

***A Qualitative Study of the Barriers to Procedural Sedation Practices in Paediatric Emergency Medicine in the UK and Ireland.***

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**SHORT TITLE:**

A Qualitative Study of the Barriers to Procedural Sedation Practices in Paediatric Emergency Medicine

**KEYWORDS:** Focus group, Paediatric, Procedural Sedation, Emergency Department, Emergency Medicine

**WORD COUNT:** 2,700

**FUNDING SOURCE:**

All phases of this study were funded by the National Children's Research Centre, Our Lady's Children's Hospital, Crumlin, Dublin 12, Ireland.

**FINANCIAL DISCLOSURE:**

All authors have no financial relationships relevant to this article to disclose.

**CONFLICTS OF INTEREST:**

All authors have no conflicts of interest to disclose.

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## **ABSTRACT**

### **Introduction**

There is extensive literature on paediatric procedural sedation (PPS) and its clinical applications in Emergency Departments (EDs). While numerous guidance and policy documents exist from international bodies, there remains a lack of uniformity and consistency of PPS practices within EDs. PPS is now gaining traction in the UK and Ireland and this study aimed to describe existing PPS practices and identify any challenges to training and provision of ED-based PPS.

### **Methods**

A qualitative approach was employed to capture data through a focus group interview. Nine Consultants in Emergency Medicine (EM) participated, varying in years of experience, clinical settings (mixed adult and paediatric ED or paediatric only) and geographical location (UK and Ireland). The focus group was audio-recorded, transcribed verbatim and analysed using Attride-Stirling's framework for thematic network analysis.

### **Results**

The global theme 'The Future of Paediatric Procedural Sedation (PPS) in Emergency Medicine – A UK and Ireland perspective' emerged from the following three organising themes: 1) training and education of ED staff; 2) current realities of PPS in EDs; and 3) PPS and the wider hospital community. The main findings were 1) there is variability in ED PPS practice throughout the UK and Ireland; 2) lack of formal PPS training for trainees is a barrier to its implementation as a standard treatment; 3) there is a lack of recognition of PPS at a College level as a specialised EM skill.

### **Conclusion**

Establishment of PPS as a standard treatment option in the emergency setting will require implementation of robust training into general and paediatric EM training. This should be supported and enhanced through national and international collaboration in EM-led PPS research and audit.

## INTRODUCTION

Over the past two decades procedural sedation (PS) as a specialist interest has grown to incorporate specialities outside anaesthesia, in particular Emergency Medicine (EM) (1). While numerous guidance and policy documents exist from international bodies, there remains a lack of uniformity and consistency of PS practices within emergency departments (EDs) (2, 3). EM practitioners possess a specific skill set required for the management of airway and ventilation in patient rescue, making EM practitioners ideally placed to provide all levels of sedation (4). Provision of point-of-care treatment through PS has multiple advantages for both the service (by reducing overall length of stay and the need for theatre space) and the patient (by circumventing the need for general anaesthetic and hospital admission). Equally, PS offers considerable savings compared to inpatient or theatre-based management (5). PS has been long standing practice in most adult Emergency Departments (EDs); however the translation of this practice into paediatric emergency medicine (PEM) has only gained traction in past 10-15 years in Australia, USA and Canada, where paediatric procedural sedation (PPS) has developed as a core PEM skill (6-9). Expertise in the UK, Ireland and the rest of Europe has been slower to develop but has grown in recent years (6, 9, 10). Despite pockets of expertise in procedural sedation across the UK and Ireland, it remains common practice to admit most children for management of their injuries rather than performing the procedure in the ED. The rationale for admission versus management in the ED have been previously identified as a lack of staff trained in procedural sedation, significant clinical demand within the ED and parental preference for theatre-based repairs (5).

There are two training options for EM trainees seeking sub-specialty training in PEM in the UK. Option one is via EM training with the Royal College of Emergency Medicine (RCEM), whereby the trainees will undertake a year of paediatric training at a senior level in addition to the mandatory basic PEM competencies. This year consists of six months in an approved paediatric ED (PED) and the second six months in a paediatric ward setting with at least three months spent in paediatric critical care. The result of option one is entry to the specialist register of “Emergency Medicine with a sub-speciality interest in PEM” (11).

The alternative option is via paediatric training with Royal College of Paediatrics and Child Health (RCPCH). Following completion of five years specialty training (core training) in

paediatrics, trainees can apply to the sub-speciality training programme or 'GRID' training for PEM. This includes approximately two year sub-specialty training, this consists of one year in an approved PED, six months in an approved PICU and six months in paediatric surgical specialties. On successful completion of this and their paediatric training, trainees are entered on the specialist registry as "Paediatrics with sub-specialty training in PEM" (12). Ultimately, both are qualified as PEM consultants, and can work in a PED accordingly as a fully trained PEM consultant. However, other consultants will opt for a combination post involving working in PEM with some general paed, or PEM with some adult EM.

PPS training programmes have been developed in Australia, USA and Canada which could potentially be adapted and implemented in other settings, including Europe. However, resources, hospital structures and staffing levels vary significantly between these countries and our own (6, 9, 10). Although procedural sedation is identified as a competency in the curriculum in both of the training options described above there is, however, a lack of specific detail and training (11, 12). In order to progress development of a robust programme of PEM-relevant PPS education for our healthcare system it is important to: (i) identify perceived barriers and enablers in current practice; and (ii) establish current baseline PPS practices. This will facilitate forward planning with the parallel development of strategies to overcome or harness identified barriers and enablers.

## **OBJECTIVES**

This study sought opinions regarding PPS from EM and PEM consultants from the UK & Ireland. We aimed to identify barriers and enablers, current training options and interaction with other specialties in the provision of PPS in the ED setting.

## **METHODS**

### **Study Participants and Setting**

An invitation of participation which outlined the study objectives, focus group schedule, types of questions that would be posed and eligibility criteria was disseminated via Paediatric Emergency Research in the UK & Ireland (PERUKI) (18). The eligibility criteria were:

- Must be emergency practitioners (Consultants working in either a Paediatric or Adult ED with a sub-specialty interest in PEM); and
- Must have experience of paediatric procedural sedation in an ED setting.

### **Study Design**

We adopted a qualitative method, utilising a focus group interview as the method for data collection (19, 20). Focus groups aim to explore the issues of a group of individuals in the context of their experiences, views and concerns (21, 22). Their design enables discussion on a specific topic, allowing participants to express opinions and contribute to a wider discussion guided by a moderator (23).

The focus group was moderated by a PEM specialist (ROS). To ensure sustained focused discussion, the moderator utilised an interview guide (Table 1). This was developed and piloted by a panel of experts drawn from PEM and Emergency Nursing. It consisted of open questions which placed a structure and sequence to the questions posed, enabling elicitation of relevant information from participants (19, 24). Promotion of an interactive dialogue within the focus group, through probing and elucidation led to the development and exploration of particular topics and themes on PPS based on practitioner experience. To ensure rigor the relevant procedures were applied (25).

Data collection ceased once no new data was emerging in the focus group, therefore no specific time restriction was imposed on the group (22, 24). The moderator avoided giving positive or negative feedback or opinions to minimise biasing subsequent responses. The interviews were audio-recorded and transcribed verbatim by a member of the research team (SMC).

This study was discussed with ethical committees in the UK and Ireland and was felt that due to the setting, participants and nature of the study, research ethics committee or NHS approval was not required. Participants did not receive payment for their contribution. In the interest of good ethical practice written consent was sought from each participant prior to interview to emphasise that participation was voluntary and confidentiality is assured.

**Table 1:** Interview Guide

TOPIC	QUESTION
Relevance to practice	What are your thoughts on the use of sedation in your practice?
Challenges	Can you tell me about what influences your decision to use paediatric procedural sedation? Can you tell me about a particular sedation event, what were the positives or negatives of this event? What would you identify as challenges to procedural sedation in the ED?
Current Sedation Guidelines	Can you tell me about any sedation specific guidelines in your department? Do your department guidelines apply to a specific drug(s)/route(s)? Can you tell me about the current guidelines for sedation in the emergency department?
Training	Can you tell me about the specific sedation education/training programme available for staff? Can you tell me about the competencies staff must have prior to providing sedation in the ED? Can you explain the attitudes of your staff towards paediatric procedural sedation in the ED?

## Data Analysis

Analysis of transcriptions was performed utilising Attride-Stirling's framework for thematic network analysis which allows the researcher to identify the key elements considered barriers and enablers (26). The network analysis exposed significant themes at different levels. The transcripts were coded by consolidating the interview text and dividing them into quotations. From these codes the "basic themes" were developed which, in isolation, mean very little but contribute to the development of the "organising themes" when considered within the context of other basic themes. An "organising theme" is a culmination of the principle assumptions derived from the basic themes on which the "global theme" is based. The "global theme" comprises the core elements and encapsulates the principal metaphors existing in the text as a whole (Figure 1).

## RESULTS

### Characteristics of Focus Group Participants

Nine Consultants from various ED sites in the UK and Ireland participated in the focus group. The majority of participants were female (n = 6). There was one Consultant in EM while the remainder were Consultants in PEM with various backgrounds including EM (4); General Paediatrics (3) and General Practice (1). The focus group lasted approximately 60 minutes.

## Thematic Network Analysis

The global theme 'The Future of Paediatric Procedural Sedation in Emergency Medicine – A UK and Ireland perspective' emerged from three organising themes as follows (Figure 1):

- Training and Education of ED Staff;
- Current realities of PPS in the ED;
- ED PPS and the wider hospital Community.

### I. Training and Education of staff

This organising theme comprised of the culmination of three basic themes which were (1) no formalised training; (2) staff competency; and (3) existing variation in practice. Participants described PPS as an important PEM skill. However although the current subspecialty curriculum for EM and PEM trainees in the UK and Ireland identifies PPS in the ED, there is no detail in relation to training. A number of the participants identified the lack of PPS competencies and training programmes available as an oversight by the governing body and a barrier to the future development of PPS as a standard treatment option in the ED:

*"...because it's not actually detailed in the competency document, which is clearly an oversight and that needs to be reviewed." (PEM\_PED\_>10)<sup>1</sup>*

Competence in PPS has become an expected skill for PEM specialists. However exposure or experience appears to be the responsibility of the individual practitioner, with most of the focus group members gaining their PPS experience outside the UK and Ireland during their fellowship years:

*"As you say procedural sedation is not in the GRID Paeds ED training, therefore, how can we expect it to be a competency?" (PEM\_PED\_8)*

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<sup>1</sup> Coded Quotations: EM Training\_Current work setting\_Years in EM



*“It’s something we expect new Consultants to be able to do but it’s actually not on the list.” (PEM\_PED\_>10)*

The experience of our focus group members was that the recent increase in PEM consultant appointments has been in part responsible for the renewed interest in PPS:

*“We’re finding that the more recently appointed Consultants who have had training in this are very keen to be hands on, some of the more established Consultants who have never done it are very anxious about their airway skills...” (PEM\_PED\_8)*

*“We had four new appointments within 3 years, all of whom had done procedural sedation elsewhere and our old hands were suddenly very much in the minority and have actually up-skilled very quickly.” (PEM\_PED\_5)*

The appointment of new PEM consultants and the lack of access to formalised PPS training has led to the development of individual site-specific programmes in many EDs throughout the UK and Ireland. Each programme is tailored towards the developer’s opinions and local service needs, which in turn may lead to national variation in practice creating potential risks to the patient and quality issues:

*“We have a very robust training package, we have a very clear guideline and we keep a database of every sedation we do.” (PEM\_PED\_8)*

*“We’re very keen to develop our own package.” (PEM\_PED\_5)*

Participants agreed that there should be formalised training for all ED practitioners (medical & nursing) providing PPS. Establishment of a PPS service within the ED could result in an improved point-of-care service that impacts on patient flow and has the potential to reduce admissions:

*“...there should be a formal training programme...” (PEM\_PED\_10)*

*“It’s about accessibility and point-of-care use isn’t it, you want a service you can access where our patients are so they don’t have to go away or go somewhere different and it’s done during their attendance for that particular problem.” (PEM\_PED\_8)*

*“...also the cost argument for the trust, so you perform a procedure which is usually completed within 4 hours in the ED versus bringing a patient onto a ward, having a GA, realistically staying overnight because Anaesthetics may not be available, so they have to have it the following day.” (PEM\_PED\_10)*

The group was asked to consider training for nursing staff. It was evident from the discussion that this had not been previously formally considered. Despite this, it was agreed that nurses involved in the provision of PPS should have basic knowledge and understanding of emergent airway management, sedation agents used and skills in assessing levels of sedation:

*“We don’t have any training for nurses per se but, they have all as a bare minimum done APLS.” (PEM\_PED\_10)*

*“...you would assume that nurses would need specific training as well.” (PEM\_PED\_8)*

*“Yeah, it is a gap, there’s no question.” (PEM\_PED\_10)*

It was felt by the group that EM needs to take ownership of PPS. Participants unanimously agreed that EM practitioners are the experts in PPS and it should be part of our everyday practice. There should therefore be a programme developed, approved and supported at a governing body level:

*“It’s not just ‘is there a programme’ but is it a regular reliable programme or is it on an ad hoc basis which is personnel-dependent?” (PEM\_PED\_5)*

*“...people are individually taking ownership of PPS in their institutions and everyone has slightly different practice but I do think it needs to be owned at training level and at an APEM level or an RCPCH level or a CEM level wherever people feel, I don’t really mind where it is but it needs to be owned, procedural sedation is what we do...” (PEM\_PED\_8)*

*“I think in the same way ultrasound came into the College curriculum... I think it’s the same for procedural sedation. Anaesthetists may think they’ve got control of airways in the whole hospital but actually we’ve got our own specific patients and our own specific environment.” (PEM\_MIXED\_>15)*

Allocating time for training was identified as a potential barrier to national roll out of PPS education for ED medical staff:

*"I think the biggest barrier is just ability to free everybody to go... You know, we struggle to get our SHOs free for two hours of training once a week, so that would be the biggest barrier." (PEM\_PED\_5)*

The group suggested that the integration of PPS into higher training would overcome the issue of time available to deliver the programme, as well as alleviating the issue of competency and sustainability of the programme.

*"If you incorporated it into part of GRID training..." (EM\_MIXED\_>15)*

*"...and it was put in the GRID training lets' say....you will do it..." (PEM\_PED\_8)*

*"Everyone has to do APLS; everybody has got to do procedural sedation as part of their GRID training." (PEM\_PED\_8)*

## **II. Current realities of Paediatric Procedural Sedation in EDs**

This organising theme encompassed three basic themes which included: the ED environment; possible benefits to ED practitioners and the hospital and; the ED physicians are the specialist in relation to PPS in the ED. Participants were asked to comment on their own practice, identifying the challenges they have experienced in trying to develop their service. A number of participants identified that the hesitance of their Anaesthesia colleagues to acknowledge the EM skill set could have potentially have had an adverse effect on the provision of PPS:

*"I think it needs to be done by someone who is competent to do it...so if that means that it is ED staff who do it rather than the child going to theatre..." (PEM\_PED\_5)*

*"We had to wrestle with our own ICU and Anaesthetists all of whom had this, I think, quite old-fashioned view that anything like this should be done by Anaesthetists and we're playing at it. I hope that we have come to a mutual agreement that it is happening and they're happy with it and the hospital have been largely quite comfortable with it." (PEM\_PED\_8)*

The critical element to practice change or widespread implementation of a new policy or protocol is the existence of robust evidence to support such a significant change. Participants felt that the ability to defend the service was crucial in promoting hospital wide buy-in. Providing colleagues with substantial local evidence that illustrates the effectiveness of the service is essential in promoting co-operation from other specialities. There was group agreement on the importance of making this evidence available not only to local colleagues, but also wider dissemination through publication:

*“We have a very robust training package, we have a very clear guideline and we keep a database of every sedation that we do. I think being able to defend ourselves if at any point we have a complication. So we can say, well, actually the data suggests it is safe and we are competent to do this.” (PEM\_PED\_8)*

*“Our CEO is on our side and we have published in the EMJ.” (EM\_MIXED\_>15)*

It was felt that staffing and skill level were potential barriers to the provision of a robust PPS service, as the clinical demands of the department can shift significantly in the ED environment. Participants discussed the need for an adequate skill mix and the need for a pragmatic approach to service delivery at times of increased clinical demand:

*“...It’s to do with competency or staff skill mix on that day.” (PEM\_MIXED\_8)*

*“We take a pragmatic view on it, in that most of our sedation is done at the point of care but on occasion and it’s usually because the department is heaving, we just don’t have the ability to free-up staff to be able to perform PPS.” (PEM\_PED\_8)*

*“Out of eleven of us, only two people are comfortable doing it.” (PEM\_MIXED\_10)*

### **III. ED Procedural Sedation and the wider hospital community**

There were three basic themes that identified the possible impact of PPS on the wider hospital community; these were the existence of institutional or traditional practices,

engagement and facilitation of specialist colleagues in the ED and establishing an evidence base and provision of a specialist skill set.

Establishing an ED PPS training programme and clinical guideline can trigger reactions from other specialities. Whether positive or negative they must be addressed professionally to ensure continued support from colleagues. Focus group participants attributed reactions of other specialities to experience and confidence with the agents used in PPS, and institutional practices already in existence outside the ED:

*“...morphine and midazolam has been used for many years and incidence of harm caused by midazolam overdoses and losing airways and the length of recovery from midazolam. When ketamine came out, it is so much safer in terms of airway reflexes and in some centres Anaesthetists prefer us using morphine and midazolam which to me is an unsafe combination rather than ketamine which is a much safer anaesthetic and analgesic agent...” (PEM\_MIXED\_8)*

*“I think because they aren’t used to using ketamine...it’s out of context to what they do.” (PEM\_MIXED\_8)*

*“They’re not experienced in procedural sedation, and it comes back to that same point we started with, competency.” (PEM\_PED\_5)*

*“It was really quite hard work to get other specialties on board...they say oh well we’ve been doing it this way for years.” (PEM\_PED\_8)*

The group considered collaboration with key stakeholders within the hospital such as Anaesthesia and Critical Care as a potential enabler to acceptance of the PPS service:

*“I also found getting an Anaesthetist involved in the guideline that you’re going to launch in the ED is quite helpful.” (PEM\_PED\_8)*

*“I’ve had a very positive experience with my Anaesthetic colleagues. Some who are Paediatric Anaesthetists...they have been phenomenally supportive. I think that’s primarily because they have an understanding of who we are and what our training is.” (PEM\_PED\_10)*

Participants drawing from their own experience recognised facilitation and engagement with specialities (including Orthopaedics, Plastics and Maxillofacial Surgery) as instrumental in the acceptance of the service. An anecdotal change in patient management by these specialities was noted by focus group members:

*“Orthopaedics love the fact that we’re sorting out their patients quickly.”*

*(PEM\_PED\_8)*

*“There has been a culture change but recently in the last six months with us, MaxFax now will, rather than instinctively booking them on to OT lists, they’re coming to us...” (PEM\_MIXED\_>15)*

*“...the Orthopaedic guys are to the point where they want to get an image intensifier in the department...” (PEM\_PED\_8)*

Advantages for the hospital and patients were also mentioned; participants believed PPS in the ED facilitates more efficient patient flow, admission avoidance, cost reduction, increased patient comfort and provision of a point of care service:

*“Orthopaedics love the fact that we’re...freeing up time in theatre and freeing up time in the wards.” (PEM\_PED\_8)*

*“...it’s also about accessibility and point of care use, isn’t it?” (PEM\_PED\_5)*

*“So you’re doing a procedure which is usually within 4 hours in the ED versus bringing a patient onto a ward, fasting them, having a general anaesthetic, realistically staying overnight because that anaesthetic may not be available, so they have to have it the following day. I think it is a huge improvement for everyone.”*

*(PEM\_PED\_10)*

*“...we published in the EMJ; door-to-leaving the hospital time if you compared doing it in the ED with a median time of 6 hours versus having a general anaesthetic, median time if you had a general anaesthetic to going home was 21 hours, to see that from a parents perspective...” (EM\_MIXED\_>15)*

## DISCUSSION

This study sought opinions regarding PPS from EM and PEM consultants from the UK & Ireland. We aimed to identify barriers and enablers, current training options and interaction with other specialities in the provision of PPS in the ED setting using a focus group methodology. The findings are likely to be representative of experience within the EM community throughout the UK and Ireland due to the geographical spread and level of training that existed in the participants.

Participants voiced concern regarding the lack of training in PPS, despite it being considered an essential part of daily practice. Among the participants, a minority had developed their own training programme for their individual departments due to the absence of a nationally developed and standardised PPS programme. Individual programmes create potential variation in practice, competence and standards, and influence the risks to patients and the quality of care provided. These can be optimised through development of system-wide guidelines, training programmes, staff competency monitoring, and audit. Internationally there has been PPS programme development for ED staff (9, 10, 27) though, similar to the situation in the UK and Ireland, individual departments have designed their own programmes and the effect is localised.

Participants believed the best strategy to address the variation in practice would be, for EM to take responsibility and ownership of PPS during PEM training. Participants were not concerned which institution/organisation (Royal College of Paediatrics and Child Health or Royal College of Emergency Medicine) developed PPS training, but any such programme would have to be approved and supported at a specialist training level. Participants recognised that ED nursing staff involved in PPS should be expected to maintain competency in relation to basic knowledge and understanding of emergent airway management, sedation agents used and skills in assessing levels of sedation. A national approach to training would standardise practice and be key in developing a robust service across EDs, improving quality of care for children. In a recent study from the state of Victoria, Australia, a multimodal PPS training implementation strategy (development of a clinical governance self-assessment checklist, adaption of previously developed training materials, identification of clinical leads and conducting a 'train-the-trainer' approach,

development of clinical audit tool) was adopted by 14 of 21 (67%) eligible EDs. Within 6 months 971 staff were trained and credentialed with an improvement in clinical governance arrangements and a high compliance rate in relation to key audit criteria. Improvement of clinical practice can therefore be achieved and can be instrumental in improving the quality of care for children attending EDs (28).

PPS in the ED can encounter resistance from other specialities, attributable to a lack of understanding around the concept of PPS, sedative agents used, and differentiation between a 'Sedationist' and 'Anaesthetist'. Participants made it clear that the intention of EM sedationists was not to undermine their Anaesthetist colleagues but to emphasise that EM sedationists use sedative agents in a specific subset of patients. Participants considered the goal of PPS is to provide the best service for families at the point of care by reducing length of stay, requirement for general anaesthetic, and admissions for theatre. Participants in our study felt that resistance may be a symptom of uncertainty and reticence to relinquish control. To counteract this it is therefore important to engage with key stakeholders such as Anaesthesia, informing them of the proposal and inviting their contribution. Engagement with surgical specialities can also be instrumental in the acceptance of the service. However, participants highlighted the need for establishing boundaries in such an arrangement so that practice remains safe and a mutually beneficial arrangement is reached.

There was unanimous agreement that publication and dissemination of PPS data or experiences within individual departments would facilitate the acceptance of PPS into the standard ED armamentarium. A number of participants mentioned the development of a national database completed locally that would house a record of all PPS events, believing this to be key in the 'demonstrating the quality and safety of their service'. Of note, practitioners within the group who had already established training and educational programmes for their staff have observed anecdotal improvements in patient flow, admission avoidance, increased patient comfort and an improved service credited to the provision of point-of-care procedures and management.



This study indicates that there is a requirement for formal PPS training of ED medical and nursing staff. There are pockets of expertise within the EM community; however the variation in practice impedes full acceptance of PPS as part of the core EM skill set. In order to overcome these deficits it may be that these issues would best be governed by the training bodies in the UK and Ireland.

## **CONCLUSION**

This study demonstrates that EM physicians consider provision of Paediatric Procedural Sedation as a core skill required by staff working in the ED. Participants considered the lack of training and education available for trainees in PPS as a significant barrier. The development of standardised national training is essential in establishing PPS as a standard treatment option in all EDs.

## **ACKNOWLEDGEMENTS**

The authors would like to thank all of the participants who shared their time and experience with us and without whom this study would not have been possible.

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