Palliative care teams in the intensive care unit: a randomised, controlled, feasibility study

Winston Cheung, Ghauri Aggarwal, Elizabeth Fugaccia, Govindasamy Thanakrishnan, David Milliss, Rachel Anderson, David Stock, Helen Bird, Jeff Tan and Amelia C Fryc

ABSTRACT

Objectives: To determine whether palliative care teams can improve patient, family and staff satisfaction for patients receiving end-of-life care in the intensive care unit and reduce surrogate markers of health care costs.

Design: Randomised controlled, feasibility study.

Setting: 14-bed general ICU over 29 months in 2006–2008.

Participants: Patients admitted with a terminal or pre-terminal condition, for whom the treating intensivist considered that escalating or continuing treatment was unlikely to achieve significant improvement in the patient's clinical condition.

Intervention: A consultation from a palliative care team, in addition to usual ICU end-of-life care.

Main outcome measures: ICU and hospital length of stay, and changes in composite scores of satisfaction obtained from questionnaires administered to families, nursing staff and intensivists.

Results: The study was constrained by significant logistical and methodological problems, including low recruitment and questionnaire completion rates, and the lack of an available validated questionnaire. From a total of 2009 admissions over a 29-month period, 20 patients were enrolled, 10 in each group. There were significant differences in baseline characteristics. There were no statistically significant differences between those who had a consultation with the palliative care team and those who did not in median ICU length of stay (3 days v 5 days, $P = 0.97$), median hospital length of stay (5 days v 11 days, $P = 0.44$), or changes in overall composite satisfaction scores reported by families (–6% v –6%, $P = 0.91$), nursing staff (+5% v +15%, $P = 0.30$), and intensivists (–2% v +2%, $P = 0.42$).

Conclusion: This feasibility study was difficult to conduct and did not generate any robust conclusions about the utility of involving palliative care teams in end-of-life care in the ICU. Larger studies are technically possible but unlikely to be feasible.

Trial registration: Australian Clinical Trials Registry ACTRN012606000110583.

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Many problems exist in management of patients at the end of life in the ICU, involving a complex interplay between patients, their surrogates and families, technology, and treating medical teams.[1-4] In other settings, palliative care teams have been shown to improve many outcome measures,[5,6] but little research has been done into their benefits in the ICU. Palliative care intervention in the ICU may reduce the time to initiate comfort treatment, shorten hospital length of stay,[7,8] and reduce unnecessary investigations and interventions. However, drawbacks include the potential for miscommunication and disagreement between teams, and ICU teams absolving themselves of responsibility for dealing with "difficult" patients.[9]

Because of the known benefits of palliative care teams and the paucity of studies of these teams in the ICU, we undertook a feasibility study to determine:

- whether palliative care teams improve patient, family, and staff satisfaction with end-of-life care in the ICU; and
- whether palliative care teams reduce surrogate markers of health care costs.

Methods

The study was a single-centre, unblinded, randomised controlled feasibility trial conducted between May 2006 and October 2008. The initial trial period of 24 months was extended to 29 months because of slow recruitment. Patients were recruited from an intensivist-led, 14-bed general ICU in an urban, tertiary hospital, which admitted about 800 patients per year.

Participants

Patients were eligible for the study if the treating intensivist indicated to the patient or the patient's surrogate that they believed treatment should not be escalated or should be withdrawn. Patients were then screened for inclusion and exclusion criteria (Appendix 1), and enrolled in the study if they fulfilled these selection criteria.

Randomisation and intervention

Patients were randomly allocated to an intervention or control group. Allocations were computer-generated by an

independent statistician using the biased coin technique, and stored sequentially in sealed envelopes.

The intervention was a consultation and subsequent management by a palliative care team. This team comprised a physician, registrar, resident and clinical nurse consultant, and undertook ward rounds daily. The first consultation occurred within 24 hours of randomisation.

The intervention was provided in addition to usual ICU care commensurate with the patient's medical condition. The control group received usual ICU care but no palliative care consultation.

Outcome measures

The primary outcome measures were ICU and hospital length of stay and change in composite scores for satisfaction with quality of care of families, intensivists, and bedside nursing staff. Satisfaction was assessed by a questionnaire administered at the time of randomisation and again after the patient had died or been discharged from the ICU.

Secondary outcome measures were ICU and hospital mortality, the number of medical teams caring or consulting for the patient, and changes in individual domain scores from the questionnaires.

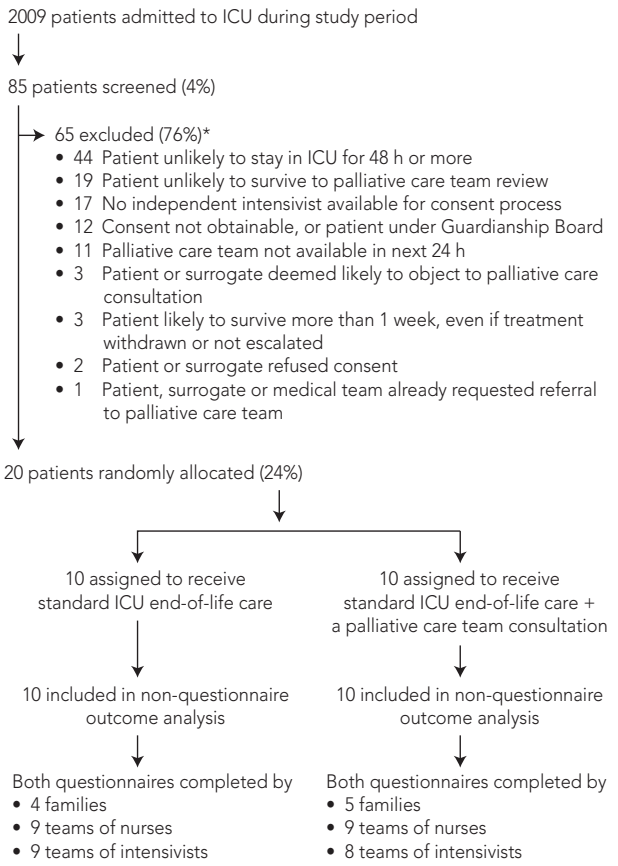
Questionnaires

More than 25 measurement instruments were available to evaluate the quality of end-of-life care,[10,11] but we could not identify an ICU-validated questionnaire that could be administered to families and staff both before and after a patient's death. Consequently, we developed two new questionnaires, based on seven quality indicator domains for end-of-life care suggested by the Robert Wood Johnson Foundation Critical Care End-of-Life Peer Workgroup[12] (Appendix 2 and Appendix 3). Respondents were asked to circle a score on an analogue scale (range, 1–9) for each question, and scores were totalled to derive a composite score. The questionnaires were administered to patients' families, nursing staff and intensivists immediately after randomisation and again after the patient had died or been discharged from the ICU.

Ethical issues

Written consent was obtained for the administration of the questionnaires to patients, family and staff, but consent for the intervention process was waived by the institutional ethics committee. Detailed discussion of the ethical issues is beyond the scope of this report, but approval of the study was based on the National Health and Medical Research Council *National statement on ethical conduct in research involving humans* (1999), which acknowledges that, in some fields of research, there are exceptional circumstances where studies cannot be conducted without deception.[13,14]

Figure 1. Recruitment and flow of patients through the study



* More than one exclusion criterion may have been present.

Sample size

About 70 patients died in the study ICU each year. It was predicted that the greatest impediments to enrolment would be lack of an independent intensivist to obtain consent outside usual working hours, the requirement that the patient stay in the ICU for at least 48 hours after the enrolment discussion, and refusal of consent. Initially, we planned a 2-year study duration. If 50% of end-of-life discussions occurred outside usual working hours, and 30% of the remaining patients fulfilled the inclusion and exclusion criteria, then 20 patients would be enrolled during this period.

Statistical analysis

Analysis was by intention-to-treat except for data derived from questionnaires. Non-questionnaire data were analysed using Fisher's exact test and the Mann–Whitney test (SPSS version 13.0, SPSS Inc, Chicago, Ill, USA, 2004). For questionnaire data, the Wilcoxon signed rank test was used to assess within-group differences; the Mann–Whitney test was used

to assess between-group differences in average change over the course of the study, and the ANCOVA was used to assess expected change where baseline scores were the same.

Results

Recruitment

Recruitment and flow of patients through the study are summarised in Figure 1. From a total of 2009 admissions, 85 patients were screened for the selection criteria, and 20 were enrolled in the study. Nine families (45%) completed and returned both the initial and second questionnaire. For one patient, neither questionnaire was given to family or staff as the patient died suddenly soon after the enrolment discussion. For another patient, we decided not to administer the second questionnaire to family or staff as the patient died 24 hours after enrolment.

Nursing staff and intensivists completed and returned both questionnaires for 18 patients (90%) and 17 patients (85%), respectively. One patient was discharged alive to the ward 24 hours after the enrolment discussion, and we decided not to administer the second questionnaire to the same intensivist.

Baseline characteristics

Patients allocated to standard ICU end-of-life care were younger, were more likely to be female, and had higher APACHE II scores than those allocated to receive a consultation with the palliative care team (Table 1). The intensivist's management intent was to limit escalation of treatment in the

Table 1. Baseline characteristics of patients in the ICU, by treatment group*

	No palliative care consultation ($n = 10$)	Palliative care consultation ($n = 10$)
Average age, years	72	81
Median age, years (IQR)	74 (20)	83 (14)
No. not admitted from operating theatre (OT)	9 (90%)	9 (90%)
Admission code for those not admitted from OT		
Cardiovascular	2	1
Gastroenterology	1	0
Neurology	1	0
Respiratory	1	5
Sepsis	2	2
Trauma	1	1
Other	1	0
Male sex, no.	3 (30%)	5 (50%)
Mean APACHE II score (SD)	31 (8)	27 (5)
Intent of treatment		
Non-escalation	7 (70%)	8 (80%)
Withdrawal	3 (30%)	2 (20%)

IQR = interquartile range.
* Values are number of patients (%) unless otherwise indicated.

Table 2. Outcomes for patients in the ICU, by treatment group

	No palliative care consultation ($n = 10$)	Palliative care consultation ($n = 10$)	*P*
Median ICU length-of-stay, days (IQR)	5 (8)	3 (7)	0.97
Median hospital length-of-stay, days (IQR)	11 (27)	5 (8)	0.44
No. of patients who died in the ICU (%)	6 (60%)	5 (50%)	1.00
No. of patients who died in hospital (%)	7 (70%)	9 (90%)	0.58
Median no. of medical teams caring for patient (IQR)	5 (5)	5 (5)	1.00

Table 3. Average overall composite scores of satisfaction with patient management given by family, nursing staff and intensivists, by treatment group

	No palliative care consultation			Palliative care consultation				
Satisfaction score	Before ($n = 4$)	After ($n = 4$)	Difference (%)	Before ($n = 5$)	After ($n = 5$)	Difference (%)	*P**	*P*†
Family score (possible range, 20–180)	161	151.5	–9.5 (–6%)	153.8	144.8	–9 (–6%)	0.91	0.56
Nursing staff score (possible range, 11–99)	69.4	79.6	10.1 (15%)	70.4	74.2	3.8 (5%)	0.30	0.23
Intensivist score (possible range, 11–99)	81.5	83.2	1.7 (2%)	76.8	75.6	–1.3 (–2%)	0.42	0.008

* Between-group *P* for Mann–Whitney test. † Between-group *P* for ANCOVA.

majority of patients in each group, and to withdraw treatment altogether in five of the 20 patients.

Outcomes

Of 20 patients enrolled, 11 died in the ICU and 16 died in hospital (Table 2). Of the four surviving patients, three were discharged to nursing homes, and one was transferred to a private hospital. The intent of treatment in all four patients was non-escalation rather than withdrawal. There were no significant differences between the control and intervention groups in median ICU length of stay (5 days v 3 days, P= 0.97), or hospital length of stay (11 days v 5 days, P=0.44).

We found no significant differences in average overall composite satisfaction scores between the control and intervention groups for families (–6% v –6%, P=0.91), nursing staff (+15% v +5%, P=0.30), or intensivists (+2% v –2%, P=0.42), using the Mann–Whitney test (Table 3). The difference in intensivists' composite satisfaction scores was significant only using the ANCOVA test (P=0.008).

We also found no significant differences between the control and intervention groups in ICU mortality (60% v 50%, P=1.00), hospital mortality (70% v 90%, P=0.58), or median number of medical teams caring for the patient (5 v 5, P= 1.00). The secondary outcomes of changes to individual domain scores for satisfaction are detailed in Appendices 4, 5 and 6.

Discussion

This feasibility study is the first randomised controlled trial that has attempted to examine the effect of palliative care teams on end-of-life care in the ICU. The study was difficult to conduct, and no robust conclusions can be drawn from the results. A significant problem was the lack of statistical power. Recruitment for the study was lower than predicted, with only 4% of all ICU patients being considered for enrolment, and only 1% actually being enrolled.

The stringent inclusion and exclusion criteria were major impediments to recruitment. Many patients were not considered for enrolment as it was predicted that, following treatment withdrawal, the patient would be discharged from the ICU within 48 hours. However, over half the 85 patients actually screened were excluded from the study for the same reason. The 48-hour cut-off was chosen as it was hypothesised that palliative care teams would require at least this period of time to exert any beneficial effect, but, in reality, many patients receiving end-of-life care are discharged from the ICU within this time frame.

In addition, a significant proportion of screened patients (22%) were not enrolled as we predicted they would not survive to review by the palliative care team. The lack of an independent intensivist to obtain consent outside usual working hours also significantly reduced the number of enrolments. Other major reasons for patient exclusion were inability to obtain consent and lack of availability of a palliative care team to consult in the 24 hours after screening.

The low completion rate for questionnaires administered to families (45%) was understandable given the emotion surrounding end-of-life care of a loved one. Using satisfaction as a primary outcome, given that improvement is probably not likely to be clinically relevant until it reaches at least 10%, and assuming a study non-completion rate of 55%, baseline satisfaction rate of 80%, significance of 0.05 and power of 0.80, a future study would require 1400 patients.

The optimal study design to minimise contamination, bias and any Hawthorne effect was uncertain. A cluster-randomised design was not considered because of the requirement for multiple sites. The hospital had only one ICU, and therefore a parallel-group design was not possible, and, as future studies would likely necessitate a multicentric approach, a "before-and-after" design was not deemed optimal.

The choice of outcome measures was also difficult. Usual indicators of ICU care, such as mortality, are not relevant to palliative care studies. It was not certain which patient-centred variables were the most important, and thus overall satisfaction was used. However, the use of satisfaction as a measure of outcome may be problematic where high-quality care is already provided. The lowest of any composite satisfaction rating from families was 144.8 on a scale of 20–180, and a ceiling effect may have prevented further improvements in outcome becoming evident. As the use of palliative care teams has resource implications, we attempted to assess length of stay as a surrogate marker of cost, but this approach may not be valid.

The lack of a validated tool was also a difficulty. The study tested a new questionnaire, which had the advantage of prospectively collecting standardised information at two stages of the end-of-life process, thereby reducing the recall bias that results from use of a single retrospective questionnaire. Unfortunately, even if a validated tool were available, it would have to show a larger separation between groups to reduce the required sample size for a larger study.

Finally, prognostication for study entry appears to have been difficult, as evident by patients dying earlier than expected or being discharged from hospital alive.

Conclusion

This feasibility study was difficult to perform for many logistical and methodological reasons, as well as the end-of-life setting. It did not generate any robust conclusions about the involvement of palliative care teams in the end-of-life care of patients in the ICU. Recruitment and ques-

tionnaire completion rates were low and are unlikely to be able to be improved significantly. The optimal study design and outcome measure remain uncertain, and the measurement instrument requires validation before further use. Larger studies in this area are technically possible but currently are unlikely to be feasible.

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Author details

Winston Cheung, Intensivist[1]
Ghauri Aggarwal, Director[2]
Elizabeth Fugaccia, Intensivist[1]
Govindasamy Thanakrishnan, Intensivist[1]
David Milliss, Director[1]
Rachel Anderson, Nursing Unit Manager[1]
David Stock, Registered Nurse[1]
Helen Bird, Registered Nurse[1]
Jeff Tan, Research Manager[1]
Amelia C Fryc, Registered Nurse[1]

1 Department of Intensive Care, Concord Repatriation General Hospital, Sydney, NSW.
2 Department of Palliative Care, Concord Repatriation General Hospital, Sydney, NSW.

Correspondence: winston.cheung@email.cs.nsw.gov.au

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Appendix 1. Inclusion and exclusion criteria

Inclusion criteria

Patients were enrolled if they fulfilled all the following criteria:

- The patient was aged 18 years or older.
- The patient had a pre-terminal or terminal condition, and the duty intensivist and parent treating teams believed that continuing current treatment or escalating treatment was unlikely to result in a significant improvement in the patient's medical condition.
- The duty intensivist deemed it appropriate that a not-for-resuscitation (NFR) order be written for the patient.
- The patient was deemed unlikely to survive more than 1 week if treatment was either withdrawn or not escalated.
- The patient was expected to stay in the ICU for at least another 48 hours.
- The patient or surrogate was willing to consent to the completion of two questionnaires during the end-of-life process.
- There was no reason to believe that the patient or family would object to a palliative care team being involved in the patient's end-of-life care.

Exclusion criteria

Patients were excluded from the study if they fulfilled any of the following criteria:

- The patient was unable to give consent or participate in the decision-making process and had no readily available legal surrogate decision-maker to give consent, or was under control of the Guardianship Board.
- A palliative care team was not available to see the patient within the next 24 hours.
- The patient was unlikely to survive to review by the palliative care team.
- The patient, surrogate or treating medical teams had already specifically requested palliative care involvement in end-of-life care.
- No independent intensivist was available to approach the patient or family for consent.

Appendix 2. Patient questionnaire for the quality-of-care study

Patient- and family-centred decision-making

1. The doctors have told you that they believe that the time has come to either limit treatment or withdraw treatment from your relative. Does the family, as a whole, agree with this decision?
(1 = no family consensus or agreement,
9 = complete family agreement)

2. Based on your knowledge of your relative's wishes, when the doctors told you that they believed that the time had come to either limit treatment or withdraw treatment from your relative, did you think your relative's wishes were taken into account?
(1 = wishes not taken into account,
9 = wishes fully taken into account)

3. As the representative of the family, when the doctors told you that they believed that the time had come to either limit treatment or withdraw treatment from your relative, did you think the views of the family were taken into account?
(1 = wishes not taken into account at all,
9 = wishes fully taken into account)

4. Overall, how satisfied are you with you or your family's involvement, and your relative's involvement in the decision-making process leading up to the discussion about limiting treatment or withdrawing treatment from your relative?
(1 = very dissatisfied, 9 = very satisfied)

Overall patient and family-centred decision-making composite score = totals of Questions 1 to 4
(lowest possible score 4, highest possible score 36)

Communication

5. Were you and your family satisfied with the availability of doctors to talk with you about your relative?
(1 = very dissatisfied, 9 = very satisfied)

6. Were you satisfied that doctors met with you regularly enough to discuss your relative?
(1 = very dissatisfied, 9 = very satisfied)

7. Were you satisfied that communication from the doctors was sensitive and compassionate?
(1 = very dissatisfied, 9 = very satisfied)

8. Were you satisfied that communication from the doctors was clear and easy to understand?
(1 = very dissatisfied, 9 = very satisfied)

9. Were you satisfied that all your questions were answered?
(1 = very dissatisfied, 9 = very satisfied)

10. What was your overall satisfaction with communication from the medical staff?
(1 = very dissatisfied, 9 = very satisfied)

Overall communication composite score
= totals of Questions 5 to 9 (excludes Question 10;
lowest possible score 5, highest possible score 45)

Continuity of care

11. Were you satisfied with the number of doctors and nurses looking after your relative?
(1 = very dissatisfied, too many or too little staff,
9 = very satisfied, the number just right)

12. Overall, how satisfied were you with the ability of the ICU to provide continuing care for your relative?
(1 = very dissatisfied, 9 = very satisfied)

Overall continuity of care composite score
= totals of Questions 11 and 12
(lowest possible score 2, highest possible score 18)

Emotional and practical support

13. Were you satisfied that the emotional needs of your relative were met by the ICU?
(1 = very dissatisfied, 9 = very satisfied)

14. Were you satisfied that the emotional needs of your relative's family were met by the ICU?
(1 = very dissatisfied, 9 = very satisfied)

15. Were you satisfied that the ICU provided enough practical support, if required (such as counselling, orientation to the ICU information), to your relative?
(1 = very dissatisfied, 9 = very satisfied)

16. Were you satisfied that the ICU provided enough practical support, if required (such as accommodation, counselling, orientation to the ICU information), to your relative's family?
(1 = very dissatisfied, 9 = very satisfied)

17. Overall, how satisfied are you that the ICU met the emotional and practical needs of your relative and your relative's family?
(1 = very dissatisfied, 9 = very satisfied)

Overall emotional and practical support composite score
= totals of Questions 13 to 16 (excludes Question 17;
lowest possible score 4, highest possible score 36)

Symptom management and comfort care

18. How satisfied were you with the ICU management of your relative's pain?
(1 = very dissatisfied, 9 = very satisfied)

19. How satisfied were you with the ICU management of your relative's breathing difficulties?
(1 = very dissatisfied, 9 = very satisfied)

20. How satisfied were you with the ICU management of your relative's distress or anxiety?
(1 = very dissatisfied, 9 = very satisfied)

21. How satisfied were you with the ICU management of your relative's symptoms other than those above?
(1 = very dissatisfied, 9 = very satisfied)

22. Overall, how satisfied were you with the ICU management of your relative's symptoms and comfort?
(1 = very dissatisfied, 9 = very satisfied)

Overall symptom management and comfort care composite score = totals of Questions 18 to 21 (excludes Question 22;
lowest possible score 4, highest possible score 36)

Spiritual support

23. Overall, how satisfied were you with the spiritual support provided to you from the ICU?
(1 = very dissatisfied, 9 = very satisfied)

Overall satisfaction

24. How satisfied are you with the overall care provided to your relative from the ICU?
(1 = very dissatisfied, 9 = very satisfied)

Overall satisfaction composite score
= totals of all questions except Questions 10, 17, 22 and 24; lowest possible score 20, highest possible score 180)

Appendix 3. Staff questionnaire for the quality-of-care study

Symptom management and comfort care

1 How satisfied are you with the current management of the patient's pain?
(1 = very dissatisfied, 9 = very satisfied)

2. How satisfied are you with the current management of the patient's breathing difficulties?
(1 = very dissatisfied, 9 = very satisfied)

3. How satisfied are you with the current management of the patient's distress or anxiety?
(1 = very dissatisfied, 9 = very satisfied)

4. How satisfied are you with the current management of the patient's symptoms other than those above?
(1 = very dissatisfied, 9 = very satisfied)

5. Overall, how satisfied are you with the current management of the patient's symptoms and comfort?
(1 = very dissatisfied, 9 = very satisfied)

Overall symptom management and comfort care composite score = totals of Questions 1 to 4 (excludes Question 5; lowest possible score 4, highest possible score 36)

Communication and support

6. How satisfied are you with the current level of communication between yourself and all the medical staff (including ICU, other teams, eg, cardiology, palliative care), involved in the care of the patient?
(1 = very dissatisfied, 9 = very satisfied)

7. How satisfied are you with the current overall level of counselling provided to you during the care of the patient?
(1 = very dissatisfied, 9 = very satisfied)

8. How satisfied are you with your involvement in the care of the patient?
(1 = very dissatisfied, 9 = very satisfied)

9. Overall, how satisfied are you, in general, with the current overall level of support provided to you during the care of the patient?
(1 = very dissatisfied, 9 = very satisfied)

10. How satisfied are you, in general, with the current level of support provided to you by just the ICU staff (nursing and medical) involved in the care of the patient?
(1 = very dissatisfied, 9 = very satisfied)

Overall communication and support composite score = totals of Questions 6 to 10 (lowest possible score 5, highest possible score 45)

Goals of care

11. Were the goals of the patient's treatment clear to you?
(1 = very unclear, 9 = very clear)

12. Were you satisfied with the care/treatment plan?
(1 = very dissatisfied, 9 = very satisfied)

Overall goals of care composite score = totals of Questions 11 to 12 (lowest possible score 2, highest possible score 18)

Management difficulty

13. Is the family difficult to interact with, overall, in terms of managing day-to-day patient management issues?
(1 = very difficult, 9 = very easy going)

14. Is the family difficult to interact with, overall, in terms of managing the end-of-life issues?
(1 = very difficult, 9 = very easy going)

Overall satisfaction

15. Overall, how satisfied are you with the total overall care provided to the patient?
(1 = very dissatisfied, 9 = very satisfied)

Overall satisfaction composite score = totals of all Questions except Questions 5 and 13–15; lowest possible score 11, highest possible score 99)

Appendix 4. Satisfaction scores given by family for patient management before and after randomisation, by treatment group

	No palliative care consultation			Palliative care consultation				
Score (range of possible scores)	Before (n = 4)	After (n = 4)	Difference (%)	Before (n = 5)	After (n = 5)	Difference (%)	P*	$P^{\dagger}$
Average overall composite score for satisfaction (20–180)	161	151.5	–9.5 (–6%)	153.8	144.8	–9.0 (–6%)	0.91	0.56
Average composite scores for satisfaction with individual domains								
Patient- and family-centred decision-making (4–36)	34.3	28.0	–6.3 (–18%)	30.4	29.4	–1.0 (–3%)	0.29	0.40
Communication (5–45)	38.3	38.8	0.5 (1%)	41.8	37.0	–4.8 (–11%)	0.06	0.19
Continuity of care (2–18)	17.3	16.3	–1 (–6%)	17.2	15.2	–2.0 (–12%)	0.91	0.51
Emotional and practical support (4–36)	32.0	30.3	–1.8 (–6%)	27.8	27.6	–0.2 (–1%)	0.91	0.81
Symptom management and comfort care (4–36)	33.3	31.3	–2 (–6%)	30.0	29.0	–1.0 (–3%)	0.91	0.15
Spiritual support (1–9)	6.0	7.0	1 (17%)	6.6	6.6	0	0.41	0.39
Patient care (1–9)	8.0	8.3	0.3 (4%)	8.2	7.6	–0.6 (–7%)	0.29	0.13

* Between-group P for Mann–Whitney test. † Between-group P for ANCOVA.

Appendix 5. Satisfaction scores given by ICU nursing staff for patient management before and after randomisation, by treatment group

	No palliative care consultation			Palliative care consultation				
Score (range of possible scores)	Before ($n = 9$)	After ($n = 9$)	Difference (%)	Before ($n = 9$)	After ($n = 9$)	Difference (%)	P*	P†
Average overall composite score for satisfaction (11–99)	69.4	79.6	10.1 (15%)	70.4	74.2	3.8 (5%)	0.30	0.23
Average composite score for individual domains								
Satisfaction with symptom management (4–36)	26.2	28.6	2.3 (9%)	27.2	27.1	–0.1 (–0.2%)	0.49	0.42
Satisfaction with communication and support (5–45)	30.4	36.7	6.3 (21%)	31.6	32.6	0.9 (3%)	0.09	0.02
Satisfaction with goals of care (2–18)	12.8	14.3	1.4 (11%)	11.6	14.6	2.9 (25%)	0.61	0.77
Grading of difficulty in managing family in day-to-day issues (1–9)	6.9	6.4	–0.5 (–7%)	6.4	6.1	–0.4 (–6%)	0.93	0.83
Grading of difficulty in managing family in end-of-life issues (1–9)	6.3	6.2	–0.1 (–2%)	6.0	6.2	0.2 (3%)	0.44	0.93
Overall satisfaction with patient management (1–9)	6.8	7.7	0.8 (12%)	7.1	6.9	–0.1 (–1%)	0.03	0.10

* Between-group *P* for Mann–Whitney test. † Between-group *P* for ANCOVA.

Appendix 6. Satisfaction scores given by treating intensivists for patient management before and after randomisation, by treatment group

	No palliative care consultation			Palliative care consultation				
Score (range of possible scores)	Before ($n = 9$)	After ($n = 9$)	Difference (%)	Before ($n = 8$)	After ($n = 8$)	Difference (%)	P*	P†
Average overall composite score for satisfaction (11–99)	81.5	83.2	1.7 (2%)	76.8	75.6	–1.3 (–2%)	0.42	0.008
Average composite score for individual domains								
Satisfaction with symptom management (4–36)	31.5	31.2	–0.3 (–1%)	30.4	30.3	–0.1 (–0.3%)	0.89	0.56
Satisfaction with communication and support (5–45)	36.0	35.8	–0.2 (–1%)	32.8	30.4	–2.4 (–7%)	0.48	0.03
Satisfaction with goals of care (2–18)	14.0	16.2	2.2 (16%)	13.7	14.9	1.3 (9%)	0.48	0.12
Grading of difficulty in managing family in day-to-day issues (1–9)	7.6	7.3	–0.3 (–4%)	7.5	6.6	–0.9 (–12%)	0.14	0.22
Grading of difficulty in managing family in end-of-life issues (1–9)	7.4	7.2	–0.2 (–3%)	6.9	6.3	–0.6 (–9%)	0.37	0.32
Overall satisfaction with patient management (1–9)	7.7	7.4	–0.3 (–4%)	7.3	7.0	–0.3 (–4%)	0.74	0.37

* Between-group *P* for Mann–Whitney test. † Between-group *P* for ANCOVA.