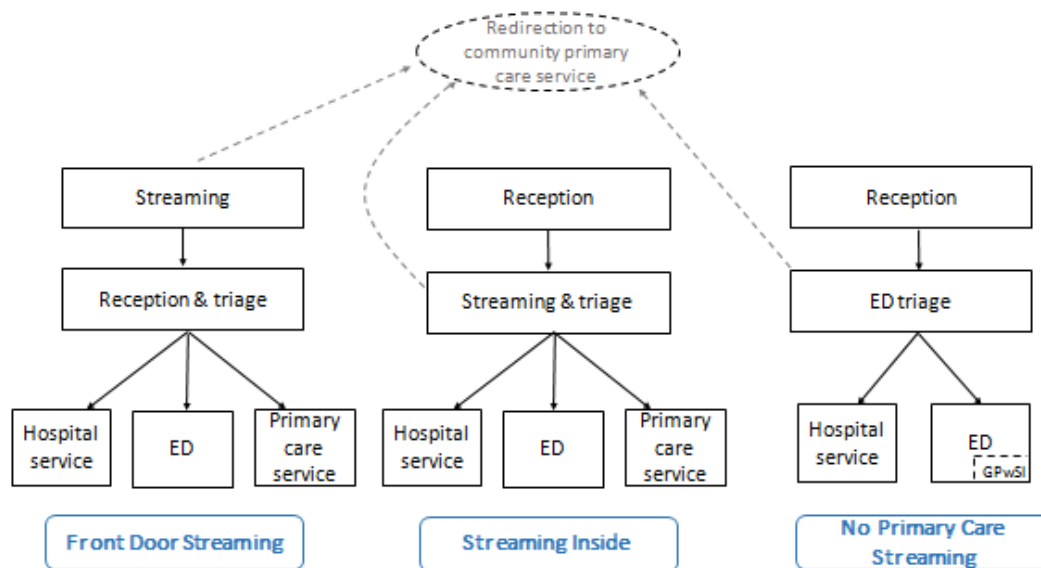# International Emergency Nursing

A classification of primary care streaming pathways in UK emergency departments: findings from a multi-methods study comprising cross-sectional survey; site visits with observations, semi-structured and informal interviews
--Manuscript Draft--

Manuscript Number:	
Article Type:	Original Research Paper
Keywords:	Primary care streaming; Emergency department triage; Urgent care
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Abstract:	Background Methods of initial assessment at emergency departments include: primary care clinicians screening and directing patients, emergency department nurses streaming patients from the front door to a primary care service, emergency department nurses combining streaming with a triage process; and patients being called for assessment and treatment by the emergency department nurses. However, descriptions of how these assessments are implemented vary considerably and a conflated terminology causes difficulties in assessing relative performance, improving quality or gathering evidence about safety and clinical effectiveness. We aim to describe and classify the predominant streaming pathways in emergency departments in different models of emergency department primary care services in England and Wales. Methods This study is part of a larger project evaluating effectiveness, safety, patient experience and system implications of different models of primary care servicesin or alongside Emergency Departmentsin England and Wales.We used a multi-stage (and iterative) method, including an online survey completed by 77 emergency departments across

	England & Wales, interviews with 21 clinical leads, and finally, undertaking in-depth case studies of 13 emergency departments. The qualitative data were triangulated and analysed using a framework analysis approach. Results The most common emergency department pathways to primary care services were: front door streaming before ED registration; streaming inside the emergency department; or without streaming but primary care staff selecting patients. Pathways were often adapted, based on local circumstances such as the department layout, patient demand levels, skill mix and interests of primary care staff and accessibility of community primary care services. Pathways were in place to redirect patients with non-urgent primary care problems to community primary care services in most services, with local variation in protocols based on staffing, patient demand and links to community primary care services. Conclusion Local clinical leads and managers need to consider which pathway(s) may best suit their local context and needs. Consistency of terminology used to describe pathways between emergency departments and primary care services is necessary for performance measurement, quality improvement and rigorous future multi-site evaluative and descriptive research.
Suggested Reviewers:	Kirsti Soanes Advanced clinical practitioner kirsti.soanes@gmail.com
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Figure 1

Key: Hospital service- e.g. eye clinic, early pregnancy unit;ED – emergency department minors, majors and resus; Primary care service –Primary care clinicians, GPs, nurse practitioners, nurses; GPwSi – GPs with a special interest in emergency care
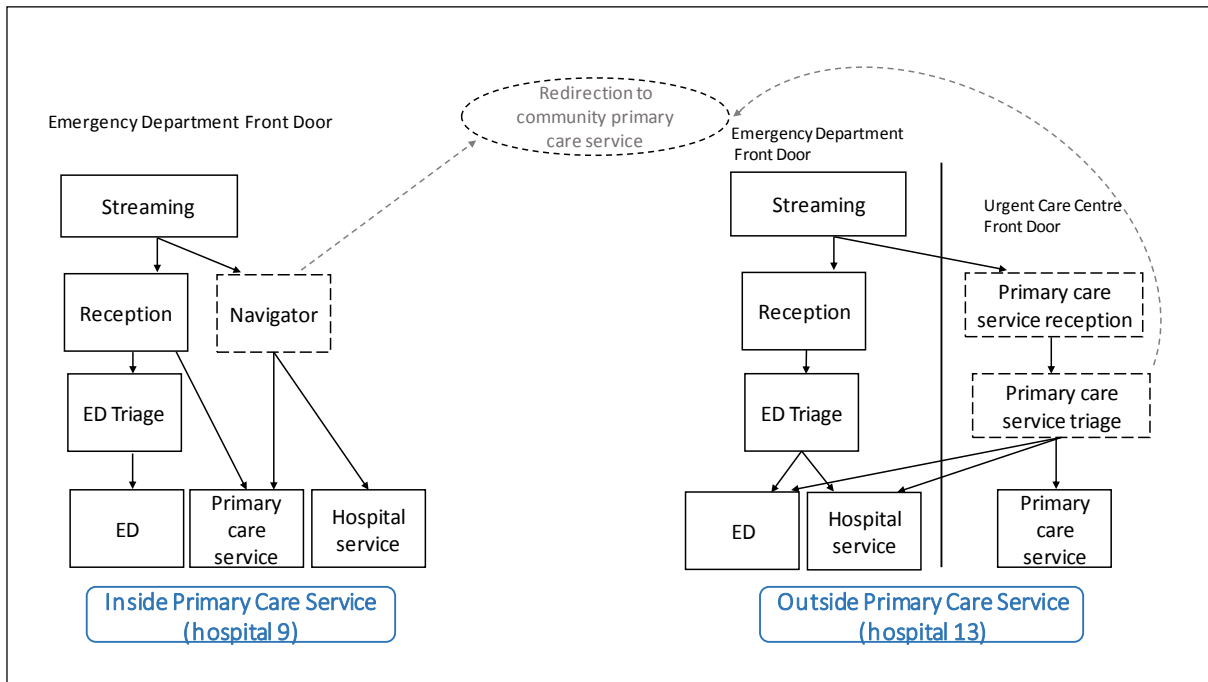
Figure 2

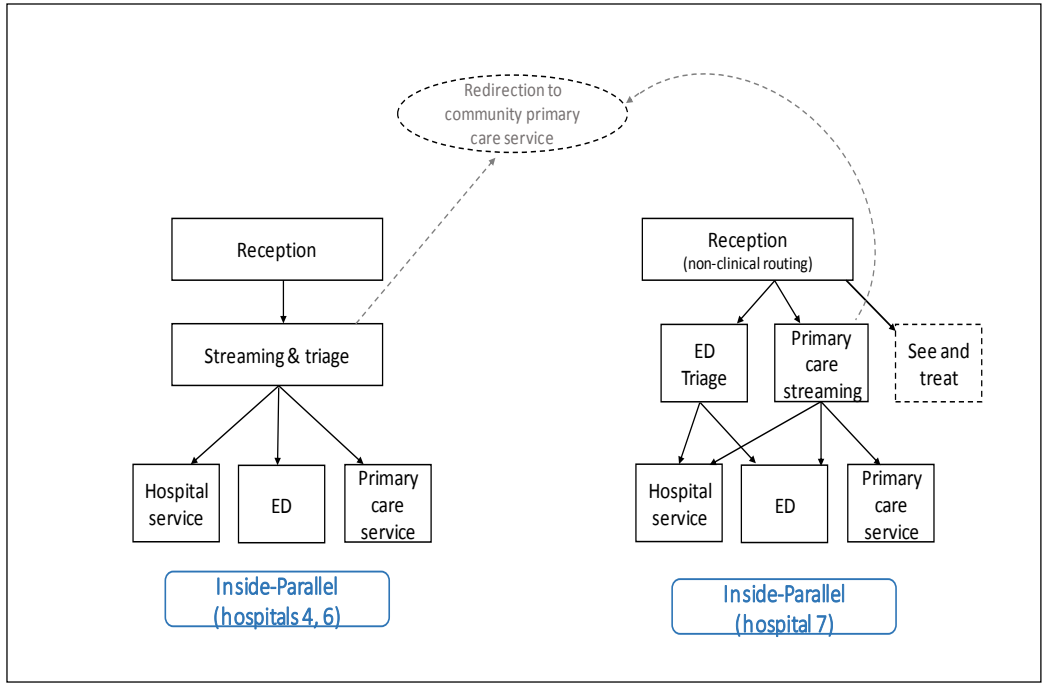Emergency Department Front Door

Streaming

Reception

Navigator

ED Triage

ED

Primary care service

Hospital service

Redirection to community primary care service

Inside Primary Care Service (hospital 9)

Emergency Department Front Door

Streaming

Reception

ED Triage

ED

Hospital service

Urgent Care Centre Front Door

Primary care service reception

Primary care service triage

Primary care service

Outside Primary Care Service (hospital 13)

Figure 3

Highlights

- We identify three common emergency department to primary care streaming pathways

- Primary care streaming pathways were often adapted to fit local contexts

- Non-urgent primary care patients were re-directed to community primary care

- Clinical leads need to consider which pathway(s) may best suit their local context

A classification of primary care streaming pathways in UK emergency departments: findings from a multi-methods study comprising cross-sectional survey; site visits with observations, semi-structured and informal interviews

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Declarations

Competing interests

The authors declare that they have no competing interests

Abstract

Background

Variation in initial assessment methods at emergency departments in with primary care service models and a conflated terminology causes difficulties in assessing relative performance, improving quality or gathering evidence about safety and clinical effectiveness. We aim to describe and classify streaming pathways in emergency departments in different models of emergency department primary care services in England and Wales.

Methods

We used a multi-stage method, including an online survey completed by 77 emergency departments across England & Wales, interviews with 21 clinical leads, and in-depth case studies of 13 emergency departments. All qualitative data were triangulated and analysed using a framework approach.

Results

Common emergency department pathways to primary care services were: front door streaming; streaming inside the emergency department; or primary care staff selecting patients. Pathways were also in place to redirect patients with non-urgent primary care problems to community primary care services. Streaming and redirection pathways were often adapted, with variation in protocols based on local circumstances.

Conclusion

Clinical leads should consider which pathway(s) best suit their local context. Consistency of terminology used to describe pathways between emergency departments and

primary care services is necessary for performance measurement, quality improvement

and rigorous future multi-site evaluative and descriptive research.

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	8,10
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	N/A
Occupation	3	What was their occupation at the time of the study?	N/A
Gender	4	Was the researcher male or female?	N/A
Experience and training	5	What experience or training did the researcher have?	N/A
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	N/A
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	N/A
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	N/A
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	9
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	9
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	9
Sample size	12	How many participants were in the study?	8
Non-participation	13	How many people refused to participate or dropped out? Reasons?	N/A
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	9,10
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	N/A
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	8,9
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	8
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	N/A
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	8
Field notes	20	Were field notes made during and/or after the inter view or focus group?	10
Duration	21	What was the duration of the inter views or focus group?	8,10
Data saturation	22	Was data saturation discussed?	N/A
Transcripts returned	23	Were transcripts returned to participants for comment and/or	N/A

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	11
Description of the coding tree	25	Did authors provide a description of the coding tree?	11
Derivation of themes	26	Were themes identified in advance or derived from the data?	11
Software	27	What software, if applicable, was used to manage the data?	11
Participant checking	28	Did participants provide feedback on the findings?	N/A
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	16,18
Data and findings consistent	30	Was there consistency between the data presented and the findings?	14-20
Clarity of major themes	31	Were major themes clearly presented in the findings?	14
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	16,18

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.

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16th November

Dear Editor,

We wish to submit an original research article entitled "**A classification of primary care pathways in UK emergency departments: findings from a multi-methods study comprising cross-sectional survey; site visits with observations, semi-structured and informal interviews**" for consideration by International emergency nursing .

In this paper we aim to describe and classify streaming pathways in emergency departments in England and Wales and explain how they operate in the different models of emergency department primary care services that we have described in our previous papers and in our evaluation of the effectiveness, safety, patient experience and system implications of different models of using GPs in or alongside Emergency Departments.

The findings build on our previous findings in papers published in BMJ and Emergency Medicine Journal:

Cooper A, Davies F, Edwards M, Anderson P, Carson-Stevens A, Cooke MW, et al. The impact of general practitioners working in or alongside emergency departments: a rapid realist review. BMJ Open. 2019;9(4):e024501.
https://bmjopen.bmj.com/content/9/4/e024501

Cooper A, Edwards M, Brandling J, Carson-Stevens A, Cooke M, Davies F, et al. Taxonomy of the form and function of primary care services in or alongside emergency departments: concepts paper. Emergency Medicine Journal. 2019:emermed-2018-208305
https://emj.bmj.com/content/emermed/early/2019/09/07/emermed-2018-208305.full.pdf

Cooper A, Carson-Stevens A, Hughes T, Edwards A. Is streaming patients in emergency departments to primary care services effective and safe? BMJ. 2020;368:m462.

https://www.bmj.com/content/368/bmj.m462

The paper also follows on from a paperwe recently published in BMC Emergency Meicine entitled "Senior clinical managers' experiences of implementing primary care services where GPs work in or alongside emergency departments in the UK: a qualitative study"

https://bmcemergmed.biomedcentral.com/articles/10.1186/s12873-020-00358-3

This work is significant because there has been recent policy recommendations and investment in implementing primary care services within emergency departments in the UK using a single model of primary care streaming as an example. However, there is little evidence on models of primary care streaming. Or study classifies the ways in which primary care streaming has been implemented in emergency departments and provides a basis for further research to evaluate and understand how streaming operates and its effectiveness across a range of GP service models in emergency departments. We believe that this manuscript is appropriate for publication by Emergency Medicine Journal because we were able to extensively survey emergency departments in England and Wales to identify different models of primary care in or alongside emergency departments and select a purposive sample from across the two countries. We carried out high quality and rigorous research methods and our findings extend knowledge about primary care streaming. We hope that our work can help inform quality improvement/performance measurement as well as development of policy and practice.

Thank you for your consideration of this manuscript.

Sincerely,

Dr Michelle Edwards

1 **A classification of primary care streaming pathways in UK emergency departments:**

2 **findings from a multi-methods study comprising cross-sectional survey; site visits with**

3 **observations, semi-structured and informal interviews**

4

5 **<u>Introduction</u>**

6 In response to rising demand and overcrowding at UK emergency departments models of

7 service have been introduced whereby primary care patients are seen by primary care

8 clinicians working in services within or alongside emergency departments [1-4]. "Primary

9 Care streaming" was introduced in 2017 as policy guidance from NHS England (with £100

10 million of capital funding available to emergency departments in England) to help manage

11 increasing demand on emergency departments [5-9]. The recommended service design was

12 based on a service operated at Luton and Dunstable Hospital (Bedfordshire, England)

13 whereby patients attending the emergency department may be identified by emergency

14 department nurses as having non-urgent problems, have a brief initial assessment at the

15 'front door' of the emergency department and are 'streamed' to primary care clinicians

16 working in a co-located but distinct primary care service [7]. Primary care services in the

17 community typically consist of general practitioner-led practices, pharmacy, dentist and

18 optician services. However, primary care services that are co-located with emergency

19 departments consist of care delivered by general practitioners, advanced care practitioners

20 and primary care nurses. NHS England and Improvement (pre-April 2019 known as two NHS

21 organisations - NHS England and NHS Improvement) recommends these services are in

22 operation 8am-11pm, seven days per week with a robust governance structure in place to

23 inform streaming guidance and protocols [1]. Specific safeguards should be in place to

24 ensure the safety of patients redirected off-site to another appropriate service, including

25 the acceptance of the patient by the off-site service(9, 10). [9, 10].

26 A range of different primary care service models in emergency departments already existed

27 before the policy implementation .research literature [1, 2]. Various methods of initial

28 assessment have been described (see Table 1), including: primary care clinicians screening

29 and directing patients, emergency department nurses streaming patients from the front

30 door to a primary care service, emergency department nurses combining streaming with a

31 triage process [2]; and patients being called for assessment and treatment by the

32 emergency department nurses ('see and treat') [11]. Other processes include patients being

33 directed after assessment to other on-site services, or redirected off-site to community

34 primary care services.(5) However, variation in descriptions of how [5]. However, variation

35 in descriptions of the way these assessments are implemented and conflated terminology

36 causes difficulties in assessing performance, improving quality or gathering evidence about safety,

37 clinical effectiveness. Uncertainties about the evidence for costs and effects of different

38 approaches to streaming make such research vital to planning the continued (or different)

39 policy about and delivery of "primary care type services" in emergency departments [1, 12].

40 **Table1. Key activities for managing patients arriving at emergency departments [1, 11]**

Triage[1]	A **clinical** activity to **sort** patients by acuity so that those with the greater need are seen first.
Streaming[1]	An **operational** activity to assess whether **low acuity** patients are suitable to be seen by an appropriate non-ED clinician.
Simple Assessment[11]	A brief 'hands-off' assessment (i.e. no formal clinical assessment) that enables patients to be flowed to a suitable treating clinician.

Complex Assessment[11]	A detailed assessment, including a clinical assessment. This may involve measurement of clinical parameters e.g. NEWS2 score, and initiation of investigations (e.g. blood or radiological tests).
See and treat[11]	The first clinician to see the patient is responsible for all diagnosis and treatment – usually used for patients presenting with minor illness or injury.
Navigation[11]	Patients are directed to an appropriate on-site service without a formal process of clinical assessment. This process is carried out by a non-clinician (receptionist) or computer kiosk, using clear criteria.
Redirection	Patients are sent to a care provider at another geographical site. This may be in the context of a formal care relationship e.g. to an Urgent Treatment Centre / GP Out-of-Hours facility/ GP Hub or Surgery or a dentist / pharmacy.

This study is part of a larger project evaluating effectiveness, safety, patient experience and system implications of different models of primary care services in or alongside Emergency Departments in England and Wales.(13) To help our evaluation and enable consistent conceptual understanding for evaluation, a clearly defined classification was needed which identifies and describes the emergency department pathways to primary care services. In this paper we aim to describe and classify the predominant types of primary care streaming pathways in different models of emergency department primary care services in England and Wales.[1]

50 **Methods**

51 We used a multi-stage (and iterative) method, firstly distributing an online survey to

52 emergency departments across England & Wales, then interviewing selected clinical leads,

53 and finally, undertaking case studies of certain sampled emergency departments. Thus we

54 sought greater detail from sites illustrating specific features, and used the in-depth site visits

55 for detailed description of different types of streaming pathways.

56 **Cross-sectional survey**

57 In September 2017 we distributed an online survey (www.onlinesurveys.co.uk) (and

58 reminder) to all type 1 emergency departments(consultant-led 24-hour services with full

59 resuscitation facilities)in England (n=171)and Wales (n=13).(14) The survey was designed

60 and piloted by our study management group comprised of frontline clinicians, academic GPs

61 and ED clinicians, and patients. We used the expertise and experience of some of our

62 emergency department clinical contacts to review the survey and support us in validating

63 the survey content. The survey topics covered a range of questions relating to primary care

64 services located in or alongside the emergency departments and included specific questions

65 relating to primary care streaming (e.g. how and what type of patient groups were selected

66 for primary care streaming; how they were streamed to primary care; and who streamed

67 them; seeAppendix1).(1) We identified whether the department had made capital funding

68 bids for streaming (data available from Department of Health) when these were available in

69 2017 and used this to assess non-response bias. We supplemented the responses with other

70 publicly available data (e.g. https://www.Nhsbenchmarking.nhs.uk/ and

71 https://www.healthylondon.org/ resource/londonuec-stocktake/) and publicly available

72 documents (including Care Quality Commission reports, Board papers and news items

73 sourced from internet searches).

74

75 **<u>Clinical lead interviews</u>**

76 Using survey data, we purposively selected a sample of 30 potential study sites that

77 reflected three different models of emergency department primary care services ("inside-

78 integrated", "inside-parallel" and "outside-onsite" – see Table 2 [1]) to invite participation in

79 a follow-up interview. It was important to capture variation in context, so we selected

80 departments that described different ways of streaming patients to primary care services

81 and departments of different sizes and locations [see Box 1 below]. Clinical leads were

82 invited by email and written informed consent was obtained before conducting interviews.

83 Semi-structured interview guides included follow-up questions asking about which members

84 of staff carried out initial assessments, how they made streaming decisions, and the services

85 to which they streamed patients [see Appendix 2]. Interviews were conducted by telephone

86 or in-person by ME between February 2018 and March 2019 (average length 60 minutes).

87 All interviews were audio-recorded and transcribed verbatim. Ethical approval for the

88 survey and follow-up interviews was given by Cardiff University School of Medicine Ethics

89 Committee (ref: 17/45).

90 **Box 1: Selection criteria for the purposive sample of Emergency Departments**

In EDs where a primary care service had been implemented in the emergency department since 2010 we selected sites to ensure we included:

- Variation in service model - delivering a separate primary care service, inside or outside the footprint of the emergency department, a primary care service integrated with the emergency medicine service or
- Spread of geographical locations in England and Wales
- Variety of contexts - including hospitals in rural and urban locations, small and large hospitals, higher vs lower attendances
- Variation in streaming method – who streams, streaming criteria and guidance
- Variation in the physical layout of the department

91

92

93 **Case study observations and interviews**

94 We invited clinical directors of 13 emergency departments from our interview sample to

95 volunteer their department for in-depth 'case study' site evaluations. The sampling strategy

96 included three or four emergency departments from the three different types of primary

97 care service models and three emergency departments with no primary care service models

98 (see Table 2). To ensure maximum diversity of types and characteristics of emergency

99 departments we also selected hospitals of different sizes, different levels of attendance and

100 different geographical variations locations throughout England (there were no GP models in

101 use in Wales).

102

103

104

Table 2. Primary care service models

Primary care service model	Description
Inside: integrated	A primary care service fully integrated with the emergency medicine service, where staff see both primary and emergency care patients (n=3).
Inside: parallel	A separate primary care service within the emergency department, for patients with primary care type problems (n=4).
Outside: onsite	Primary care service is elsewhere on the hospital site (n=3).

106

107 We conducted visits between February 2018 and April 2019. Two researchers (ME and AC)

108 visited each case study site for three days and conducted formal and short informal

109 interviews [see Appendix 3] with key members of staff (consultants, general practitioners,

110 nurses). We observed the patient flow in each department (including observations of triage

111 and streaming assessments). Observations were carried out during the hours that primary

112 care staff worked in the department (generally between 8am and 10pm) and included

113 weekdays and weekends. Observations and informal interviews were recorded in field notes

114 and formal interviews were audio-recorded and transcribed verbatim. Ethical approval for

115 case study visits was given by Wales Research Ethics Committee 1 (ref: 17/WA/0328).

116 **Data analysis**

117   *Survey*

118   For this paper the survey data were analysed descriptively to summarise how many

119   departments had primary care services and the methods of streaming that were reported.

120

121   *Clinical lead interviews*

122   An initial thematic coding framework was created by ME that was partly deductive (based

123   on our earlier rapid realist review and taxonomy of models [1, 15]) and partly inductive

124   (based on the interview data). Interview transcripts were coded in NVivo11 (QSR

125   International, Daresbury; see appendix 4) to themes/ and subthemes within this thematic

126   framework, also allowing for new themes to be identified.(16) The themes were explored to

127   identify patterns of commonality, variations and differences between and within different

128   models of primary care streaming pathways in emergency departments.(17)

129

130   *Case study visits*

131   Interview transcripts and observation notes from case study visits were also coded in Vivo

132   11 to identify themes relating to primary care streaming. We triangulated themes from the

133   survey responses, interviews with clinical leads and themes from interviews and

134   observations at case study sites to produce a set of draft classifications for methods of

135   streaming. Because data were collected from multiple sources, we sometimes encountered

136   elements of conflict between these sources. To resolve this, we used a hierarchy approach

137   in which fieldwork observations (where available) were considered the most reliable,

138   followed by clinical director interviews, survey

139 responses and other data sources, in descending order of reliability (1). These were based

140 on: where streaming took place (at the front door or inside the emergency department);

141 who streamed patients (level of nursing or other staff); to where patients were streamed

142 (emergency department, primary care service or other hospital services); and to where

143 patients were redirected (off-site).

144

145 *Consultation with Stakeholders*

146 We held a stakeholder conference in December 2019. Invited attendees included

147 emergency department and primary care clinicians, service managers, primary and

148 emergency care academics, patient and public contributors and Royal College of Emergency

149 Medicine representatives. Attendees received information packs including a diagram of the

150 pathways to primary care to read before attending the conference. At the conference, a

151 workshop was held where attendees were shown different streaming pathways and were

152 asked to evaluate statements based on patients' experiences of streaming (data presented

153 from the case study sites). Feedback was obtained verbally (flipchart summaries) and in

154 writing on feedback forms.

155

156 *Patient and public involvement*

157 Patients and public members were involved in the study design and as co-applicants in the

158 funded study.(13) They used their experience as NHS patients to contribute to the content

159 of the questionnaire and qualitative interview guides and also advised on recruiting public

160 and patient contributors to the stakeholder conference. They were involved in discussing

161 the draft classifications in Management Group meetings, and at the Stakeholder conference

162 [18]

163 **Results**

164 **Summary of survey findings**

165 Seventy-one English and six Welsh survey responses were received (n=77/184, 42%).In

166 addition, we obtained data for 41 English departments from other sources (e.g. NHS

167 Benchmarking), including five English Type 1 departments that had not been invited to

168 complete the survey (status can change year on year), totalling information on 62%

169 (n=118/189) of type 1 emergency departments in England and Wales.[1, 15] Of the 71

170 English survey responders, 82% (n= 58/71) had applied for capital funding, and of 100 non-

171 responders in England, 84% (n=84/100) applied for capital bid funding [1, 15] Table 3

172 summarises survey data on who streams which patients and how to primary care staff.

173 **Table 3. Summary of survey data on streaming**

Survey Question: Who streams patients to primary care staff?	Number of responses (EDs)
ED nurse	37
GP self-selects	23
ED Dr	16
Primary Care nurse	9
111 telephone triage service books appointments	9
Paramedics stream ambulance patients	6
Other	2
Which patients are streamed to a primary care staff?	**Number of EDs**
Primary care problems	49

Low acuity (including minor trauma)	28
Only specific groups	
Directing patients from the front door to most appropriate area or clinician within ED	11
Directing patients from the front door e.g. to ED or community	9
Undifferentiated patients (same case mix as ED clinicians)	7
Other	2

How are patients selected to be streamed to primary care staff?	Number of EDs
Using locally developed criteria	35
Using clinical judgement	35
Using a national tool (e.g. Manchester Triage System)	11
Other	3

174

175 *Numbers total more than 77 as responses not mutually exclusive*

176

177 **Qualitative findings**

178 **Selecting a sample of emergency departments that used streaming**

179 We conducted interviews with 21 emergency department clinical leads following the survey.

180 Only 11 emergency department streamed patients to a primary care service: five

181 departments streamed at the 'front door' (before patients were booked in at reception),

182 and six had nurses streaming from 'inside the department' (after patients were booked in at

183 reception).

184

185 **Case study observations and interviews**

186 Streaming was carried out in eight of 13 emergency departments in which we were

187 conducting visits for in-depth observation and interviews (hospitals 3, 4, 6, 7, 9, 10, 11 and

188 13). Of the five that did not operate streaming, three emergency departments did not have

189 a primary care service (hospitals 2, 12 and 15) and in the two other departments general

190 practitioners selected their own patients (hospitals 8 and 14).

191 We observed a range of pathways used to allocate patients to primary care clinicians,

192 emergency department clinicians, clinicians in other hospital services or redirected to

193 community primary care services. These can be summarised as follows:

194 1) **Front door streaming** (patients streamed by a nurse at the front of the emergency

195 department – before being booked in at reception),

196 2) **Streaming inside the emergency department** (patients streamed by a nurse working

197 inside the emergency department– after being booked in at reception),

198 3) **No primary care streaming** (usual triage, with GPs self-selecting patients)

199 4) **Combined streaming pathways** (combinations of 1-3 within the emergency

200 department or across the ED and primary care services, varying at different times).

201 These will now be described, including their implications for other activities such as triage

202 and re-direction. Figure 1 portrays three pathways (1-3) where patients are first seen by a

203 clinician (usually an emergency care nurse) at the front door and have a rapid assessment

204 before being streamed; or are first seen by a receptionist and booked in before being

205 streamed from a triage room inside the emergency department to the emergency

206 department areas (minors, majors, resus), to a primary care service or to other hospital

207 services (e.g. eye clinic, early pregnancy unit, GP out-of-hours service); or are redirected to

208 community primary care services.

209

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216 **Fig 1. Streaming pathways in emergency departments**

217

218

219   1. **Front door streaming**

220 Senior emergency department nurses typically carried out a rapid assessment (with

221 observations of vital signs if necessary) in a cubicle near the emergency department front

222 door and streamed patients to emergency, primary care or other hospital services based on

223 Manchester Triage scores and using streaming criteria (hospitals 9, 10, 13; see Figure 2).

224 Patients then book in at the emergency department reception and are 'flowed' to be seen

225 by emergency department clinicians or primary care clinicians working in a treatment room

226 next to the emergency department (inside-parallel model) **or** to an urgent care reception in

227 a separate part of the hospital with a separate entrance to be seen there by a primary care

228 clinician (outside-onsite model).

229

230 Within the 'front door streaming' type, some variations were identified (Figure 2). At

231 hospital 9 we observed a non-clinical 'navigator' who assisted with redirecting patients after

232 they were streamed, helping to book appointment slots with community primary care

233 services.

234 *"So, we have a navigator who's a clerical individual who will phone up your GP and*

235 *say can you see this patient today and they'll say yes, tell them to come along at 4*

236 *o'clock and we send a bunch of patients away every day using that methodology".*

237 (Clinical director, hospital 9)

238 At hospital 13 (an outside-onsite model) there were two separate front doors, two

239 reception areas, streaming from the emergency department into the emergency

240 department or to the reception area of the urgent care centre in part of the hospital 100

241 metres away from the emergency department.

242 **Fig. 2 Variations in front door streaming pathways**

243

244

245 *Different pathways for children*

246 At hospital 13, children were assessed and streamed at the *front door* to which adults

247 attended, but with specific criteria for children to be streamed to a children's area of the

248 emergency department or to an urgent care centre. At hospitals 9 and 10 children were

249 streamed to be assessed by a triage nurse in a dedicated paediatric emergency care area

250 *inside the emergency department*. At hospital 10, streaming criteria were applied during the

251 triage process to stream children to the urgent care centre if appropriate. At hospital 9,

252 children could also be redirected to community primary care services.

253

254 **2. Streaming inside the Emergency Department**

255 Combined streaming and triage assessment was carried out, usually by an emergency

256 department nurse or a paramedic, in a triage room *inside the emergency department*, after

257 patients had booked in at reception. Patients could be streamed to emergency medicine,

258 primary care or other hospital services (e.g. radiology).

259 At hospitals 4, 6 and 7, some patients were also streamed to the out-of-hours services. This

260 occurred on a limited basis at certain times of the day (e.g. two patients per hour after 6pm

261 and weekends), if the emergency department primary care service was understaffed, not

262 staffed or in the process of closing. However, streaming to the out-of-hours GP services was

263 also not consistently available (e.g. where the out-of-hours GP service was understaffed or

264 unattended due to high levels of demand or GPs doing home visits, respectively).

265 Figure 3 shows a variation in emergency departments that use streaming inside the

266 emergency department. At hospitals 4 and 6 streaming was combined with emergency

267 department triage but at hospital 7 primary care streaming was a separate process from

268 emergency department triage and the urgent care centre nurses also called some patients

269 to 'see and treat'. The approach to streaming here was described as 'complex streaming',

15

270 required an additional stage of 'non-clinical routing' (using strict criteria) and it was adapted

271 based on levels of demand:

272 *"When I say streaming, because **it can mean all sorts of different things, they do**

273 **'complex streaming'**, so like 'see and treat', and **they do whatever assessment is**

274 **needed essentially, so it's not just sign-posting".** (Clinical Director, hospital 7)

275 **Fig.3 Variations in 'streaming inside 'pathways**

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277

278

279 *Different pathways for children*

280 At hospitals 7 and 11, there were separate emergency departments for adults and children

281 and an outside-onsite urgent care/primary care service. No children were streamed from

282 the children's emergency departments to the primary care services, and there were

283 procedures to transfer children from the urgent care/primary care service to the children's

284 emergency department if needed.

285   3. **No primary care streaming**, **usual triage**

286 In two services that we observed, primary care clinicians were integrated into an emergency

287 medicine team ('inside-integrated' model), the usual triage assessments were carried out

288 and primary care clinicians selected which patients they saw patients based on their

289 experience and interests (hospitals 9, 14).

290 Primary care clinicians at hospital 14 focussed on a specific group of emergency care

291 patients (e.g. frail elderly patients) during daytime hours and saw patients with low acuity

292 minor illness from late afternoon into the evening.

293

294 **4. Combined methods (including streaming and GPs selecting primary care patients)**

295 We observed combined pathways to primary care in some emergency departments.

296 *Front door <u>and</u> further inside streaming*

297 Front door and further inside streaming were observed in some departments. At hospitals

298 10 and 13 the streaming nurse at the emergency department front door could stream

299 patients not suitable for emergency care to the urgent care centre where a primary care

300 triage nurse could also (re-)stream them to a primary care clinician, to other hospital

301 services such as the eye clinic or early pregnancy unit, or hand them back to the emergency

302 department. The primary care nurse at hospital 13 could also make telephone calls to

303 redirect non-urgent primary care patients into booked appointments at their own GP

304 surgery.

305

306 *Streaming inside the emergency department and primary care clinicians selecting emergency*

307 *care patients*

308 At hospital 3, streaming decisions were made *inside the emergency department* during a

309 triage assessment. A wider range of hospital services was available, to which patients could

310 be streamed within the emergency department; these included general practitioners,

311 physiotherapists, occupational therapists, older person's nurse, chest pain nurse or

312 psychiatric nurse services. The model here was described by the clinical lead as an

313 "integrated front door model" although streaming was *inside the emergency department*.

314 However, some GPs with a special interest in emergency care conditions also self-selected

315 some patients waiting in the emergency department stream.

316

317 *Streaming inside the emergency department <u>and</u> non-clinical streaming by reception staff in*

318 *a primary care centre.*

319 At hospital 11 in addition to *streaming inside the emergency department*, receptionists in

320 the primary care walk-in centre used proforma screening questions to make decisions on

321 where to direct patients entering the front door of the primary care centre. Patients were

322 directed to the emergency department if they were deemed to need emergency care or

323 were directed to wait for the primary care clinician in the primary care walk-in centre.

324 Patients who needed primary care services not offered at the walk-in centre were re-

325 directed to their community primary care service.

326

327 **Discussion**

328 *Principal Findings*

329 Our classification (Figure 1) reflects the most common emergency department streaming

330 pathways to primary care services, usually performed by emergency care nurses: front door

331 streaming; streaming inside the emergency department (usually as part of the triage

332 process); or without streaming but primary care clinicians selecting patients. These methods

333 were used in combination in some services. Pathways were influenced by whether the

334 primary care service was 'inside' or 'outside' the emergency department and were often

18

335 adapted, based on local circumstances such as the department layout, patient demand

336 levels, skill mix and interests of primary care clinicians and accessibility of community

337 primary care services (Figures 2 and 3). Varied approaches to streaming were also

338 implemented for specific groups of patients (e.g. older people and children). Pathways were

339 in place to redirect patients with non-urgent primary care problems to community primary

340 care services in most services, with local variation in protocols based on staffing, patient

341 demand and links to community primary care services.

342 *Strengths and weaknesses*

343 The sampling process was based on results from a national survey, and responses from

344 emergency departments with a wide range of characteristics and contextual influences,

345 different sizes and various locations in England and Wales. The principal models of primary

346 care services in emergency departments were all represented,(1)The principal models of

347 using general practitioners in emergency departments were all represented [1], and there

348 was no evidence of non-response bias for the important aspect about whether or not the

349 department had applied for the capital funding to develop "clinical streaming" in 2017 (1).

350 From this range of departments, we could ensure maximum variation in the sample. We

351 gathered in-depth qualitative interview and observational data from a variety of staff

352 groups, ranging from clinical leads to nurses, GPs and reception staff working on the

353 streaming, triage and redirection pathways within the emergency department and primary

354 care services.

355 One limitation is the survey response rate (42%) and limited number of sites studied as part

356 of the larger study of primary care services in emergency departments,(13)GP models in

357 emergency departments [13], so there may be other service models and streaming

19

358 pathways which were not included in our classification. Further survey research could help

359 explore whether our classification is more widely applicable and whether there are other

360 variations implemented.

361

362 *Context of other literature*

363 Our classification builds on descriptions of primary care service models within or alongside

364 emergency departments [1, 2], by describing and integrating the range of initial assessments

365 (clinical and non-clinical) and ways of directing patients to emergency and primary care

366 clinicians or to other primary and secondary services, on and off hospital sites. 'Front door

367 streaming' was generally consistent with the policy literature [9]. Our description of

368 streaming *'inside the emergency department'* encompasses the range of processes

369 described by the Royal College of Emergency Medicine within their definition of 'complex

370 streaming' (see Table 1).(11)) [11].Within our study we also observed the use of 'see and

371 treat' and non-clinical routing carried out by non-clinical members of staff [11].

372

373 *Implications for policy and practice*

374 Although policy guidance was developed based on a 'front door' streaming model,[9] local

375 context may not allow for this. Our study shows most emergency departments had

376 implemented streaming pathways with greater flexibility, adapting to local contextual

377 variations (such as the availability of staff, primary care demand and case-mix, design of the

378 department, relationships with out-of-hours and in-hours primary care services and other

379 community primary care services).

380 Good practice guidance issued in 2017 recommends safeguarding measures to ensure that

381 non-urgent patients are redirected off-site to other available services appropriately and

382 safely [19]. However, more recently, redirection is not generally recommended or endorsed

383 by the NHS due to safety risks. Despite this, we saw variation in redirection pathways, from

384 patients being advised to seek access to in-hours primary care, to nurses making telephone

385 calls to check availability and book appointments in community GP practices. However,

386 using time to make safe redirection arrangements can potentially slow down the triage and

387 streaming process and negatively affect assessment time targets. Having a non-clinical

388 member of staff (a navigator at hospital 9) to assist with redirection and to help access GP

389 appointments for patients was perceived as helping to overcome such delays and ensuring

390 patients were redirected safely and efficiently. Local agreements between emergency

391 departments and general practices, with for example some GP appointments reserved for

392 patients being redirected, could support such navigation. The Covid-19 pandemic has

393 prompted efforts to better integrate clinical systems e.g. the 111 telephone and internet

394 clinical triage system and face-to-face urgent and emergency care. The ability of digital care

395 to help integrate a decentralised care model relies on high quality data, and until there is

396 consistent measurement of streaming, it will be difficult to decide how effective it is in

397 practice and which models of care are optimum.

398

Further research

400 All such developments depend on effective streaming. The classification proposed here

401 provides a basis for further research to evaluate and understand how streaming operates

402 and its effectiveness across a range of emergency and primary care service models in

403 emergency departments. Further research that takes account of the heterogeneity of

404 streaming pathways is required to examine experiences, barriers, enablers, and concerns about

405 implementation. Our classification can help inform quality improvement/performance

406 measurement as well as development of policy and practice. Key quality outcomes

407 measured against our classification could include emergency department waiting times,

408 patient flow and experience, patient safety and cost-effectiveness, about which there are

409 still considerable uncertainties [12]. Redirection processes also need to be evaluated to

410 assess the feasibility of patients accessing off-site services (especially in rural locations),

411 their safety, acceptability to patients, completion of follow-up with other services and

412 associated clinical outcomes [10, 19]. A more in-depth focus on streaming policies and their

413 outcomes for specific patient groups such as children, the elderly or those with

414 musculoskeletal or mental health problems would also be valuable. Evaluations based on

415 this classification would offer potentially transferable findings.

416

Conclusion

417

418 Our study has highlighted how a central government intervention with a clear stated

419 intended model has resulted in a highly heterogeneous range of models of care. We have

420 shown that pathways for directing patients between emergency care and primary care

421 services (including streaming, triage, primary care clinicians selecting their own patients and

422 redirection) vary across the different models of primary care services in emergency

423 departments. The three main pathways observed were: streaming at the front door;

424 streaming inside the emergency department; no streaming but with primary care clinicians

425 self-selecting their patients. Local clinical leads and managers need to consider which

426 pathway(s) may best suit their local context and needs. Consistency of terminology used to

427 describe pathways between emergency departments and primary care services is necessary

428 for performance measurement, quality improvement and rigorous future multi-site

429 evaluative and descriptive research.

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