

Rehabilitation and follow up from Intensive care

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EDIC, EDRA, FFICM

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Surrey, United Kingdom



Acknowledgements

- Sr Frances Clarke- ICU follow up Nurse lead
- Georgina Linstead- Lead Physiotherapy, Intensive care
- All patients consented for their images to be used for educational purposes
- Few images from open source, & video from Youtube



2019/3/13 08:41

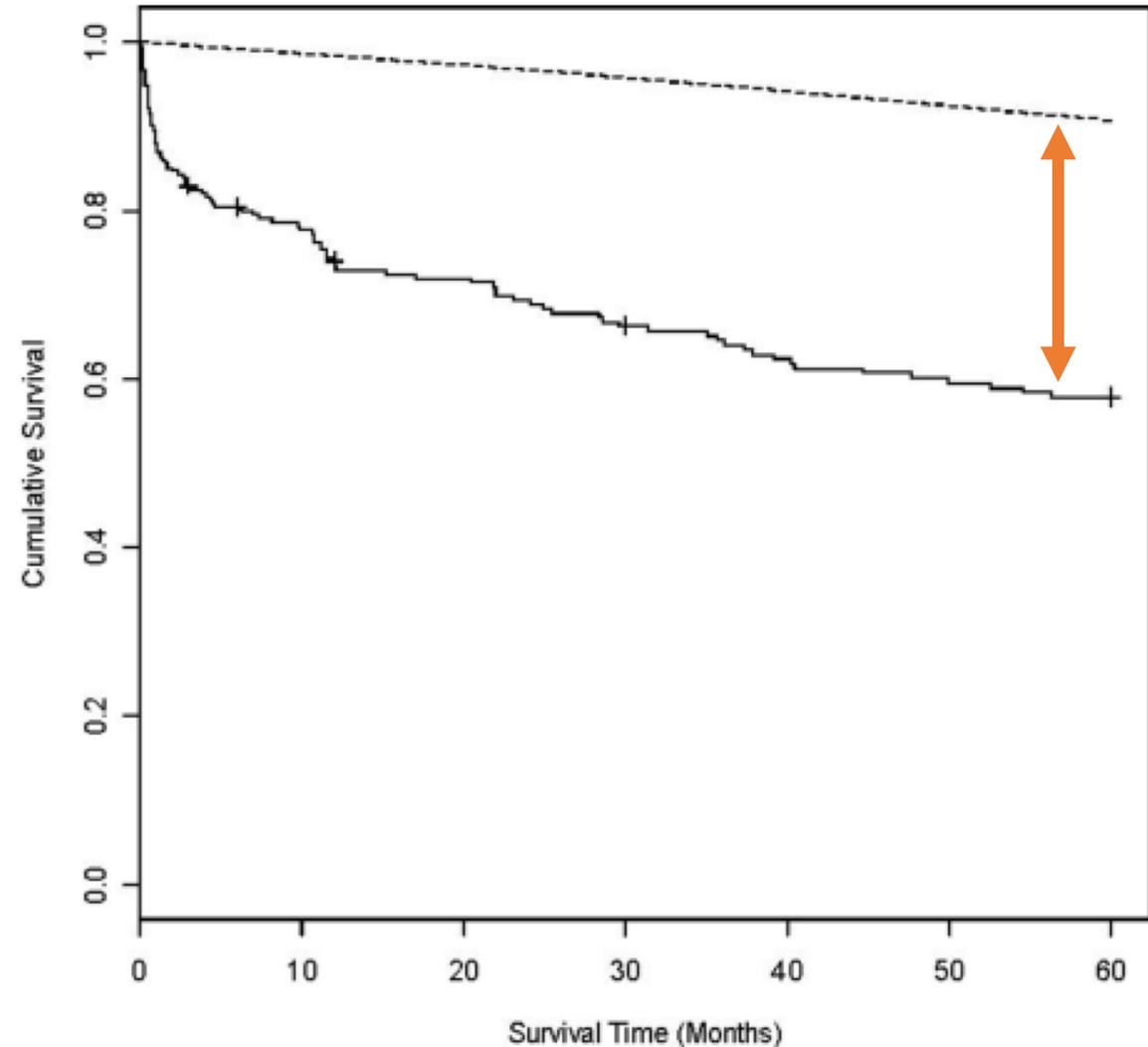


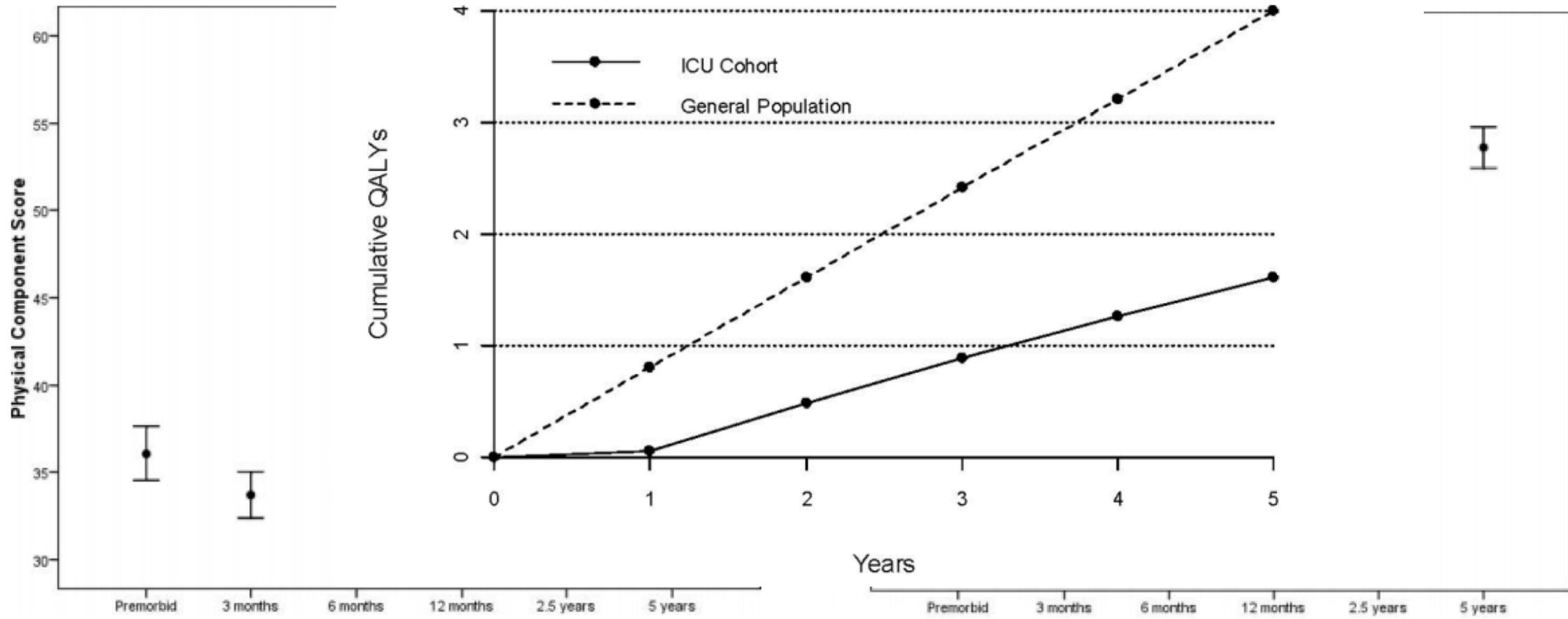


Quality of life in the five years after intensive care: a cohort study

Brian H Cuthbertson^{1*}, Siân Roughton², David Jenkinson³, Graeme MacLennan³, Luke Vale^{2,4}

Intensive care unit admission is associated with a **high mortality, a poor physical quality of life and a low quality adjusted life years** gained compared to the general population for 5 years after discharge.





The psychological and neurocognitive consequences of critical illness. A pragmatic review of current evidence

**Olivia Clancy^{1,2}, Trudi Edginton³, Annalisa Casarin^{1,4} and
Marcela P Vizcaychipi^{1,2}**

High incidence of Psychological (23-39%) and Neurocognitive
problems (upto 66%)



Definition of *rehabilitation* in English:

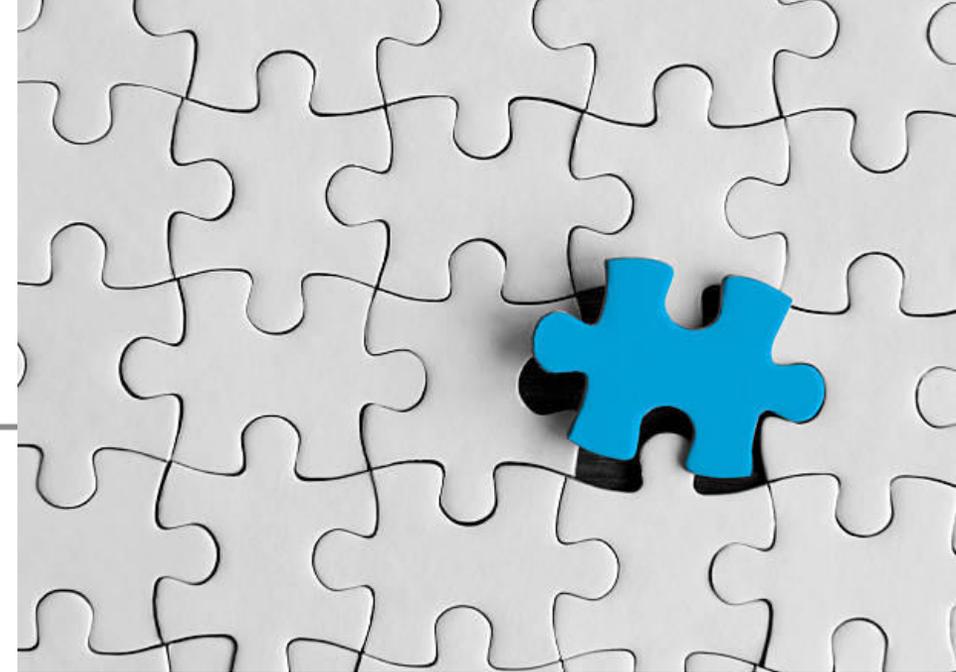
rehabilitation

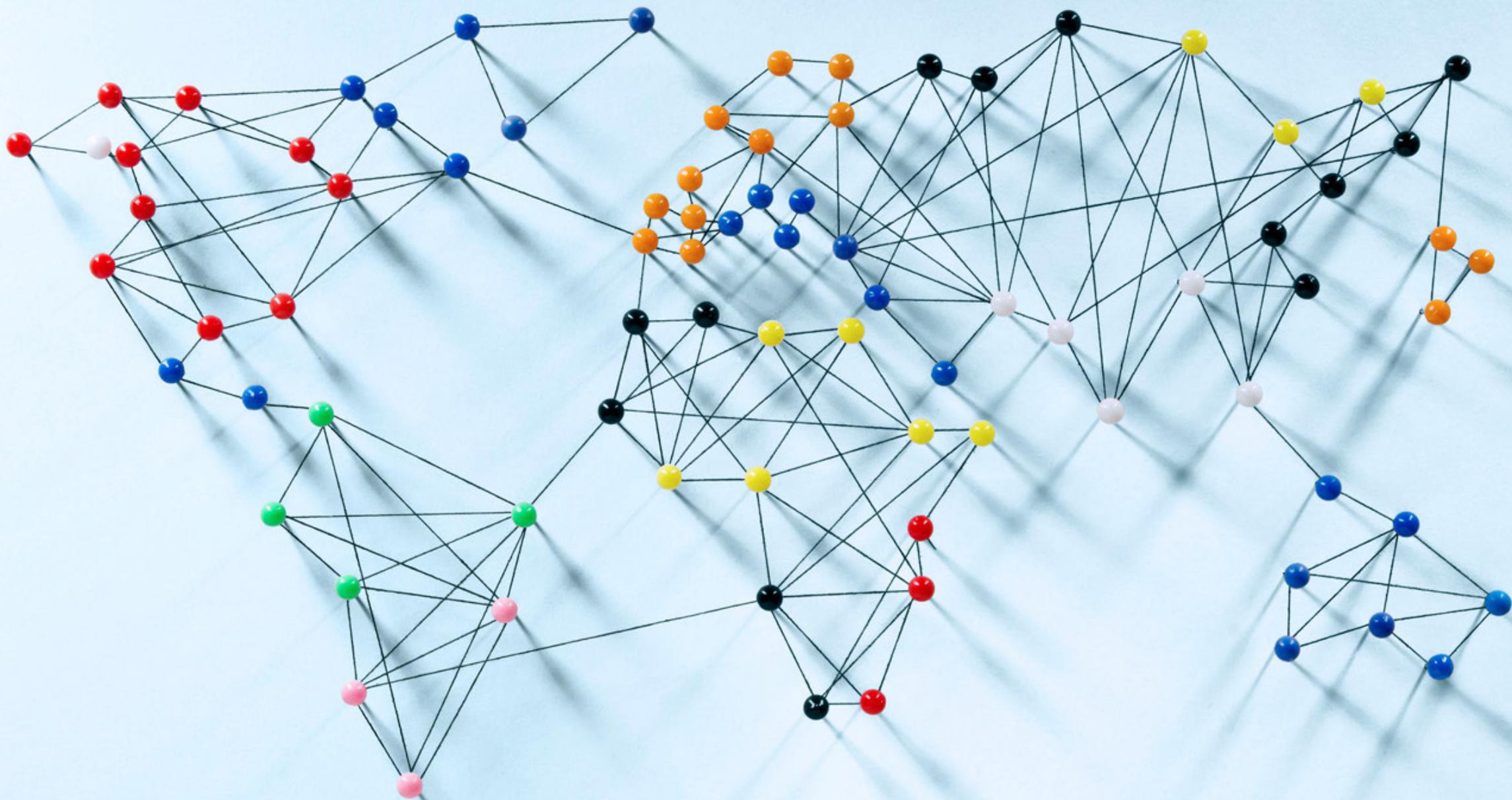
NOUN

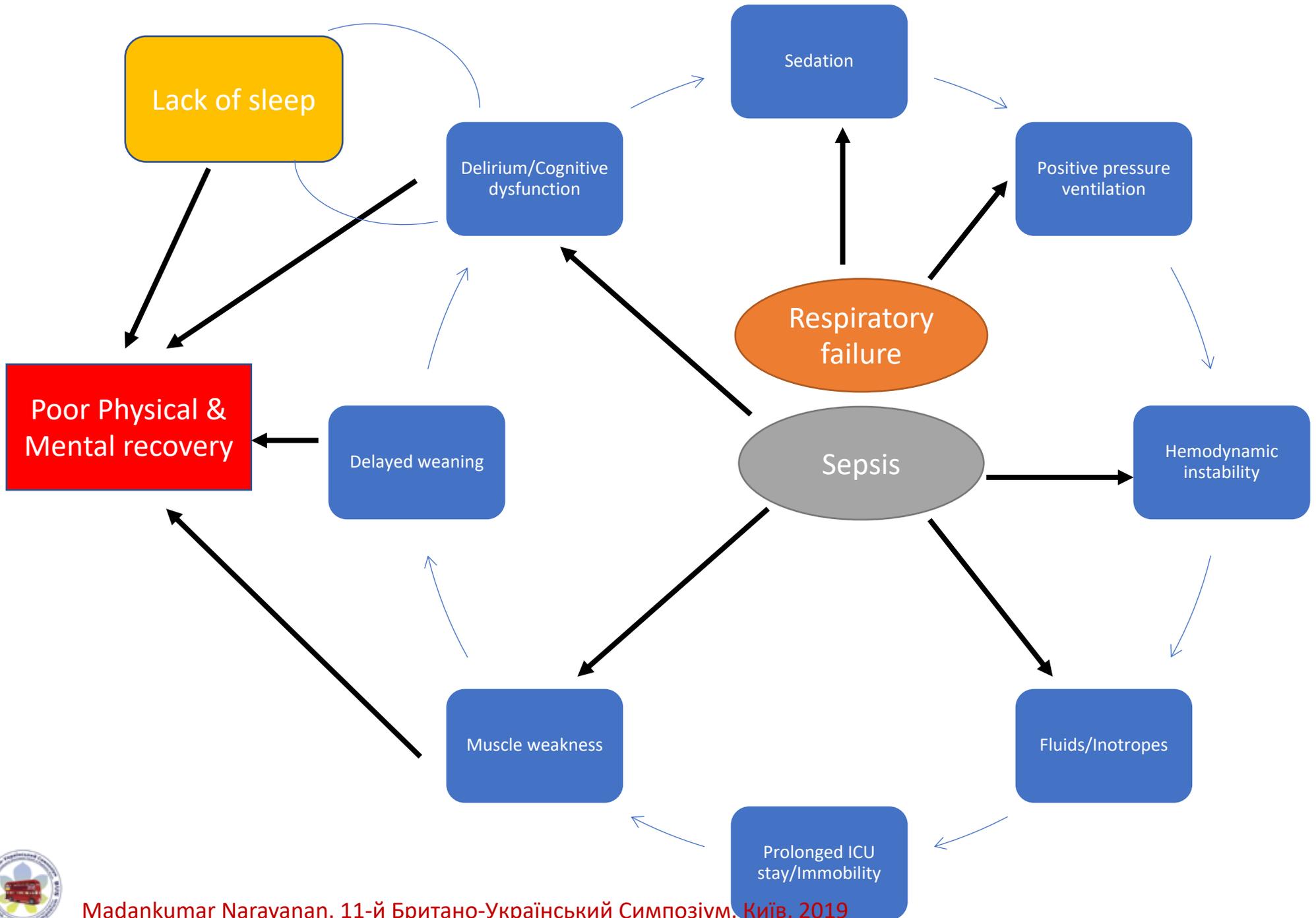
[mass noun]

- 1 The action of restoring someone to health or normal life through training and therapy after imprisonment, addiction, or illness.

‘she underwent rehabilitation and was walking within three weeks’











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LEO

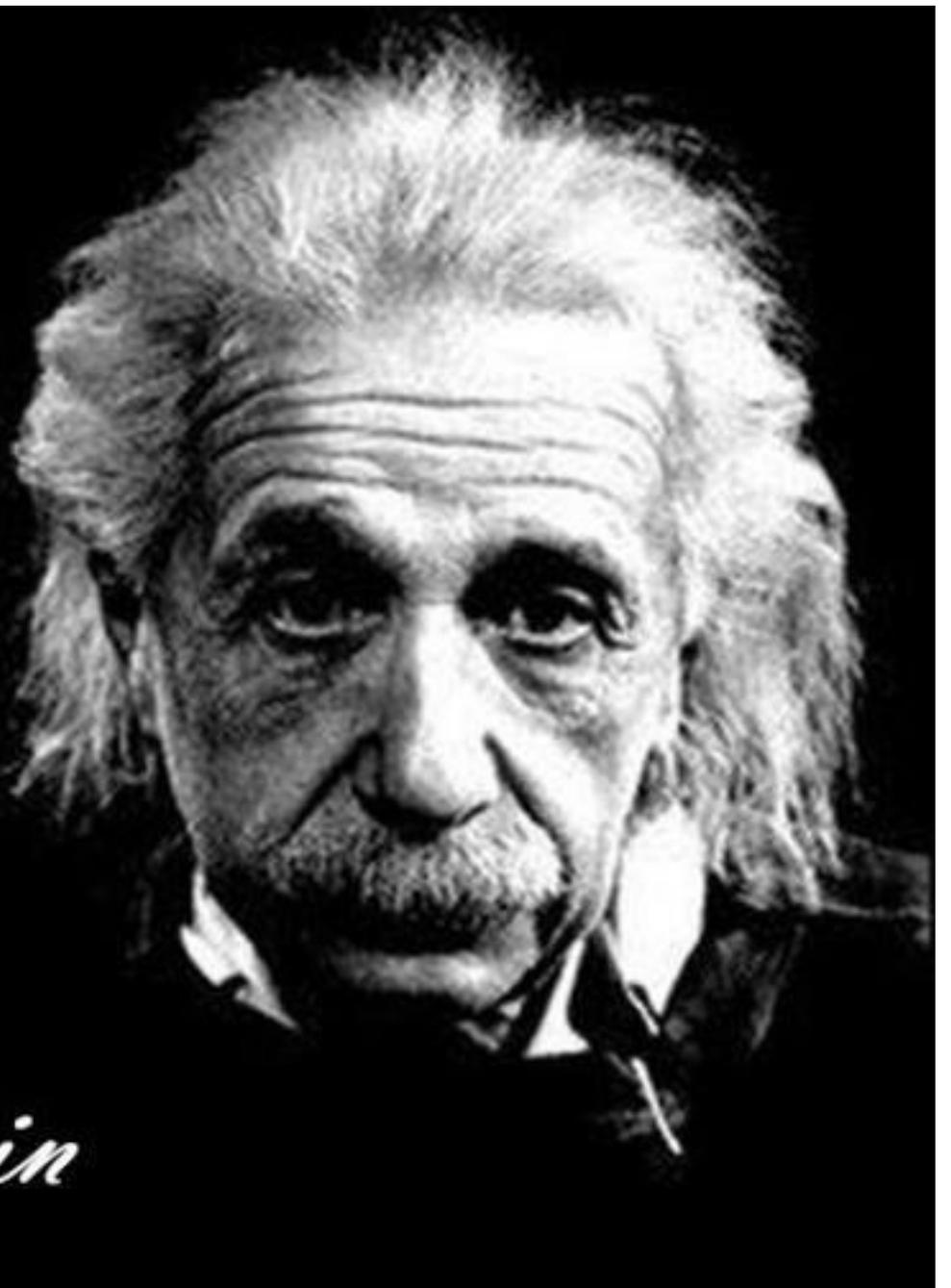
RTS

“Rehabilitation should commence right from the time the patient is admitted to ICU”



WE CANNOT SOLVE
OUR PROBLEMS WITH
THE SAME THINKING
WE USED WHEN
WE CREATED THEM

~ Albert Einstein



Put simply....how small improvements in a number of different aspects of what we do can have a huge impact to the overall performance of the team.’ – Dave Brailsford



Overview of the Surviving Sepsis Campaign

The International
S

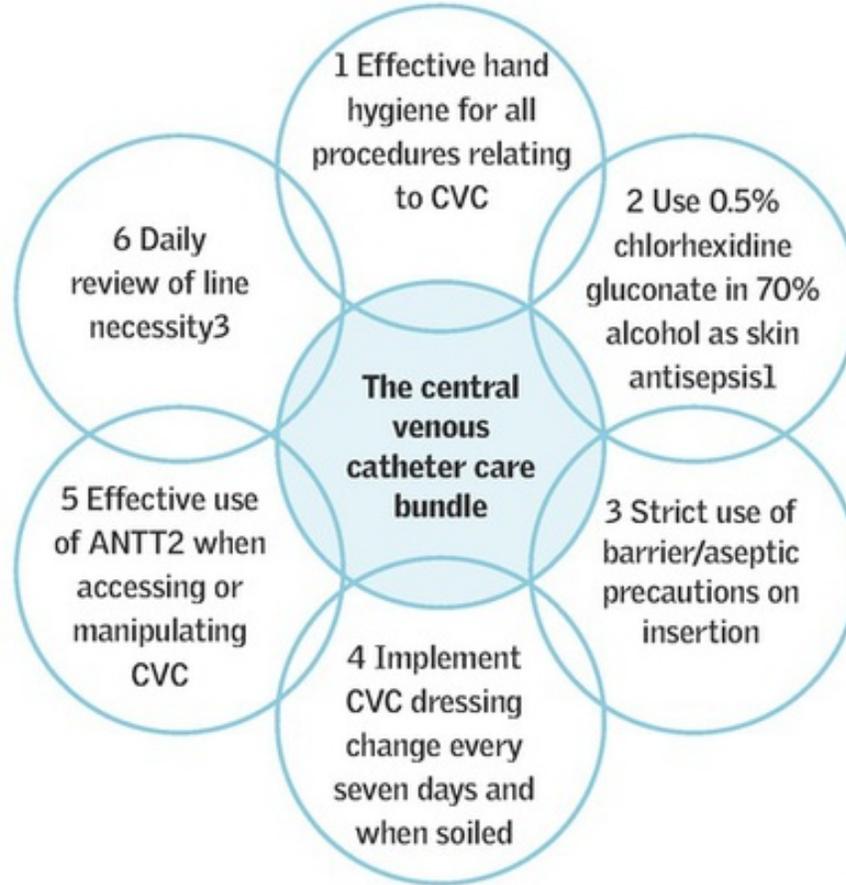
EFFECT OF VAP BUNDLE CARE

VAP RATE

VAP BUN

HOB elevati
DVT prophyl
Stress ulcer p
Daily interrup
Daily oral ca

VAP
by



- 1 Alternatively use povidone iodine if chlorhexidine gluconate contraindicated
- 2 Aseptic non-touch technique
- 3 With subsequent removal of unnecessary lines

Adapted from IHI 2006

Society of
Critical Care M
The Intensive Care Professionals



REHABILITATION BUNDLE



Early mobilization



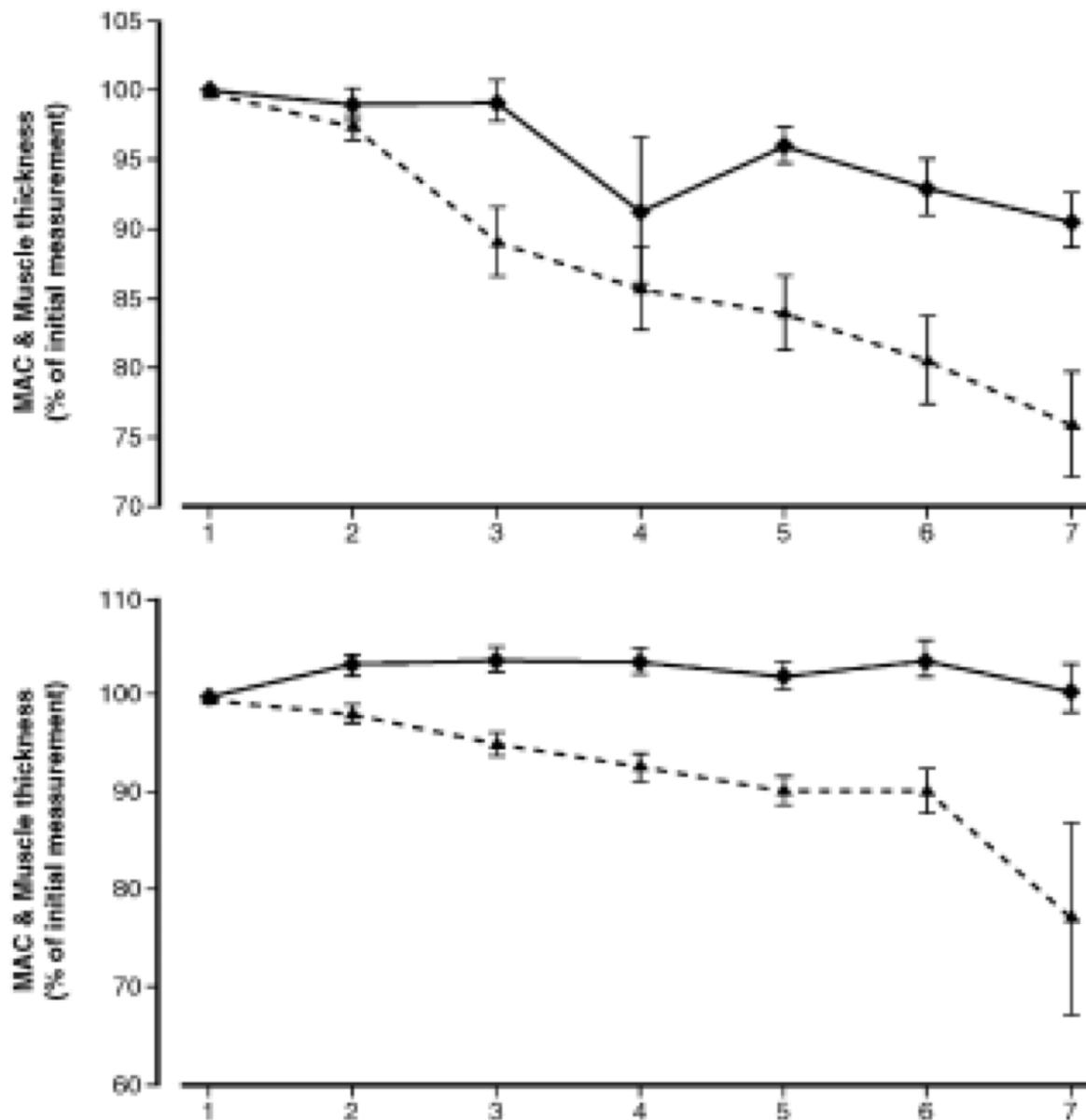


ORIGINAL ARTICLE

Muscle wasting and energy balance in critical illness [☆]

Clare L. Reid^{a,b,c,*}, Iain T. Campbell^b, Rod A. Little^c

Muscle thickness decreased 1.6%/day
Energy balance made not difference to
rate of wasting



Consequences of delayed mobilisation

- Muscle atrophy- ICU Acquired weakness
- Pressure ulcers
- Atelectasis, Pneumonia- Increased Ventilator days
- Deep vein thrombosis
- Osteoporosis
- Prolonged hospital stay



Early mobilization and recovery in mechanically ventilated patients in the ICU: a bi-national, multi-centre, prospective cohort study

The TEAM Study Investigators*

Early mobilization of patients receiving mechanical ventilation was uncommon.

More than 50% of patients discharged from the ICU had developed ICU-acquired weakness,

ICU-AW was associated with death between ICU discharge and day-90



Early intensive care unit mobilization in patients with acute respiratory failure*

Mobilised patients were out of bed early, had lower length of ICU, hospital stay.
No untoward events

Peter Morris; Amanda Goad; Clifton Thompson; Karen Taylor; Bethany Harry; Leah Passmore; Amelia Ross; Laura Anderson; Shirley Baker; Mary Sanchez; Laretta Penley; April Howard; Luz Dixon; Susan Leach; Ronald Small; R Hite; Edward Haponik;

Critical Care Medicine 26(8):2228-2242 AUG 2008

W Early physical and occupational therapy in mechanically ventilated, critically ill patients

William D Schweickert, Mark C Pohlman, J Mietka Franczyk, Deanna Deprizio, Gregor

Greater return to independent functional status at hospital discharge
Shorter duration of delirium and Ventilator free days at 28 days



Archives of Physical Medicine and Rehabilitation

journal homepage: www.archives-pmr.org

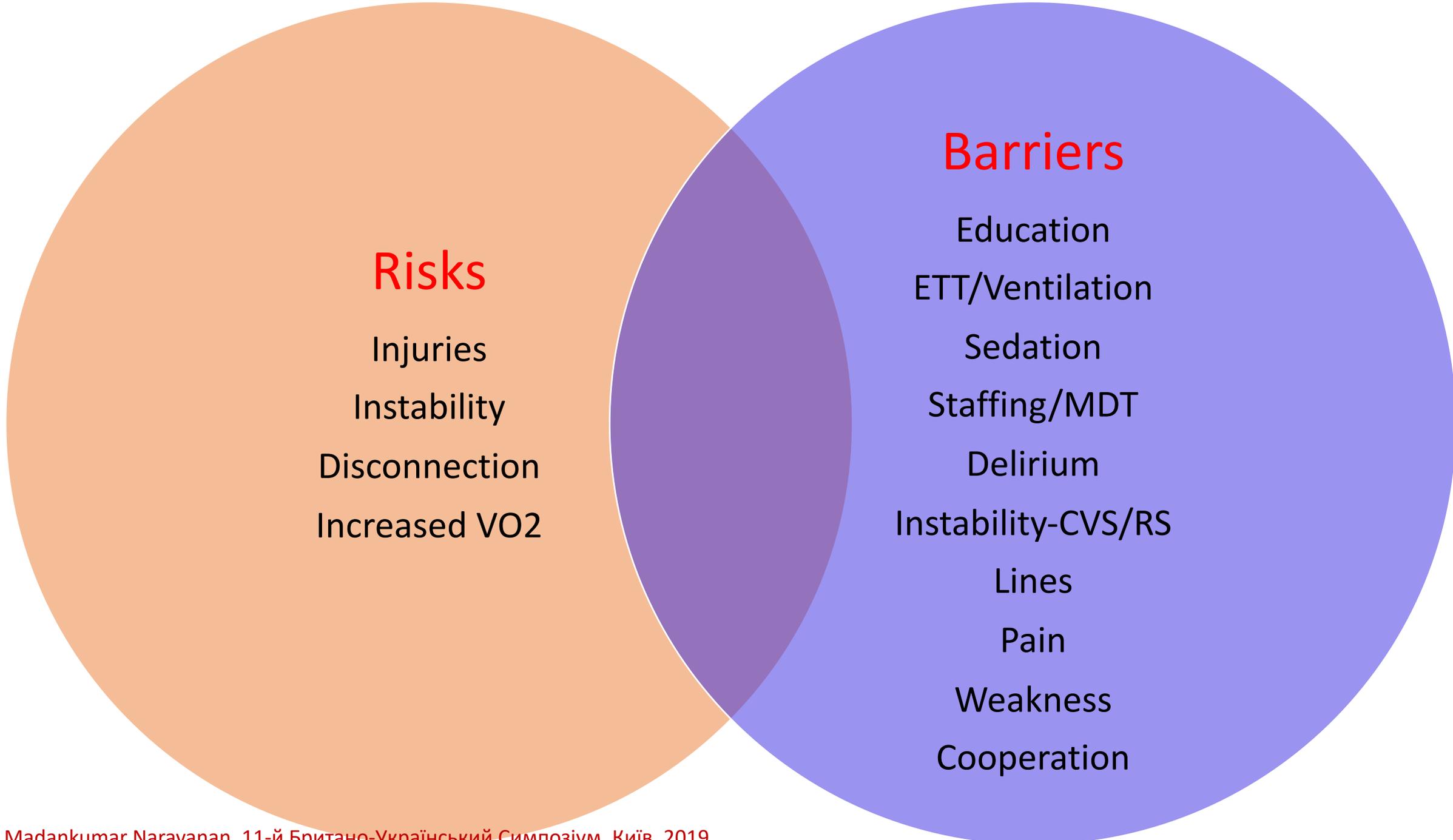
Archives of Physical Medicine and Rehabilitation 2017;98:931-9



ORIGINAL RESEARCH

Early Mobilization Reduces Duration of Mechanical Ventilation and Intensive Care Unit Stay in Patients With Acute Respiratory Failure







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Good pain management- Regional Anaesthesia





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Good Sedation practises

Spontaneous Awakening Trials
Targeted Sedation



Pain-Agitation-Delirium (PAD) Guidelines

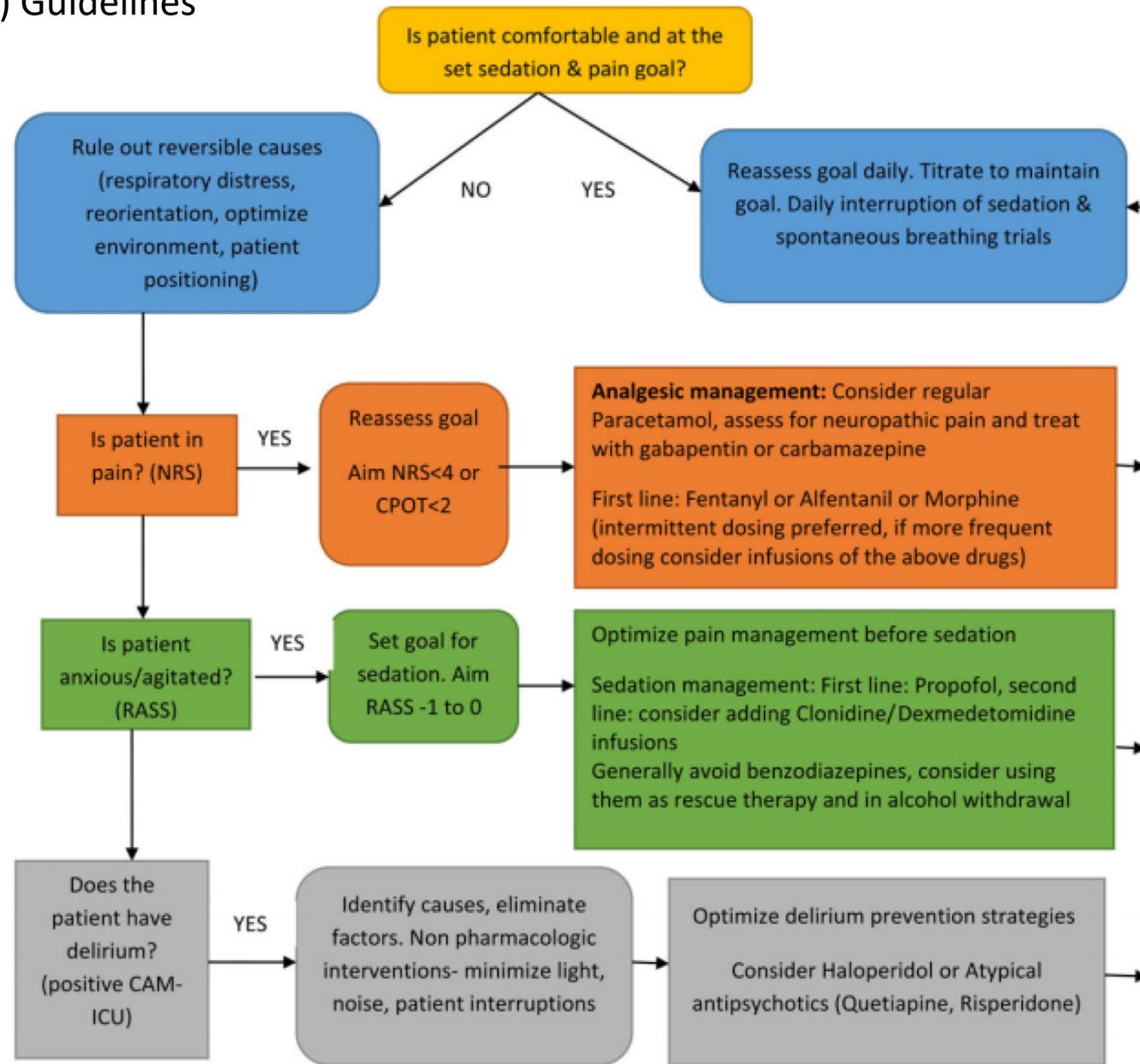


Fig A1 Composite pain, agitation and delirium management guideline in mechanically ventilated adult ICU patients. NRS, numerical rating scale; CPOT, critical care pain observation tool; RASS, Richmond agitation and sedation scale; CAM-ICU, confusion assessment method for ICU. Adapted from Barr and colleagues.⁴





- 60/M
- OOHCA- 16 minutes no CPR
- VF when paramedic crew arrived, Single shock, with CPR, ROSC
- Intubated and remained stable
- GCS 3/15
- Angio- Obstructed LAD and RCA, stents to LAD
- ICU- Targeted temperature management



Early extubation/Non invasive ventilation

Spontaneous Breathing Trials

Early extubation

NIV bridge

Early Tracheostomy



D0: 12 hours after Emergency aneurysm surgery-
Intraoperative 11 Litres fluid, preop lactate: 19







Fluid balance



Sepsis in European intensive care units: Results of the SOAP study*

Vincent, Jean-Louis MD, PhD, FCCM; Sakr, Yasser MB, BCh, MSc; Sprung, Charles L. MD; Ranieri, V Marco MD; Reinhart, Konrad MD, PhD; Gerlach, Herwig MD, PhD; Moreno, Rui MD, PhD; Carlet, Jean MD, PhD; Le Gall, Jean-Roger MD; Payen, Didier MD

Critical Care Medicine: February 2006 - Volume 34 - Issue 2 - p 344-353

The NEW ENGLAND JOURNAL *of* MEDICINE

ORIGINAL ARTICLE

Comparison of Two Fluid-Management Strategies in Acute Lung Injury

The National Heart, Lung, and Blood Institute Acute Respiratory Distress Syndrome (ARDS) Clinical Trials Network*

Review of A Large Clinical Series

Association of Cumulative Fluid Balance on Outcome in Acute Lung Injury: A Retrospective Review of the ARDSnet Tidal Volume Study Cohort

Andrew L. Rosenberg, MD, Ronald E. Dechert, DrPH, Pauline K. Park, MD, and Robert H. Bartlett, MD; for the NIH NHLBI ARDS Network

Journal of Intensive
Care Medicine
Volume 24 Number 1
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hosted at
<http://online.sagepub.com>

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Vasopressin versus Norepinephrine Infusion in Patients with Septic Shock



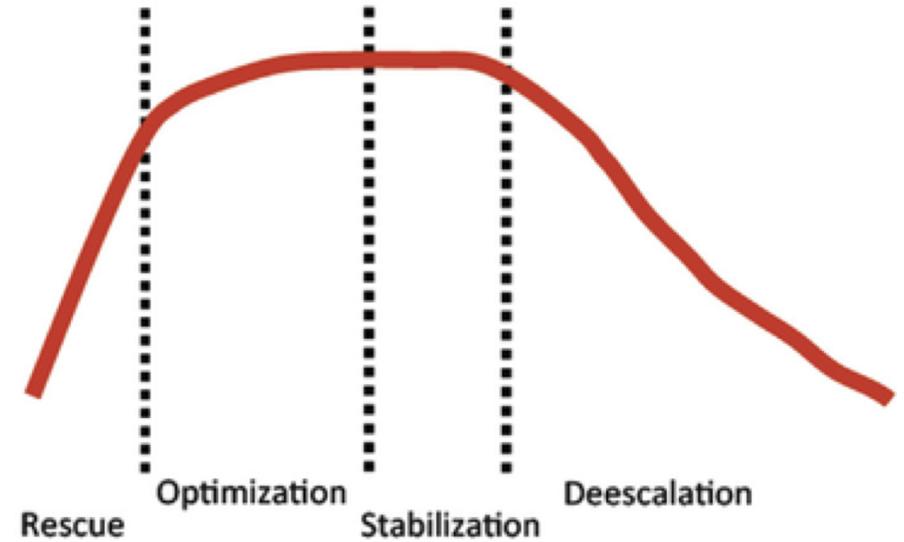
A

Saving the patient



B

Volume status





“a goal of a **zero to negative fluid balance by day 3** and to keep the **cumulative fluid balance on day 7 as low as possible** (Grade 2B)” (Malbrain et al, 2014)

“diuretics or renal replacement therapy (in combination with albumin) can be used to mobilise fluids in haemodynamically stable patients with intra-abdominal hypertension and a positive cumulative fluid balance after the acute resuscitation has been completed and the inciting issues/source control have been addressed (Grade 2D)” (Malbrain et al, 2014)





- 51/M
- Type 1 respiratory failure
- ARDS post Below Knee amputation for Osteomyelitis
- T2DM with poor control
- Stuck on NIV & 80% FiO₂



Early Oral nutrition & hydration



- 35/F
- Poorly controlled T1DM
- Below knee amputation
- Post op VF cardiac arrest in theatre
- CPR approx. 40 minutes (reverted to Sinus after initial 3 cycles of CPR)
- Myocardial stunning on Adrenaline & Noradrenaline infusion



Recognising and Preventing delirium

Monitor for delirium

Search for causes

Rationalise drug management

Search for infection

Alcohol/Opioid withdrawal



April 14, 2004

Delirium as a Predictor of Mortality in Mechanically Ventilated Patients in the Intensive Care Unit

E. Wesley Ely, MD, MPH; Ayumi Shintani, PhD, MPH; Brenda Truman, PhD, MSc, et al

JAMA. 2004;291(14):1753-1762. doi:10.1001/jama.291.14.1753



[Intensive Care Medicine](#)

December 2001, Volume 27, [Issue 12](#), pp 1892-1900 | [Cite as](#)

The impact of delirium in the intensive care unit on hospital length of stay

[Authors](#)

[Authors and affiliations](#)

E. Ely, S. Gautam, R. Margolin, J. Francis, L. May, T. Speroff, B. Truman, R. Dittus, G. Bernard, S. Inouye

Original Investigation

March 2017

Association of Delirium With Cognitive Decline in Late Life

A Neuropathologic Study of 3 Population-Based Cohort Studies

Daniel H. J. Davis, PhD, MRCP^{1,2}; Graciela Muniz-Terrera, PhD³; Hannah A. D. Keage, PhD⁴; [et al](#)

[» Author Affiliations](#) | [Article Information](#)

JAMA Psychiatry. 2017;74(3):244-251. doi:10.1001/jamapsychiatry.2016.3423



Promoting sleep hygiene

Environmental modification



Noise levels in ICU

WHO recommendation:

< 35dB average background in Hospital

< 40dB at peaks in the Night

Average Noise levels at Frimley ICU

Daytime – 59dB

Quiet time – 56dB

Nocturnal – 59dB



Audit of noise levels in Intensive care. Chana S, Kukreja Y, Narayanan M. 2013

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- Exercise
- Minimise monitoring
- Minimise blood sampling
- Eye masks
- Ear plugs
- Music/Noise cancelling headphones
- Music therapy



CARING FOR THE
CRITICALLY ILL PATIENT

ONLINE FIRST

**Effects of Patient-Directed Music Intervention
on Anxiety and Sedative Exposure in Critically Ill
Patients Receiving Mechanical Ventilatory Support**
A Randomized Clinical Trial



Light therapy-Circadian rhythm



Communication & Speech

Speech & Language Therapy
Involvement





- Communication tools



Family involvement in the care

Participation
Joint decision making





Independence, Mental focus and Goal setting

Patient own clothes
What is important for patient??
Going home
Daily goals to achieve







Published in final edited form as:

Crit Care Clin. 2017 April ; 33(2): 225–243. doi:10.1016/j.ccc.2016.12.005.

The ABCDEF Bundle in Critical Care

Annachiara Marra, MD, PhD(c)¹, E. Wesley Ely, MD, MPH², Pratik P. Pandharipande, MD, MSCI, FCCM³, and Mayur B. Patel, MD, MPH, FACS⁴

A: Assess, Prevent & Manage pain

B: Both Spontaneous Awakening Trials (SAT) & Spontaneous Breathing Trials (SBT)

C: Choice of Analgesia & Sedation

D: Delirium- Assess, Prevent & Manage

E: Early Mobilization

F: Family engagement & Empowerment



Patient Name:
 Hospital Number:

Rehab Bundle

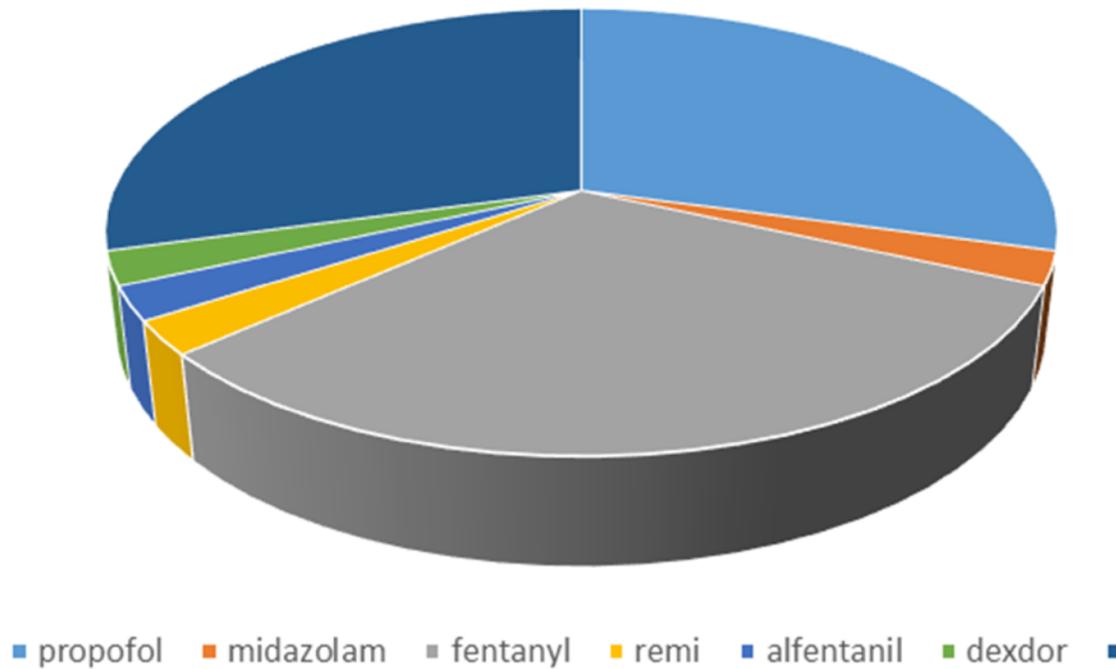
Sedation Management/Pain	RASS	Current RASS:	Target RASS:
	Pain Assessment/ Analgesics		
	Sedation hold successful?	Y <input type="checkbox"/> N <input type="checkbox"/> Comment:	
	Overall Plan		
Spontaneous Breathing Trials (weaning plan)	Airway	Artificial Airway? Y <input type="checkbox"/> N <input type="checkbox"/> If yes: ETT <input type="checkbox"/> Tracheostomy <input type="checkbox"/>	
	Current Level of Ventilation		
	Weaning Parameters (as appropriate)	SpO ₂ : pH:	PaO ₂ : RR: PCO ₂ : P0.1:
	Today's Weaning Plan		
Communication	Able to communicate? Is a SLT referral required	Yes <input type="checkbox"/> No <input type="checkbox"/> Comments: No <input type="checkbox"/> Yes <input type="checkbox"/> N/A <input type="checkbox"/>	
	Communication aids required	Glasses <input type="checkbox"/> Writing <input type="checkbox"/>	Hearing Aids <input type="checkbox"/> Cuff Down Speech <input type="checkbox"/>
		Communication Boards <input type="checkbox"/> PMV <input type="checkbox"/>	
	Patient Diary in use?	No <input type="checkbox"/> Yes <input type="checkbox"/> If yes, are the relatives contributing?	
Delirium	Is the patient delirious? If delirious are any potential causes present? (see overleaf)	CAM-ICU -ve <input type="checkbox"/> CAM-ICU +ive <input type="checkbox"/> Hypoactive <input type="checkbox"/> Hyperactive <input type="checkbox"/> Mixed <input type="checkbox"/> Causes:	
	Is treatment required (also consider light box or treatment of agitation)	No <input type="checkbox"/> Yes <input type="checkbox"/> If yes, what is the management plan:	
Early Mobilisation/Environment	Transfers/ mobility	How do they transfer: How far can they walk:	
	Seating Requirements	Chair Type: How long can they sit out for:	
	Bike & Exercise Prescription	Is it appropriate: Y <input type="checkbox"/> N <input type="checkbox"/> If No, why not? In bed <input type="checkbox"/> In chair <input type="checkbox"/> Arms <input type="checkbox"/> Legs <input type="checkbox"/> Time: Active or Passive: Resistance(if active):	
	Environment/ Attachments (please discuss with Consultant Intensivist)	Can any of the following be safely removed? A-Line <input type="checkbox"/> CVC <input type="checkbox"/> NGT <input type="checkbox"/> Urinary Catheter <input type="checkbox"/> Monitoring frequency: Blood test frequency:	
	Patient Attire	Can the patient be fully dressed/ wear pyjamas? Y <input type="checkbox"/> N <input type="checkbox"/>	
	Sleep (consider factors overleaf)		
Feeding/Nutrition	Speech & Language Therapy	Completed swallow screen Y <input type="checkbox"/> N <input type="checkbox"/> N/A <input type="checkbox"/>	
	Route of Nutrition	E & D <input type="checkbox"/> Enteral Feed <input type="checkbox"/> PN <input type="checkbox"/> Fluids <input type="checkbox"/> NBM <input type="checkbox"/>	
	Nutritional Needs	Nutritional needs fully met? Y <input type="checkbox"/> N <input type="checkbox"/> Risk of re-feeding Y <input type="checkbox"/> N <input type="checkbox"/> Dietitian Involved? Y <input type="checkbox"/> N <input type="checkbox"/> Nutritional Sip Feeds Y <input type="checkbox"/> N <input type="checkbox"/>	
Daily G oal (see overleaf for suggestions)			

Signature: Print:
 Designation:

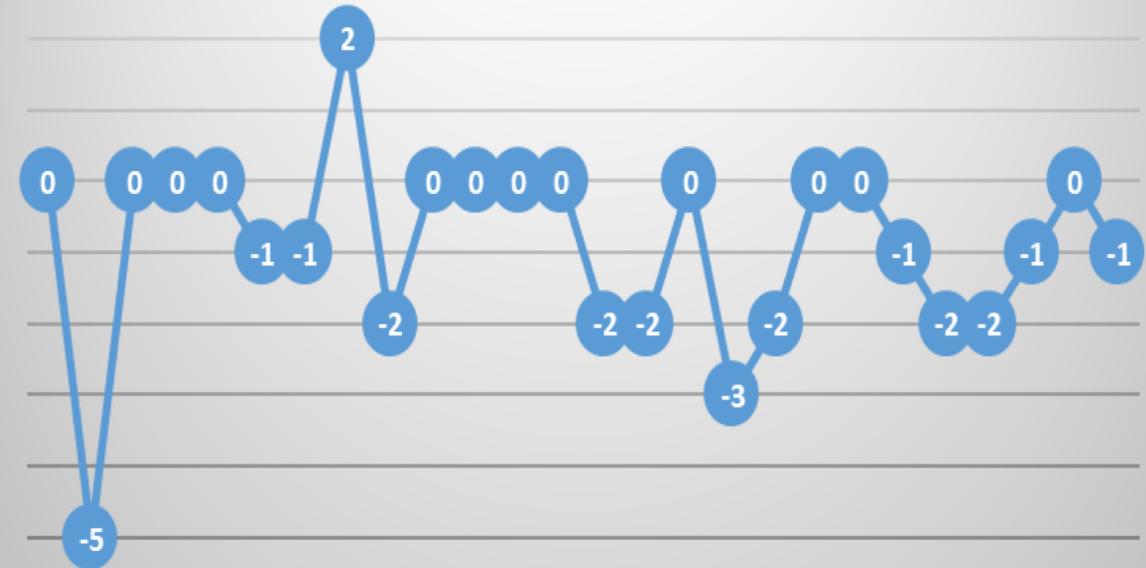


Where we are now.....Sedation

Sedative & IV Analgesic use after initial 24hrs



Average RASS



Where we are now.....Delirium

- A CAM-ICU assessment was attempted 91%
- Delirium incidence = 41%
- % days with delirium ranged from 0 -100%
- Average days with delirium was 26%

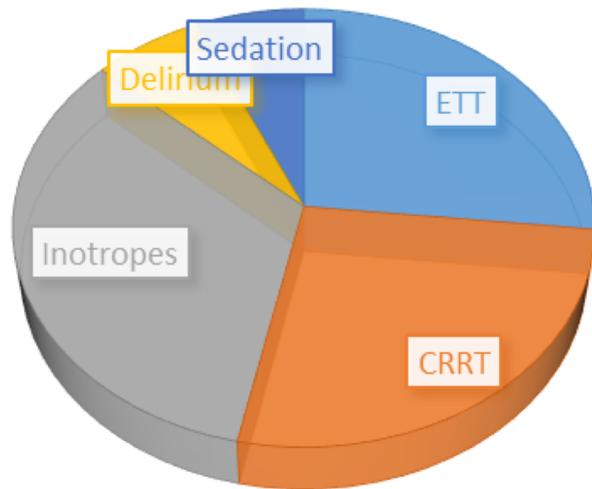
However.....

- In 45% of patients (11 of 24) there were instances where CAM-ICU was documented as unable to assess
- Management of modifiable risk factors

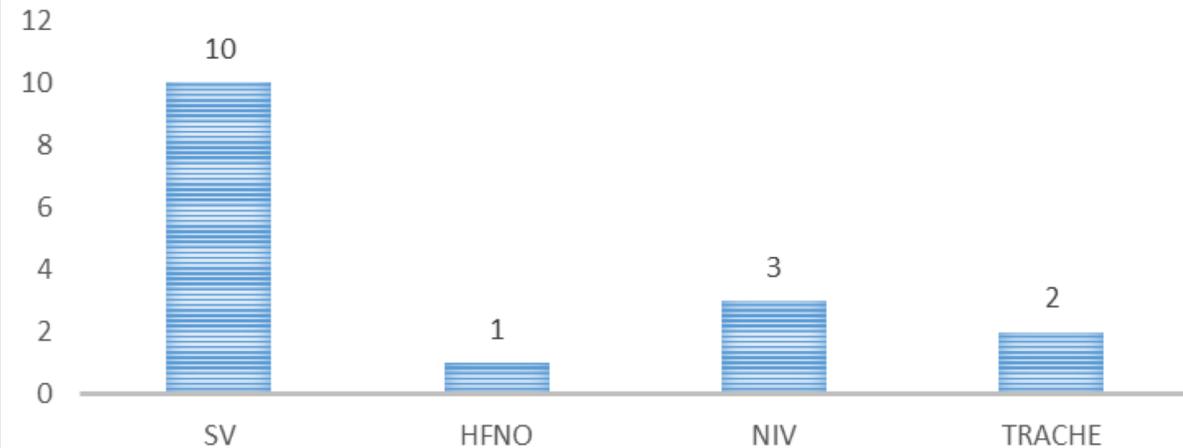


Where we are now.....Early mobilisation

BARRIERS TO EARLY MOBILISATION - PER PATIENT



AIRWAY/ RESPIRATORY SUPPORT ON FIRST MOBILISATION



Post- Intensive care



Problems after leaving intensive care

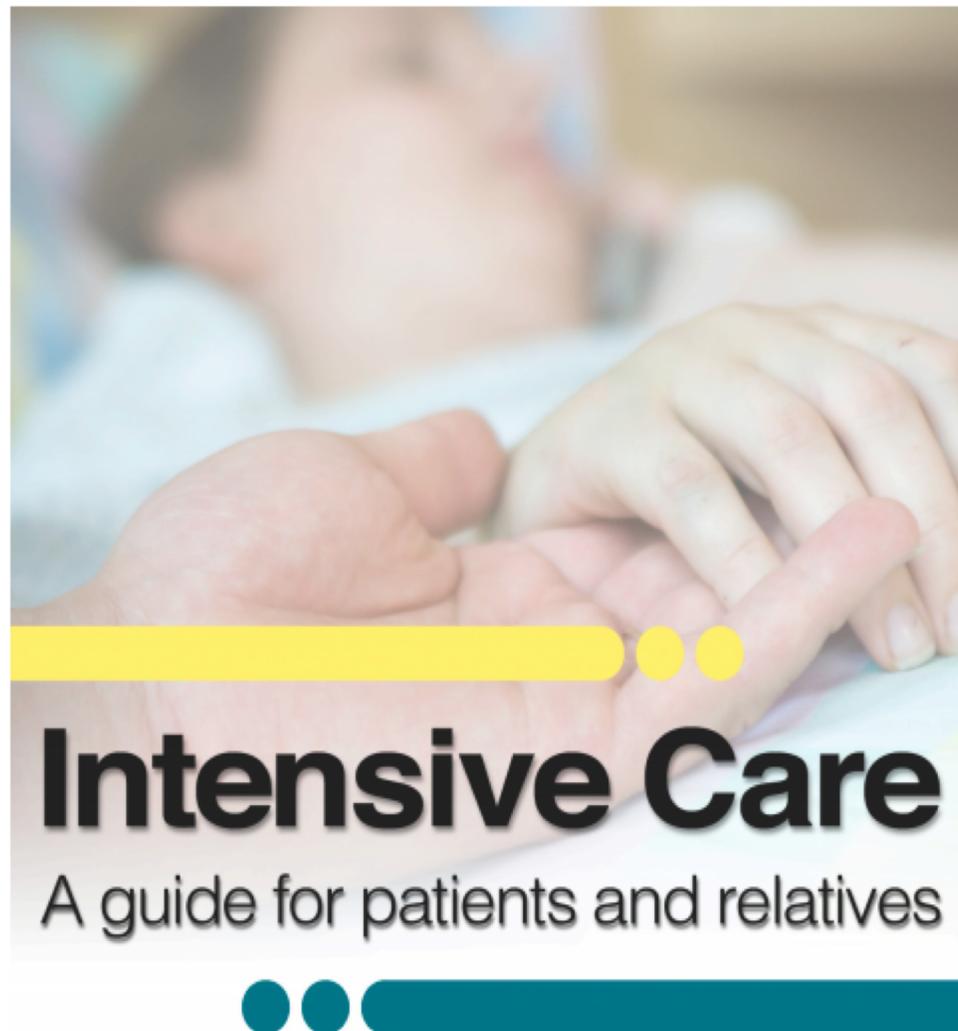
- Memory/Sleep/Nightmares/Anxiety/Depression
- PTSD
- Physical Weakness
- Pain
- Social issues- Job, relationship
- Lack of information on Disease
- Lack of Information to access help
- Lack of support



Rehabilitation after critical care

Jones, Christina PhD; Skirrow, Paul MPhil;
Ingleby, Sarah BSc; Eddleston, Jane FRCR

A self help rehabilitation guide showed improved function scores and a lower rate of delirium



Produced by ICUsteps with the help
and support of the Department of Health

Madankumar Narayanan. 11-й Британо-Український Симпозіум. Київ, 2019

psych;

Care Medicine®

to routine care,
Survey physical
ere was a trend to

Care Med. 2003 Oct;31(10):2456-61.



RESEARCH

Open Access

Intensive care diaries reduce new onset post traumatic stress disorder following critical illness: a randomised, controlled trial

Christina Jones^{1,2}, Carl Bäckman³, Maurizia Capuzzo⁴, Ingrid Egerod⁵, Hans Flaatten⁶, Cristina Granja⁷, Christian Rylander⁸, Richard D Griffiths^{1,2*}, the RACHEL group

The incidence of new cases of PTSD was reduced in the intervention group compared to the control patients (5% versus 13%).



Rehabilitation Interventions for Postintensive Care Syndrome: A Systematic Review*

Juliane Mehlhorn, MD¹; Antje Freytag, PhD¹; Konrad Schmidt, MD¹; Frank M. Brunkhorst, MD^{2,3};
Juergen Graf, MD⁴; Ute Troitzsch⁵; Peter Schlattmann, PhD⁶; Michel Wensing, PhD^{1,7};
Jochen Gensichen, MD, MPH, MSc¹



- The ICU diary showed the best evidence for effectiveness in this systematic review.
- It is a potentially effective, low cost, and highly acceptable intervention.



The PRaCTICaL study of nurse led, intensive care follow-up programmes for improving long term outcomes from critical illness: a pragmatic randomised controlled trial

An ICU follow-up service did not improve HRQOL or mental health more than standard care within a year of ICU discharge

1/3rd of patients required psychology referral
3/4ths patients took up the offer of ICU follow up visit





**Cochrane
Library**

Cochrane Database of Systematic Reviews

Exercise rehabilitation following intensive care unit discharge for recovery from critical illness (Review)

Connolly B, Salisbury L, O'Neill B, Geneen L, Douiri A, Grocott MPW, Hart N, Walsh TS, Blackwood B, for the ERACIP Group

Heterogenous data, high risk of bias, Low quality of evidence
Wide variability in intervention and outcome measures (Anaerobic
threshold, Endurance testing, Self reported Physical function)



Thank you for your attention.

