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ICU trainee perception of end of life care provided during medical emergency team activation events

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On behalf of the Victorian EOLC MET investigators.

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Introduction

Medical Emergency Teams (MET) and Rapid Response Systems (RRS) were introduced into hospitals to identify deteriorating patients, prevent adverse events and unplanned Intensive Care Unit (ICU) admissions[1,2]. Although the MET was developed to reduce preventable morbidity and mortality, patients who are dying also frequently meet the physiological calling criteria that activates a MET call[3].

Up to one third of MET calls involve patients with pre-existing medical treatment limitations or involve discussions about end of life care (EOLC)[4]. Goals of Care (GOC) discussions leading to a new limitation of medical treatment occur in one out of ten MET calls[4].

In ICU-equipped hospitals in Australia and New Zealand, the MET response is typically made up of an ICU Registrar, accompanied by a critical care trained nurse[2]. Formal training or supervision of ICU doctors attending MET calls maybe highly variable[2, 5]. There is also limited information about the issues encountered at MET calls, particularly at those that are more clinically and morally challenging, such as EOLC MET calls. Identifying the areas of concern may help focus training and support of intensive care doctors, as well as leading to the improvement of quality EOLC provided during inpatient hospitalisations.

The purpose of this study was to measure the perceptions of Victorian hospital medical staff, training in the speciality of intensive care, about multiple aspects of EOLC MET calls. We sought to determine the overall extent of formal training in MET and EOLC and assess the domains of self-perceived confidence, barriers to communication, frequency of clinician agreement and trainee distress.

Methods

Ethics approval

Full ethical approval was obtained prospectively from the Melbourne Health Human Research Ethics Committee (HREC 2018.381). The overall survey conduct was under the supervision of each local hospital College of Intensive Care Medicine of Australia and New Zealand (CICM) supervisor of training (Appendix 1), who acted as support person in the event of participants distress from recalled events. Participation was voluntary, and completion of the survey implied informed consent.

Survey development

The survey tool (Appendix 2) was developed using recommended methods for the design and conduct of self-administered surveys[6]. Most questions used a 5-point ordinal symmetric "agree-disagree" (Likert) scale for a series of statements, accompanied by a minority of questions inviting free-text answers. Questions relating to similar themes surrounding EOLC MET calls were categorised into pre-defined domains. During survey development, a pilot version was administered to a small convenience sample of ICU doctors not eligible for the final survey. Pilot questions determined to be poorly worded or ambiguous were revised, and three duplicate themed questions were removed.

Setting

The study was conducted over a four-week period between 13th May and 9th June 2019, in Victoria, Australia. All surveyed acute adult hospitals were accredited by the CICM to provide at least six months of intensive care training. Within these hospitals, the RRS team that attends medical emergencies consists of an ICU doctor and nurse, and also commonly a ward-based medical fellow. The mix of acute care hospitals included tertiary and quaternary referral hospitals, as well as smaller metropolitan and regional hospitals.

Participants

The participants in this study were trainees of CICM who were working in an accredited adult ICU training unit within Victoria, Australia, during the study period. ICU doctors who were not current CICM trainees were excluded.

Survey Conduct

The survey was distributed to participants by the supervisor of intensive care training at the hospital of employment via an invitation email including a detailed participant information sheet. The survey was in an online format (www.surveymonkey.com). A reminder email to participate was sent after two weeks to all original invitees, as individual responses were not identified (Survey Anonymous Responses configuration turned on).

Data analysis

Survey data were exported from the SurveyMonkey platform to an Excel spreadsheet, then imported for most analyses using STATA (StataCorp 2019. Stata Statistical Software: Release 16. College Station, TX: StataCorp LLC.). No imputations or assumptions were made for missing data. Descriptive statistics were displayed as proportions, or as a median within an associated interquartile range. In selected cases, ordinal scale responses were simplified to a dichotomized binary outcome (such as “distress at least occasionally” versus “rarely or never”). These binary dichotomized responses aimed to collapse categories into a dichotomy close to an “optimal” point, creating equal numbers of “positive” and “negative” responders, while achieving a straightforward clinical interpretation[7]. These dichotomized outcomes were then incorporated in multivariable logistic regression models to explore associations between potential predictors and risk factors for trainee distress. Standard generalized linear model diagnostics for the finally accepted model included Pearson chi square and Hosmer-Lemeshow goodness-of-fit tests. Logistic regression effect estimates were reported as odds ratios with 95% confidence intervals. There was no adjustment of these results for multiplicity of testing. Free text answers to questions were assessed manually and

grouped into subjective themes. A two-sided p-value of < 0.05 was taken to indicated statistical significance.

Results

Details of survey sample frame and respondents

The survey target population comprised 124 CICM-associated ICU trainees in Victoria, Australia in May 2019. Responses were received from 75 (60%). Data exclusions comprised all responses from three individuals who were not CICM trainees. One other participant did not complete any responses, leaving data from 71 respondents as the final analysis cohort. Of those, 43/71 (61%) worked in a tertiary or quaternary referral centre and the majority, 52/71 (73%), were male. Participants were relatively senior, with 58% describing themselves as at least eight years post-graduate. Only 8/71 (11%) were less than five years postgraduate. Just over half of the analysis cohort (38/71, 54%) had been CICM trainees for three or more years. Two of these eligible survey participants provided essentially no responses to any subsequent question, reducing to 69 individuals the cohort with answers on survey topics including confidence, competence, medical consensus, personal distress and supervision.

Self-perceived confidence in elements of end of life care

Overall, 54/69 (78%) respondents agreed or strongly agreed that they felt confident to make end-of-life care decisions at MET calls. Similarly, these CICM trainees agreed or strongly agreed that they felt both confident to have end-of-life discussions with patients and/or their next-of-kin (55/69, 80%), and to prescribe medication to aid symptom relief of the dying patient during MET calls (63/69, 91%). This was despite half of trainees (34/69, 49%) reporting no formal training in leading MET calls, and over two-thirds of respondents (48/69, 70%) reporting no formal training in palliative care.

Perceived barriers to the conduct of EOLC MET calls

There were often perceived barriers to communication about patient wishes at EOLC MET calls, with essentially all (68/69, 99%) respondents reporting that patients were commonly or very commonly unable to participate in their own end of life discussions due to their illness. It was a frequent finding (48/69, 70%) that patients' families or next-of-kin were often unavailable at the time of EOLC MET calls. A lack of access to a private meeting room for discussions was a common problem (43/69, 62%). In addition, most (47/69, 68%) trainees felt that time or resource constraints were a common or very common barrier to communication with patients/family at EOLC MET calls.

It was reported that medical consensus between the MET staff and the treating clinical team did not always occur, with a substantial proportion 28/69 (41%) of responses indicating that consensus was achieved rarely or only occasionally. Furthermore, one in five (15/69, 22%) ICU trainees reported frequently experiencing conflict or a negative encounter with another medical team during an EOLC MET call. An additional barrier noted was that at EOLC MET calls outside usual working hours, 43/69 (62 %) of trainees reported that the covering doctor rarely or never knew the patient.

Self- reported distress with EOLC MET calls

Almost two-thirds of respondents (45/69, 65%) reported emotional or moral distress during an EOLC MET call at least occasionally, with 14 (20%) of these reporting distress was frequent at such events. Respondents were asked to select from one or more of eleven specific categories regarding the most common reasons for distress during EOLC MET calls. The 71 respondents provided 240 responses with a median (IQR) of three (3 to 3) responses. The most commonly selected themes were (a) the treating clinical team had not discussed a poor prognosis with the patient or their next-of-kin, (b) patient suffering and (c) conflict or lack of consensus with another medical team (Figure 1). The least common of supplied reasons was lack of support from ICU, chosen only twice. In answer to a direct question, the majority (47/69, 68%) of respondents confirmed a sufficiency of senior supervision and support at EOLC MET calls was frequently or always present. However, one third of responses (22/69, 32%) described the ICU Consultant assistance as frequently or always provided.

Insert Figure 1 here.

Associations with trainee reported distress

A number of univariable associations with greater odds of trainee distress at EOLC MET calls were observed (Table 1). Unadjusted for any other influence, these included working in a tertiary hospital, female gender, greater trainee age, resource / time constraints, negative encounters with other medical teams, and the patient not being able to participate in discussions. Adjusted for the influence of each other within a multivariable logistic model (Table 1), independent predictors of a greater odds of trainee distress were greater trainee age, patient non-participation, resource/time constraints and negative encounters with other medical teams. Senior supervision, as well as formal training in MET, EOLC discussion and palliative care did not show strong univariable associations with a lower odds of distress (data not shown).

Insert Table 1 here.

Qualitative analyses of questions inviting free-text answers identified congruent themes (Table 2). Suggestions for improvement in EOLC MET calls included attention to recognition of end of life by treating home teams, with greater documentation of appropriate care planning.

Insert Table 2 here.

Discussion

Summary of findings

The present study of survey responses of CICM trainees in Victoria, Australia clarifies aspects of clinical care within RRS calls involving EOLC. These events are common but both incompletely characterized and important to the quality of patient care. The present anonymous and voluntary survey was relatively well supported by those eligible to participate, with the survey results providing evidence that trainees had confidence in managing EOLC MET calls. However, trainees

frequently perceived difficulties, to the point that distress amongst trainees at those events was not rare.

Comparison with previous studies

The clinical environment on hospital wards during a MET event poses unique challenges distinct to those experienced within the walls of the intensive care department, especially when dealing with discussions of limitations of medical treatments and the initiation of EOLC[8]. A recent systematic review highlighted that EOLC is commonly delivered during MET calls and likely occurs more often than life saving interventions such as endotracheal intubation or cardio-pulmonary resuscitation[9].

The present survey found barriers to communication at EOLC MET calls were commonly perceived to exist with patients, next-of-kin, and treating medical team members. There has been a growing understanding of the importance of early discussion of goals of care (GOC) to provide high quality EOLC and to avoid the use of non-beneficial life sustaining treatments towards the end of life[10]. This study highlights the importance of timing GOC discussions, with trainees frequently reporting barriers to communication after patient physiological deterioration has occurred. Trainees reported that patients were frequently no longer able to participate in conversations due to their illness and that patients and families often seemed unprepared for end-of-life events.

Of great concern, one fifth of ICU trainees reported frequently experiencing emotional or moral distress, and all trainees reported experiencing such distress at least on one occasion. Beyond studies evaluating general burn-out and post-traumatic stress within critical care staff[11], there is a growing appreciation of the impact of moral distress[12]. Issues arising around end-of-life may be the most common cause of moral distress in a clinical context[12, 13]. In particular, Hayver et al identify that the provision of futile treatments contributes to moral distress in physician trainees[14].

The results of the present Australian study also reflect the ethical issues associated with physician emotional and moral distress reported for MET teams in Italy[15]. Conflict with ward physicians and

dealing with families unprepared for EOLC were the most commonly experienced ethical issues. This supports findings of the present study where conflict with other medical teams was independently predictive of trainee distress when attending EOLC MET events.

The current survey's results suggest that Victorian ICU trainees do not identify a concern for the lack of formal training or senior supervision at EOLC MET events. Previous Australasian and North American data also describe low rates of training in MET and palliative care, as well as the lack of senior medical staff supervision when managing EOLC in a general ward environment[5, 16]. These potential problems may have been reduced by the relative medical seniority of the trainees participating in this survey.

An understandable focus to the present time has been on the training and staffing of the RRS efferent limb[2]. However, the themes identified in this study suggest that challenges to patient-centred care, moral distress in MET responders and conflict with treating home teams are more important issues for Victorian trainees than their professional confidence, supervision or possession of any formal training in either EOLC or MET processes. This is supported by the finding that greater trainee age and those working in tertiary hospitals experience more frequent distress. We propose their relative seniority may provide them with greater insight to the ethical and moral challenges faced.

Strengths and limitations

This survey has more clearly characterized aspects of EOLC within MET events which may be modified to improve patient, family and professional medical experiences at end of life events within our hospitals.

The strengths of this study include its addition of new data to expand the limited characterization of issues faced by doctors at EOLC MET calls. The study group includes both junior and senior trainees from a range of hospitals within the Victorian state health system. With a relatively high response

rate of 60% for a voluntary and anonymous survey, the findings may to a reasonable degree be representative of the Victorian CICM cohort, and by extension perhaps CICM trainees more widely in Australasia.

In common with similar surveys, these data also have limitations. Data collection was voluntary and conclusions are self-reported, both of which introduce the potential for bias. The characteristics of the non-responders remain unknown, leading to another potential source of bias. As well, the data sample only included Victorian CICM trainees and these medical staff may not be representative of different health systems using alternative RRS models. The present study also did not collect responses from critical care nurse members of the MET team or the medical and nursing staff on patient wards.

In the present study, only 27% of respondents were female whereas that proportion is approximately 41% in current CICM trainee records for Australia and New Zealand. Any under-representation of female CICM trainees may bias our observed results, as gender has been reported to influence the differential rate of moral distress in a critical care environment[13].

Further Study

Important areas for future study and quality improvement may include patient/family unpreparedness for EOLC and the associated potential conflict between medical teams and RRS teams. Implementation of policies such as the requirement for GOC documentation for all patients may facilitate earlier care goal discussions prior to the onset of substantial clinical deterioration. Predictive scores could be further developed to prospectively identify admitted patients with end of life care needs who are at high risk of deterioration[17]. Engagement in advanced care planning may improve person-centred care and may reduce potentially inappropriate MET team activation[8, 18].

Conclusions

Overall, Victorian intensive care trainees included in this survey reported confidence in the management of EOLC MET calls. However, distress at EOLC MET events was not rare among these relatively senior hospital medical staff, with a number of factors identified which appeared to independently influence that distress. Allocation of resources to improve patient preparedness for EOLC, such as advanced care planning, may result in reduced inappropriate MET team activation and improve the quality of EOLC provided.

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Figure 1. Histogram of counts of categories of distress reported by trainees at end-of-life MET events (n = 240 selections).

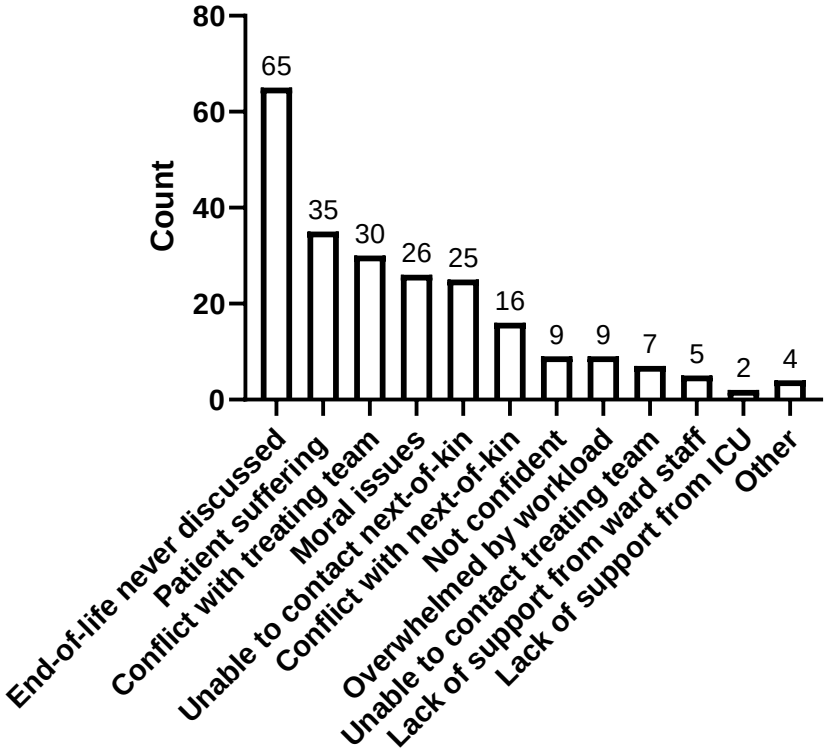

Table 1 Univariable (unadjusted) and multivariable (adjusted) associations of aspects of end-of-life MET events with self-reported trainee distress trainee distress more than rarely (at least occasionally).

		Univariable (unadjusted)			Multivariable (adjusted)		
Predictor	Reference	Odds ratio	95% CI	P	Odds ratio	95% CI	P
Tertiary or quaternary hospital	Acute regional or metropolitan hospital	4.1	1.4 - 12	0.008	3.9	0.7 - 21	0.11
Female	Male	3.9	1.0 - 15	0.05	3.1	0.4 - 25	0.29
Age of trainee							
30 – 39 y	20 - 29 y	7.0	2.0 - 24	0.002	6.6	1.1 - 38	0.03
≥ 40 y	20 - 29 y	19	1.9 - >100	0.01	99	1.2 - >100	0.04
Patient too ill to participate							
Very common	Common / sometimes	2.5	0.9 – 6.9	0.08	6.3	1.1 - 36	0.04
Resource and time constraints							
Common / very common	Sometimes or less	6.5	2.1 - 20	0.001	8.2	1.3 - 51	0.02
Medical consensus MET + treating team							
Frequent	Occasionally / rarely	0.5	0.2 – 1.4	0.16	3.1	0.5 - 19	0.23
After hours cover doctor knows patient							
Rare / never	Occasionally or more	2.2	0.8 – 6.1	0.13	2.5	0.4 - 15	0.32
Medical team negative encounter							
Occasional / frequent	Rare / never	13	3.9 - 44	<0.001	15	2.3 - >100	0.005

MET = medical emergency team

Multivariable logistic regression model for the binary outcome “trainee distress more than rarely (at least occasionally)”. Multivariable effect estimates adjusted for all model covariates included in the table.

Goodness -of-fit tests with 69 observations. Linktest hatsq P = 0.96; Pearson χ^2_{43} = 57.47, P = 0.069; Hosmer-Lemeshow χ^2_8 = 5.00, P = 0.76; Correctly classified 88%; Area under ROC curve = 0.93

Table 2. A summary of free text responses to questions on EOLC MET calls.

	Themes and examples of trainee comments
What are the three best aspects of managing an end of life care MET call?	*Benefit to the patient* "Providing comfort to the patient and their family" "Seeing the family and patient relieved that dignity and symptom alleviation are now the main priority" *Supporting staff* "Support for junior covering staff reduces their emotional distress" "Seeing ward staff relieved that their advocacy for the patient is being heard" *Facilitating goals of care discussions* "Ability to facilitate and direct end of life care decision making to produce the best outcome for the patient"
What are the three most challenging aspects of managing an end of life care MET call?	*Obtaining medical consensus* "Home team may not be on the same page and may not recognise the patient is dying" *Limitations of medical treatment not previously discussed or documented by home team* "When patients who have obvious life limiting illnesses have had no discussions around prognosis of their condition or treatment limitations" "Having discussions surrounding the patient's imminent mortality with relatives who are poorly prepared for this" *Ward staff not knowing patient* "Frustration at not knowing a patient and having difficulty getting a clear picture from a home team about their status and plan" "Senior home team medical staff familiarity with patients is lacking"
How can your experience during an end of life care MET call be improved?	*Improving limitation of medical treatment or having advanced care planning* "Better recognition by home teams of those at high risk of dying in hospital and early discussions about goals of care" "Making it a requirement that resuscitation plans are part of admission documentation, that way you are not commencing treatment limitation discussions in the midst of a MET call where the patient and/or their family may be distressed" *Providing further education and training* "Attending focused courses or simulation" *Palliative Care resources* "Palliative care pathway that can be accessed during these MET calls"

EOLC = end of life care

MET = medical emergency team

Appendix 1. End of Life Care MET Call Investigators and participating sites

The Alfred Hospital, L Tan, Austin Hospital, S Radford, Ballarat Hospital, M Kubicki, Bendigo Hospital, T Chimunda, Box Hill Hospital, P LeFevre, Cabrini Hospital, D Brewster, S Simpson, Dandenong Hospital, G Lukas, Epworth Richmond, L Padayachee, Frankston Hospital, K Haji, Geelong Hospital, D Green, Northern Hospital, A Ghosh, Royal Melbourne Hospital, T Rechnitzer, St Vincent's Hospital, T Haydon, Western Health, S Koottayi.

Appendix 2. Survey tool used to assess ICU trainee perspectives on EOLC MET calls

ICU Trainee Perceptions of EOLC MET Call Survey

DEMOGRAPHICS

	Regional or Outer Metropolitan	Tertiary
What type of hospital do you currently work in?	☐	☐

	Less than 12 months	1 to 2 years	3 or more years
How long have you been a registered ICU trainee of the College of Intensive Care Medicine?	☐	☐	☐

	PGY 4 or less	PGY 5 to 7	PGY 8 or more
How many years postgraduate are you?	☐	☐	☐

	20 to 29 years	30 to 39 years	40 years or older
What is your age group?	☐	☐	☐

For all the following questions an End of Life Care MET Call refers to a MET call where the patient requires end of life care or they have limits on medical treatment (LOMT) discussed or documented.

SELF PERCEIVED CONFIDENCE

For each of the following statements please select your level of agreement.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I feel confident to have end of life care discussions at MET calls with patients and/or next of kin.	☐	☐	☐	☐	☐
I feel confident to correctly prognosticate on end of life care issues at MET calls.	☐	☐	☐	☐	☐
I feel confident to make end of life care decisions at MET calls.	☐	☐	☐	☐	☐

	Usually immediately obvious	Less than 5 minutes	5 to 10 minutes	More than 10 minutes
On average, how long does it take for you to determine if the MET call will require end of life care decision making or discussion?	☐	☐	☐	☐

BARRIERS TO COMMUNICATION

In regards to end of life discussions with patients and families on the ward during MET calls, please indicate how frequently each of the following are an issue.

	Very Uncommon	Uncommon	Sometimes	Common	Very common
Access to private meeting room	☐	☐	☐	☐	☐
Patient unable to participate due to illness	☐	☐	☐	☐	☐
Family/NOK availability	☐	☐	☐	☐	☐
Resource and time constraints	☐	☐	☐	☐	☐
Other? Please state					

CLINICIAN AGREEMENT

	Never	Rarely	Occasionally	Frequently	Always
How often is there medical consensus between the MET team and the home team?	☐	☐	☐	☐	☐
In end of life care MET calls that occur after hours, how often does the cover doctor know the patient?	☐	☐	☐	☐	☐

REGISTRAR DISTRESS

	Never	Rarely	Occasionally	Frequently	Always
How often do you feel uncertain about what is the appropriate end of life decision?	☐	☐	☐	☐	☐
How often do you experience conflict or a negative encounter with another medical team in relation to end of life care MET calls?	☐	☐	☐	☐	☐
How often do you experience emotional or moral distress during an end of life care MET call?	☐	☐	☐	☐	☐

If you have experienced distress whilst attending an end of life care MET call, please select up to three (3) most frequent reasons for your distress.

- ☐ Unable to contact home team
- ☐ Unable to contact family
- ☐ Patient suffering
- ☐ Home team had not previously discussed poor prognosis with patient and family
- ☐ Do not feel confident to make end of life care decisions or feel uncertain about what the appropriate end of life care decision is.
- ☐ Moral issues, such as being in a situation where you feel that the ethically correct action to take is different from what you are being asked to do.
- ☐ Experiencing conflict with another medical team or the lack of medical consensus
- ☐ Lack of support from the ICU
- ☐ Lack of support from ward staff
- ☐ Overwhelmed by workload
- ☐ OTHER: Please specify……..

SUPPORT AND SUPERVISION

	Never	Rarely	Occasionally	Frequently	Always
How often do you feel you have sufficient senior supervision and support during end of life care MET calls?	☐	☐	☐	☐	☐
How often do you want to call the ICU consultant to assist with an EOLC MET call?	☐	☐	☐	☐	☐
How often does ICU consultant assist with an EOLC MET call?	☐	☐	☐	☐	☐

PALLIATIVE CARE

For each of the following statements please select your level of agreement.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I feel confident prescribing medication to aid symptom relief of the dying patient during MET calls.	☐	☐	☐	☐	☐
I have a structured approach to managing the dying patient during MET calls.	☐	☐	☐	☐	☐

TRAINING AND EDUCATION

	Yes	No
Have you ever had formal training in attending/leading MET calls?	☐	☐
Have you ever had formal training in communication for end of life discussions or advanced care planning?	☐	☐
Have you ever had formal training in palliative care and symptom relief?	☐	☐

What are the 3 best aspects of managing EOLC MET calls?

1.

2.

3.

What are the 3 most challenging aspects of managing an EOLC MET call?

1.

2.

3.

How could your experience during EOLC MET calls be improved?

1.

2.

3.

Armstrong, B. G. and M. Sloan (1989). "Ordinal regression models for epidemiologic data." American Journal of Epidemiology **129**(1): 191-204.

Abstract

Background: Hospital Medical Emergency Team (MET) activation events involving end of life care (EOLC) are common. The issues faced by medical staff attending these events are incompletely described.

Methods: We conducted an anonymous, voluntary, internet-based survey of registered trainees of the College of Intensive Care Medicine of Australia and New Zealand in May 2019. The participants eligible were those trainees working in an adult intensive care unit in Victoria, Australia during the study period. The main outcome measures were self-reported levels of confidence, barriers to communication, frequency of conflict and distress, senior support, supervision and access to training.

Results: Of 124 trainees surveyed, 75 (60%) responded. Overall, 78 % of respondents felt confident to manage EOLC MET calls, but the frequently reported barriers to effective patient / next of kin communication included 1) lack of private meeting rooms, 2) resource and time constraints and 3) lack of patient and family availability during a MET call to discuss medical treatment limitations. Two thirds of respondents reported emotional distress at least occasionally, this being frequent in one in five. Most trainees (68%) experienced conflict with other medical teams at least occasionally. Factors associated with experiencing distress at least occasionally include greater trainee age, patients' being unable to participate in discussion due to illness, resource and time constraints and negative encounters with other medical teams.

Conclusions: Victorian intensive care trainees were confident managing EOLC MET activation events. However, distress was reported commonly and strategies are required to address the areas of concern.

Key words

Hospital rapid response team, terminal care, psychological distress, critical care, quality of health care

ICU trainee perception of end of life care provided during medical emergency team activation events

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On behalf of the Victorian EOLC MET investigators.

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Declarations:

Dr Hannah Rotherham: No conflict of interest.

A/Prof Daryl Jones: No conflict of interest.

A/Prof Jeffrey Presneill: No conflict of interest.

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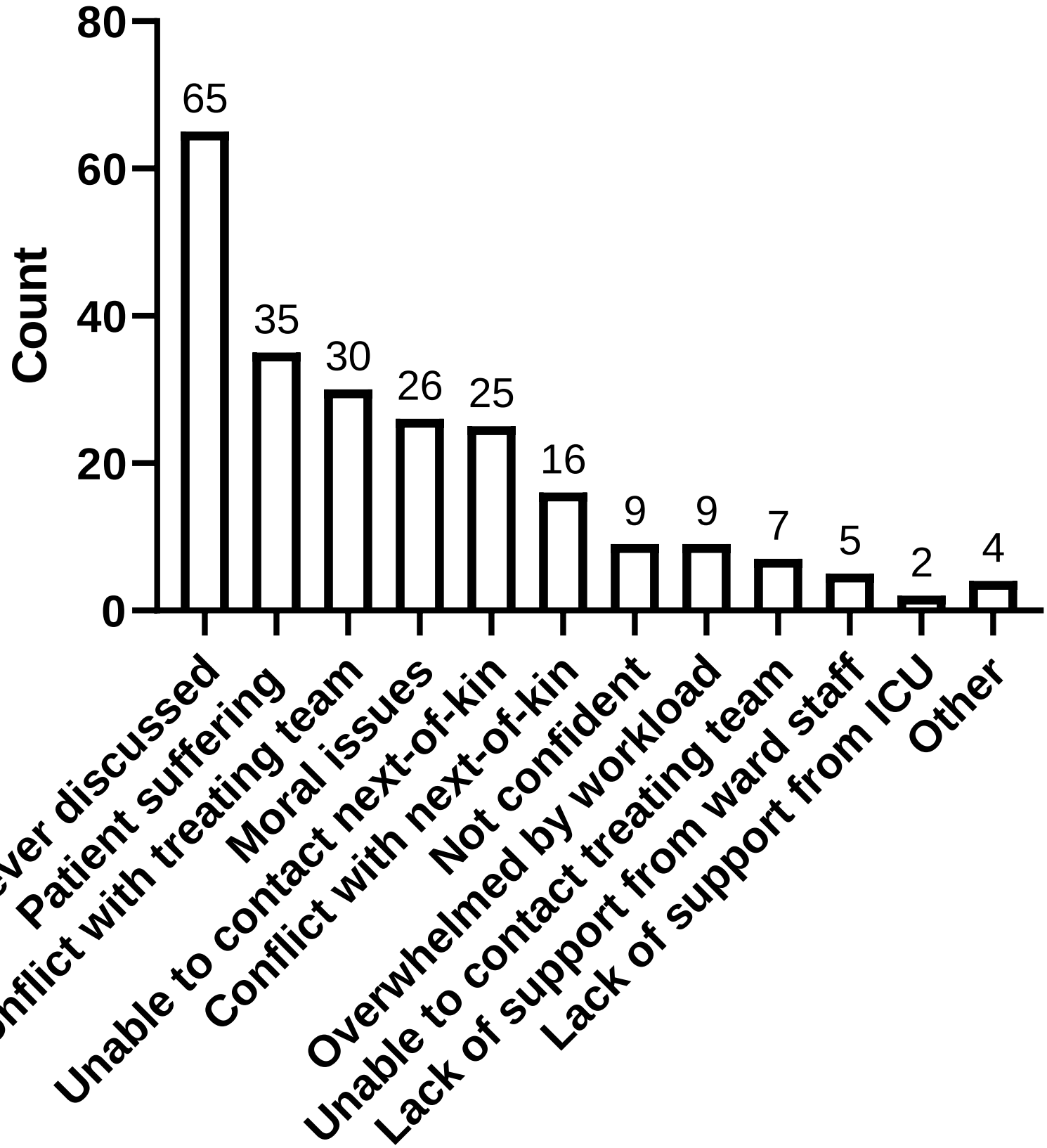

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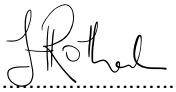
NAME: Hannah Rotherham ..... SIGNATURE: 

Additional comments: No conflict of interest .....

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3. Effective Date (07-August-2008): 22/10/2020

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5. Manuscript Title: ICU trainee perception of end of life care provided during medical emergency team activation events

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