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1 **Opportunities for collaboration between pharmacists and clinical pharmacologists to support**  
2 **medicines optimisation in the UK.**

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9 Abstract 149 words

10 Medicines optimisation is a clinician-driven, person-centred ongoing process. Pharmacists and  
11 clinical pharmacologists have medicines-related expertise to deliver medication review to optimise  
12 clinical and cost effective use of medication, aligned with patient preferences, to contribute to  
13 improved health outcomes. There is a large pharmacy workforce, directly accessible to patients,  
14 who can provide expert medicines-related care on the high street, and increasingly in General  
15 Practice and care homes settings. There are a small number of clinical pharmacologists in practice,  
16 mainly working in a hospital setting. Potential opportunities for collaboration are extensive,  
17 including local initiatives in collaborative in education, formulary/medicines management, electronic  
18 prescribing, service evaluation, research, direct clinical services as well as strategic planning through  
19 the Regional Medicines Optimisation Committees. Pharmacists and clinical pharmacologists have  
20 complementary skill sets and through acknowledging the differences in their approaches and valuing  
21 their unique skills, health services can ensure that patients are signposted to appropriate services.

22

23 **Medicines optimisation**

24 Medicines optimisation has been variously defined by National Institute of Health and Clinical  
25 Excellence (NICE, United Kingdom) , Royal Pharmaceutical Society (RPS, Great Britain) and NHS  
26 England (1,2,3) as involving medication review to optimise clinical and cost effective use of  
27 medication, in line with patient preferences, to contribute to improved health outcomes. It is a  
28 **clinician-driven, person-centred** ongoing process supporting patients in the **safe, effective**  
29 **medicines use**, to facilitate **getting the most from the medicines they choose to take**. The agenda is  
30 huge and requires input from different health care professions although. Medicines optimisation is  
31 the responsibility of all clinical professionals involved in improving the health of patients through  
32 medicines. Thus far, the agenda has been driven by pharmacists, clinical pharmacologists, and  
33 geriatricians as well as some general practitioners who have all led the way in both identifying  
34 patients at risk of preventable medicines-related problems and undertaking medication review to  
35 reduce this risk. This involves understanding the evidence for the effectiveness, risks and benefits of  
36 prescribing (starting) and deprescribing (stopping) medicines in relation to individual patients as well  
37 as at a population level. This aligns with the definition proposed by Sackett et al (4) in 1996, which  
38 describes evidence-based medicine as combining the best available research evidence and the

39 patient's views, goals, wishes and circumstances, using clinical judgement to agree on an  
40 appropriate way forward for medication use.

#### 41 **Workforce**

42 The pharmacy workforce is ideally placed to support medicines optimisation in this way, using both  
43 the evidence base and person-centred skills. In 2008 approximately 70% of the workforce (table 1)  
44 was placed the community, where patients have direct access, without appointments, to  
45 increasingly expert health professionals in medicines-related care on the high street (see table 1).

*Table 1: Proportion of GB pharmacist workforce by sector (2008)*

Sector	Proportion of 2008 workforce <sup>7</sup>
Community	71%
Hospital	21%
Primary care	7%
Industry	4%
Academia	3%
Other	4%

46 **Source: Pharmacy Workforce Census 2008 (RPSGB, 2009)**

47 \* Total is >100% because some respondents had more than one sector of work.

48 The demographic is changing and pharmacists are now being deployed into new areas of practice,  
49 including General Practice and care homes. Following a successful pilot programme, 491 pharmacists  
50 began working in general practice. The General Practice Forward View (5) committed over  
51 £100million to support an extra 1,500 clinical pharmacists to work in general practice by 2020/21  
52 (6). Many of these pharmacists are already in place, running medicines optimisation clinics in general  
53 practice and in specific therapeutic areas. Additionally, there is much work being undertaken to  
54 improve medicines-related support for people in care homes, with 240 new clinical pharmacy  
55 professionals being recruited to work in care homes (7), trained through a national programme.

56 Pharmacists in the community are directly available to patient without appointment on the high  
57 street. In addition, there are a smaller number of specialist pharmacists and Consultant Pharmacists  
58 working across primary and secondary care. A recent UK publication, known as the NHS Long term  
59 plan (8), has further developed opportunities for pharmacists to contribute to medicines  
60 optimisation. This includes increasing the number of clinical pharmacists in primary care networks  
61 supporting general practitioners and highlighting the continuing role of community pharmacists in  
62 supporting prevention.

63

64 However, pharmacists are not the only health care professionals actively involved in medicines  
65 optimisation. Other such health care providers include consultants such as internists (general  
66 physicians), geriatricians and clinical pharmacologists. Given the difference in skillset between  
67 pharmacists and their medical peers (clinical pharmacologists) it is important to both professions to

68 recognise where pharmacists skills can complement those of clinical pharmacologists, and to identify  
69 where the combined skills of others involved in medicine optimisation, such as geriatricians, can  
70 contribute to this agenda. It is important to recognise the large difference in workforce numbers  
71 between the two professions, with 52,000 registered pharmacists in Great Britain (in 2016) and 136  
72 registered clinical pharmacologists (in 2017). In relation to the clinical pharmacology  
73 workforce, there are currently a small number of clinical pharmacologists in practice, with the Royal  
74 College of Physicians census dashboard (9) indicating 94 consultants and 42 trainees. The consultant  
75 workforce has expanded over the last 15 years from approximately 60 in 2004 to the current 94. In  
76 relation to the 42 trainees across the UK, there are also clinical pharmacology/therapeutics  
77 academic clinical fellows and clinical lecturers in the specialty, encouraged by this speciality as a  
78 theme for the National Institute of Health Research (NIHR) in its competition bids for academic  
79 posts. For example, in London, there are 3 lecturers and 7 academic clinical fellows, in addition to  
80 the NHS-funded clinical pharmacologist posts (10)

81 Despite the large difference in workforce numbers, both professions are active in virtually all settings  
82 where pharmaceutical care is provided such as hospitals, nursing homes, general practice settings  
83 and communities. Medicines optimisation at the level of the individual patient is undertaken by both  
84 professions and in hospital settings, medicines optimisation committees are often chaired by a  
85 clinical pharmacologist (where available) and co-chaired by a pharmacist. As multidisciplinary, cross-  
86 sector and interface team working increases, this may result in closer working relationships between  
87 clinical pharmacologists and pharmacists, particularly in general practice, which could positively  
88 contribute to medicines-related care for the most complex patients requiring medication review.

89 ..

90

## 91 **Collaboration**

92 Given that both pharmacists and clinical pharmacologists focus on maximising the benefit and  
93 minimising harm from medication, collaboration between professions would seem a natural pairing  
94 to promote medicines optimisation in a variety of settings. However, thus far, joint working is not  
95 yet commonly found in clinical settings. A systematic review of medication review identified  
96 pharmacist-led interventions (11) and a recent evaluation discusses the potential impact of  
97 medication review in general practice (12). However there is little current evidence for the  
98 involvement of clinical pharmacologists, despite the fact that clinical pharmacologists play an  
99 essential part in medicines optimisation. Given the size of the medicines optimisation challenge, it  
100 would be prudent to consider all suitably skilled clinical not only as contributors but also as  
101 collaborators in this work.

102 Potential opportunities for collaboration are extensive, including initiatives in collaborative in  
103 education, formulary/medicines management, electronic prescribing, service evaluation and  
104 research as well as clinical services. One example of this is the work at University College London  
105 (UCL), University College London Hospital (UCLH) and North Central London (NCL). Future  
106 opportunities can make use of technological advances to offer opportunities for remote  
107 consultations both between professionals (pharmacists and clinical pharmacologists who are not co-  
108 located).

**Education** –Medical and pharmacy undergraduate students have been participating in integrated workshops at UCL. Pharmacists and Clinical Pharmacologist have collaborated to deliver innovative teaching methods, some of which become routine practice outside the university environment, for example, prescribing assessments and fitness to practice sessions. Clinical pharmacologists have also acted as Designated Medical Practitioners (DMPs) for many of the pharmacists undertaking independent prescribing courses.

**Formulary and Medicines Management** – UCLH and NCL formulary/drug and therapeutics committees are joined within the NCL Sustainability and Transformation Plan (STP) footprint. They are run and managed collaboratively between clinical pharmacologists and pharmacists. The Chairs of both committees are clinical pharmacologists, and the supporting team are pharmacists. Juniors from both professions are involved in reviewing and presenting the evidence bases for applications.

**Prescribing technology** - The project to procure, develop, implement and electronic prescribing and administration technology was led by Pharmacy and supported by clinical pharmacologists who provided input to weekly team meetings, and the monthly project board meetings. The project and rollout took four years and collaborative working has continued towards implementing a total electronic health record system to replace all electronic systems across the organisation.

**Audit, service evaluation and research** – A Centre for Medicines Optimisation Research and Education (CMORE) has been established with work streams involving collaborations between pharmacists and clinical pharmacologists. The Board includes pharmacists and clinical pharmacologists, along with other academics and clinicians.

**Clinical** – Clinical Pharmacologists and pharmacists are working together to explore the potential for a joint pharmacist/clinical pharmacologist ‘polypharmacy’ and de-prescribing clinic. While this is currently in the feasibility and proof-of-concept pilot phase, the demand for this is supported by enthusiasm from GPs it is expected that this will be a long-term venture towards shared responsibility for medicines optimisation.

110 **Personal communication: R Offord, 16<sup>th</sup> August 2018**

111 **How can Regional Medicines Optimisation Committees (RMOCS) support collaboration?**

112 There are four RMOCS set up by NHS England to maximise the opportunity for collaboration in  
 113 relation to all areas of medicines optimisation. The RMOCS focus on areas of healthcare where there  
 114 is unwarranted variation which could benefit from sharing of best practice, such as Polypharmacy,  
 115 care homes, use of Biosimilar medicines and antimicrobial stewardship. The RMOCS aim to (13):

- 116 ➤ Identify best practice and evidence
- 117 ➤ Establish standards and metrics
- 118 ➤ Highlight examples of good practice
- 119 ➤ Support monitoring/governance

120 The four RMOCs across England have identified areas of specific focus, with London focussing on  
121 polypharmacy. The chair and vice chair of the subgroup are a pharmacist and clinical pharmacologist  
122 and it is intended that good practice in medicines optimisation around polypharmacy will be  
123 disseminated through both professions to optimise clinical skills mix for patient benefit in this area.

#### 124 **Challenges and enablers**

125 With any agenda as large as polypharmacy, there are challenges as well as enablers to moving this  
126 work forward. Organisational and Sustainability and Transformation Partnership (STP) priorities can  
127 promote or preclude establishment of polypharmacy reviews. The challenge of both identifying who  
128 benefits most from complex reviews and having the appropriate amount of time to undertake  
129 polypharmacy consultations is common to all health professionals involved in medicines  
130 optimisation, as dedicated time is required for complex reviews. Individual clinicians, clinical  
131 pharmacologists, geriatricians and pharmacists alike, have access to excellent tools to support  
132 medicines optimisation, such as the NHS Scotland polypharmacy tool (14), anticholinergic burden  
133 (15) and the National Health Service Business Services Authority (NHS BSA) polypharmacy metrics  
134 (16), however there are challenges to embedding the use of these tools in practice. Patients have  
135 specific views regarding polypharmacy and medication review: some may wish to reduce their  
136 medicines, some may not, and some may consider reviews as cost saving measures and reject them.  
137 For medicines optimisation consultations around polypharmacy to be effective, it will require  
138 conversations with patients to elicit their agenda: what matters to them. This needs to be combined  
139 with an easily accessible, relevant evidence base to support practitioners in using the clinical  
140 judgement to optimise medicines in person-centred way.

141

#### 142 **Moving forward**

143 By identifying areas of good practice, evidence and metrics, the RMOCs can support embedding of  
144 effective medicines optimisation in the area of polypharmacy, using the skills of the most  
145 appropriate health care professionals. Both pharmacists and clinical pharmacologists can respond to  
146 the need for generalist clinicians to do this (working across all disease areas with medicines) as well  
147 as provide expert practice (expertise in use of medicines). This may be new territory for some  
148 practitioners, but both professions are aware that their traditional roles are changing and this is an  
149 opportunity not to be missed for both professionals and for patient benefit.

150 By setting minimum standards for polypharmacy and minimum competencies for practitioners, the  
151 public will be assured that medicines optimisation consultations will be undertaken by the most  
152 suitable person for their needs. The RMOC can work with commissioners to develop contractual  
153 levers to encourage polypharmacy activity and encourage use of validated measurable outcomes,  
154 such as NHS Business Services Authority polypharmacy metrics. The RMOC has the opportunity to be  
155 flexible about **which** tool or method is chosen to undertake reviews without compromising the  
156 quality or validity of the metrics.

157 It is up to both professions to be flexible about **who** does the work, ensuring the competencies of  
158 whichever professional group undertakes the work. The following table illustrates how

159 polypharmacy work could be shared according to complexity of cases and competencies of  
160 practitioners:

161 **Table 3 Complexity of medicines optimisation consultations with practitioner examples**

What	When (post qualification)	Who
Level 1: Basic	Year 1	Foundation practitioners (doctors and independent prescribers)
Level 2: Intermediate	Year 2 to 5	Doctors and independent prescribers expanding their practice
Level 3: Advanced	Year 5 to 9	Specialist practitioners e.g. SpR, senior pharmacist IPs
Level 4: Very advanced	Years 10 onwards	Consultant pharmacists, Consultants Clinical Pharmacologists, advanced clinical pharmacists, some GPs, General Medicine Care of the Elderly consultants

162 *Courtesy of Prof E Baker. Personal Communication [May 2018]*

### 163 Summary

164 Pharmacists and clinical pharmacologists have complementary skill sets. By acknowledging the  
165 differences in their approaches and valuing their unique skills, health services can ensure that  
166 patients are signposted to appropriate services. Both professions have the opportunity to work  
167 together to share their professional experiences of patient care and medication review, learn from  
168 each other to deliver medicines optimisation consistently, widely and effectively for patient benefit.

169 Declaration of interest

170 No interests to declare.

### 171 References

- 172 1. National Institute for Health and Care Excellence. Medicines optimisation: the safe and  
173 effective use of medicines to enable the best possible outcomes. NG5 published March 2015.  
174 <https://www.nice.org.uk/guidance/ng5/chapter/introduction> [accessed 31 Oct 2018]
- 175 2. Picton C and Wright H. Medicines Optimisation: Helping patients make the most of  
176 medicines. Royal Pharmaceutical Society. Published May 2013  
177 [https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy/  
178 helping-patients-make-the-most-of-their-medicines.pdf](https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy/helping-patients-make-the-most-of-their-medicines.pdf) [accessed 31 Oct 2018]
- 179 3. NHS England. Medicines Optimisation. [https://www.england.nhs.uk/medicines/medicines-  
180 optimisation/](https://www.england.nhs.uk/medicines/medicines-optimisation/) [accessed 31 Oct 2018]
- 181 4. Sackett, David L., William MC Rosenberg, JA Muir Gray, R. Brian Haynes, and W. Scott  
182 Richardson. "Evidence based medicine: what it is and what it isn't." British Medical Journal  
183 (1996): 71-72. <https://www.bmj.com/content/312/7023/71> [accessed 31 Oct 2018]

- 184 5. NHS England. General practice forward view published 21 April 2016 updated 19 May 2017  
185 <https://www.england.nhs.uk/publication/general-practice-forward-view-gpfv/> [accessed 31  
186 Oct 2018]
- 187 6. NHS England Clinical Pharmacists in General Practice  
188 [https://www.england.nhs.uk/gp/gpfv/workforce/building-the-general-practice-](https://www.england.nhs.uk/gp/gpfv/workforce/building-the-general-practice-workforce/cp-gp/)  
189 [workforce/cp-gp/](https://www.england.nhs.uk/gp/gpfv/workforce/building-the-general-practice-workforce/cp-gp/) [accessed 31 Oct 2018]
- 190 7. Ridge K. Pharmacists prescribing better care (blog). NHS England 20 April 2018  
191 <https://www.england.nhs.uk/blog/pharmacists-prescribing-better-care/> [accessed 31 Oct  
192 2018]
- 193 8. NHS Long Term Plan. NHS England published 7<sup>th</sup> January 2019  
194 <https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan/> [accessed 3 February  
195 2019]
- 196 9. Royal College of Physicians. Focus on Physicians: 2017-18 census (UK consultants and higher  
197 speciality trainees). Royal College of Physicians 28th June 2017.  
198 [https://www.rcplondon.ac.uk/projects/outputs/focus-physicians-2017-18-census-uk-](https://www.rcplondon.ac.uk/projects/outputs/focus-physicians-2017-18-census-uk-consultants-and-higher-specialty-trainees)  
199 [consultants-and-higher-specialty-trainees](https://www.rcplondon.ac.uk/projects/outputs/focus-physicians-2017-18-census-uk-consultants-and-higher-specialty-trainees) (accessed 25 February 2019)
- 200 10. Personal communication, Professor Emma Baker, 26th February 2019
- 201 11. 11 Jokanovic N, Tan EC, Sudhakaran S, Kirkpatrick CM, Dooley MJ, Ryan-Atwood TE, Bell JS.  
202 Pharmacist-led medication review in community settings: an overview of systematic reviews.  
203 Research in Social and Administrative Pharmacy. 2017 Jul 1;13(4):661-85.  
204 <https://www.ncbi.nlm.nih.gov/pubmed/27665364>
- 205 12. Hazen AC, de Bont AA, Leendertse AJ, Zwart DL, de Wit NJ, de Gier JJ, Bouvy ML. How Clinical  
206 Integration of Pharmacists in General Practice has Impact on Medication Therapy Management:  
207 A Theory-oriented Evaluation. International journal of integrated care. 2019 Jan 2;19(1).
- 208 13. NHS England Regional Medicines Optimisation Committees. First edition April 2017  
209 [https://www.england.nhs.uk/wp-content/uploads/2017/04/regional-medicines-optimisation-](https://www.england.nhs.uk/wp-content/uploads/2017/04/regional-medicines-optimisation-committees-operating-model.pdf)  
210 [committees-operating-model.pdf](https://www.england.nhs.uk/wp-content/uploads/2017/04/regional-medicines-optimisation-committees-operating-model.pdf) [accessed 31 Oct 2018]
- 211 14. NHS Scotland Polypharmacy Guidance Realistic Prescribing 3<sup>rd</sup> Edition, 2018  
212 [https://www.therapeutics.scot.nhs.uk/wp-content/uploads/2018/09/Polypharmacy-Guidance-](https://www.therapeutics.scot.nhs.uk/wp-content/uploads/2018/09/Polypharmacy-Guidance-2018.pdf)  
213 [2018.pdf](https://www.therapeutics.scot.nhs.uk/wp-content/uploads/2018/09/Polypharmacy-Guidance-2018.pdf)
- 214 15. South London and Maudsley NHS Foundation Trust 2019 The anticholinergic effect on  
215 cognition tool <http://www.medichec.com/> [accessed 3 February 2019]
- 216 16. National Health Service Medicines Optimisation: Polypharmacy  
217 [https://www.nhsbsa.nhs.uk/epact2/dashboards-specifications/medicines-optimisation-](https://www.nhsbsa.nhs.uk/epact2/dashboards-specifications/medicines-optimisation-polypharmacy)  
218 [polypharmacy](https://www.nhsbsa.nhs.uk/epact2/dashboards-specifications/medicines-optimisation-polypharmacy) [accessed 3 February 2019]