

réanimation 2023

PARIS 14-16 JUIN

Palais des Congrès de Paris
Porte Maillot



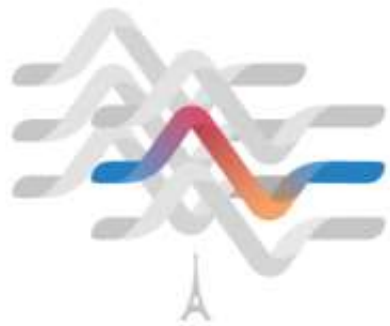
N'ayez pas peur ! Entrez et faites bouger

Assistance ventilatoire



Dr Nicolas PÉRON
Médecine intensive Réanimation
H.E.G.P., Paris





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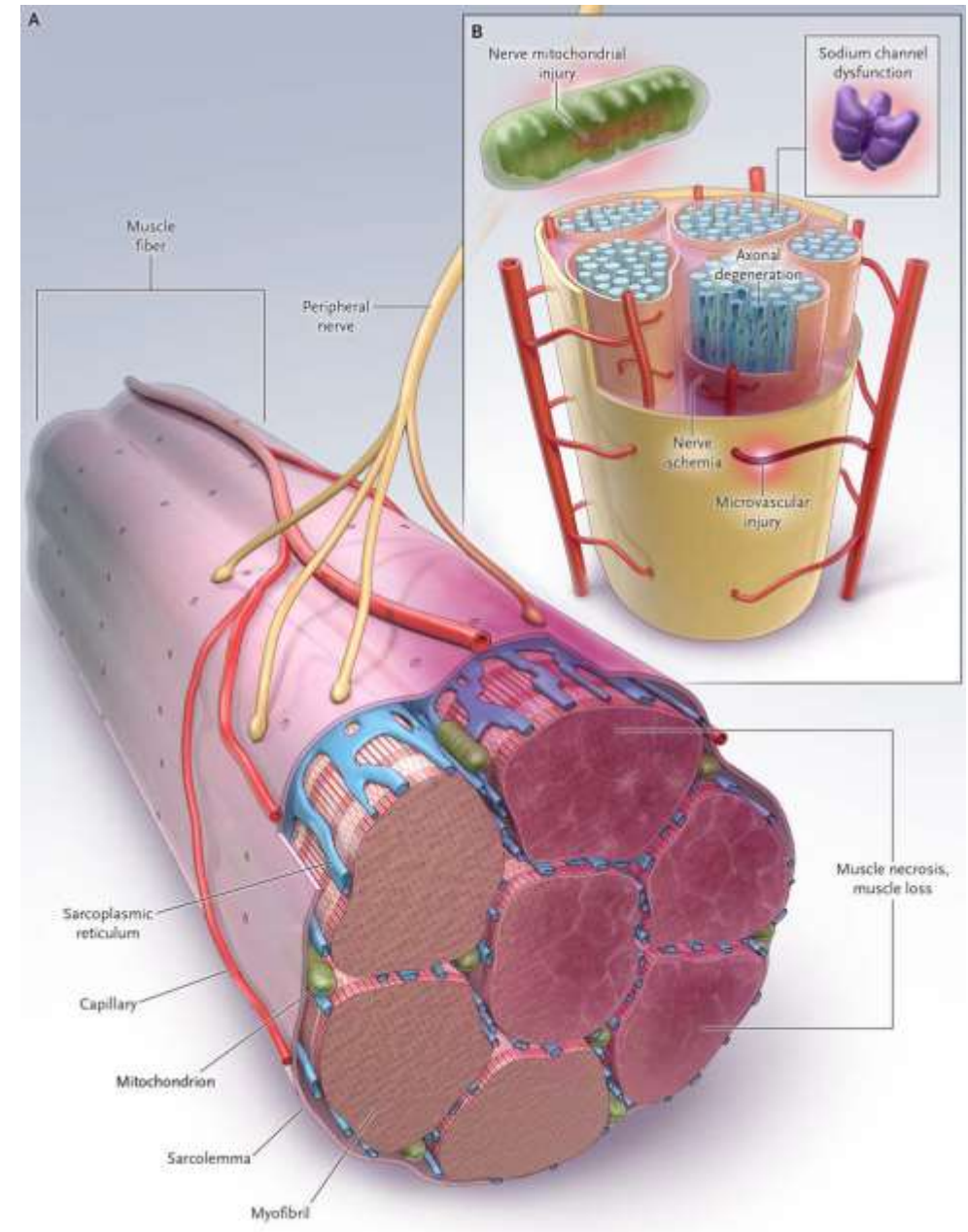


Nicolas PERON, Paris

☒ Je n'ai pas de lien d'intérêt à déclarer

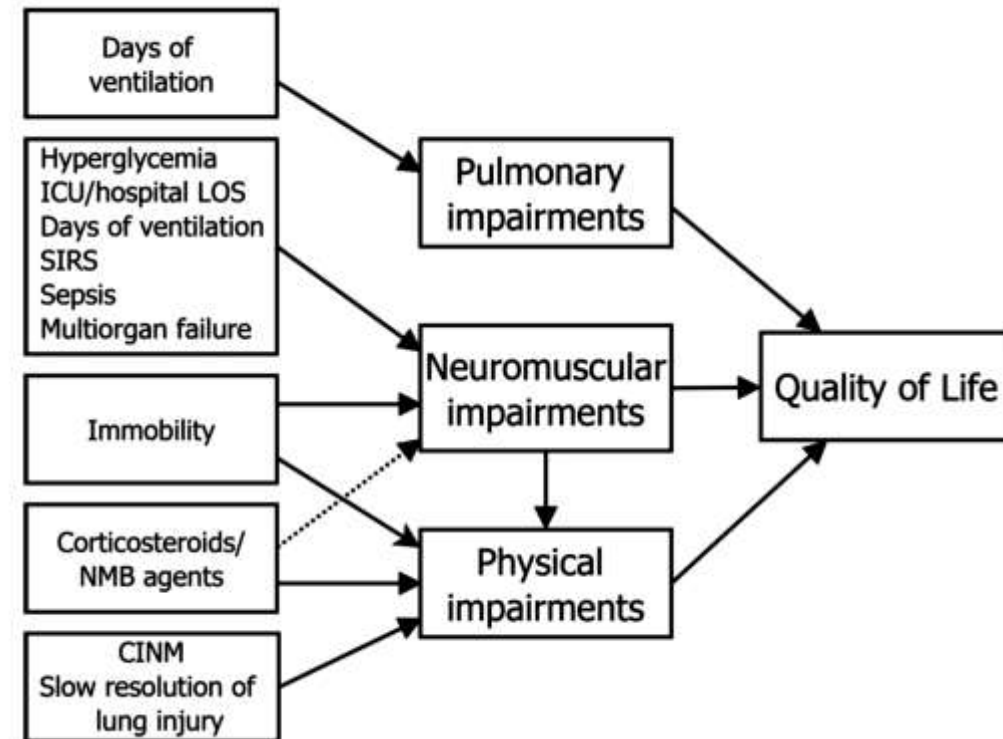
En réanimation

- Faiblesse acquise en réanimation (ICUAW)
- Dès les premiers jours (48h)
- Atteinte neurologique, musculaire
- Dysfonction diaphragmatique
- Mécanismes multiples :
 - Catabolisme
 - Microcirculation
 - Ischémie axonale
 - Inactivation des canaux sodiques
 - Dysfonction mitochondriale



Des facteurs multiples

- Effets de l'alitement et de l'immobilisation
- Facteurs intrinsèques à la réanimation :
 - Sepsis
 - Médicaments (Corticoïdes, benzodiazépines, curares)
 - Catécholamines
 - Défaillance rénale
 - Défaillance multi-viscérale



Des conséquences... à long terme

- Durée de ventilation

De Jonghe B, JAMA 2002

- Durée de séjour

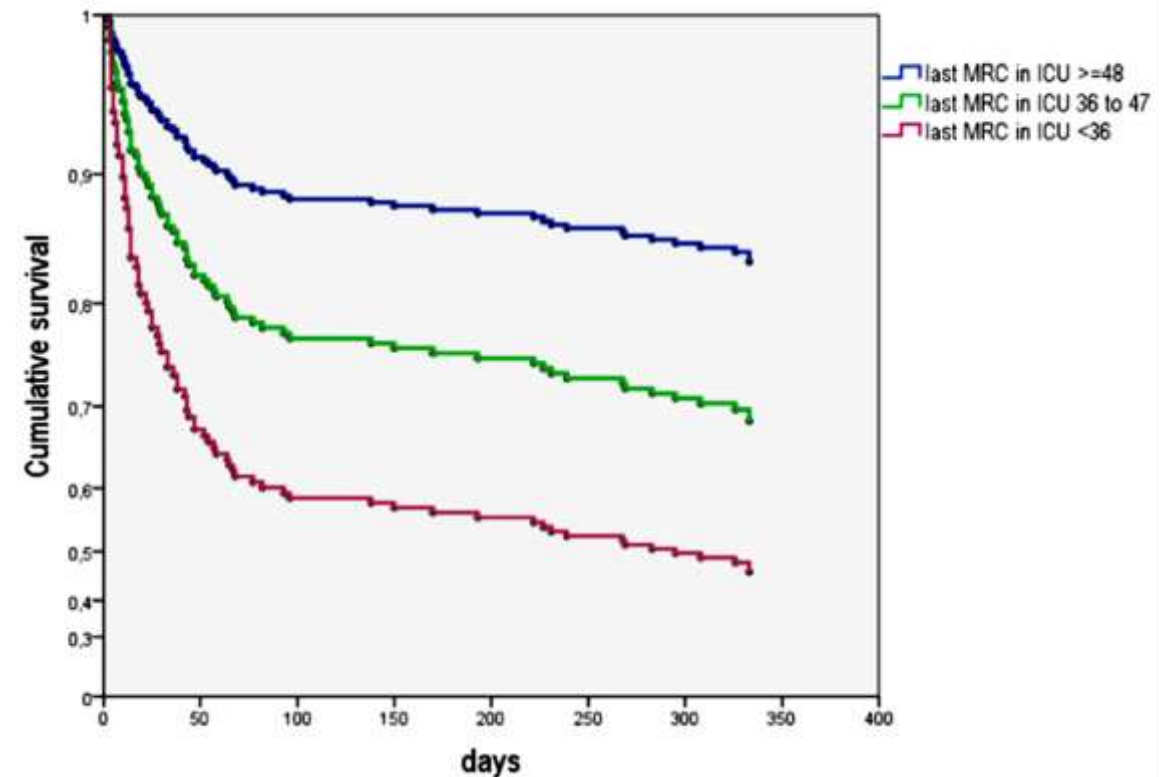
Garnacho-Montero J, Crit Care Med 2005

- Augmentation de la mortalité

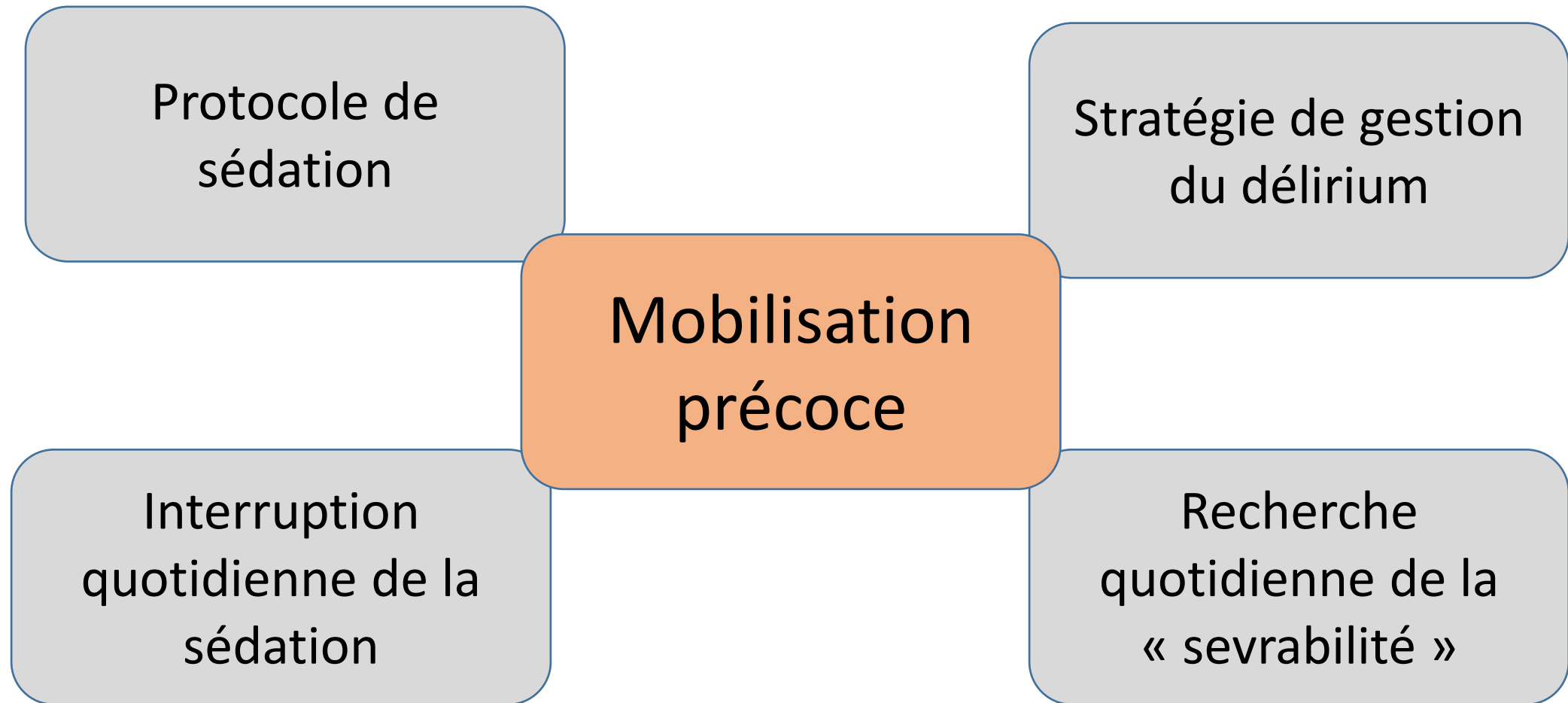
- Perte d'autonomie

- Mais contribue aussi :

- Delirium
- Dépression
- Troubles cognitifs



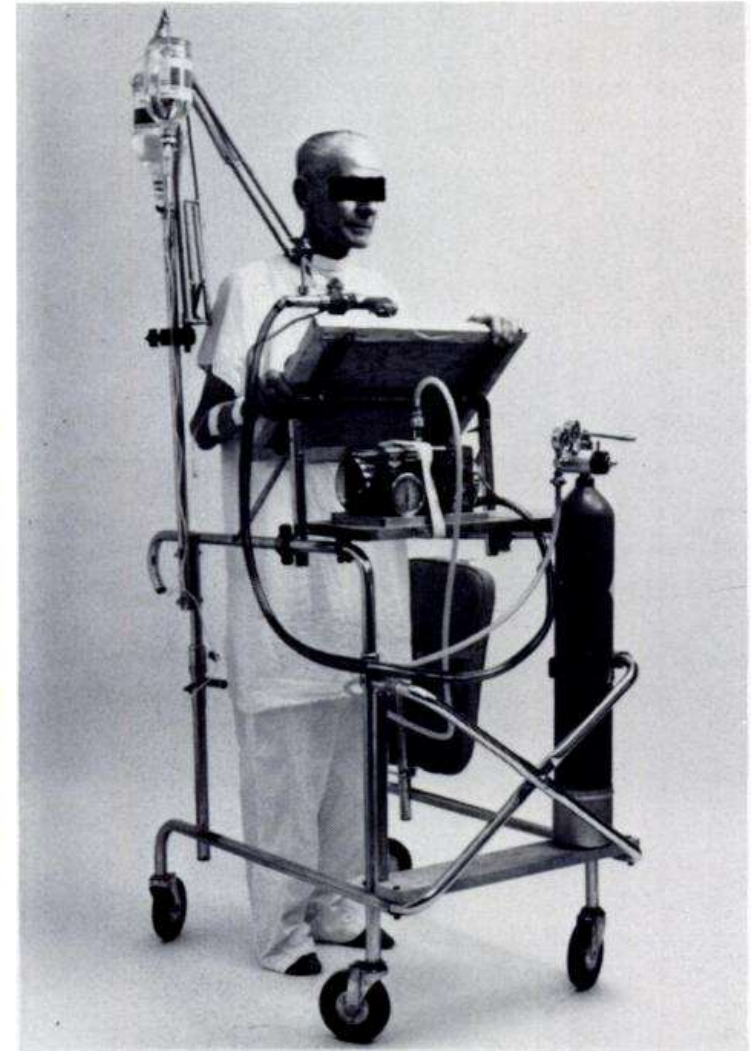
Quelles solutions ?



La mobilisation : toute une histoire

- Début XX^{ème} : Immobilisation délétère
- 1975 :

Although the method utilized is not critical, the concept of early ambulation is clinically useful and rests on a sound physiologic basis. Patient acceptance has been excellent. It is our impression that by early ambulation, weaning has been facilitated and hastened, and the problems of prolonged bed and chair rest minimized.



Etats des lieux

- Etude de faisabilité française :

Rehabilitation Interventions While on Ventilator (*n*, %)

Chair-sitting	55 (35)
Tilting-up with arms unsupported	18 (82)
Tilting-up with arms supported	18 (26)
Walking	0 (0)
Total	91 (33)

- Etude prévalence en Allemagne

Level of Mobilization	Total (<i>n</i> = 775) (%) ^a	Endotracheal Tube (<i>n</i> = 401) (%) ^b
Remaining in bed ^d	590 (76)	370 (92)
No mobilization	81 (11)	61 (15)
Turning in bed	342 (44)	224 (56)
Sitting in bed	167 (22)	85 (21)
Mobilized out of bed ^d	185 (24)	31 (8)
Sitting on edge of bed	73 (9)	22 (6)
Sitting in a chair	76 (10)	8 (2)
Standing out of bed	18 (2)	0 (0)
Marching in place	8 (1)	1 (0)
Walking	10 (1)	0 (0)

Mobilisation au lit

- Techniques passives ou actives :
 - Passive si inconscient/déficitaire
 - Active dès que possible
- Positionnement
- Mobilisation passive manuelle
 - Prévention de la rétraction, ankylose, œdème...
- Active, assistée, contre résistance



Hors du lit

- Bord de lit
- Mise au fauteuil
- Table de verticalisation
- Station debout
- Marche

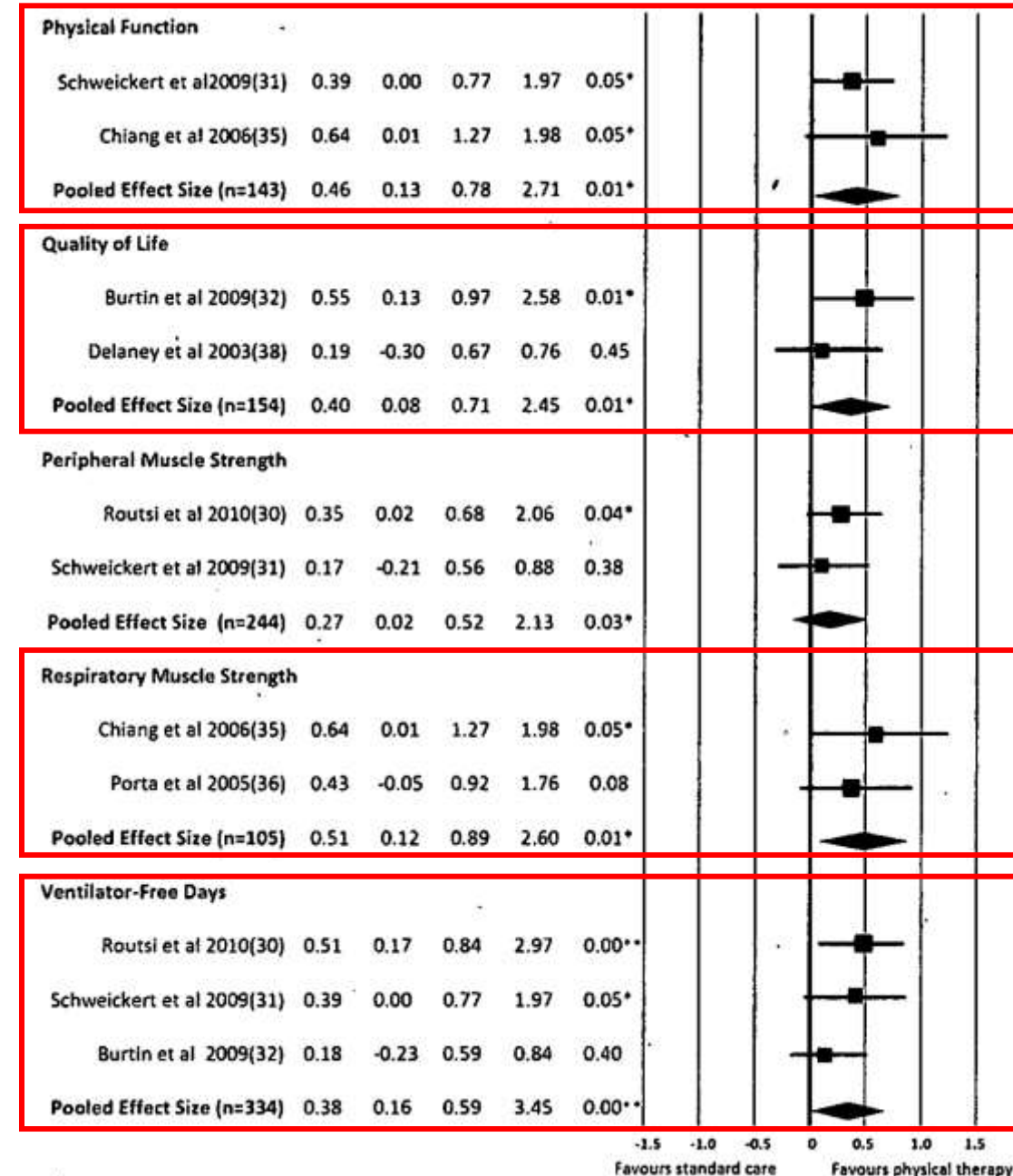


Aide mécanique



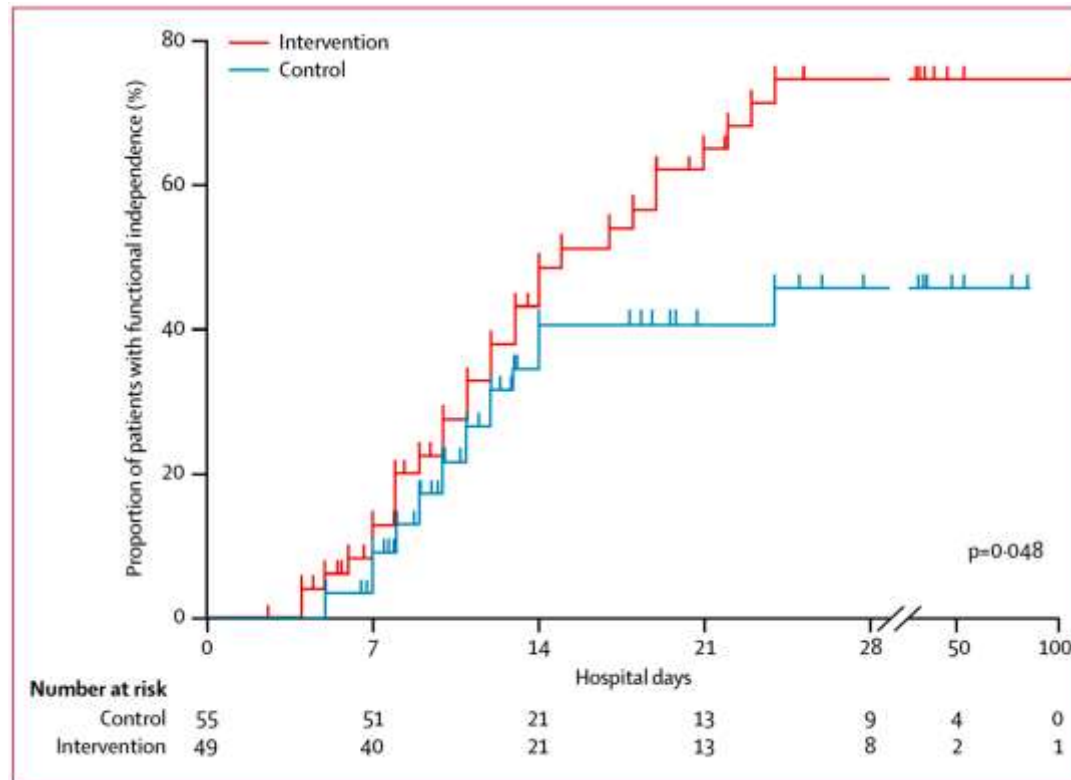
Quelles preuves ?

- Effets sur:
 - Les ADL
 - Qualité de vie
 - Muscles respiratoires
 - Durée de ventilation
- Pas d'effet retrouvé sur la mortalité
- Hétérogénéité des études
 - Timing de la rééducation
 - Bras contrôle
 - Intensité



Quelles preuves ?

N=104, ventilation < 72h
Mobilisation précoce vs contrôle
CJP : Retour aux ADL antérieurs



	Intervention (n=49)	Control (n=55)	p value
Return to independent functional status at hospital discharge	29 (59%)	19 (35%)	0.02
ICU delirium (days)	2.0 (0.0-6.0)	4.0 (2.0-7.0)	0.03
Time in ICU with delirium (%)	33% (0-58)	57% (33-69)	0.02
Hospital delirium (days)	2.0 (0.0-6.0)	4.0 (2.0-8.0)	0.02
Hospital days with delirium (%)	28% (26)	41% (27)	0.01
Barthel Index score at hospital discharge	75 (7.5-95)	55 (0-85)	0.05
ICU-acquired paresis at hospital discharge	15 (31%)	27 (49%)	0.09
Ventilator-free days*	23.5 (7.4-25.6)	21.1 (0.0-23.8)	0.05
Duration of mechanical ventilation (days)	3.4 (2.3-7.3)	6.1 (4.0-9.6)	0.02
Duration of mechanical ventilation, survivors (days)	3.7 (2.3-7.7)	5.6 (3.4-8.4)	0.19
Duration of mechanical ventilation, non-survivors (days)	2.5 (2.4-5.5)	9.5 (5.9-14.1)	0.04
Length of stay in ICU (days)	5.9 (4.5-13.2)	7.9 (6.1-12.9)	0.08
Length of stay in hospital (days)	13.5 (8.0-23.1)	12.9 (8.9-19.8)	0.93
Hospital mortality	9 (18%)	14 (25%)	0.53

Data are n (%), median (IQR), or mean (SD). ICU=intensive care unit. *Ventilator-free days from study day 1 to day 28. Barthel Index scale 0-100, APACHE II scale 0-71.

Table 3: Main outcomes according to study group

Quelles preuves ?

N=750, ventilation < 72h

Mobilisation précoce quotidienne vs soins usuels

CJP : Survie en dehors de l'hôpital à 6 mois

• Pas d'effet bénéfique retrouvé

Characteristic	Early Mobilization (N=371)	Usual Care (N=370)	Between-Group Difference (95% CI) [†]	
Patients who were assessed by a physiotherapist on day of randomization — no./total no. (%)	320/370 (86.5)	265/363 (73.0)	13.5 (6.7 to 20.3)	0 Nothing (lying in bed)
No. of days per patient when physiotherapy assessment occurred	0.94±0.11	0.81±0.24	0.14 (0.12 to 0.16)	1 Sitting in bed, exercises in bed
No. of minutes of active mobilization per day	20.8±14.6	8.8±9.0	12.0 (10.4 to 13.6)	2 Passively moved to chair (no standing)
Mobilization milestones [‡]				3 Sitting over edge of bed
IMS 3 or higher				4 Standing
Patients — no. (%)	331 (89.2)	330 (89.2)	0 (−4.3 to 4.3)	5 Transferring bed to chair
Median no. of days since randomization (IQR)	3 (1 to 6)	4 (2 to 7)	−1 (−2.2 to −0.2)	6 Marching on spot (at bedside)
IMS 4 or higher				7 Walking with assistance of 2 or more people
Patients — no. (%)	287 (77.4)	286 (77.3)	0.1 (−6.0 to 6.1)	8 Walking with assistance of 1 person
Median no. of days since randomization (IQR)	3 (2 to 7)	5 (3 to 8)	−2 (−3.4 to −0.6)	9 Walking independently with a gait aid
IMS 7 or higher				10 Walking independently without a gait aid
Patients — no. (%)	176 (47.4)	150 (40.5)	6.9 (−0.2 to 14.0)	
Median no. of days since randomization (IQR)	5 (3 to 8)	7 (4 to 13)	−2 (−3.4 to −0.7)	
Median peak IMS (IQR)	6 (4 to 8)	6 (4 to 8)	0 (−1 to 1)	

Quand ne pas mobiliser ?

RESPIRATORY CONSIDERATIONS	IN-BED EXERCISES	OUT-OF-BED EXERCISES
Intubation		
Endotracheal tube ^a	●	●
Tracheostomy tube	●	●
Respiratory parameters		
Fraction of inspired oxygen		
≤ 0.6	●	●
> 0.6	▲	▲
Percutaneous oxygen saturation		
≥ 90%	●	●
< 90% ^b	▲	●
Respiratory rate		
≤ 30 bpm	●	●
> 30 bpm	▲	▲
Ventilation		
Mode HFOV	▲	●
PEEP		
≤ 10 cmH ₂ O	●	●
> 10 cmH ₂ O	▲	●
Ventilator dyssynchrony ^c	▲	▲
Rescue therapies		
Nitric oxide	▲	▲
Prostacyclin	▲	▲
Prone positioning ^d	●	●

CARDIOVASCULAR CONSIDERATIONS	IN-BED EXERCISES	OUT-OF-BED EXERCISES
Blood pressure		
Intravenous antihypertensive therapy for hypertensive emergency ^a	●	●
MAP ^b :		
Below target range and causing symptoms	▲	▲
Below target range despite support (vasoactive and/or mechanical)	▲	▲
Greater than lower limit of target range while receiving no support or low level support	▲	▲
Greater than lower limit of target range while receiving moderate level support	▲	▲
Greater than lower limit of target range while receiving high level support	▲	●
Known or suspected arrhythmia	▲	▲
Pharmacological treatment (e.g., vasopressors, inotropes, antiarrhythmics) or awaiting emergency pacemaker insertion	●	●
Not requiring pharmacological treatment and not awaiting emergency pacemaker insertion	▲	▲
Transvenous or epicardial pacemaker:		
Dependent rhythm	▲	●
Stable underlying rhythm	●	●

OTHER CONSIDERATIONS	IN-BED EXERCISES	OUT-OF-BED EXERCISES
Surgical		
Unstable/unstabilized major fracture	▲	●
Open fracture of long bone	▲	●
Wound	●	●
Uncontrolled active bleeding	●	●
Suspicion of active bleeding or increased bleeding risk ^b	▲	▲
Patient is febrile with a temperature exceeding acceptable maximum despite active physical or pharmacological cooling management	▲	▲
Active hypothermia management	▲	▲
Other considerations		
ICU-acquired weakness	●	●
Continuous renal replacement therapy (including femoral dialysis catheters)	●	●
Venous and arterial femoral catheters	●	●
Femoral sheaths	▲	●
All other drains and attachments, e.g., Nasogastric tube Central venous catheter Pleural drain Wound drain Intercostal catheter Urinary catheter	●	●

Toute situation non contrôlée

Consensus et recommandations

RECOMMANDATIONS / RECOMMENDATIONS

Prise en charge de la mobilisation précoce en réanimation, chez l'adulte et l'enfant (électrostimulation incluse)

Clinical Practice Guidelines for Early Mobilization in the ICU: A Systematic Review

Jenna K. Lang, BPhysio (Hons)^{1,2}; Melanie S. Paykel, DPhysio²; Kimberley J. Haines, PhD¹⁻³; Carol L. Hodgson, PhD^{1,4}

Expert consensus and recommendations on safety criteria for active mobilization of mechanically ventilated critically ill adults

Carol L. Hodgson^{1,2*}, Kathy Stiller³, Dale M. Needham⁴, Claire J. Tipping², Megan Harrold⁵, Claire E. Baldwin^{6,7}, Scott Bradley², Sue Berney⁸, Lawrence R. Caruana⁹, Doug Elliott¹⁰, Margot Green¹¹, Kimberley Haines^{8,12}, Alisa M. Higgins¹, Kirsi-Majja Kaukonen^{1,13}, Isabel Anne Leditschke^{14,15}, Marc R. Nickels¹⁶, Jennifer Paratz^{17,18}, Shane Patman¹⁹, Elizabeth H. Skinner^{20,21}, Paul J. Young^{22,23}, Jennifer M. Zanni²⁴, Linda Denehy²⁵ and Steven A. Webb^{1,26}

The ABCDEF Bundle: Science and Philosophy of How ICU Liberation Serves Patients and Families

E. Wesley Ely, MD, MPH, FCCM

Quels risques ?

Etude sur 6 mois en 2003 aux USA
1449 séances dont 593 chez patients intubés
42 % de marche

Complication	Total (n = 654) (%) ^a	Mobilized in Bed ^b (n = 473) (%) ^c	Mobilization Out of Bed ^d (n = 181) (%) ^e	p ^f
Any complication	135 (21)	94 (20)	41 (23)	0.450
Specific complications				
Ventilator dyssynchrony	23 (4)	15 (3)	8 (4)	0.478
Anxiety or confusion	22 (3)	14 (3)	8 (4)	0.341
Oxygen saturation < 85%	19 (3)	13 (3)	6 (3)	0.795
Mean arterial pressure < 55 mm Hg	15 (2)	12 (3)	3 (2)	0.771
Arrhythmia (any type)	12 (2)	10 (2)	2 (1)	0.526
Cardiac arrest	4 (1)	4 (1)	0 (0)	0.580
Disconnection from ventilator	7 (1)	4 (1)	3 (2)	0.403
Bleeding	2 (0)	2 (1)	0 (0)	> 0.999
Mean arterial pressure > 140 mm Hg	5 (1)	2 (0)	3 (2)	0.133
Removal of endotracheal tube	1 (0)	1 (0)	0 (0)	> 0.999
Removal of bladder catheter	1 (0)	1 (0)	0 (0)	> 0.999
Removal of feeding tube	1 (0)	0 (0)	1 (1)	0.277
Removal of intravascular catheter ^g	0 (0)	0 (0)	0 (0)	> 0.999
Fall	0 (0)	0 (0)	0 (0)	> 0.999
Other	23 (4)	16 (3)	7 (4)	0.813

Early activity in our respiratory failure patients was safe. The number of adverse events was low, and no event was serious. Early activity had a low risk (<1%) of complications even though a majority of activity events occurred when patients had an artificial airway in place (Fig. 3). Adverse events did not result in extubation, complications that required additional therapy, additional cost, or longer length of hospital stays.

Quels obstacles ?

Le patient

Diagnostic, sévérité, âge, comorbidités
Sédation, Délirium, Douleurs
Etat psychologique / motivation

Physiologiques

Cathéters, Hémodialyse
Blessure du soignant

Manque

De volonté, de travail d'équipe, de
leadership, d'expérience, de formation,
ou de soutien de l'équipe médicale

Croyance

Manque de confiance dans le bénéfice
et les risques de la séance

Autres

Manque de fonds
Manque de professionnels
Manque de temps

Quels leviers ?

Le patient

Protocole de sédation/douleur/delirium
Des objectifs pour le patient/famille
Rythme éveil/sommeil

Physiologiques

Etablir des critères pour débuter/arrêter
Sécuriser les voies veineuses

Manque

Développer la culture, mettre en place
une équipe motivée pluridisciplinaire
Développer une routine

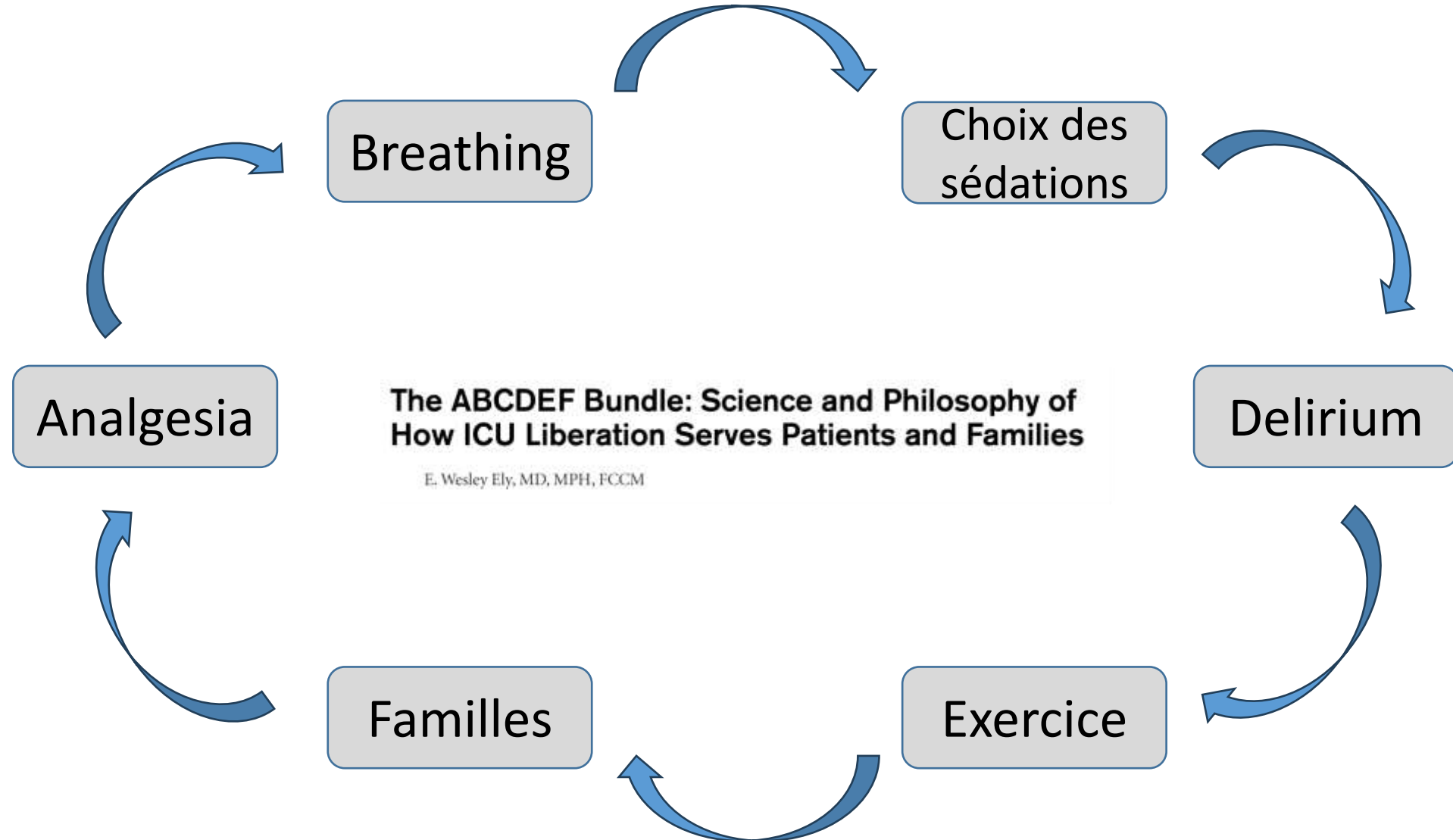
Croyance

Education/Information sur les bénéfices
Renforcer les expériences positives

Autres

Démontrer le bénéfice économique
Concordance des temps
Mettre en place des protocoles

ABCDEF



Pour conclure,

- Pour ne pas avoir peur :
 - Etablir des protocoles
 - Motiver les équipes et établir une volonté pluridisciplinaire
 - Réaliser la sécurité et la faisabilité de la mobilisation précoce

1) La mobilisation précoce nécessite l'entraide et l'implication de l'équipe de réanimation afin d'assurer efficacité et sécurité pour le patient. (Accord fort)

1) L'ensemble du personnel soignant doit s'inscrire dans une démarche de mobilisation précoce, coordonnée par un kinésithérapeute. (Accord fort) [Avis d'experts]

7) Il ne faut pas priver les patients ventilés de mobilisation active ou de déambulation du seul fait de la présence d'un tube endotrachéal et/ou d'une ventilation mécanique invasive. (Accord fort)