

support caseload management that was previously difficult to obtain through manual review of EHRs.

The systems efficiency audit revealed a reduction in duration of crisis and inpatient admissions following MaST implementation.

**Conclusion** The MaST RoC algorithm supports the identification of people more likely to use crisis services in NHS mental health trusts, is feasible to implement, and improves systems efficiency. The visualisation of these insights enables improved caseload management within community mental health teams. EHR-derived algorithms can support real-world clinical practice to improve outcomes in people receiving NHS mental healthcare.

### 3 THE DOCUMENTATION OF ALLERGY ACROSS ELECTRONIC SYSTEMS FOR PATIENTS PRESENTING TO EMERGENCY DEPARTMENTS IN LEEDS

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**Objective** How consistent is the recording of allergy documentation across multiple electronic systems in patients presenting to the emergency departments of a large UK tertiary trust?

Over 20% of the UK population are affected by one or more allergic disorders (1) and there has been shown to be a 615% increase in the rate of hospital admissions for anaphylaxis in the UK, between 1992 and 2012 (2). Correct documentation of patient allergies is essential to protect patients and prevent avoidable drug errors, estimated to cause around 1080 deaths annually in secondary care across England (3). Our objective was to determine how consistently allergies were recorded across multiple patient electronic record systems, in patients presenting to the emergency departments (ED) of Leeds Teaching Hospitals Trust.

**Methods** 50 patients were randomly selected from those presenting to the ED between 25th and 27th October 2021 with an allergy recorded on at least one electronic system. A further 51 patients were randomly selected from the those who had presented with anaphylaxis between 1st April 2020 and 31st March 2021. Their allergy status was then analysed retrospectively from the following five electronic records: Yorkshire Ambulance Service patient report form, Symphony (ED patient information system), the medical assessment record, Leeds Care Record (primary care summary) and eMEDS (electronic prescribing system). The patients' records were then compared for accuracy relative to each other and if they were not identical, compared against part 1.2.1 of NICE guideline CG183 (5). This states that their medical record must include one of the following: 'drug allergy', 'unable to ascertain' or 'none known'. Patients who did not have identical records, but 'unable to ascertain' listed instead, were recorded in a separate group as meeting this guideline due to the nature of ED presentations.

We excluded the following allergies: hay fever, dust mites and pollen. The group presenting with anaphylaxis had to have previously been diagnosed with the allergy before that attendance.

**Results** 413 individual electronic allergy records were analysed, of which 214 records were part of the anaphylaxis group and

199 were part of the non-anaphylaxis group. Only 17% of patients had synonymous records across the 5 possible electronic systems. Overall, 33% of patients had at least one record that stated they did not have an allergy when at least two others stated they did have an allergy. Concerningly in the anaphylaxis group, 20 individual records (9%) across 15 patients (27%) had records that stated they did not have an allergy, despite their attendance for an anaphylaxis reaction. 27% of all patients had either synonymous records or records that met the NICE guideline. Every patient who had three or more allergies did not have synonymous records.

**Conclusion** The inconsistency of recording allergy status in a patient's health record demonstrates the importance of improved interoperability between electronic systems, to reduce the risk of administration errors and patient harm due to multiple versions of the 'truth'. To mitigate the limitations of the current systems, it is important clinicians review the patient's allergy status every time a medication is prescribed. This can be especially challenging in emergency and urgent health care environments, when due to a patient's clinical status, they may be unable to provide an accurate allergy history.

Our findings are consistent with those of other studies, including a 2008 study which compared two key forms of patient allergy documentation, 36.5% of these records were not synonymous (4). This further suggests the need for additional research, not just across the trust but nationally. Depending on the results it is likely further safety measures may need to be introduced, especially in areas where multiple patient information systems are used or in patients who cannot accurately recall their own allergies. Further audits should also be carried out against the second part of the NICE guideline CG183, part 1.2.2, which sets criteria for how the allergy should be recorded (5).

### 4 REDUCTION OF ORDER ALERTS THROUGH FILTERS: IMPACT ON PHARMACISTS' OVERRIDE RATE AND PERCEPTIONS OF ALERT FATIGUE

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**Objective** Clinical decision supports (CDS) in electronic medication order systems identify alerts for clinicians. However, CDS may cause alert fatigue, which is the tendency for clinicians to ignore prompts presented by CDS due to excessive numbers and/or their perceived limited clinical significance. Alert fatigue may increase the risk of missing clinically relevant alerts. At North York General Hospital, pharmacists managed over 50% of all medication CDS alerts amounting to approximately 60 alerts per day per pharmacist with an override rate of over 90% indicating a high likelihood of alert fatigue. Thus, we attempted to reduce pharmacists' alert fatigue utilizing customizable filters.

**Methods** Optimizing medication CDS has traditionally centered around turning on or off alerts, changing alert severity levels or clinician role tailoring. These strategies can be labor and time-intensive requiring clinicians from different specialties to review hundreds of individual alerts. As such, this study pursued the use of customizable, context-based filters to reduce unnecessary alerts. Utilizing data from the EHR vendor's

visual analytics dashboard and guided by pharmacists' feedback, three customizable filters were applied. First, a filter to suppress alerts for medications that are ordered by the same prescriber during one session was implemented. Second, a filter to reduce alerts for medications that are commonly ordered both as scheduled and as needed was applied. Finally, customization was done on how long discontinued medications are eligible for alert checking by the medication CDS system. Data was collected 1 month prior to and 3 months after implementation for a duration of one month each. Alerts data was taken from the analytics dashboard. Pharmacists' perceptions of alert fatigue were collected using a voluntary online survey. Adverse medication events data was obtained from the hospital's incident reporting tool.

**Results** Comparing before and after implementation, total alerts decreased by 48.4% for pharmacists. In practice, this represented a reduction from 59.7 to 27.1 medication CDS alerts per day per pharmacist. However, pharmacists' alert override rate was minimally changed from 98.1% to 97.3%. Fourteen (78%) of the 18 pharmacists surveyed felt there was an overall decrease in unnecessary alerts while 67% perceived they were able to spend more time on reviewing meaningful alerts post-implementation. Compared to pre-implementation, pharmacists reported a minor reduction in the percentage of alerts they deemed unnecessary or inappropriate from 66.8% to 59.3%. However, 78% still remarked that there was room for improvement in the CDS alerting system. The number of adverse medication incidents were similar between the periods before and after implementation. No incidents were found to be a result of the new customized contextual filters.

**Conclusion** The use of customizable filters may be a viable alternate approach to reducing alert volume without needing to completely turn off specific alerts or changing alert severity. Pharmacists' perceptions of alert fatigue appeared to improve modestly post implementation. Comparison of medication incidents before and after implementation did not show an increase in medication errors. However, override rates remain elevated and pharmacists felt that further improvements could still be made to the medication CDS system.

## 5 THE LIMITATIONS OF USING COMMERCIAL WEARABLE ACTIVITY TRACKERS, SUCH AS FITBITS, FOR THE CLINICAL MONITORING OF PATIENT ACTIVITY LEVELS

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**Objective** There is increasing interest in remote monitoring of patients within the comfort and safety of their homes or care homes and became more pertinent during the COVID-19 pandemic to reduce hospital footfall and staff risk. While specifically designed medical devices exist, commercial wearable activity trackers (WAT), such as FitBits, are cheap, easy to use, and patients may already use them for lifestyle advice so their value in clinical intervention is of interest.

The feasibility of using commercial WAT for daily monitoring within a tertiary oncology centre was investigated, including limitations of non-medical devices, such as data collection and synchronisation errors.

**Methods** Participants were recruited for a study that investigated if remote monitoring of step counts was feasible and

acceptable. Patients with advanced lung, upper and lower gastrointestinal cancer, or mesothelioma who were starting a new line of systemic anti-cancer treatment were recruited between December 2020 and December 2021.

Once recruited, participants were provided with a FitBit Inspire HR or Inspire 2 and asked to wear it every day for a 16-week monitoring period. Pseudo-anonymous accounts were created to register the FitBits without sharing patient identifiable data and the devices were set up to automatically synchronise data to the cloud-based platform, Fitabase, via their smartphone.

Steps were monitored on every workday and the ability to record heart rate was used as a proxy marker for compliance as it confirmed that the device was being worn. A day was considered complaint if the device was worn for >70% of waking hours, assumed for purpose of trial to be 7am to 10pm.

The manufacturer or age of the participant's smartphone was not recorded. Previous discussions with FitBit regarding synchronisation issues had highlighted potential clashes with other Bluetooth devices preventing automatic synchronisation so use of other such devices was documented.

**Results** Forty-seven patients were recruited and 43 were eligible for ongoing monitoring. Average age was 66 (SD 9) and majority were men (72%). Twenty-nine patients completed the maximum 112 days of monitoring.

Patients were eligible for monitoring on 3855 days. Of these, synchronisation errors occurred on 482 days (13%) and all data from the previous 24 hours was missing on 275 days (7%) due to synchronisation not occurring on the day on monitoring. Only 5 (11%) of participants did not have synchronisation errors during their monitoring period. The median number of synchronisation errors per patient was 8 and maximum of 49, which accounted for 64% of that participant's monitored days. One participant was withdrawn due to 100% synchronisation error over the first seven monitored days.

Twenty-two participants (47%) used other Bluetooth devices but there was no correlation between their use and synchronisation errors ( $r=-0.32$ ), nor significant difference in synchronisation error rate ( $p=0.08$ ).

562 days (15%) were considered non-compliant as heart rate was documented for less than 70% of the waking hour period. When synchronisation errors were removed, however, only 216 days (7%) were truly non-compliant due to the patient not wearing the device, rather than not having access to the data.

**Conclusion** This study has revealed a potential limitation of using commercial wearable activity trackers, such as FitBits, for clinical monitoring. While compliance with monitoring was good and matched previous reports on compliance at over 80%, the loss of data due to synchronisation errors reduced perceived compliance and, importantly for clinical interventions, reduced data available for immediate action.

Correcting these issues and restarting the automatic synchronisation was not a complex procedure but did necessitate a telephone call with the participant to manually synchronise the device, restart their smartphone or occasionally reinstall the app, which added to the participant burden of the investigation and overwhelmed the technological abilities of some participants. Currently, it is not clear what causes these synchronisation errors and, therefore, it is not possible to select patients who would be more suitable for this intervention.