Instrument knowledge acquired through simulation training results in improved identification and retained recognition of real instruments.

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Studying behaviors among neurosurgery residents using web 2.0 analytic tools

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Background: Web 2.0 technologies (e.g. blogs, social networks, and wikis) are increasingly being utilized by medical schools and postgraduate training programs as tools for information dissemination. These technologies offer the unique opportunity to track metrics of user engagement and interaction. Here, we employ Web 2.0 technologies to assess academic behaviors among neurosurgery residents. *Methods:* We performed a retrospective review of all educational lectures, part of the core Neurosurgery Residency curriculum at the University of Toronto, posted on our teaching blog (www.TheBrainSchool.net) from Sept 2013 - Nov 2016. We looked for associations with lecturer's academic position, timing of examinations, and lecture/subspecialty topic. *Results:* The overall number of clicks on 123 lectures was 1079. Most of these clicks were occurring during the in-training exam month (43%). Click numbers were significantly higher on lectures presented by faculty (mean 18.6, SD ± 4.1) compared to residents-delivered lectures (mean 8.4, SD ± 2.1) (P= 0.031). Functional neurosurgery lectures were the most downloaded (47%), followed by pediatric neurosurgery (22%). *Conclusions:* The current study demonstrates the value of Web 2.0 analytic tools in examining residents study behavior. Residents tend to 'cram' downloading lectures in the same month of training exams and display a preference for faculty-delivered lectures.

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Factors influencing resident engagement in research during post-graduate training

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Background: Residency training programs aspire to develop residents' research skills, but engaging trainees in research often proves challenging. Addressing this requires a better understanding of factors influencing residents' engagement in scholarship. We sought to identify such factors through an interview-based study that explored residents' interest and involvement in research during training. *Methods:* We conducted 15 semi-structured interviews with neurology (n=8) and neurosurgery (n=7) residents at our institution based on an interview guide developed through a literature review and pilot interviews (n=3). Using template analysis, we examined transcripts to identify facilitators and barriers to resident research. *Results:* Motivation, mentorship, and resource availability were noted to significantly impact resident research. Trainees indicated motivation is influenced by personal desire to develop research skills, interest in available projects, and pressure to engage in scholarship from peers, mentors, and future employers. While strong mentorship and departmental resources for data collection and analysis facilitate resident research, funding and time constraints are barriers to success. *Conclusions:* We have identified multiple factors influencing residents' engagement in research, which may be targeted by program directors to optimize the post-graduate training environment for resident scholarship. In the next phase of our project, we will corroborate and expand on these findings through a national survey of residents across all specialties.

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Smartphone and mobile app use among Canadian Neurosurgery residents and fellows

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Background: Communicating with senior neurosurgical colleagues during residency necessitates a reliable and versatile smartphone. Smartphones and their apps are commonplace. They enhance communication with colleagues, provide the ability to access patient information and results, and allow access to medical reference applications. Patient data safety and compliance with the Personal Health Information Protection Act (PHIPA, 2004) in Canada remain a public concern that can significantly impact the way in which mobile smartphones are utilized by resident physicians *Methods:* Through the Canadian Neurosurgery Research Collaborative (CNRC), an online survey characterizing smartphone ownership and utilization of apps among Canadian neurosurgery residents and fellows was completed in April 2016. *Results:* Our study had a 47% response rate (80 surveys completed out of 171 eligible residents and fellows). Smartphone ownership was almost universal with a high rate of app utilization for learning and facilitating the care of patients. Utilization of smartphones to communicate and transfer urgent imaging with senior colleagues was common. *Conclusions:* Smartphone and app utilization is an essential part of neurosurgery resident workflow. In this study we characterize the smartphone and app usage within a specialized cohort of residents and suggest potential solutions to facilitate greater PHIPA adherence

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Ethics education in neurosurgical training- a survey of North American program directors

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Background: Despite being mandatory for accreditation by the RCPSC and ACGME, little is known about how ethics education is undertaken during neurosurgery training. This study assessed the current state of ethics education in North American neurosurgery training programs. *Methods:* A web-based survey was developed based on ethics competencies outlined by the RCPSC and the ACGME and emailed to North American neurosurgery residency program directors(PD's). Responses were analyzed using descrip-

tive statistics. *Results:* 47/119 (40%) PD's completed the survey. Most(74%) spent <10 hours/year on ethics education. Informal discussion(86%), case presentations(67%) and lectures(55%) were common teaching methods. Most(85%) felt real-life experience was the best teaching method. Neurosurgical faculty(86% of programs), medical faculty(48%) and ethicists(26%) provided ethics teaching. Time constraints(42%) and lack of expert faculty(24%) were common barriers. Important topics were end of life care(95%), conflicts of interest(81%), informed consent(81%), futility(66%) and research ethics(66%). Most(78%) felt ethics education should be mandatory and that trainees were prepared to deal with ethically challenging situations(95%). *Conclusions:* This study provides a snapshot of ethics education in neurosurgery training. Time constraints and a lack of expert faculty were seen as barriers to ethics education. Most program directors felt residents were well prepared to deal with ethical issues. Identified ethical topics of importance should be incorporated into training curricula.

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Standardizing resident operative-case logging: the first step of a prospective national study of resident operative volume

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Background: No standardized method of resident operative-case logging exists. Our study sought to develop a standardized form used by residents to log operative-cases. *Methods:* Members of the Canadian Neurosurgery Research Collaborative (CNRC), a national resident-led research organization have created a standardized document based on the current Royal College objectives for operative procedures (section 5). Modifications to structure and content will be guided via consensus from Canadian neurosurgery program-directors. *Results:* Program directors in each CNRC collaborative institution will be asked to modify the standardized form. The CNRC currently involves thirteen of the fourteen Canadian neurosurgery residency programs. Additional consensus, if necessary, can be reached at the Royal College meeting for program directors of neurosurgery March 20th 2017. *Conclusions:* A standardized operative-case log represents the first step in a prospective study towards compiling operative volume of all Canadian neurosurgical residents over one academic year. Such data will be essential to guide informed decisions with regard to Royal College requirements as Canadian neurosurgical programs transition to a competency based framework.

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Integrating learner feedback in developing an evidence-based palliative care curriculum for neurology residents

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Background: Palliative care is a cornerstone of the management of progressive neurological illness, but there lacks a standardized evidence-based curriculum to teach the unique aspects of neurology-based palliative care to current learners. *Methods:* A needs assessment involving focus groups with patients, physicians, interdisciplinary members, and trainees was conducted to identify gaps in the current curriculum. The Kolb Learning Style Inventory identified learning strategies among neurology residents. A Palliative Medicine Comfort and Confidence Survey and knowledge pre-test was distributed to determine current learner needs. The curriculum was delivered during academic time, and feedback was obtained for further content revision. *Results:* Qualitative analysis was used to develop the curriculum with the key principles of symptom management, end-of life communication, psychosocial components of care, and community coordination. Learning styles varied, but preference for active experimentation and concrete experience was noted. Learners identified as comfortable with withdrawal of medical interventions, but requiring support on home palliative care referral, and management of terminal delirium and dyspnea. Further teaching was requested for end of life ethics and communication skills. *Conclusions:* By integrating current best evidence-based practice in palliative neurology with learner feedback, this project aims to create a comprehensive palliative care curriculum for neurology learners.