Supplementary appendix 3.

Tailored Intervention by Pharmacists and consultant respiratory physicians: description of intervention using the TiDier Framework [37]

Why?

Pharmacists working closeley with consultant respiratory physicians, aimed to provide repeated visits to patients' homes, for a year, to enable an individualised medication review intervention. The rationale for the repeated visits was to enable building of a therapeutic relationship, and introduction of changes to pharmacotherapy of the patient's COPD and other conditions, based on the pharmacists' repeated clinical assessments. The same pharmacist visited the same patients throughout the year. To improve patient outcomes, each of the patient's pharmacological treatments needed to be patient-specific, with a dose and formulation modified at the right time according to symptom severity, exacerbation risk, and the patient's response.

Social determinants of health were identified and addressed, because of their key role in the health of people with COPD.

What?

Materials: pharmacists visited participants' homes and carried the following clinical equipment: sphygmomanometer; stethoscope; oxygen saturation probe; weighing scales; peak flow meter; and thermometer. They had an NHS laptop enabling remote access to each participant's hospital records, referrals, clinic lists, and prescribing. A paper prescription pad enabled the pharmacist to write immediate prescriptions if required, during home visits. If a medicine was to be discontinued, the pharmacist called the patient's GP and advised, then followed up to confirm the change was made.

Procedures: at each visit, pharmacists assessed the participant's respiratory symptoms through a clinical examination and validated subjective instruments (Modified Medical Research Council breathlessness scale mMRC;[35] COPD Assessment Test, (CAT).[66] Using placebo devices, the pharmacist demonstrated correct inhaler technique if required. The pharmacist discussed smoking cessation and opportunities for pulmonary rehabilitation; and encouraged the uptake of vaccinations (flu, pneumococcal). If required, and following clinical assessment and the participant's agreement, the pharmacist prescribed respiratory medicines, and/or referred the participant to other healthcare services. The pharmacist contacted the participant's respiratory physician or GP if required, to discuss different options for therapeutic management.

Comorbidity management was approached in the same way, leading to introduction of new/changed dose/discontinuation of non-respiratory medicines and support for medicine adherence e.g., dose simplification or de-prescribing, patient education about rescue packs etc.

The pharmacist referred to local or national clinical guidelines and formularies to support clinical decision making. The participant's GP and / or consultant respiratory physician were informed of changes through pharmacists' immediate updates to clinical records, made during or after each visit. Typically, these included a note of having conducted the home visit, findings, and any subsequent changes to prescribing and follow up. Pharmacists liaised with the participant's Community Pharmacy to reduce the need for participants to contact their Community Pharmacy to check prescriptions were ready and correct, and delivery dates.

Pharmacists asked about wider health needs. They socially prescribed e.g., referred participants to local physical activity classes if the participant agreed. They offered help with

benefits/money advice and supported some participants to access food banks. They offered practical help e.g., contacted specialist clinics to re-book missed appointments.

Who?

Two generalist trained pharmacists delivered the intervention: one in Glasgow (JA) and one in Lothian (GC). Both worked two days per week for the first six months, then one day per week for the next six months. They had practiced pharmacy in General Practices for at least 15 years. This included Independent Prescribing (IP) for people with co-morbidities, including respiratory disease, with occasional home visits. Both pharmacists had Master's degrees in Pharmacy; a Master's degree in Clinical Pharmacy; and an IP qualification. Before intervention delivery, JA and GC received additional training within their local hospital specialist respiratory teams for one week. This included a refresher on local respiratory guidelines, referral pathways, and clinical consultations supervised by the consultant physician. Respiratory physicians were full time, NHS Greater Glasgow and Clyde (DA) and NHS Lothian (DN) employees. The respiratory physician and pharmacist met every two weeks to discuss cases including clinical decisions, and any onward referrals to other specialists.

How and where?

Pharmacists phoned their allocated participants in the Intervention arm to arrange dates and times of home visits. Monthly in-person home visits were offered to participants for six months, reducing to every two months for the following six months. Participants were encouraged to contact the pharmacist between visits, if required. Each pharmacist was expected to have a caseload of up to 25 participants. The frequency and duration of pharmacist visits depended on the pharmacist's assessment of the participant's problem list.

Pharmacists varied the duration of each visit depending on the participant's presenting respiratory and other problems. Home visits were expected to last about one hour, with supplementary phone calls lasting 5-10 minutes, if required to follow up changes to medicines or referrals, or welfare checks (many participants were socially isolated).

Tailoring

The content of the intervention differed for each participant, and the intensity changed over time, depending on the health and social care issues identified and prioritised by the participant. More urgent issues tended to be addressed during initial visits. As the pharmacist-participant therapeutic relationship developed, wider non-health issues were discussed and addressed as appropriate.

Fidelity

Intervention fidelity was assessed by pharmacists keeping a detailed log of each visit including date, time, duration, assessments made and actions taken at each contact. This included any prescriptions written, advice given, onward referrals, and discussions with other healthcare professionals.