UNIVERSITÉ MONTPELLIER I
FACULTÉ DE MEDECINE

LES HANDICAPS POST-REANIMATION

CHRU MONTPELLIER
CENTRE HOSPITALIER REGIONAL UNIVERSITAIRE

Gérald CHANQUES

Département d'Anesthésie-Réanimation
Hôpital Saint Eloi; CHU-MONTPELLIER

INSERM U1046 Physiologie et médecine expérimentale
Hôpital Arnaud de Villeneuve; CHU-MONTPELLIER

Université Montpellier I
FACULTÉ de MÉDECINE
Montpellier - Nîmes

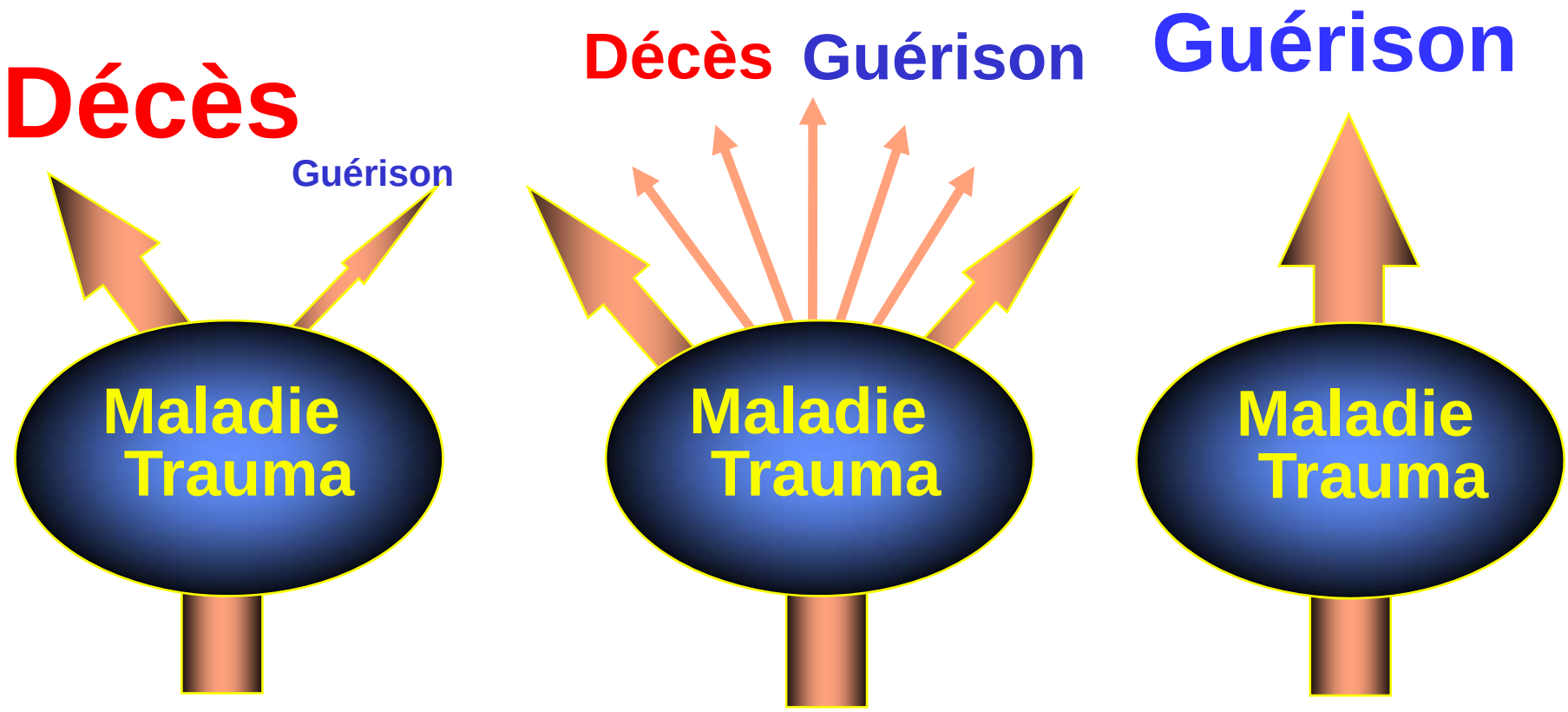
SKR

XXVI^{ème} Congrès annuel

Paris 2013

Pas de conflit d’intérêt

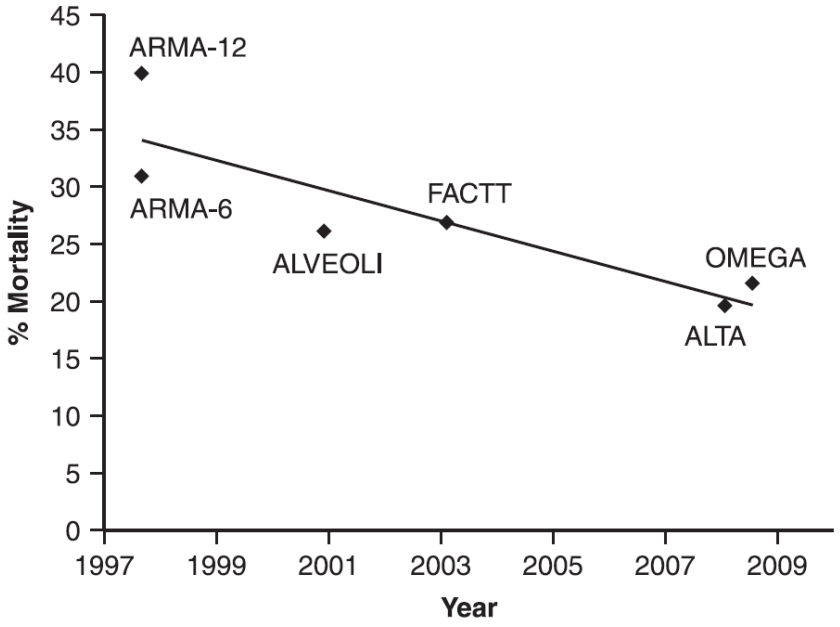
Le rêve du réanimateur

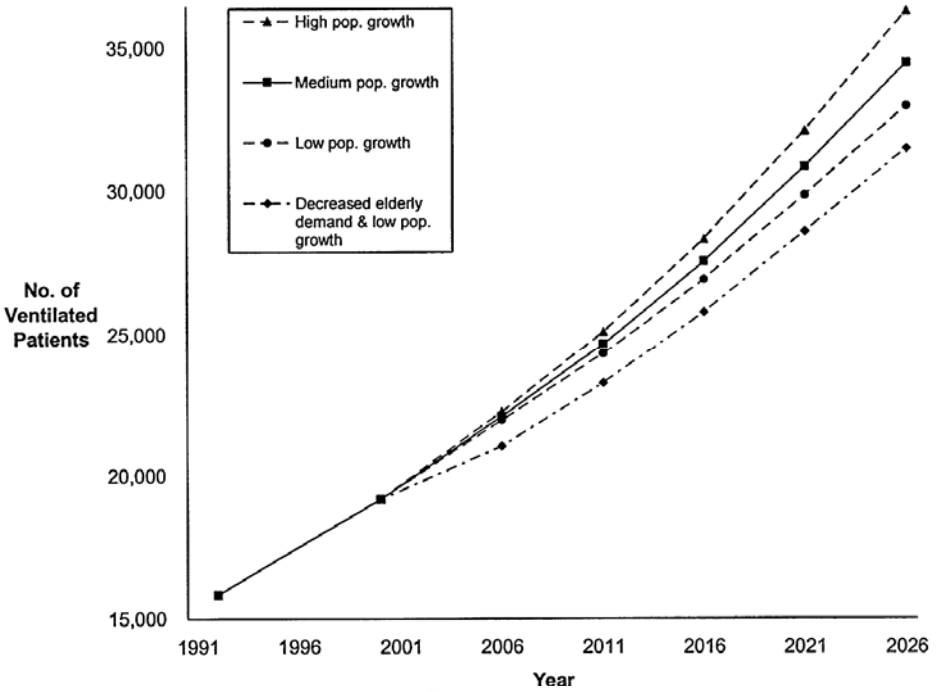


Il était 1 fois… **La réalité** **L'illusion**

Alex Mauron, Bioethics - Geneva

Admission en réa des baby boomers





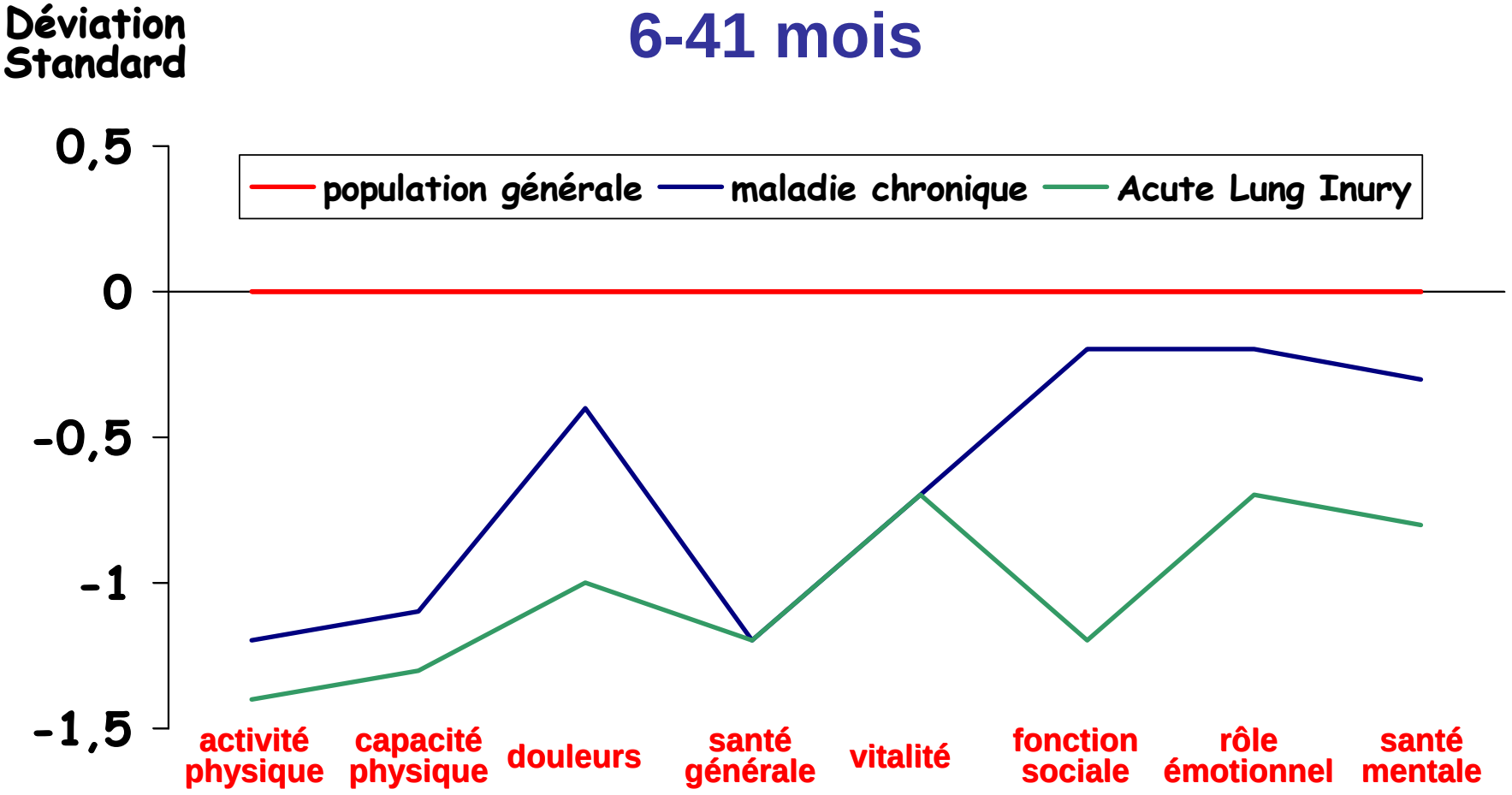
Spragg et al. AJRCCM 2010

1. La qualité de vie post-réa
2. Déterminants du handicap physique
3. Le handicap PSYCHIQUE
4. La réhabilitation

1. **La qualité de vie post-réa**
2. **Déterminants du handicap physique**
3. **Le handicap PSYCHIQUE**
4. **La réhabilitation**

Qualité de vie SF 36

6-41 mois



Weinert et al. AJRCCM 1997

Intensive Care Med (2006) 32:1115–1124
DOI 10.1007/s00134-006-0217-3

SYSTEMATIC REVIEW

INTENSIVE CARE MEDICINE

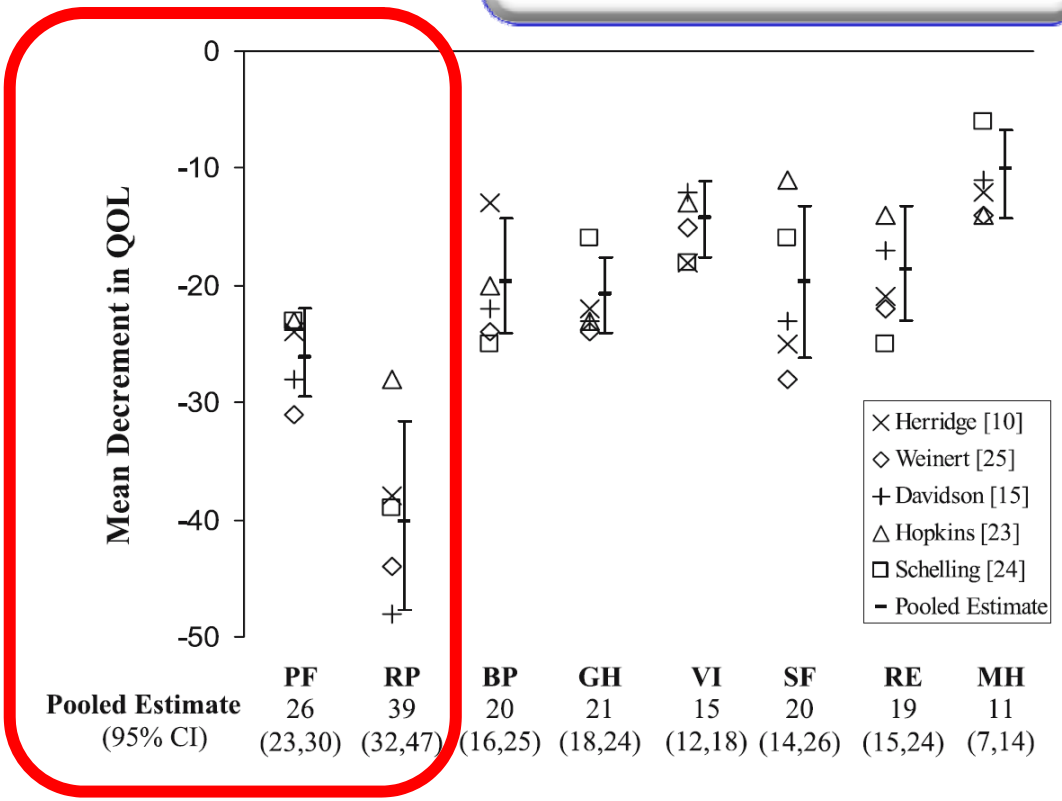
David W. Dowdy
Mark P. Eid
Cheryl R. Dennison
Pedro A. Mendez-Tellez
Margaret S. Herridge
Eliseo Guallar
Peter J. Pronovost
Dale M. Needham

Quality of life after acute respiratory distress syndrome: a meta-analysis

2006

SDRA

1-4 ans



activité physique capacité physique

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 7, 2011 VOL. 364 NO. 14

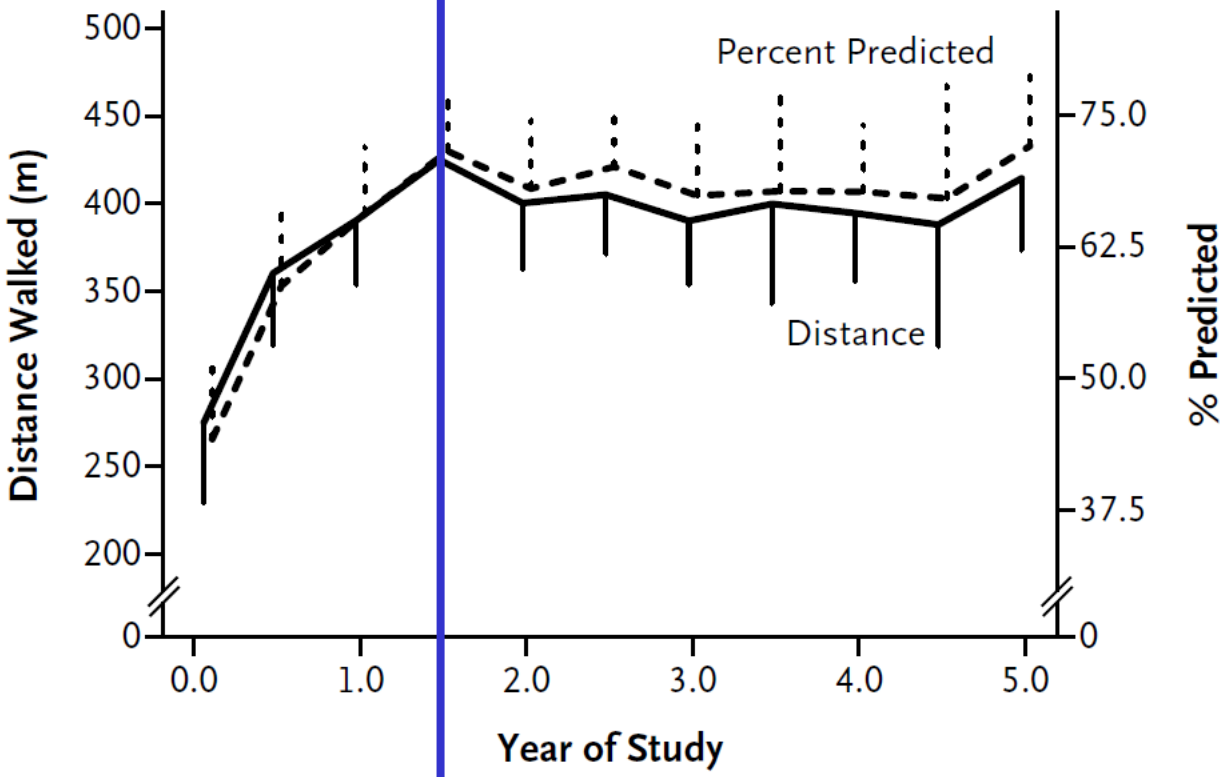
Functional Disability 5 Years after Acute Respiratory Distress Syndrome

Margaret S. Herridge, M.D., M.P.H., Catherine M. Tansey, M.Sc., Andrea Matté, B.Sc., George Tomlinson, Ph.D., Natalia Diaz-Granados, M.Sc., Andrew Cooper, M.D., Cameron B. Guest, M.D., C. David Mazer, M.D., Sangeeta Mehta, M.D., Thomas E. Stewart, M.D., Paul Kudlow, B.Sc., Deborah Cook, M.D., Arthur S. Slutsky, M.D., and Angela M. Cheung, M.D., Ph.D., for the Canadian Critical Care Trials Group

Characteristic	At 1 Year (N = 83)	At 5 Years (N = 64)
Age at enrollment — yr		
Median	45	44
Interquartile range	36–56	35–57
Male sex — no. (%)	46 (55)	33 (52)
Coexisting illness — no. (%)*		
None	34 (41)	26 (41)
1	31 (37)	27 (42)
2 or more	18 (22)	11 (17)
Preexisting pulmonary disease — no. (%)	8 (10)	6 (9)
Working full time before ARDS — no. (%)	64 (77)	53 (83)

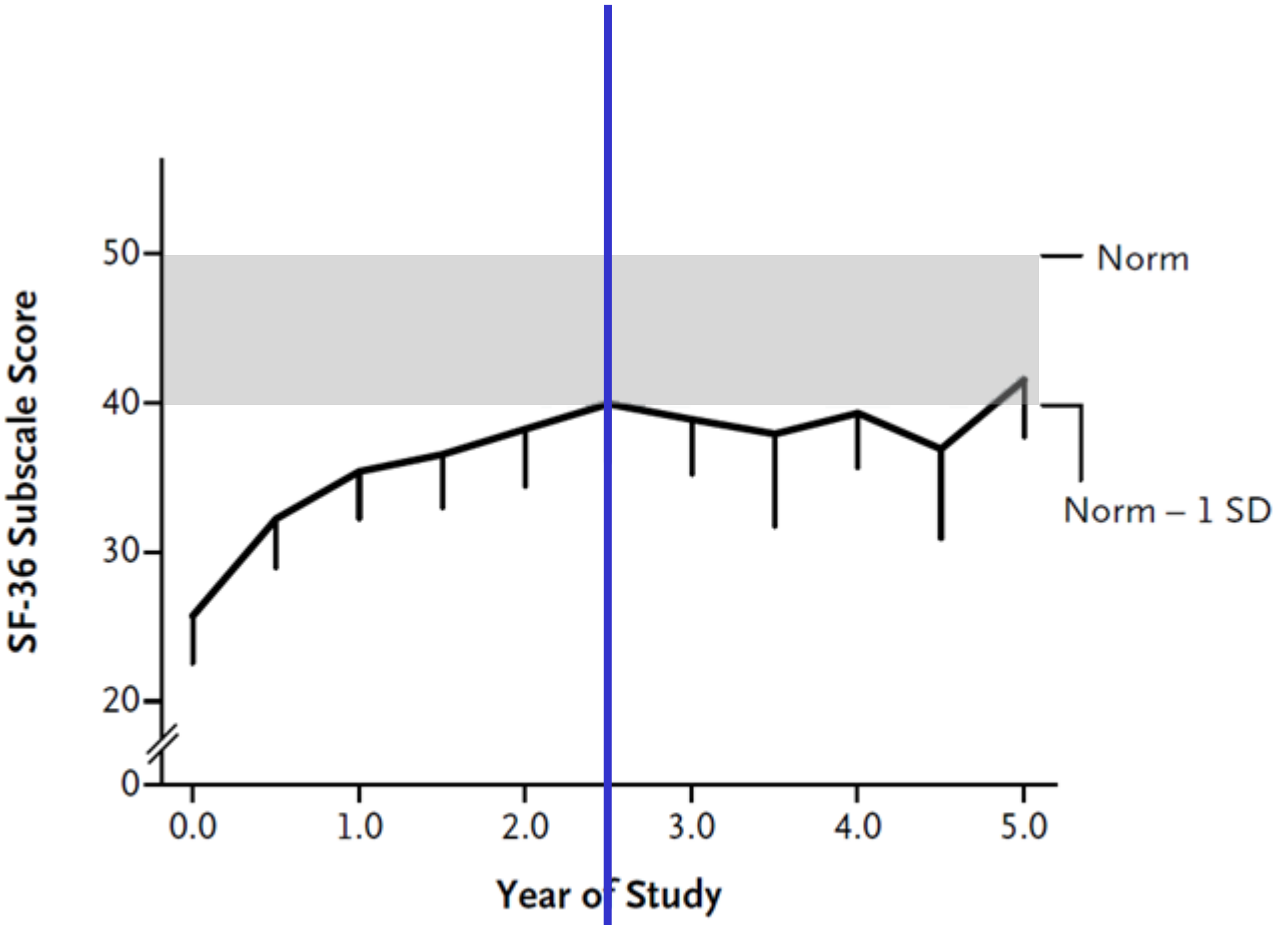

WALK

6 min


Distance Walked (m)
500
450
400
350
300
250
200
0
Percent Predicted
Distance
75.0
62.5
50.0
37.5
0
% Predicted
0.0
1.0
2.0
3.0
4.0
5.0
Year of Study

1½ an

Score Global de santé Physique



2½ ans

≠ SDRA et population générale de réa?

Intensive Care Med (2005) 31:611–620
DOI 10.1007/s00134-005-2592-6

SYSTEMATIC REVIEW

David W. Dowdy
Mark P. Eid
Artyom Sedrakyan
Pedro A. Mendez-Tellez
Peter J. Pronovost
Margaret S. Herridge
Dale M. Needham

Quality of life in adult survivors of critical illness: A systematic review of the literature

2005

Pas SDRA

Source	N[a]	Follow-up time[b]	Physical QOL domains[c]				Mental QOL domains[c]			
			Physical function	Role physical	Bodily pain	General health	Vitality	Social function	Role emotional	Mental health
Studies of QOL prior to ICU admission[d]										
Wehler [26]	318	–	↓*	↓*	↓*	↓*	↓*	↓*	↓*	↓*
Graf [27]	153	–	↓*	↓*	↓*	↓*	↓*	↓*	↓*	↓*
Ridley [32] [e]	75	–	↓*	↓*	↓*	↓*	↓*	↓*	↓*	↓*
Studies of QOL after ICU stay										
Wehler [26]	171	6 months	↓*	↓*	–	↓*	↓*	↓*	↓*	↓*
Ridley [32] [e]	75	6 months	↓*	↓*	↓*	↓*	↓*	↓*	↓*	↓*
Vedio [31] [f]										
Elective	66	6 months	–	↓*	↑	–	–	–	–	–
Emergency	49	6 months	↓*	↓*	↓	–	↓*	↓*	–	↓*
Graf [27]	153	9 months	↓*	↓*	–	↓*	↓*	↓*	↓*	↓*
Pettila [23]	298	12 months	↓*	↓*	↓	↓*	↓*	↓	↓*	↓
Kaarlola [24] [g]	169	6 years	↓	↓	–	↓	–	–	–	–
Flaatten [33]	51	13–14 years	↓*	↓*	↓	↓*	↓	↓*	↓*	↓*

Intensive Care Med (2005) 31:611–620
DOI 10.1007/s00134-005-2592-6

SYSTEMATIC REVIEW

INTENSIVE CARE MEDICINE

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Quality of life in adult survivors of critical illness: A systematic review of the literature

2005

Pas SDRA

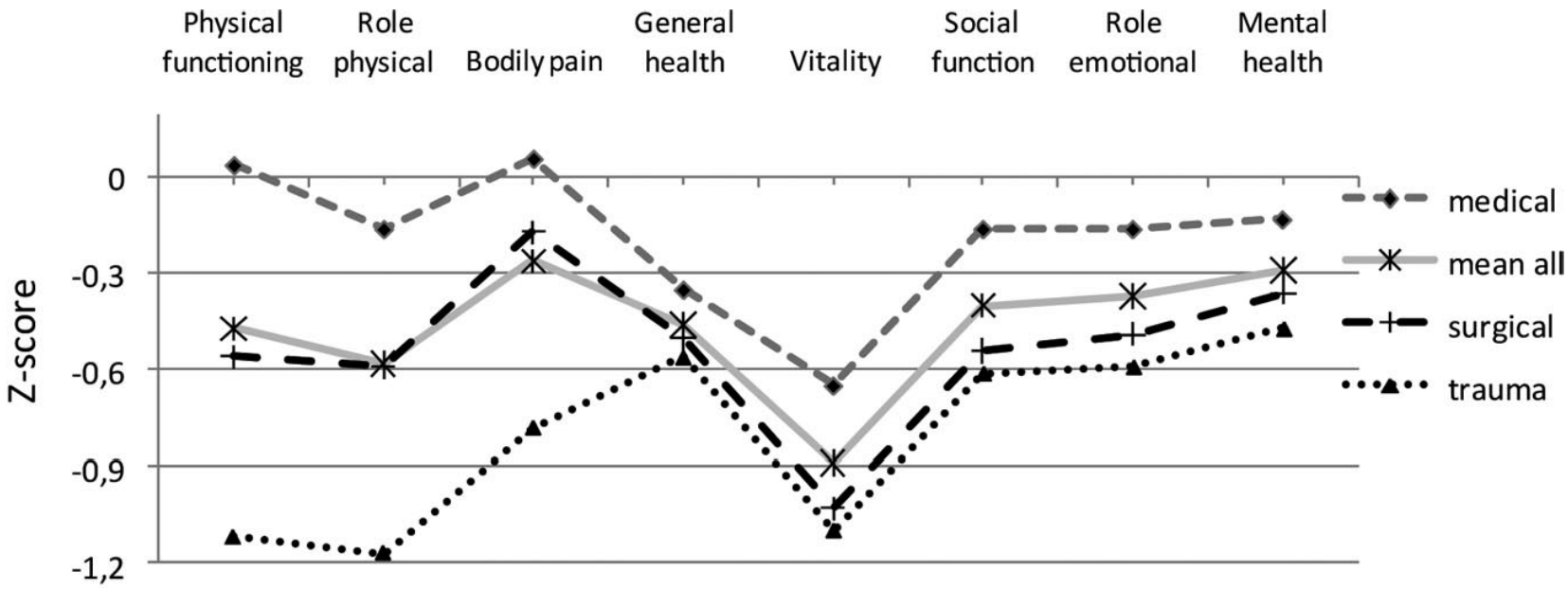
Domain	Follow-up time[b]						
	1 month		6 months			9 months	12 months
	Kleinpell [25]	Graf [27]	Kleinpell [25]	Wehler [26]	Ridley [32]	Graf [27]	Kleinpell [25]
Physical domains							
Physical functioning	↑*	↑*	↑*	–	–	↑*	↑*
Role – physical	↓*	↓*	↑	↑	–	↑*	↑*
Bodily pain	–	↑*	↑	–	↑*	↑*	↑
General health	–	–	–	–	–	–	–
Mental domains							
Vitality	–	–	↑	–	↑*	↑*	↑
Social functioning	–	↓*	↑*	↑*	↑*	–	↑*
Role – emotional	–	↓*	↑	↑*	–	–	↑
Mental health	–	↑*	–	–	–	↑*	–

≠ trauma, réa chir., réa méd ?

Critical Care Medicine 2010

Health-related quality of life and return to work after critical illness in general intensive care unit patients: A 1-year follow-up study

Hilde Myhren, MD; Øivind Ekeberg, MD, PhD; Olav Stokland, MD, PhD



Patient âgé?

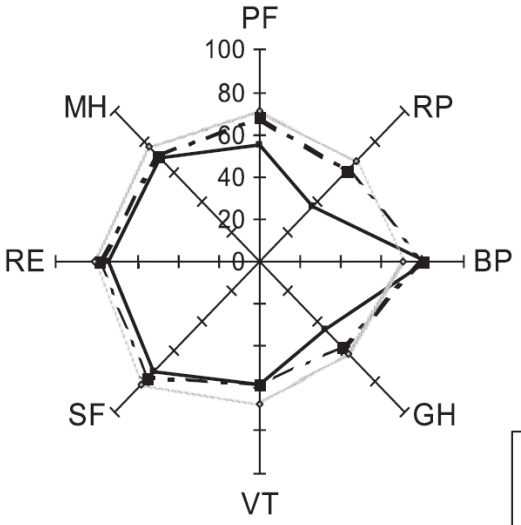
CHEST 2011 Original Research
CRITICAL CARE

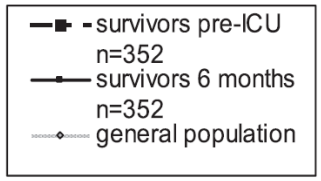
Changes of Health-Related Quality of Life in Critically Ill Octogenarians

A Follow-up Study

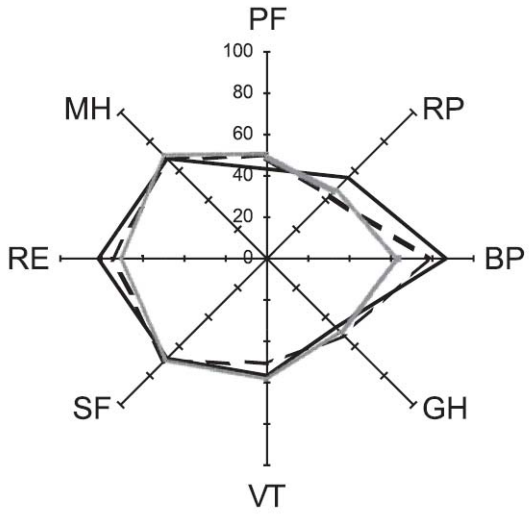
José G. M. Hofhuis, PhD; Henk F. van Stel, PhD; Augustinus J. P. Schrijvers, PhD; Johannes H. Rommes, MD, PhD; and Peter E. Spronk, MD, PhD, FCCP

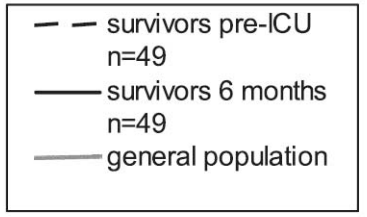
< 80 ans



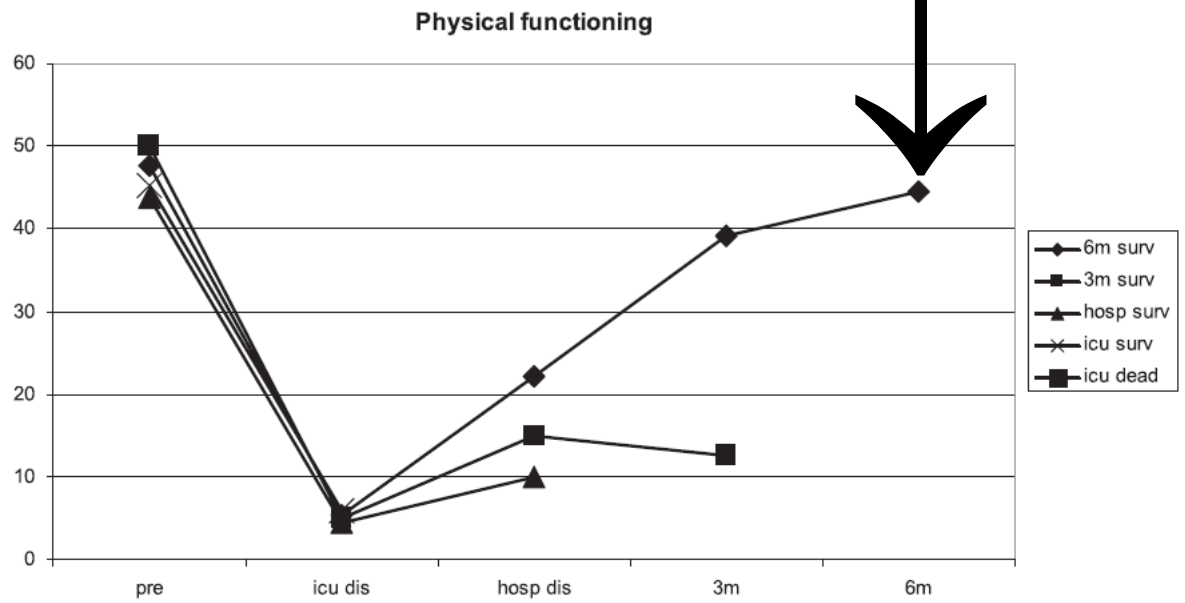


> 80 ans





Survie à 6 mois 1/3



Daubin *et al. Health and Quality of Life Outcomes* 2011, **9**:35
http://www.hqlo.com/content/9/1/35

2011

HEALTH AND QUALITY OF LIFE OUTCOMES

RESEARCH Open Access

Predictors of mortality and short-term physical and cognitive dependence in critically ill persons 75 years and older: a prospective cohort study

Cédric Daubin[1*], Stéphanie Chevalier[1], Amélie Séguin[1], Cathy Gaillard[2], Xavier Valette[1], Fabrice Prévost[1], Nicolas Terzi[1,3], Michel Ramakers[1], Jean-Jacques Parienti[2,4], Damien du Cheyron[1,5] and Pierre Charbonneau[1]

> 75 ans

Conclusions: In a selected population of non surgical patients 75 years and older, admission into the ICU is associated with a 3-month survival rate of 38% with little impact on physical and cognitive dependence and subjective health status. Nevertheless, a high comorbidity level (ie, Charlson index), multi-organ failure, and the need for extra-renal support at the early phase of intensive care could be considered as predictors of death.

1. La qualité de vie post-réa
2. **Déterminants du handicap physique**
3. Le handicap PSYCHIQUE
4. La réhabilitation

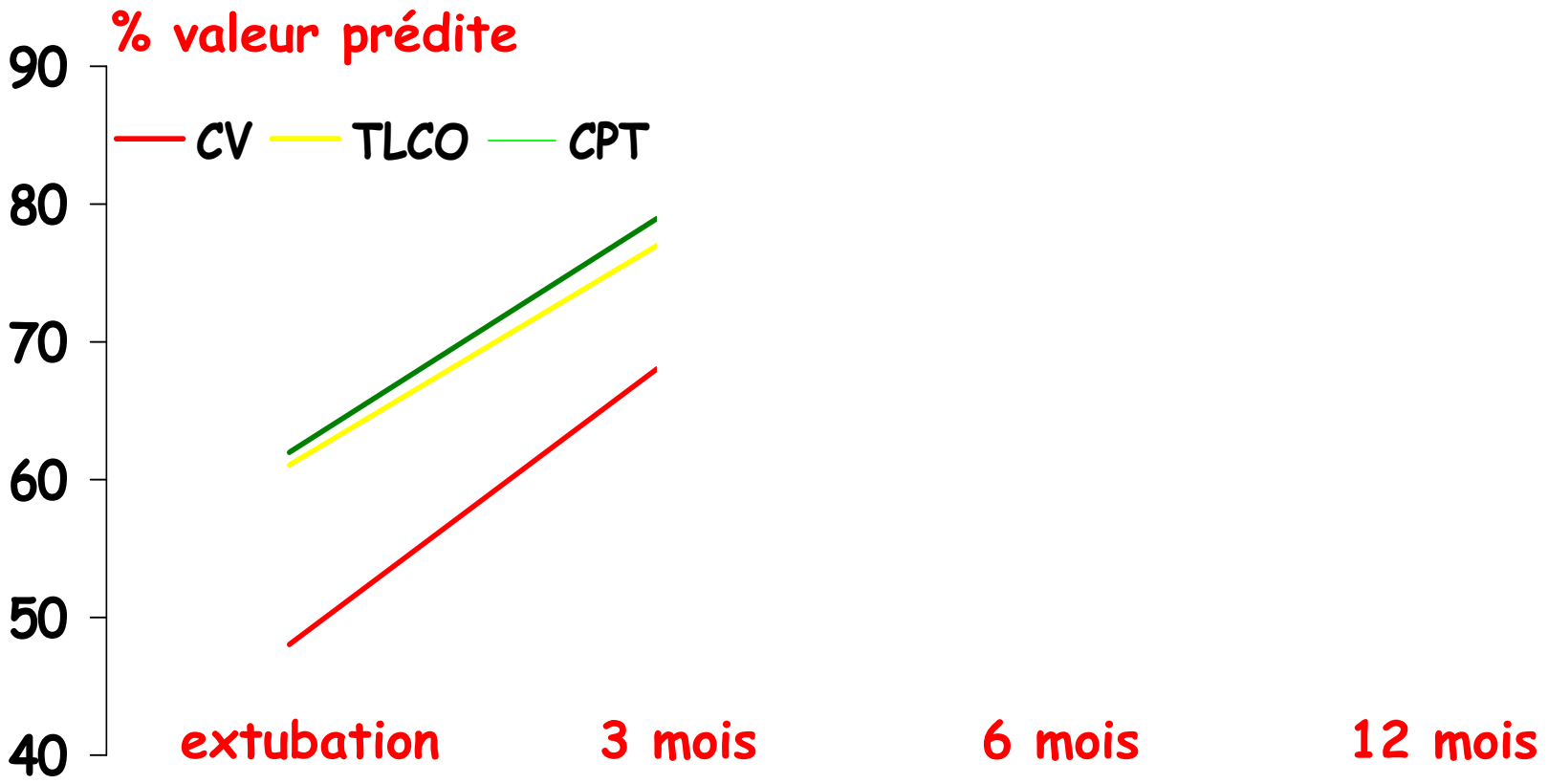
Right Lung

Left Lung

Complications pulmonaires

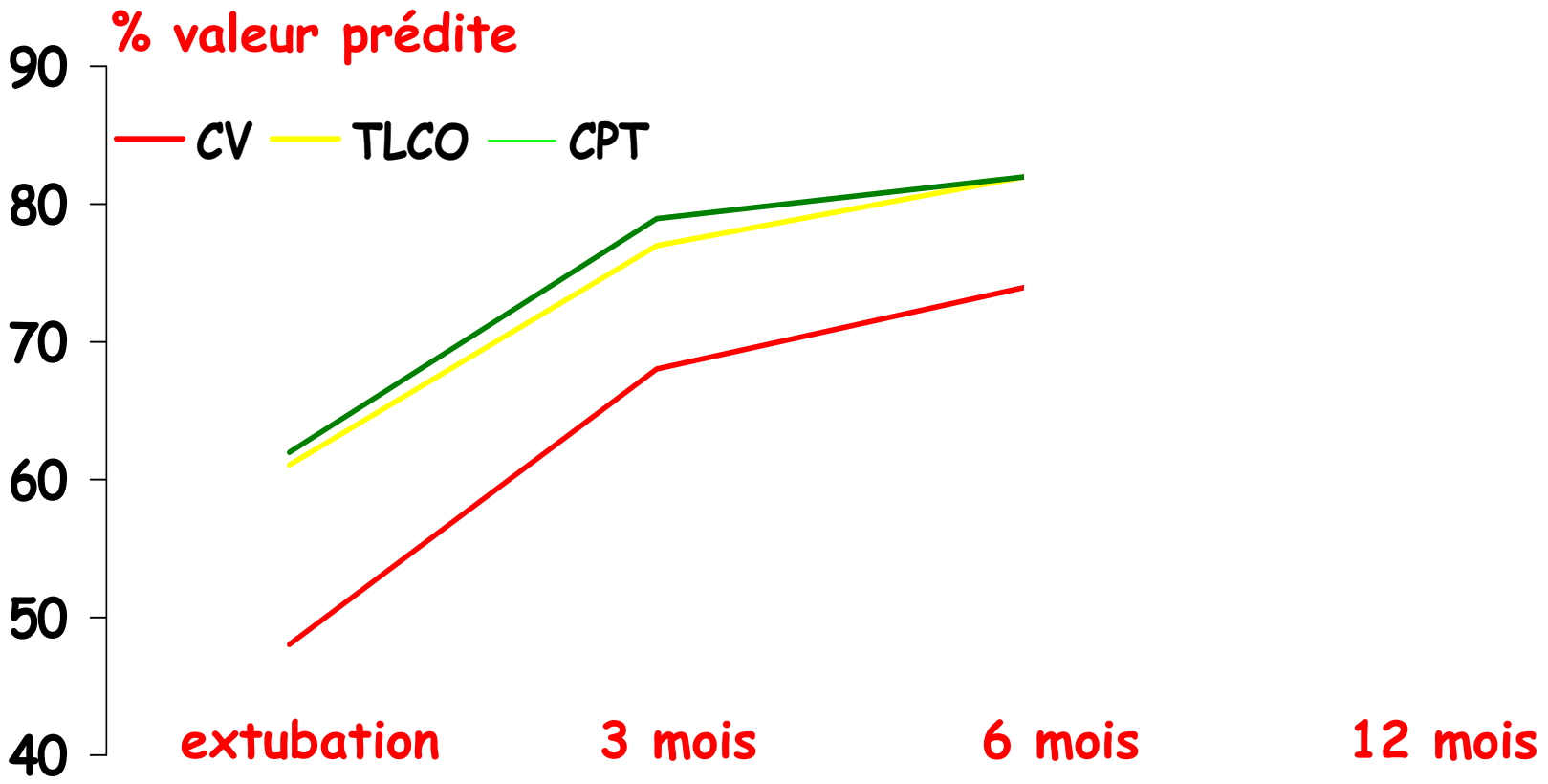
- Syndrome Restrictif
- Troubles de la diffusion

Evolution de la fonction respiratoire



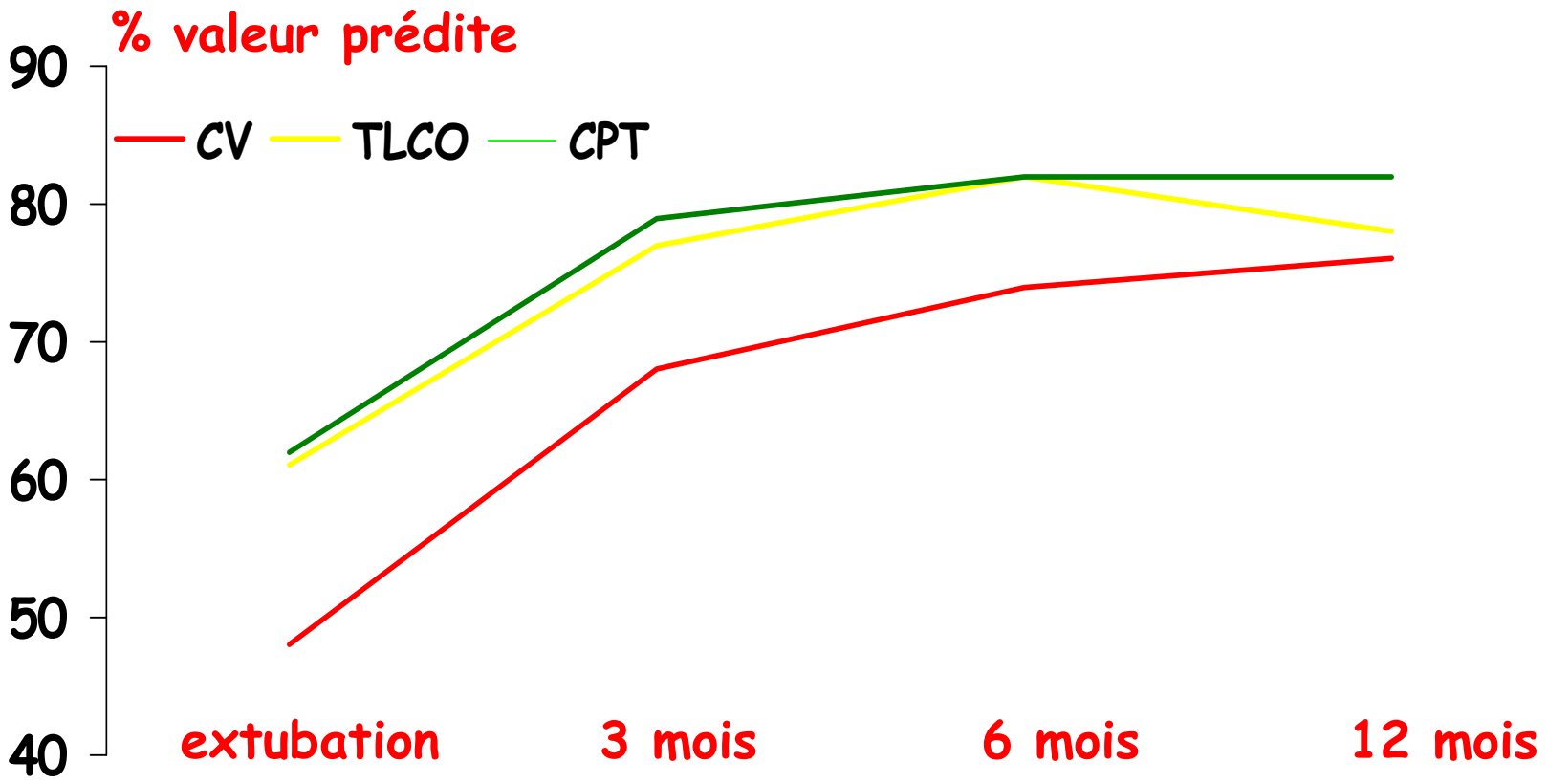
McHugh et al. AJRCCM 1994

Evolution de la fonction respiratoire



McHugh et al. AJRCCM 1994

Evolution de la fonction respiratoire



McHugh et al. AJRCCM 1994

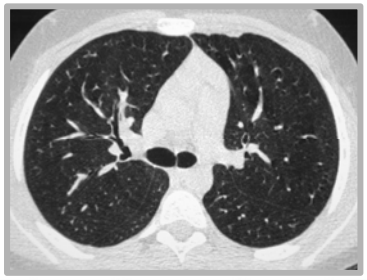
CHEST 2011 Original Research
CRITICAL CARE

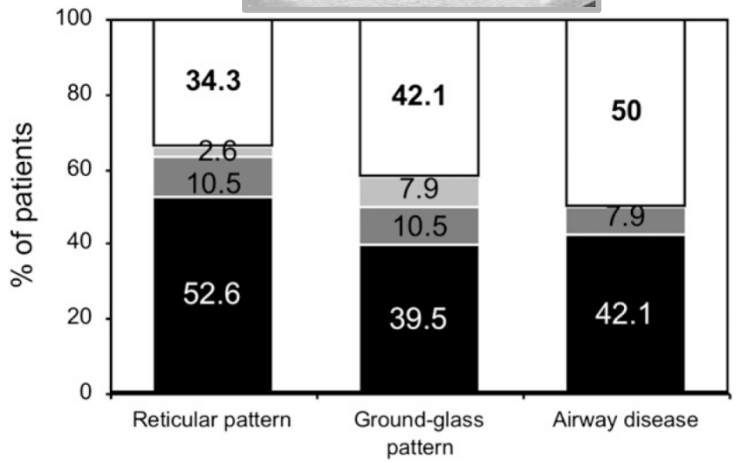
Quality of Life, Pulmonary Function, and Tomographic Scan Abnormalities After ARDS

Joan R. Masclans, MD, PhD; Oriol Roca, MD, PhD; Xavier Muñoz, MD, PhD; Esther Pallisa, MD; Ferran Torres, MD, PhD; Jordi Rello, MD, PhD; and Ferran Morell, MD, PhD

Variable	6 Mo Post-ARDS
FEV_1, %	76 (67-88)
FVC, %	71 (63-83)
FEV_1/FVC, %	80 (72-89)
FEF_{25-75}, %	77 (55-97)
TLC, %	83 (75-97)
RV, %	88 (76-114)
DLCO, %	65 (54-76)
DLCO/AV, %	86 (68-98)
MIP, cm H_2O	62 (45-89)
MEP, cm H_2O	82 (67-114)

70-80% des valeurs normales





80-90% lésions < ¼ poumon

Mécanismes extrapulmonaires ?

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 7, 2011 VOL. 364 NO. 14

Functional Disability 5 Years after Acute Respiratory Distress Syndrome

Margaret S. Herridge, M.D., M.P.H., Catherine M. Tansey, M.Sc., Andrea Matté, B.Sc., George Tomlinson, Ph.D., Natalia Diaz-Granados, M.Sc., Andrew Cooper, M.D., Cameron B. Guest, M.D., C. David Mazer, M.D., Sangeeta Mehta, M.D., Thomas E. Stewart, M.D., Paul Kudlow, B.Sc., Deborah Cook, M.D., Arthur S. Slutsky, M.D., and Angela M. Cheung, M.D., Ph.D., for the Canadian Critical Care Trials Group

GLOBAL ASSESSMENT

At 5 years after ICU discharge, no patient had demonstrable weakness on examination, but all commented on having varying degrees of perceived weakness and stated that their ability to do vigorous exercise was reduced, as compared with their ability before their critical illness. Patients' weight remained stable between 1 and 5 years after ICU discharge.

- 4 ans

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 FEBRUARY 20, 2003 VOL. 348 NO. 8

One-Year Outcomes in Survivors of the Acute Respiratory Distress Syndrome

Margaret S. Herridge, M.D., M.P.H., Angela M. Cheung, M.D., Ph.D., Catherine M. Tansey, M.Sc., Andrea Matte-Martyn, B.Sc., Natalia Diaz-Granados, B.Sc., Fatma Al-Saidi, M.D., Andrew B. Cooper, M.D., Cameron B. Guest, M.D., C. David Mazer, M.D., Sangeeta Mehta, M.D., Thomas E. Stewart, M.D., Aiala Barr, Ph.D., Deborah Cook, M.D., and Arthur S. Slutsky, M.D., for the Canadian Critical Care Trials Group

CONCLUSIONS

Survivors of the acute respiratory distress syndrome have persistent functional disability one year after discharge from the intensive care unit. Most patients have extrapulmonary conditions, with muscle wasting and weakness being most prominent.

GLOBAL ASSESSMENT

At the time of discharge from the ICU, patients who survived the acute respiratory distress syndrome were severely wasted and had lost 18 percent of their base-line body weight (Fig. 2). Seventy-one percent of patients (59 of 83) returned to their base-line weight by one year. All patients reported poor function and attributed this to the loss of muscle bulk, proximal weakness, and fatigue.

1 year follow-up

Table 2. Recovery of Pulmonary Function among Patients with the Acute Respiratory Distress Syndrome during the First 12 Months after Discharge from the ICU.

Variable	3 Mo (N=71)*	6 Mo (N=77)†	12 Mo (N=80)‡
	median (interquartile range)		
Forced vital capacity (% of predicted)	72 (57–86)	80 (68–94)	85 (71–98)
Forced expiratory volume in one second (% of predicted)	75 (58–92)	85 (69–98)	86 (74–100)
Total lung capacity (% of predicted)§	92 (77–97)	92 (83–101)	95 (81–103)
Residual volume (% of predicted)§	107 (87–121)	97 (82–117)	105 (90–116)
Carbon monoxide diffusion capacity (% of predicted)§¶	63 (54–77)	70 (58–82)	72 (61–86)

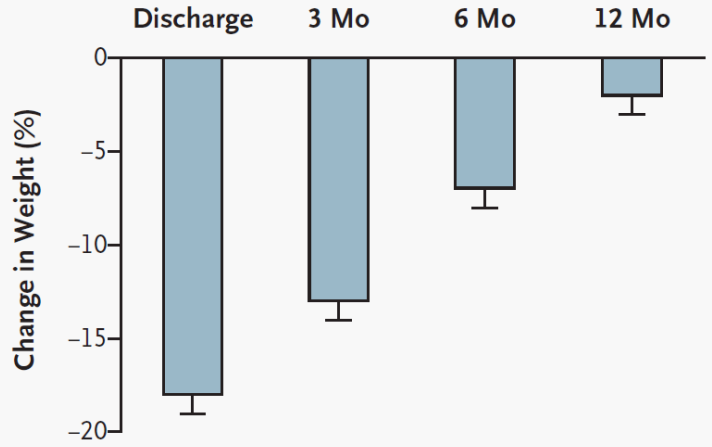
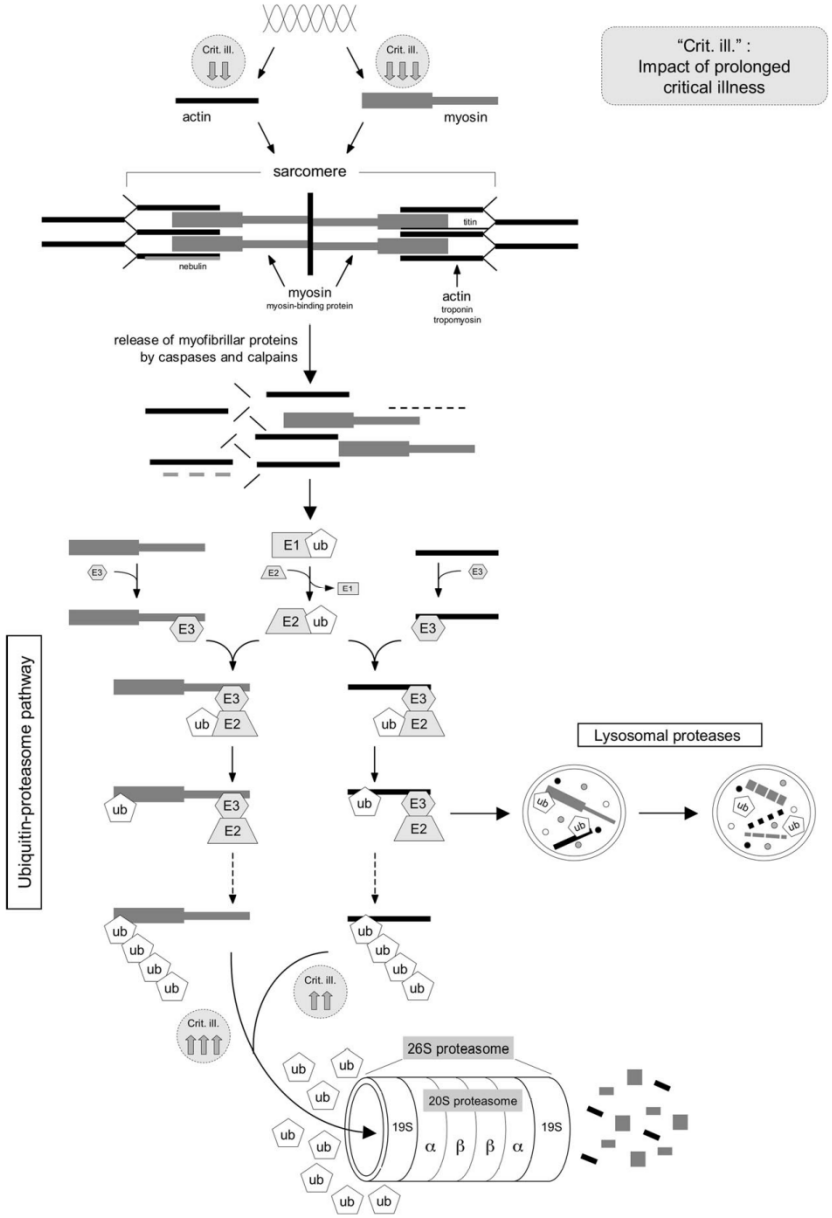


Figure 2. Mean (+SE) Change in Weight from Base Line among Patients with the Acute Respiratory Distress Syndrome at the Time of Discharge from the ICU and at 3, 6, and 12 Months.

CONCLUSIONS

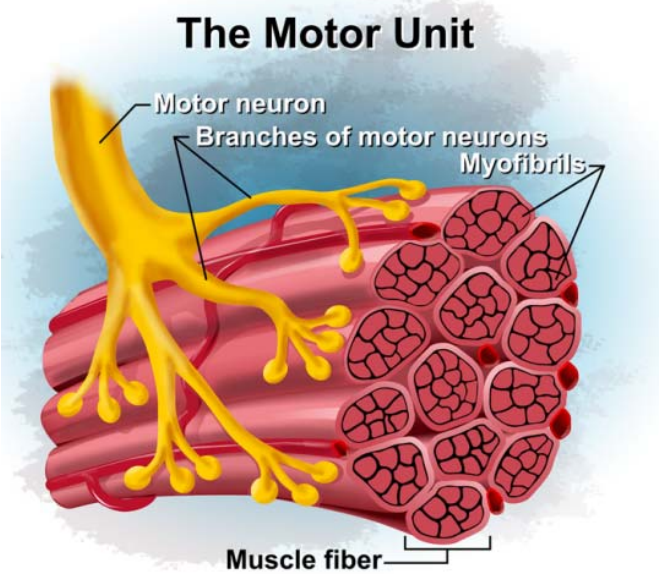
Survivors of the acute respiratory distress syndrome have persistent functional disability one year after discharge from the intensive care unit. Most patients have extrapulmonary conditions, with muscle wasting and weakness being most prominent.

- ❑ **Immobilisation**
- ❑ **Sédation**
- ❑ **Curares**
- ❑ **Corticoïdes**
- ❑ **Hyperglycémie**
- ❑ **Stress oxydatif**
- ❑ **Défaillance multiple**



Derde et al. CCM 2012

"ICU acquired weakness"



- **Myopathie**
  Atrophie fibres type II
- **Neuropathie**
  Dégénération axonale
- **Neuromyopathies**
- **Atrophie diffuse**

Short report

EDITOR'S CHOICE

2008

Long-term outcome in patients with critical illness myopathy or neuropathy: the Italian multicentre CRIMYNE study

B Guarneri,[1] G Bertolini,[2] N Latronico[3]

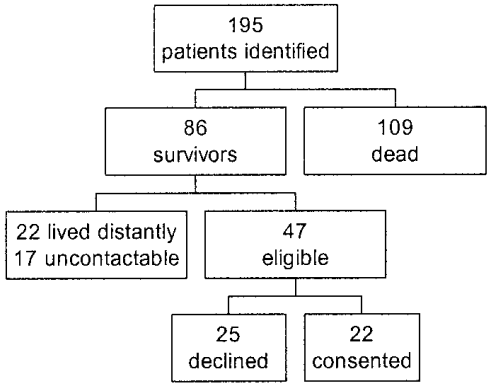
	Sortie hôpital	1 an
Myopathie	n= 5	n= 0
Neuropathie	n= 4	n= 4
Neuromyopathie	n= 3	n= 2

Critical Care Medicine 2003

Persistent neuromuscular and neurophysiologic abnormalities in long-term survivors of prolonged critical illness*

Simon N. Fletcher, FRCA; Daniel D. Kennedy, FRCA; Indrajit R. Ghosh, MRCP; Vijay P. Misra, MRCP; Kevin Kiff, FRCA; John H. Coakley, MRCP; Charles J. Hinds, FRCP, FRCA

Séjour réa > 28 jours



3 ½ ans

59% Déficit sensitivomoteur clinique

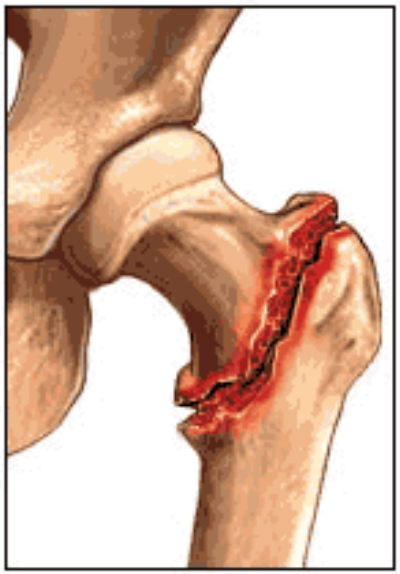
95% Dénervation chronique partielle

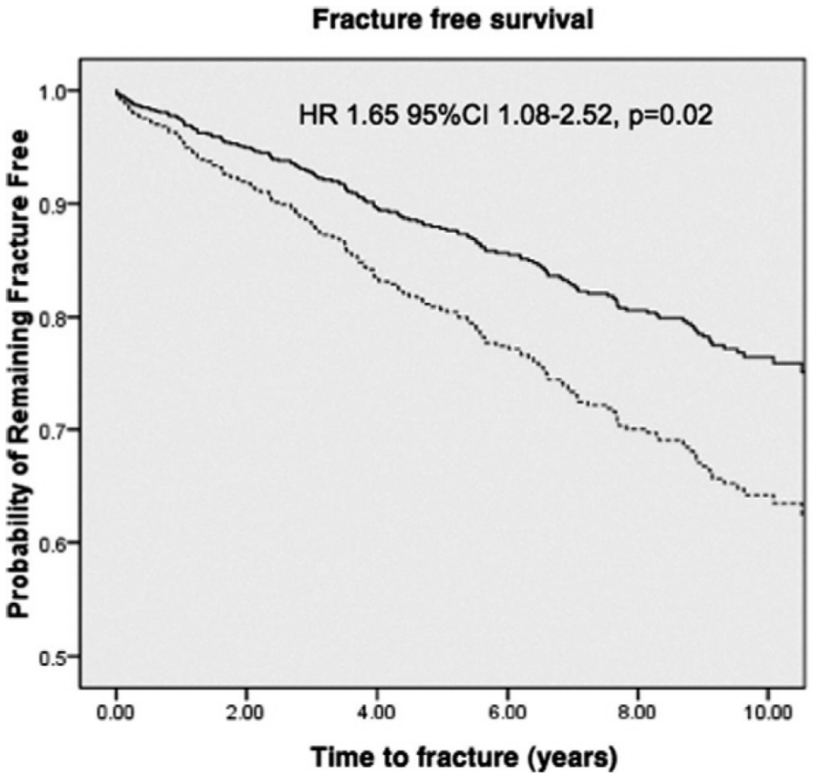
0% Myopathie

Critical Care Medicine 2011

Skeletal morbidity among survivors of critical illness*

Neil R. Orford, MBBS, FCICM; Kym Saunders, MBBS, FCICM; Elizabeth Merriman, BSc(Hons); Margaret Henry, BSc(Hons); Julie Pasco, BSc(Hons); Peter Stow, MBBS, FCICM; Mark Kotowicz, MBBS, FRACP





Ostéoporose

Post-Réa

Ossifications hétérotopiques

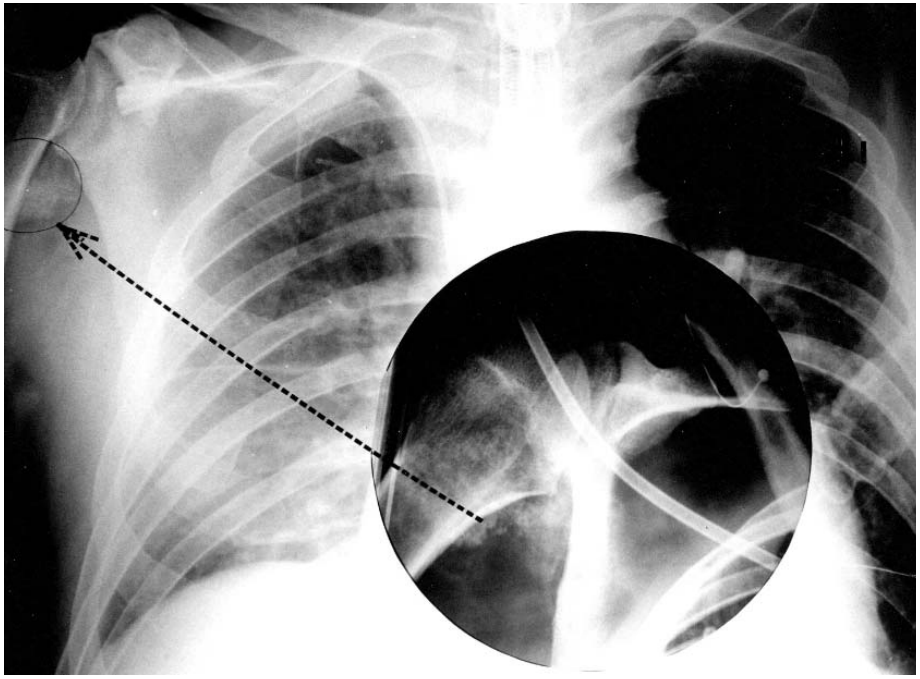
- Comas
- Lésions de la moelle épinière
- Pancréatites aiguës
- Immobilisation prolongée en réanimation

Jacobs et al, Rheumatology 99

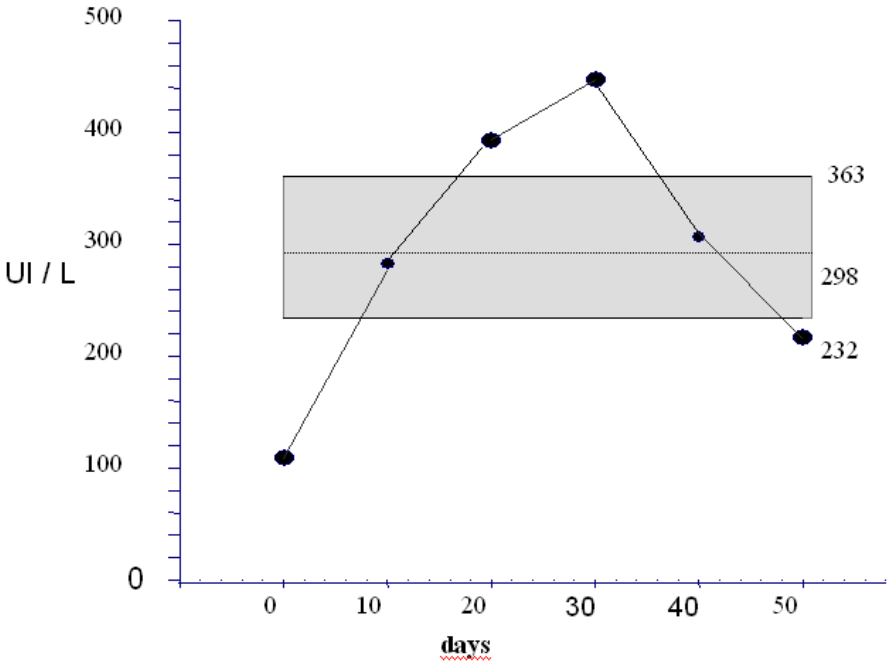
Sebastiani et al, Clin Rheumatol 02

Recherche systématique en réanimation si sédation prolongée

Radio du thorax



Phosphatases alcalines



Courtesy Pr. Eric Viel, Nîmes

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3. **Le handicap PSYCHIQUE**
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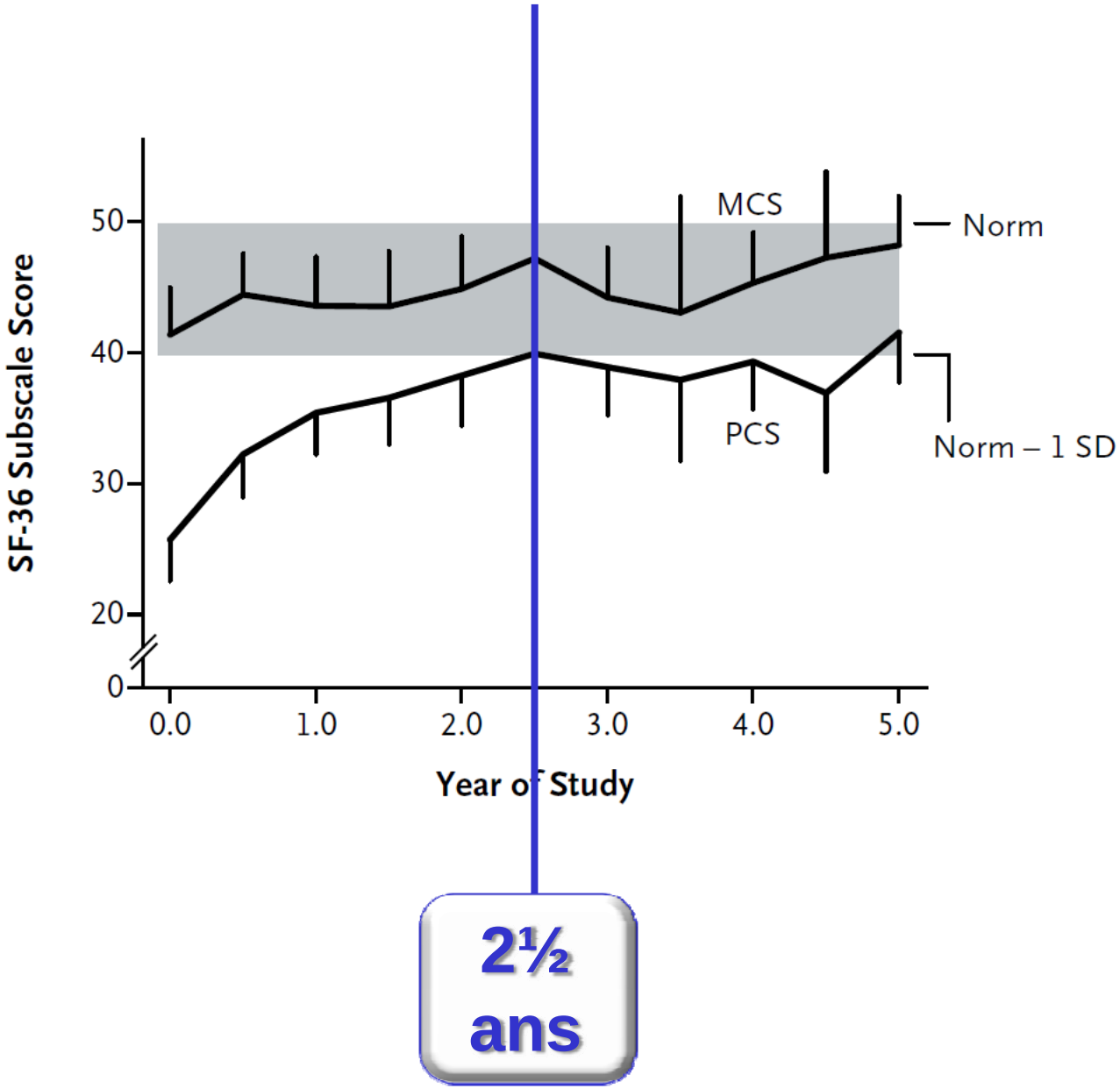
ESTABLISHED IN 1812 APRIL 7, 2011 VOL. 364 NO. 14

Functional Disability 5 Years after Acute Respiratory Distress Syndrome

Margaret S. Herridge, M.D., M.P.H., Catherine M. Tansey, M.Sc., Andrea Matté, B.Sc., George Tomlinson, Ph.D., Natalia Diaz-Granados, M.Sc., Andrew Cooper, M.D., Cameron B. Guest, M.D., C. David Mazer, M.D., Sangeeta Mehta, M.D., Thomas E. Stewart, M.D., Paul Kudlow, B.Sc., Deborah Cook, M.D., Arthur S. Slutsky, M.D., and Angela M. Cheung, M.D., Ph.D., for the Canadian Critical Care Trials Group

Score Global de santé Mental

Score Global de santé Physique



2½ ans

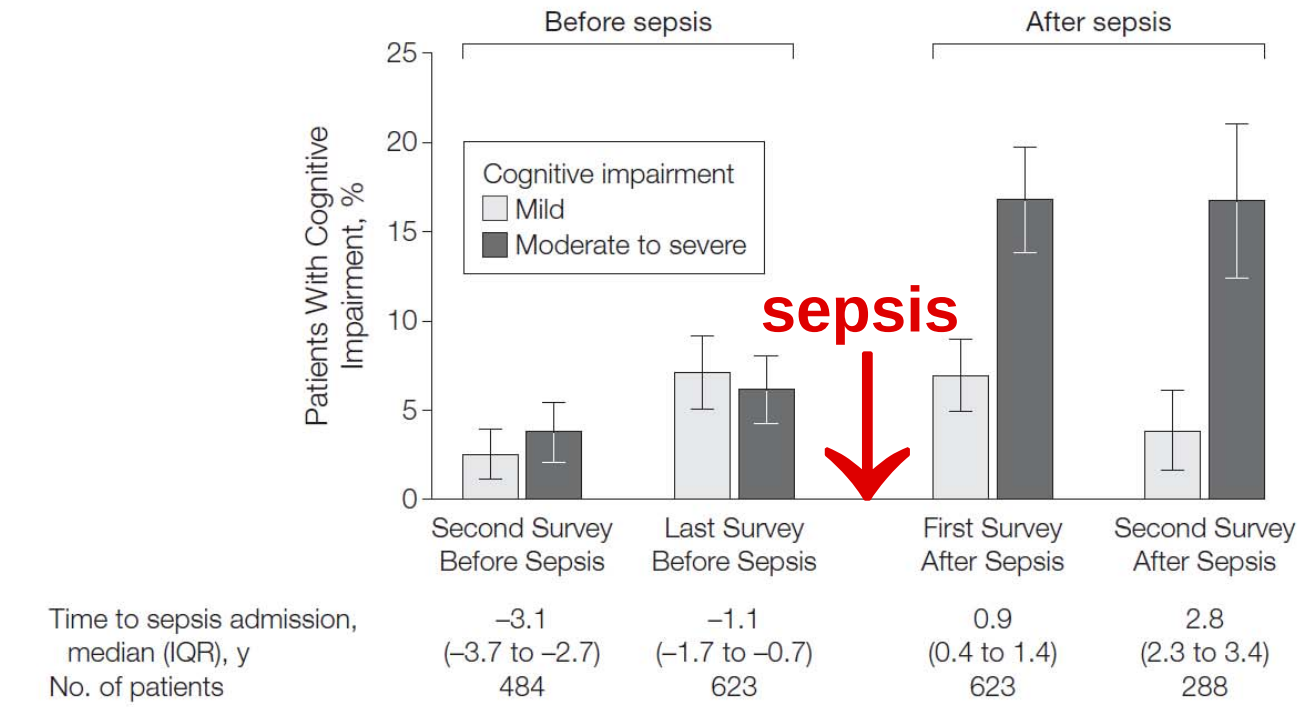
JAMA®

CARING FOR THE CRITICALLY ILL PATIENT

2010

Long-term Cognitive Impairment and Functional Disability Among Survivors of Severe Sepsis

Theodore J. Iwashyna, MD, PhD
E. Wesley Ely, MD, MPH
Dylan M. Smith, PhD
Kenneth M. Langa, MD, PhD



Temps (années)

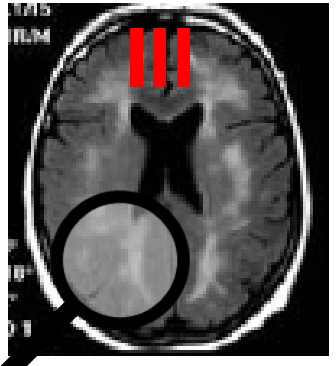
LEUCO-ENCEPHALOPATHIE SEPTIQUE

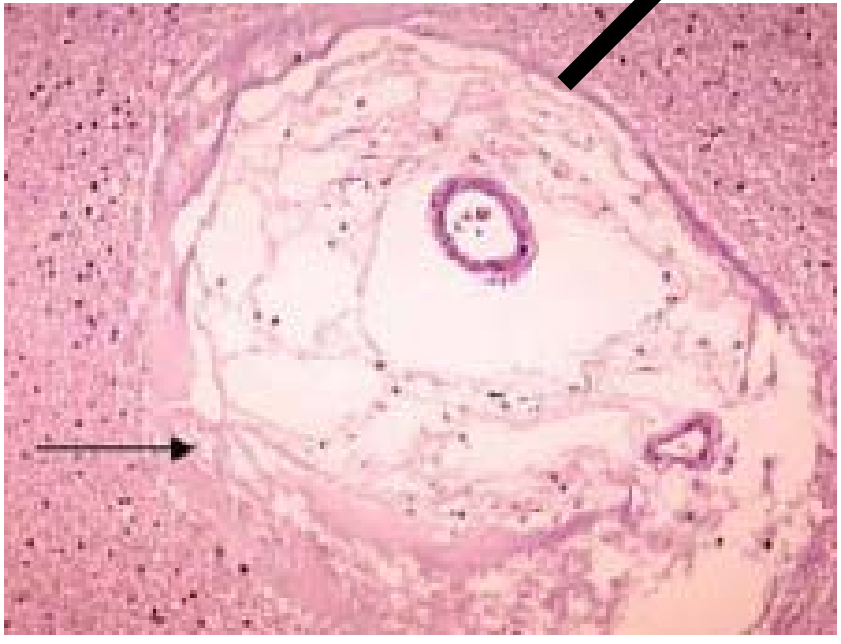
Sharshar et al, Intensive Care Med 2007

Grade I

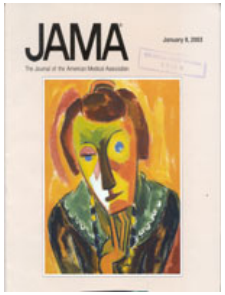
Grade II

Grade III



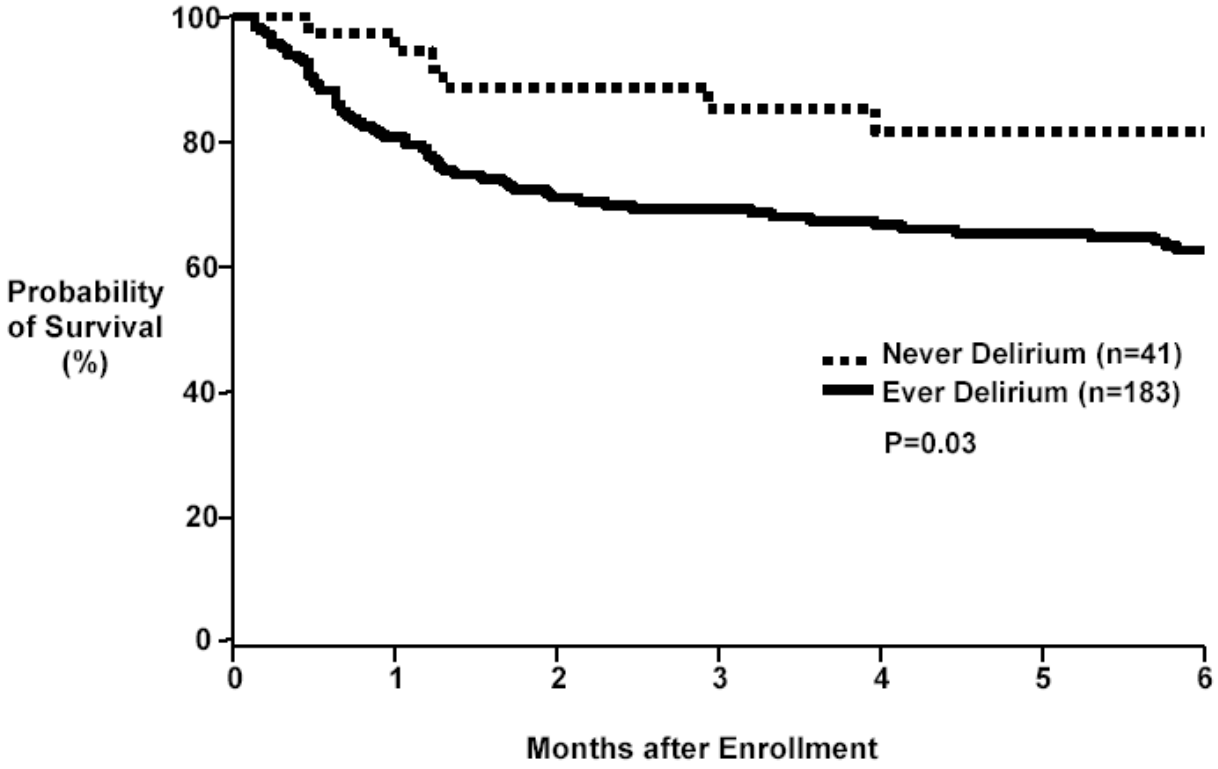


Delirium as a Predictor of Mortality in Mechanically Ventilated Patients in the Intensive Care Unit.



Ely EW; Shintani A; Truman B; Speroff T; Gordon SM;
Harrell FE Jr; Inouye SK; Bernard GR; Dittus RS

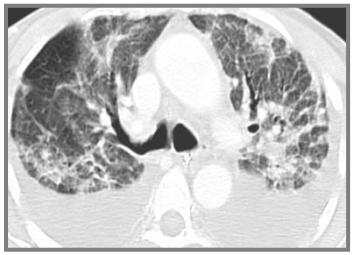
2004

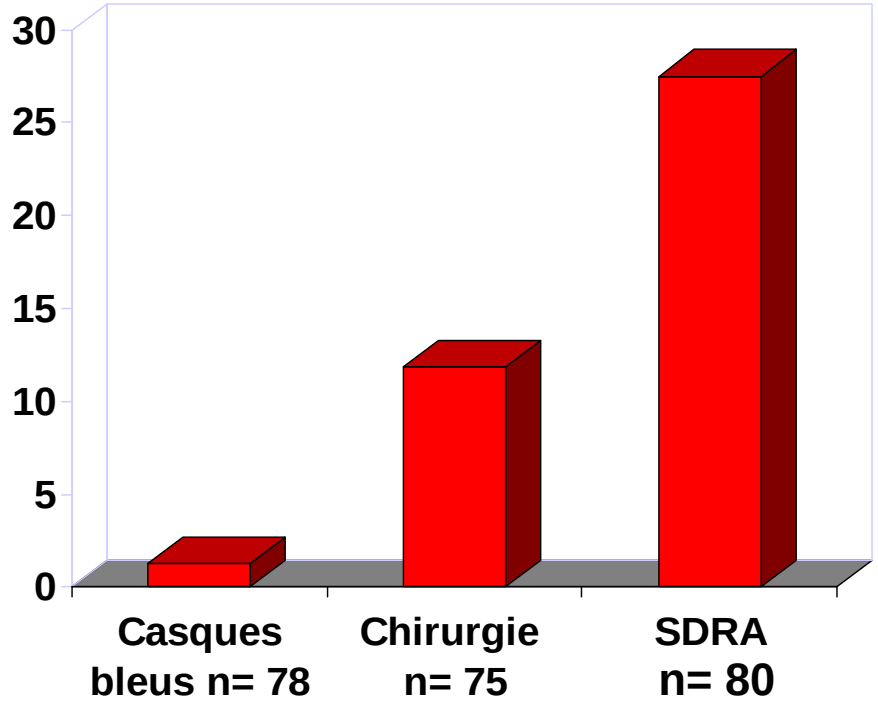


Syndrome de stress post traumatique (PTSD)

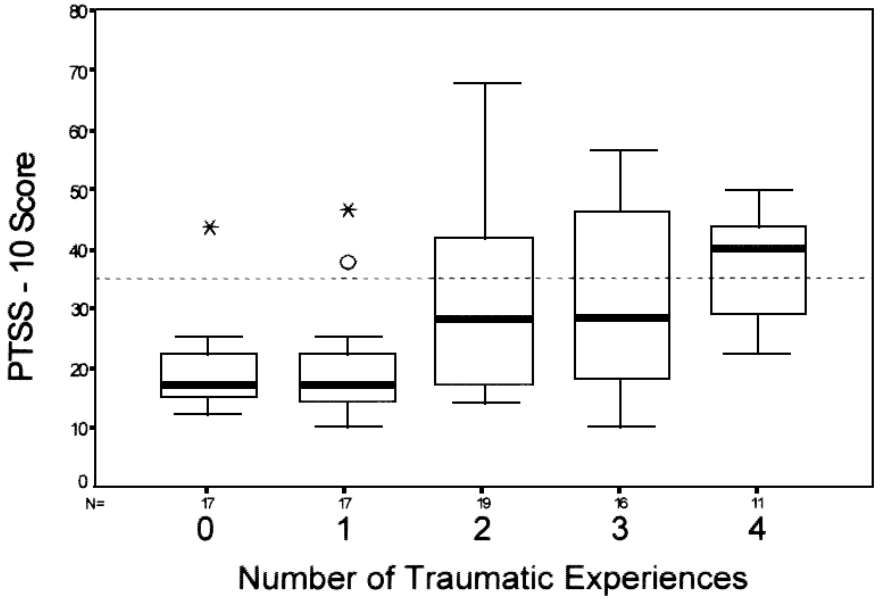
SSPT : trouble anxieux sévère qui se manifeste à la suite d'une expérience vécue comme traumatisante (attentats, viol, guerre...)

Syndrome de stress post traumatique (PTSD)





% SSPT à 4 ans



Douleur
Dyspnée
Angoisse
Cauchemars

Schelling et al. CCM 1998

Myhren *et al. Critical Care* 2010, **14**:R14
http://ccforum.com/content/14/1/R14

2010

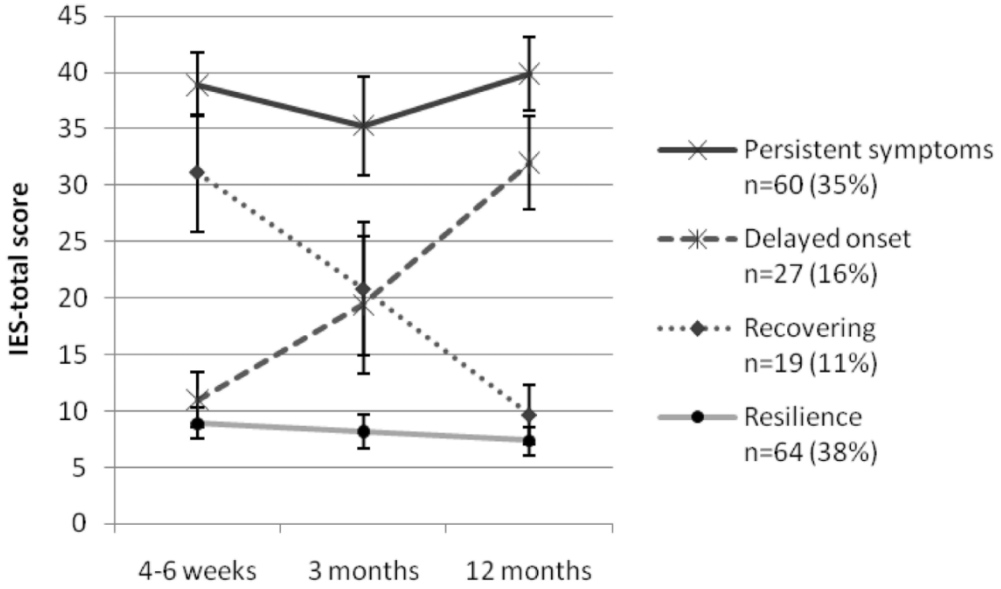
CRITICAL CARE

RESEARCH Open Access

Posttraumatic stress, anxiety and depression symptoms in patients during the first year post intensive care unit discharge

Hilde Myhren[1*], Øivind Ekeberg[2,3], Kirsti Tøien[1], Susanne Karlsson[1], Olav Stokland[1]

PTSD 27% à 1 an



Anxiété-Dépression "border line" 27-33%

The NEW ENGLAND JOURNAL of MEDICINE

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CHEST Original Research

CRITICAL CARE

Self-reported Depressive Symptoms and Memory Complaints in Survivors Five Years After ARDS

Neill K. J. Adhikari, MDCM; Catherine M. Tansey, PhD; Mary Pat McAndrews, PhD; Andrea Matté, BSc; Ruxandra Pinto, PhD; Angela M. Cheung, MD, PhD; Natalia Diaz-Granados, MSc; and Margaret S. Herridge, MD, MPH

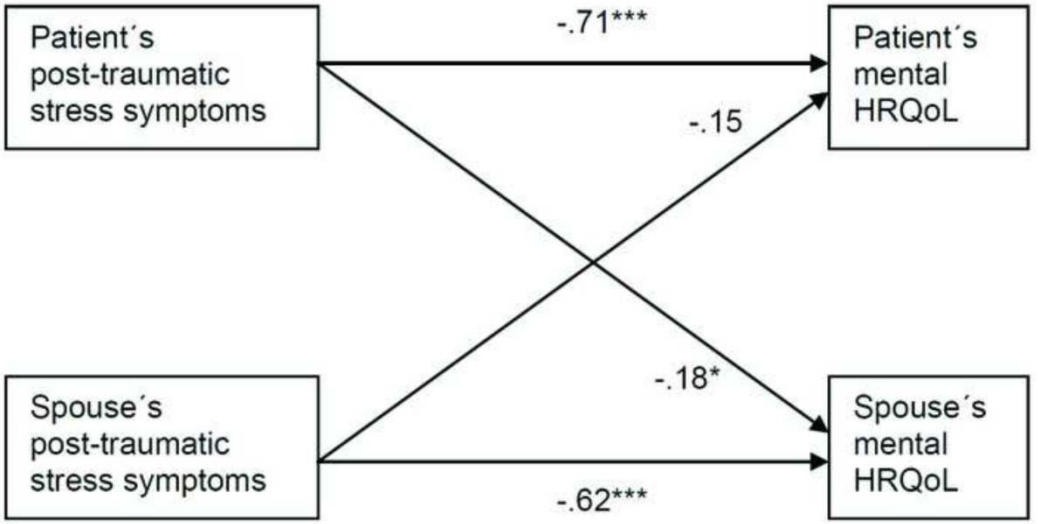
2 ans **5 ans**

33% → **19%**

Critical Care Medicine 2013

Physical and Mental Health in Patients and Spouses After Intensive Care of Severe Sepsis: A Dyadic Perspective on Long-Term Sequelae Testing the Actor–Partner Interdependence Model*

Jenny Rosendahl, PhD[1,5]; Frank M. Brunkhorst, MD[2,4,5]; Doreen Jaenichen, MD[1–3]; Bernhard Strauss, PhD[1]

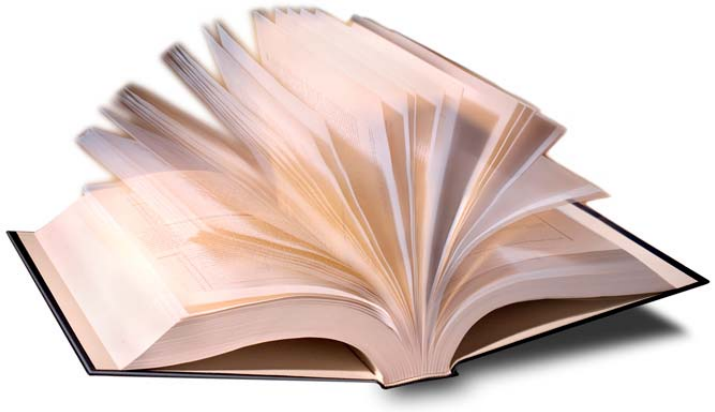


1. La qualité de vie post-réa
2. Déterminants du handicap physique
3. Le handicap PSYCHIQUE
4. **La réhabilitation**

Critical Care Medicine 2003

Rehabilitation after critical illness: A randomized, controlled trial

Christina Jones, PhD; Paul Skirrow, MPhil; Richard D. Griffiths, MD, FRCP;
Gerald H. Humphris, PhD, M Clin Psych; Sarah Ingleby, BSc; Jane Eddleston, FRCA; Carl Waldmann, FRCA;
Melanie Gager, RGN



93 pages!

A self-help rehabilitation manual is effective in aiding physical recovery and reducing depression.

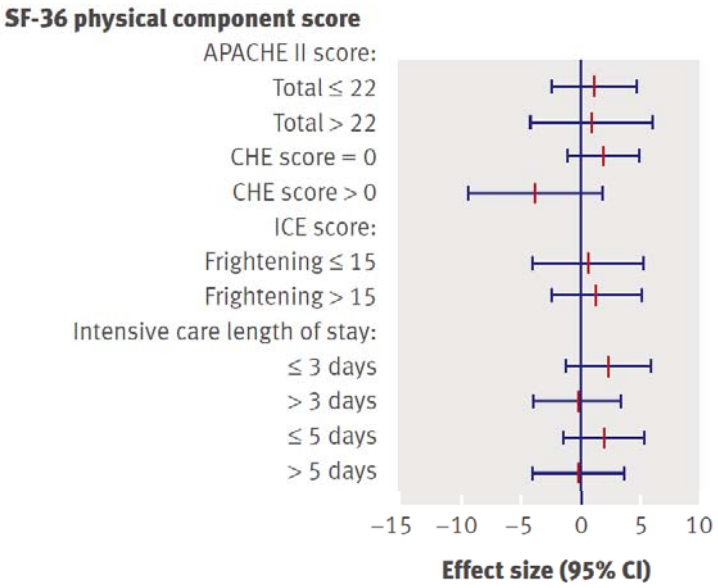
BMJ 2009

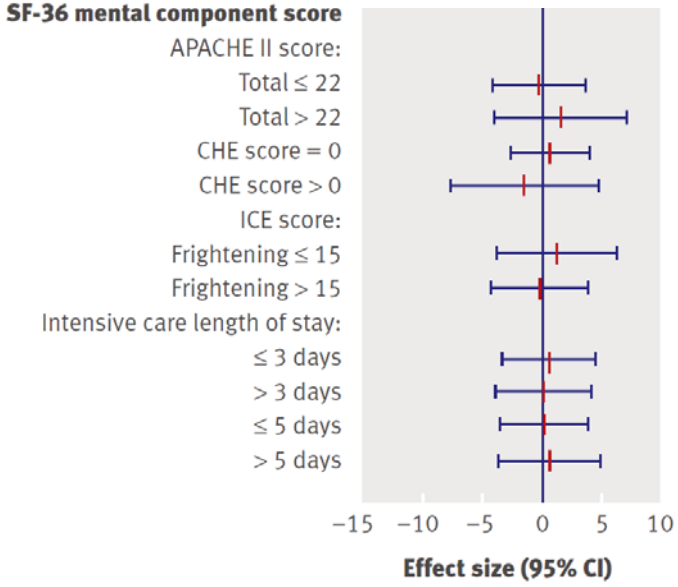
RESEARCH

échec

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

B H Cuthbertson, chief of critical care medicine and professor of anaesthesia,[1] J Rattray, senior lecturer,[2] M K Campbell, director and professor,[3] M Gager, intensive care follow-up nurse,[4] S Roughton, intensive care follow-up nurse,[3,5] A Smith, intensive care follow-up nurse,[2] A Hull, consultant pyschiatrist,[6] S Breeman, trial manager,[3] J Norrie, professor of biomedical statistics,[7] D Jenkinson, statistician,[3] R Hernández, health psychologist,[3,8] M Johnston, professor of health psychology,[9] E Wilson, consultant in anaesthesia and intensive care ,[10] C Waldmann, consultant in anaesthesia and intensive care[4] on behalf of the PRaCTICaL study group





Elliott *et al. Critical Care* 2011, **15**:R142
http://ccforum.com/content/15/3/R142

2011

CRITICAL CARE

RESEARCH Open Access

H[illegible]th-related quality of life and physical [illegible]y after a critical illness: a multi-centre [illegible]mised controlled trial of a home-based [illegible]ysical rehabilitation program

[illegible]oug Elliott[1*], Sharon McKinley[2], Jennifer Alison[3], Leanne M Aitken[4], Madeleine King[5], Gavin D Leslie[6], Patricia Kenny[7], Penny Taylor[1], Rachel Foley[8] and Elizabeth Burmeister[9]

PHYSIOTHERAPY

échec

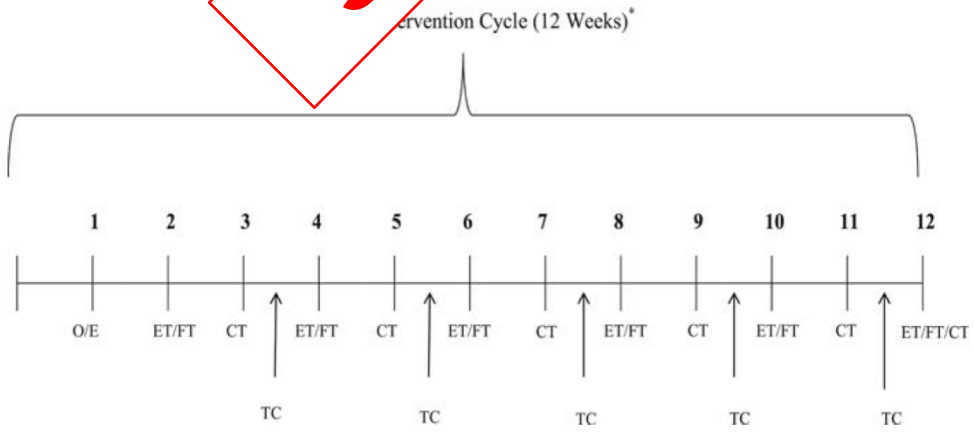
Outcome	Week	Control	Treatment	*P*-value
Physical functioning	8	41.0	39.9	Group0.84
	26	41.8	42.6	Time0.034
				Group × time 0.68
Six Minute Walk Test distance	8	395.6	402.5	Group0.92
	26	431.4	428.3	Time0.0003
				Group × time 0.55
Physical component summary	8	42.5	40.7	Group0.39
	26	43.2	42.7	Time0.06
				Group × time 0.37
Mental component summary	8	47.1	46.9	Group0.95
	26	47.0	47.0	Time0.97
				Group × time 0.89

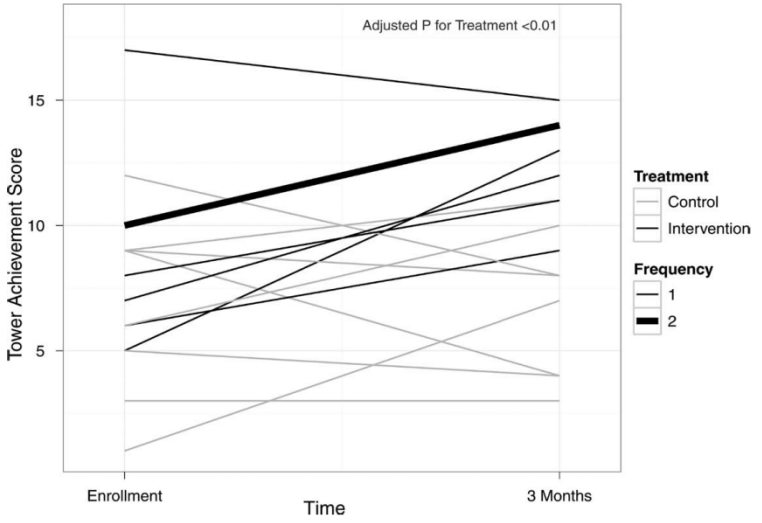
succès

Critical Care Medicine 2012

Cognitive and physical rehabilitation of intensive care unit survivors: Results of the RETURN randomized controlled pilot investigation*

James C. Jackson, PsyD; E. Wesley Ely, MD, MPH; Miriam C. Morey, PhD; Venice M. Anderson, MA; Laural B. Denne, MSW; Jennifer Clune, MD; Carol S. Siebert, MS; Kristin R. Archer, PhD; Renee Torres, MS; David Janz, MD; Elena Schiro, BA; Julie Jones, BA; Ayumi K. Shintani, PhD; Brian Levine, PhD; Brenda T. Pun, MSN; Jennifer Thompson, MA; Nathan E. Brummel, MD; Helen Hoenig, MD

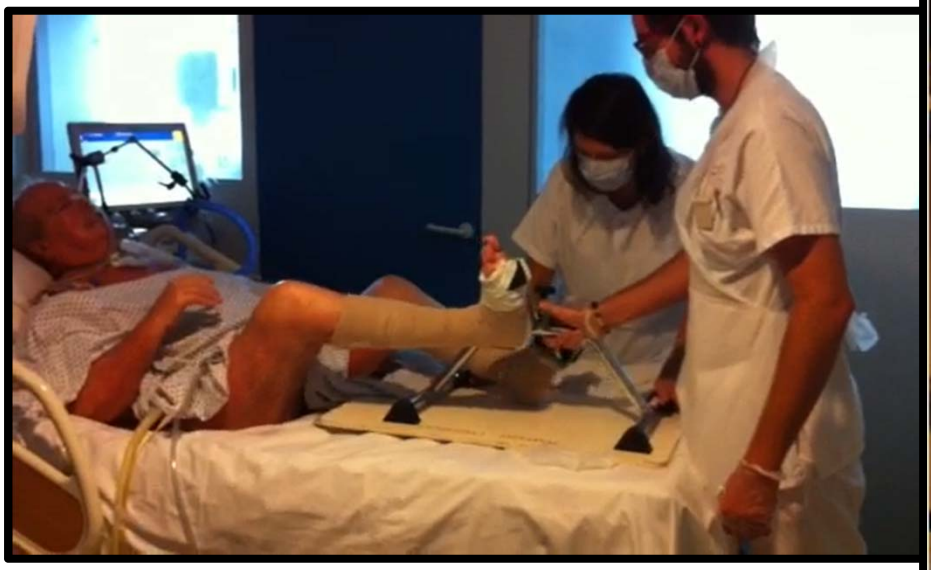


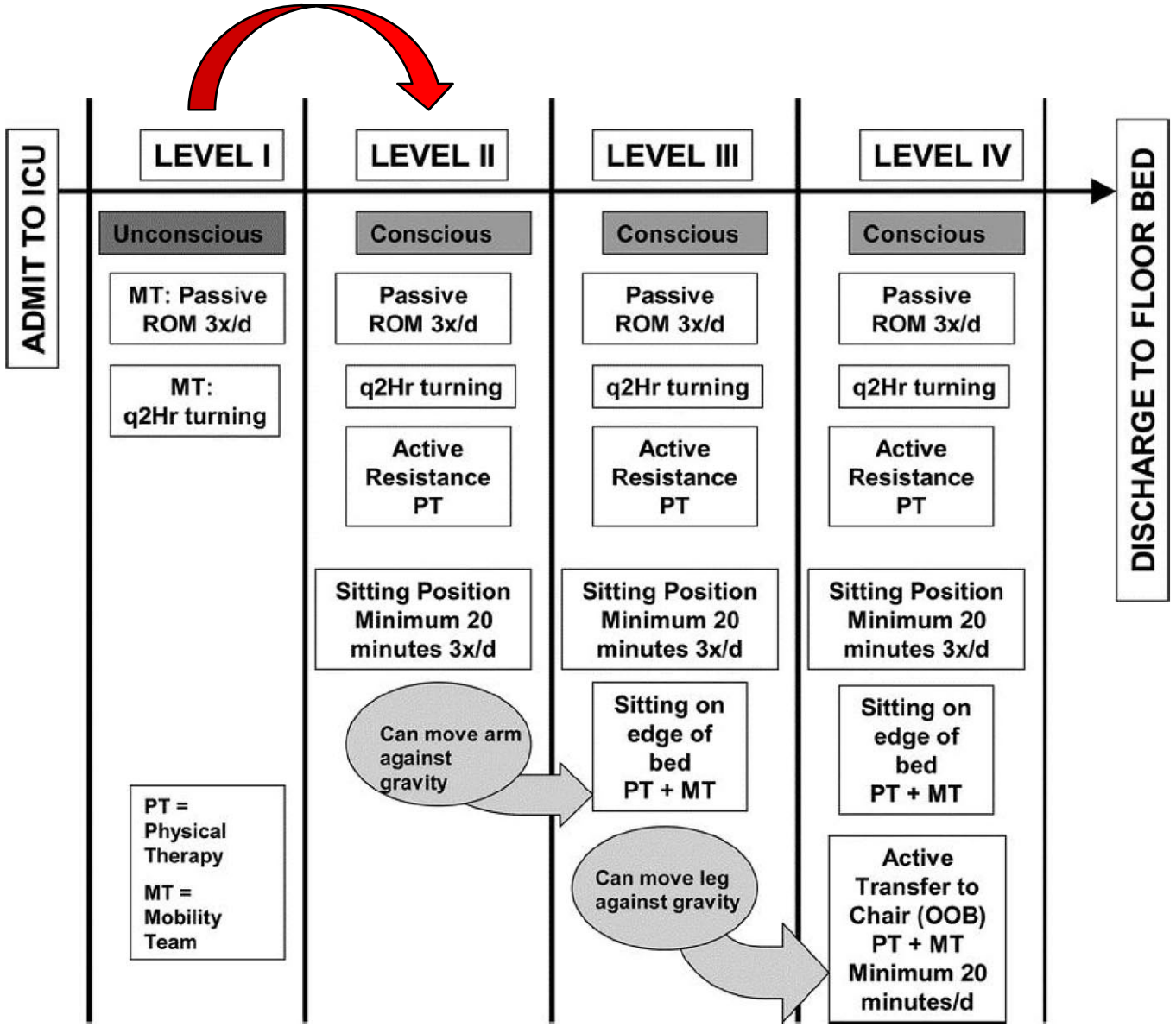


ET= Exercice
FT= Functional
CT= Cognitive

TRAINING

Réhabilitation précoce en réanimation !!





Morris et al. CCM 2008

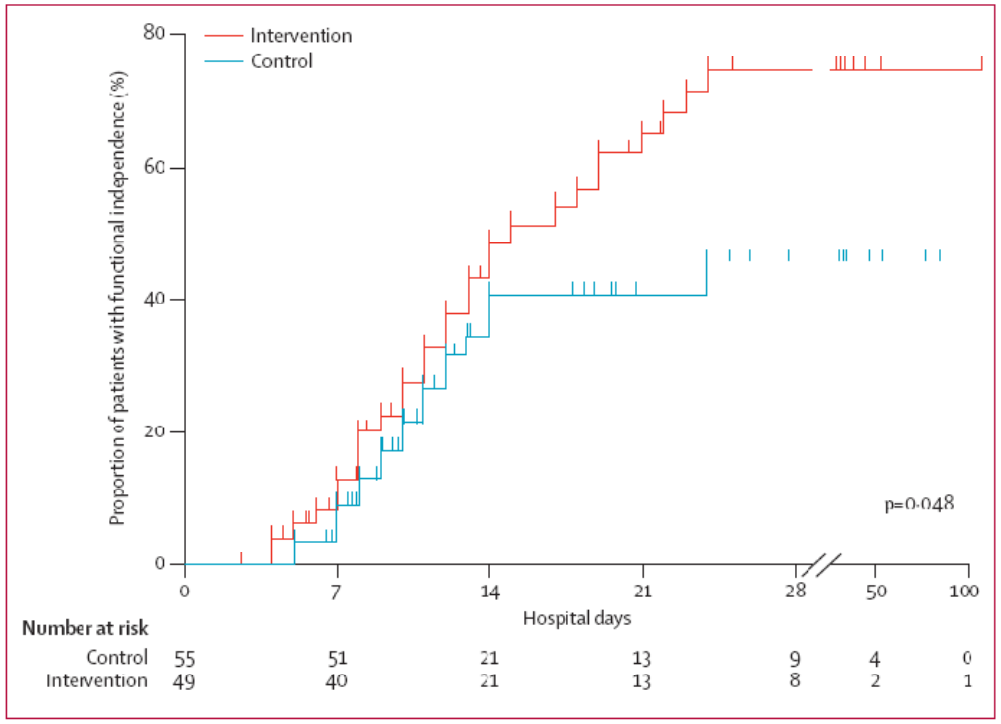
THE LANCET

2009

Early physical and occupational therapy in mechanically ventilated, critically ill patients: a randomised controlled trial

William D Schweickert, Mark C Pohlman, Anne S Pohlman, Celerina Nigos, Amy J Pawlik, Cheryl L Esbrook, Linda Spears, Megan Miller, Mietka Franczyk, Deanna Deprizio, Gregory A Schmidt, Amy Bowman, Rhonda Barr, Kathryn E McCallister, Jesse B Hall, John P Kress

Indépendance fonctionnelle



↓ Durée de delirium de 50%

Coma artificiel

Immobilisation
Ventilation mécanique

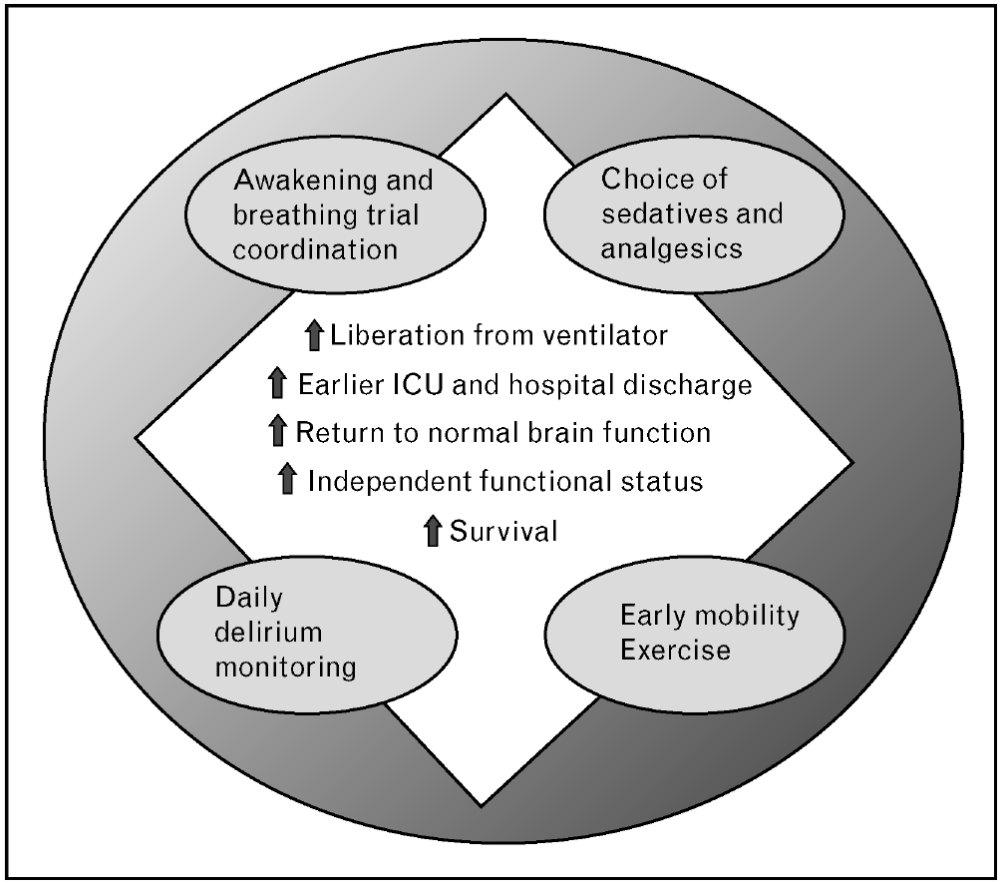
Analgésie & Sédation insuffisantes

Agitation
Lésion pulmonaire

Current Opinion in Critical Care

Sedation, delirium and mechanical ventilation: the 'ABCDE' approach

Alessandro Morandi[a,b,c], Nathan E. Brummel[a,b] and E. Wesley Ely[a,b,c,d]



AWAKE

BREATH

CHOICE OF DRUGS

DELIRIUM

EARLY MOBILIZATION

Special Article

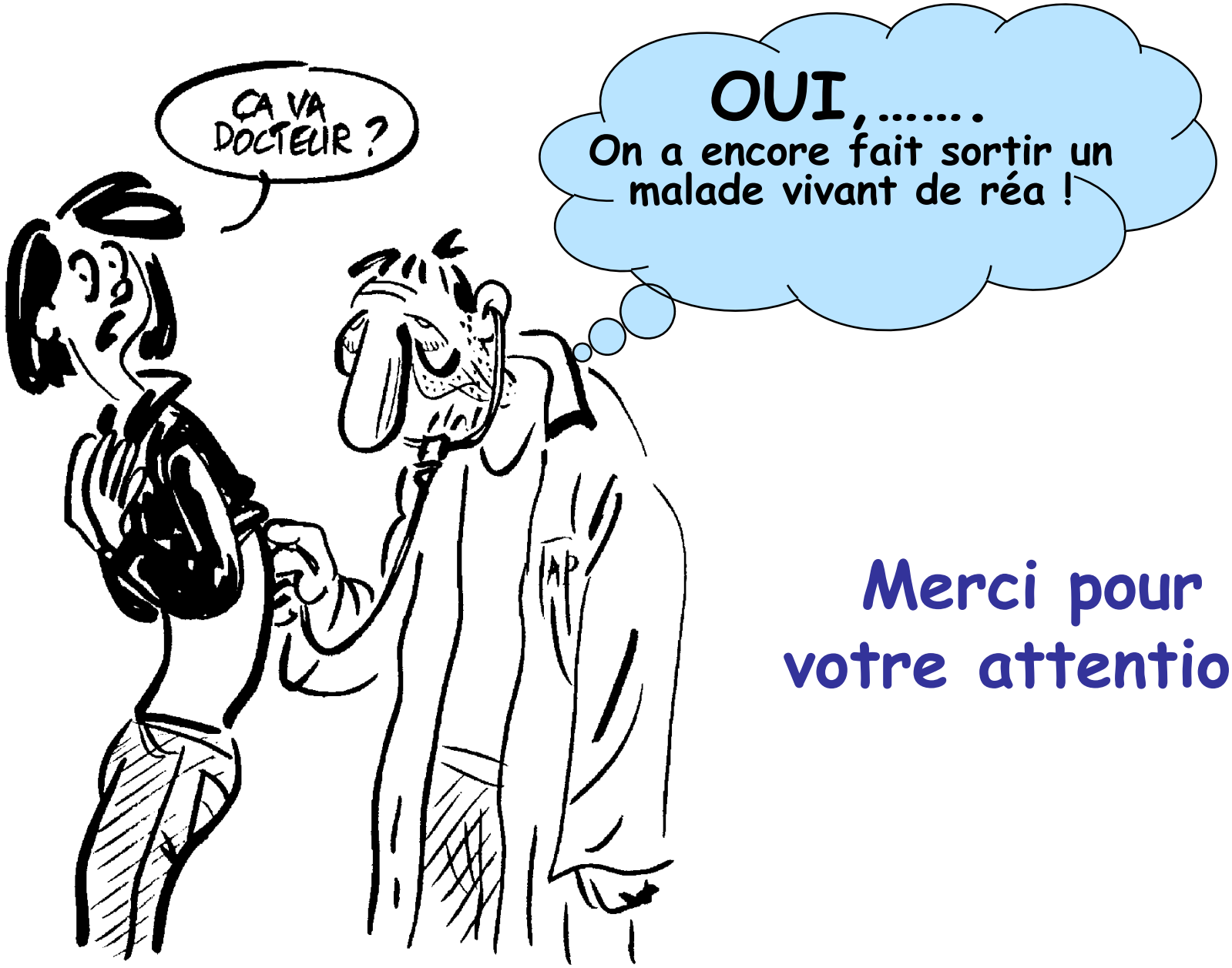
Janvier 2013

Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit

d. Delirium prevention
   i. We recommend performing early mobilization of adult ICU patients whenever feasible to reduce the incidence and duration of delirium (+1B).
   ii. We provide no recommendation for using a pharmacologic delirium prevention protocol in adult ICU patients, as no compelling data demonstrate that this reduces the incidence or duration of delirium in these patients (0,C).

CONCLUSION

- Handicaps post-réanimation intriqués
- Handicaps physiques neuropathiques++++
- Handicaps psychiques séquellaires
- Réhabilitation commence par
  - le réveil précoce des patients en réanimation
  - leur confort
  - leur lever systématique dès que possible



Merci pour votre attention!