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Patient and family perceptions of the provision of medicines as part of virtual outpatient consultations for children during COVID-19 pandemic

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ABSTRACT

Objectives To evaluate (1) views and perceptions of patients/parents/carers and healthcare professionals on the medicines optimisation (MO) process following virtual outpatient clinic (VOC) during the COVID-19 pandemic and (2) the processes introduced at this time, identifying areas for improvements and suggest potential solutions.

Design A mixed-methods service evaluation using qualitative and quantitative methods of the MO pathway in children aged 0–18 years following VOC across three specialist children's units.

Semi-structured interviews were conducted over the telephone with the participants exploring their experiences and categorised into themes.

Process mapping sessions with the multidisciplinary team identified areas for improvement and an ease impact framework developed for potential solutions.

Outcome measures included: (1) themes from interviews, (2) patients satisfaction rates, (3) process maps and (4) development of a simplified future process.

Results One hundred and twenty-five patients' families were contacted: 71 families consented to participate and their views were categorised into four main themes: (1) patient experience, (2) communication, (3) need for virtual video consultations for patient education by hospital pharmacists and (4) need for electronic processes to send prescriptions to local pharmacies.

Median patient satisfaction rate was 96% (range 67%–100%). The convenience of receiving medications directly to patient's homes; access to medicines information helplines and education provided by pharmacists were regarded as valuable. Communication between care providers, development of virtual video consultations by hospital pharmacists and electronic transfer of some prescriptions directly to community pharmacies were identified as areas of improvement.

Conclusions Participants appreciated the pharmacy processes adopted during the pandemic, however, challenges and recommendations for improvement in delivering MO VOC were identified. As digital innovations evolve within the NHS, future research should focus on integrated care and improved communication between care providers with selected medications prescribed directly to community pharmacies using electronic prescription service, with clinical screening and education provided by hospital pharmacists.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ While the concept of virtual outpatients clinics is not new, there has been limited published research in how patients and healthcare professionals felt about pharmacy medicines optimisation (MO) flow processes adopted during the pandemic and identify if any improvement need to be made as we continue to use these processes in our current hybrid model of care.

WHAT THIS STUDY ADDS

⇒ This study provides rich information from families and healthcare professionals interviewed across a range of specialisms, of the newly developed MO processes and who articulate what they liked about the service as well as what could be improved.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Potential solutions to the improvements identified and the ease with which these could be implemented may aid changes in practice which could be adopted by other organisations.

INTRODUCTION

Background

In response to the COVID-19 pandemic, there was an NHS directive to reduce traditional face-to-face (F2F) outpatient clinics and release capacity to treat increasing numbers of COVID-19 inpatients.[1] This led hospitals to quickly develop new service models and create virtual outpatient clinics (VOC) to ensure patients continued to receive ongoing healthcare.[2–5]

The rapid implementation of VOCs meant patients were no longer able to collect prescriptions from hospital pharmacies. To ensure patients could still receive their medications safely, hospital pharmacy departments adopted innovative methods, including use of Royal Mail post, courier and drive-through collections of medicines, and engaging general practitioner (GP) surgeries to issue

prescriptions to community pharmacies so that patients might obtain their medicines locally.

While there has been much research in VOC's in the pandemic, there is a paucity of information on the impact of pharmacy medicines optimisation (MO) processes as a result of VOC's on patients/carers and healthcare professionals.

Following the implementation of VOC's in NHS organisations across Kings Health Partners (KHP) Cardiovascular and Respiratory Partnership (The Partnership comprises Royal Brompton and Harefield Hospitals, now merged with Guy's and St Thomas' NHS Foundation Trust (as of 1 February 2021), as part of King's Health Partners (the Academic Health Sciences Centre comprising Guy's and St Thomas', King's College Hospital and South London and the Maudsley NHS Foundation Trusts and King's College London), some medicines-related incidents within paediatrics were identified but not reported, resulting in lost medication, medication sent to incorrect addresses and, in some instances, patients missing doses. This highlighted a need for a service evaluation across paediatric departments in the partnership to seek the views of patients/parents/carers and healthcare professionals involved in the MO process.

The aims of this project were to:

1. Seek the views and perceptions of patients/parents/carers and healthcare professionals on the current MO process following VOC.
2. Evaluate the processes introduced during the pandemic identifying areas for improvements and suggest potential solutions.

METHODS

This was a mixed-methods service evaluation using qualitative and quantitative methods to evaluate the MO pathway following virtual paediatric outpatient appointments across three hospital sites between January and May 2021.

The qualitative aspect of the study involved semistructured telephone interviews using topic guides with patients' families and healthcare professionals to seek their views and experiences. We also conducted workshops to process map current-state pathways and used ease/impact tools.

The quantitative aspect included patient satisfaction rates and identification of the medications prescribed. The medicines were coded against the South East London Formulary as red, amber or green (RAG) rating.[6] Categorisation of RAG rating is based on a decision graphic, which takes into account patient safety, clinical effectiveness, cost-effectiveness or resource impact, strength of evidence, place in therapy, national guidance, equity of access and stakeholder views. Medicines are approved for inclusion in the formulary following detailed presentation at an integrated MO committee comprising consultants, GPs, and pharmacists.[7]

The RAG rating is defined as follows:

► Green-suitable for prescribing in primary care.
► Amber 1, 2 or 3-suitable for restricted prescribing under defined conditions.
► Red-not suitable for prescribing in primary care.

The aim of using this RAG rating was to provide an overview of medication that could have been prescribed in primary care and closer to the patient's home. For example, drugs categorised as 'green' and 'amber 1' can be prescribed by GPs with no restrictions and are available from local community pharmacies.

Sample size

The sample size was randomly chosen with the aim of interviewing 25 families from each site for patient feedback, on the basis that it would allow thematic saturation. Convenience sampling was used based on the ease of identifying patents through prescriptions on hospital systems.

Participants

Children aged between 0 and 18 years who received outpatient medication via post or courier following a VOC were eligible to be included. Children receiving medicines following F2F consultations were excluded. Children were identified using clinical informatics and paper logs from patient services teams. Patient cohorts included respiratory (hospital 1), renal and neuromuscular (hospital 2), liver, haematology, immunology and transplant (hospital 3) based on ease of access to electronic outpatient prescriptions.

Questionnaire design

Semistructured interview questions and topic guides were developed, reviewed and further validated by the Trusts' patient and public engagement teams to ensure appropriate language and structure. Interviews were conducted by one pharmacist for consistency. To strengthen the rigour, validity and reliability of the study, 50% of the transcripts were double coded.[8 9]

Process mapping

Process mapping was conducted using an online visual management system, Miro to map the current state of the MO process following VOC as well as to identify potential areas of improvement (online supplemental material). Three virtual process mapping sessions were facilitated across three sites with good response from 30 representatives across multidisciplinary teams including pharmacists, nurses, consultants, pharmacy technicians, post room attendants, general managers, operational managers and project managers.

Following this, we conducted a workshop with six paediatric pharmacists to assess the areas of improvement with potential solutions and categorised these based on ease of implementation with greatest impact on patient care.

Patient and public involvement

Patients and their families were at the centre of this initiative, as MO is integral to patient safety. The findings will

be shared with patients and families at the KHP Cardiovascular and Respiratory Patient Public Reference Group and through summary reports to those that indicated they would like to be contacted postinterview.

Data analysis
Qualitative
The audio recorded interviews were transcribed as 'intelligent verbatim' and thematic analysis was conducted using NVivo V.12. An inductive process using Braun and Clarke's six phase approach[8] was used to analyse the transcripts consisting of: (1) data familiarisation, (2) initial code generation, (3) searching for themes, (4) reviewing themes, (5) consensus building to define and name themes and (6) producing the report.

Quantitative
Excel was used to assign the RAG rating for each medicine supplied following VOC and to calculate satisfaction rates.

RESULTS: QUANTITATIVE
Families from 125 patients were contacted. From these 71 families were interviewed between January and May 2021 to capture their experience of receiving medications following a VOC (figure 1).

Children across 14 specialties were included in the study (38% respiratory, 14% nephrology, 7% neurology and 41% others). The families interviewed were identified as white British (47%), black African (16%), Indian (10%) and another ethnic group (27%).

Nine hundred and seventy-seven outpatient prescriptions were posted or couriered from two of the three sites between January and March 2021. Overall 40% (392/977) of medications processed from the two hospitals were categorised as green and could be prescribed by GP's as per the SEL formulary agreement.[6]

The median patient satisfaction rate was 96% (range 67%–100%) with hospital 1 at 100% (n=25/25), hospital 2 at 96% (n=24/25) and hospital 3 at 67% (n=14/24).
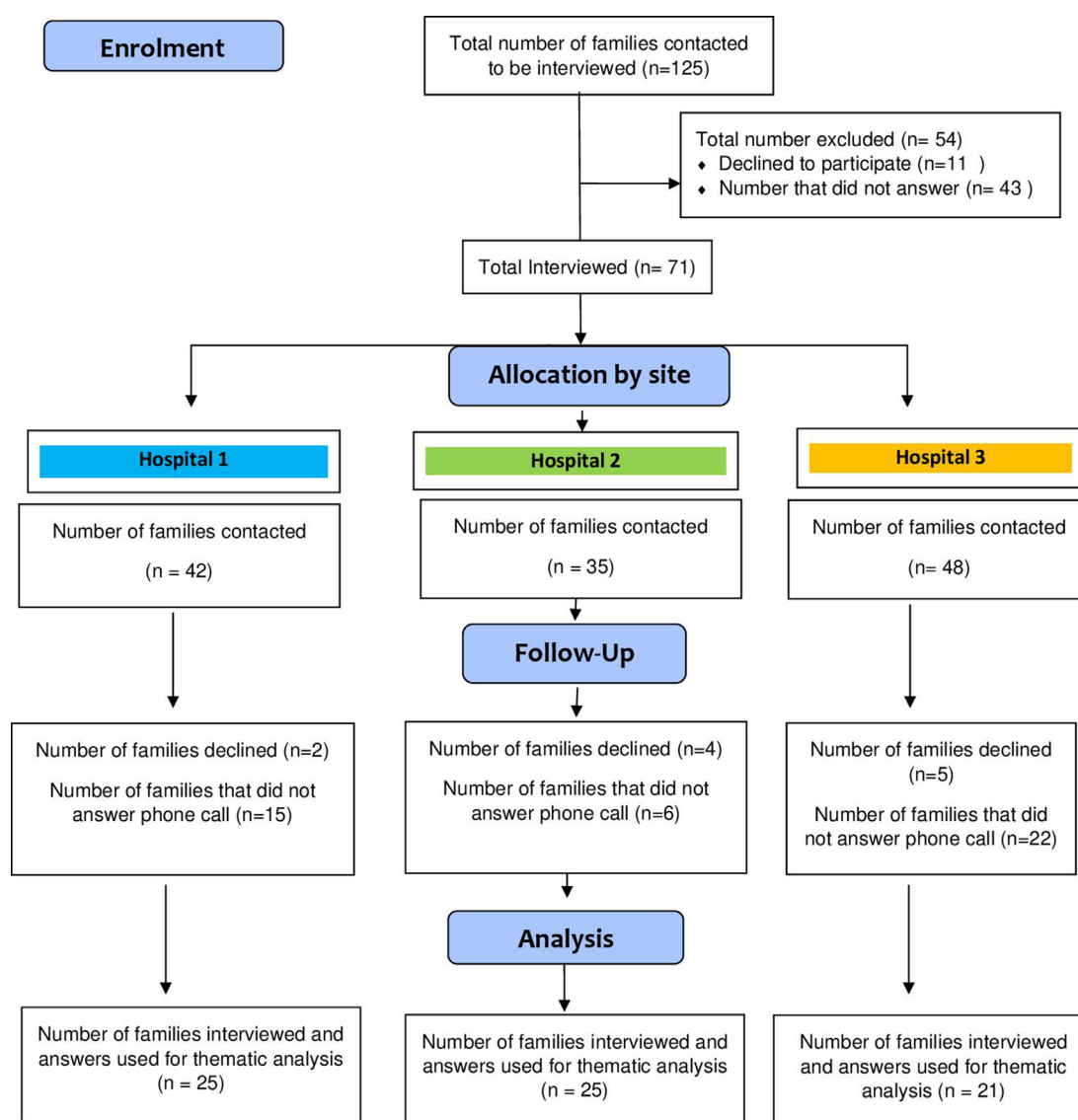

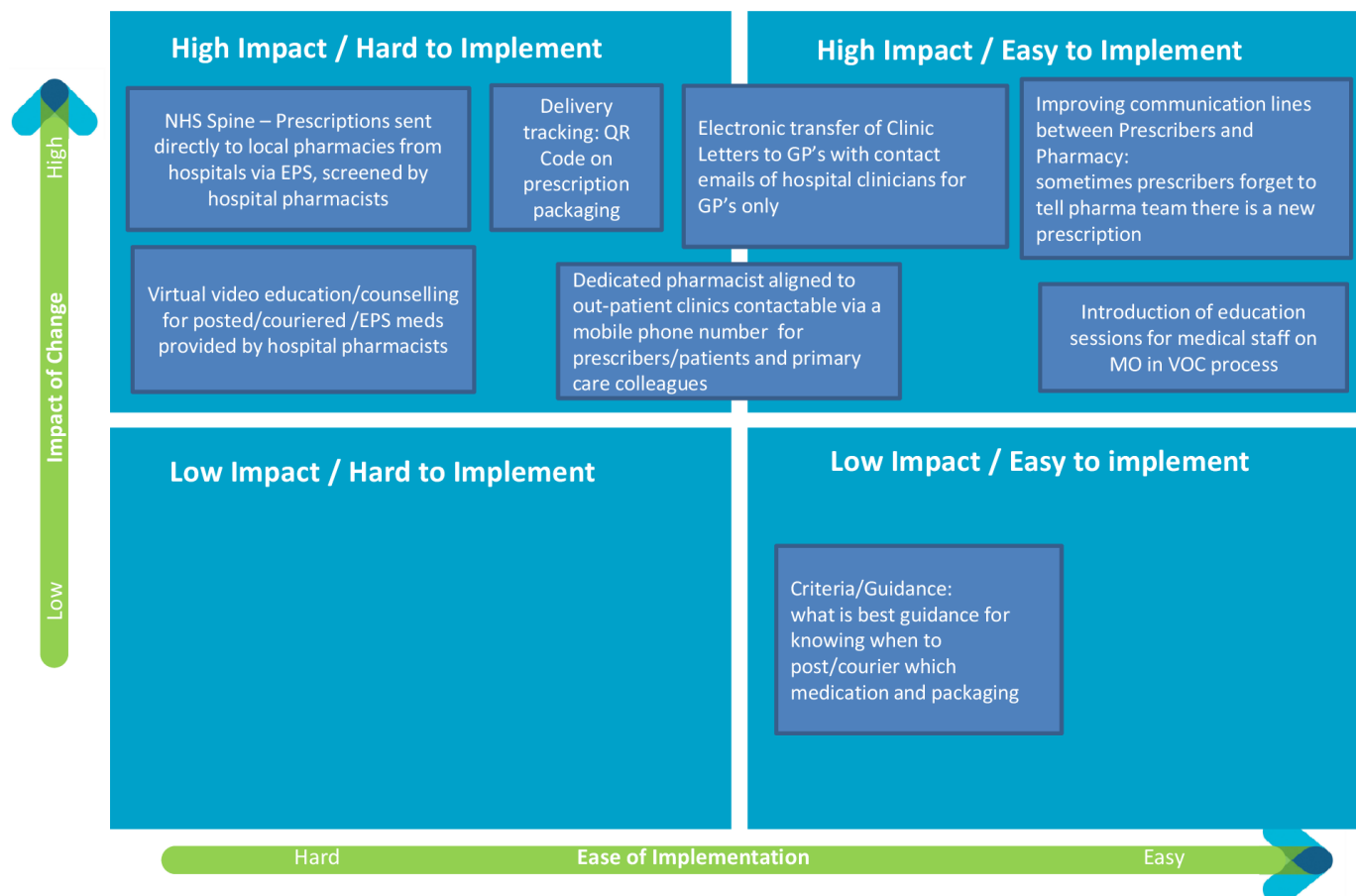**Figure 1** CONSORT flow diagram of families interviewed and analysed

Figure 2 Ease impact matrix of proposed solutions. EPS, electronic prescription service; GP, general practitioner.

RESULTS: QUALITATIVE

The virtual process mapping sessions identified similarities and differences in processes at each site and enabled process maps to be created on areas for improvement at each site (online supplemental material). Improvements identified from the process mapping sessions included electronic transfer of clinic letter to facilitate communication, dedicated pharmacist/technician aligned to outpatients with a mobile phone number, a tracking system with QR codes and ability to see if medication is delivered, quick links to GP pharmacists, introduction of education sessions for medical staff on their induction training on MO in VOC process, improved packaging for liquid medicines, links to local hospitals to facilitate supply of specialised medication closer to home, use of electronic prescription service (EPS) for sending prescriptions directly to local pharmacies and use of virtual video consultations for patient education by hospital pharmacists.

The Ease Impact Matrix (figure 2) highlights solutions that could be implemented locally. For example using the EPS for prescriptions directly to community pharmacies via the NHS spine[10] would be classed as high impact but be hard to implement until integrated digital systems are in place, however, emailing clinic letters to GP's would be classed as high impact, easy to implement.

A simplified future map of the MO flow process following VOC (figure 3) was agreed based on the introduction of new digital technology EPIC.

Four main themes of improvement were identified with sub themes as below:

Patient experience

Sixty-three out of seventy-one (89%) families across the three hospitals reported a positive experience with the new service process with a median satisfaction rate of 96% (range 67%–100%). Patients who received medication directly to their address reported the convenience of the current process: '*10 out of 10… it has been a big relief for us as a family not having to worry too much, and knowing that they [medications] are going to turn up*' [Hospital 2 parent]. This was especially true for when children were prescribed a new medication and it was delivered by post or courier; '*I think it is really good to have that first load delivered from the pharmacy. What we've normally experienced is that then the GP is able to prescribe the next load. I just really value it being sent through and us not having to worry about sorting it out quickly with the GP, etc.*' [Hospital 1 parent].

In particular, families with patients who require a lot of equipment to travel reported the ease of the current process; '*together with my daughter and her bags, feeding pump and her other bag of change nappies, because we travel from*
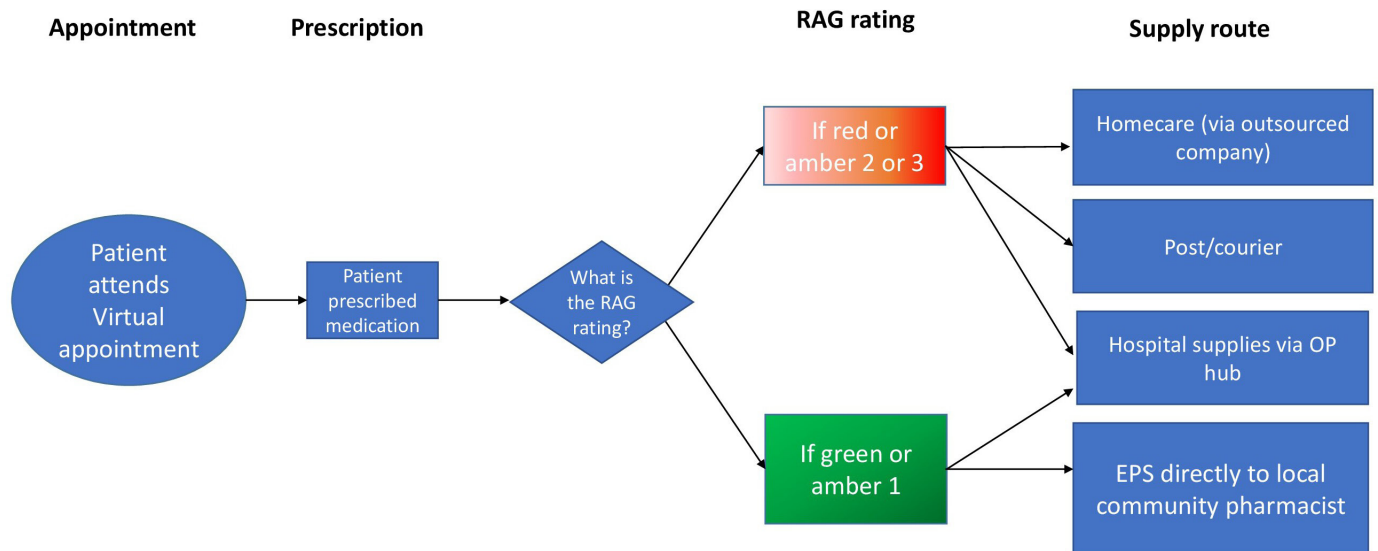
| Appointment | Prescription | | RAG rating | Supply route |

Figure 3 Simplified future map of the medicines optimisation flow process following VOC (online supplemental material) Medicines Optimisation process maps following paediatric virtual outpatient clinics introduced during the pandemic. EPS, electronic prescription service; OP, Out-patient; RAG, red, amber or gree; VOC, virtual outpatient clinic.

Brighton to London. To carry a suitcase all the way through with her buggy and of course, it is not convenient for a single parent to deal with all of this' [Hospital 2 parent]. An additional benefit for receiving medications directly to a patient's home was noted for those who live outside London, as the financial and time constraints associated with hospital visits were minimised.

Eight of the 71 (11%) families interviewed expressed some frustration towards the process. Some reasons for dissatisfaction of the current service were due to the communication between healthcare professionals as described below.

Communication
Communication was identified as a key area of improvement by both patients' families and GPs. Patients' families reported the importance of being informed about how they will have access to their medication. A primary care pharmacist suggested '*patients just need to be in the loop more than anything*' to minimise them being caught in the middle between primary and hospital care. The importance of having a point of contact within the hospital was echoed by both GPs and patients' families.

Communication between care providers
Parents and GPs commented on the disconnect between primary care and hospitals, and how they communicate. This can often cause a delay in a patient's medications; '*The only problem I've had is between the consultant and my GP, the communication between them, because my GP won't prescribe it again. I'm trying to figure out a way of how I can get the GP to carry on prescribing it because it is meant to be an ongoing medication*' [Hospital 2 parent].

Another parent also faced delays '*it took a month and a half for the GP to contact me about the creams*' [Hospital 2 parent]. This resulted in parents occasionally contacting the practice for prescription requests for medications

before the practice received any communication from the hospital; '*there is a lag period and methods used to contact primary care, sometimes they* (hospital) *send an email, but before the email is sent, the parents will be calling*' (GP).

GPs also reported a need to ensure a point of contact within hospitals for follow-up queries relating to indications and monitoring:

'Clear ways of communicating with the specialist, email ideally if there are queries from us' [GP].

Missed doses
A breakdown in communication also resulted in missed doses of medication following a VOC '*my paediatrician would write to my GP to indicate that [patient's name] would require this repeat prescription. I'm not quite sure what happened, but essentially, something in the process fell down. So, he didn't automatically have a repeat prescription after the first time that we collected the medication*' [Hospital 3 parent]

Medicines information hotline
Medicines information helplines were accessed by both GP's and families and seen as benefits of the service. '*People can have questions. The key is having that back up in place so that people can clarify their doubts*' [Hospital 2 parent].

Need for virtual video consultations for patient education by hospital pharmacists
Some patients' families acknowledged challenges associated with VOC. In comparison to F2F, there are limited opportunities to perform visual demonstrations of medications and sometimes difficulties understanding how to administer medications when being counselled over the phone, '*When you come face to face it feels like you understand everything. You see the medication and if you have any questions you can ask directly. Well,*

when they call you through the telephone I don't see the medication, just you tell me, I have to imagine…' [Hospital 1 parent].

There was one report of difficulty in understanding via telephone due to language barriers, lack of visual demonstration and inability to see body language *'I think it's a little bit difficult (having counselling via telephone) rather than face-to-face, because… you can't see the person and there is limited time'* [Hospital 3 parent].

There was a risk of an interaction when a parent was unable to discuss their medication with a pharmacist face to face *'my son was prescribed one lot of antibiotics, which he shouldn't be taking when he's taking another drug… So, it was only because I read the leaflet that comes with the medication, they shouldn't be taken with tacrolimus… And I know that sadly not all parents read the leaflet that comes with medication'.* [Hospital 2, parent].

Pharmacists were identified as providing practical advice on taking the medication and side effects as well as reinforcing advice provided by doctors and clinical nurse specialists *'I think that normally the pharmacy has been able to give me additional information which is more practical, and perhaps specifically relating to side effects and things which I wouldn't expect the registrar necessarily to talk about'* [Hospital 1 parent].

Where hospital pharmacists did not offer counselling/education, families often contacted the hospital pharmacy for clarification and assurance. *'In terms of the instructions to take it, I just wanted to double-check what the doctors had told us'* [Hospital 2 patient's parent].

Need for electronic processes to send prescriptions to local pharmacies

The need for electronic processes to send prescriptions to local pharmacies was highlighted by both parents and healthcare professionals especially as we move towards hybrid models of care.

A minority of families reported concerns for the current process and its feasibility as the country comes out of national lockdown and people return to school and work; deliveries from all three hospitals require a signature on receipt, which may not be practical. *'Perhaps the only disadvantage I could see is perhaps if I'm not actually at home at that present time, and I miss the delivery'* [Hospital 3 parent].

The use of EPS by hospital staff to allow patients to have access to their medications directly from their local pharmacy could be a way forward, allowing medication to be obtained locally with F2F education provided by pharmacists. EPS is a national system that is used by GP's, urgent care centres and NHS 111 to send electronic prescriptions to the patient's nominated pharmacy. This system can now be adapted to allow hospitals to use EPS. From the interviews conducted, the advantage would be improved timeliness and convenience for patients' families while reducing burden on GPs.

DISCUSSION

Increased digitalisation such as through virtual consultations and clinics have been proposed in the NHS long-term plan as a means to meeting increasing needs, improving flow processes and reducing costs to NHS and patients.[11–13]

Although VOCs have generally been well accepted following the COVID-19 pandemic[14] the use of telehealth poses its own problems in terms of technical and communication issues.

Patient experience of the process adopted during the pandemic has been very positive and families identified the ease, reduction in travel time and costs the new process had created, similar to the rapid review conducted by Murphy *et al.*[15]

However, some themes were identified from parent/carer/healthcare professionals as areas for improvement which included better communication between care providers, the need for virtual video consultations for patient education by hospital pharmacists following a VOC requiring medication and the need for EPS to send prescriptions directly to local pharmacies allowing patients to pick up their medication closer to home, which should be explored.

It was noted by a primary care healthcare professional that the knowledge and skills of community pharmacists are different to hospital pharmacists. Therefore, hospitals implementing EPS will need to consider governance structures that allow clinical screening and patient education by hospital pharmacists within their processes.

Additionally, use of EPS may be a cost-effective option if it allows savings on Value Added Tax incurred by hospital pharmacies, though it was 'hard to implement but high impact' in the ease impact matrix generated, as this would require new digital systems.

Current work is underway within the partnership to integrate systems, processes, and treatments guidelines, through new digital technologies using EPIC.

Improving communication through digital technology where systems between primary care and hospitals can be integrated will facilitate accurate information for decision making and efficient transfer of care of patients thereby improving quality of care. Both patients' families and primary care staff noted how poor transfer of care can have an impact on patient's safety when there is a delay in accessing medications.

Pharmacists were identified as providing good practical visual advice and the use of virtual video consultations to mimic F2F advice and education on medication alongside VOCs by clinicians should be explored as the use of telephone consultations is somewhat limited.

The expanding role of hospital pharmacists embedded within outpatient clinics has been shown to improve patient safety, assist improvement in patient outcomes[16–18] and improve education on use of medicines and medication adherence,[19] however, this service requires appropriate resources.

A simplified future map of the ideal process was developed based on all these parameters; however, it has not been tested and future work could look to test this (figure 3).

With VOCs becoming the 'new normal' across many services, there is a potential positive impact on overall carbon emissions due to reduction in travel. Now more than ever, climate change is at the forefront of political and health agendas with concerns on the environmental impact, population health, increase in demand for health services and therefore sustainability of the NHS.[20–23] The NHS have launched campaigns to tackle climate change including, Greener NHS campaign[24] and Delivering a Net Zero Health service[25] report, which outlined medicines as a big contributor to the NHS carbon footprint. The use of virtual clinics, consultations and EPS could aid this.

Key limitations were testing the areas for improvement due to the time frame of the project. Additionally, for one of three hospitals, interview response rates were lower as it was harder to reach families via telephone when the national lockdown eased.

Future research needs to explore hybrid models of care with integrated digital systems that allow communication between primary and hospital care providers allowing accurate decision making with the added security of patient data protection, in addition to exploring new 'homecare' providers with tracking delivery facilities and better integrated digital systems to improve communication.

Conclusion

To our knowledge, this is the first study to explore the perceptions of parents/carers and healthcare professionals on the pharmacy MO pathways following a VOC adopted during the pandemic with positive patient/parent/carer feedback and experience.

Improvements were highlighted both from parent/carer interviews and process mapping workshops undertaken by the MDT and solutions identified categorised into the ease of impact.

A simplistic future process map was developed incorporating integrated digital technology and future work could focus on testing this process.

In the 'new normal', hybrid models of care for providing efficient, cost effective and safe MO for VOCs will continue to evolve as digital innovations within the NHS improve.

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Supplemental material

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Medicines Optimisation pathway following paediatric virtual outpatient appointments

High-level pathway mapping from when a new drug is prescribed at a virtual outpatient appointment to when it is received via post or courier. Created in collaboration with MDT colleagues from across 3 hospitals.