

Junior doctors' communication with hospital pharmacists about prescribing: findings from a qualitative interview study

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1 **Junior Doctors' communication with hospital pharmacists about prescribing: findings from a qualitative**
2 **interview study**

3

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27

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30

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61 **ABSTRACT**

62 Objectives: To explore factors affecting communication between Foundation Year (FY) 1 doctors and hospital
63 pharmacists about prescribing from the junior doctors' perspective.

64 Methods: Trained interviewers (n=4) conducted semi-structured interviews with FY1 doctors who were
65 purposively sampled from three hospitals in England. FY1 doctors were asked about: their experiences of
66 communication with hospital pharmacists about their prescribing; instances where they disagreed with or did
67 not implement a hospital pharmacist's recommendation; and their preferences for communicating with hospital
68 pharmacists about prescribing. Interviews were audio-recorded, transcribed verbatim and analysed thematically.

69 Results: A total of 27 FY1 doctors were interviewed. Findings were categorized into four main themes: (i)
70 nature and context of communication; (ii) FY1 doctors' perceptions of communication with hospital
71 pharmacists; (iii) factors influencing FY1 doctors' decision whether to act on pharmacists' prescribing
72 recommendations; and (iv) suggestions to improve communication with pharmacists. FY1 doctors and hospital
73 pharmacists generally communicated well. FY1 doctors appreciated and frequently acted upon pharmacists'
74 advice yet there was deference to senior medical staff when advice differed. Joint ward rounds, pharmacist-led
75 teaching sessions and a standardised approach to communication were all suggested as ways to improve
76 communication and may increase the likelihood of pharmacists' recommendations being acted upon.

77 Conclusions: FY1 doctors and hospital pharmacists communicated frequently about medication prescribing.

78 Issues occurred when there were differences in professional judgment between senior medical staff and
79 pharmacists but these were usually resolved satisfactorily for the FY1 doctor. Further interventions to improve
80 communication and safe prescribing could involve a multi-disciplinary and systems approach.

81 INTRODUCTION

82 Communication problems between healthcare professionals (HCPs), such as doctors and pharmacists, are
83 prevalent and known to contribute to medication errors.[1] In particular, poor communication has been
84 identified as one factor that can affect prescribing errors.[2] Studies have already explored communication
85 between doctors and pharmacists in primary care from both professionals' perspectives,[3-6] but there is a lack
86 of research investigating communication between doctors and pharmacists in secondary care,[7] particularly
87 from the junior (Foundation Year (FY) 1) doctors' (doctors in their first year of training post-graduation)
88 perspective with whom pharmacists have frequent contact.

89

90 Studies in primary care settings in several countries have shown doctors act upon pharmacist's
91 recommendations 46-100% of the time (median 79%),[8-12] but it is unknown why this variation exists and
92 why doctors do not act upon pharmacists' recommendations. These findings suggest there may be unaddressed
93 issues with communication that could be improved. Primary care research found doctors' negative attitudes
94 towards pharmacists [3-4] and their lack of appreciation for pharmacists' skills [5-6] can cause communication
95 problems; for example, no feedback following pharmacists' recommendations and a disinterest in collaboration
96 from doctors. Poor communication between FY1 doctors and hospital pharmacists has also been identified as a
97 barrier to effective feedback.[13]

98

99 A previous study found FY1 doctors made the most prescribing errors, but since they are generally responsible
100 for the majority of prescribing it could not be assumed that they make more prescribing errors than senior
101 doctors (registrars and consultants).[14] A more recent study found that FY1 doctors were twice as likely to
102 make a prescribing error compared to consultants.[15] FY1 doctors have previously said that one-way
103 communication with little discussion and few opportunities for learning contributed to prescribing errors,[2]
104 suggesting better communication may reduce prescribing errors and improve medication safety.

105

106 Exploring FY1 doctors' views of communication with hospital pharmacists is important to further add to the
107 knowledge base of communication between doctors and pharmacists. Identifying factors that facilitate or hinder
108 communication could help inform strategies to reduce prescribing errors and improve pharmaceutical care.
109 Therefore, the aim of this study was to explore factors affecting communication between FY1 doctors and
110 hospital pharmacists about prescribing issues from the FY1 doctors' perspective.

111

112 **METHODS**

113 **Study Design**

114 This study used semi-structured interviews with FY1 doctors in a secondary care setting to elicit information
115 about their communication with hospital pharmacists about their prescribing. The semi-structured approach
116 allowed participants to openly discuss their experiences of communication with hospital pharmacists, whilst
117 retaining emphasis on the areas of interest. This study received ethical approval from the University of Reading
118 Research Ethics Committee (ref 12/12).

119

120 **Development of Interview Schedule**

121 Interview questions were developed from relevant literature and with discussion between the interprofessional
122 research team (who consisted of pharmacists and doctors with extensive experience of medication errors and
123 their causes). Three core questions were developed, with prompts to encourage discussion. The first question
124 asked about FY1 doctors' last three conversations with hospital pharmacists about their prescribing. The second
125 question asked about instances where the FY1 doctor disagreed with or did not implement a hospital
126 pharmacist's recommendation, and the final question asked about FY1 doctors' preferences for communicating
127 with hospital pharmacists about their prescribing. Questions deliberately avoided asking directly about
128 communication problems to allow doctors to identify what they perceived to be problems and to avoid talking
129 specifically about prescribing errors. The questions were tested in a small pilot study of FY1 doctors and did not
130 identify any issues, thus no changes were made to the questions for this study. The interview questions used in
131 this study are summarized in Box 1.

132

133 **Recruitment of Participants**

134 In order to participate in this study, participants had to be an FY1 doctor working at a hospital in England. A
135 convenience sample of FY1 doctors was identified via existing contacts at three acute hospital trusts in England
136 (Oxford, Reading, and Manchester). These doctors were sent information letters via email inviting them to
137 participate in the study. Members of the research team also recruited FY1 doctors by attending FY1 doctor
138 training days. Interviews were conducted with all participants who agreed to participate in the study until data
139 saturation was reached. Written informed consent was sought from participants prior to data collection.

140

141 **Data Collection**

142 Four researchers (pre-registration pharmacists and undergraduate pharmacy students) who had received
143 appropriate training conducted one-on-one audio-recorded interviews (n=27) between November 2012 and June
144 2013. Interviews were conducted in-person at the hospital site or via teleconferencing facilities at the University
145 according to the preference of the FY1 doctor being interviewed. Interviewers introduced themselves and their
146 role (pharmacy student or pre-registration pharmacist) at the start of the interview.

147
148 **Data Analysis**

149 Two researchers transcribed interview recordings verbatim. Another independent researcher analysed the data
150 using thematic analysis aided by QSR International's NVivo version 10 (2012) qualitative data management
151 software. Data were coded, and similar codes grouped into categories to identify themes. The analysis process
152 was iterative and the researcher referred back to previous points as new observations became apparent. Another
153 trained researcher independently coded a third (nine) of the interview transcripts. On comparison, the two code
154 lists provided a good match with 94% agreement. Minor differences were discussed between the two researchers
155 until agreement was reached.

156
157 **RESULTS**

158 **Participant demographics**

159 A total of 27 participants across the three hospital sites were recruited and interviewed. All FY1 doctors who
160 responded were interviewed. Participants worked in general medicine (n=15), general surgery (n=9) and
161 unknown (n=3) settings at the time of the interview. Participants' time in their current post varied from a few
162 days to four and a half months so some participants drew on their previous experiences working in other settings
163 when interviewed. Interviews lasted between four and 16 minutes.

164
165 **Themes identified**

166 Thematic analysis identified four main themes described below: 1) Nature and context of communication; 2)
167 perceptions of communication with hospital pharmacists; 3) factors influencing doctors' decision whether to act
168 on pharmacists' recommendations; and 4) suggestions to improve communication with pharmacists.

169
170 **Nature and context of communication**

171 Both FY1 doctors and hospital pharmacists initiated communication about prescribing. FY1 doctors usually
172 approached pharmacists before prescribing for advice such as interpreting guidelines or calculating doses, whilst
173 hospital pharmacists contacted doctors after medications were prescribed or after reviewing patients' blood test
174 results, for example to suggest an alternative medicine or dose. Many FY1 doctors said they had regular contact
175 with hospital pharmacists, whilst only a couple reported few or intermittent communications with hospital
176 pharmacists, usually when the doctor was working nights. Reported frequency of communication with hospital
177 pharmacists varied depending on the time of day, with fewer interactions occurring out of hours (evenings,
178 nights and weekends):

179 *"We've got a pharmacist who comes quite regularly, almost everyday in the mornings." (I11)*

180

181 The doctors' speciality also affected communication frequency, for example doctors on a medical rotation
182 reported communicating more frequently with hospital pharmacists compared to those on a surgical rotation.
183 FY1 doctors reported that they communicated most frequently with hospital pharmacists in their first post, and
184 that this contact reduced as they became more experienced:

185 *"I found the pharmacists really useful on stroke especially at the beginning, because when you're new*
186 *you don't know your doses." (I18)*

187

188 **Perceptions of communication with hospital pharmacists**

189 FY1 doctors described pharmacists positively and commented that pharmacists were helpful, had excellent
190 knowledge of medicines, always willing to answer questions and approachable:

191 *"Pharmacists that I've worked with ... have been fantastic and really approachable, happy to have*
192 *questions, don't make you feel stupid when you don't know things and a really valuable resource." (I6)*

193

194 Participants described how they worked closely with hospital pharmacists and many commented positively on
195 their interactions describing communication using words such as 'clear', 'helpful' and 'pleasant'. FY1 doctors
196 also commented that knowing the names of pharmacists aided communication by getting to know the
197 pharmacists better and establishing rapport within the multidisciplinary team, which ultimately helped doctors'
198 understanding of pharmacists' recommendations. It was apparent from the interviews that pharmacists' provided
199 FY1 doctors with a safety net for their prescribing and that this provided reassurance to these newly qualified
200 prescribers:

201 *"I feel like they [the pharmacists] are a really nice safety check...I am comforted knowing it's there."*
202 *(I3)*

203

204 Conversely, some FY1 doctors provided examples of unhelpful communication. FY1 doctors expressed how
205 communication with pharmacists could sometimes become frustrating, inconvenient and repetitive (especially
206 true if several pharmacists were involved in a prescribing scenario), and that communication with pharmacists
207 may not be a priority when they have other tasks to complete:

208 *"You're trying to do an important job and your eleventh bleep is from a pharmacist ... sometimes in*
209 *the context of lots of other demands made upon you it would be nice not to have that extra bleep."* (I4)

210

211 One participant also raised timing of communication by pharmacists as an issue:

212 *"He takes quite un-opportune times to talk to you ... it's just a timing issue."* (I13)

213

214 Despite these negative comments, doctors acknowledged the information given by pharmacists may be useful in
215 the future or to someone else.

216

217 **Factors influencing doctors' decision whether to act on pharmacists' recommendations**

218 FY1 doctors described how they would discuss pharmacists' recommendations one to one to ensure they
219 understood the advice and to resolve any misunderstandings. FY1 doctors appreciated and generally agreed with
220 pharmacists' prescribing advice, accepting their recommendations. On other occasions, FYI doctors came to a
221 mutual agreement over the correct course of action with the pharmacist:

222 *"I thought it was very important to discuss these issues, especially if there is a risk of prescribing*
223 *error."* (I19)

224

225 The trust that doctors placed in pharmacists prompted doctors to act on their recommendations and facilitated
226 two-way communication:

227 *"Nice for the pharmacist to pick that up ... I completely trust pharmacists."* (I23)

228

229 Those occasions in which FY1 doctors did not act on pharmacists' recommendations were explored during the
230 interviews. It emerged that a divergence between senior doctors' and pharmacists' professional opinions would

231 commonly lead to a deference to the opinion of senior doctors; senior doctors were more experienced and FY1
232 doctors did not wish to challenge their decisions:

233 *“They [the consultants] have more wisdom than I do so I usually take their advice.” (13).*

234

235 Additionally, there were a small number of occasions in which FY1 doctors did not act on pharmacists’
236 recommendations:

237 *“They’ve suggested ‘why don’t we try this’ and we’ve said ‘well actually no we’re not doing that*
238 *because of x, y, z’.” (16)*

239

240 **Suggestions to improve communication with pharmacists**

241 FY1 doctors made suggestions for how pharmacists could improve the likelihood of their recommendations
242 being acted upon, as summarized in Box 2.

243

244 FY1 doctors suggested greater access to pharmacists would be helpful, especially out of regular working hours,
245 as they felt pharmacists could be difficult to find, pharmacy departments could be slow and their phones always
246 busy. FY1 doctors indicated the lack of continuity of staff to be an issue and preferred a dedicated, regular ward
247 pharmacist who could be approached for advice when necessary, which would reduce repetitive, time-
248 consuming conversations caused by different pharmacists’ covering ward rounds:

249 *“It would be better if the ward pharmacists were more ward based so they were always there ... at the*
250 *moment it’s a bit sporadic when you see them.” (113)*

251

252 Some FY1 doctors outlined the benefits of having pharmacists on ward rounds, an existing practice in some
253 hospitals that enables pharmacists to review patients’ medications together as part of a multidisciplinary team:

254 *“I’ve seen in other hospitals and from past experience, the pharmacists actually do ward rounds with*
255 *the consultant as an extra member of the team. I think that’s much better and a very sensible system.”*
256 *(19)*

257

258 FY1 doctors in the study raised concerns about guidelines and protocols that were difficult to interpret or
259 contained conflicting information. In addition it was felt that there was a lack of protocols, for example, in the

260 administration of medicines. It was suggested that unclear guidelines and protocols could be reviewed to
261 improve the decision-making process and address FY1 doctors' concerns:

262 *“Our department doesn't have a protocol for one medication that we commonly use ... from our point*
263 *of view if we could sort out a departmental protocol it would be even more helpful and would solve all*
264 *of these problems.” (I9)*

265

266 FY1 doctors would welcome more pharmacist-led teaching sessions on basic prescribing skills such as how to
267 prescribe on a medicine chart or how to calculate values such as creatinine clearance:

268 *“I think that teaching session was really good. So more of them.” (I23)*

269

270 Data suggests that implementing a consistent communication method between hospital pharmacists and FY1

271 doctors could increase the likelihood of pharmacists' recommendations being implemented by FY1 doctors.

272 Some doctors preferred verbal communication, others written communication and some a combination of both

273 verbal and written communication. However, there was no unanimous agreement over which was preferred.

274

275 **DISCUSSION**

276 Our study found FY1 doctors communicate well with hospital pharmacists but suggested that communication

277 between hospital pharmacists and senior doctors was less collaborative. Hospital pharmacists' input was

278 generally appreciated and their prescribing recommendations acted upon, except some instances where FY1

279 doctors acted on senior doctors' advice instead. Suggestions for improving communication include greater

280 access to pharmacists, joint ward rounds and more pharmacist-led teaching sessions.

281

282 FY1 doctors described several positive aspects of communication between themselves and hospital pharmacists.

283 Trusting and knowing each other has been found to improve communication between doctors and pharmacists

284 in primary care [3-4, 16-17] and the findings of our study suggest this may also be the case in secondary care

285 since FY1 doctors preferred to work with regular ward pharmacists who they could become acquainted with,

286 rather than irregular or part-time pharmacists. However, when faced with different advice FY1 doctors would

287 usually defer to senior doctors' recommendations rather than the pharmacists', which may be because doctors

288 work in a hierarchical structure and FY1 doctors do not want to upset the team relationship.[18] Further work

289 could explore the role of trust in decision-making and communication between healthcare professionals.

290

291 FY1 doctors said pharmacists ensured effective and safe prescribing; an important finding that concurs with a
292 previous study and demonstrates the impact of pharmacists' skills.[19] FY1 doctors in this study valued and
293 were confident to act on pharmacists' prescribing recommendations or mutually agree an acceptable course of
294 action. However, FY1 doctors said that some senior doctors would continue to act on their own experience,
295 rather than the pharmacists' recommendations.

296

297 Our study found doctors usually discussed pharmacists' prescribing recommendations, which supports the
298 findings of a recent study that found 85% of issues identified by pharmacists were discussed with the doctor and
299 the rest were discussed with nurses or medical students.[20] Discussions with healthcare professionals other
300 than doctors may explain why conversations between pharmacists and doctors did not occur in some instances
301 and account for why pharmacists' recommendations were not acted upon.

302

303 Our study found that poor timing of pharmacy queries from pharmacists was a problem. Doctors and
304 pharmacists have already agreed the need for greater collaboration to improve pharmaceutical care.[21]
305 Developing a relationship based on mutual understanding of competing priorities, and agreeing upon the most
306 appropriate mode of communication and optimal timing of communication are important next steps. In addition,
307 joint ward rounds could potentially reduce communication problems between FY1 doctors and hospital
308 pharmacists, such as misinterpreting communication and difficulty contacting each other, as prescribing queries
309 would be resolved at the time of prescribing. Joint ward rounds have already been shown to optimise decision-
310 making,[22] reduce medication errors,[23-24] and decrease medicine-related problems.[25] However, joint ward
311 rounds require both the doctor and the pharmacist to be available at the same time, which could prove
312 challenging given that doctors' heavy workload has previously been identified as a barrier to
313 communication.[26]

314

315 FY1 doctors appreciated pharmacists teaching basic skills such as how to prescribe, and would like more of this.
316 Since the time of the study, there has been progress in this area; the Royal College of Physicians in the United
317 Kingdom has introduced guidance that recommends prescribing induction should be practically focussed and
318 cover safety principles, and that junior doctors should receive regular feedback on prescribing errors in a
319 structured and supportive way.[27] Pharmacists teaching FY1 doctors in a hospital setting resulted in a 37.5%

320 reduction in prescribing errors,[28] which highlights the value of pharmacists' skills in improving
321 pharmaceutical care. Previous studies have found junior doctors acknowledged their lack of prescribing
322 skills[29] and only 38%[30] of FY1 doctors considered themselves competent to prescribe at graduation. This
323 explains the desire for this service, although improvements in teaching and assessing prescribing competence at
324 medical schools could reduce this need in the future. Since the time of the study, there has been technological
325 advances in the way prescribing is undertaken in acute hospitals for example a switch from paper-based to
326 electronic prescribing. Future studies could investigate whether such changes influence communication about
327 prescribing.

328

329 There were some limitations of this study. First, three study sites were used which is more representative of the
330 study population than a single site but not wholly representative of the entire population. Second, distinctions
331 were not made between doctor specialties or the pharmacist's level of experience, although a wide sample of
332 pharmacists from across the three hospitals should have captured differences in experience and communication
333 skills. Comparing communication between different specialties of doctor may identify communication problems
334 that are inherent to one group rather than all junior doctors. Third, interviews were short with some interviewees
335 only detailing one example rather than several; despite this data saturation was achieved.

336

337 **CONCLUSION**

338 FY1 doctors and hospital pharmacists communicated frequently, and both approach each other for different
339 reasons. The majority of FY1 doctors appreciated input from hospital pharmacists about their prescribing, but
340 where the senior doctor and hospital pharmacists' recommendations differed, FY1 doctors would defer to the
341 senior doctor's advice. FY1 doctors' suggestions to improve communication such as joint ward rounds and
342 more pharmacist-led teaching sessions have the potential to decrease prescribing errors and improve medication
343 safety. Agreement on the most appropriate mode and timing of communication are important next steps. Future
344 development of interventions to reduce prescribing errors could take into account the multi-factorial issues
345 identified in this study.

346

347 **CONFLICT OF INTEREST**

348 All authors declare that they have no conflict of interest.

349 **REFERENCES**

- 350 1. Howard RL, Avery A, Bissell P. Causes of preventable drug-related hospital admissions; a qualitative
351 study. *Qual Saf Health Care* 2008;17:109-16.
- 352 2. Coombes ID, Stowasser DA, Coombes JA, et al. Why do interns make prescribing errors? A qualitative
353 study. *MJA* 2008;188(2):89-94.
- 354 3. Van C, Mitchell B, Krass I. General practitioner-pharmacist interactions in professional pharmacy services.
355 *J Interprof Care* 2011;25:366-72.
- 356 4. Bradley F, Ashcroft DM, Noyce PR. Integration and differentiation: a conceptual model of general
357 practitioner and community pharmacist collaboration. *Res Social Adm Pharm* 2012;8:36-46.
- 358 5. Pottie K, Haydt S, Farrell B, et al. Narrative reports to monitor and evaluate the integration of pharmacists
359 into family practice settings. *Ann Fam Med* 2008;6:161-5.
- 360 6. Farrell B, Pottie K, Woodend K, et al. Shifts in expectations: evaluating physicians' perceptions as
361 pharmacists become integrated into family practice. *J Interprof Care* 2010;24:80-9.
- 362 7. Astrom K, Duggan C, Bates I. Developing a way to improve communication between healthcare
363 professionals in secondary care. *Pharmacy Education*. 2007;7(3):279-85.
- 364 8. Soendergaard B, Kirkeby B, Dinsen C, et al. Drug-related problems in general practice: results from a
365 development project in Denmark. *Pharm World Sci* 2006;28(2):61-4.
- 366 9. Gable KN, Stunson MJ. Clinical pharmacist interventions on an assertive community treatment team.
367 *Community Ment Health J* 2010;46(4):351-5.
- 368 10. Weber CA, Ernst ME, Sezate GS, et al. Pharmacist-physician comanagement of hypertension and reduction
369 in 24-hour ambulatory blood pressures. *Arch Intern Med* 2010;170(18):1634-9.
- 370 11. Bryant LJM, Coster G, Gamble GD, et al. The General Practitioner-Pharmacist Collaboration (GPPC)
371 study: a randomised controlled trial of clinical medication reviews in community pharmacy. *Int J Pharm*
372 *Pract* 2011;19(2):94-105.
- 373 12. Tahaineh L, Albsoul-Younes A, Al-Ashqar E, et al. The role of clinical pharmacist on lipid control in
374 dyslipidemic patients in North of Jordan. *Int J Clin Pharm* 2011;33(2):229-36.
- 375 13. Bertels J, Almoudaris AM, Cortoos PJ, et al. Feedback on prescribing errors to junior doctors: exploring
376 views, problems and preferred methods. *Int J Clin Pharm* 2013;35(3):332-8.
- 377 14. Dean B, Schachter M, Vincent C, et al. Prescribing errors in hospital inpatients: their incidence and clinical
378 significance. *Qual Saf Health Care* 2002;11:340-344.

- 379 15. Ashcroft DM, Lewis PJ, Tully MP, et al. Prevalence, nature, severity and risk factors for prescribing errors
380 in hospital inpatients: prospective study in 20 UK hospitals. *Drug Saf* 2015;38(9):833-843.
- 381 16. Snyder ME, Zillich AJ, Primack BA, et al. Exploring successful community pharmacist-physician
382 collaborative working relationships using mixed methods. *Res Social Adm Pharm* 2010;6:307-23.
- 383 17. Chui MA, Stone JA, Odukoya OK, et al. Facilitating collaboration between pharmacists and physicians
384 using an iterative interview process. *J Am Pharm Assoc* 2014;54:35-41.
- 385 18. Lewis PJ, Tully MP. Uncomfortable prescribing decisions in hospitals: the impact of teamwork. *J R Soc*
386 *Med* 2009;102(11):481-488.
- 387 19. Zargazadeh AH, Jacob S, Klotz RS, et al. Clinical pharmacists and basic scientists: do patients and
388 physicians need this collaboration? *Int J Clin Pract* 2011;33:886-94.
- 389 20. Stemer G, Lemmens-Gruber R. The clinical pharmacist's contributions within the multidisciplinary patient
390 care team of an intern nephrology ward. *Int J Clin Pharm* 2011;33(5):759-62.
- 391 21. Kelly DV, Bishop L, Young S, et al. Pharmacist and physician views on collaborative practice: findings
392 from the community pharmaceutical care project. *Can Pharm J (Ott)* 2013;146:218-26.
- 393 22. O'Hare JA. Anatomy of the ward round. *Eur J Intern Med* 2008;19:309-13.
- 394 23. Scarsi KK, Fotis MA, Noskin GA. Pharmacist participation in medical rounds reduces medication errors.
395 *Am J Health Syst Pharm* 2002;59(21):2089-92.
- 396 24. Kucukarslan SN, Peters M, Mlynarek M, et al. Pharmacists on rounding teams reduce preventable adverse
397 drug events in hospital general medicine. *Arch Intern Med* 2003;163(17):2014-18.
- 398 25. Amruso NA, O'Neal ML. Pharmacist and physician collaboration in the patient's home. *Ann Pharmacother*
399 2004;38:1048-52.
- 400 26. Teinila T, Kaunisvesi K, Airaksinen M. Primary care physicians' perceptions of medication errors and error
401 prevention in cooperation with community pharmacists. *Res Social Adm Pharm* 2011;7:162-79.
- 402 27. Royal College of Physicians. Supporting junior doctors in safe prescribing. 2017. URL:
403 <https://www.rcplondon.ac.uk/projects/outputs/supporting-junior-doctors-safe-prescribing>. Date accessed: 20
404 December 2017.
- 405 28. Webbe D, Dhillon S, Roberts CM. Improving junior doctor prescribing – the positive impact of a
406 pharmacist intervention. *Pharm J* 2007;278:136-139.
- 407 29. Lewis PJ, Ashcroft DM, Dornan T, et al. Exploring the causes of junior doctors' prescribing mistakes: a
408 qualitative study. *Br J Clin Pharmacol* 2014;78(2):310-9.

409 30. Heaton A, Webb DJ, Maxwell SRJ. Undergraduate preparation for prescribing: the views of 2413 UK
410 medical students and recent graduates. *Br J Clin Pharmacol* 2008;66(1):128-134.

411 **Key messages**

412 **What is already known on this subject**

- 413 • Communication problems between doctors and pharmacists exist, but there is a lack of information
414 about communication between FY1 doctors and hospital pharmacists from the FY1 doctors'
415 perspective.
- 416 • Poor communication between FY1 doctors and hospital pharmacists may lead to prescribing errors.

417 **What this study adds**

- 418 • FY1 doctors and hospital pharmacists communicate frequently about prescribing
- 419 • FY1 doctors valued pharmacists input and usually acted on pharmacists' prescribing recommendations,
420 unless the senior doctor had a different recommendation.
- 421 • Joint ward rounds, improving prescribing guidelines and more pharmacist-led teaching sessions could
422 improve communication

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Box 1. Interview questions used in the study.

1. Can you tell me about the last three conversations you had with a pharmacist about your prescribing?

Who started the conversation?

What was the conversation was about?

What was particularly good or helpful about this conversation?

What would have improved the conversation (on the part of the doctor or the pharmacist)?

2. Can you think of an instance where a pharmacist has recommended a change in medication that you disagreed with or didn't implement?

What was the recommendation?

How was the recommendation made (written note, conversation, in medical notes etc.)?

Why did you disagree with the recommendation?

Why did you choose not to implement the recommendation?

Was the rationale for this decision discussed with the pharmacist (why/why not)?

3. When a pharmacist gives you advice about (or queries) your prescribing, do you prefer them to talk to you about it, or to write it down for you?

Why is this form of communication preferred?

If written, where would you prefer it to be written?

If verbal, do you prefer face to face or telephone communication?

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Box 2. Suggestions to improve communication between junior doctors and pharmacists.

- Greater access to pharmacists
- Joint ward rounds
- Guidelines review
- Pharmacist teaching sessions
- Standardised communication methods

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