54 AN ARTIFICIAL INTELLIGENCE APPROACH TO AUTOMATED GLOMERULAR ANNOTATION AND COUNTING IN DIGITAL RENAL BIOPSIES

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Introduction In recent years digital pathology is evolving into the standard of care for the histology laboratory workflow; allowing remote reporting of cases, improved record keeping, and accountability in reporting (1). Digital pathology allows us to bring quantitative and advanced analysis to the histopathology field.

Machine learning has been implemented to segment features of whole slide images (WSI), with a U-net architecture (2) accurately segmenting glomeruli, tubuli and interstitium (3). Here we create a workflow for automated glomerular annotation and deliver number and shape of glomeruli metrics to the pathologist.

Materials and Methods Anonymised Haematoxylin and Eosin (H&E) stained, archival diagnostic paediatric renal biopsy samples from Great Ormond Street Hospital were imaged on an Aperio CS2 slide scanner at 40x magnification. Glomeruli were manually annotated using ImageScope software and image patches (2048 × 2048) with annotation masks saved to the training database which was used to train a U-net model.

A pipeline was developed using Python to take WSIs, export tiles which feed the trained U-net to generate predictions. Prediction tiles are recombined into a mask indicating the presence of glomeruli. This was converted into WSI annotation format using the bounding polygons of positive mask regions.

Results The mean dice score for all test image patches (n=384) was 0.71 for glomerular segmentation. The network identified 106 glomeruli with 8 false positives and 8 false negatives for the testing WSIs (N=3).

The speed of image annotation on a CPU was 13.63±1.31 minutes (mean±SD, n=3); producing annotations for a 18000 × 203000 pixel WSI.

Discussion U-net segmentation of histopathology features in WSI renal biopsies is readily incorporable into the histology pipeline and can be used to produce annotation files before reaching the pathologist. A quantitative glomerular count can improve the reproducibility of reports and lead to a better-informed treatment plan for the patient.

55 THINKING OUTSIDE THE BOX – ENHANCING SIMULATED LAPAROSCOPIC SKILLS TRAINING AT GREAT ORMOND STREET HOSPITAL

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Background The role of simulation in laparoscopic skills training is substantial, particularly so in paediatric surgery where real life training opportunities can be limited by relative case complexity and smaller patient size. COVID-19 has further impacted on such opportunities owing to the reduction in provision of non-emergency surgery.

This QIP aimed to evaluate and enhance trainee engagement and delivery of laparoscopic skills simulation training at GOSH. **Methods** A retrospective review of attendance in the laparoscopic skills room (LSR) was conducted using sign-in records over 7 months from June 2019. Trainees completed a survey to assess self-reported awareness and engagement with the LSR and trainee perspectives. A modified survey was distributed in June 2020 to capture trainee experience over the preceding 3 months following introduction of a low-cost box trainer in the general surgery office.

Results Retrospective sign-in data from June-December 2019 demonstrated the LSR was visited by 7 individuals on 18 occasions, averaging 2.5 visits per month with survey data reflecting limited trainee engagement (60% of trainees reported having ever visited the LSR).

Secondary survey data from 14 participants in June 2020 demonstrated no trainees had visited the LSR in the preceding 3 months. Only 2 trainees (14%) had used the office box trainer with the remainder citing workload (79%) and distracting environment (50%) as reasons for limited uptake. 29% of trainees reported owning a box trainer for home use. 93% of trainees felt they would benefit from consultant led box trainer supervisions.

Conclusion Whilst low-cost box trainers have been shown to be effective tools for simulated skills training, factors such as environment and a lack of allocated training time can limit trainee engagement. A combined approach to laparoscopic skills training with designated low-cost simulators for home use as well as designated consultant supervisions could enhance local laparoscopic skills training.

56 TEACHING IN 2020: THE SHIFT TO VIRTUAL TEACHING AND HOW WE IMPROVED

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Background In 2020 when all non-essential face to face teaching was cancelled, The Graduate Team who deliver the Preceptorship Programme at GOSH faced a huge challenge in their practice. Preceptorship is an NMC and HEE standard for all newly registered practitioners (NRPs), so as we settled into our 'new normal' this teaching, including vital tools of reflection and resilience, needed to be completed in a new way. The Graduate Team at Great Ormond Street Hospital had to work flexibly and reshape their preceptorship teaching to work in a digital, distanced world.

Method Based on our previous teaching curriculum and focusing on HEE and NMC standards of preceptorship, we made a programme of condensed study days, delivered using a combination of zoom and independent learning. We asked for feedback throughout the study days, and reviewed all anonymous feedback after each day to continue to improve.

Results Through regular virtual teaching, and feedback provided in evaluations, we found that learners are less likely to interact in a virtual environment, be that due to a lack of equipment or confidence. After reviewing feedback and increasing in confidence with zoom, we added in further opportunities to interact, using the chat and polling functions on zoom, utilising apps like slido and kahoot as well as 'ice breakers' to ensure everyone has spoken on camera and introduced themselves before the sessions begin. Our evaluations,