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DEVELOPMENT AND VALIDATION OF A TRIPLE-LED SURGICAL LOUPE
DEVICE FOR FLUORESCENCE-GUIDED RESECTIONS WITH 5-ALA

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Introduction: Fluorescence-guided resections using 5-aminolevulinic acid (5-ALA) have been studied extensively using the BLUE400 system (Carl Zeiss Meditec). We now introduce a triple-LED headlight/loupe device for visualizing fluorescence, and compare this to the BLUE400 gold-standard in order to assure similar and not more or less sensitive protoporphyrin-IX (PPIX) visualization.

Methods: We defined the spectral requirements for a triple-LED headlight/loupe device for reproducing the xenon-based BLUE400 module. The system consisted of a white-light LED, a 409nm LED for excitation, a 450nm LED for background illumination and appropriate observation filters. We determined prototype's excitation and emission spectra, illumination and detection intensities, and spot homogeneity. We further performed a prospectively-randomized and blinded study for fluorescence assessments of fresh, marginal, fluorescing and non-fluorescing tumor samples comparing the LED/loupe device with BLUE400 in malignant glioma patients treated with 20mg/kg b.w. 5-ALA. Tumor samples were immediately assessed in turn both with a Kinevo® and a novel triple-LED/loupe device by different surgeons.

Results: Seven triple-diode/loupe devices were analyzed. Illumination intensities in the 409 and 450nm range were comparable to BLUE400, with high spot homogeneity. Fluorescence intensities measured distally to oculars/telescope were 9.9x higher with the loupe device. For validation, 26 malignant gliomas patients with 240 biopsies were analyzed. With BLUE400 results as reference, sensitivity for reproducing fluorescence findings was 100%, specificity 95%, PPV 98%, NPV 100% and accuracy 95%. This study reached its primary study aim with agreement in 226 of 240 (0.942; lower-95% CI:0.904, upper-95% CI:0.968).

Conclusion: We observed only minor differences regarding spectra and illumination intensities during evaluation. Fluorescence intensities available to surgeons was 9.9-fold higher with the loupe device. Importantly, the independent perception of fluorescence using the new system and BLUE400 was statistically equivalent. We believe the triple-LED loupe device to be a useful and safe option for surgeons who prefer loupes for surgical resections in appropriate patients.

14 HISTORY, ETHICS and EDUCATION

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DELIVERING A VIRTUAL POSTGRADUATE NEUROSURGICAL TEACHING COURSE
IN ORDER TO IMPROVE POSTGRADUATE EDUCATION FOR PROSPECTIVE
NEUROSURGICAL TRAINEES

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Background: Undergraduate and early postgraduate neurosurgery education varies across the UK. The division of neurosurgical training and care into a relatively small number of specialist units brings challenges in delivering accessible and standardised education to junior doctors. The relative lack of standardised undergraduate neurosurgical education, as well as the perception of the clinical neurosciences as difficult, has raised concerns regarding junior doctors' lack of confidence in managing neurosurgical presentations and pathology. Here we describe a national, virtually-delivered teaching course for junior doctors with the aim to prepare them for neurosurgical practice and improve their knowledge and skills.

Methods: An educational committee from 2 UK neurosurgical units delivered the course to junior doctors working within UK neurosurgical departments. 24 participants from 7 units attended the course. Lectures covering 8 core topics were

delivered fortnightly online from August 2021 to November 2021. Data was collected about participants' pre-and-post course self-perceived understanding, as well as the course's impact on their neurosurgical knowledge, practice and confidence using a 5-point Likert scale.

Results: Feedback was obtained from 21/24 participants. The participants were a mixture of Foundation doctors (38%) and trust grade post foundation doctors (62%), with the majority having had either no experience (33%) or less than 6 months (48%) clinical experience of neurosurgery. All participants agreed that the course improved their understanding, confidence and clinical practice of neurosurgery. All participants agreed that the virtual delivery was conducive to learning, facilitated interaction and was well structured.

Conclusions: Our results demonstrate the feasibility and benefits of delivering a national practically-focused neurosurgical course with a virtual delivery format. Through improving provision of early postgraduate neurosurgical education, we believe that such a course could improve junior doctors confidence and practice in delivering neurosurgical care, and act as a key step in preparing prospective neurosurgical candidates for specialty training.

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ARE UK MEDICAL SCHOOLS USING RECOMMENDED NATIONAL
CURRICULA FOR THE TEACHING OF CLINICAL NEUROSCIENCE?

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Background: Medical schools are responsible for training medical students to recognise and commence management for a broad spectrum of diseases, including clinical neuroscience conditions. To guide medical schools on important topics, speciality bodies have produced speciality-based core curricula. It is unknown to what extent these guidelines are used in medical school curriculum design. We aimed to assess the use of these guidelines in designing clinical neuroscience curricula.

Methods: This is a national survey. A 21-item questionnaire was sent to faculty members involved in the development of the clinical neuroscience curriculum in each medical school in the UK. The Association of British Neurologists (ABN) and the Royal College of Surgeons England (RCSEng) guidelines were used as a benchmark. Descriptive statistics are reported.

Results: Data was collected from 34 UK medical schools (91.9% of those eligible). 61.8% of respondents were aware of ABN guidelines and 35.3% were aware of RCSEng guidelines. Only 23.5% of medical schools taught all 28 recommended neuroscience topics, and were not more likely to be those that used national guidelines ($\chi^2=1.25^{-31}$, $p=0.99$). Furthermore, 97.1% said that they would use national guidance when making further developments to their curriculum. Neurologists were involved in the design of the clinical neuroscience curriculum in 94.1% of medical schools, and neurosurgeons in 61.8%. Tutorials/seminars were used by all medical schools to teach clinical neuroscience content. Neurologists were involved in teaching at all schools and neurosurgeons in 70.6%. Objective Structured Clinical Examinations and single best answer/multiple-choice question tests were used in all medical schools for assessment.

Conclusions: There is variation between medical schools on what clinical neuroscience topics are taught and by whom. Multi-modality educational delivery was evident. Some medical schools did not currently use or recommend external clinical neuroscience educational resources; but there is support for future use of external resources including guidelines.

BRAIN AND SPINE 2 (2022) 101190 101650
THE LIFE OF PROFESSOR NORMAN MCOMISH DOTT – SCOTTISH PIONEER
IN MODERN NEUROSURGERY

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Modern neurosurgical practices have been largely influenced by an established, celebrated history of Scottish innovation and influence. Scottish neurosurgery has a long and illustrious history; from the foundations laid by Sir William Macewan, a pioneer of contemporary surgery on the brain deemed the ‘father of neurosurgery’ and the development of the Glasgow Coma Scale by Dr Bryan Jennett and Dr Graham Teasdale being a select few examples, Scotland continues to enrich surgical academia globally. Such advances are evident to this day. These visionaries are detailed extensively in the current literature. We draw attention to one other such figure, Professor Norman McOmish Dott, a Scottish neurosurgeon born on August 26th, 1897, in Edinburgh, credited with establishing contemporary neurosurgical practise in Scotland and for his contributions to intracranial aneurysm, transsphenoidal, and craniopharyngioma surgery. We pay reverential tribute to the life and work of Professor Norman McOmish Dott through this literature review.

BRAIN AND SPINE 2 (2022) 101190 101651 TRAINING AND EDUCATION IN NEUROSURGERY: CHALLENGES AND STRATEGIES FOR THE NEXT TEN YEARS

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Background: Training and education are the foundation of the progress of every surgical specialty because of the craftsmanship component implied. Moving from the advances in technology, how are we providing knowledge to the newer generations?

Materials and Methods: We performed a narrative review about the most recent challenges and strategies in training and education in neurosurgery.

Results: The main challenge is the need for modern neurosurgeons to be trained in high-tech subspecialties, burdened by a steep learning curve. Hence the necessity to be exposed to a sufficient case load in order to become proficient and to prove the quality of both training and clinical outcomes, especially in this “open-data” era. Newer generations might also have different learning abilities (shorter attention span, better videogame-trained hand-eye coordination) to be accounted for.

In practice, the introduction of augmented or virtual reality tools has allowed to experience an unprecedented understanding of both normal and pathological anatomy. 3D printing technology and simulators have also led to the possibility of a hands-on training while limiting cost and ethical issues. On the educational side, several mobile tools have emerged with no time, space, device or country of origin restraints. The pandemic-related rise of webinars has also been proven to be positively associated with achievement in knowledge, behavior, and skills. Nevertheless, the plethora of information provided has already been deemed potentially too overwhelming. Mentors should then shift from the classical top-down teaching to the so called “facilitating learning” method. The best teaching will be to help uncover and understand the information students easily find at their fingertips.

Conclusions: Paraphrasing Sir William Osler, in the next ten years: “He who studies medicine without ~~books~~ technology sails an uncharted sea, but he who studies medicine without ~~patients~~ simulations should not go to sea at all.”

BRAIN AND SPINE 2 (2022) 101190 101652 DEFINING THE STRUCTURAL TRAITS AND PROBLEMS OF NEUROSURGICAL DEPARTMENTS IN EUROPE

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Background: Neurosurgery is a highly demanding specialty. We present the results of an Europe-wide survey comparing aspects of training and working in different countries.

Methods: We distributed an electronic questionnaire, stratified according to the participants surgical experience and current career position. We enquired about demographic data, monthly net salary and its dependence on seniority or number of operations, average number of operations per month, working hours per week and mandatory training. We also enquired about issues encountered in receiving support from senior colleagues, overall competition, satisfaction level from work/ life balance, discrimination and abuse of power from a resident’s or specialist’s point of view.

Results: There were a total of 201 responses from 41 European countries - 53.2% were specialists and 46.8% - residents with a male to female ratio of 1.2:2.

More than 80% of the residents would like a change in the neurosurgical training in their country; 47.9% are not satisfied with their ability to operate independently at the end of their residency with 69.8% of them saying they need more practice. 69.1% of residents have considered continuing their residency program in another institute or another country.

Most specialists (76.6%) are satisfied with their current practice but more than 80% express the necessity to operate more. 57.9% are not satisfied with the salary they receive, while 58.9% point out a difference in salaries amongst co-workers of the same department. Specialists report career advancement is harder for women (29.9%), foreigners (23.4%) and younger neurosurgeons (19.6%). Half of the specialists have felt mistreated or insulted by a senior at work. Negative experiences are linked to the hierarchical role/years of practice – 43.9%, qualifications – 35.5% and acquaintances – 23.4%.

Conclusion: We highlight the most pressing problems and differences between neurosurgical departments in Europe and perhaps mark the beginning for future improvements.

BRAIN AND SPINE 2 (2022) 101190 101653 FELLOWSHIPS AS THE NEXT STEP AFTER RESIDENCY AND HOW TO ORGANIZE THEM IN EUROPE

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Fellowships have a strong tradition in American Neurological Surgery.

In Europe, due to the nature of our individual countries and cultures that exchange of knowledge is still underdeveloped.

After residency, a young neurosurgeon is faced with many challenges. Where to find a position, how to establish himself in his/her department and how to evolve from a young to an experienced surgeon are relevant questions to be answered. How to get money and how to balance the money issues with work add uncertainties to this equation.

The answers to those questions are very often not clear. Obviously hard work and commitment with the specialty are requirements to the transformation of a young in an experienced neurosurgeon.

Why fellowships can be a plus in this equation and why should EANS play a role in this organization in Europe.

The answers to these questions are based on the personal experience of the author as a Vascular and Skull-base Fellow in Helsinki University Hospital during 1 year.

Fellowships are an opportunity to think on what we’ve done over the years, to meet new people, to learn new techniques, to question what we thought we knew and to establish a plan for ourselves and our careers. This time to think and to establish goals is only possible if we are able to see our environment from the outside. When we are in our departments, the burden of our tasks limits us and tapers our sight.

EANS is in a privileged position to promote these exchanges of neurosurgeons. This is a tradition to be established, something to be planned on the long run in