

Power, Ryan, Bury. Clinical presentations and practitioner levels appropriate for the introduction of 'treat and referral pathway(s)' into the Irish Emergency Medical Service: A survey of Consultants in emergency medicine. <https://doi.org/10.32378/ijp.v5i1.233>

Clinical presentations and practitioner levels appropriate for the introduction of 'Treat and referral pathway(s)' into the Irish Emergency Medical Service: A survey of Consultants in emergency medicine.

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**Keywords:**

Paramedic; emergency department; admission avoidance; pre-hospital emergency care; treat and referral.

**ABSTRACT**

Objectives: Overcrowding in emergency departments (EDs) is an international issue and ambulance bypass is seen as one element of the solution to a complex problem. Irish EDs are not immune to this healthcare crisis, which, together with increased off-load delays for ambulances, is one catalyst for the introduction of Treat and referral pathway(s) (paramedic non-ED disposition decision). The confidence of consultants in emergency medicine in

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paramedics and advanced paramedics offering Treat and referral pathway(s) to patients presenting with hypoglycaemia or seizure was explored. Other specific clinical presentations were also investigated for suitability for Treat and referral pathway(s) and a consensus was sought on an upper age limit for such patients.

Methods: Public-sector consultants in emergency medicine in Ireland at the time of the study, were invited to complete an online survey. A 62% response was received from the targeted population.

Results: Confidence was expressed in advanced paramedics offering Treat and referral pathway(s) to patients with hypoglycaemia or seizure by the majority (78%) of respondents. However, confidence was reduced for paramedics (53%). Six of the twelve specific clinical presentations received clear support as suitable for Treat and referral pathway(s), with the remaining receiving reducing support and 'falls in the elderly (without injury)' was opposed. There was no consensus on an upper age limit for patients being offered Treat and referral pathway(s).

Conclusions: Support for the highest level of EMS practitioner in Ireland, advanced paramedic, to expand their scope of practice to include Treat and referral pathway(s) was identified. Clinical presentations have been identified that would be conducive to a treat and referral clinical care pathway. A trial implementation period may be essential to build confidence in the programme before a universal roll-out.

## INTRODUCTION

### Background

Overcrowding in emergency departments (EDs) is an international issue and ambulance bypass/diversion is seen as one element of the solution to a complex problem.<sup>1</sup> Irish EDs are not immune to this healthcare crisis<sup>2</sup>, which, together with increased off-load delays for ambulances<sup>3</sup>, is a catalyst for the introduction of treat and referral pathway(s). Between 30% and 50% of patients attending ED could be appropriately treated in a less emergency setting.<sup>4</sup><sup>5</sup><sup>6</sup> Indeed, up to 80% of these inappropriate patients could be treated adequately in a primary care setting.<sup>7</sup>

Greater than 50% of patients transported to an ED by ambulance do not have life-threatening nor serious conditions<sup>8</sup><sup>9</sup> and do not necessarily require an ambulance to get to an ED.<sup>10</sup><sup>11</sup><sup>12</sup> Furthermore, pre-hospital emergency care practice has demonstrated safety and efficacy in managing specific acute presentations, thereby alleviating the need for immediate ED care.<sup>13</sup>

14 15 16

Currently, paramedics and advanced paramedics are required to transport all patients in Ireland by ambulance to a hospital with acute services. Similarly, the traditional role of paramedics in North America has been to examine, treat, and then transport patients to an ED.<sup>17</sup><sup>18</sup> This contrasts with the UK and Australian ambulance services, which have transitioned to non-conveyance of selected patients.<sup>19-21</sup> With a focus on ED avoidance, the introduction of treat and referral pathway(s) in the UK was associated with a substantial reduction in ambulance service conveyance rates, from 90% to 58%, over a twelve-year period.<sup>20</sup>

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In Ireland, paramedics and advanced paramedics are regulated by the Pre-Hospital Emergency Care Council (PHECC), since 2006. In recent years, patient disposition options have been introduced by PHECC for ST-elevation Myocardial Infarction, stroke and certain trauma presentations, permitting by-passing of the nearest ED.<sup>22</sup> Pre-hospital emergency care interventions have improved significantly over the decades and specific acute presentations can be definitively managed through these interventions, reducing the requirements for ongoing immediate acute care.<sup>23 24 25 26</sup> The ability of paramedics to universally make decisions about treat and referral pathway(s), however, has not been definitively established. Furthermore, the available evidence does not support practitioners below that of an Irish advanced paramedic making such decisions.<sup>27</sup>

The issue of not transporting patients to an ED, following a 112/999 call, has now become a critical consideration for emergency medical services (EMS) which needs to be reviewed.<sup>20</sup><sup>28 29</sup> Patient disposition decisions by EMS practitioners would seem both necessary and appropriate. However, decisions to not transport patients to ED must include patient safety as a key consideration.<sup>30 31</sup>

This study engaged Consultant in emergency medicine (hereafter referred to as EM consultants) in Ireland about the proposed introduction of treat and referral pathway(s), as stakeholder buy-in is necessary for change management success.<sup>32</sup> Treat and referral was defined as the process whereby a paramedic treats a patient, following a 112/999 incident, and offers a patient disposition other than ambulance transport to an ED.<sup>11 33</sup> While treat and referral pathway(s) has been introduced in other jurisdictions for some time, including the

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UK and Australia, there remain concerns with this pathway among medical practitioners in these and other countries.<sup>34 35 18 36</sup>

The objective of this study was to elicit the views of EM consultants on their confidence in PHECC practitioners to select appropriate patients, to identify the upper age limit and clinical presentations suitable for a treat and referral care pathway. The New South Wales Ambulance Service, Clinical Assessment & Referral (CARE) programme<sup>37</sup> offers treat and referral pathway(s) to patients presenting with a range of clinical presentations. This programme is ongoing for over twelve years with positive outcomes. The 'CARE' clinical presentations were used as a template for the study.

## **METHODS**

On line anonymised questionnaire surveys were circulated to consultants in emergency medicine to explore their perceptions and views of the introduction in Ireland of treat and referral pathway(s).

Ethical approval was obtained through the University Hospital Limerick Ethics Committee. An electronic survey was constructed using an online survey tool (Survey Monkey) with 45 items. To assist with face validity the survey was piloted, in paper form, amongst ED nurses due to the low numbers of ED consultants in Ireland. Feedback from the pilot resulted in updating the wording and content. The SRQR reporting guidelines were used to frame the research.<sup>38</sup>

The survey had four domains: (1) demographics, (2) hypoglycaemia and seizure management, (3) opinion on treat and referral presentations, (4) confidence in care management. A combination of question types was utilised, including dichotomous, ordinal

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polytomous (5-point Likert scales [1 = strongly disagree to 5 = strongly agree]) and open-ended questions. All survey responses were anonymised.

The total population, at the time of the survey, consisted of sixty-seven EM consultants in the public sector in Ireland.<sup>39</sup> The initial sample frame was defined by consultants whose e-mail address was established. An invitation to respond to the survey was sent through e-mail followed by reminder e-mails. A delivery receipt was requested with the e-mails sent. The final sample size was therefore determined by e-mails delivered verified by a delivery receipt.

Data was downloaded into an Excel spreadsheet (Microsoft). The data was coded for and imported into, IBM SPSS Statistics 20 software for analysis. Cross-tabulation and frequency distribution were used to interpret the quantitative data. A thematic approach was used to analyse free text. Median values were used to interpret the results for the Likert scales. For analysis, the Likert scale was collapsed into a trichotomous scale (disagree, neutral, agree). Jeong (2016)<sup>40</sup> established that reliability or validity of the questionnaire is not reduced as a result of this conversion. Confidence intervals were calculated at 95% using an online calculator.<sup>41</sup> Pearson's Chi-square and Fisher's exact tests were calculated, using IBM SPSS version 20, to identify statistically significant differences. Statistical significance was taken at a level of  $p < 0.05$ .

Patient and Public Involvement included direct interaction with patient focus groups and seeking patient and family member's opinion on the introduction of treat and referral pathway(s) into Ireland. This is reported on elsewhere.

## **RESULTS**

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The response rates were n = 39 (62% of EM consultants who received the survey). The demographics of respondents identified ED attendance rates, urban/rural population and geographical spread. Table 1 and Figure 1 summarises respondents principal work setting by urban /rural mix and geographical area.

**Table 1** Population service area of respondents

Service area	EM consultant
Totally urban	6 (15.3%)
Mainly urban	19 (48.7%)
Mainly rural	13 (33.3%)
Totally rural	1 (2.5%)
Total	39

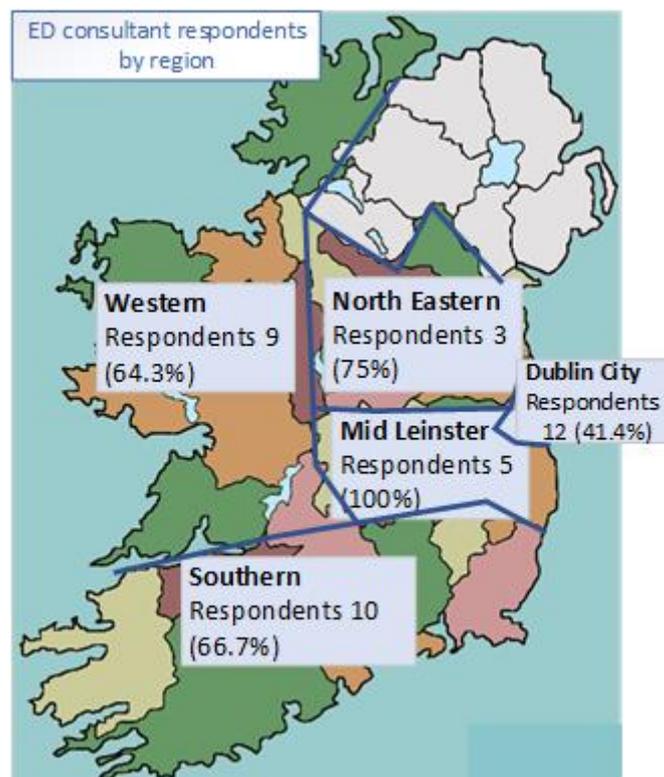
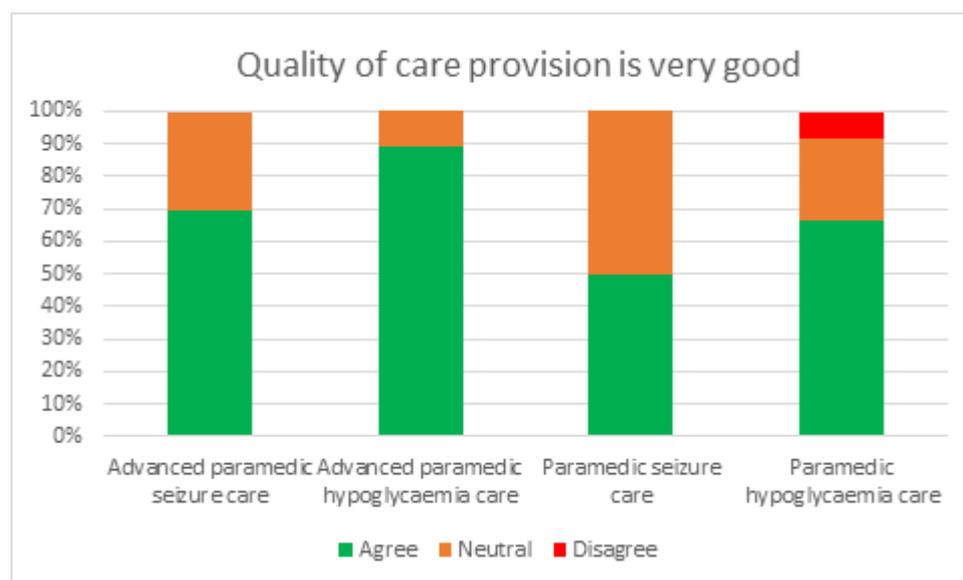


Figure 1, Geographical spread of EM consultant respondents

The majority (n=34, 94.9%) reported an ED attendance of >30,000 per annum, while the remainder (n=2, 5.1%) reported attendance of 20,000 – 30,000 at their ED. The maximum distance of travel to ED was collapsed into two groups ≤ 20 Km and > 20 Km for analysis.

### Confidence in PHECC practitioners by EM consultants

Hypoglycaemia and seizure were the index presentations under consideration for treat and referral pathway(s), as these presentations may be definitively managed in the pre-hospital environment.<sup>42 13 14 15 16</sup> EM consultants agreed that the current treatment of hypoglycaemic and seizure by paramedics or advanced paramedics is generally very good. The current treatment of seizures by paramedics and the treatment of both hypoglycaemia and seizures by advanced paramedics did not elicit any negative response and had a median of 4 from a 5-point Likert scale. One area of weakness was identified when 8.3% of EM consultants indicated that they were not satisfied with the treatment of hypoglycaemia by paramedics, see figure 2.



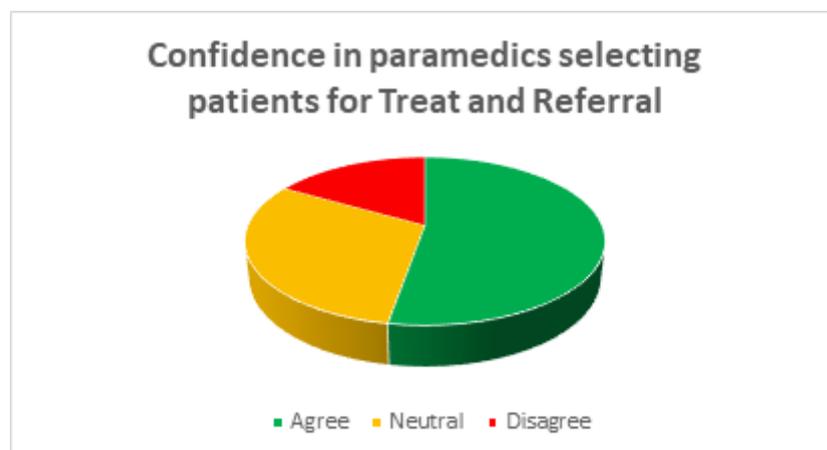
**Figure 2,** EM consultants' opinion on current care provision for hypoglycaemia and seizure by paramedics and advanced paramedics

### EM consultant confidence in practitioners selecting patients for treat and referral pathway(s) by clinical level.

Paramedics

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When results are collapsed into three groups (disagree, neutral and agree), a small majority (n = 19, 52.8%) expressed confidence in paramedics having the clinical judgement to select patients for treat and referral pathway(s). A sizeable minority (n = 11, 30.6%) did not express an opinion and the remainder (n = 6, 16.7%) expressed no confidence in paramedics to perform this function, see Figure 3. This result finding is reinforced as 41.7% (n=15) also agreed that they would be happy for a family member to be offered treat and referral pathway(s) by paramedics. When cross-tabulated there is no statistical difference between both findings (p = 0.179).



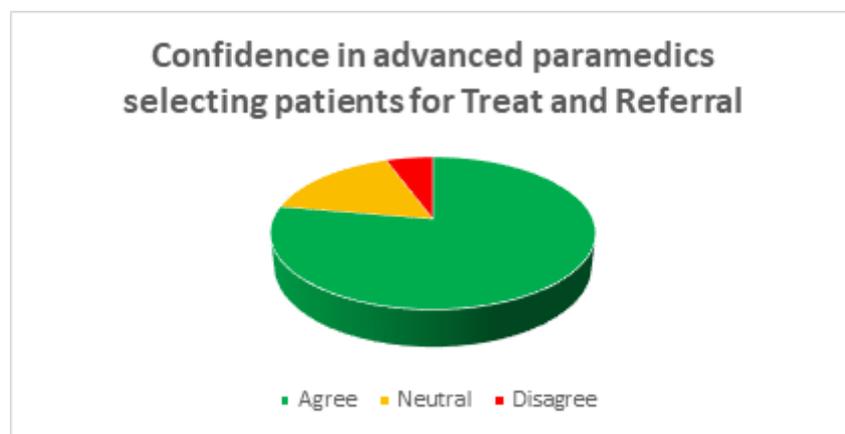
**Figure 3**, EM consultant confidence in paramedics selecting patients for treat and referral pathway(s)

A follow-up question permitted EM consultant respondents to outline, in free text, training that may help improve clinical judgement of paramedics. Five EM consultant respondents inserted free text. Only one specified training requirements, 'need to be at AP level'. The other respondents expressed a lack of confidence in the general paramedic population, although not excluding all. Operational issues such as the reducing numbers of GPs was identified as possible barriers to the introduction of treat and referral pathway(s). Also, the reduction of ED journeys was not envisaged.

Advanced paramedic

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When results are collapsed into three groups (disagree, neutral and agree), a sizeable majority (n = 28, 77.8%) expressed confidence in advanced paramedics having the necessary clinical judgement to select patients for treat and referral pathway(s). A small minority (n = 6, 16.7%) did not express an opinion and the remainder (n = 2, 5.6%) expressed no confidence in advanced paramedics to perform this function, see Figure 4. This result finding is reinforced as 69.4% (n=25) also agreed that they would be happy for a family member to be offered treat and referral pathway(s) by advanced paramedics, however when cross-tabulated there is a statistically significant difference between both findings ( $p = < 0.001$ ).



**Figure 4**, EM consultant confidence in advanced paramedics selecting patients for treat and referral pathway(s)

A follow-up question permitted EM consultant respondents to outline, in free text, training that may help improve clinical judgement of advanced paramedics.

Two responses were received, one indicated support for treat and referral pathway(s) provided that a high level of training and clinical audit was available. The second expressed a negative opinion indicating that "ECG training has not increased STEMI detection rates", implying that training was not the only answer.

When questions relating to both clinical levels, confidence in paramedics and confidence in advanced paramedics, were cross-tabulated the results indicated a statistically significant

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difference between confidence levels;  $\chi^2(16, 36) = 58.689, p < 0.001$ . The clear confidence in advanced paramedic over paramedic ability to select suitable patients for treat and referral pathway(s) is highly significant.

The scale for the items relating to confidence in PHECC practitioners had a very high level of internal consistency as determined by a Cronbach's alpha of 0.833.

### **Clinical presentations suitable for treat and referral pathway(s)**

EM consultant's opinion on the CARE clinical conditions being offered treat and referral pathway(s) demonstrated that the clinical conditions listed had  $\geq 50\%$  agreement, except for 'falls in the elderly without injury', for which 50% disagreed. The scale for these clinical presentations had a very high level of internal consistency, as determined by a Cronbach's alpha of 0.883. Toothache received the highest support (94.5%) for treat and referral pathway(s) introduction, with mild bronchospasm controlled by salbutamol receiving just 50% support (Table 2).

**Table 2** Consultants opinion on CARE clinical conditions being offered treat and referral pathway(s)

<b>Clinical condition</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Agree CI 95% = (<math>\pm 10.2\%</math>)</b>
Toothache	2.8%	2.8%	94.5%	84.3% - 100%
Pepper (Oleoresin) spray	2.8%	13.9%	83.4%	73.2% - 93.6%
Minor wounds (not requiring suturing)	16.7%	8.3%	75.0%	64.8% - 85.2%
Epistaxis (controlled by pressure)	8.3%	19.4%	72.3%	62.1% - 82.5%
Palliative care (DNAR)	13.9%	13.9%	72.2%	62.0% - 82.4%
Non injured following trauma (RTC)	16.7%	11.1%	72.2%	62.0% - 82.4%
Tazer (stun) gun	22.2%	22.2%	55.6%	45.4% - 65.8%
Soft tissue limb injury (excluding hand)	27.8%	16.7%	55.5%	45.3% - 65.7%
Vomiting & diarrhoea (tolerating PO fluids)	30.6%	16.7%	52.8%	42.6% - 63.0%

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Minor closed head injury (excluding LoC)	38.9%	8.3%	52.8%	42.6% - 63.0%
Mild bronchospasm (controlled by salbutamol)	33.3%	16.7%	50.0%	39.8% - 60.2%
Falls in elderly (without injury)	50.0%	11.1%	38.9%	28.7% - 49.1%

No statistical difference was identified between the opinion on the suitability of the listed clinical presentations for treat and referral pathway(s) and either the geographical region or service area ( $p > 0.05$ ).

### Age groups for treat and referral pathway(s)

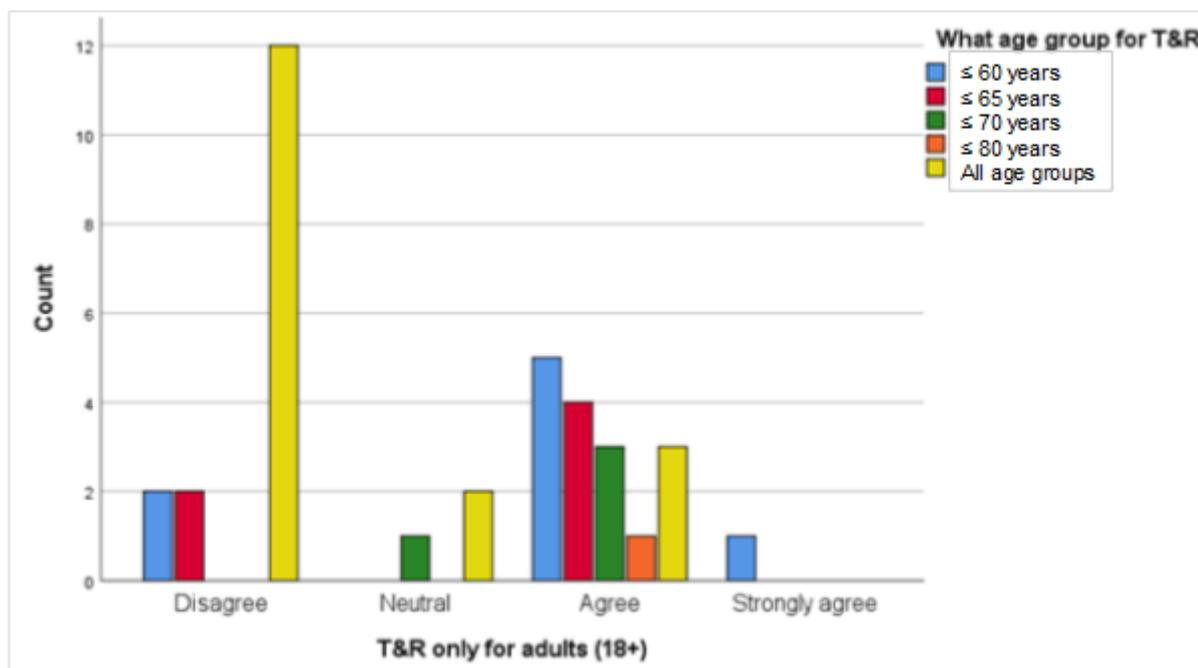
The Medical Advisory Committee within PHECC decided an age limit of  $\geq 18$  and  $\leq 60$  years for treat and referral pathway(s) for research purposes. Restricting treat and referral pathway(s) to ‘adults ( $\geq 18$  years) only’ was supported by a minority (47.2%) of EM consultants.

In a follow-up question, the EM consultants were requested to select from defined upper age limits. The largest consensus (47.2%) opted for no restriction on the upper age limits. However, the majority (52.8%) specified an age limit for adults but without consensus on the specific upper age limit. The largest group specified the upper adult age as ‘ $\leq 60$  years’ (22.2%), which is similar to the outcome of the Neely Conference (USA)<sup>43</sup> (Table 3).

**Table 3** EM consultants view on appropriate adult age profile for treat and referral pathway(s)

	Number	Percent
all age groups	n = 17	47.2%
$\leq 60$ years	n = 8	22.2%
$\leq 65$ years	n = 6	16.7%
$\leq 70$ years	n = 4	11.1%
$\leq 80$ years	n = 1	2.8%
Total	n = 36	100.0%

The consultants’ opinion on ‘adults only’ and ‘upper age limits’ were cross-tabulated and the majority were in favour of no age restrictions for paediatrics or adults (Figure 5).



**Figure 5,** EM consultants' opinion on age profile for treat and referral pathway(s)

## DISCUSSION

In this study, EM consultants were surveyed to elicit their opinion about treat and referral pathway(s) issues including; confidence in PHECC practitioners to select patients, the upper age limit and the suitability of specific clinical presentations for treat and referral pathway(s) care pathway. While Emergency Medical Technicians have been used successfully in research for treat and referral pathway(s)<sup>44</sup> concern was raised about the clinical acumen of some PHECC practitioners to select appropriate patients for a treat and referral clinical care pathway. This was also identified by Leikkola et al, where decision making concerning non-conveyance was reported as being more difficult for lower clinical levels.<sup>45</sup> This current study identified reduced confidence among EM consultants in paramedics compared to advanced paramedics in this regard. As with any new process, our data would suggest prudence in the implementation of treat and referral pathway(s), commencing with the higher clinical level of advanced paramedic initially.

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A definitive agreement on an upper age limit was not identified. While age does not define health status, there is a direct correlation between increasing age and poorer health.<sup>46</sup> Upper age limits of  $\geq 70$  years for patients following falls and not conveyed to ED have found them to be a vulnerable population who are likely to benefit from a routine onward referral process.<sup>47</sup> An upper cut-off age will, therefore, have to be agreed before implementing treat and referral pathway(s).

EM consultants give clear support to 6/12 of the CARE (NSW) list of presentations that could be considered for treat and referral pathway(s) in Ireland. Five of 12 conditions were supported by a majority. 'Falls in the elderly without injury' was not supported for treat and referral pathway(s). This concern is supported by Barnard et al<sup>48</sup> who identified 33.6% of non-conveyed patients following falls re-contacted the ambulance service within 24 hours. Similarly, Deasy (2018)<sup>49</sup> identified that low-level falls (<2 meters) account for 51% of major trauma mechanism in Ireland. Falls in the elderly without injury represent a small minority (0.006%) of 112/999 calls in Ireland.

### Limitations

First, a relatively low response rate was noted among EM consultants resulting in a wide confidence interval ( $\pm 10.2\%$ ). Second, the study instruments have not been validated elsewhere. Finally, the limitations of anonymous electronic surveys may preclude the identification of other barriers or facilitators among respondents.

Nonresponse bias was an issue as ~40% of delivered e-mails were not opened, verified by no read receipt received.

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The study focused on ED stakeholders directly involved in the provision of emergency care. However, other health care professionals, who may be requested to accept referrals, such as GPs and diabetes and epilepsy specialists, were not consulted.

## CONCLUSION

The findings suggest that the EM consultants surveyed are, in the main, supportive of treat and referral pathway(s) being introduced, however more information is required to confirm this view.

Support for the highest level of EMS practitioner in Ireland, advanced paramedic, to expand their scope of practice to include treat and referral pathway(s) was identified which is comparable to that reported in the literature. However, this confidence was reduced when paramedics were considered. Clinical presentations have been identified that would be conducive to a treat and referral clinical care pathway. No consensus was reached on an upper age limit.

The complexity of treat and referral pathway(s) and the possibility to formalise protocols and/or to select appropriate patient conditions will affect the confidence of healthcare policymakers in entrusting PHECC practitioners to safely implement it. A trial implementation period may be essential to build confidence in the programme before a universal roll-out.

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