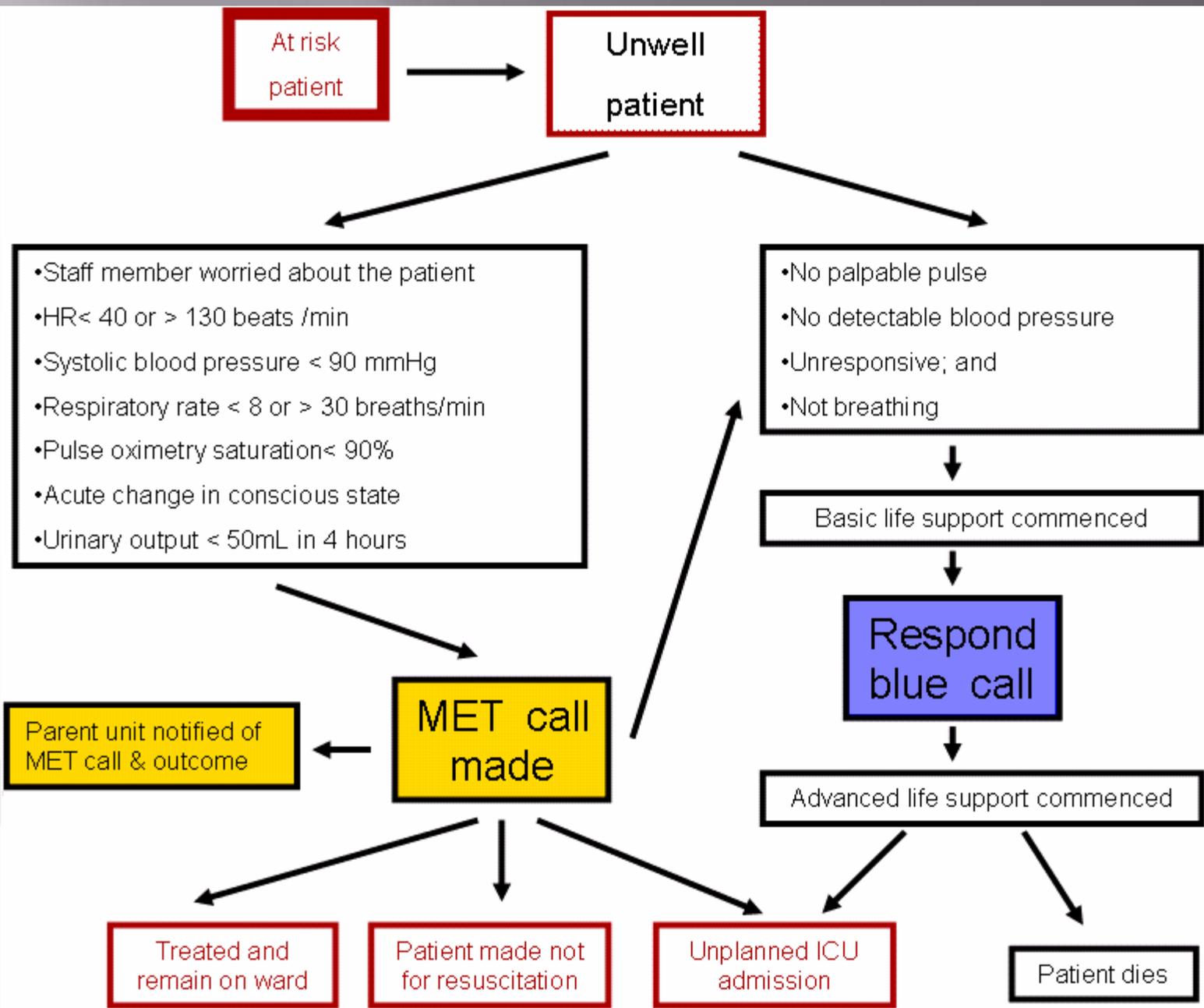


MEDICAL EMERGENCY TEAM EDUCATION: WHY - HOW - FOR HOW LONG?

Rinaldo Bellomo
Austin Hospital
Melbourne

The MET system is complex

- ▣ Especially in a teaching hospital, the MET system is complex
- ▣ It involves the triggering system (afferent limb)
- ▣ It involves the intervention system (efferent limb)
- ▣ It also involves a support system which enables function, quality improvement, problem identification, support and reflection (**Hospital wide education**)



At risk patient

Unwell patient

- Staff member worried about the patient
- HR < 40 or > 130 beats /min
- Systolic blood pressure < 90 mmHg
- Respiratory rate < 8 or > 30 breaths/min
- Pulse oximetry saturation < 90%
- Acute change in conscious state
- Urinary output < 50mL in 4 hours

- No palpable pulse
- No detectable blood pressure
- Unresponsive; and
- Not breathing

Basic life support commenced

Respond blue call

Advanced life support commenced

Parent unit notified of MET call & outcome

MET call made

Treated and remain on ward

Patient made not for resuscitation

Unplanned ICU admission

Patient dies

The RRT Support System at Austin

- ▣ 1. Medical supervisor (R.Bellomo)
- ▣ 2. Hospital nurse educator (D. Goldsmith)
- ▣ 3. ICU MET nurse education (K.Mitchener)
- ▣ 4. MET database/ monthly report (I. Mercer)
- ▣ 5. Charge Nurse Group link (M. Heland)

RRT support

- ▣ 6. MET system research fellow (D. Jones)
- ▣ 7. MET review group (R. Bellomo, D Goldsmith, K. Mitchener, M. Heland, S. Warrillow)
- ▣ 8. Clinical Governance Link (A. Kattula)
- ▣ 9. Senior Medical Staff link (M. Garwood)
- ▣ 10. Senior Nursing Staff link (M. Petty)

Medical supervisor

- ▣ Educates new medical staff about MET
- ▣ Educates ICU fellows
- ▣ Reviews their performance as MET fellow
- ▣ Provides mentorship to MET fellows
- ▣ Assists with complex MET calls as needed
- ▣ Together with MET fellows identifies system problems uncovered by MET which require “political” / “administrative” intervention.

System change

- ▣ Medical Supervisor takes newly identify system problem (eg nasogastric tube inserted into RM bronchus and feeding started at night) to Clinical Governance. From here to:
 - ▣ 1. Surgical Outcome Review Committee
 - ▣ 2. Clinical Outcome Review Committee
 - ▣ Process of system change begins

Nurse educator

- ▣ Gives regular feedback to ward about MET activity
- ▣ Gives regular lectures to ward staff on MET
- ▣ Educates all new nurses entering hospital to MET concept
- ▣ Educates all new ICU nurses and gives feedback to ICU nursing staff

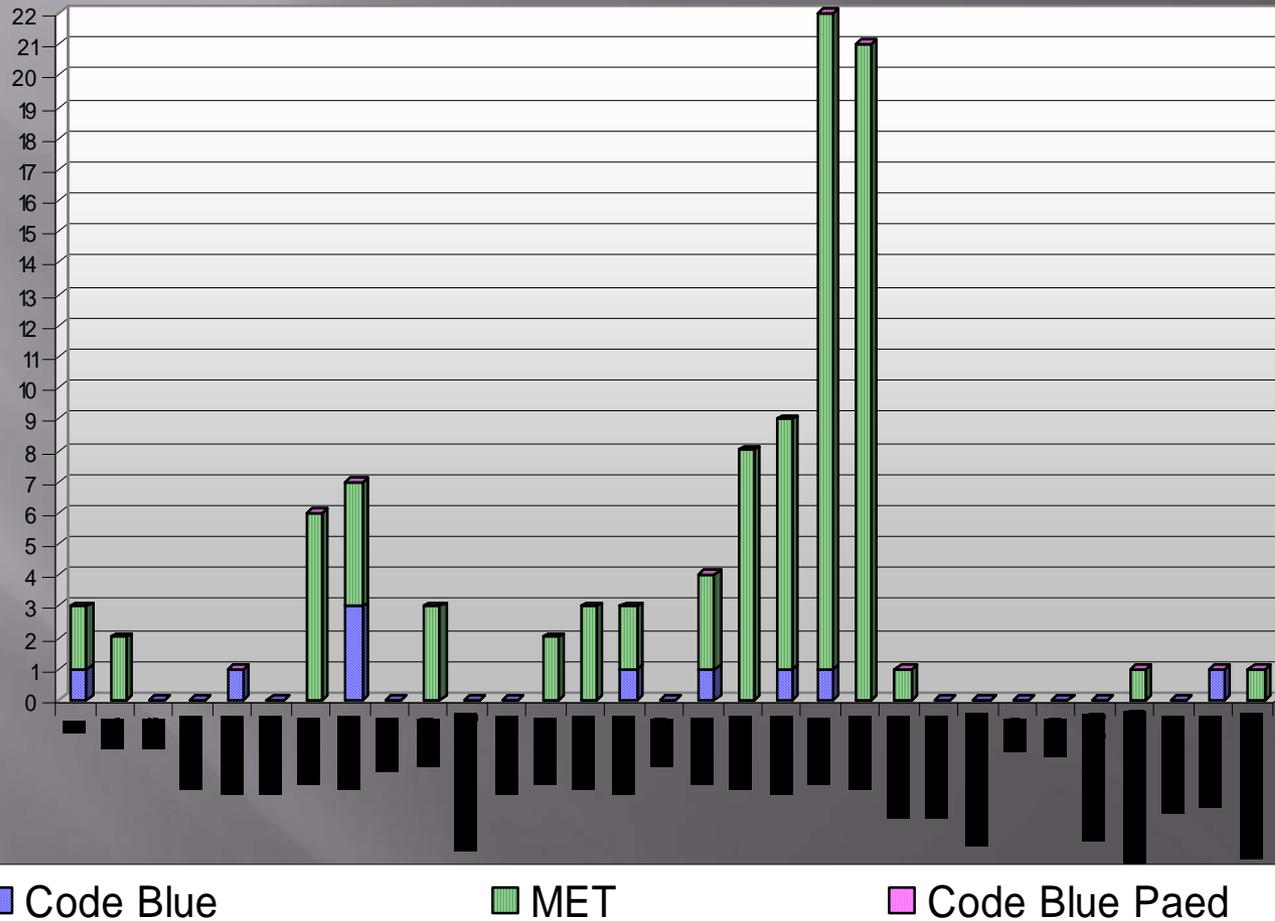
ICU Nurse Educator

- ▣ Trains ICU nurses to be part of MET
- ▣ Does MET simulation training sessions
- ▣ Teaches advanced resuscitation skills
- ▣ Develops nursing research projects in relation to MET
- ▣ Conducts nursing research

MET Database- Monthly report nurse

- ▣ Ensures all MET calls data are entered in computerized database
- ▣ Ensures completeness against ICU NUM shift report
- ▣ Generates monthly report
- ▣ Uses monthly report of all emergency activity (code blue calls and MET calls) to identify areas of concern

Emergency Calls by Department (Austin Hospital)



Charge Nurse link

- ▣ ICU NUM meets with all NUMs from hospital wards
- ▣ Issues of mutual concern discussed
- ▣ Adverse events reported
- ▣ Unsatisfactory MET responses identified
- ▣ Problems reported to MET review group

MET Research Fellow

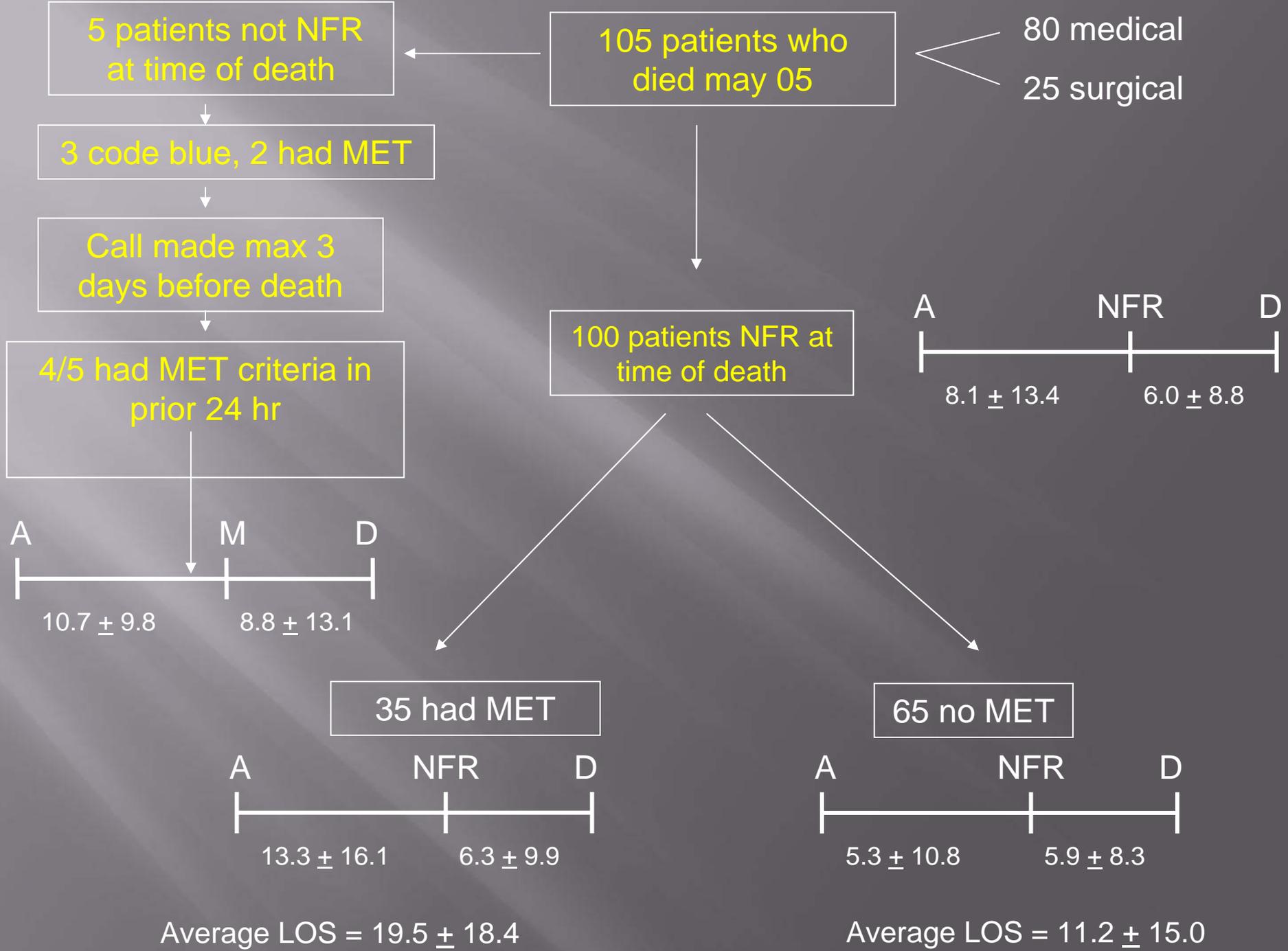
- ▣ Identifies all aspects of MET system which require research
- ▣ Designs research project with MET supervisor
- ▣ Obtains ethics approval
- ▣ Conducts research work with MET administrative team
- ▣ Develops manuscripts with MET supervisor

MET review group

- ▣ Meets to review issues related to MET
- ▣ Develops strategic plan to resolve them
- ▣ Develops plans for future developments
- ▣ Identifies hospital-wide issues that require involvement of governance
- ▣ Communicates with ward NUMs through open forum

Clinical Governance

- ▣ Co-ordinates process of hospital-wide system change
- ▣ **Reviews all hospital deaths**
- ▣ Develops root-cause analysis for problem areas identified by MET
- ▣ Takes findings to executive committees
- ▣ Liaises with Board and CEO



5 patients not NFR at time of death

105 patients who died may 05

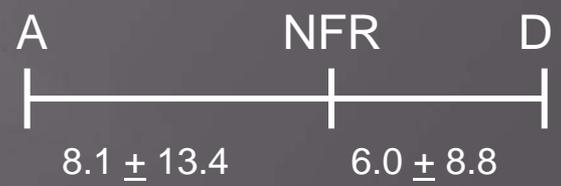
80 medical
25 surgical

3 code blue, 2 had MET

Call made max 3 days before death

4/5 had MET criteria in prior 24 hr

100 patients NFR at time of death



35 had MET

65 no MET



Average LOS = 19.5 ± 18.4

Average LOS = 11.2 ± 15.0

ORIGINAL ARTICLE

Effect of an education program on the utilization of a medical emergency team in a teaching hospital

D. Jones,^{1,3} S. Bates,² S. Warrillow,² D. Goldsmith,² A. Kattula,¹ M. Way,¹ G. Gutteridge,² J. Buckmaster² and R. Bellomo²

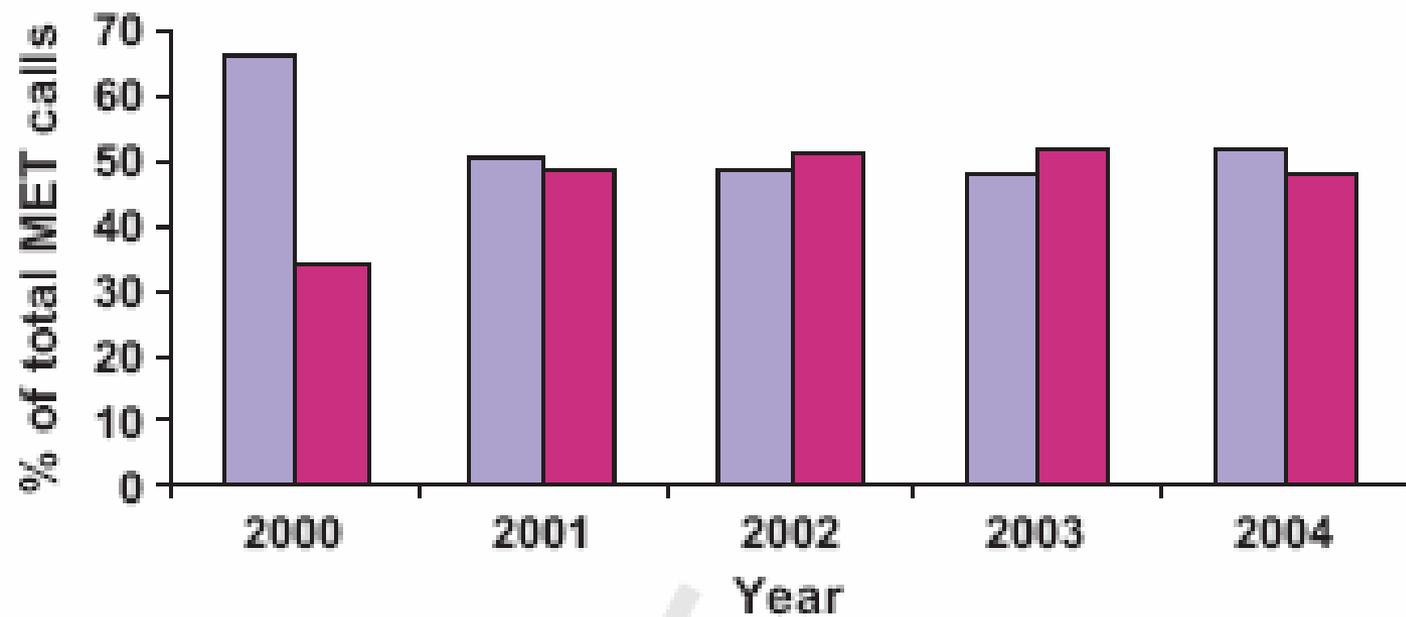
¹Clinical Governance Unit, ²Department of Intensive Care and Department of Surgery, Melbourne University, Austin Hospital, ³Department of Intensive Care, Monash University, The Alfred Hospital, Commercial Road, Melbourne, Victoria, Australia

Aims: To determine the effect of a detailed education program on the rate of utilization of the MET system 3.5 years after its introduction in a University teaching hospital.

Methods: Prospective interventional study involving a detailed program of education, feedback and decision support for nursing and medical staff given before, during and after implementation of a MET system. We measured the number of MET calls per month for both medical and surgical patients for 109 250 consecutive admissions to the acute care campus of Austin Health from August 2000 to June 2004.

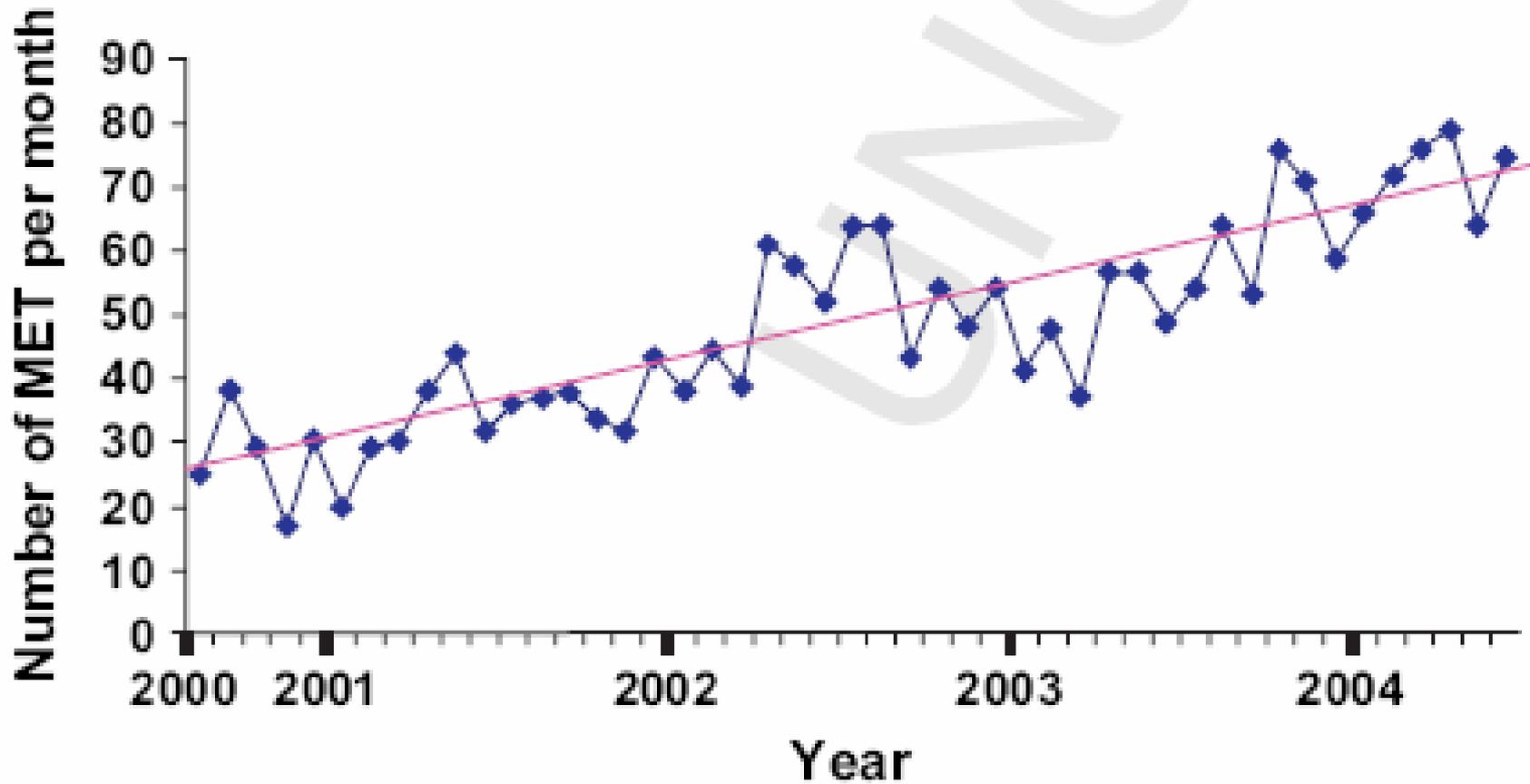
Outcome measures and results: Overall activation of the MET increased from 25 calls per month to a peak of 79 calls per month over the study period (average increase of one MET call/month). After standardization for monthly admissions, the increase in MET utilization for surgical patients (increase by 1.13 MET/1000 admissions/month) was 4.9-fold greater than for medical patients (increase by 0.23 MET/1000 admissions/month; $P < 0.0001$). At the peak level of activity (April 2004), the MET was called to review 8.4% of surgical and 2.7% of medical admissions ($P < 0.0001$).

Conclusions: There was a progressive increase in the utilization of the MET service in the 3.5 years after implementation, with the rate of uptake 4.9 times greater for surgical than for medical patients. Sustained uptake of the MET system is possible, but increased utilization may take several years to develop. Short-term studies testing the efficacy of the MET system are likely to significantly underestimate its effect on reducing adverse events. Intensive care unit resource adjustments will become necessary to meet increased demand.

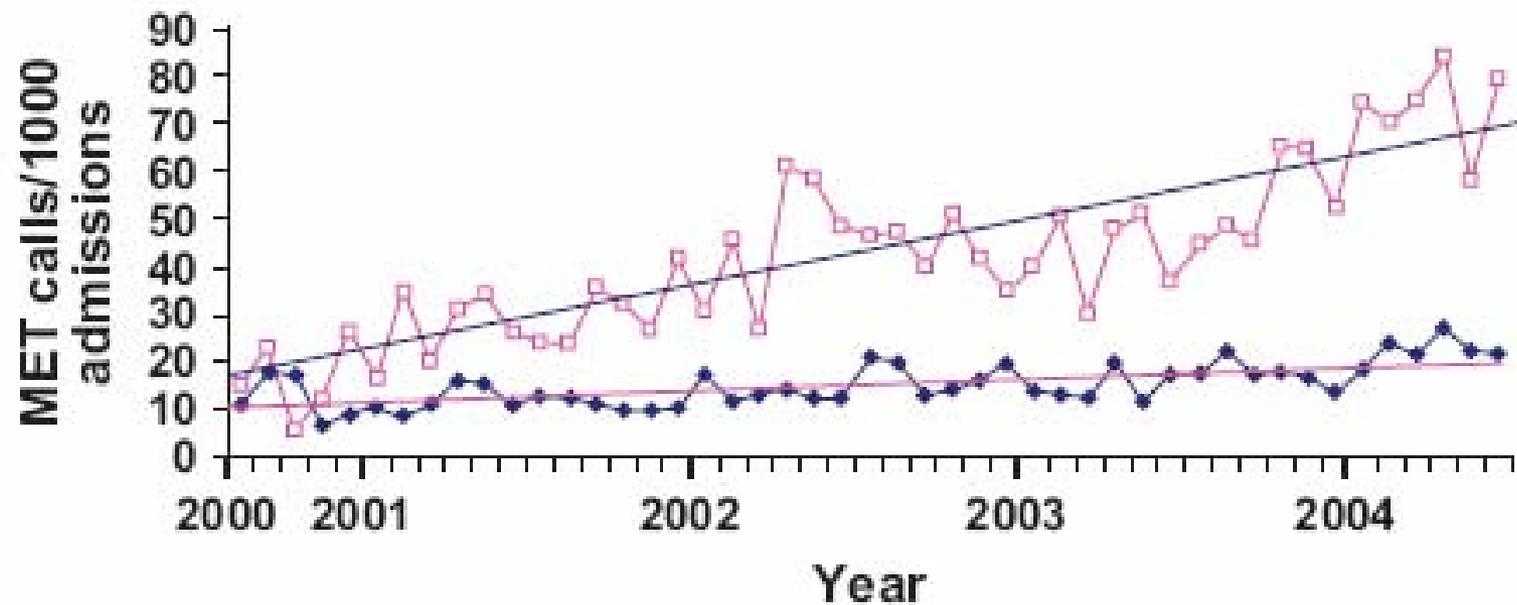


Color Figure

Figure 4 Comparison of use of MET for medical (■) and surgical (■) patients over study period before adjustment for number of admissions.



Monthly calls in 2008: 157



Major increase over time is in surgical patients

Does education affect nursing attitudes?

Quality & Safety in Health Care **qc16956** Module 1 24/10/06 11:05:16

Topics:

1

ORIGINAL ARTICLE

Nurses' attitudes to a medical emergency team service in a teaching hospital

D Jones, I Baldwin, T McIntyre, D Story, I Mercer, A Miglic, D Goldsmith, R Bellomo

Background: Cultural barriers including allegiance to traditional models of ward care and fear of criticism may restrict use of a medical emergency team (MET) service, particularly by nursing staff. A 1-year preparation and education programme was undertaken before implementing the MET at the Austin Hospital, Melbourne, Australia. During the 4 years after introduction of the MET, the programme has continued to inform staff of the benefits of the MET and to overcome barriers restricting its use.

Objective: To assess whether nurses value the MET service and to determine whether barriers to calling the MET exist in a 400-bed teaching hospital.

Methods: Immediately before hand-over of ward nursing, we conducted a modified personal interview, using a 17-item Likert agreement scale questionnaire.

Table 1 Responses to "Survey of nurses attitudes to the MET"*

	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
1. Patients in the hospital have complex medical problems (n = 347)	0.3	2.0	1.4	34.9	61.4
2. The MET prevents unwell patients from having an arrest (n = 350)	0.6	4.6	3.7	38.0	→ 53.1
3. The MET allows me to seek help for my patients when I am worried about them (n = 349)	0	0.9	1.7	28.7	→ 68.8
4. The MET is not helpful in managing sick patients on the ward (n = 350)	49.1	38.9	4.6	4.6	2.9
5. When one of my patients is sick I call the covering doctor before calling a MET (n = 343)	1.7	9.0	17.2	58.0	14.0
6. If I cannot contact the covering doctor about my sick patient I call a MET (n = 345)	1.7	6.4	10.7	47.8	33.3
7. I am reluctant to call a MET on my patients because I will be criticised if they are not that unwell (n = 350)	35.4	46.3	8.3	→ 8.0	2.0
8. MET calls are required because the management of the patient by the doctors has been inadequate (n = 350)	16.6	48.0	16.3	15.4	3.7
9. MET calls are required because the management of the patient by the nurses has been inadequate (n = 351)	38.2	48.7	6.6	4.8	1.7
10. I would call a MET on a patient I am worried about even if their vital signs are normal (n = 351)	1.1	19.4	23.6	41.9	14.0

Table 1 Responses to "Survey of nurses attitudes to the MET"*

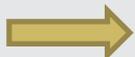
	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
11. I think that the MET is overused in the management of hospital patients (n = 350)	43.4	42.9	9.7	2.9	1.1
12. I don't like calling MET because I will be criticised for not looking after my patient well enough (n = 350)	51.4	44.0	3.1	0.9	0.6
13. MET calls reduce my skills in managing sick patients (n = 351) 	51.0	43.6	3.4	0.9	1.1
14. Using the MET system increases my work load when caring for a sick patient (n = 351)	39.9	44.4	6.6	8.3	0.9
15. The MET can be used to prevent a minor problem from becoming a major problem (n = 347)	1.4	2.6	3.2	37.5	55.3
16. If my patient fulfils the listed MET criteria but does not look unwell I would not make a MET call (n = 349)	22.1	39.5	22.6	13.8	2.0
17. MET calls teach me how to better manage sick patients in my ward (n = 350)	2.9	12.0	14.3	53.7	17.1

Table 3 Categorisation of additional comments

Category	Number of comments
It is reassuring to have the MET as back-up when managing sick patients	52
The MET improves outcome or prevents deterioration	28
MET calls are required because of doctor inexperience or poor management	23
I have been criticised or fear criticism for making a MET call	14
The MET teaches me how to manage sick patients	10
MET calls are required because of poor nursing management	8
I have not been involved in a MET call	7
The MET staff are friendly, patient, and approachable	7
The MET helps establish a management plan for unwell patients	6
I would consult others (registrar other nurse) before making a MET call	5

Do nursing attitudes affect call rates?

The effectiveness of implementation of the medical emergency team (MET) system and factors associated with use during the MERIT study

Michelle A Cretikos, Jack Chen, Ken M Hillman,
Rinaldo Bellomo, Simon R Finfer, Arthas Flabouris
and the MERIT study investigators

Methods: Surveys were conducted on the nursing staff from the general adult wards of all 12 MERIT study intervention hospitals after the 4-month implementation period and again after the 6-month study period. Hospital-level variables were assessed for their correlation with MET utilisation. We measured awareness and understanding of the MET system, attendance at a MET education session, knowledge of the activation criteria, intention to call the MET, attitude to the MET system and the level of MET utilisation.

Results: Across the 12 intervention hospitals, a median of 85.6% (interquartile range, 81.3%–88.8%) of MET activations were not related to a cardiac arrest or death. This measure of MET system utilisation varied significantly across the 12 hospitals ($P = 0.002$), and was significantly associated with knowledge of the activation criteria ($P = 0.048$), understanding of the purpose of the MET system ($P = 0.01$), perceptions of the hospital's readiness for a change in the way care was provided ($P = 0.004$), and an overall positive attitude to the MET system ($P = 0.003$).

Conclusions: Measures of the process of implementation of the MET system were significantly associated with the level of MET system utilisation.

Table 3. Correlation between hospital-level response to statements about the MET and hospital level of MET utilisation

Statement about the MET	Correlation coefficient*	<i>P</i>
Heard about MET	0.41	0.18
Attended a MET education session	0.57	0.06
Number of activation criteria correctly identified	0.58	0.048
I understand the purpose of the MET	0.69	0.01
Hospital will be able to adopt the MET	0.18	0.57
I have been given adequate information about the MET	0.56	0.06
I would call a MET	0.57	0.05
Hospital is ready for a change in the way care is provided	0.76	0.004
It would be difficult for me to decide to call the MET	-0.28	0.38
MET implementation in this hospital is a bad idea	-0.24	0.46
The MET system offers significant advantages	0.45	0.15
I feel a lack of support for the MET system	0.05	0.88
The MET system is irrelevant to my clinical practice	0.26	0.42
I would feel uncomfortable calling the MET	-0.19	0.56
It is important to have a system like MET	0.55	0.06
My overall attitude to MET is positive	0.78	0.003

Education

- ▣ The journey never ends
- ▣ The system is horribly imperfect (there are people in it)
- ▣ What we are doing at Austin is vastly better than when we started...but not good enough
- ▣ We need to do so much more....and only a persistent targeted and informed educational program can do it

Education targets

- ▣ Clinical Governance
- ▣ Medical Supervisor
- ▣ Senior colleagues
- ▣ Junior colleagues
- ▣ Senior Nursing staff
- ▣ Junior Nursing staff
- ▣ Team members
- ▣ ICU nurses

Conclusions

- ▣ Although a lot of attention within RRT systems is focused on “the efferent” limb of the MET system **EDUCATION** is just as important
- ▣ Without education the MET is just a band-aid
- ▣ **Only by linking the MET with an educational processes and strategies can one improve the system and prevent more MET calls**

Evolution

- ▣ We thought we had to put a MET in place and all would be ok – we were wrong
- ▣ We have learned education was vital
- ▣ We have learned that education must never stop
- ▣ We have learned that targeting all people and all aspect of the process is vital
- ▣ We now think that **MET = Medical Education Team**

So..why, how and how long?

- ▣ **Why?** -Because if you do not, the RRT system will either fail or work sub-optimally
- ▣ **How?:** in every possible way (lectures, grand rounds, tutorials, simulation, data collection, data presentation, research)
- ▣ **How long?:** until hospitals exist.