Host department: Bristol
Project Title: Inhaled antibiotics for treatment of acute lower respiratory tract infections in primary care: a qualitative investigation into potential acceptability, adherence, and facilitators/barriers to use and a Discrete Choice Experiment to identify patient and prescriber priorities.
Proposed supervisory team:

Proposed supervisory team:
- Dr Jenny Scott (lead) – Senior Lecturer (pharmacist) Centre for Academic Primary Care, University of Bristol
- Dr Matthew Jones (co-supervisor) – Senior Lecturer (pharmacist), Department of Life Sciences, University of Bath
- Prof Alastair Hay (co-supervisor) – Professor of Primary Care, Centre for Academic Primary Care, University of Bristol.

Potential for cross consortium networking and educational opportunities:

This project will help strengthen pharmacy related research and build cross-disciplinary links between medicines design and safety (Dr Jones), antimicrobial resistance (AMR) (Prof Hay) and pharmacy practice (Dr Scott). It aligns with CAPC priorities to grow academic collaboration with external University healthcare departments in the Southwest.

Project description:

Background

Acute lower respiratory tract infections (aLRTIs) are the most common condition managed by primary care globally[1]. About 50% of antibiotic prescribing is considered inappropriate[2]. WHO *'Global Action plan on antimicrobial resistance'* has 'optimising the use of antimicrobial medicines' as one of its 5 strategic objectives. Co-supervisors Hay and Jones hypothesise that to tackle AMR, appropriately prescribed inhaled antibiotics, such as a doxycycline dry powder inhaler (DPI), could be a useful therapeutic alternative to oral antibiotics for the treatment of aLRTIs in primary care, with potential to reduce AMR and adverse effects[3]. However, history with Exubera (inhaled insulin) tells us that failure to consider patient, prescriber and other key stakeholder views, in relation to acceptability and feasibility can, at least in part, contribute to product failure[4]. Understanding what is most important to patients and prescribers could inform target areas within product development and how to introduce such devices successfully in practice.

Aim: To explore acceptability and feasibility of short-course DPI antibiotics for aLRTIs from the perspective of patients, primary care practitioners and other stakeholders; and to quantify what is most important to them with regard to product characteristics and application in practice.

Objectives:
(i) Establish the acceptability and feasibility of short-course DPI antibiotics in primary care.
(ii) Explore potential patient behavioural aspects of short-course DPI antibiotic adherence
(iii) Describe barriers and facilitators to short-course DPI antibiotic prescribing

(iv) Using the findings from (i) to (iii), quantify preference of patients, prescribers and key stakeholders, with regard to DPI antibiotic characteristics and utility to inform future product development direction and introduction.

Method(s)
1. Scoping review to examine factors that influence adoption of new therapies in primary care and acceptability of aLRTI medications. Critically analyse findings against relevant predicted characteristics of doxycycline DPI[3].
2. Qualitative study, using reflexive thematic analysis, interviewing patients, primary care practitioners and decision makers (e.g. drug and therapeutics committee members), to identify inhaled antibiotic DPI acceptability, barriers and facilitators that may influence prescribing and medication adherence.
3. Discrete Choice Experiment (DCE) to quantitatively elicit preferences for key characteristics of inhaled antibiotic DPIs amongst patients, practitioners and other stakeholders. Attributes and levels assessed will be determined from the findings of 1 and 2 and formed into an efficient experimental design. An appropriate regression model will be used to estimate outcomes such as choice probabilities. The influence of participant characteristics will be explored.

Impact
This project has potential to inform the development of antibiotic DPIs for use in primary care, including characteristics of a future medicine/device and evidencing whether this approach would be feasible. It will also contribute to wider understanding of perspectives on AMR. We will ensure EDI and vulnerable group representation amongst participants.

Training and development provision by host:

Formal training: Within the first 3 months, a bespoke needs assessment will be conducted with the student. Sources of training include methodology short-courses at University of Bristol (e.g. Introduction to Systematic Reviews, Introduction to Qualitative Methods, Statistical analysis, Writing a Journal Paper); Bristol Medical School Graduate Studies programmes (1/2 days): Library induction and literature searching; Introduction to EndNote; Open access; Quality papers; Patient & Public Involvement (ARC West). University of Bristol IT courses as needed. A formal course on using NVivo to manage qualitative analysis will also be sought e.g. Oxford (Primary Care) or Surrey (CAQDAS).

Informal training: Discrete Choice Experiment design and analysis training will be led by experienced co-supervisor Dr Jones. Qualitative, PPIE, and Research Ethics informal training will be led by Dr Scott; Prof Hay will provide informal training on AMR research and the clinical context. EDI in research drawn from in-house expertise to inform recruitment strategy. Attendance at CAPC Medicines & Prescribing Team meetings, as well as attendance at seminars within PHS and the Southwest Pharmacy Research Network provide additional opportunities.

PPIE: CAPC Medicines & Prescribing Team has an established PPI group that will be approached to support the project, paying attention to EDI and vulnerable group representation.

References:

1. Dolk F.C.K., Pouwels K.B, Smith D.R.M., Robotham J.V. & Smieszek T. Antibiotics in primary care in England: which antibiotics are prescribed and for which conditions? *J Antimicrob Chemother*. 2018; 73: ii2-i10.

2. Smieszek T., Pouwels K.B., Dolk F.C.K., et al. Potential for reducing inappropriate antibiotic prescribing in English primary care. J Antimicrob Chemother. 2018; 73: ii36-ii43.

3. Hay, A.D., Bolhuis, A., Huntley, A.L. & Jones, M.D. Inhaled antibiotics for acute lower respiratory tract infections in primary care: a hypothesis. *Lancet Respiratory Medicine*, 2022. 10(8): 731-732.

4. Clesham, K., Farzana, Z., Chowdhury, T. Withdrawal of Exubera: a great therapeutic loss? 2008. *Geriatric Medicine Journal*. 38 (March).