tomography (CT) and O-arm imaging enabled a detailed three-dimensional comparison of screw placement. The objective was to compare the accuracy of pedicle screw placement with intraoperative X-ray versus O-arm image-guided navigation. **Methods:** This was a retrospective analysis of image-guided pedicle screw placement in patients who underwent spinal instrumentation. Post-operative CT and O-arm imaging allowed grading of screw accuracy based on pedicle breaches. Clinical outcomes included patient and operative factors. **Results:** Pedicle screws were placed in 208 patients (1116 screws). Three-dimensional O-arm guidance was utilized for 126 patients, while the remainder underwent two-dimensional X-ray imaging and post-operative CT assessment. O-arm navigation was associated with improved pedicle screw accuracy: pedicle breaches were more likely to be low grade (odds ratio 2.84, p=0.001) and less likely to be medium grade (odds ratio 0.35, p=0.007) or high grade (odds ratio 0.31, p=0.025). **Conclusions:** This study provided a detailed comparison of surgical accuracy with X-ray versus O-arm guidance. Navigation with O-arm imaging is associated with benefits in spinal instrumentation, without impacting operative risks for patients.

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Direct Visualization of Thalamic Nuclei using 7 Tesla MRI and quantification in patients with temporal lobe epilepsy.

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Background: Most individual thalamic nuclei cannot be directly visualized on routine clinical MRI. Stereotactic targeting techniques are indirect, relying on histological atlases and electrophysiological recording. We investigate whether high-field MRI can directly visualize the thalamic nuclei in vivo and allow for analysis of disease-related changes. **Methods:** Thirty-two healthy individuals were imaged with 7T MRI at a resolution of $0.7mm^3$. To obtain a high-resolution composite image, these were registered across subjects and averaged together. Three thalamic structures closely integrated in seizure propagation, the anterior thalamic nucleus (ATN), mammillothalamic tract (MTT), and centromedian nucleus (CM) were manually segmented in a subset of healthy subjects and patients with temporal lobe epilepsy (TLE). **Results:** There is sufficient resolution within the thalamus at 7T for visualization of the ATN, CM, and MTT. In the small subset of 5 controls and 5 TLE patients examined, there was no significant difference (p>0.05) in volume or mean T1map for the three thalamic sturctures of interest. **Conclusions:** MRI at 7T provides a method of direct visualization of thalamic nuclei, uncovering substructures not previously identifiable in vivo. These advances will enable quantitative analysis of disease-related changes to these structures and improved clinical targeting as demonstrated in this initial 'proof-of-concept' subset analysis.

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Assessing the competence of neurology residents in performing an interphysician telephone consultation.

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Background: Neurology Residency training in Canada is transitioning to competence based medical education (CBME) in July 2020 and the Royal College Neurology Specialty Committee has identified "providing consultation for and managing patients at outlying centers," to be an entrustable professional activity (EPA). At Western, neurology telephone consultations, from outlying centres, are attended by both the resident and the staff Neurologist. This scenario provides the ideal situation for direct observation and immediate formative feedback. The resident's performance is assessed using the 'TeleTool' which utilizes an entrustment scale and has a short narrative portion. **Methods:** This mixed methods study aims to determine the reliability and validity of the 'TeleTool' in assessing the performance of the telephone consultation by senior neurology residents. Informed consent was obtained from residents (9) and staff (7) involved. Scores on the entrustment scale and narrative comments were analysed. **Results:** Information on 30 encounters (involving 9 residents) was collected. TeleTool results demonstrated higher entrustment scores in PGY4 and PGY5 levels. Overall, ratings were consistent across the 7 consultants assessors. **Conclusions:** The TeleTool was reliable and valid in assessing competence in the telephone consultation and will be a useful tool for assessment of this EPA.

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The Effect of the COVID 19 Pandemic on theTraining of Surgical Residents in Canada. A Survey of Residents and Program Directors.

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Background: The coronavirus 2019 pandemic has led to restructuring of health care systems and has subsequently had secondary effects on medical education. This study examines the impact on training of surgical residents in Canada. **Methods:** The study consisted of a 25-question survey for residents and a 22-question survey for program directors, which were distributed electronically through program administrators on July 3rd- July

11th, 2020. Questions sought to elicit residents' current experiences and gain insight into methods by which to enhance future training. **Results:** 108 residents and 21 program directors, from various surgical specialties across Canada, completed the survey. Operative exposures were reported to be reduced by 25-100% and 39% of residents were redeployed. However, 89% of residents reported accessing academic half days virtually and 57% had additional online modules. Despite lost time, 100% of program directors confirmed that residents did not require training extensions. Concerns regarding training, personal health, employability and fellowships were raised. 55-70% of residents and program directors advocated for alternative educational courses, increasing elective time, utilizing simulation for assessment and flexibility in crediting different training experiences. **Conclusions:** Canadian surgical residents had a significant reduction in operative experiences during the pandemic. Moving forward, it will be important to find alternative educational experiences.

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Neurosurgical Faculty Expectations of Entrustable Professional Activities Evaluations

J Rabski (Ottawa)*, *MD Cusimano* (Toronto)

Background: Competence by Design (CBD), a new outcomes-based approach to medical education, has been recently introduced into neurosurgical programs across Canada. A cornerstone of this educational paradigm shift requires evaluation of residents' performances of entrustable professional activities (EPAs). This study aimed to define Faculty expectations and markers of competence for resident EPA performances. **Methods:** Canada-wide survey of neurosurgical Faculty (NSF) with a 55-item online questionnaire referencing 15/45 available core neurosurgery EPAs. **Results:** Of the 52 respondents, majority believed that being able to perform safely (98%), effectively (92%) and independently (90%) and being able to adapt to contextual complexities of the case (88%) and unexpected events (88%) represented necessary qualities for demonstrating competence achievement of an EPA. Performing efficiently, without supervision and responding to rare events were all considered less important. On average, NSF believed that at least five separate assessments involving two or more different assessors were necessary for documenting competence achievement of each EPA. Proportion believing EPAs were representative of general neurosurgery competences varied significantly across all EPAs (p<0.00001) with >25% believing 5/15 EPAs required fellowship training. **Conclusions:** This study defined expectations and indicators of competent surgical performance and revealed a significant debate regarding perceived appropriateness of current EPAs for general neurosurgical training.

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An International Comparison of Neurosurgical Competence by Design Curriculum

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Background: Prior to its recent introduction into Canadian neurosurgical curriculum, Competence by Design (CBD) principles have been implemented across many international neurosurgical training programs for several years. As such, comparing other international competency-based educational frameworks and curricula can help anticipate, avoid or mitigate potential future challenges for Canadian neurosurgical trainees. **Methods:** A comparative web-based analysis of neurosurgical postgraduate medical education documents and resources provided by medical accreditation and regulatory bodies of Canada, the United States, the United Kingdom and Australasia, was performed. **Results:** All four countries varied considerably across four major curriculum-based themes: 1) general program structure; 2) overarching foundational competency frameworks; 3) types and numbers of performance assessments required and; 4) curricular learning outcomes. In particular, the expected progression and degree of competence required of neurosurgical residents when performing entrustable professional activities (EPAs) or defined tasks of neurosurgical practice, varied across all countries. Differences in types of neurosurgical EPAs and number of required assessments demonstrating a trainee's competence achievement were also appreciated. **Conclusions:** This study revealed variations across competency-based neurosurgical curricula proposed by four international medical training regulatory bodies. Differences in types of EPAs and their required degree of competence achievement suggests potential disconnects between neurosurgical educational outcomes and actual medical practice.

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What do patients expect of a competent neurosurgeon?

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Background: To improve accountability and reflect patient and societal needs, the Royal College of Physicians and Surgeons of Canada proposed Competence by Design (CBD) for all residency programs. This study compares neurosurgical patient values and expectations of their neurosurgeon to resident competences proposed by CBD curriculum. **Methods:** Semi-structured interviews of 30 neurosurgical patients and family members were recorded, transcribed and analyzed for themes. **Results:** Of