Posters presented at the South Pharmacy Research Network Innovation Day

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Albemarle Centre, Taunton

PRESCRIBING CORTICOSTEROIDS FOR THE ACUTE EXACERBATION OF COPD

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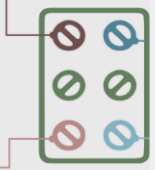
Background

Chronic obstructive pulmonary disease (COPD) is a lung condition characterised by obstructive airways causing chronic cough, breathlessness, and sputum production. Smoking or long-term exposure to dusts/ fumes are major risk factors for COPD. Oral corticosteroids (OCS) are prescribed alongside antibiotics as their prompt use can shorten recovery time after an exacerbation. Prolonged use of corticosteroids can lead to adverse effects including osteoporosis. Guidance advises all patients on >3 courses of oral corticosteroids in 12 months should be offered appropriate osteoporosis prophylaxis. This audit project assessed OCS prescribing at a GP practice and whether the prescribing adhered to NICE, GOLD and local guidelines.

A COPD Rescue Pack contains:
- A short course of oral steroids, prednisolone, to address wheeze and breathlessness not managed by inhalers.
- An antibiotic for use if sputum purulent or if signs of pneumonia.

Risks:
- Overuse of steroids can result in skin thinning, bone thinning and raised risk of osteoporosis and fractures, diabetes, pneumonia and cataracts.
- Overuse of antibiotics, or not taking the course exactly as prescribed, can result in antibiotic resistance.



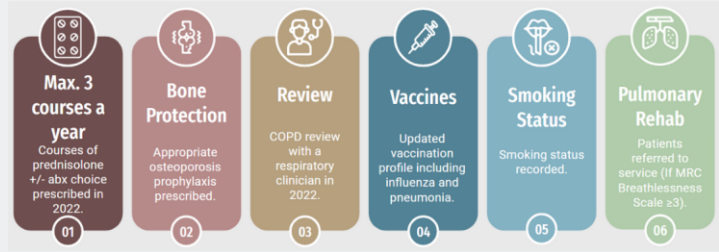
Aims

The aim is to review prescribing practises at a GP surgery for exacerbation management in COPD patients. The objective is to compare current practise against the set standards as listed below.
1. 100% patients prescribed ≥3 rescue packs have been properly assessed.
2. 100% of patients prescribed regular rescue packs to be on appropriate osteoporosis prophylaxis.
3. 100% of patients have had a COPD review in 2022 with an optimised treatment plan.
4. 100% of patients have had the appropriate vaccinations.
5. 100% of eligible patients have attended pulmonary rehabilitation.
6. 100% smoker status identified, and patients offered smoking cessation.

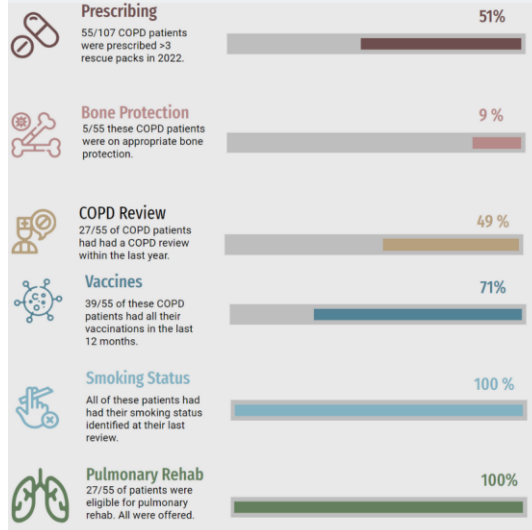
Method

This study did not require ethics approval. Two search reports from the practice's own database were used to compile a list of patients with multiple prescriptions of prednisolone, either on their repeat template or prescribed as acute. Each patient record was assessed, and important data collated onto an Excel spreadsheet to allow comparison to guidelines. The dataset focuses on prescribing that occurred only in the year 2022. This audit was completed before April 2023.

Standards



Results



Conclusions

Majority of COPD patients had ≥3 oral corticosteroids in 2022 without assessment. These were acute prescriptions where there was opportunity for intervention. Not enough patients were prescribed osteoporosis prophylaxis. Patients using ≥3 rescue packs would need bone protection as they are taking equivalent of ≥7.5 mg prednisolone daily for >3 months. Prednisolone was prescribed as 30-40mg daily for 5 days and some for 7 days. The shorter duration is better suited for patient safety, reducing steroid burden. Prescribing disparities occurred as clinicians were unaware of updated guidelines. Only 49% patients had a recent review due to respiratory-staff shortages, leading to increased exacerbations. 29% were not vaccinated including housebound patients and those not attending. Patients who attended a COPD review were offered pulmonary rehabilitation; but majority declined. Better promotion of pulmonary rehab may be needed to reach a higher target. Standard 6 was met but changes to smoking status were not reflected as COPD reviews were delayed.

Interventions proposed:
1. A visit by a Respiratory specialist & ANP to tackle complex COPD reviews.
2. Patients not prescribed bone protection to be assessed for suitability of bisphosphonate prescribing.
3. Practice meeting to discuss rescue pack prescribing and to reach a consensus amongst clinicians.
4. Learning session on COPD and corticosteroid prescribing to consolidate clinician knowledge.
5. To implement a procedure for follow ups post-rescue pack initiation. The conversation should include a discussion about the exacerbation, revision of the patient's management plan for future events, compliance to treatment and inhaler technique.

References
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Poster 1

Exploration of mental health Core Trainee (CT) level psychiatry training for experienced mental health prescribing pharmacists from a range of stakeholder perspectives

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Background

One in four adults and one in ten children experience mental health problems (NHS England, 2023) and people with severe and prolonged mental health problems are at risk of dying on average 15 to 20 years earlier than the general population (Public Health England, 2018). This health need has focused the NHS to think about how to transform mental health services to better support people who need them.

One way forward is the Mental Health Implementation Plan. This indicated a need to increase pharmacists specialising in mental health by 280 by 2023/24 (Health Education England, 2020). However to support pharmacists for these roles, are there any learning or development needs, particularly in diagnosis required.

To consider this question, Health Education England SW School of Pharmacy and Medicines Optimisation piloted pharmacist prescribers working within mental health services joining 6-month Core Trainee (CT) psychiatry training.

Who are Core Trainees or CTs?

Core trainees or CTs are doctors who have completed their foundation year one and two and have chosen the area of psychiatry to specialise within. They are called CT for three years and during this time training is offered and exams are taken before progression to higher level specialism and consultant psychiatrist role.

The training consisted of two parts

Off site training
(online/face to face)

- Core Trainee study days
- History tasking, examination skills
- Optional modules

+

Practice based-supervisor

- Supervision in practice
- Reflection

Study Aim

To explore benefits and challenges of pharmacist prescribers participating in CT psychiatry training from stakeholder perspectives (pharmacists and CTs on course, pharmacists' line managers and service users).

Research questions

- What were stakeholder aim(s) for pharmacists undertaking the mental health assessment skills pilot programme?
- What challenges have been experienced by stakeholders involved in the mental health assessment skills pilot programme?
- What do stakeholders understand has been the impact of the mental health assessment skills training for pharmacists?

Method

A qualitative methodological approach was adopted.

One-to-one semi-structured interviews with each pharmacist took place at start and end of training. Line managers invited to one-to-one semi-structured interview at month 6.

An e-questionnaire was co-designed with a service user and carer. Once piloted, the e-questionnaire was cascaded via the SW local Mind charity network branches for service users and carers to complete. CTs contributed by qualitative e-questionnaire that was cascaded by the CT training organisers.

Thematic analysis across all data (Braun and Clarke, 2021).
Study did not need NHS ethics as service evaluation.

Results

4 Pharmacists	1 Line Manager	14 Service Users	8 CTs
were interviewed at start, and 3 at month 6.	was interviewed. RESPONSE RATE 33%	participated in e-questionnaire. RESPONSE RATE 23%	participated in e-questionnaire. RESPONSE RATE 23%

Pharmacists and line managers accepted specialist roles required further training; *"More training than prescribing course"* Pharmacist A.

The benefits of the training complementing and adding to existing workplace relationships were recognized *"This training is extension of multidisciplinary clinical setting"* Line Manager.

Pharmacists reported the training would support the career development of a future consultant pharmacist post but identified there are no mental health consultant posts in the South of England *"No consultant (mental health) pharmacists in my area… I think this pilot would help towards this (future consultant pharmacist position)"* Pharmacist B.

All CTs supported pharmacists dispensing. One CT welcomed pharmacists prescribing. All CTs did not agree to pharmacists diagnosing mental health conditions. Four (50%) CTs supported learning with pharmacists; *"Useful to learn with and from pharmacists"* CT5.

Eight service users (62%) were unaware pharmacists did more than dispensing but embraced specialist roles; *"appointment with pharmacist… would be welcomed"* Respondent 7. All service users agreed to health professionals learning together.

Conclusion

The benefits of pharmacists and CT's learning together include, learning with and from each other, and adding to workplace multidisciplinary relationships. Challenges, such as some stakeholders holding a lack of awareness of current and future pharmacist roles, were noted.

Limitations: Limitation of study (small numbers, one intake).

Poster 2

Reference list:

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Feasibility of retrospective chart review to assess alignment of urinary tract infection (UTI) diagnosis, testing and treatment decisions with UKHSA diagnostic guidance in patients 65 years+ in the emergency department (ED)

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Scan for references/ further detail

Introduction

UTI is the second commonest infection.
Diagnosis can be complex – particularly in the elderly.
Risks of misdiagnosis include:

- escalation to serious infection
- overuse of antibiotics

UK guidance exists and government bodies encourage its use.
How do we measure how are we doing?

Aims and Objectives

Aim
To explore the feasibility of retrospective chart review as a method to quantify UTI diagnosis and treatment alignment with UKHSA guidance.

Objectives

- Assess alignment with relevant UKHSA guidance
- Record time taken

Methods

Retrospective chart review:

- ❑ 3 months data
- ❑ patients ≥ 65 years in ED
- ❑ not admitted
- ❑ primary diagnosis of UTI

Information collected from patient notes on documented presence/absence of:

- UTI symptoms and signs
- urine dipstick test
- urine sampling for microscopy culture and sensitivity (MC&S)
- antibiotic treatment

Management considered aligned if the following matched UKHSA UTI diagnostic and treatment guidance:

a. documented symptoms and signs
b. tests performed
c. treatment decision

Results (See *Figures 1 and 2*)

Documented symptoms and signs aligned with UKHSA diagnostic criteria	67.5% (27/40)
Followed recommended diagnosis/test/treat pathway	12.5% (5/40)
Received recommended treatment	75% (30/40)
Unnecessary Tests	27 urine dipsticks 6 urine samples
Omitted tests	11 urine samples
Time taken (40 patients)	20 hours

Guideline pathway alignment

Non aligned test/treatment outcome
Aligned test/treatment outcome via non aligned testing route
Aligned pathway

Blue –Test result
Grey – No patient had this outcome
NOTE: Map of test/ treatment actions, this is NOT a decision tree.

Figure 1 **Documented symptoms aligned** with UKHSA UTI diagnosis

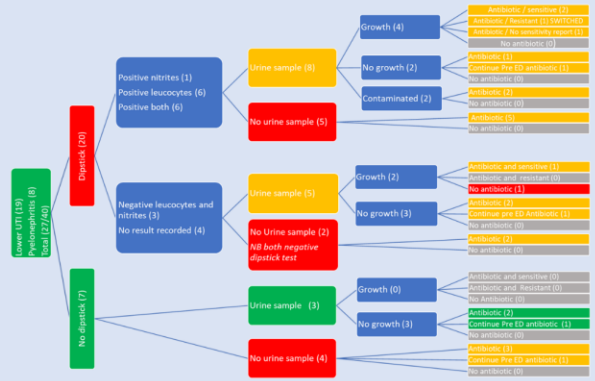
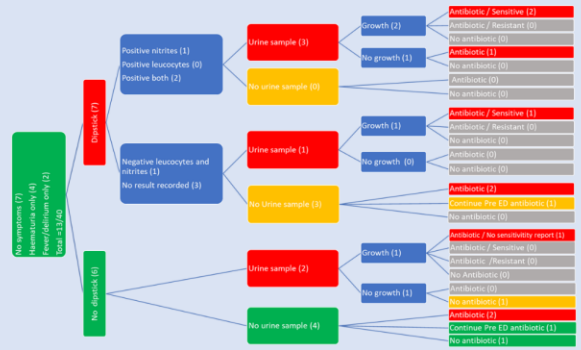


Figure 2 **Documented symptoms not aligned** with UKHSA UTI diagnosis



Discussion

Alignment with UKHSA guidelines appears low; this could be due to poor documentation.
A prospective observational study would likely provide a more accurate picture of patient symptoms and signs.
Testing where symptoms and signs were not aligned with diagnostic criteria appeared to be linked with unnecessary antibiotic use.
Missed urine sampling may hinder future treatment decisions if escalation of infection.

Conclusion

This method gathers rich data but is time consuming and may contain inaccuracies on alignment due to poor documentation.
Future research could investigate if guideline alignment is associated with patient outcome.

Poster 3

A discrete choice experiment to identify patient preferences for the provision of NHS medicines helpline services

Medicines helplines should prioritise seven-day opening for extended hours with queries answered the same day

Poster 4

Background

Medicines helplines for patients discharged from hospital can prevent medicines-related harm. They are **underused**, which is partially attributed to **under-resourcing** & consequent **inability to meet NHS standards**. There is no evidence to inform standards that should be **prioritised** to **increase patient access**.

Aim: To measure **patient preferences** for different **attributes** of the provision of medicines helpline services using a **discrete choice experiment**.

Methods

Attributes and levels
Seven key helpline attributes each with 2 to 4 associated levels selected from recent research & consultation with helpline managers

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Experimental design
D-efficient experimental design produces 2 blocks of 10 choice pairs of helplines described by differing levels of the 7 attributes

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Data collection
460 participants complete pre-tested online survey containing one of the two blocks of 10 choice pairs

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Inclusion criteria
Adult members of the NHS 'Research for the Future' database who regularly take ≥1 prescribed medicine

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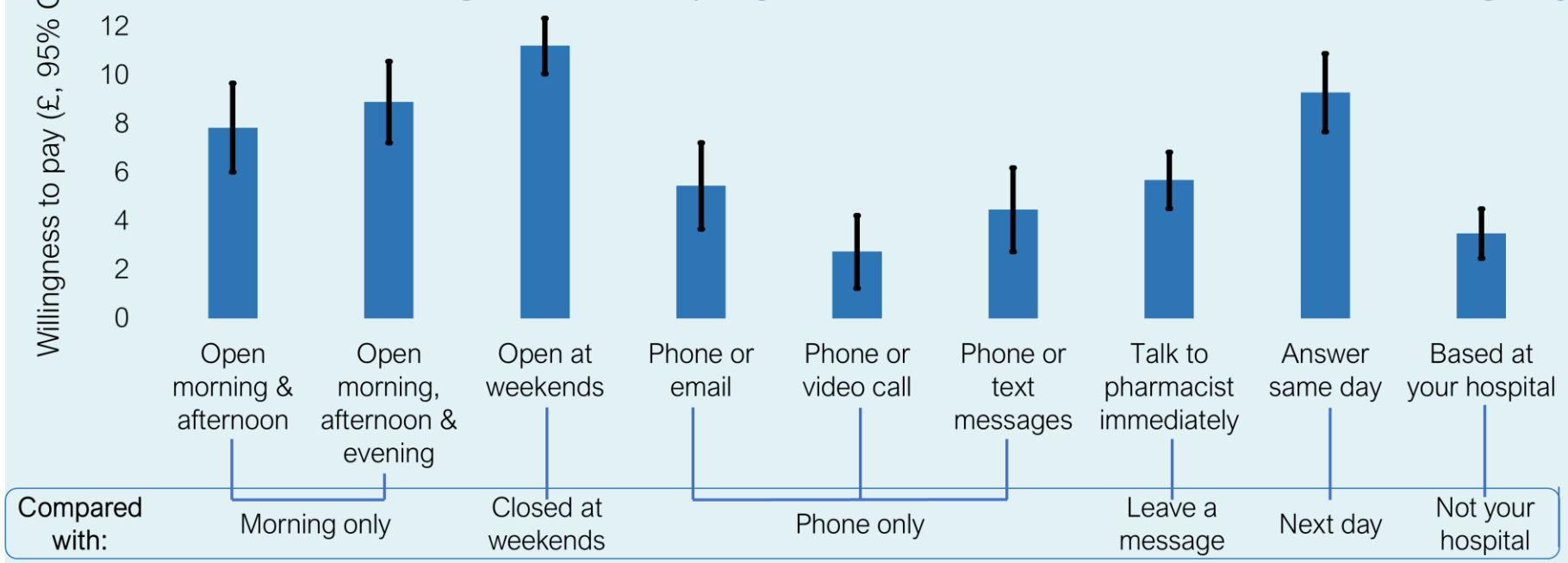
Statistical analysis
Preferences for each attribute level obtained using conditional logit regression & expressed as willingness for the NHS to pay

Greater willingness to pay = attribute valued more highly



Participant characteristics

53% female, aged 20-91 years, 95% white ethnicity, 56% university educated, 52% retired, mean number of medicines: 6.0 (SD = 4.8)

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Transforming the Clinical Pharmacy Service by Utilizing the Pre-Admission Phase of Elective Joint Replacement Surgery

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Introduction and Background

Practice Plus Group Hospital in Shepton Mallet is a small secondary care centre that offers elective surgical management of numerous conditions to both NHS and private patients. Arguably the most pharmaceutically challenging procedures conducted on this site are knee and hip arthroplasties, as these require consideration of extended VTE prophylaxis in addition to standard post-operative pain relief, laxatives and anti-emetics.

The benefits of a pharmacy-led medicines reconciliation have been widely documented. As per company policy, medicines reconciliation should be completed by a member of the pharmacy team using at least two sources to derive drug history information, with one of these sources ideally being the patient themselves. This should be done within 24 hours of the patient's admission, as per NICE guidance 2015.

PROBLEM: Prior to undertaking this project, the number of medicines reconciliations being completed by a member of the pharmacy team was negligible. Nursing staff were completing the drug history page of the drug chart at the time of patient arrival; 6am for all joint arthroplasties, which is outside of pharmacy opening hours. The pharmacy team were then struggling to find an opportunity in amongst other pharmacy work pressures to see patients when they aren't in theatre, recovery or undergoing physiotherapy. It was then even more challenging to make timely and meaningful prescribing interventions before the patient is discharged home.

Aim

Increase the number of medicines reconciliations completed by the pharmacy team to 90% of patients admitted for joint arthroplasty, measured during a one-month period. Each medicines reconciliation must be taken from two sources, with the patient ideally being one of these.

1. Plan

Inspired by work conducted elsewhere in the country (NICE, 2016), the planned nature of the surgery was looked upon as an opportunity to start the medicines reconciliation process in the days before the patient arrives for surgery.

Two methods of confirming drug histories with patients prior to their admission were identified:

- Contacting patients by telephone in the days leading up to surgery
- Speaking to patients in person when they attend the outpatient department for a group and screen (G&S) test, which is required 1-6 days before surgery

Using hospital computer systems, it is possible to obtain lists of patients expected for surgery, and patients expected for G+S appointments. Drug histories were to be initially documented using the Summary Care Record, in preparation for discussion with the patient.

Both processes were to be piloted for approximately 5 days with an aim to review successes and challenges with each before commencing a formal trial of the chosen approach.

2. Do

Both pilots proved effective for fully completing medicines reconciliations. Other observations are summarized below.

Telephone Consultation	Consultation at G&S Appointment
Advantages:	
Pharmacy staff could chose to contact patients at a convenient time around the departmental workload	G&S appointments by serendipity run at the same time as pharmacy opening hours so it is possible to see all the patients booked onto this clinic
	The outpatient department were very co-operative with escorting patients round to pharmacy following their appointment; fortuitously departments are adjacent to each another
	Allows for more effective communication including non-verbal as well as verbal cues
Disadvantages:	
Time wasted when patients don't answer the phone	Requires a pharmacist or medicines management accredited technician to be present in the pharmacy at the times patients are expected following group and screen thereby limiting opportunity to visit other areas of the hospital such as the ward
Poor phone signal causing communication difficulties	Relies on outpatient staff remembering to direct patients to pharmacy after their appointment
Phoning patient at an inconvenient time and therefore needing to arrange a second call	
Less personal	

The decision was made to move forwards with in-person consultation following the patient's G&S appointment, but with a telephone consultation being a second-line option if the patient is missed at the G&S appointment. The outpatient department agreed to continue in their assistance with this.

Documentation

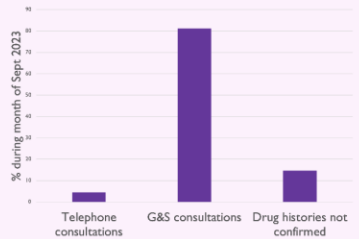
During the pilot, documentation of the drug history was considered. Initially, a pharmacy communication sheet was created for documenting this, as well as communicating any potential problems to the prescriber. It was later identified that a more efficient method would be for the pharmacist to document the drug history directly onto the drug chart. Following discussion with the ward staff, it was agreed that the drug chart for a patient's stay would be initiated by pharmacy to allow for the drug history documentation, and the pharmacy team would then be responsible for ensuring these drug charts arrive on the ward in time for the patient's admission.

3. Study

During the month of September 2023, 135 of 158 joint replacement patients had medicines reconciliation completed at the pre-admission stage (95.6%), either via in-person consultation at the G&S appointment, or over the phone..

Positive feedback has been received from patients regarding this service, as well as from nursing staff who appreciated the reduced workload of writing out drug histories themselves.

Additional opportunities for pharmaceutical interventions at the pre-admission stage have also materialized during the project:



- 4 patients have been identified by the pharmacy team as taking over-the-counter vitamins or herbal remedies that are contraindicated peri-operatively. These patients have consequently been advised to discontinue these medications and had surgery postponed with sufficient notice for that theatre slot to be re-filled.
- Reminding patients of other medications that must be held pre-operatively
- 1 patient with swallowing difficulties identified, meaning there was sufficient opportunity to order in suitable medication
- 26 allergies or intolerances identified that would be pertinent to the patient's admission
- 53 patients able to confirm they have sufficient proton pump inhibitor at home, and therefore would not need a supply on discharge to cover NSAID usage.
- 1 patient on dual antiplatelet therapy identified who had a clear pre-operative plan provided from their cardiologist, but no post-operative plan. This was raised with the team pre-operatively allowing for a plan to be considered in advance, reducing delays post-operatively.

4. Act

Due to the resounding success of this project, this process is to continue beyond this trial. Further improvements have been identified and will be implemented as soon as possible:

- Formalizing the provision of information about management of a patients own medication in the pre-operative stage
- Working with the outpatient department to amend their G&S appointment letters to include an explanation of the pharmacy visit, and to request that patients bring a list of medication with them in order to further improve accuracy
- Pharmacist completion of the independent prescriber course to allow for medicines to be prescribed directly onto the drug chart at the pre-admission stage
- As we enter the winter period, formally checking if patients have had a Covid or flu vaccine within the last 7 days, as this is a contraindication to joint replacement surgery at this site. Identification of any issues at the G&S appointment would still allow for enough time for that theatre slot to be filled by another patient, whilst ensuring optimal patient safety

NICE, 2015. *Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes.* Available from: https://www.nice.org.uk/guidance/ng5/chapter/1-Recommendations#medicines-reconciliation [Accessed 13 October 2023].

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Poster 5

Use of anti-TNF biologics in Inflammatory Bowel Disease (IBD). Are we adequately reviewing patients, including therapeutic drug monitoring (TDM)? How can Pharmacy help at Royal United Hospital (RUH)?

Poster 6

Aim

To investigate whether patients initiated on adalimumab (ADA) and infliximab (IFX) for IBD are reviewed post-induction, including TDM, and at 1 year. To investigate whether a Specialist IBD Pharmacist could be used to conduct such reviews.

Objectives

1. How many patients received a post-induction review at 12-16 weeks?
2. How many patients had TDM checked post-induction?
3. How many patients had an annual review?
4. Which multi-disciplinary team (MDT) member conducted post-induction and annual reviews?

Methods

Patients were identified using the Blueteq High Cost Drugs database by refining for:

- Blueteq initiation form for ADA or IFX
- Diagnosis of UC and CD
- Initiation form completed between March 2021 and March 2022

Treatment start date was determined using Blueteq date + 4 weeks - to allow the drug to be delivered via Homecare, or administered on Biologics Day Unit.

Electronic patient records were reviewed for the following:

1. **Post-induction reviews**: Clinic letters and appointment dates approximately **12-16 weeks after treatment start date**
2. **Annual reviews**: Clinic letters and appointment dates approximately **1 year after treatment start date**
3. **Post-induction TDM**: Lab results for ADA or IFX level approximately **12-16 weeks after treatment start date**

Background

IFX and ADA are anti-TNF biologics used to treat IBD in line with National Institute for Health Care Excellence (NICE)[1,2] and IBD consensus guidelines published by British Society of Gastroenterology (BSG).[3] If there is no response to induction therapy, there is little benefit of continuing treatment,[5,6] patients should be classed as primary non-responders and switched to a different drug-class.[3]. Trough drug concentrations post induction correlate to response to therapy[6], and treatment should be optimised. [3] NICE recommends an annual review of biologics, only to be continued if clinically appropriate. [1,2] Pharmacists are well placed to conduct these reviews, advise on results of TDM and ensure these biologics are used in the most appropriate way. The IBD MDT at RUH currently consists of consultants, IBD Nurses and registrars and work is being done to incorporate Specialist IBD Pharmacists and develop Pharmacy-led biologics clinics.

Results

74 patients started on IFX (n=28) and ADA (n=46) between March 2021 and March 2022.

Post-Induction:

☺ 88% (n=65) were reviewed on time

Could these have been done by a Specialist IBD Pharmacist?

44 appointments saved?

☹ 27% (n=20) had TDM done

IFX 35% ADA 14%

Would a Specialist IBD Pharmacist improve this?

↑ **TDM = improved clinical outcomes** [7]

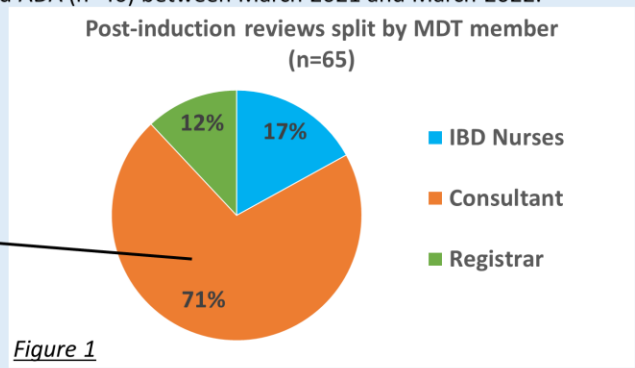

Figure 1

Annual Review:

69 patients continued treatment to 1 year

☺ 83% (n=57) were reviewed on time

☺ Majority reviewed at VBIC

Could these have been done by a Specialist IBD Pharmacist?

23 appointments saved?

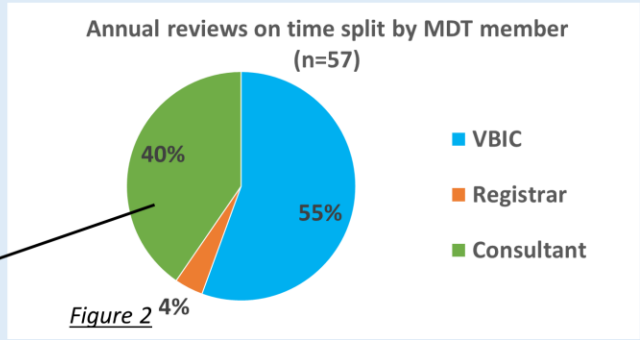

Figure 2

Conclusions

Most patients were reviewed on time post-induction and at 1 year. For those not reviewed on time, it was clear an attempt was made to contact the patient but they failed to attend. VBIC was an extremely useful way of reviewing treatment annually, without requiring a clinic appointment. TDM requires improvement. A Specialist IBD Pharmacist would be well placed to review these patients and advise on TDM.

Limitations

- Low patient numbers
- Somerset patients missed (no Blueteq)
- VBIC weekly MDT
  - Not appropriate for everyone
  - IBD Nurse time not accounted for requesting & chasing results
- Data not split between ADA and IFX
  - If IFX worse – could we have reviewed them at infusion?

Future Work

- Embed IBD Pharmacist in IBD MDT
- Run Pharmacy-led biologics clinics
  - **Specific TDM/monitoring clinics?**
- Repeat this study in the future
  - **Does IBD Pharmacist ↑ results?**
  - **Map optimisation of biologic + clinical outcomes + Pharmacy-led clinics?**

References

1. NICE TA329 2. NICE TA187 3. BSG IBD Guidelines 2019
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Evaluating Supervised Opioid Agonist Treatment Consumption

Background
Daily supervised consumption for Opioid Agonist Treatment (OAT) to treat opioid dependence was the norm before the COVID-19 pandemic. Under lockdown, most patients had weekly or fortnightly take home supplies. For some patients, these changes may have been positive, but others may face difficulties taking their medication as prescribed.

Rationale
Many patients stayed on unsupervised consumption during and after the COVID-19 pandemic, without much evidence to show how safe or effective it is for patients

Study aim
To compare drug-related harms and treatment outcomes during periods of supervised and unsupervised OAT and off OAT

Study outcomes
- Hospital admissions, non-fatal overdose, self-harm, drug-related deaths, suicide deaths and all-cause mortality
- Treatment retention and duration

Data sets
Patient clinical data from Change, Grow, Live, a community drug agency
Linked with
Hospital admissions and A&E data from NHS England
Linked with
ONS mortality data

Patient cohort
Adults (18+) prescribed OAT 2015-2022 with available linked data

This observational study is a collaborative project between the University of Bristol and Change, Grow, Live

If you would like to learn more, please scan the QR code below or contact us directly

Dr Rebecca Wilson
Senior Research Associate
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This research is funded by the National Institute for Health and Care Research Applied Research Collaboration West (NIHR ARC West).
The views expressed are those of the authors and not necessarily those of the NIHR, the NHS or the Department of Health and Social Care.

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University of BRISTOL

Poster 7

Royal United Hospitals Bath
NHS Foundation Trust

Diagnostic Stewardship for Urinary Tract Infection (UTI) in the Emergency Department (ED): Are we testing the right patients at the right time?

Mandy Slatter, Rachel Pilgrim, Mike Price, Julia Vasant (Royal United Hospital Bath NHS Trust) , Alessandria Cappelletti, Rebecca Miller, Kelechi Victor (Department of Life Sciences, University of Bath) Octpber 2023

Background

- UTI is the second most common infection seen in ED
- Diagnosis can be complex, particularly in the elderly
- Significant numbers of urine samples are collected for microscopy, culture and sensitivity testing (MC&S)
- UKHSA diagnostic guidance defines WHO needs a urine sample collecting and WHEN
- **OVER testing urine may** lead to antibiotics when not needed and contribute to antimicrobial resistance
- **UNDER testing urine may** miss an opportunity to identify causative bacteria and sensitivity to antibiotics; cannot then select antibiotic based on narrowest spectrum of activity so may contribute to antimicrobial resistance or under treatment

AIM:
Understand if patients in ED are having urine samples taken for MC&S for the right reasons at the right time

OBJECTIIVES:
For patients with **no suspicion of sepsis**/no blood for culture sent: Quantify alignment of urine sampling for patients 16 yrs+ presenting to ED with suspected UTI with UKHSA UTI diagnostic guidance.
For patients where **suspicion of sepsis of unknown or possible urinary source**/blood for culture sent: identify if concurrent urine sample sent for MC&S.

Ethical approval not required – service evaluation.

Methods

GROUP A – NO suspicion of sepsis

Over 2 weeks in Jan 2023 an electronic patient record search identified 90 patients 16 years+ presenting to ED and admitted to hospital who had a urine or catheter urine sample submitted for MC&S within the first 24 hours of admission but NO blood sent for culture. Paper notes were located for 60 of these. Retrospective chart review of paper and electronic notes completed to establish if documented symptoms, signs and patient criteria aligned with UKHSA guidance for urine sampling. Timing of urine sample in relation to antibiotic administration was recorded.

GROUP B – suspicion of sepsis

In Jan 2023, 425 admitted patients 16 years+ had blood taken for culture within 24 hours of ED presentation. A random sample of 119 patients were screened via electronic record and 51 identified with potential unknown or possible urinary source of infection for which full paper notes were requested. Retrospective review of all notes confirmed either unknown or possible urinary source of infection in 33/51. For these patients electronic record was reviewed to establish if concurrent urine samples were sent for MC&S:

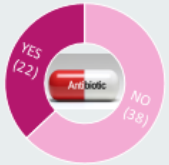
(i) 12 hours either side of blood sent for culture
(ii) >12 hours after blood sent for culture

Thanks to Emergency Department and Microbiology Service, RUH, for advice and support.

Results

GROUP A – NO suspicion of sepsis

27/60 (45%) patients had NO documented indication for urine sampling according to UKHSA guidance



22/60 (37%) patients had antibiotic treatment for UTI of which 16 (73%) had UTI symptoms documented

10/22 (45%) patients had urine sample taken prior to antibiotic administration

GROUP B - suspicion of sepsis of unknown or possible urinary source

14/33 (42%) patients had urine sample within 12 hours of blood culture

7/33 (21%) patients had urine sample taken >12 hours after blood culture

12/33 (37%) patients had no urine sample taken

References:
- Urinary tract infection: diagnostic tools for primary care - GOV.UK (www.gov.uk)
- NHS England » Commissioning for Quality and Innovation (CQUIN) scheme 2022/23
- WHO Diagnostic stewardship. A guide to implementation in antimicrobial resistance surveillance sites

Conclusions

GROUP A – NO suspicion of sepsis

Nearly half of patients had no indication documented for urine sampling according to UKHSA guidance.
- Wasted nursing and laboratory time
- Potential for unnecessary antibiotic use

Less than half of patients who received antibiotics had urine sampled PRIOR to antibiotic use.
Where there is no suspicion of sepsis, samples for MC&S should be taken prior to antibiotic use to optimise bacterial growth and elicit antibiotic sensitivities to guide treatment.
- Opportunity to improve timing of urine sampling

GROUP B – suspicion of sepsis of unknown or possible urinary source

- Opportunities to test urine for potential causative bacteria in sepsis are being missed

Blood cultures do not always grow bacteria. If UTI is a potential source of sepsis or source is unknown a urine sample should be taken to help guide future treatment including step down to narrow spectrum antibiotics. In sepsis, antibiotics should be administered within 1 hour. The earlier the urine sample the greater the chance of bacterial growth.
- Earlier urine sampling should be encouraged

LIMITATIONS AND NEXT STEPS
Retrospective chart review relies on accurate documentation. Small numbers studied.
Discuss with stakeholders barriers and enablers for improvement.

Contact: mandy.slatter@nhs.net

Poster 8

Low carbon footprint inhalers in England: a review of dispensing data

Background

Metered dose inhalers (pMDIs) have a **higher carbon footprint** than **low carbon inhalers** (LCIs), such as dry powder inhalers. pMDIs contribute **3.5% of the NHS's** CO_2 equivalent emissions. In 2019, NICE and BTS/SIGN **guidelines attempted to increase use of LCIs**, but their effects & factors influencing success are unknown.

Aim: To investigate **temporal & geographical variation** in LCI prescribing in England over 5 years.

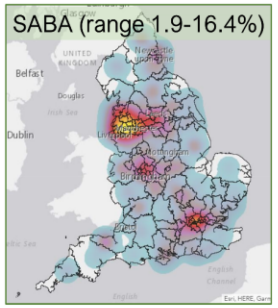
Methods

Data
CCG dispensed items (March 2016-Feb 2021) from openprescribing.net
CCG population characteristics from ONS, PHE & CCG websites

Key measure
Low carbon inhaler % = LCI items relative to total inhaler items (pMDI + LCI)

Statistical analysis
Interrupted time series analysis to investigate temporal variation. Multivariate regression models to investigate geographical variation

Low carbon inhaler % by CCG

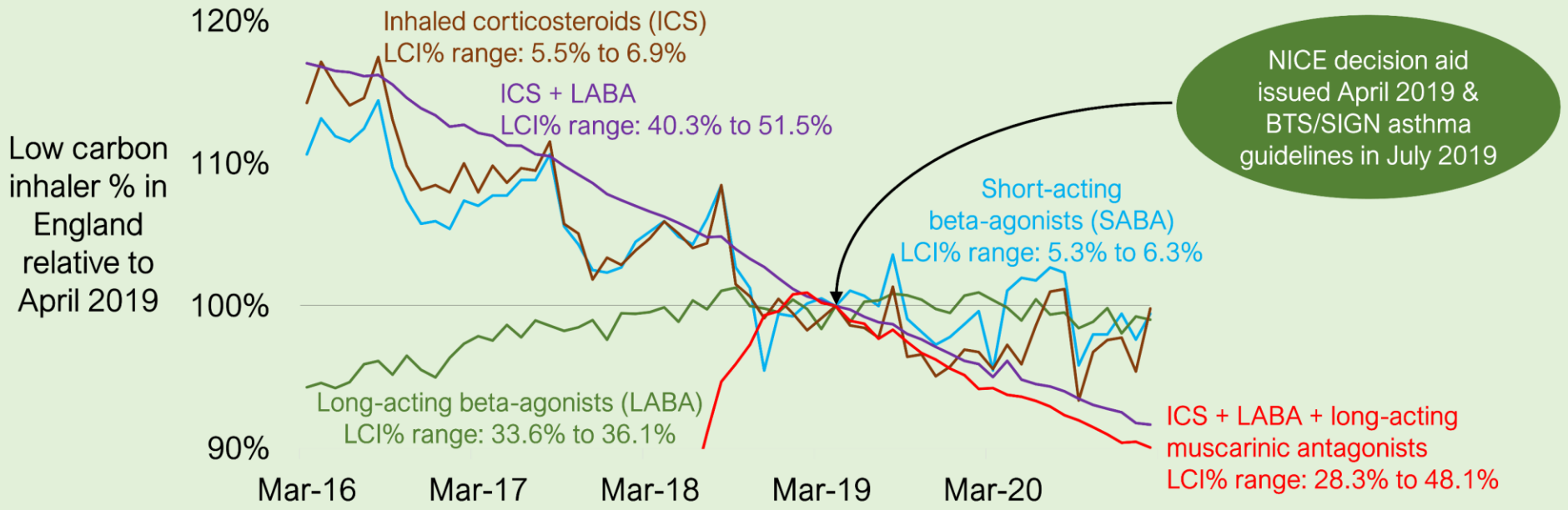


SABA & ICS: both **advice on climate change** in CCG guidelines & **asthma prevalence** associated with **higher %LCI**

ICS & ICS+LABA: CCG **population <15 years** associated with **lower %LCI**

Despite current initiatives, use of low carbon inhalers in England has fallen since 2019

Poster 9



Only a small increase in low carbon inhaler % seen after publication of NICE & British Thoracic Society guidelines, which was soon erased by the long-term trend

JT acknowledges the EPSRC Centre for Doctoral Training in Aerosol Science (EP/S023593/1) for financial support and the award of a China Scholarship Council (CSC)-University of Bristol joint-funded scholarship for PhD research

Jianghan Tian, Presenter Anita McGrogan, Presenter Matthew Jones
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UNIVERSITY OF BATH

A Two Part study to investigate the Environmental (viable) and Physical impact on Pharmaceutical Cleanrooms when High Efficiency Particulate Air filtered supply is temporarily suspended.

Teresa Morris[1] *Royal United Hospitals Bath – Pharmacy department*

Introduction

The manufacture of sterile pharmaceutical products must be conducted in dedicated cleanroom facilities, maintained and operated in line with EU GMP parameters[1]. The Heating Ventilation and Air Conditioning (HVAC) system controls supply and extract of High-efficiency particulate (filtered) air, which is essential for maintaining regulatory requirements.

Approximately 50% of a pharmaceutical cleanrooms total energy is dedicated to continuously running a HVAC system[2]; however, 78% of a HVAC systems operating time is for maintaining cleanroom parameters, when no operational activities are being undertaken.

In October 2020, the NHS launched its campaign for a greener NHS with a net zero emission target by 2040[3]. Energy prices are set to increases which means the cost of running a HVAC system will increase two fold, during a time of austerity.

This two part study was conducted to ascertain the risk and impact of switching off the HVAC system to the cleanroom environment, to enable HVAC switch off out of working hours, as both a cost reduction and carbon neutral strategy.

Methods

Both studies were conducted in a fully operational cleanroom suite consisting of C and D grade cleanrooms.

Sampling methods adopted are shown below, and were conducted in line with ISO14644[4] and EU GMP[1]

Sampling Method	Equipment & Media used	Sampling Regime
Cleanroom physical parameters Air change rate; Pressure differentials; Temperature; Humidity	Hooded Balometer (HAVI) Environmental Montiroing system (Pa, °C, %RH)	Pre and Post Continuous
Airborne particles Airborne particle monitoring	MET 1 Particle counter (Grade C - 6.9Ltrs/ Grade D 1min:2.8Ltrs)	Pre and Post
Viable monitoring Active Air sampling Surface sampling Passive Sampling	SAS 180 Active Air Sampler (1m3) Tryptone Soya Agar (TSA) Contact plates 55mm (10 seconds) TSA Settle plates 90mm (2 hours)	Pre and Post Pre and Post Continous (Study 2)
ISO14644 & EUGMP	ISO14644 & EUGMP	ISO14644 & EUGMP

Sampling Parameters

Study 1 sampling parameters for the viable and particulate impact of operator presence during supply disruption.

Study 2 sampling parameters for the viable and particulate impact of operator presence during supply disruption.

Method	Working Parameters	0-30 minutes	30-90 minutes	90-120 minutes
1	Operative processes undertaken	HVAC Operating	HVAC Operating	HVAC Operating
2	Unoccupied	HVAC Operating	HVAC "Switched Off"	HVAC Operating
3	Operative processes undertaken	HVAC Operating	HVAC "Switched Off"	HVAC Operating

Results – Study 1

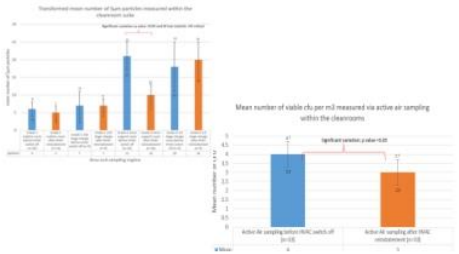
Physical Parameters

No impact on the cleanroom physical parameters

✓All within EU GMP limits[1] and storage requirements

Airborne particle concentration and AAS viable recovery

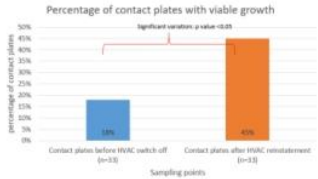
Significant variation was found in the 5µm particulate concentration measured and the viable AAS collected; with a skew in favour of post HVAC switch off.



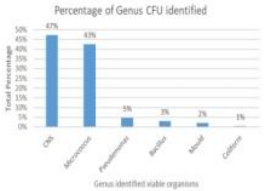
Results – Study 1 *continued*

Viable recovery

There was also significant variation in viable recovery from surface samples, this time higher recovery post HVAC switch off



Viable recovery Genus identification



- Low recovery rates
- No notable difference in genus identification before and after HVAC switch off

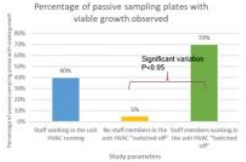
- Genus identification conferred with trends and types of cleanroom microflora identified in a study conducted by Sandle in 2011[5]
- The presence of these micro-organisms in our cleanrooms:
  - Cleaning activities
  - Changing rooms
  - **Ultimately personnel shedding**

✓ All results from study 1 within particle concentrations and viable counts were within EU GMP limits

Results – Study 2

Viable recovery

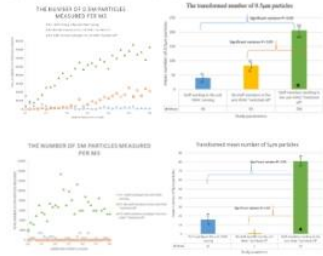
Recovery rates for viable growth was low; however, significant variation found with viable growth detected between test 2 and test 3.



Results – Study 2 *continued*

Airborne particle concentration

As demonstrated below, significant variation for both 0.5µm and 5µm particle concentration was found when staff are working within the cleanroom and HVAC is switched off.



✓ All results from study 2 within particle concentrations and viable counts were within EU GMP limits

Conclusion

- There is **no** significant variation in the working parameters of the cleanroom following 12 hour HVAC system "switch off"
- Operators **do** significantly affect the environmental parameters of a cleanroom when a HVAC system is "switched off".
- Operators **are** the biggest risk to our cleanrooms.
- Removal of operators prior to HVAC "switch off" and restriction of re-entry post HVAC reinstatement, is **key** to ensuring surfaces are free from viable bioburden and minimal risk to pharmaceutical products.

Further Studies and Recommendations

- HVAC "Switch off" for a period of 12 hours out of operational hours, can be safely adopted with no significant impact of physical and environmental conditions on reinstatement.
- If HVAC switch off is adopted, trend analysis of viable growth recovered must be completed for a minimum of three months to ensure no long term effect on the background bioburden
- Additional thought should be directed on the risk to cleanrooms following an unexpected HVAC failure during operational hours.
- The findings of this study are of national significance and through a risk based approach, could be applied to other NHS Pharmaceutical aseptic unit.

References: *[1] Medicines and Healthcare products Regulatory Agency (MHRA), 2022. Annex 1. 11th ed. London: Pharmaceutical Press. [2]Tschudi, W. & Xu, T., 2001. Cleanroom Energy Benchmarking Results, California: University of California. [3] NHS England, 2022. Delivering a 'Net Zero' National Health Service, London: NHS England and Improvement.[4] International Organization for Standardization, 2005. ISO14644 Cleanrooms and associated controlled environments - Part 3: Test methods, Geneva: ISO.*

Poster 10

Project Aim

The Devon Teach and Treat Pilot will support community pharmacists from across the county to achieve their independent prescribing qualification by providing access to suitable supervisors and clinical environment.

Background

One of the biggest obstacles community pharmacists face is securing appropriate supervision and a clinical environment to facilitate the course requirement of 90 hours of supervised practice learning.

As prescribing does not yet exist within community pharmacy in England, supervision and practice learning must be sourced from another healthcare sector.

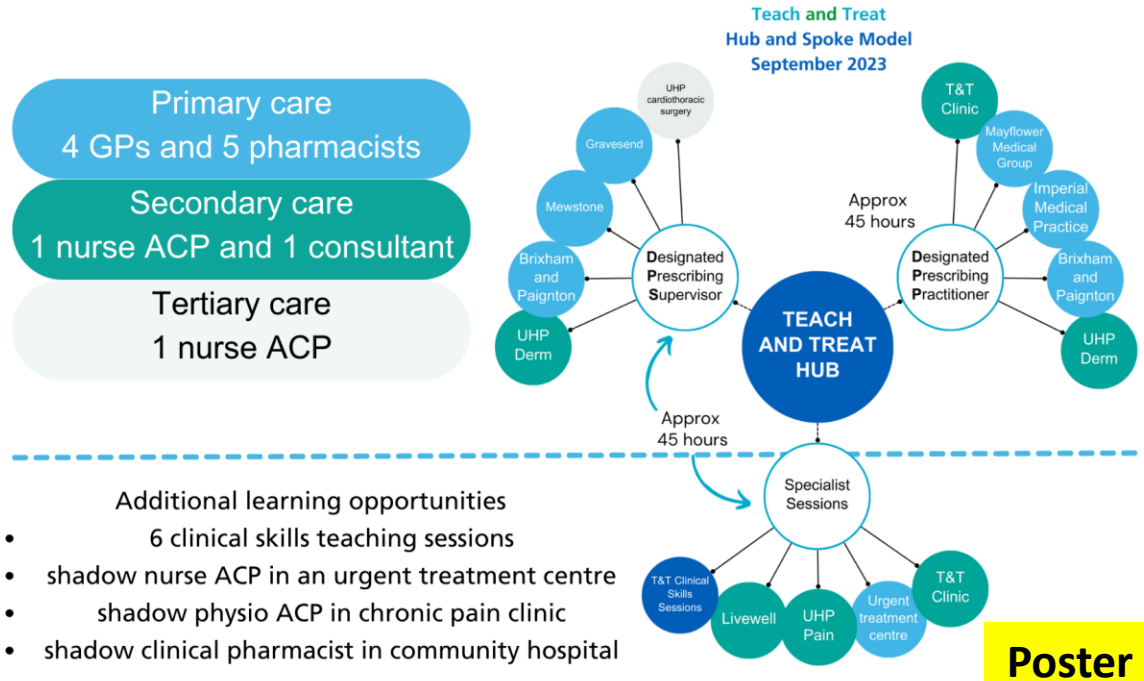
TEACH & TREAT

Supporting community pharmacist independent prescribing

University Hospitals Plymouth NHS Trust

Model

The lead for Teach and Treat is a nurse Advanced Clinical Practitioner (ACP) by background and is directly supporting 5 community pharmacists as their Designated Prescribing Practitioner. We have collaborated with additional healthcare professionals to increase supervision capacity. This has evolved into a cross-sector, multi-professional hub-and-spoke model. The supervisors and clinical environment are made up of...



Additional learning opportunities

- 6 clinical skills teaching sessions
- shadow nurse ACP in an urgent treatment centre
- shadow physio ACP in chronic pain clinic
- shadow clinical pharmacist in community hospital

Outcomes

In September, 11 community pharmacists started their prescribing qualification with support of Teach and Treat.

So far we have had 2 teaching sessions on history taking and consultation, and respiratory examination.

We have facilitated approx. 150 hours of supervised practice learning in the first month.

We have created a forum for Devon Community Pharmacist Independent Prescribers within the NHS Futures platform.

If would like to know more, please email v.webb1@nhs.net.
Vicky Webb.
Independent Prescribing Clinical Lead and Strategic Lead for Devon Teach & Treat Pilot

Poster 11

Poster 12

Antibiotic prescribing in COVID-19 patients in LMICs: systematic review

Vincent Cheng

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Objectives

Low and middle-income countries (LMICs) are particularly vulnerable to the threat of antimicrobial resistance (AMR). Use of antibiotics to treat COVID-19 patients during the pandemic may contribute to increasing the AMR burden, but systematic evidence is lacking.

Methods

We searched Web of Science, EMBASE, PubMed, China National Knowledge Infrastructure (CNKI), VIP databases from 1 December 2019 to 31 March 2021. Interventional and observation studies across all settings that reported antibiotic use in at least 10 COVID-19 patients were included. We restricted publications to English and Chinese languages. Screening and data extraction were undertaken by at least two independent reviewers. Results were synthesised using random-effects meta-analyses. Subgroup analyses and meta-regression were used to explore heterogeneities. This review was registered with PROSPERO (CRD42021288291).

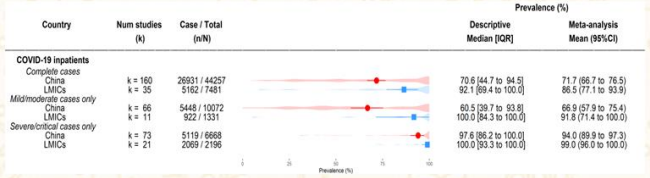
Results

We included 284 studies involving 210,611 people in 19 countries. The antibiotic prescribing rates (APRs) in COVID-19 inpatients were 71.7% (95%CI 66.7-76.5%) in China and 86.5% (77.1-93.9%) in other LMICs respectively. APR was lower in mild/moderate cases in China 66.9% (57.9-75.4%), compared to other LMICs (91.8%, 71.4-100%). High APRs were found among pregnant women and the elderly in China. Disparities in APRs of other patient groups were identified. In studies reporting bacterial infections, the prevalence was 17.3% (10.0-25.9%) in China and 24.9% (0.1-68.8%) in other LMICs. Several antibiotics on the WHO "Watch" and "Reserve" list were prescribed frequently in LMICs.

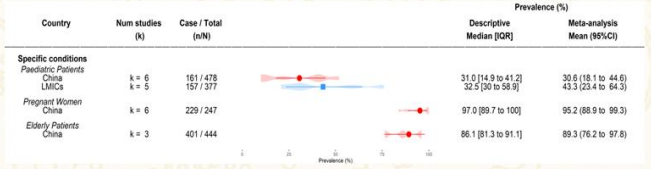
Conclusions

Inappropriate antibiotic use and high prevalence of antibiotic prescribing were found in COVID-19 inpatients in many LMICs.

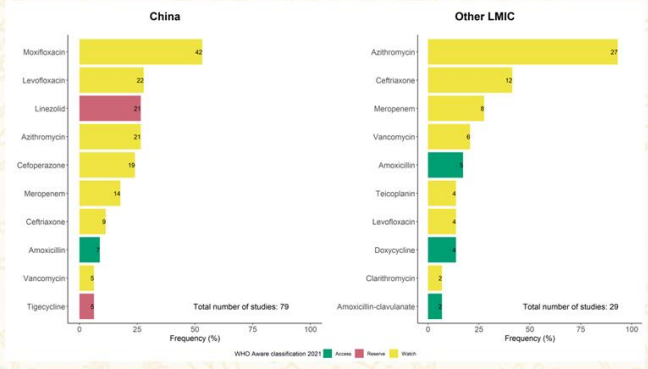
Rates of antibiotic prescribing in COVID-19 inpatients were **higher than 60%** in China and other LMICs



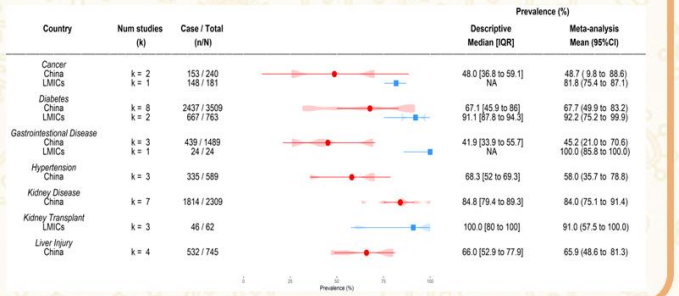
In **pregnant women** and **elderly patients**, the antibiotic prescribing rates were **even higher than 85%**



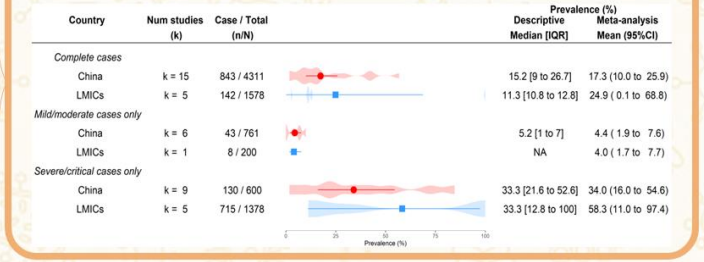
Many **later-line antibiotics** were used in these patients in LMICs



The prescribing rates were not often related to patients' existing diseases

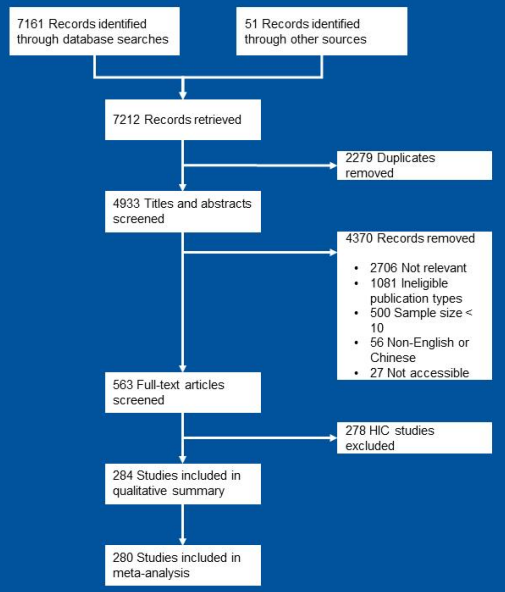


However, the bacterial infections were not evidently seen in these patients



Take a picture to the full paper

Encouraging Responsible Prescribing



Fundings

This research was funded by the British Society of Antimicrobial Chemotherapy through the BSAC Covid-19 Rapid Response Call (Grant Ref: BSAC-COVID-72). HYC is supported by NIHR Advanced Fellowship (NIHR301440).

Authors

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University of BRISTOL
Queen Mary University of London

Well-designed information for nurses makes injections safer

Matthew Jones, University of Bath

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Why did we carry out this research?

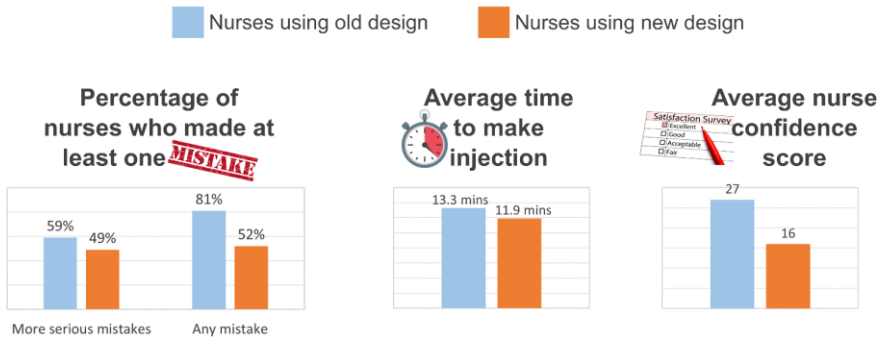
- One in every hundred injections is given incorrectly and causes harm
- To reduce mistakes, the NHS publishes the Injectable Medicines Guide
- This website tells nurses in many hospitals how to prepare each injection
- Research has found that mistakes are often caused by confusing information
- At the start of this project, we used "user testing" to improve the Injectable Medicines Guide design
- So we wanted to find out if nurses using our new design made fewer mistakes

How did we do this research?

273 nurses working on hospital wards

What did we find out?

- The new user tested design made it safer, faster and easier to give injections
- We can be confident these differences are not due to chance



Nurses with the new design made fewer mistakes
The difference in serious mistakes might be due to chance

Nurses with the new design were more than 1 minute faster making the injection

Lower scores = more confidence, so nurses with the new design were more confident

Matthew Jones is funded by a National Institute for Health Research (NIHR) Transitional Research Fellowship for this research project.

This poster presents independent research funded by the National Institute for Health Research (NIHR). The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health and Social Care.

FUNDED BY NIHR | National Institute for Health Research

Poster 13

Pharmacists may need help planning their route up

Selected interview themes

Enthusiasm about advanced practice:

We've got a massive role that we can play

Uncertainty about roles and routes of study:

in the absence of …a structured career pathway…and people [seeing] *the clear delineation between the roles and clear progression. I think it is alienating people…*

It's that blur between what's a consultant pharmacist and ACP…. Problem is in pharmacy you've got all these different models…

Education fatigue:

Three years, on top of a diploma. I think that is a big barrier for a lot of people.

Funding and pay:

[you need] sufficient funding to allow you to release people for training, and then to reward salary wise on completion

Courteney Rainey; Holly Read; Kieran Tsang; Tia White; Sarah Jones

Email scm20@bath.ac.uk Twitter @SarahJPharm

Factors affecting pharmacist participation in education for advanced practice

Department of Pharmacy & Pharmacology

UNIVERSITY OF BATH

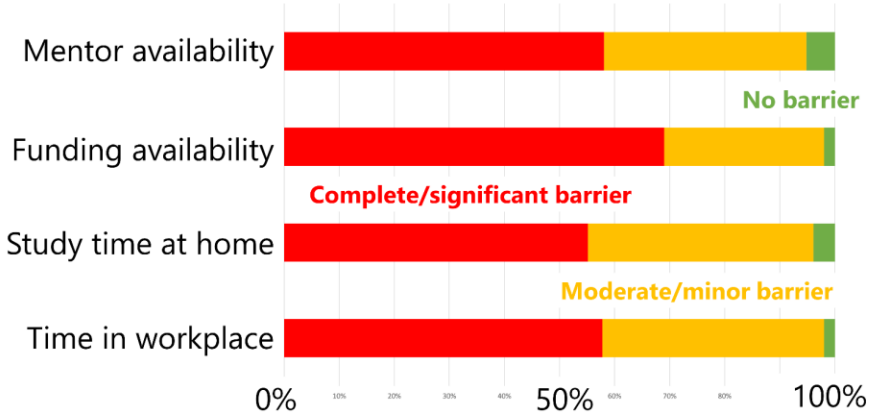
Bath BA2 7AY · United Kingdom

Mixed-methods sequential design: semi-structured qualitative interviews, followed by quantitative survey. Both explored pharmacists' views and understanding of advanced roles such as Advanced Clinical Practitioner (ACP) and Consultant Pharmacist which are key to NHS future workforce capacity.

Seventeen interviews with pharmacists either in current postgraduate study or workforce planning roles, reviewed using thematic analysis. **Survey** (**n=163**) of pharmacists distributed using social media and professional networks.

Pharmacists are enthusiastic about advanced roles but unclear about terminology and pathways

Key perceived barriers



You can't aspire to what you haven't heard of:

- Fewer than a third of respondents claimed a full understanding of terms like ACP
- Less than half had heard of the Health Education England Centre for Advancing Practice

Many pharmacists don't see current ACP MSc routes as a good fit with their previous study and experience. Those currently considering advanced roles generally have:

- 4yr undergraduate degree +1yr pre-reg/foundation
- Post-qualification training at Masters level 1-3 years often including Independent Prescribing

When asked about training time needed, over 80% thought such pharmacists required ≤2yrs study for an advanced role. The portfolio route may be a good option for such individuals and needs further promotion within pharmacy.

Poster 14

Capacity constraints in cost effectiveness of pharmacogenetic testing in mental health: A Systematic Review

Imperial College London

Adrusha Ramsunder ✉ Stuart Wright* and Katherine Payne*
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University of Bath – ar828@bath.ac.uk

Introduction & Background

- By 2030, mental health illness will cost the global economy approximately US$ 16 trillion of lost economic output[1]. Currently the cost to the UK economy is approximately £117.9 billion per year[2]. Pharmacogenetic (PGx) testing can be used to guide therapeutic management of mental health illness[3].
- Can the NHS afford it? More pertinently – given the impact of cost of mental health, can the NHS afford not to?
- A capacity constraint (CC) is defined as: 'any factor which impedes or limits the amount of health status produced for a population of patients receiving specified interventions, or policies, provided by the healthcare system.'[4]
- These can make an intervention more expensive, reducing cost-effectiveness[4]. Therefore, inclusion is important to ensure accuracy of the analyses used by decision/policy makers in implementation.
- Cost-effectiveness analyses (CEA) of PGx testing within mental health have been published. However, the degree to which CEA has considered of CCs and barriers, to PGx testing implementation in mental health, is not known

The aim of this study is to understand if, and how, published model-based EEs of PGx testing in mental health have taken account of the impact of CCs and barriers to implementation and uptake of PGx testing.

Objectives

o To identify all published model-based CEAs of PGx testing within mental health.
o To determine if the published CEAs within mental health, identified CCs and barriers and CCs.
o If barriers and CCs were incorporated within the CEAs of pharmacogenomics in mental health, to determine whether this had an impact on the cost-effectiveness

Method

A systematic review was completed in line with published guidance and reported according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework.

The electronic database (Medline via Ovid) was used as a database source.

Identified studies from electronic search was screened using a three-stage process. The reference list of all included studies was checked to identify any potentially relevant studies. These were also screened against the CHEERS criteria for quality assurance.

The systematic review protocol has been registered with the International Prospective Register of Systematic Reviews (PROSPERO CRD42023430483).

Results

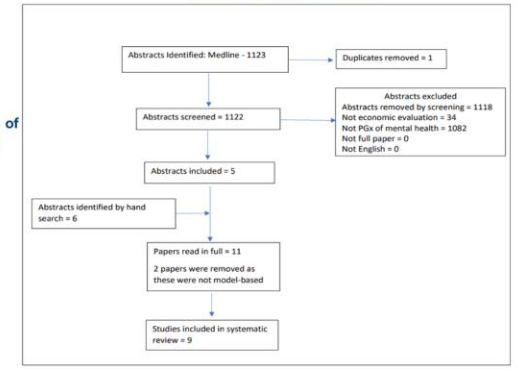

Figure 1: **PRISMA flow chart, identifying model-based CEAs of PGx implementation in mental health.**

Table 1: **Summary of capacity constraints identified within each identified CEA paper**

Author, Year (Country)	Mental health condition	Gene and Medicine	Did study mention capacity constraints? Yes/No	How did study describe capacity constraints? Qualitative/Quantitative (NI – not included)	List of capacity constraints considered (NI – not included)	Did the study quantify the impact of capacity constraints in the analysis? If so, what methods were used? Yes/No
Rejon-Parilla et al., 2014 (UK)	Schizophrenia	Genotyping of CYP2D6 for metaboliser status (poor metaboliser; intermediate metaboliser, extensive metaboliser, or ultra metaboliser) with risperidone	No	NI	NI	No
Hornberger et al. 2015 (USA)	Major depressive disorder	CPGx testing in patients who did not respond to previous treatment (6 genes: CYP2D6; CYP2C19; CYP2C9; CYP1A2; SLC6A4; HTR2A) (to guide selection of 38 FDA approved antidepressant & antipsychotic medicines – not specified within the paper)	No	NI	NI	No
Berm et al., 2016 (Netherlands)	Major depressive disorder	Genotyping of CYP2D6 for metaboliser status (poor metaboliser; intermediate metaboliser, extensive metaboliser, or ultra metaboliser) with nortriptyline	No	NI	NI	No
Girardin et al., 2017 (USA)	Treatment resistant schizophrenia	HLA (HLA-DQB1 & HLA-B) genotyping for clozapine	No	NI	NI	No
Najafzadeh et al., 2017 (USA)	Depression and/or Anxiety	CPGx panel test (called IDGx®) with 10 genes, 40 drugs (not specified within the paper)	No	NI	NI	No
Sluiter et al., 2017 (Netherlands)	Major depressive disorder	Genotyping of CYP2D6 for metaboliser status (poor metaboliser; intermediate metaboliser, extensive metaboliser, or ultra metaboliser) with SSRIs, SNRIs and TCAs	No	NI	NI	No
Groessl et al., 2018 (USA)	Major depressive disorder – treatment naïve or non-responder	CPGx panel test (called IDGx®) with 10 genes, 40 drugs (not specified within the paper) used for depression and anxiety	No	NI	NI	No
Jin et al., 2019 (UK)	Schizophrenia where 1st line antipsychotic has failed	Stratified test to predict response to second line conventional antipsychotics (5 loci in GWAS)	No	NI	NI	No
Tanner et al, 2020 (Canada)	Moderate – severe depression	CPGx testing (GeneSight® combinatorial PGx testing for depression. Drugs and genes not stated)	No	NI	NI	No

Conclusion

The main finding of this study is that within the nine studies identified by the systematic review, i.e., CEA of PGx testing in mental health, none had barriers and CCs, accounted for, either quantitatively or qualitatively.

Thus, as none of the studies could indicate how CCs and barriers would affect the CEA, its effect is unknown.

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Further references are available on request.

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Image from: https://depositphotos.com/photo/brain-medicine-59811263.html

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