EVALUATION OF A TELEMEDICINE MODEL TO DELIVER FREE TEXT NOTES ADDED TO A PATIENT

DURING COVID-19, AI prediction tools helped identify patients that might potentially need mechanical ventilation and ICU admission. Healthcare staff also felt it was important that AI prediction tools provided reliable information, that was easy to understand, and integrated with the current systems. A concern raised around the use of AI prediction tools was whether they might ‘mislead junior doctors or doctors who would not have that much of a clinical sense and would totally depend on it’.

Conclusion This study demonstrated opportunities for the application of AI predictive tools in clinical practice. Concerns raised around the use of these tools should be considered by developers. We recognise that the perceptions of only a small number of clinicians were included mainly due to the increased time pressures on staff during the COVID-19 pandemic. Healthcare staff described essential features that will guide the future development of AI predictive tools with higher potential for application in real practice.

EVALUATION OF A TELEMEDICINE MODEL TO DELIVER CATARACT CARE USING IMAGING TECHNOLOGY INSTEAD OF TRADITIONAL F2F PATHWAYS

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Objective To set up and establish a sustainable teledmedicine model to deliver cataract care pathway, where the traditional face-to-face cataract assessment clinic is replaced with a teledmedicine consult with imaging technology to develop a safe, efficient teledmedicine care delivery model in contrast to the current established traditional face-to-face pathways. To study the efficacy, efficiency, safety, patient experience of the new service. To assess usability and review risk of digital exclusion with patients and staff.

Methods Patients referred for cataract surgery from the community are booked into a video clinic (AttendAnywhere) as per date of referral. Patients were not pre-called or pre-selected for the digital pathway. After video consultation and pt confirmed to have symptomatic cataract affecting quality of life, the patient is preliminary listed for cataract surgery and verbally consented. The patient then attends a cataract imaging hub where anterior segment and fundus high resolution photography and optical coherence scans were performed. In addition, patient blood pressure and blood sugar are obtained. The results of the assessments are reviewed by the surgeon remotely to confirm the stratification of the cataract and plan for surgery. Any patient with unexpected findings or abnormal vitals were brought back for face to face review. Post-op patients are follow-up in the community. All patient consultation and imaging were recorded in an electronic patient records (Medisfot). Prospective data collected on patient demographics, access to video consult, referral date, review date, stratification, and outcome of surgery. Patient experience assessed via a post video clinic survey.

Results 403 patients were assessed, 42 excluded from the final data analysis due to erroneous bookings into the clinic. Total 361 patients correctly booked for new cataract assessment were included. 9 patients were brought back for further assessment in a face-to-face clinic as well as those abnormalities were found on imaging. 299 listed for surgery (conversion to surgery rate of 82%). Average age of the patient is 74 yrs old, 31% >75 and 17% > 80 years old. 24% patients were the presumed digital excluded group e.g. elderly, language barrier, care home resident, patient with partial or lack capacity, and lack of technology. To date, 166 patients have completed their surgery and 6 week post-op follow up. 96% reported improvement of vision post surgery. 7% had post-op complications and 3 patients had intraoperative complications. Cases were stratified and operated appropriately by all levels of surgeons, 52% by trainees and 48% by consultants or consultant grade surgeons.

No attendance to the emergency eye care service within 1 month post-operation. Patient survey showed 95% satisfied with care, 57% preferred the video clinic method. 82% would have come to a face to face clinic via a carbon emitting mode of transport, 60% by car.

Conclusion Digital cataract service (DCS) has demonstrated it is safe; patients with abnormal findings on imaging clinics were correctly stopped from proceeding with surgery. 96% of patients reported improvement of vision post surgery, this is better than the national audit standard of 95%. 4% patients had post-op complications which is lower than the 14% audit standard.

DCS is effective as it has a high conversion to surgery rate at 82% compared to the national average of 74%. The stratification of patients and their cataracts enabled surgery to be carried out safely by all levels of surgeons.

For patient experience it shortened the overall assessment time to 1.5 hours compared to a 3–4 hour wait in a face-to-face clinic. It also maximises the efficient use of staff, equipment and space; patients are consulted/assessed at time of arrival with no idle staff in the process. 24% patients with demographics traditionally included in the digitally excluded group were able to access the service by proxy, it also enabled clinicians to bring care to patients’ home environment.

Overall DCS provides a safe, effective, efficient way of delivering cataract care with reduced carbon footprint by minimising patient and staff travelling.

FREE TEXT NOTES ADDED TO A PATIENT’S ALLERGY STATUS IN ELECTRONIC PRESCRIBING SYSTEMS DIGITALLY ANALYSED FOR BETTER USABILITY

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Objective Electronic prescribing systems often provide a drop-down list of medications and pre-specified reactions to record a patient’s allergy status. This list is non-exhaustive; less common reaction types require the user to add a free text note.

The Careflow Medicines Management EPMA system provides decision support preventing a prescriber initiating a drug a patient has a recorded reaction to. Where a free text...
Abstracts

Development and Evaluation of a Machine Learning Model to Predict Positive Urine Cultures in the Outpatient Setting and Minimize the Use of Antibiotics

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Objective Excessive prescription of antibiotics is amongst the principal drivers of antibiotic resistance, which is considered a surging threat to global health. The most frequent resistant pathogens are usually linked with urinary tract diseases, such as urinary tract infections (UTI). Studies have shown that clinicians may prescribe antibiotics based on presenting symptoms due to the prolonged time required to obtain the final results of urine bacterial cultures. While many of the current approaches to ameliorate prescribing behavior are educational or regulatory, here we develop and evaluate a logistic regression model that detects the risk of positive urine cultures based on the patient’s history and presenting physiological data extracted from the electronic health records, to help clinicians make informed antibiotic prescription decisions without the need to wait for urine culture results.

Methods We used an anonymized dataset collected between 2015 and 2021 in a multi-specialty large hospital with primary, secondary and tertiary care facilities. The retrospective study received approval by the Institutional Review Board (IRB) from both the research institution and hospital (IRB references: HRPP-2020-173 & A-2019-054, respectively). We included adult outpatient encounters associated with at least one urine culture test. For the input features, we extracted and pre-processed each patient’s demographics (age, sex), comorbidities (diabetes mellitus, hypertension, cancer and hyperlipidemia), vital signs (pulse, respiratory rate, oxygen saturation, temperature, systolic blood pressure, diastolic blood pressure and fraction of inspired oxygen), instant urine dipstick test results, all collected prior to the acquisition of the urine culture, as well as diagnosis codes (ICD-10 codes) and procedure codes (hospital custom codes) from the patient’s previous hospital encounter. We defined the output as a binary label indicating a positive or negative urine culture result by processing textual data within laboratory test results. We assume a positive urine culture if the concentration of urine pathogen is higher than 100,000 colony forming units per milliliter (CFU/ml). We split the dataset randomly into a training (70%), and test set (30%). We optimized a logistic regression model using the training set with stratified k-fold validation, and evaluated it on the test set with 95% confidence intervals computed using bootstrapping with 1000 iterations.

Results After applying the inclusion criteria, the overall dataset consisted of 11,388 patients with 17,452 unique encounters (56.1% females; mean age 49.1 standard deviation 17.5 years). Amongst all encounters, 2,431 (13.9%) were associated with a positive urine culture. We binarized the predictions by adjusting the threshold to achieve approximately 80% sensitivity on the test set, which is a clinically acceptable level of sensitivity. Amongst the 4,460 encounters associated with a negative urine culture in...