anti-epidemic measures, a rational antibiotic policy, and MDR bacteria prevalence and infection control. The most important achievement of our work is in obtaining results demonstrating that HAIs in neurointensive care are preventable diseases that can be effectively prevented.

[1]² **SPATENKOVA, Vera*(corresponding author)***, Ondrej BRADAC, Daniela FACKOVA, Zdenka BOHUNOVA and Petr SUCHOMEL. Low incidence of multidrug-resistant bacteria and nosocomial infection due to a preventive multimodal nosocomial infection control: a 10-year single centre prospective cohort study in neurocritical care. *Bmc Neurology* [online]. 2018, **18**(23, Article 23). ISSN 1471-2377. Available at: doi:10.1186/s12883-018-1031-6

Document Type: Article; IF = 2,233; median IF CLINICAL NEUROLOGY – SCIE 2,635; according to AIS CLINICAL NEUROLOGY – SCIE Q2

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
-	90 %	90%	100 %

[2] **SPATENKOVA, Vera*(corresponding author)***, Ondrej BRADAC, Zdenek JINDRISEK, Jan HRADIL, Daniela FACKOVA and Milada HALACOVA. Risk factors associated with surgical site infections after thoracic or lumbar surgery: a 6-year single centre prospective cohort study. *Journal Of Orthopaedic Surgery And Research* [online]. 2021, **16**(1, Article 265). ISSN 1749-799X. Available at: doi:10.1186/s13018-021-02418-1

Document Type: Article; IF = 2,677; median IF ORTHOPEDICS – SCIE 2,620; according to IF ORTHOPEDICS – SCIE Q2

² Bibliographic record of a published scientific result, which is part of the habilitation thesis.

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
-	90 %	90 %	100 %

[3] SPATENKOVA, Vera*(corresponding author)*, Ondrej BRADAC, Zuzana MARECKOVA, Petr SUCHOMEL, Jan HRADIL, Eduard KURISCAK and Milada HALACOVA. Incidence of surgical site infections after cervical spine surgery: results of a single-center cohort study adhering to multimodal preventive wound control protocol. *European Journal Of Orthopaedic Surgery And Traumatology* [online]. 2023, **33**(5), 1997–2004. ISSN 1432-1068. Available at: doi:10.1007/s00590-022-03379-9

Document Type: Article; IF = 1,400; median IF ORTHOPEDICS – ESCI 1,650 + SURGERY – ESCI 1,600; according to IF ORTHOPEDICS – ESCI Q3

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
-	90 %	85 %	100 %

[4] SPATENKOVA, Vera*(corresponding author)*, David SILA, Milada HALACOVA, Jan HRADIL, Zdenek KREJZAR and Eduard KURISCAK. Individualized perioperative management in transoral spine surgery: a single-center cohort study evaluating surgical wound complications and wound infections. *Bmc Anesthesiology* [online]. 2022, **22**(1, Article 123). ISSN 1471-2253. Available at: doi:10.1186/s12871-022-01673-x

Document Type: Article; IF = 2,200; median IF ANESTHESIOLOGY – SCIE 2,900; according to IF ANESTHESIOLOGY – SCIE Q3

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
-	90 %	85 %	95 %