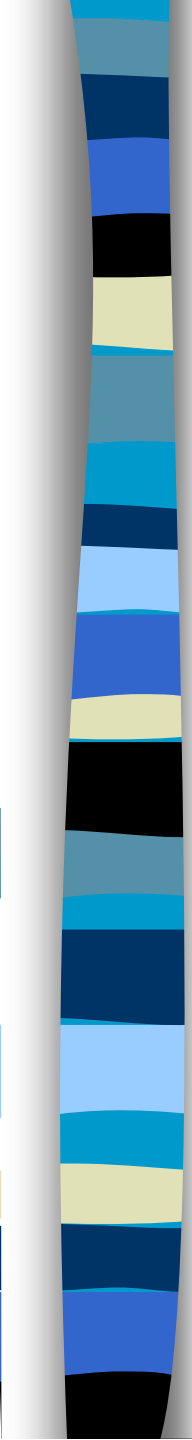


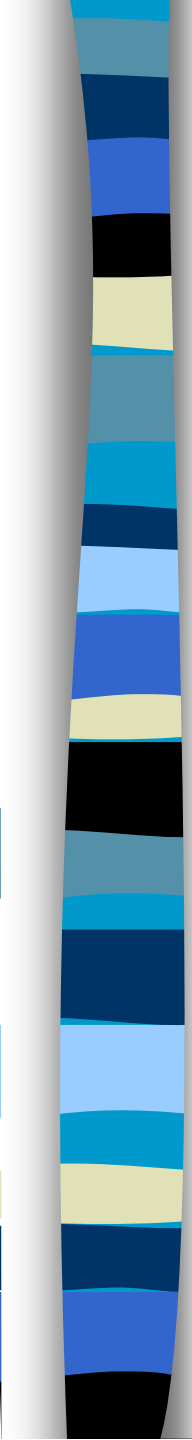
***The NHS is broke.***



***What are you going to cut?***

**Paul Lawler**

- 
- The evidence base for much of our “good practice “ is suspect
  - This has translated into the need for increased staffing levels

- 
- Do only what works
  - (Do less)
  - Do what you do properly
  - Rebuild the walls

*This is an opportunity for  
review & redesign*



*Hello, good morning and welcome...*





*David Frost*

“.... <*The ex-President of ICS*> Dr Mick Nielsen of one of our greatest hospitals, the Southampton General, Intensive Care Unit <*told me*> “It is staggering for Health Ministers to say that the service is coping. Their statements - reassuring the public that patients needing intensive care are getting it - are total nonsense.....”

*BBC Breakfast with Frost*

09:04 16 January 2000



*Tony Blair*

“.... If this July when we work out the next three year period after that three year period we can carry on getting real-term rises in the Health Service of almost five per cent, ***then at the end of that five years we will be in a position where our Health Service spending comes up to the average of the European Union....***”

*BBC Breakfast with Frost*

09:07 16 January 2000



*“You stole my effing budget”*

*Rt Hon Gordon Brown  
Chancellor of the Exchequer  
09:55 16 January 2000*

# NewStatesman

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## Blair has made a historic pledge

Donald Hirsch

Published 24 January 2000

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Astute historians of social policy will mark down Sunday 16 January 2000 as the single most significant date of Tony Blair's first administration.

This was the day that, in the wake of the *New Statesman's* interview with Lord Winston and various other revelations about NHS shortcomings, Tony Blair announced on the BBC's *Breakfast with Frost* that UK health spending is nowhere near high enough and will rise to the European Union average by 2006.

The initial reaction was one of understandable scepticism. The government has made promises of new spending before and they have turned out to be old spending dressed up in new ways or spending that doesn't take account of inflation.

'Astute historians  
... will mark down  
16 January 2000  
as the single most  
significant date of  
Tony Blair's  
first  
administration'

'New Statesman'  
24 January 2000

***Ten years later...***

LEHMAN BROTHERS

SEP 15

***... the party's over***



## Exclusive: NHS investment set to be axed

Updated on 03 February 2010

By Channel 4 News

**In an exclusive report for Channel 4 News FactCheck, Cathy Newman finds that investment in the NHS is set to be axed despite Alistair Darling's promise to increase hospital spending.**

Channel 4 News FactCheck has learned that the Department of Health plans to cut expenditure on new hospitals and crucial equipment - known as capital spending - by 22 per cent in the next financial year.

The chancellor pledged in his pre-budget report in December that spending on hospitals, schools and policing would increase in 2010/11.

But a document drawn up by the Department of Health reveals that total capital spending will be £1.4bn less in 2010/11 - a real-terms cut of almost 22 per cent. That's in part because contribution from private finance is expected to almost halve from just over £1 billion to just £580m.

The Tories tonight accused Labour of dishonesty over the financial pressures facing the health service, and warned that projects across the country - including in Liverpool, Bristol and Stanmore - were under threat.

Andrew Lansley, shadow health secretary, told the programme: "Gordon Brown keeps saying he is

£1.4bn

22%

Channel 4 News  
3 February 2010

## Savings do not have to deplete quality of care

By Nicholas Timmins

Published: February 12 2010 02:00 | Last updated: February 12 2010 02:00

The National Health Service can make the £15bn to £20bn of efficiency gains needed during the next few years without compromising on quality, says a leading health service analyst and former civil servant.

Penny Dash, of McKinsey management consultants and a former head of strategy at the Department of Health, said the savings could be made by applying existing knowledge more widely.

"There need be no trade-off between spending and quality, and the savings can be made," said Dr Dash.

She said the NHS could adopt more than half a dozen stratagems, each of which could save 2 to 4 per cent of spending, to produce the cumulative sum needed.

A key move would be to stop providing treatments that bring little benefit to patients.

She said: "We are still doing hip replacements on people who are obese, and knee replacements that actually produce only marginal improvements in mobility. And there are still many follow-up outpatient appointments that are not needed."

Savings could be made on back-office functions and the NHS estate, and money could be

2-4%

£20bn

FT

12 February 2010

## Leak revealing scale of proposed NHS cuts 'torpedos' talks on jobs guarantee

Foundation trusts threaten job losses, abolition of bonuses and daytime working hours that end at 10pm

[Read the leaked document in full](#)

Owen Bowcott

The Guardian, Thursday 28 January 2010



Surgery to the NHS threatens consultants' bonuses, a leaked document reveals. Photograph: Christopher Furlong/Getty Images

NHS staff are facing compulsory redundancies, consultants the loss of bonuses and district hospitals severely reduced funding, according a leaked health service document proposing savings to negotiate the economic downturn.

The internal briefing paper circulated by the NHS foundation trust network (FTN) calls for wide-ranging reform of national wage scales, an end to guaranteed employment for trainees and a cap on pensions for those earning more than £100,000 a year.

Such radical cost-cutting – being discussed by senior managers as part of the reconfiguration of the health service to deliver more community services – threatens to undermine the NHS employment guarantee proposed last month by the health secretary, Andy Burnham.

'Surgery to the  
NHS threatens  
consultants'  
bonuses,  
a leaked  
document  
reveals'

Guardian  
28 January 2010





# *Foundation Trust Network Red Line Proposals*

- Reduce number of pay points on A4C Bands
- Freeze increments on incremental pay progression for 2-3 years
- Extend plain rate time (07.00 - 22.00)
- Plain rate only for sick pay
- New consultants: reduce SPAs 9:1
- Existing consultants reduce SPAs to 1.5 or 1
- Cap pensions over £100k
- Stop CEAs

Guardian  
28 January 2010

# Pay frozen for doctors but boosted for MPs

Jill Sherman Whitehall Editor  
Roland Watson Political Editor

Hospital consultants, GPs and senior civil servants were furious last night after being told that their pay would be frozen this year while MPs enjoy a 1.5 per cent rise.

Gordon Brown announced pay freezes for senior public sector workers including NHS managers, judges, dentists and generals, to help to save £3.5 billion within three years.

But the Armed Forces will get a 2 per cent rise in recognition of their time in Afghanistan, and junior doctors and prison officers are to get 1 per cent and 0.7 per cent increases from next month. The basic pay of a private soldier will go up to £17,015 plus a £260 bonus for a six-month tour in Afghanistan, while top general's pay will stay at £247,000.

The Prime Minister accepted many of the recommendations from a series of independent pay review body reports published yesterday but infuriated senior mandarins by refusing to honour their three-year pay deal, which would have given civil servants a 3 per cent rise this year. The Government will, however, honour the final year of three-year awards for nurses and teachers, who will get increases of 2.3 per cent and 2.25 per cent respectively.

The Government also rejected a recommendation from the Senior Salaries Review Body to raise minimum salaries for top officials to £61,500 and to award a 2.25 per cent increase for all NHS managers earning less than £80,000. It also refused to fund a gross increase in GPs' pay, including inflation-related costs, of 1.4 per cent. Instead, ministers froze GPs' pay and told family doctors to find efficiency savings to fund inflation-related costs.

Mr Brown made clear that top public sector chiefs would pay the price for spiralling salaries. He has already announced that any proposed salaries of more than £150,000 would have to



Public sector pay rises (median salary)			
	2005	2009	2010
Consultants	£78,094	£81,502	£81,502
Junior doctors	£34,337	£37,077	£37,448
GPs	£74,816	£80,354	£81,158*
Dentists	£56,080	£63,278	£63,910
Nurses	£21,118	£23,345	£24,554*
Armed Forces Private**	£13,461	£16,681	£17,015
Brigadier	£79,895	£97,056	£98,997
Senior civil servant	£73,151	£78,088	£78,088
Judge Group 5 Circuit Judge (Old Bailey level)	£125,803	£138,548	£138,548
Teachers	£31,464	£34,650	£35,447*

## The NHS budget cut is not a bluff



recommended by the review bodies. Jonathan Baume, FDA general secretary, said: "It is simply untenable for

fair treatment but got gesture politics." Dr Hamish Meldrum, chairman of council at the British Medical Association,

ly", or to c until it becomes self-sustaining. The Government has pledged to

Party banking on Darling to put nation first

Peter Riddell  
Political Briefing



**A**listair Darling is being told by his Cabinet colleagues that Labour's election prospects are in his hands. He advises them not to raise their expectations about the Budget on March 24, the last big event before the election campaign starts. He will also disappoint deficit hawks who want early action to cut spending.

Of course, there will be some vote-pleasing announcements, but they will be on a small scale. He believes that voters are so disenchanted with politicians that a giveaway Budget would raise scepticism and rebound on Labour. That fits both circumstances and the Chancellor's temperament.

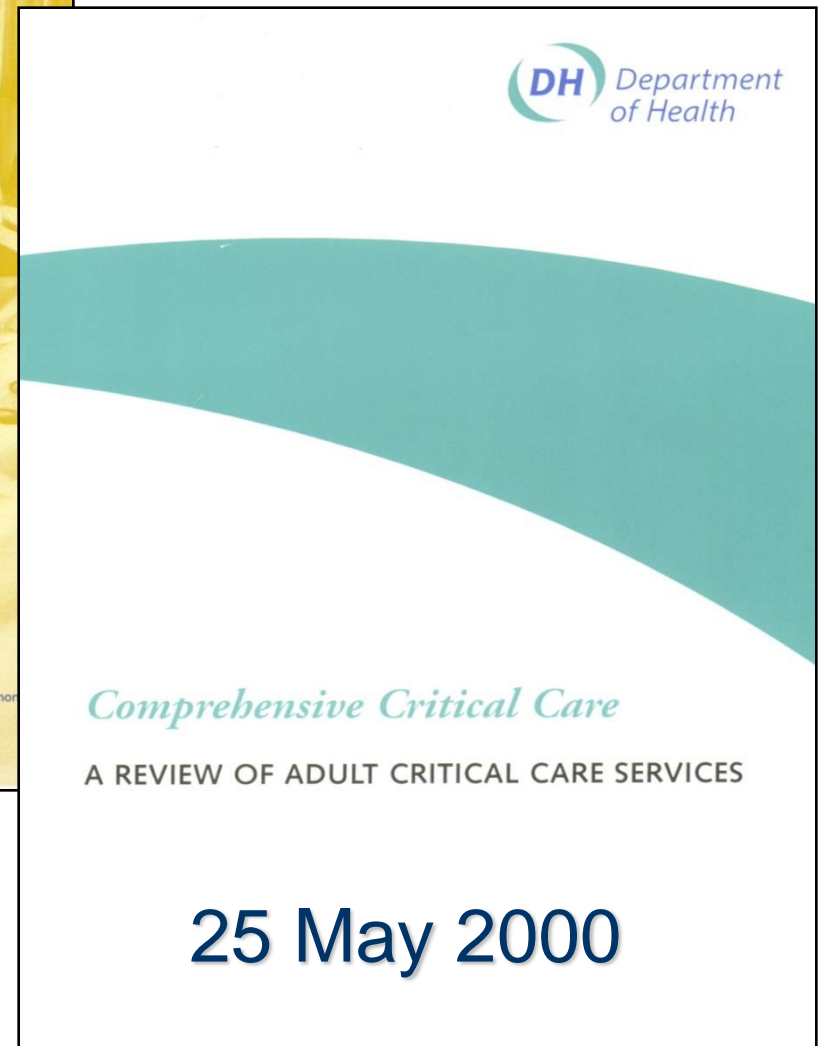
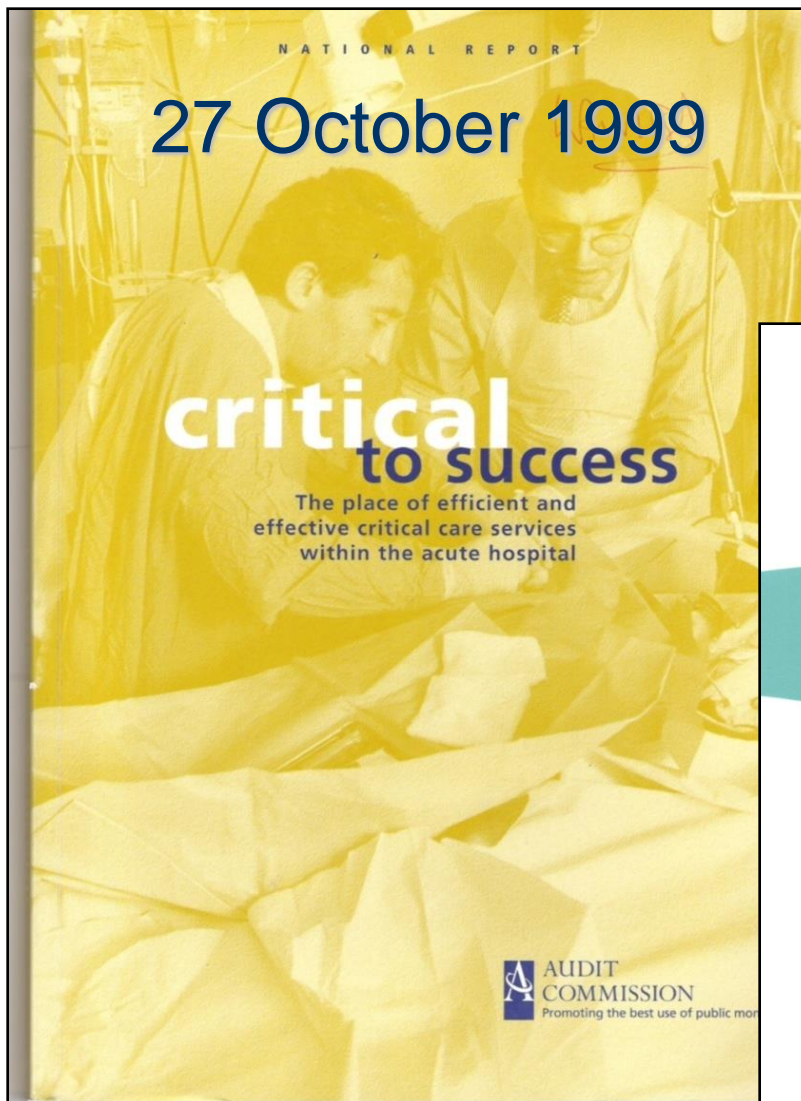
The Times  
11 March 2010

on the international side, with weak demand in Europe, particularly



So what happened?  
*(to Intensive Care)*







31 October 2000

£142 million

*Comprehensive Critical Care*

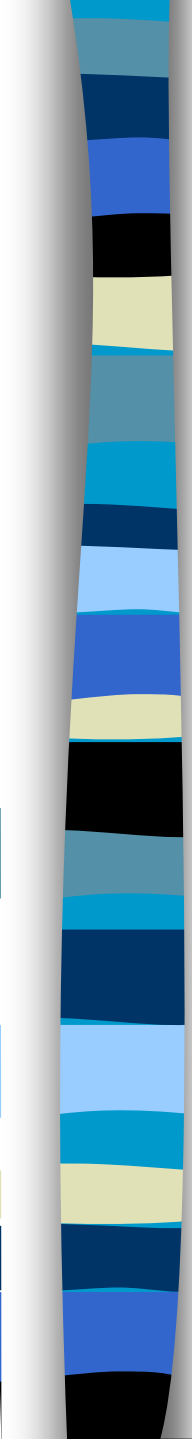
A REVIEW OF ADULT CRITICAL CARE SERVICES

*Comprehensive Critical Care*

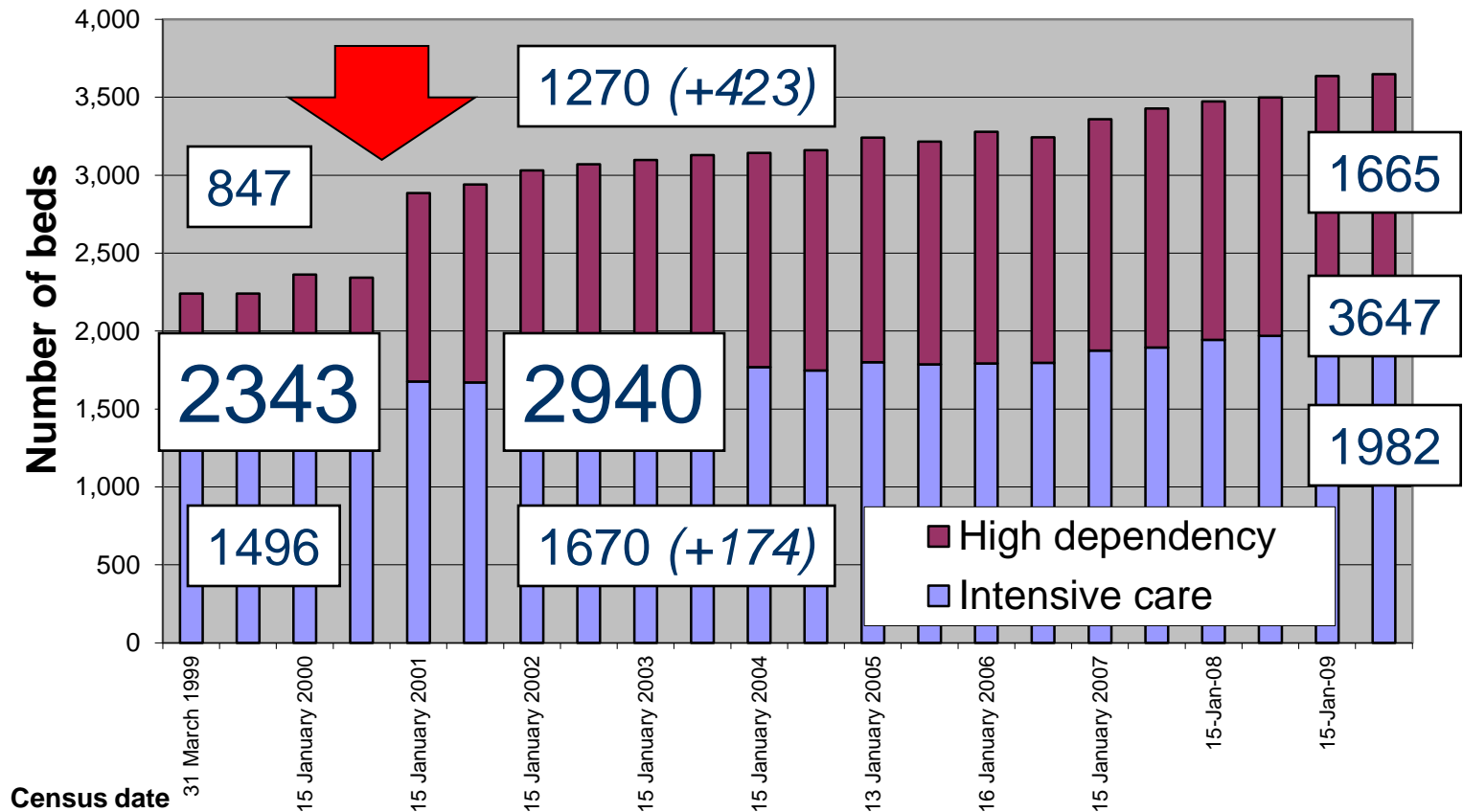
A REVIEW OF ADULT CRITICAL CARE SERVICES

***Investment to  
support***

***‘Critical care  
without walls’***

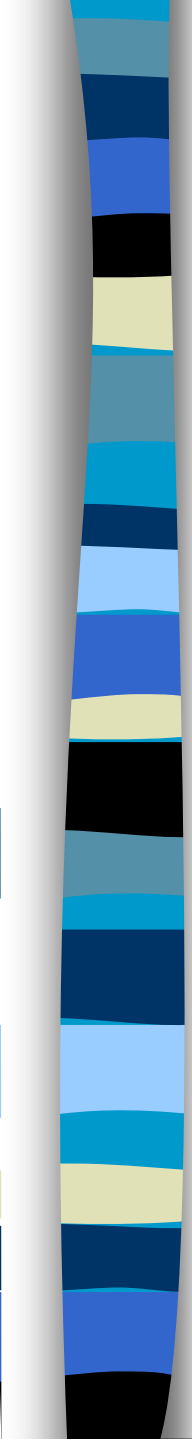
- 
- Money released 31 October 2000
  - Money must be spent by March 31 2001
  - £>0.5M/ICU (hospital)
  - Nurses: WTE 5.5/bed
  - No funding for medical staff
  - Financial envelope ensured:
    - maximum political impact (597 beds)
    - most rapid implementation/investment
    - shift to High Dependency Care

## Number of open and staffed adult critical care beds on the census day



***KH03 data set***





*The money must be  
(was) spent  
(somehow)*

*But spent wisely?*



2004

*Lots of investment  
but NHS output  
hasn't risen ....*



# NHS High Impact Changes

*Increase performance  
(through put)  
without increasing costs*

31 August 2004

# 10 High Impact Changes for Service Improvement and Delivery

A guide for NHS leaders

Improve clinical quality

Eliminate 2 million un

**Improve patient choice**

Reduce hospital acquired i

Virtually eliminate outpatient waits

**Increase patient satisfac**

**Enhance patient exper**

**Increase staff training and educa**

Better care without delay

**Enhance patient sa**

Save 25 million weeks of patient waiting time

Prevent a quarter of a million emergency a

**Decrease length of**

Release nearly 1.2 million inpatient bed days

Create 80,000 extra patient interactions

**Improve staff morale**

Eliminate one million DN

## Change N°6

Increase the reliability of performing therapeutic interventions through a Care Bundle approach



# Bundles

- “A care bundle aims to achieve maximum impact by taking a list of recommendations and *selecting* those which are *deliverable*, *measurable*, supported by *strong evidence of improving outcomes*, and which are *currently not performed well*”

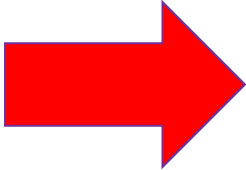

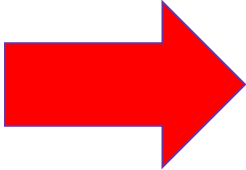

*NHS Evidence - emergency and urgent care*

- ***They may also take up time, effort, cost money and have a poor evidence base....***





## Box 1. High-impact interventions

- 
- 
- 
- 
1. Central venous catheter care bundle;
  2. Peripheral venous catheter care bundle;
  3. Renal catheter care bundle;
  4. Care bundle to prevent surgical site infection;
  5. Care bundle for ventilated patients (or tracheostomy where appropriate);
  6. Urinary catheter care bundle;
  7. Care bundle to reduce the risk from *Clostridium difficile*.



**8. Sepsis bundle**

## Reducing harm in critical care: Reducing harm from mechanical ventilation

### The Goal

Prevent ventilator-associated pneumonia (VAP) and other complications in patients on ventilators by reliably implementing a set of interventions known as the "Ventilator Care Bundle."

### Background

Some references from Saving Lives  
Intervention No.5 – Care bundle (where appropriate). Department of Health

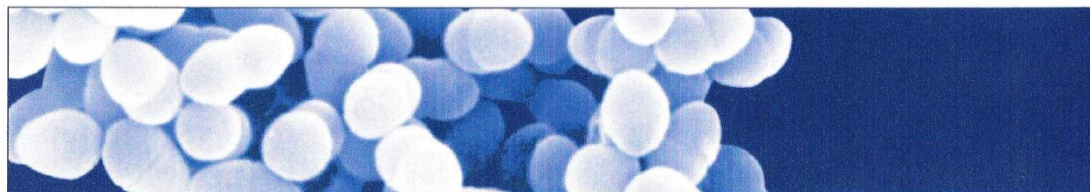
- Respiratory infections are the most common infection in the UK, and 19% of all hospital inpatients have a respiratory infection.  
– Smyth ETM. Healthcare acquire international conference of the available in Hospital Infection 5 infections in acute hospitals, 2001.
- VAP is a significant cause of postoperative patients receive the most frequent infection in intensive care units (ICUs) in Europe.  
– Vincent JL, Bihari DJ, Suter PM, et al. Intensive care units in Europe. Results of the EPIC Study. *Journal of American Medical Association* 1996; 275:1221-1226.
- The incidence of VAP can vary between patients. VAP is associated with longer hospital stay, and cost.  
– Bowton DL. Nosocomial pneumonia. *Chest* 1995; 107:1155-1161.  
– Rello J, Ollendorf DA, Oster G, et al. Ventilator-associated pneumonia in a large U.S. data set. *Chest* 1999; 115:1155-1161.
- VAP occurs in up to 15% of patients on ventilators. Factors include tracheostomy and the use of antacids. The incidence of VAP is 46%, compared with 12% in patients who do not develop VAP.  
– Ibrahim EH, Tracy L, Hill C, Fraser VJ. Ventilator-associated pneumonia in a community hospital. *Chest* 1999; 115:555-561.



**Saving Lives:** reducing infection, delivering clean and safe care

## High Impact Intervention No 5

Care bundle for ventilated patients (or tracheostomy where appropriate)



### Aim

To prevent the development of ventilator-associated pneumonia (VAP)

# 2010

## REDUCING HARM IN CRITICAL CARE

8

**1** PATIENT  
SAFETY  
FIRST

### Reduce harm from mechanical ventilation

2

5

6

Elevation of the head of the bed

Daily sedative interruption and assessment of readiness to extubate

Peptic ulcer disease (PUD) prophylaxis

Venous Thromboembolism (VTE) prophylaxis

Ventilator care bundle

1

### Prevent central line infections

4

7

Hand hygiene

Maximum barrier precautions

Chlorhexidine skin antisepsis

Optimal catheter site selection

Daily review of line necessity and prompt removal

Central line bundle

3



## References

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3. Vincent JL, Bihari DJ, Suter PM, Bruining HA et al. The prevalence of nosocomial infection in intensive care units in Europe. Results of the European Prevalence of Infection in Intensive Care (EPIC) Study. Journal of American Medical Association 1995; 278:639–644
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7. American Thoracic Society. Guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcare-associated pneumonia. 2005. Available at [www.atsjournals.org](http://www.atsjournals.org)
14. Kress JP, Pohlman AS, O'Connor MF, Hall JB. Daily interruption of sedative infusions in critically ill patients undergoing mechanical ventilation. New England Journal of Medicine 2000; 342:1471–1477
15. Attia J, Ray JG, Cook DJ, Douketis J et al. Deep vein thrombosis and its prevention in critically ill adults. Archives Internal Medicine 2001; 161:1268–1279
16. Cook DJ, Fuller HD, Guyatt GH et al. Risk factors for gastrointestinal bleeding in critically ill patients. New England Journal of Medicine 1994; 330:377–381

**1994**

**2000**

**2001**

medicine 2006; 34:211–218

14. Kress JP, Pohlman AS, O'Connor MF, Hall JB. Daily interruption of sedative infusions in critically ill patients undergoing mechanical ventilation. New England Journal of Medicine 2000; 342:1471–1477
15. Attia J, Ray JG, Cook DJ, Douketis J et al. Deep vein thrombosis and its prevention in critically ill adults. Archives Internal Medicine 2001; 161:1268–1279
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8

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ventilation

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1

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Optimal catheter site selection

Daily review of line necessity  
and prompt removal

Central line bundle

3



# The Use of Continuous IV Sedation Is Associated With Prolongation of Mechanical Ventilation\*

*Marin H. Kollef, MD, FCCP; Nat T. Levy, MD; Thomas S. Ahrens, DNSc; Robyn Schaiff, PharmD; Donna Prentice, MSN; and Glenda Sherman, RN*

**Conclusion:** We conclude from these preliminary observational data that the use of continuous IV sedation may be associated with the prolongation of mechanical ventilation. This study suggests that strategies targeted at reducing the use of continuous IV sedation could shorten the duration of mechanical ventilation for some patients.

We conclude ... that the use of continuous IV sedation <lorazepam & fentanyl> is associated with ... the prolongation of ... mechanical ventilation

*Kollef et al Chest 1998; 114: 541*

DAILY INTERRUPTION OF SEDATIVE INFUSIONS IN CRITICALLY ILL PATIENTS  
UNDERGOING MECHANICAL VENTILATION

JOHN P. KRESS, M.D., ANNE S. POHLMAN, R.N., MICHAEL F. O'CONNOR, M.D., AND JESSE B. HALL, M.D.

midazolam  
& morphine

or

propofol  
& morphine

*Conclusions* In patients who are receiving mechanical ventilation, daily interruption of sedative-drug infusions decreases the duration of mechanical ventilation and the length of stay in the intensive care unit. (N Engl J Med 2000;342:1471-7.)

*... Midazolam & morphine have long half lives*

*... The dose of propofol was the same*

*? A single centre study of half lives & a great case for propofol?*



*If sedation holidays are so good  
why does no one use them?*

*Germany 34%<sup>1</sup>*

*Canada 40%<sup>2</sup>*

*USA 40%<sup>3</sup>*

*Martin et al Crit Care 2007; 11: R124*

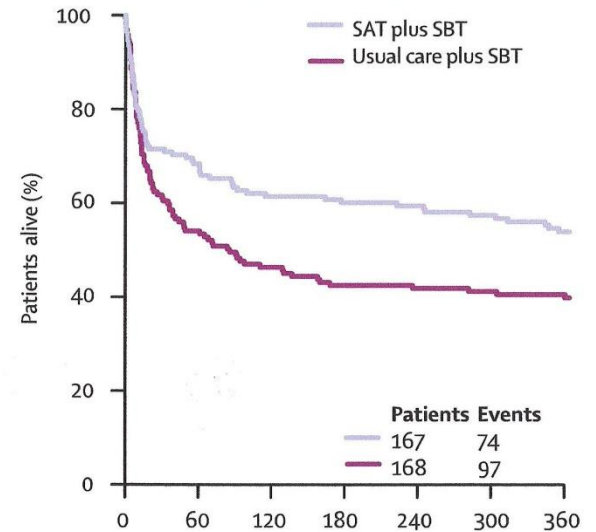
*Mehta et al CCM 2006; 34: 374*

*Devlin et al CCM 2006; 34: 556*



# **Efficacy and safety of a paired sedation and ventilator weaning protocol for mechanically ventilated patients in intensive care (Awakening and Breathing Controlled trial): a randomised controlled trial**

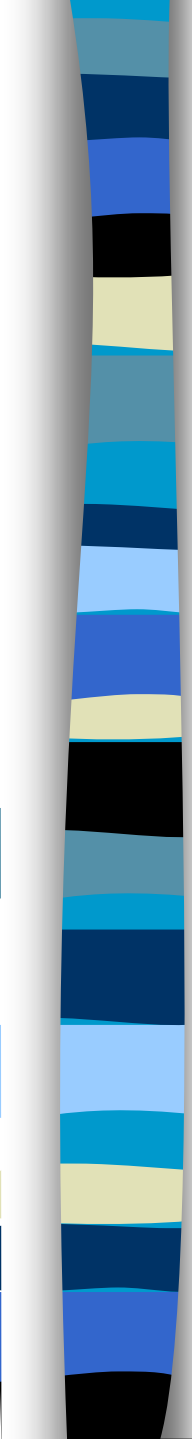
Timothy D Girard, John P Kress, Barry D Fuchs, Jason WW Thomason, William D Schweickert, Brenda T Pun, Darren B Taichman, Jan G Dunn, Anne S Pohlman, Paul A Kinniry, James C Jackson, Angelo E Canonico, Richard W Light, Ayumi K Shintani, Jennifer L Thompson, Sharon M Gordon, Jesse B Hall, Robert S Dittus, Gordon R Bernard, E Wesley Ely



In conclusion, our results suggest that use of a so-called wake up and breathe protocol that pairs daily spontaneous awakening trials (ie, interruption of sedatives) with daily spontaneous breathing trials for the management of mechanically ventilated patients in intensive care results in better outcomes than current standard approaches and should become routine practice.

**...or the trial selects survivors?**

*Girard et al Lancet 2008; 371: 126*



Perhaps a better sedative  
or  
better sedation control  
rather than  
of sedation holidays?

*or better staffing?*

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Jeremy M. Kahn  
Jason N. Doctor  
Gordon D. Rubenfeld

## **Stress ulcer prophylaxis in mechanically ventilated patients: integrating evidence and judgment using a decision analysis**

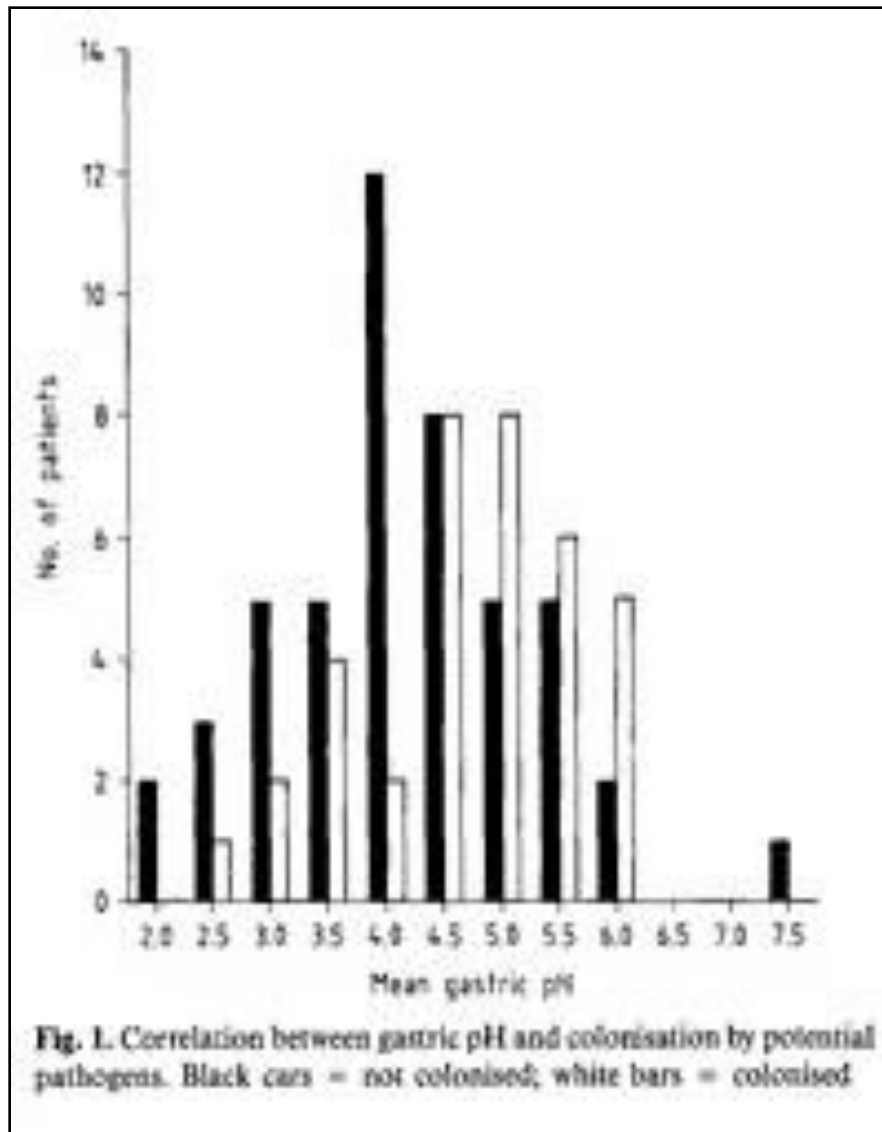
### **Introduction**

Stress ulcer prophylaxis is commonly used in patients receiving mechanical ventilation to prevent clinically significant gastrointestinal (GI) bleeding (GIB) [1]. Over 50 randomized trials and several meta-analyses have been published, however, the optimal strategy for stress ulcer prophylaxis remains controversial and practice patterns vary across providers [2, 3, 4, 5, 6]. One reason for this is that no clinical trial of stress ulcer prophylaxis has demonstrated a statistically significant reduction in mor-

**Conclusions:** No single strategy of stress ulcer prophylaxis is preferred when mortality is used as the outcome. In the absence of a clinical trial demonstrating survival benefit, the individual clinician's assumptions regarding the effect of prophylaxis on gastrointestinal bleeding and pneumonia and the attributable mortality of pneumonia vs. gastrointestinal bleeding will have a significant effect on the decision.

**'50' RCTs.....  
no single strategy  
demonstrates  
clinical benefit**

*Kahn et al ICM 2006; 32: 1151*



**Do you need to  
reduce gastric  
pH?**

*Winter RA et al ICM; 1989: 15: 479*

Christophe Faisy  
Emmanuel Guerot  
Jean-Luc Diehl  
Eléonore Iftimovici  
Jean-Yves Fagon

**Clinically significant gastrointestinal  
bleeding in critically ill patients  
with and without stress-ulcer prophylaxis**

## Introduction

During the past two decades the rate of stress-related gastrointestinal bleeding has declined in critical care probably due to improved management of acutely ill patients including prevention of mucosal hypoperfusion and enteral feeding [1, 2, 3, 4, 5]. Reported frequencies of clinically significant gastrointestinal bleeding vary from 0.6% to 6% [6] with or without stress-ulcer prophylaxis and reach 10% in a multicenter cohort.

*Conclusions:* Our results suggest that stress-ulcer prophylaxis does not influence the clinically significant gastrointestinal bleeding rate in intensive care unit patients or the cost of its management.



Is stress ulcer  
prophylaxis  
warranted?

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CRITICAL CARE**

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3



## Reducing harm in critical care: Prevent central line infections

### The Goal

Prevent central line infections (CLIs) and deaths from these by reliably implementing a set of interventions known as the "Central Line Bundle".

### Background

From *Saving Lives: delivering clean and safe care. High Impact Intervention No.1 – Central venous catheter care bundle*. Department of Health, 2007.

- Bloodstream infections associated with central venous catheter insertion are a major cause of morbidity. A 2006 prevalence survey found that 42.3% of bloodstream infections in England are central line-related.

- **Clorhexidine 2% skin antisepsis**

- Maki DG, Ringer M, Alvarado CJ. *Prospective randomised trial of povidone-iodine, alcohol, and chlorhexidine for prevention of infection associated with central venous and arterial catheters. Lancet, 10 August 1991; 338(8763):339-343.*
- Chaiyakunapruk N, Veenstra DL, Lipsky BA, Saint S. *Chlorhexidine compared with povidone-iodine solution for vascular catheter-site care: a meta-analysis. Annals of Internal Medicine, 4 June 2002; 136(11):792-801.*

**2002**

**1991**

Comparison of 0.05% Chlorhexidine Gluconate and 0.5% Povidone-Iodine as Cutaneous Disinfectant for Catheter-Related Bloodstream Infection  
M. Ishizuka, H. Nagata, K. Takagi, et al.

Critical Care Medicine  
November 1996 - Volume 21  
Clinical Investigation

Prospective, randomized trial of chlorhexidine versus povidone-iodine for central venous catheter colonization in intensive care unit patients

Mimoz, Olivier MD; Lawrence, Christopher MD; Costa, Yannick MD; Samii, Karim MD; Buisson, Christian MD



### Abstract

**Objectives:** To compare the efficacy of a newly available solution (composed of 0.25% chlorhexidine gluconate, benzalkonium chloride, and 4% benzyl alcohol), with 10% povidone-iodine, on the prevention of central venous or arterial catheter colonization and infection.

## Chlorhexidine Compared with Povidone-Iodine Solution for Vascular Catheter-Site Care: A Meta-Analysis

Nathorn Chaiyakunapruk, PharmD, PhD; David L. Veenstra, PharmD, PhD; Benjamin A. Lipsky, MD; and Sanjay Saint, MD, MPH

**Purpose:** Bloodstream infections, particularly central-line associated infections, morbidity, mortality, and costs evaluated the efficacy of chlorhexidine gluconate compared with povidone-iodine for catheter-related blood stream infections.

**Data Sources:** Medline, Cochrane reference lists of investigators and antisepsis.

**Study Selection:** Randomized trials comparing chlorhexidine gluconate with povidone-iodine for catheter site care.

**Data Extraction:** Abstracted data on catheter site care and incidence of catheter-related infections included studies.

## THE LANCET

Volume 338, Issue 8763, 10 August 1991, Pages 339-343

doi:10.1016/0140-6736(91)90479-9 | How to Cite or Link Using DOI  
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Cited By in Scopus (368)

### Prospective randomised trial of povidone-iodine, alcohol, and chlorhexidine for prevention of infection associated with central venous and arterial catheters

D. G. Maki MD, Prof<sup>a, b, c, d</sup>, C. J. Alvarado MS<sup>b</sup> and M. Ringer MS<sup>b</sup>

<sup>a</sup> Section of Infectious Diseases, Department of Medicine, University of Wisconsin-Madison, Madison, Wisconsin, U.S.A.

<sup>b</sup> Infection Control Department

<sup>c</sup> Center for Trauma and Life Support

Available online 20 September 1991

#### Abstract

More than 90% of all intravascular infections are caused by bacteria introduced at the catheter insertion site. Chlorhexidine disinfection of the skin at the catheter insertion site has been shown to reduce the incidence of local catheter-related bacteremia (infections to infected catheters), 1 with chlorhexidine, rather than povidone-iodine, insertion site care can substantially reduce the incidence of catheter-related bacteremia.

### Prospective Randomized Trial of 10% Povidone-Iodine versus 0.5% Tincture of Chlorhexidine as Cutaneous Antisepsis for Prevention of Central Venous Catheter Infection

Atul Humar,<sup>1</sup> Aileen Ostromecki,<sup>2</sup> Judy Drenfeld,<sup>2</sup> John C. Marshall,<sup>3</sup> Neil Lazar,<sup>4</sup> Patricia C. Houston,<sup>4,a</sup> Paul Boiteau,<sup>1,b</sup> and John M. Conly<sup>1,2</sup>

Departments of <sup>1</sup>Medicine, <sup>2</sup>Microbiology, <sup>3</sup>Surgery, and <sup>4</sup>Anesthesia, University Health Network (Toronto General Hospital, Toronto Western Hospital, and Princess Margaret Hospital), and Mount Sinai Hospital, University of Toronto, Toronto, Ontario, Canada

Review

### ORIGINAL ARTICLE

## Chlorhexidine-Alcohol versus Povidone-Iodine for Surgical-Site Antisepsis

Rabih O. Darouiche, M.D., Matthew J. Wall, Jr., M.D., Kamal M.F. Itani, M.D., Mary F. Otterson, M.D., Alexandra L. Webb, M.D., Matthew M. Carrick, M.D., Harold J. Miller, M.D., Samir S. Awad, M.D., Cynthia T. Crosby, B.S., Michael C. Mosier, Ph.D., Atef AlSharif, M.D., and David H. Berger, M.D.

# Chlorhexidine: the right stuff....

0.05%

Vol. 43, No. 3, 2009

Free Abstract Article (Reference)

Original Paper

Comparison of 0.05% Chlorhexidine and 10% Povidone-Iodine as Cutaneous Disinfectant for Catheter-Related Bloodstream Infections  
M. Ishizuka, H. Nagata, K. Takagishi, et al.

Critical Care Medicine  
November 1996 - Volume 21  
Clinical Investigation

Prospective, randomized, controlled trial of chlorhexidine versus alcohol for central venous catheter colonization in intensive care unit patients

Mimoz, Olivier MD; Lawrence, Christopher MD; Costa, Yannick MD; Samii, Kamran MD; Buisson, Christian MD



Abstract

Objective: To compare the efficacy of 0.05% chlorhexidine gluconate, 10% povidone-iodine, and 70% alcohol on the prevention of central venous or arterial catheter colonization and infection.

0.25%

## Prospective Randomized Trial of 10% Povidone-Iodine vs Chlorhexidine as Cutaneous Antisepsis for Prevention of Catheter Infection

Atul Humar,<sup>1</sup> Aileen Ostromecki,<sup>2</sup> Judy Drenfeld,<sup>2</sup> John C. Marshall,<sup>3</sup> Neil Lazar,<sup>4</sup> Patricia C. Houston,<sup>4,a</sup> Paul Boiteau,<sup>1,b</sup> and John M. Conly<sup>1,2</sup>

Departments of <sup>1</sup>General Surgery and <sup>2</sup>Anesthesia, University Health Network (Toronto General Hospital, Toronto Western Hospital, and Princess Margaret Hospital), and Mount Sinai Hospital, University of Toronto, Toronto, Ontario, Canada

0.5%

## Chlorhexidine Compared with Povidone-Iodine Solution for Vascular Catheter-Site Care: A Meta-Analysis

Nathorn Chaiyakunapruk, PharmD, PhD; David L. Veenstra, PharmD, PhD; Benjamin A. Lipsky, MD; and Sanjay Saint, MD, MPH

Purpose: Bloodstream infections related to use of catheters, particularly central-line catheters, are a major cause of morbidity, mortality, and cost. We evaluated the efficacy of skin antiseptics compared with povidone-iodine for catheter-related bloodstream infections.

Data Sources: Multiple databases were searched for reference lists of identified studies and antiseptic meta-analyses.

Study Selection: Randomized controlled trials comparing chlorhexidine gluconate with povidone-iodine for catheter site care.

Data Extraction: Using standardized forms, we abstracted data on study characteristics and incidence of catheter-related bloodstream infections.

Data Synthesis: Eight studies involving a total of 4143 catheters were included in the meta-analysis.

## THE LANCET

Volume 338, Issue 8763, 10 August 1991, Pages 339-343

doi:10.1016/0140-6736(91)90479-9 | How to Cite or Link Using DOI  
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## Prospective randomised trial of povidone-iodine, alcohol, and chlorhexidine for prevention of infection associated with central venous and arterial catheters

D. G. Maki MD, Prof<sup>a, b, c</sup>, C. J. Alvarado MS<sup>b</sup> and M. Ringer MS<sup>b</sup>

<sup>a</sup> Section of Infectious Diseases, University of Michigan, U.S.A.

<sup>b</sup> Infection Control Department, University of Michigan

<sup>c</sup> Center for Trauma and Shock Research, University of Michigan

Available online 20 September 1991

### Abstract

More than 90% of catheter-associated infections can be prevented by antiseptic skin care. We compared the efficacy of 10% povidone-iodine, 70% alcohol, and 0.05% chlorhexidine disinfectants on the incidence of local and systemic catheter-related infections in patients with central venous catheters. In a prospective, randomized, controlled trial, 100 patients were assigned to each of the three groups. The incidence of catheter-related infections was significantly lower in the chlorhexidine group than in the povidone-iodine or alcohol groups.

2%

ORIGINAL ARTICLE

## Chlorhexidine-Alcohol versus Povidone-Iodine for Surgical-Site Antisepsis

Rabih O. Darouiche, M.D., Matthew J. Wall, Jr., M.D., Karen L. Archer, M.D., Mary F. Otterson, M.D., Alexandra L. Webb, M.D., Matthew J. Miller, M.D., Samir S. Awad, M.D., Cynthia A. Archer, M.D., Michael C. Mosier, Ph.D., Atef AlSharif, M.D., and David N. Archer, M.D.

2%

But the concentration???



But UK availability & cost  
of 2% chlorhexidine?

REDUCING  
HARM IN  
CRITICAL CARE

8

**1** PATIENT  
SAFETY  
FIRST

Reduce harm  
from  
mechanical  
ventilation

2

5

6

Prevent  
central  
line  
infections

4

7

Elevation of the head of  
the bed

Daily sedative interruption  
and assessment of readiness  
to extubate

Peptic ulcer disease (PUD)  
prophylaxis

Venous Thromboembolism  
(VTE) prophylaxis

Ventilator care bundle

1

Hand hygiene

Maximum barrier precautions

Chlorhexidine skin antisepsis

Optimal catheter site selection

Daily review of line necessity  
and prompt removal

Central line bundle

3





## Implementing the Central Line Bundle

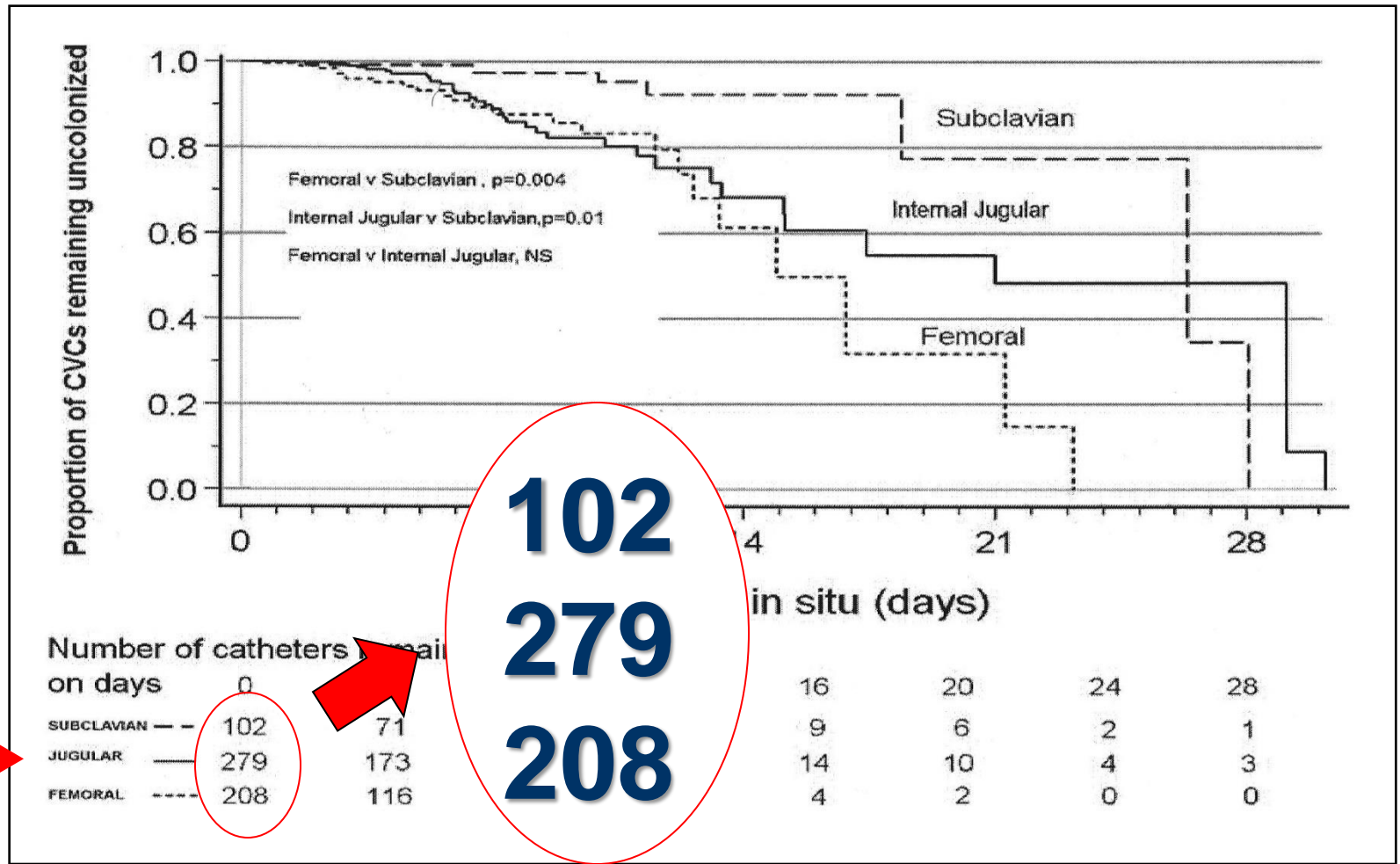
This bundle has five key components:

1. Hand hygiene
2. Maximal barrier precautions
3. Use of 2% Chlorhexidine skin antisepsis
4. Optimal catheter site selection, with subclavian vein as the preferred site for non-tunnelled catheters in adults and avoidance of the femoral site
5. Daily review of central line necessity with prompt removal of unnecessary lines



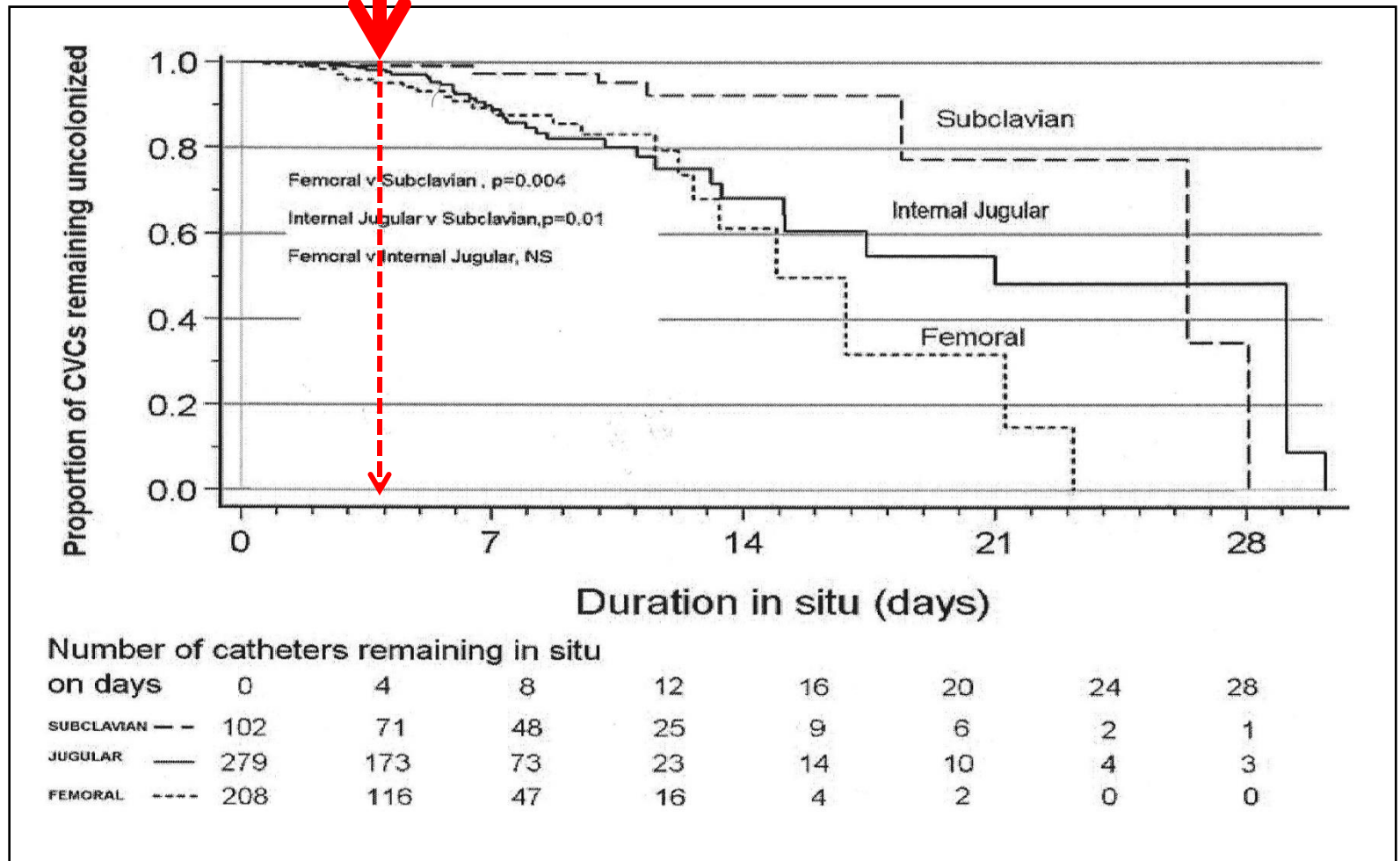
**Best in the subclavian vein:  
*avoid* the internal jugular & femoral  
veins**

# Where do you site your CVCs?



*Gowardman et al ICM 2008; 34:1046*

# Where do you site your CVCs?



*Gowardman et al ICM 2008; 34:1046*



The right antisepsis (?)  
... but the right site?

## Insertion actions

### Dialysis catheter type

- Tunnelled dual lumen catheter if dialysis treatment is expected to continue for greater than 21 days.

### Insertion site

- Internal jugular is the preferred site.<sup>6</sup>
- Femoral vein may be considered.
- Subclavian vein stenosis may impair a future shunt.

### Skin preparation

- Preferably use 2% chlorhexidine
- If patient has a sensitivity to chlorhexidine, use povidone-iodine

### Personal protective equipment

- Eye/face protection if in splash risk

### Hand hygiene

- Decontaminate hands before and after
- Use correct hand hygiene technique

### Aseptic technique

- Gown, gloves and drape

### Dressing

- Use a sterile, semi-permeable

### Safe disposal of sharps

- Sharps container should be used for needle and syringe; do not recap

### Documentation

- Date of insertion should be recorded in notes.

**Saving Lives:** reducing infection, delivering clean and safe care

## High Impact Intervention No 3

### Renal dialysis catheter care bundle



### Aim

To reduce the incidence of renal dialysis catheter-related bloodstream infection (DCR-BSI)

**Insertion Site:** best in the internal jugular vein – or the femoral vein  
***Avoid*** the subclavian vein





Does it matter?

# Sepsis Bundles

## Changes for Improvement

### ***Bundle Element 1***

Administer low-dose steroids for septic shock in accordance with a standardized ICU policy. If not administered, document why the patient did not qualify for low-dose steroids based upon the standardized protocol.

### ***Bundle Element 2***

Administer recombinant human activated protein C (rhAPC) in accordance with a standardized ICU policy. If not administered, document why the patient did not qualify for rhAPC.

### ***Bundle Element 3***

Maintain adequate glycemic control.

[Click here](#) to see SSC Statement on Glucose Control in Severe Sepsis (2009)

### ***Bundle Element 4***

Prevent excessive inspiratory plateau pressures on mechanically ventilated patients.

*Lewis JAMA 2010; 303: 777*

## Disassembling Goal-Directed Therapy for Sepsis A First Step

Roger J. Lewis, MD, PhD

ceiving lactate-guided treatment. These results support the noninferiority of the lactate-guided approach, even when

*Finfer ICM 2010; 36 187*

EDITORIAL

Simon Finfer

**The Surviving Sepsis Campaign: robust  
evaluation and high-quality primary  
research is still needed**

Original article

*Reade et al EMJ 2010; 27: 110*

## Variability in management of early severe sepsis

Michael C Reade,<sup>1,2</sup> David T Huang,<sup>1,3</sup> Derek Bell,<sup>4</sup> Timothy J Coats,<sup>5</sup>  
Anthony M Cross,<sup>6</sup> John L Moran,<sup>2</sup> Sandra L Peake,<sup>2</sup> Mervyn Singer,<sup>7</sup>  
Donald M Yealy,<sup>1,3</sup> Derek C Angus,<sup>1</sup> for the British Association for Emergency Medicine,  
the UK Intensive Care Society, the UK Society for Acute Medicine, the Australasian  
Resuscitation in Sepsis Evaluation (ARISE) Investigators and the Protocolized Care  
for Early Septic Shock (ProCESS) Investigators



Has it mattered?

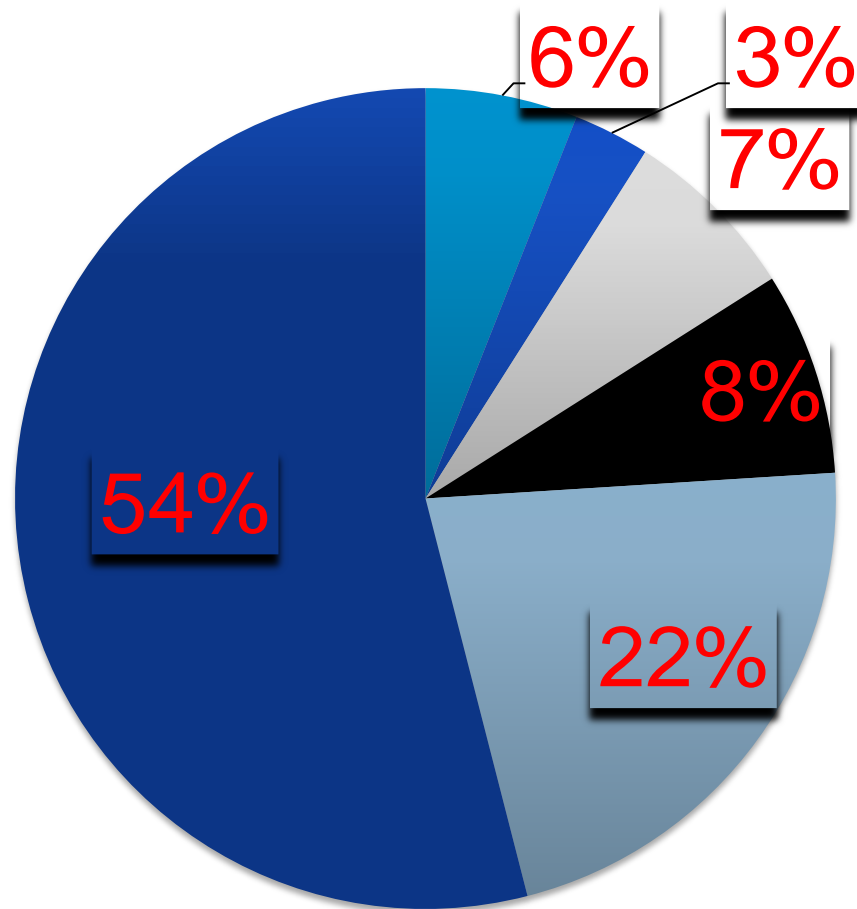
***The NHS is broke.  
What are you going to cut?***



*Do you need to do everything you  
are doing?*

*Let's save money by doing less -  
but better*



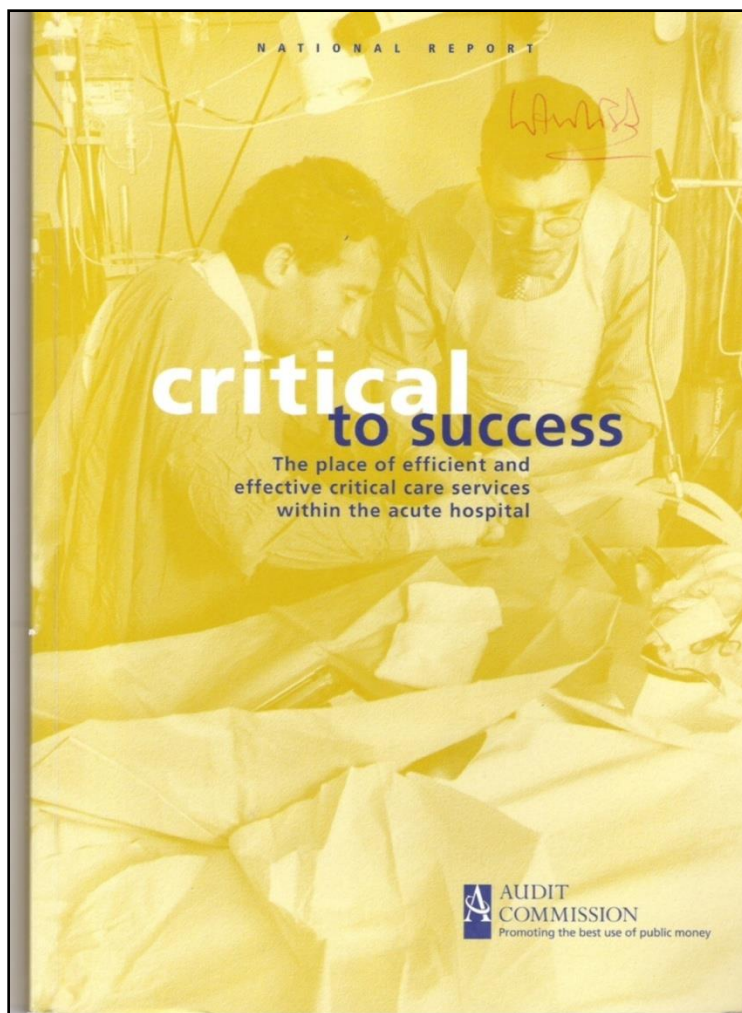


**Staff 54%:** Consumables 22%: Clinical support 8%  
Non clinical support 7%: Estates 3%: Capital 6%

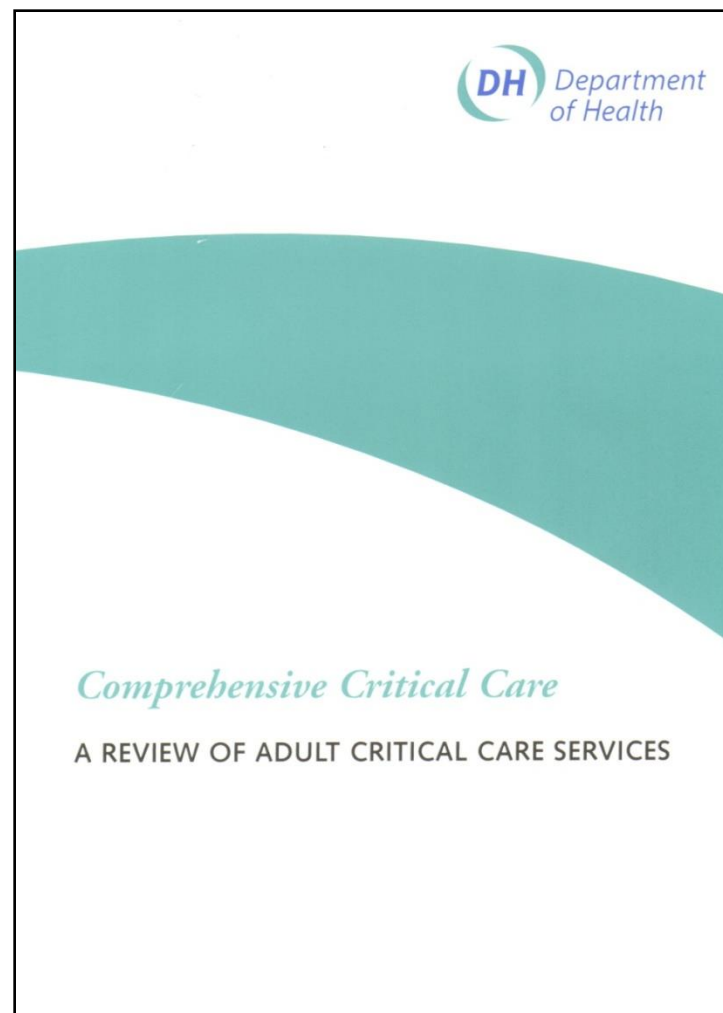
***The NHS is broke.  
What are you going to cut?***



**Let's save money by  
reviewing the services we deliver**



27 October 1999



25 May 2000



# **‘Critical to Success’: recommendations**

## **Highest priority recommendations**

- 1** Improve services for patients on wards who are at risk of deteriorating into a need for critical care:
  - review trainee doctor and senior ward nurse recognition skills of the early warning signs;
  - agree 'danger sign' guidelines to help ward staff to identify when to call for specialist advice to prevent deterioration; and
  - develop an 'outreach' service from critical care specialists to support ward staff in managing patients at risk.



## ***'Critical to Success'***

### ***References in support of the national recommendation to develop outreach***

**Goldhill DR, Singh S, Tarling M et al. The Patient at Risk team: identifying and managing critically ill ward patients. *Paper presented to the conference of the Intensive Care Society. Blackpool 1998.***

**McQuillam P, Pilkington S, Allan A et al. Confidential enquiry into quality of care before admission to intensive care. *Brit Med J. 1998; 316: 1853. (comment in Discussion)***

**Garrard C, Young JD. Suboptimal care of patients before admission to intensive care. *(Editorial). Brit Med J. 1998; 316: 1841.***

**Morgan R, Williams F, Wright M. An early warning scoring system for detecting developing critical illness. *Clinical Intensive Care. 1999; 8: 100.***

**Mercer M, Fletcher S, Bishop G. Medical emergency teams improve care. *(Letter). Brit Med J. 1999; 318: 54.***



# **‘Comprehensive Critical Care’: recommendations**

**The following recommendations should be implemented within the medium term:**

**Outreach services need to be developed as an integral part of each NHS Trust’s critical care service and will have three essential objectives:**

- **to avert admissions**
- **to enable discharges**
- **to share critical care skills**

**[Paragraph 37]**

***Summary of Recommendations: p 24***

***Nothing about dilution....***



## ***‘Comprehensive Critical Care’***

### ***References in support of the national recommendation to develop outreach***

**Goldhill DR, Singh S, Tarling M et al. the Patient at Risk team: identifying and managing critically ill ward patients. *Paper presented to the conference of the Intensive Care Society. Blackpool 1998.***

**Morgan R, Williams F, Wright M. An early warning scoring system for detecting developing critical illness. *Clinical Intensive Care. 1999; 8: 100.***

**Mercer M, Fletcher S, Bishop G. Medical emergency teams improve care. *(Letter) Brit Med J. 1999; 318: 54.***

## The Medical Emergency Team

A. LEE\*, G. BISHOP†, K. M. HILLMAN‡, K. DAFFURN#

*Department of Anaesthetics and Intensive Care, Liverpool Hospital, Liverpool, N.S.W.*

Despite the MET system, mortality from cardiopulmonary resuscitation remains high, with only 29% of patients surviving to hospital discharge. This survival rate is higher than that reported in several studies.<sup>2,3,9-11</sup> However, this study did not specifically address the question of whether early intervention improved outcome from cardiopulmonary resuscitation. In fact, the outcome from cardiopulmonary resuscitation may be worse because potentially salvageable cases have been prevented.

# CCOS: the evidence summarised

Evidence	Number of studies	Significant effect	Non-significant	Comment
Mortality (including cardiac arrest & ICU readmission)	23	10	13	RCT <sup>a</sup> : single centre; positive effect RCT <sup>b</sup> : multi-centre; no effect Three centre study <sup>c</sup> : no effect
LoS	10	3	7	RCT <sup>a</sup> : single centre; no effect
Cardiac arrest	12	5	7	RCT <sup>a</sup> : single centre; no effect Three centre study <sup>c</sup> : no effect
Unscheduled ICU admission	8	3	5	RCT <sup>b</sup> : multi-centre; no effect Three centre study <sup>c</sup> : positive effect
ICU readmission	6	2	4	Single centre or small

*a. Priestley et al. Intensive Care Med 2004; 30: 1398.*  
*b. MERIT studies investigators. Lancet 2005; 365: 2091.*  
*c. Bristow et al. MJA 2000; 173: 236.*

# Rapid Response Teams

## *A Systematic Review and Meta-analysis*

Paul S. Chan, MD, MSc; Renuka Jain, MD; Brahmajee K. Nallmothu, MD, MPH;  
Robert A. Berg, MD; Comilla Sasson, MD, MS

**Conclusion:** Although RRTs have broad appeal, robust evidence to support their effectiveness in reducing hospital mortality is lacking.

*Arch Intern Med. 2010;170(1):18-26*

of hospital mortality or the secondary outcome of cardiopulmonary arrest cases were included.

**Results:** Eighteen studies from 17 publications (with 1 treated as 2 separate studies) were identified, involving nearly 1.3 million hospital admissions. Implementation of an RRT in adults was associated with a 33.8% reduction in rates of

**Conclusion:** Although RRTs have broad appeal, robust evidence to support their effectiveness in reducing hospital mortality is lacking.

*Arch Intern Med. 2010;170(1):18-26*





It seemed a good idea  
but....

with a limited evidence base  
should you/can you afford  
an outreach system?

## Organs for Transplants

*A report from the Organ Donation Taskforce*

### Recommendation 9

The current network of DTCs should be expanded and strengthened through central employment by a UK-wide Organ Donation Organisation. Additional co-ordinators, embedded within critical care areas, should be employed to ensure a comprehensive, highly skilled, specialised and robust service. There should be a close and defined collaboration between DTCs, clinical staff and Trust donation champions. Electronic on-line donor registration and organ offering systems should be developed.



Department of  
**Health, Social Services  
and Public Safety**

[www.dhsspsni.gov.uk](http://www.dhsspsni.gov.uk)

AN tOIGH

Sláinte, Seirbhísí Sóisialta  
agus Sábháilteachta Poiblí

MAWYSTRE D

Poustie, Resydënter Heisin  
an Fowk Siccar



**The Scottish  
Government**



Llywodraeth Cynulliad Cymru  
Welsh Assembly Government

**January 2008**

## Effect of "collaborative requesting" on consent rate for organ donation: randomised controlled trial (ACRE trial)

The ACRE Trial Collaborators

Correspondence to: D Young, Intensive Care Society Clinical Trials Group, Kadoorie Centre for Critical Care Research and Education, John Radcliffe Hospital, Oxford OX3 9DU duncan.young@oxa.ox.ac.uk

Cite this as: BMJ 2009;339:b3911 doi:10.1136/bmj.b3911

## ABSTRACT

**Objective** To determine whether collaborative requesting increases consent for organ donation from the relatives of patients declared dead by criteria for brain stem death.

**Design** Unblinded multicentre randomised controlled trial using a sequential design. Centralised 24 hour telephone randomisation based on randomised permuted blocks of 10.

**Setting** 79 general, neuroscience, and paediatric intensive care units in the United Kingdom.

**Participants** 201 relatives of patients meeting criteria for

## INTRODUCTION

The most common reason why organs for transplantation are not obtained from patients after confirmation of brain stem death on an intensive care unit in the United Kingdom is the refusal of consent by the patient's relatives. A recent audit of all deaths in 341 intensive care units in the UK over a 24 month period showed that 41% of the relatives of potential organ donors denied consent for donation.<sup>1</sup> Although in the UK the Human Tissue Act 2004 prioritises the wishes and consent of the potential organ donor over his or her relatives, it is almost inconceivable that organs

**Conclusion** There is no increase in consent rates for organ donation when collaborative requesting is used in place of routine requesting by the patient's clinician.

and sex of the potential donors the risk adjusted ratio of the odds of consent in the collaborative requesting group relative to the routine group was 0.80 (95% confidence interval 0.43 to 1.53), with a P value of 0.49 adjusted for interim analysis and trial over-running. The conversion rate (donors with consent from whom any organs were retrieved) was 92% (57/62) in the routine requesting group and 79% (45/57) in the collaborative requesting group (P=0.043). There were 140 approaches to relatives in the per protocol analysis, leading to 60.3% (44/73) consent after routine and 67.2% (45/67) after collaborative requesting (risk adjusted odds ratio of consent 1.47, 0.67 to 3.20, P=0.33).

**Conclusion** There is no increase in consent rates for organ donation when collaborative requesting is used in place of routine requesting by the patient's clinician.

**Trial registration** ISRCTN01169903

que to maximise the experience of requestors is "collaborative requesting," where a request for organ donation is made jointly by the patient's clinician and a donor transplant coordinator (often referred to as an organ procurement officer outside the UK). Although widely advocated, the efficacy or effectiveness of this technique has not been rigorously tested.

## METHODS

The ACRE (Assessment of Collaborative REquesting) study was designed to test the null hypothesis that there is no difference in consent rates for organ donation when relatives are approached by the clinical team and a donor transplant coordinator together (collaborative request) compared with the clinical team alone (routine request). The study was an unblinded multicentre randomised controlled trial, with a sequential design.

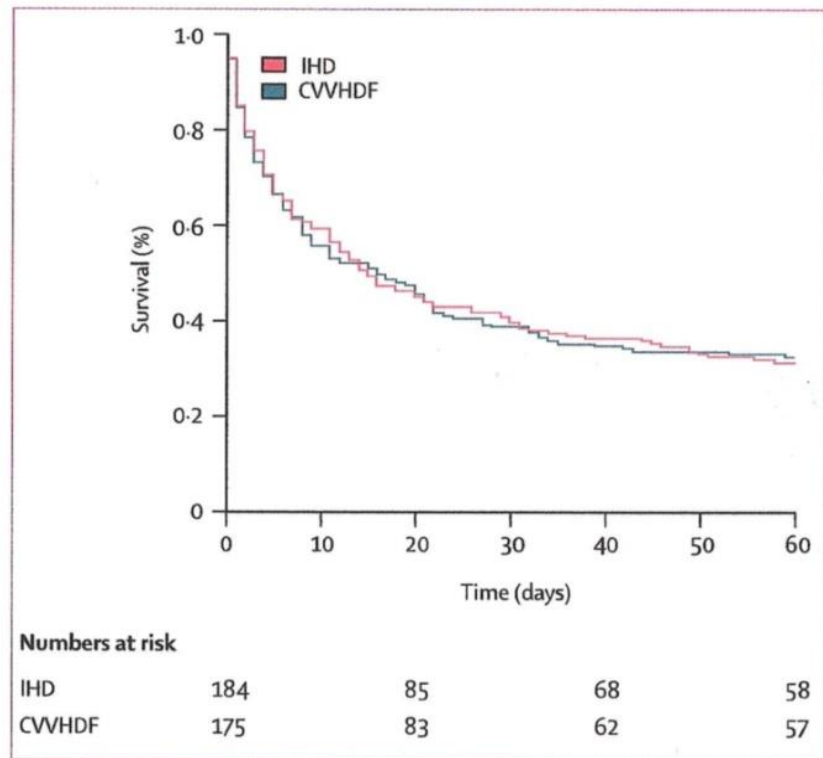
*ACRE collaborators BMJ 2009; 339: b3911*



It seemed a good idea  
but...

do you need  
(to pay for)  
donor liaison nurses?

# Continuous venovenous haemodiafiltration versus intermittent haemodialysis for acute renal failure in patients with multiple-organ dysfunction syndrome: a multicentre randomised trial



**Figure 2: Estimation of survival rate according to treatment group**  
IHD=intermittent haemodialysis, CVVHDF=continuous venovenous haemodiafiltration.

Outcome of  
ARF  
is similar  
whether  
treated with  
IDH or CRRT





*If* outcome is similar,  
is IHD more cost-effective  
than CRRT?

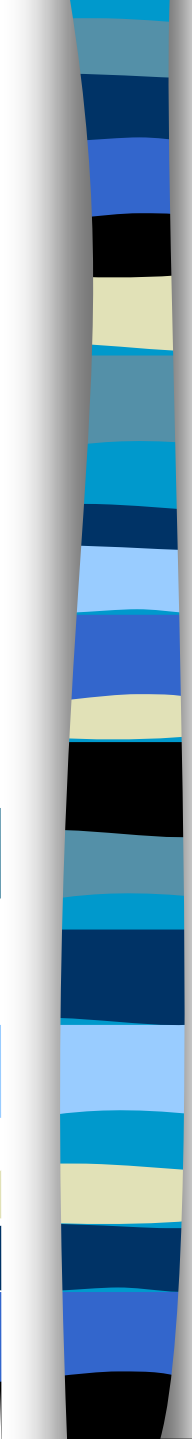
Does every ICU need to  
be able to undertake  
CRRT?



Does your ICU contribute  
to the  
cardiac arrest team?

Why?

(Do you need to provide the staff for  
airway care?)



How many fully equipped  
cardiac arrest trolleys  
are sited outside  
super acute areas?

Why?

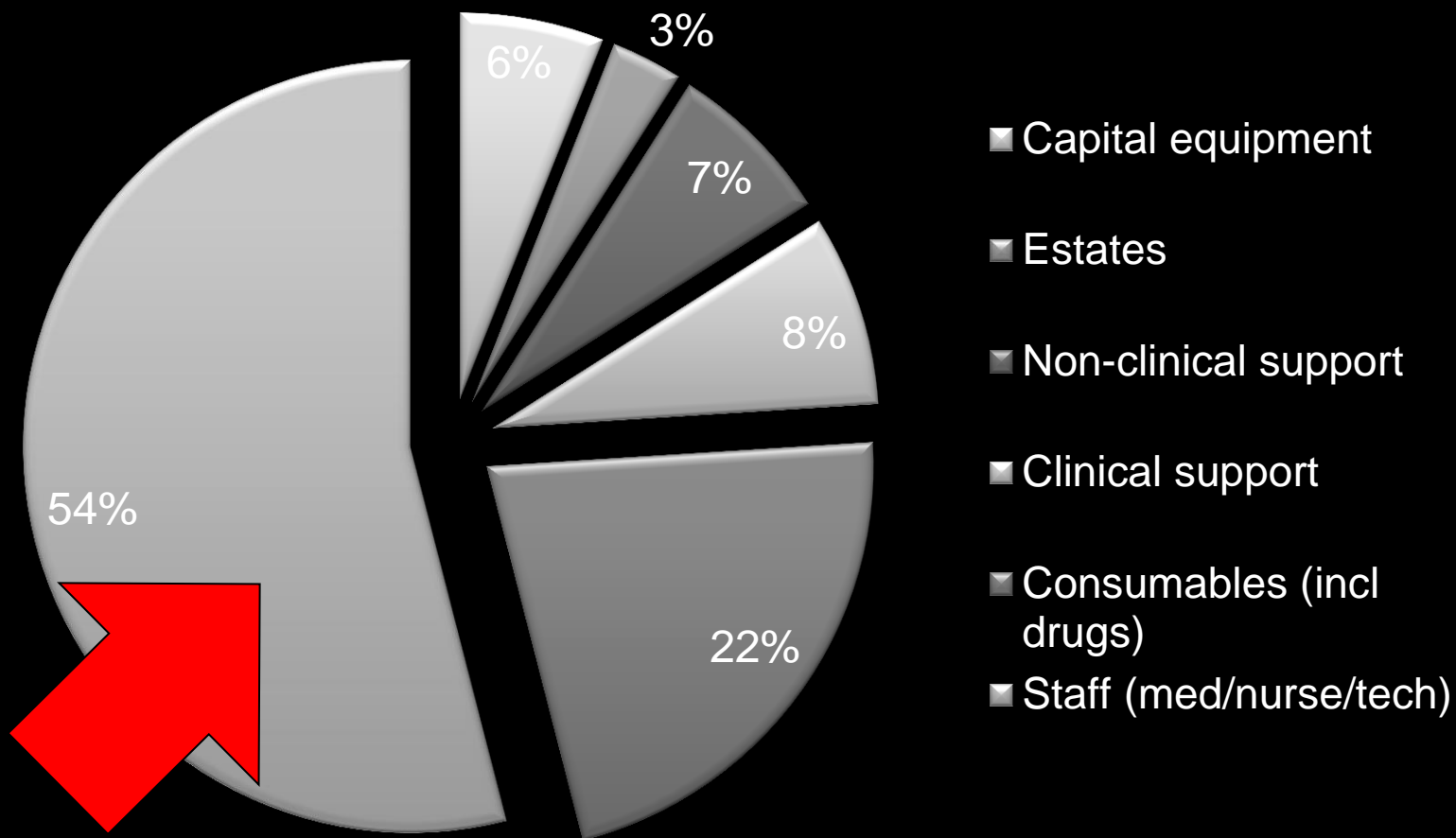
(Move the patients)



Does your ICU  
contribute to H@N?

Why?

(You don't clerk routine patients)



Our problem: staff costs





*Is it time to ask yourself:  
what is your core business?*

*If you are to ensure quality care  
for your patients, is it time to  
review your service commitments?*

# *Targeted Intensive Care*

~~*Comprehensive Critical Care*~~

A REVIEW OF ADULT CRITICAL CARE SERVICES

**23 March 2010**



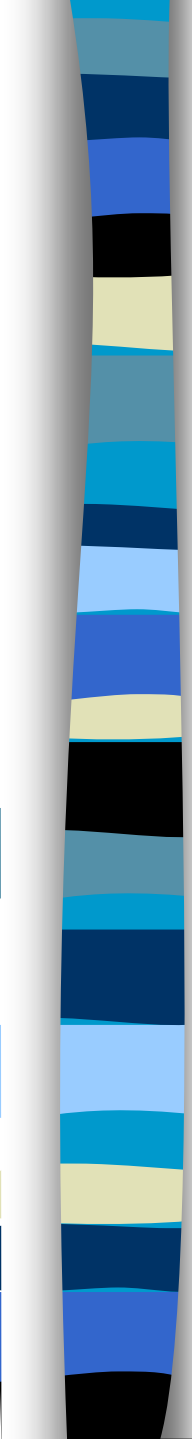
*2010  
Time to  
rebuild  
the walls*



# SMART & Lean businesses....

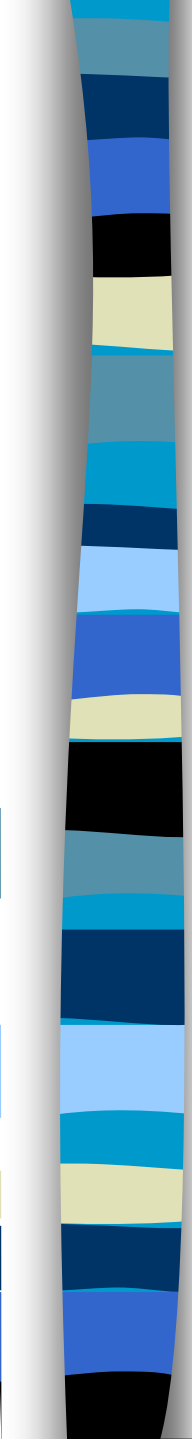
- SMART stands for Specific, Measurable, Achievable, Realistic and Timely
- Lean is Toyota's improvement approach (!): getting the right things to the right place, at the right time, in the right quantities, while minimising waste ***and being flexible and open to change.***

*Are we open to change?*



# Cutting costs: evidence limited services/non core services/new developments

- Outreach
- Donor liaison nurses
- Hospital @ Night
- CCRT
- Follow up clinics



# Cutting costs: evidence limited services/non core services: capital/revenue

- Cardiac arrest trolleys
- CCRT



# Cutting costs: staffing

- Consultant time (more for less)
- Trainees (less or more)
- CCPs?
- CCOT (none)
- Donor nurse (none)
- H@N (none)
- F/U clinics (research budget)



# Care bundles: time to rethink?



*Just big brother watching.....?*

# Ventilator Care Bundle (Stirling)



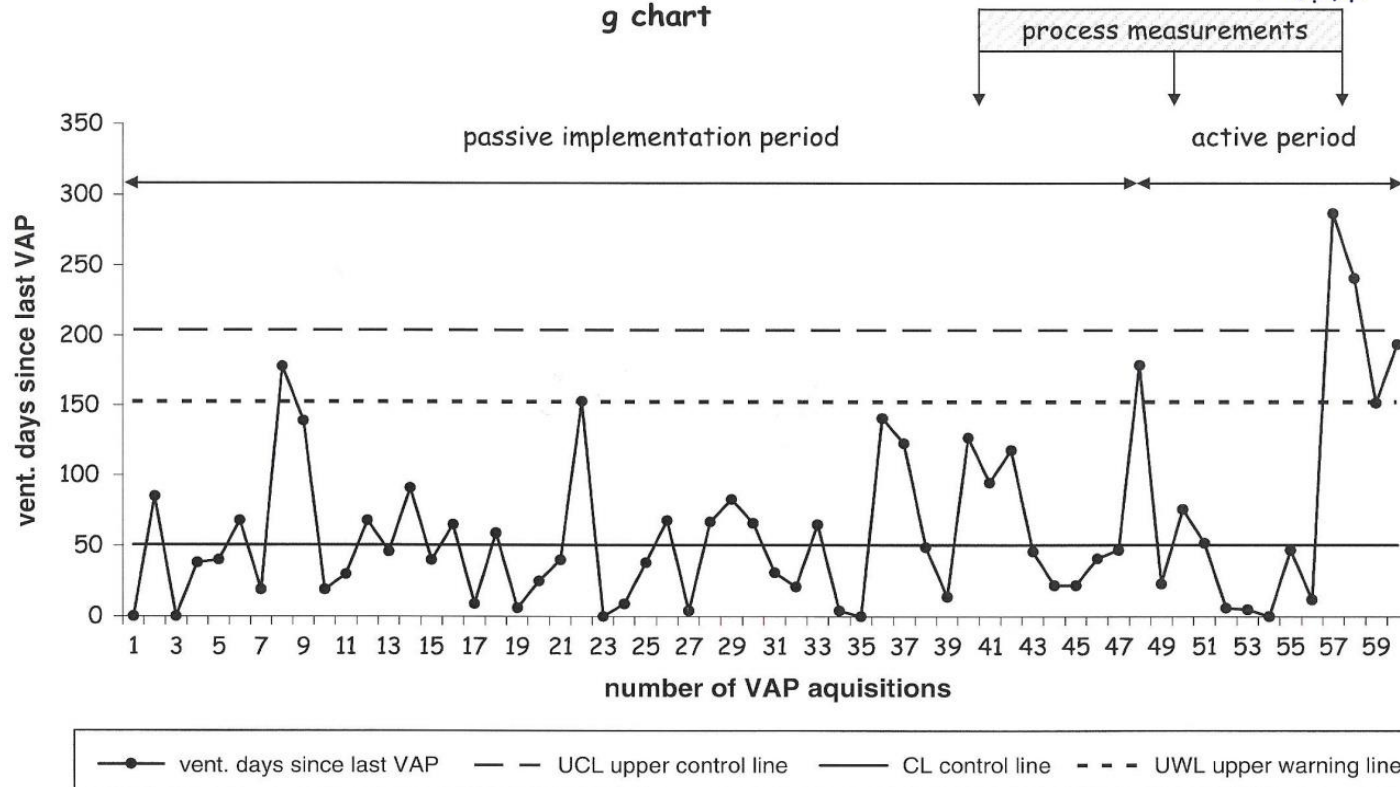
- 30-45° degree head up tilt
- Oral antiseptic
- Sub-glottic suction
- Sedation break & weaning assessment
- Tubing management (HME)

***??DVT, ??Stress ulcer***

*Hawe et al. ICM 2009; 35: 1180*



g chart



Stirling Royal Infirmary

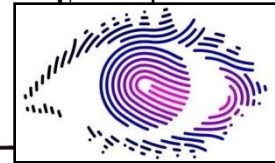
*Hawe et al. ICM 2009; 35: 1180*

# The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

DECEMBER 28, 2006

VOL. 355 NO. 26



## An Intervention to Decrease Catheter-Related Bloodstream Infections in the ICU

**Table 3.** Rates of Catheter-Related Bloodstream Infection from Baseline (before Implementation of the Study Intervention) to 18 Months of Follow-up.\*

Study Period	No. of ICUs	No. of Bloodstream Infections per 1000 Catheter-Days				
		Overall	Teaching Hospital	Nonteaching Hospital	<200 Beds	>200 Beds
Baseline	55	2.7				1.3–4.8)
During implementation	96	1.6				0–4.3)†
After implementation						
0–3 mo	96	0 (0–3.0)‡	1.3 (0–3.1)†	0 (0–1.6)†	0 (0–2.7)	1.1 (0–3.1)‡
4–6 mo	96	0				–3.2)‡
7–9 mo	95	0				–2.2)‡
10–12 mo	90	0				–2.3)‡
13–15 mo	85	0				–2.0)‡
16–18 mo	70	0 (0–2.4)‡	0 (0–2.7)‡	0 (0–1.2)†	0 (0–0)†	0 (0–2.6)‡

**2.7/1000 days**

**~ 0/1000 days**

\* Because the ICUs implemented the study intervention at different times, the total number of ICUs contributing data for each period varies. Of the 103 participating ICUs, 48 did not contribute baseline data. P values were calculated by the two-sample Wilcoxon rank-sum test.  
† P≤0.05 for the comparison with the baseline (preimplementation) period.  
‡ P≤0.002 for the comparison with the baseline (preimplementation) period.

*Pronovost et al. NEJM 2006; 355: 2725*

## Sustaining reductions in catheter related bloodstream infections in Michigan intensive care units: observational study

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# Improving outcome from critical illness



- Is that called doing things properly?
- Is that called stop cutting corners?
- Is that called staffing levels?
- Is that called re-deploy?
- Might outcome improvement boil down to asepsis and antisepsis?
- And EBM?

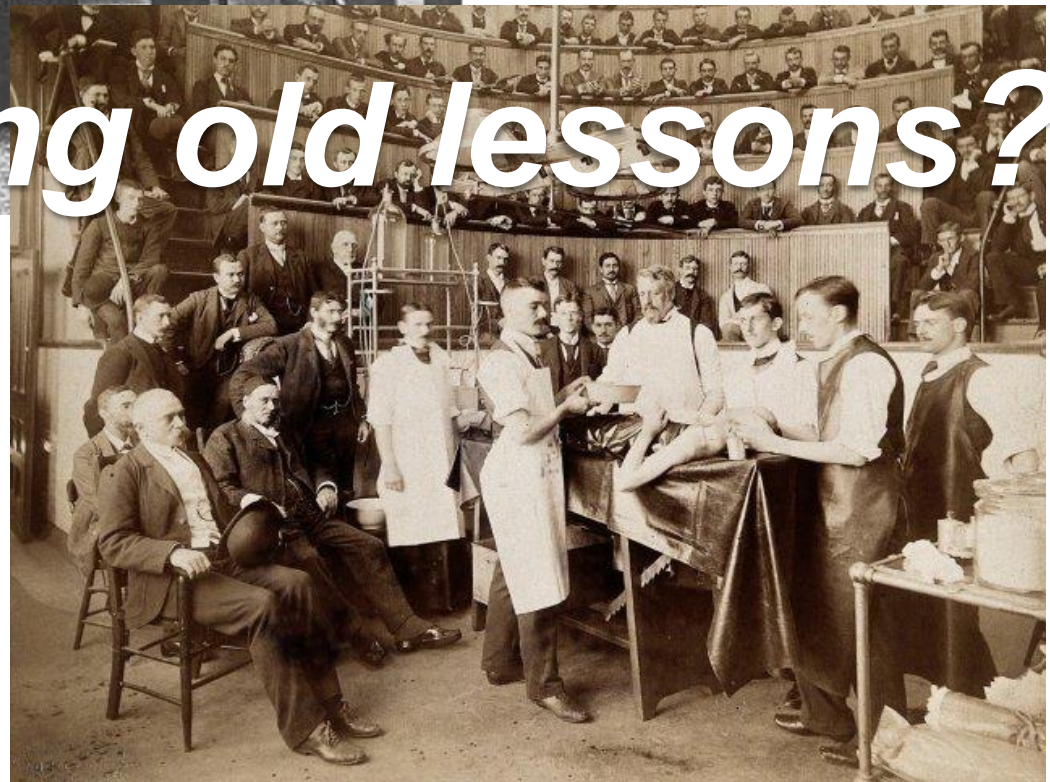





**Antisepsis**  
**Lister**  
**1867**

*Relearning old lessons?*

**Asepsis**  
**Lawson Tait**  
**1860**





**Do less  
Do what works  
Do it properly  
Rebuild the walls**

**Protect your core business' staffing levels**

**This is an opportunity for review &  
redesign**

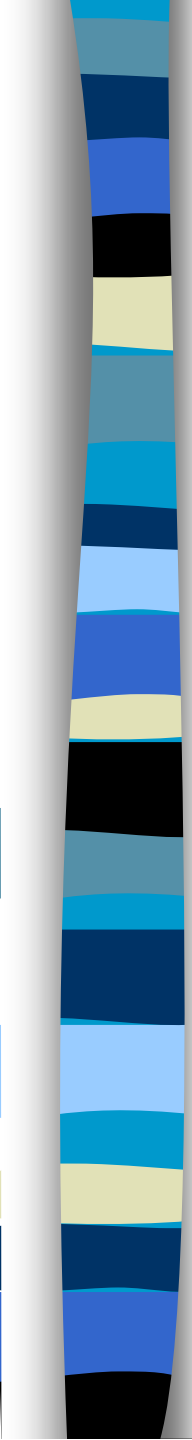
*And perhaps experts should provide less expert opinion..*

***The NHS is broke.  
What are you going to cut?***

***Review your services before someone  
does it to you ...  
(and if they haven't - they will)***







*‘Gentlemen, beware of the expert: by the time he is generally recognised as such, in my experience, he should usually be referred to in the past tense’.*

*Roger Altounyan  
Immunologist*

*‘Roger Walker’ in ‘Swallows & Amazons’  
1922 - 1987*



### ***Rubens 1614***

**“The king was overjoyed and gave orders to lift Daniel out of the den. And when Daniel was lifted from the den, no wound was found on him, because he had trusted in his God.” (Daniel 6:1-23)**