

1 *Introduction*

2 Health policy in the UK advocates early senior-decision-making (ESDM) to reduce the  
3 volume of patients admitted via urgent care services. (1,2) Policies explicitly recommend  
4 clinical expertise in this task as emerging evidence suggests consultant staff are effective in  
5 this role. (3) Various strategies for determining the suitability for admission avoidance are  
6 known to exist. These include decision-making upon patient arrival, after evaluation, and  
7 the proposed remote strategy. Strategies may involve the use of evidence-based pathways  
8 and decision support tools. Anecdotal evidence reveals that categories of staff involved in  
9 early decisions vary from administrative personnel to consultants.

10

11 Disagreement exists about the merits of early consultant decision-making in such tasks. (4)  
12 Proponents of ESDM argue that if systems effectiveness is the goal, early-career clinicians,  
13 and non-medically trained staff lack sufficient knowledge to optimise outcomes. This is  
14 supported by laboratory studies of decision-making in clinical experts and theories that  
15 experts use of intuitive decision-making supported by rapid, focused, analytical processes  
16 rather than the comprehensive evaluation of the costs and consequences of alternative  
17 solutions seen in non-experts. (5-10). However, the increasing use of conditional,  
18 probability-based algorithms (e.g., for pulmonary thromboembolism) has removed the need  
19 for direct engagement with experts and improves some decisions. (11) In addition, as a  
20 senior evaluation is still required after patient arrival, an ESDM strategy creates the  
21 potential to double the workload in a stretched professional group. (12) The costs of early  
22 consultant involvement in urgent care allocation decisions suggest poor value for the small  
23 improvement seen. (13)

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1 This paper explores the admission avoidance decision strategies currently in place in acute  
2 medical units across NHS Scotland and the extent of senior clinical involvement. We argue  
3 that this sample is representative of decision-making strategies seen in other parts of the UK  
4 as the practice of acute medicine across the UK evolved collaboratively. After describing our  
5 data collection methodology and findings, we close with a discussion about the findings and  
6 why the goals of the ESDM strategy matter for future research into the phenomenon and  
7 service planning.

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9

#### 10 *Methodology*

11 To explore the current landscape of admission avoidance decision-making, we created a  
12 structured survey using Qualtrics software (Supplement 1). We chose NHS Scotland (NHSS)  
13 as our sample as funding, governance, policy, and performance were under the remit of the  
14 same central provider for all sites. The survey focused on processes in place for AEC  
15 allocation decisions as this is the most frequently used alternative to IP admission in acute  
16 medicine. As hospital pathways were known to have altered during the COVID-19 pandemic,  
17 we created a second survey to establish any changes that had occurred (Supplement 1).

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19 Clinical or executive leaders in 26 of the 30 hospitals providing acute care across NHSS were  
20 invited to complete an anonymised survey via email. Participants were identified through  
21 local and national leadership networks of clinicians, including established Scottish  
22 government working groups in acute medicine. Where organisational representation was  
23 not identified within these groups, clinical executives for the location were contacted to  
24 advise on an appropriate local leadership to participate. One clinical leader for each hospital

1 was contacted and asked to complete the survey to avoid conflict of responses. Invited  
2 participants were asked to forward the survey link to a suitable colleague if they felt unable  
3 to complete it with accuracy.

4  
5 The same leaders were recontacted in October 2020 and asked to nominate a colleague if  
6 they felt unable to complete the second survey. Participants were asked to identify their  
7 hospital in the initial survey (non-compulsory) but were not asked to identify their location  
8 in the second to allow anonymity in voicing concern or criticism. As participants were  
9 consultant clinicians directly engaged in acute medicine delivery in the locations, responses  
10 were assumed to be an accurate reflection of current departmental practice. We assumed  
11 no motivation to deceive. Ethical approval for the survey was obtained through the  
12 University of Strathclyde.

13  
14 In view of the exploratory nature and for ease of presentation, percentages were rounded  
15 to whole numbers where possible. As this was designed as an observational, exploratory  
16 study and responses were predicted to be small, inferential analysis was deemed to be  
17 inappropriate and potentially misleading.

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### 19 *Results*

20 Fourteen subjects responded to the pre-COVID survey representing 9 of the 14 Scottish NHS  
21 boards (Table 1). Twelve participants completed the survey in full; two chose not to identify  
22 their hospital site; two participants did not complete all questions. 10 subjects completed  
23 the second survey. Health boards represented more than once did not report consistent  
24 practice across sites.

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<b>NHS Organisation</b>	<b>Number of hospitals who responded</b>
Ayrshire & Arran	1
Dumfries & Galloway	1
Fife	1
Forth Valley	1
Greater Glasgow & Clyde	1
Highland	3
Lothian	2
Lanarkshire	1
Tayside	1
Unknown	2

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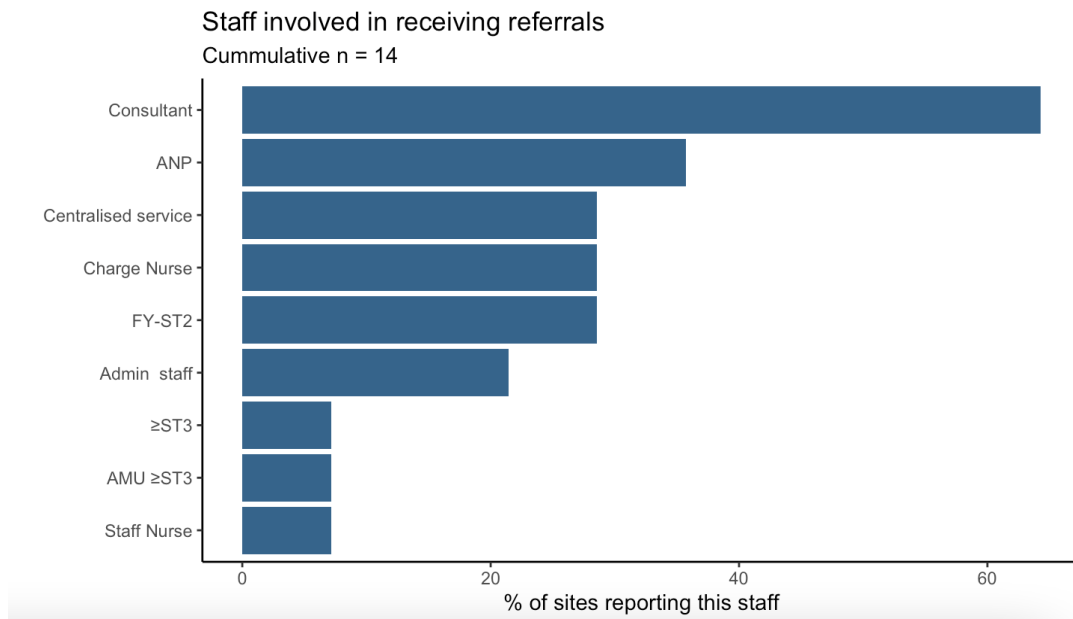
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Table 1 – Location of survey participants

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5 *Referral call-handling*

6 Figure 1 shows the diversity of staff involved in referral call-handling across all sites.



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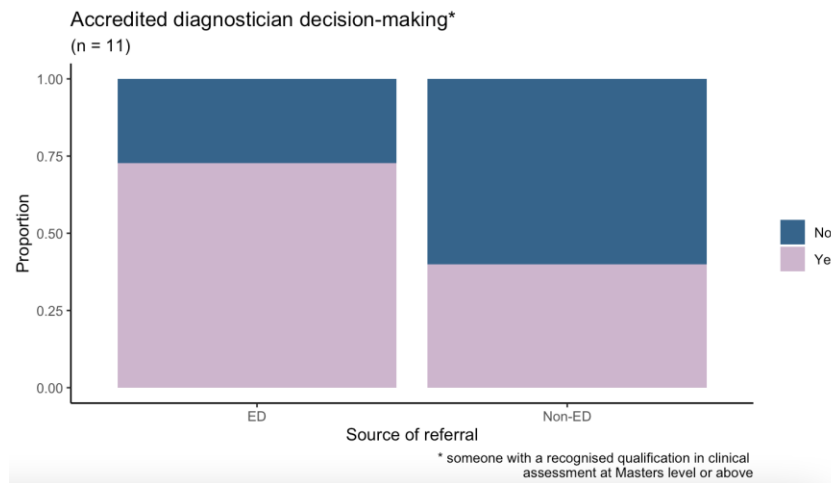
8 Figure 1 – Staff involved in urgent referral all handling across NHSS site pre-COVID (n = 14)

9 ANP – Advanced Nurse Practitioner; FY\_ST2 – Early career medical trainees; ≥ST3 mid-late career trainees

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11 Most sites reported two or fewer different staffing categories involved in fielding referrals  
 12 although some sites reported four. Although not explicitly asked, we assumed this to be the  
 13 maximum number of staff performing the task across all shifts. Community referrals

1 (median 50% of all referrals) tended to be managed by non-clinically accredited staff (Figure  
 2 2).



3  
 4 Figure 2 – Accredited clinician staff involvement in allocation decisions

5  
 6 Two hospitals reported a change in call-handling during the pandemic. In one instance, all  
 7 call-handling switched from nursing staff to (non-clinical) administrative staff. All other  
 8 responders reported no change.

9  
 10 In just under three-quarters of sites, ED teams determined AEC allocation at triage (i.e.,  
 11 before a completed evaluation) but most stated that decisions could be altered after  
 12 evaluation. Almost all teams described a verbal communication process from the ED, the  
 13 one exception being a hospital that used an electronic system. No pandemic-related  
 14 changes to ED referrals were reported.

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 16 *AEC service overview*

17 All but one hospital reported AEC delivery (94%; n=13). The team with no AEC belonged to  
 18 an organisation where another site did report AEC. Two surveys described AEC processes in

1 their hospital but were incomplete for all information pertaining to AEC delivery. Their  
 2 answers have been included where available and relevant.

3  
 4 Almost all AEC was delivered by Acute Medicine specialists, either alone (77%) or in  
 5 collaboration with ED teams (16%). One team reported AEC via ED specialists alone. AEC  
 6 was delivered in a dedicated area in most hospitals (77%). The remaining sites used ED or  
 7 shared AMU IP resources. During the pandemic, two hospitals moved from a dedicated  
 8 clinical area to a mixed model with a negative impact on service delivery.

9  
 10 *“[our] dedicated space has gone, we try and run the same services but juggle the available*  
 11 *space alongside acute admission referrals”*

12  
 13 Other participants described a negative impact on AEC from the beginnings of the pandemic  
 14 due to reduced capacity, redeployment of staff, and frequent relocation of services. One  
 15 hospital had all AEC activity cancelled (excepting one pathway) whereas four sites  
 16 experienced an increase in AEC funding, despite previous organisational resistance to invest.  
 17 One team reported emergence of an enhanced AEC service due to relocation.

18  
 19 *AEC allocation decisions*

20 Breakdown of the allocation processes is summarized in Table 2 (n=11).

Standardised pathways reported (number)	Number of hospitals reporting this number of pathways	
< 5	7 (64%)	
5-10	1 (9%)	
>10	2 (18%)	
Not sure	1 (9%)	
Who determines AEC suitability?	ED Referrals	Non-ED Referrals
Whoever takes the call regardless of referrer preference	9%	45.5%
Determined after the referrer & referee	36.5%	45.5%

discuss the options		
The referrer only	0%	0%
The referrer - call-handler may discuss with other staff for clarity	36.5%	9%
Not applicable to our location	18%	0%
<b>How the decision is taken</b>	<b>Number of hospitals reporting this process</b>	
Standardised AEC pathways only	9%	
Clinical judgment only	36%	
Combination of standardised pathways and clinical judgment	55%	

Table 2 - Components of the AEC decision process

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2

3 Four sites (36%) described a different referral process if the referrer felt AEC was  
 4 appropriate. Eight sites (73%) reported AEC allocation decisions at the point of referral and  
 5 three reported delaying AEC allocation decisions until the patient was in the hospital and  
 6 could be evaluated first. Processes in Table 2 were unchanged by the pandemic.

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## 8 *Discussion*

9 Knowledge of AEC allocation strategies provides insight into current early decision-making  
 10 practice as AEC decisions are likely to be made at the earliest opportunity if greatest value is  
 11 sought. If we assume that all AMUs who responded have effective patient care and whole  
 12 system efficiency as goals, then we may assume that their processes to determine  
 13 appropriate pathways of care have evolved to fit their local context inclusive of available  
 14 resources.

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16 Our survey suggests that most of the hospitals across Scotland deliver AEC and that the  
 17 majority have a model that determines suitability for AEC at the point of referral. Three  
 18 main categories of AEC allocation decision-making were identified:

- 19 • Expert clinician call-handling (ESDM)
- 20 • Non-expert clinician call-handling (clinical trainee or non-clinician professional)

- 1 • Standardised pathway decision-making (no urgent care clinician involvement)

2

3 Minor variations and combinations of categories exist depending on context and there is  
4 interaction between staff to aid decision-making when necessary. We identified both inter  
5 and intra-organisational variation in the use of clinical expertise (i.e., consultant staff).

6 Almost one quarter of sites that responded use staff with limited or no experience of clinical  
7 medicine for some allocation decision-making, presumably guided by the referring clinician,  
8 locally available guidelines, or collaboration with other staff as required.

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#### 10 *Personnel and pathways*

11 Almost three-quarters of sites report performing remote AEC allocation decisions, but  
12 without consultant staff as primary decision-makers across all referred populations. Further,  
13 more than half of sites report fielding of community referrals by staff who are not  
14 accredited in clinical medicine/diagnostics.

15

16 Almost all sites describe the application of 'clinical judgement' in allocation decisions. The  
17 meaning of 'clinical judgement' could vary amongst responders with some using the term to  
18 described intuitive decision-making (instantaneous, non-conscious, 'gut feeling' decisions  
19 developed via experiential learning), others meaning a conscious and rational analysis of the  
20 pros and cons of multiple potential solutions, or a combination of both. (14) Rational  
21 analysis is preferable when expertise is absent or decisions are outside of domains of  
22 expertise; however, human beings in general perform poorly when logically appraising  
23 probabilities in an analytical manner, supporting a greater need for decision-support tools  
24 especially in systems where experts are not involved in remote decision-making . (15,16)



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Most AMUs surveyed functioned with fewer than 10 evidence-based pathways for common presentations. This is likely to limit the extent of effectiveness when non-experts are charged with admission avoidance decisions. If few decision-aids are available to meet the wide arc of medical presentations, the ESDM task will require creativity in care plans, knowledge of care options, and skill in navigating local processes to avoid unnecessary admissions. A balance between the, often competing, goals of the clinical and the operational may also feature. If enhanced use of decision-support tools is preferable to employing expertise, organisations will need to consider how the pathways created support the biopsychosocial needs of an individual patient alongside goals of the system. (17) This will be difficult to achieve without expert involvement. (18)

*The right tools*

Access to the resources required to deliver alternative pathways to in-patient admission varied. Participants did not report the same resource availability although they were likely to encounter the same patient needs (albeit in different volumes). This could affect the decisions made and their impact. Resource availability in remote parts of the country is likely to differ in scope than in major cities, and logistics of transport may limit timely care via AEC in these settings. The COVID-19 pandemic has exposed the finite and fluid nature of resource availability NHSS - removing the tools that facilitate effective AEC decisions for some and enhancing them for others. Consistency in early decision-making requires consistency in the resources available to execute decisions. If resources are limited, then alternatives to in-patient admission will be too and a consultant delivered ESDM model may prove a fruitless strategy.

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2 Decision-making is not only affected by what is known to be physically feasible, but also by  
3 the intellectual and emotional capabilities of the individual at the moment of decision-  
4 making. (19, 20) As such, resources to facilitate human decisions should be considered as  
5 both physical and mental. Our survey demonstrated that consultant staff perform  
6 concurrent clinical duties during ESDM, and it is likely that other categories of staff also had  
7 simultaneous duties. This may create challenges in time and task management risking ego-  
8 depletion, poor regulation of emotions, and poor decision-making. (19) Poor performance in  
9 all tasks is a risk if the volume and complexity of decision-events are high unless additional  
10 staffing and appropriate periods of rest during shifts are available. This will have cost  
11 implications which may be mitigated by using centralised referral services, something  
12 advised in the NHS England policy and seen in some parts of Scotland. Comparison of this  
13 strategy with local decision systems has yet to be undertaken.

14

### 15 *Conclusion*

16 Urgent care health policies advocate value via senior decision-making at the point of  
17 referral. This requires expertise in remote clinical decision-making and resource access that  
18 is not consistently seen across Scotland and, potentially, other UK settings. Exploration of  
19 the true value of the ESDM model is necessary as its application has implications for staffing  
20 costs and workloads.

21

### 22 *Limitations*

23 As our study involved convenience sampling of NHS Scotland alone, we make assumptions  
24 about the generalisability of findings to the rest of the UK which may be incorrect. We invite

1 readers to add to the body of knowledge about decision-strategies in other parts of the UK  
2 to test our assumptions.

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4 Our survey was an exploratory census of fewer than 30 hospitals. Responses were small and  
5 not intended for inferential statistical analysis to prevent inappropriate rejection of pre-  
6 formed hypotheses about the extent of consultant delivered ESDM models. It is possible  
7 that we have underestimated the variation in decision-maker strategies seen in AMUs  
8 across Scotland and the UK but directional trends are valid to explore. We have  
9 demonstrated sufficient variation to facilitate discussion and are satisfied that descriptive  
10 analysis of the trends and tendencies seen is an appropriate start to understanding a  
11 previously unexplored phenomenon.

12

13 Finally, in asking clinicians to describe their departmental practice, we are aware that taking  
14 individual accounts at face-value may have some implications for differentiating what we  
15 chose to present from what we do in practice. Understanding this and the variations in  
16 adherence to stated institutional rules and values amongst staff, is a known phenomenon in  
17 social sciences (42). We are confident that our participants would have no reason to  
18 misrepresent their local services.

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20 *Declaration of competing interests: Nothing to declare*