

Oncology and Critical Care

Stuart Murdoch

Consultant Intensive Care

St. James's University Hospital

March 2010

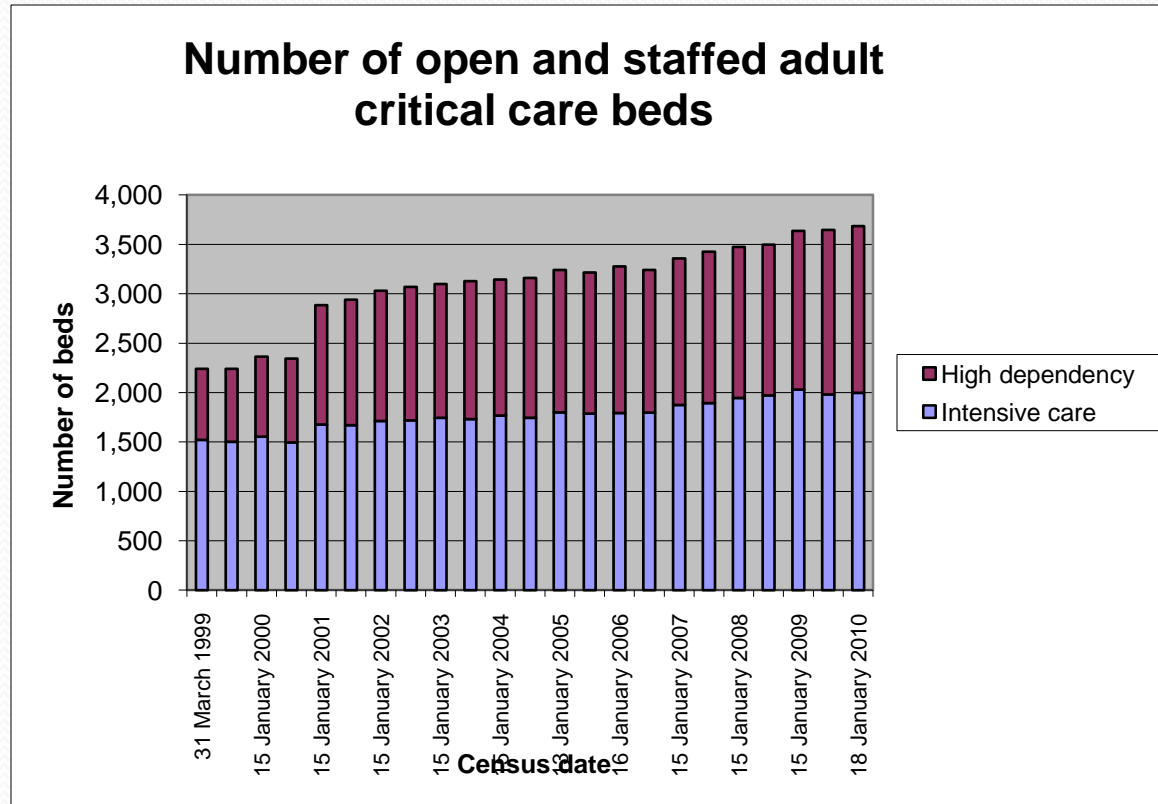
Background- Critical Care

- Critical Care originated in Denmark with Polio epidemic 1950s – respiratory support alone
- Rapid advances in organ **support** and **monitoring**
- Ability to use inotropes to support the heart
- Ability to offer renal replacement therapy for AKI

Background – Critical Care

- Developed in ad- hoc way in UK
- Comprehensive Critical Care – DOH 2000
 - Aimed to introduce a better assessment of need
 - Hospital wide approach to critically ill patients
 - Early warning score & Outreach services
- Quality Critical Care 2005
 - Recognised limited expansion (mostly HDU) and remaining unmet need
 - Still significant number of inter hospital transfers

Critical Care Beds in the UK



Background – Critical Care

- UK – fewer critical care beds than many other countries
- Sicker patients
- Greater level of nursing numbers (because of sicker patients- greater dependency)
- Makes comparison between countries difficult
- What may count as critical care in one country would not in another (HDU/advanced ward care etc)

Background – Levels of Care

- **Level 0:** Patient's needs met on normal general ward
- **Level 1:** Patient at risk of deteriorating, needs can be met on the acute general ward with **support**
- **Level 2 (HDU):** Patient requires more detailed observation and monitoring including single organ support or post-major surgery or stepped down from level 3
- **Level 3 (ICU):** Patient requires advanced respiratory support with invasive ventilation or basic respiratory support together with at least two organ supports

Why does this Matter ?

- Limited Bed Numbers
- Goldilocks phenomenon
 - patients not sick enough – too well for critical care - therefore cannot come into limited beds available.
 - If they do get into critical care discharged early
- Or too sick – unlikely to survive ? Is care appropriate ?
- Patient has to be just sick enough to get into critical care.

Too Sick

- Early experience and reporting in oncology and haematology patients demonstrated high mortality rates and raised questions about the benefits of critical care for this group of patients.
- A lot of this is anecdote – case series, from specialist centres etc.
- This informed views of appropriateness of admission to Critical Care (?still prevalent today)

Early data

- Cancer 1976 Turnbull et.al (Sloan Kettering Memorial New York)
 - Report of 1035 consecutive admissions to cancer ITU between 1971 and 1974 (surgical, med onc and haem)
 - Mortality in ICU 22.3%
 - Mortality In Hospital 16.3%
 - No indication of severity of illness or the underlying diagnosis
- Despite good results distinct note of caution in discussion

Haematology Patients

- Papers in the 1980's describe mortality 80% and higher
 - Mayo Clinic Data 1988 (1975-1985) 116 patient 82% mortality
 - Median survival of remaining 18% 12months
 - Little published data on medical Oncology Patients
- (Chest 1988 Peters et al)

Too Sick

- 60 patients with haematological malignancy 13 left hospital alive. Data collected over 5 years at Barts
- In those who had relapsed 21/22 died
- “The mortality of patients admitted to intensive care units with haematological malignancy is high. A humane approach to the management of the critically ill as well as efficient use of limited resources requires careful selection of those patients who are most likely to benefit from intensive care.”
- Br Med J 1988;296:1025-1029 (9 April)

Too Sick

- JAMA 1993 – Florida Cancer Centre 162 beds retrospective study 147 patients admitted 1990-92
- Intensive care unit mortality 41 %
- 80% of patients with solid tumours survived less than 6 months

- “The majority of patients with solid tumors and hematologic cancers admitted to the intensive care unit die before discharge, or, if they survive the hospital admission, they spend a minimal amount of time at home before dying”

Too Sick

- 1999 782 patients in 5 centres in America- 190 had solid tumours
- 78 % hospital mortality

20% of cancer patients die of respiratory failure (excluding pneumonia and pulmonary emboli). Patients with cancer who require mechanical ventilation for respiratory failure have a grim prognosis.¹⁻¹⁶ Respiratory failure in cancer patients is typically a manifestation of advanced lung disease that does not, in general, respond to supportive care. The decision to mechanically ventilate a cancer patient with respiratory failure is often contentious. The cost in terms of dollars, emotional suffering, and failed expectations is extraordinarily high.

Journal of Clinical Oncology, Vol 17, Issue 3 (March), 1999: 991

UK data

- BJA 1999
 - Review of 22 patients admitted in regional centre 1993-97 (solid tumours 55%)
 - Mortality 81% - associated with need for ventilation, renal support, neutropenia
 - No survivors in the group who needed renal support, inotropes and ventilation
- Questioned discussing with patients prior to admission –a view not supported in commentary

Better Results

- Intensive Care Medicine 2000
 - 120 patients admitted to unit in Paris 1990-1997 with solid tumours
 - 30 day mortality was 58.7%
 - Organ dysfunction and the need for ventilation strongly associated with poor outcome (not underlying malignancy)

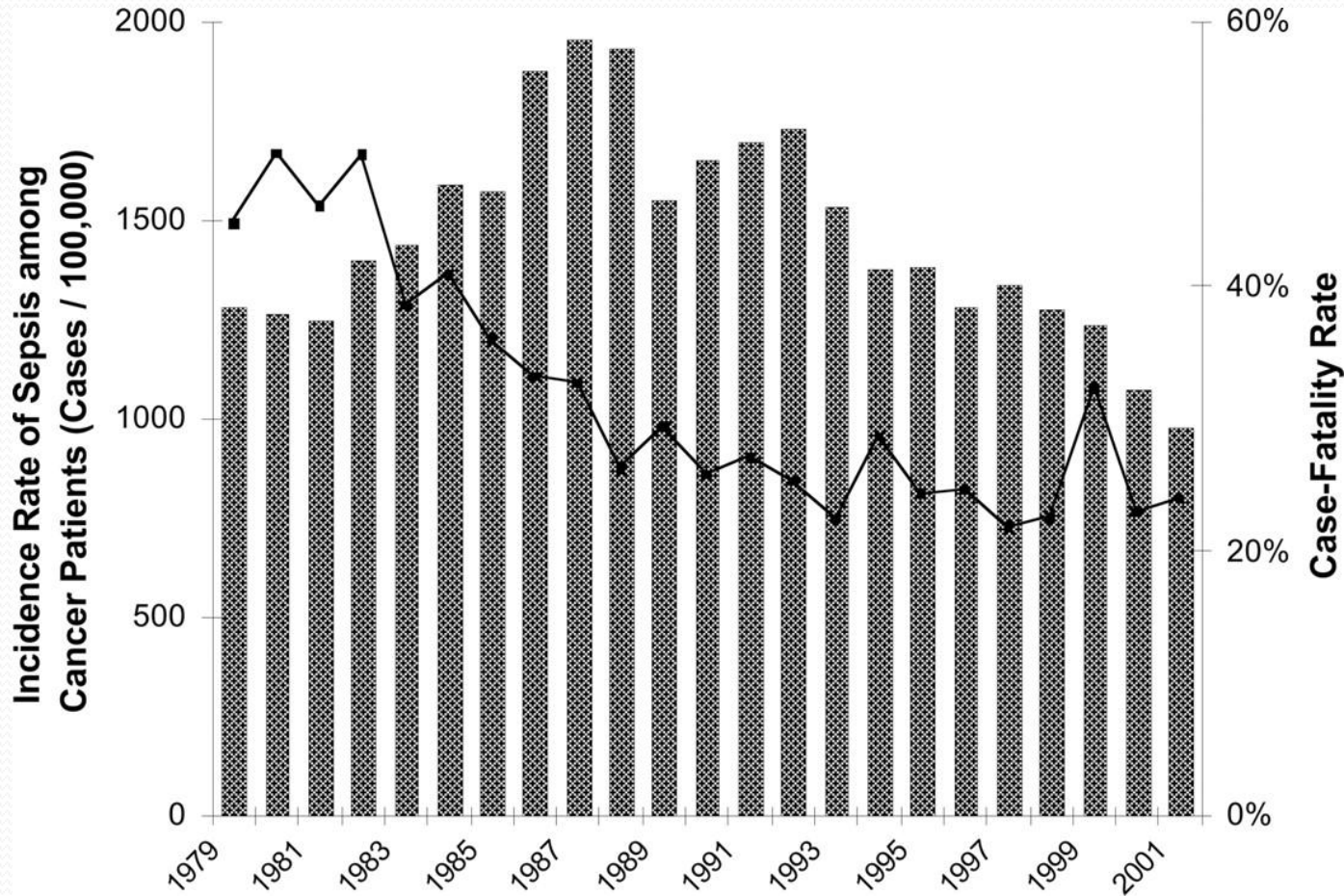
Better ??

- In the last decade some data has suggested improvements in patient survival in patients with haematological malignancy
- Associated with use of Non-invasive ventilation
- Use of growth factors
- Usually from single centre specialist units

- However May be due to case selection- very sick patient not going to critical care

Longitudinal trends in sepsis among cancer patients from 1979 through 2001

Danai P A et al. Chest 2006;129:1432-1440



NIV

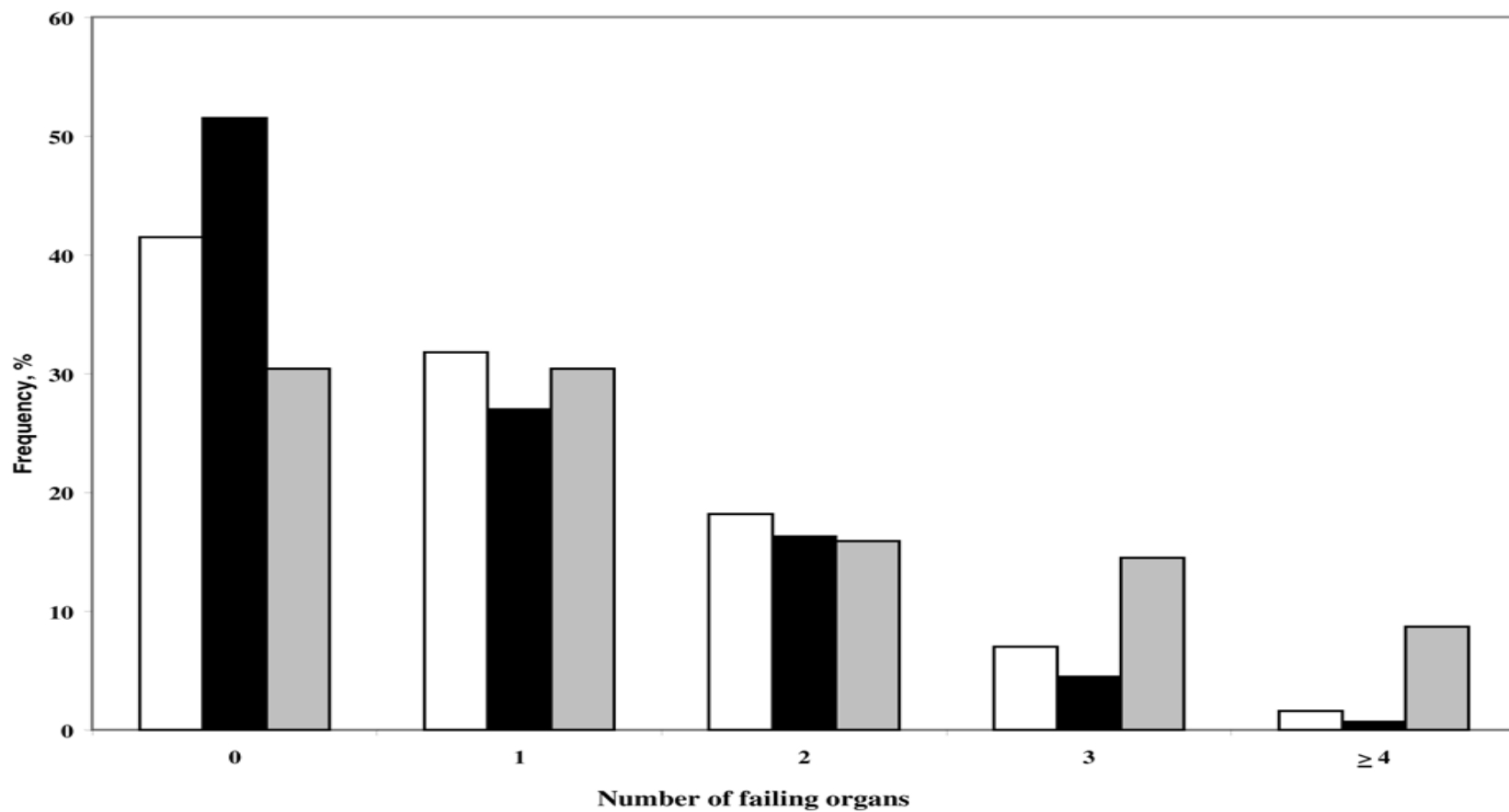
- Avoiding intubation is a major goal in the management of respiratory failure
- What can be done instead ? – Non invasive ventilation
- 52 patients 2 groups (one given NIV via face mask)
- Results
 - 12 vs. 20, required endotracheal intubation $P=0.03$
 - 13 vs. 21, had serious complications $P=0.02$,
 - 10 vs. 18, died in the intensive care unit $P=0.03$
 - 13 vs. 21, died in the hospital $P=0.02$
- (N Engl J Med 2001;344:481-7.)

NIV in haematological patients with Acute Respiratory Failure

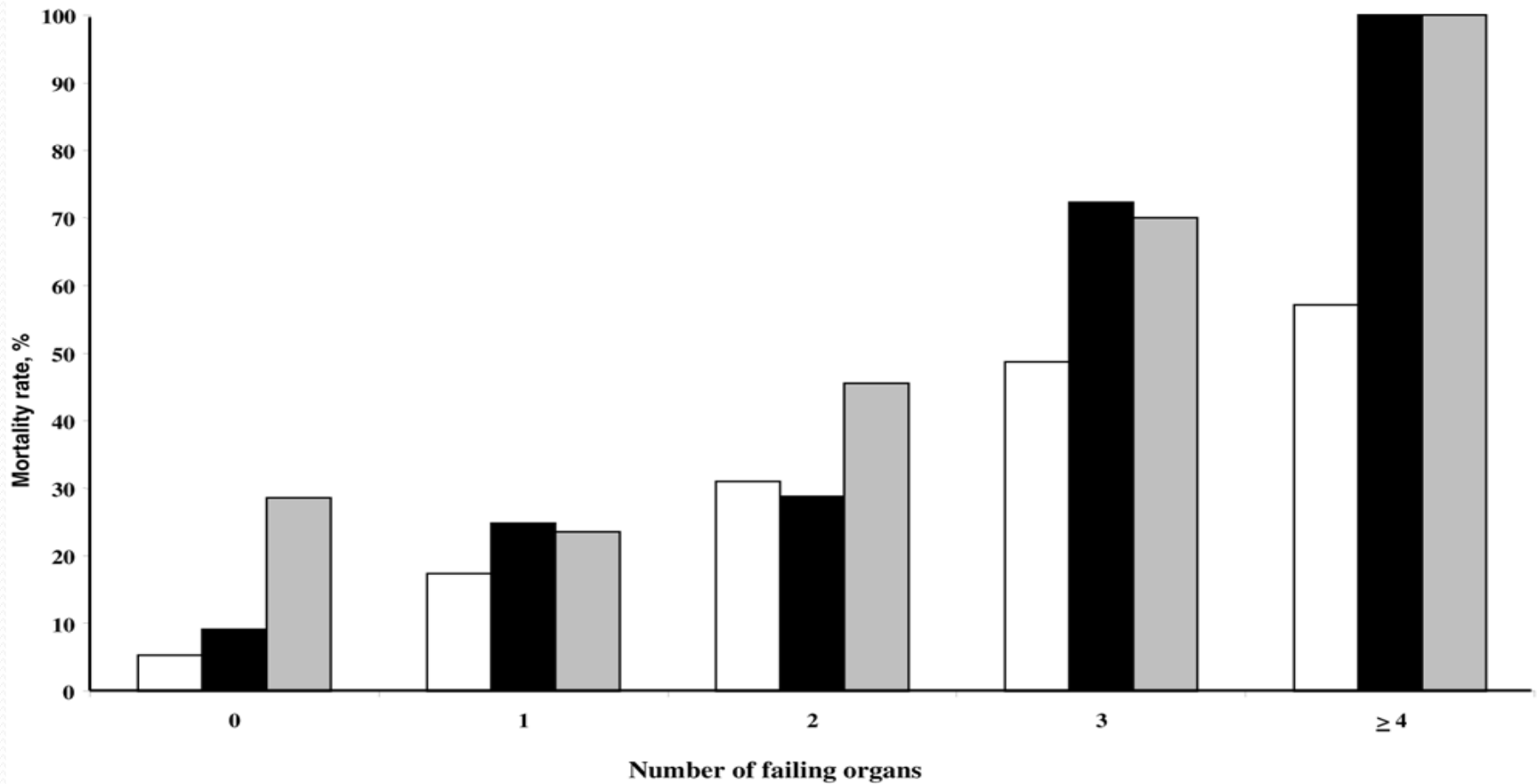
- *166 patients reviewed compared with small group 26 who received NIV*
- *62% ICU mortality*
- *71% hospital mortality*
- *Suggestion of improved outcome if avoid IPPV*
- *Depuydt et al CHEST 2004; 126:1299–1306*

Improved Outcomes ?

- European study of cancer patients in ICU -2008
- 198 units in 24 countries
- 3147 patients enrolled
 - 473 had a malignancy
 - 85% solid tumours (15% haematological)
- Cancer patients older; likely to have had surgery and higher frequency of sepsis
- Increased incidence of ARDS/AKI
- Mortality 58% vs 27% for non-cancer population
- In patients with 3 or more organ system failure 75 % mortality cf 50% in non-cancer population
 - Taccone et al *Critical Care* 2009, **13**:R15



Maximum Number of Organ Dysfunction during ICU stay
White = No Cancer; Black=Solid Tumour; Grey=Haematological



Organ Dysfunction and Mortality
White = No Cancer; Black=Solid Tumour;
Grey=Haematological

Current UK data

Haematological Malignancy

- Review of UK data entered into ICNARC
- 7689 admissions (1995-2007) (1.5% of cases in database)
 - ICU mortality 43%, hospital mortality 59.2%
 - In patients with 3 organ system failure ICU mortality 83.9%
 - Mortality associated with LOS prior to ICU and severe sepsis
 - No time effect observed
 - (Hampshire et al Critical Care 2009 , 13 R137)

What can we do

- Early recognition and treatment
 - Timely institution of appropriate care can reduce morbidity, mortality and length of stay
 - Observations – still poorly done
 - Appropriate antibiotics- reduced mortality if cover
 - Fluid resuscitation
 - Acting on Results
- Lack of knowledge widespread (NCEPOD report)

What can we do

- Good communication between oncology and critical care – important
- Review of patients not just M&M but survivors

Outreach and Mews

- Aims to assist in early recognition of patients at risk and automatically trigger review and treatment
- Based on routine observations- variation from norm generates a score
- Escalation to more experienced staff
- Variable implementation nationwide
- Outreach service recommended to be 24/7
- Not evidence based

2 Patients

1st patient

- 71 y old Non-Hodgkins lymphoma
- Septic at home- increased SOB, pyrexial,
- Admitted hypoxic; increased respiratory rate
- Signs of pneumonia on CXR
- Hypotensive admitted to ICU/HDU
- Lines – fluids/inotropes
- CPAP- not intubated
- Appropriate antibiotic
- Got better after 48 hours discharged to HDU

2nd Patient

- 73 y myeloma
- Neutropenic sepsis
- Pyrexial/Rigors at home
- ? Pneumonia /hypoxic
- On ward deteriorated
- Eventually transferred to critical care
- Arrested/Intubated
- Now ventilated; cardiac impairment on inotropes and developing renal failure



Date	Time	21/03/10				21/3/10				21/3/10							
		0700	1300	1900	2300	0700	1300	1900	2300	0700	1300	1900	2300	0700	1300	1900	2300
	Temp	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5
	Temp	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
	Pulse	64	65	66	66	67	68	68	69	69	69	69	69	69	69	69	69
	Respirations	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	White Cell Count	98	98	98	97	94	91	90	93	89%							
	Oxygen %	44	44	44	44	81	81	81	81	81	81	81	81	81	81	81	81
	Pain Score	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mouth Score	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hickman Line check (daily)	4	4	4	4	5	5	5	9	9	9	9	9	9	9	9	9
	Mews	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Other Interventions/Comments	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Stool	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Urinalysis																
	Weight																
	Antibiotics																

© Designed and Printed by The Leeds Teaching Hospitals NHS Trust Print Unit (January 2004)

Conclusion

- Admission to Critical Care in Oncology patients is associated with a high mortality
- In some patients admission may not be appropriate
- It is likely that early recognition and intervention into critically ill patients improves outcome and prevents deterioration
- Whilst data suggests improvements in outcome in oncology patients in critical care it is unclear if this is the same population as previously reported



Any Questions ?