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

E. Suero-Molina [1], S. Hellwig [1], A. Walke [1,2], A. Jeibmann [3], H. Stepp [4], W. Stummer [1]. [1] *University Hospital of Münster, Neurosurgery, Münster, Germany*[2] *Core Unit Proteomics, Interdisciplinary Center for Clinical Research, Münster, Germany*[3] *University of Münster, Institute of Neuropathology, Münster, Germany*[4] *University Hospital LMU Munich, Lase-Forschungslabor, LIFE Center, Munich, Germany*

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 NATIONAL NEUROSURGICAL TEACHING COURSE IN ORDER TO IMPROVE POSTGRADUATE EDUCATION FOR PROSPECTIVE NEUROSURGICAL TRAINEES

A. Edwards-Bailey [1], C.H. Koh [2,3,4], E. Sudin [5], S. Williams [3,4], H. Marcus [3], M. Kirkman [1], P. Sayal [3]. [1] *Nottingham University Hospitals NHS Trust, Department of Neurosurgery, Nottingham, United Kingdom*[2] *University Hospital Coventry & Warwickshire, Department of Neurosurgery, Coventry, United Kingdom*[3] *National Hospital for Neurology and Neurosurgery, Department of Neurosurgery, London, United Kingdom*[4] *Wellcome/Engineering and Physical Sciences Research Council (EPSRC) Centre for Interventional and Surgical Sciences (WEISS), London, United Kingdom*[5] *Nottingham University Hospitals NHS Trusts, Undergraduate Medical Education, Nottingham, United Kingdom*

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 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?

O. Kouli [1], S. Bandyopadhyay [2], S.Z.Y. Ooi [3], K. Whitehouse [4], A.K. Demetriades [5]. [1] *NHS Greater Glasgow and Clyde, Neurosurgery, Glasgow, United Kingdom*[2] *Oxford University Global Surgery Group, Nuffield Department of Surgical Sciences, Oxford, United Kingdom*[3] *Cardiff University, School of Medicine, Cardiff, United Kingdom*[4] *University Hospital of Wales, Department of Neurosurgery, Cardiff, United Kingdom*[5] *New Royal Infirmary, Department of Neurosurgery, Edinburgh, United Kingdom*

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 (χ^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.

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THE LIFE OF PROFESSOR NORMAN MCOMISH DOTT – SCOTTISH PIONEER IN MODERN NEUROSURGERY

A. Rahman Osman [1], A. Chaudhary [2], J. Tan [3], M. Bone [4], J. Wellington [5]. [1] *University of Aberdeen, School of Medicine and Dentistry, Aberdeen, United Kingdom*[2] *University of Glasgow, School of Medicine, Glasgow, United Kingdom*[3] *University of St Andrews, School of Medicine, St Andrews, United Kingdom*[4] *University of Manchester, Faculty of Biology, Medicine and Health, Manchester, United Kingdom*[5] *Cardiff University, School of Medicine, Cardiff, United Kingdom*