Sédation
Effets neurocognitifs

Fahmi DACHRAOUI

Réanimation Polyvalente

CHU Monastir

Sousse - 31Mai 2013

CHEST Transparency in Health Care
CASE REPORT

Iatrogenic Delirium and Coma*

A "Near Miss"

William F. Dunn, MD, FCCP; Shirley C. Adams; and Robert W. Adams

tive antagonists as a diagnostic challenge. No change in status was apparent after two doses of 0.4 mg of naloxone. However, the patient then received flumazenil at 0.2 mg IV for five doses while the team watched. Between the fourth and fifth doses, she

"Shirley. My name is Shirley Adams."

"Shirley. My name is Shirley Adams." When it was requested that she describe her hometown, she said

CHEST 2008; 133:1217–1220

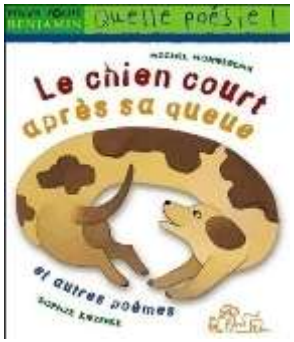
CHEST Transparency in Health Care
CASE REPORT

Iatrogenic Delirium and Coma*

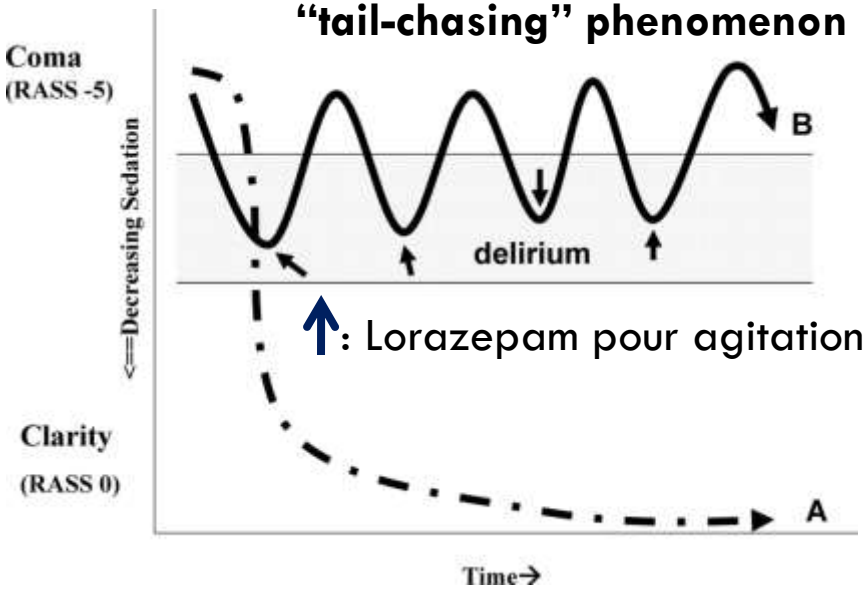
A "Near Miss"

William F. Dunn, MD, FCCP; Shirley C. Adams; and Robert W. Adams

- **Courbe A:** en pratique …
- **Courbe** B: "**tail-chasing" phenomenon,** longer-acting agents



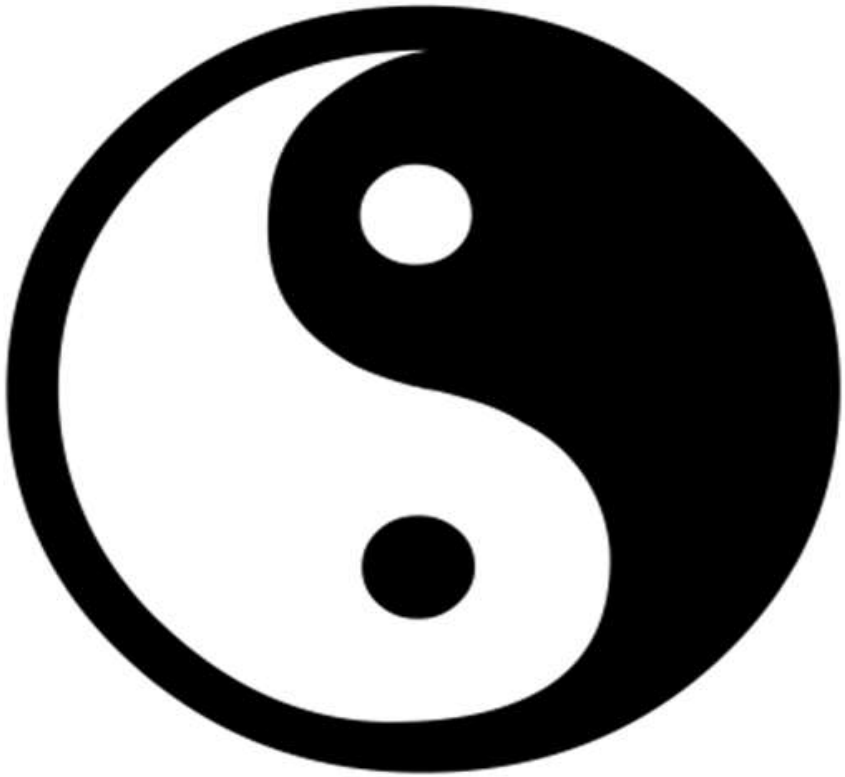
Mme Adams: For 27 days, the patient described received sedation that maintained her **cycling** between (**drug-induced) coma** and (**drug induced) delirium.**



RASS Richmond agitation and sedation scale

CHEST 2008; 133:1217–1220

Sédation en réanimation



Avant tout …

- Devant toute confusion avec ou sans agitation, une **cause organique** doit être recherchée.
  - **L'hypoxémie**
  - **l'hypotension**
  - **l'infection profonde**
  - **Cause metabolique**
- En cas de retard de réveil, la réalisation d'une **imagerie cérébrale** doit éliminer une lésion cérébrale passée inaperçue

S’agit-il…?

- Choix de molécule et/ou dose et/ou timing… ?
- Choix de l’indication « choix du patient » ?
- Choix de stratégie : protocole ?

Analogie excessive !!!!

- Pas de toxicomanie décrite après l'utilisation de BZD et/ou morphiniques en sédation en réanimation
- qq cas décrits en pop de réa adulte (pédiatrie ++++)
- La complexité des patients de réa : fait que l'association de ces signes cliniques peut se rencontrer dans de nombreuses pathologies

A Prospective Study of Agitation in a Medical-Surgical ICU*

Incidence, Risk Factors, and Outcomes

Samir Jaber, MD, PhD; Gérald Chanques, MD; Claire Altairac, PharmD; Mustapha Sebbane, MD; Christine Vergne, MD; Pierre-François Perrigault, MD; and Jean-Jacques Eledjam, MD, PhD

Table 4—*Independent Risk Factors for the Agitation*

Predictive Risk Factors	Odds Ratio	95% CI
Age ≥ 65 yr*	2.21	0.83–5.93
Medical cause of ICU admission*	3.04	0.85–10.54
Sepsis	2.61	1.03–6.58
Alcohol abuse	3.32	1.12–10.00
Use of sedatives in 48 h before onset of agitation	4.03	1.62–10.40
Body temperature ≥ 38°	4.52	1.80–11.49
Sodium level ≤ 134 mmol/L	4.87	1.58–14.99
Sodium level ≥ 143 mmol/L	4.95	1.95–12.54
Long-terme psychoactive drug user	5.63	1.32–23.70

*These risk factors are not significant.

CHEST 2005

Pour la clarté de l'exposé !

Séjour en réanimation/ hôpital

Pour la clarté de l'exposé !

A l'arrêt de la sédation
Syndrome de sevrage

Pendant l'administration
de la sédation+VM
Agitation

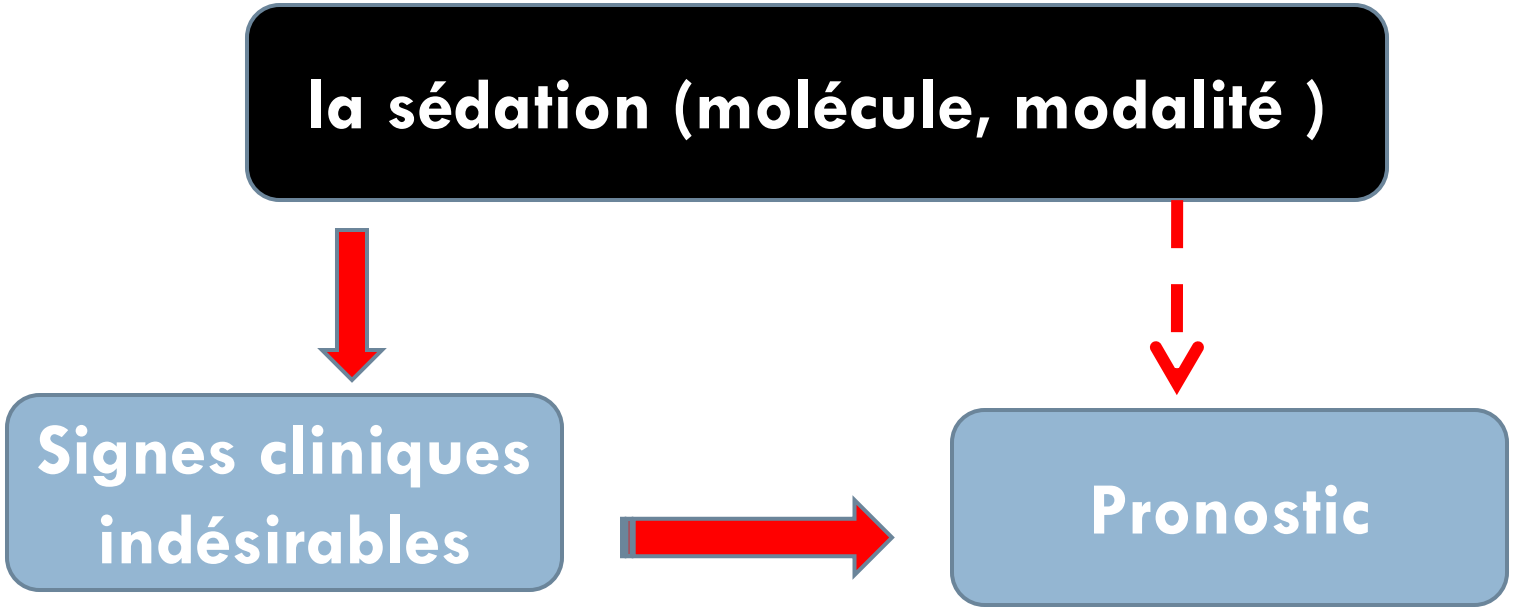
Après l'arrêt de la sédation
Etat de stress
post traumatique

Séjour en réanimation/ hôpital

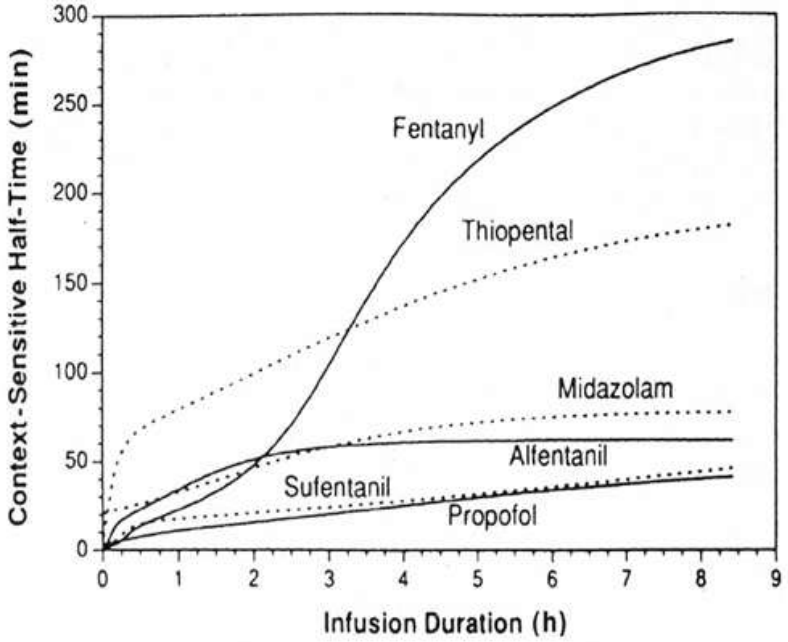
Physiopathologie

La question

- Pourquoi existerait-il une relation entre :



Choix de la molécule : demi-vie



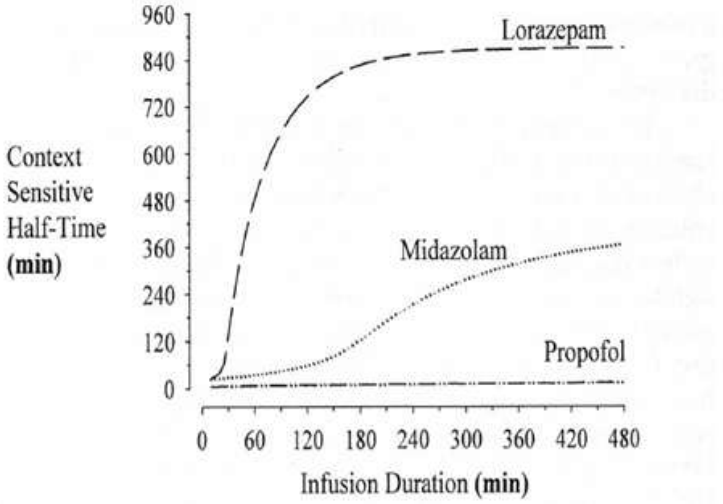


Figure 4. Context-sensitive half-times for lorazepam, midazolam, and propofol. The context-sensitive half-times increase with the duration of drug infusion. (*Data from* Greenblatt et al,[20a] Persson et al,[40a] and Klotz and Reimann.[27a])

Pandharipande PP. Lorazepam is an independent risk factor for transitioning to delirium in intensive care unit patients. Anesthesiology 2006; 104:21–26

Exemple : le Midazolam

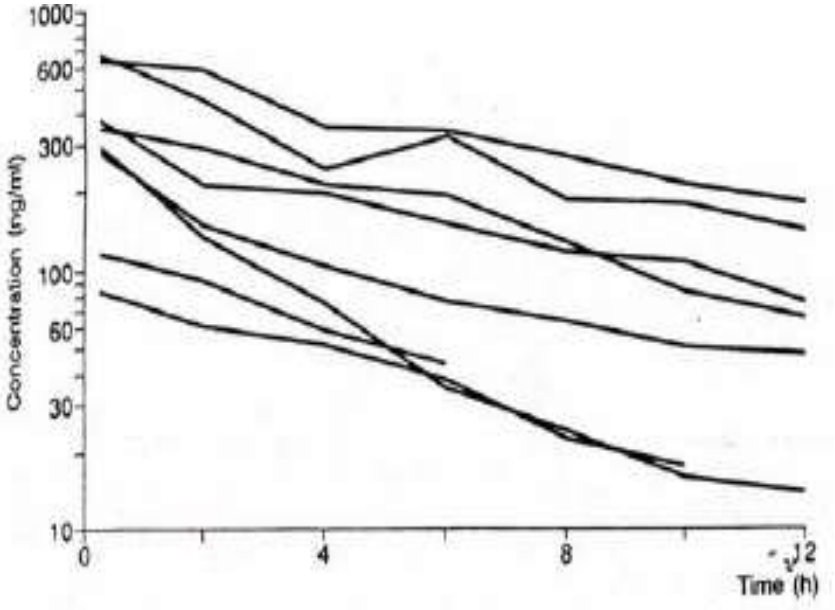


Figure 1. Individual plasma concentration-time profiles of midazolam in the group of eight ICU patients after discontinuation of the iv infusion.

Table 2. Pharmacokinetic parameters of midazolam in ICU patients and healthy volunteers

Patient	$T_{1/2}$ (hr)	Clearance (mL/min/kg)	V_D (L/kg)	C_{ss} (ng/mL)
1	5.6	4.0	2.0	622
2	7.7	6.3	4.2	657
3	7.0	7.9	4.8	291
4	6.3	6.4	3.5	323
5	3.8	4.8	1.6	297
6	4.4	8.8	3.3	190
7	4.1	—[a]	—	—
8	4.4	5.8	2.2	248
Mean ± SD	5.4 ± 1.5	6.3 ± 1.7	3.1 ± 1.2	375 ± 186
Range	3.8–7.7	4.0–8.8	1.6–4.8	190–657
Healthy volunteers (n = 6); data from Heizmann et al. (8)				
Mean ± SD	2.3 ± 0.4	4.9 ± 1.4	0.9 ± 0.2	—
Range	1.6–2.7	3.4–6.3	0.8–1.3	—

[a]No steady-state concentrations obtained.
$T_{1/2}$, elimination half-life; V_D, distribution volume; C_{ss}, average plasma concentration at steady state.

Malacrida R, et al.: Pharmacokinetics of midazolam administered by continuous intravenous infusion to intensive care patients. Crit Care Med 1992; 20: 1123-6

Anesthesiology 2006; 104:21–6

Lorazepam Is an Independent Risk Factor for Transitioning to Delirium in Intensive Care Unit Patients

Pratik Pandharipande, M.D., M.S.C.I., Ayumi Shintani, Ph.D., M.P.H.,† Josh Peterson, M.D., M.P.H.,‡ Brenda Truman Pun, R.N., M.S.N., A.C.N.P.,§ Grant R. Wilkinson, Ph.D., D.Sc.,‖ Robert S. Dittus, M.D., M.P.H.,# Gordon R. Bernard, M.D.,** E. Wesley Ely, M.D., M.P.H.††*

Table 2. Multivariable Analysis of Sedative and Analgesic Medications as Risk Factors for Transitioning to Delirium/Coma or Delirium Only*

Medication	Transitioning to Delirium Only Odds Ratio (95% CI)	*P* Value
Lorazepam	1.2 (1.1–1.4)	0.003
Midazolam	1.7 (0.9–3.2)	0.09
Fentanyl	1.2 (1.0–1.5)	0.09
Morphine	1.1 (0.9–1.2)	0.24
Propofol	1.2 (0.9–1.7)	0.18

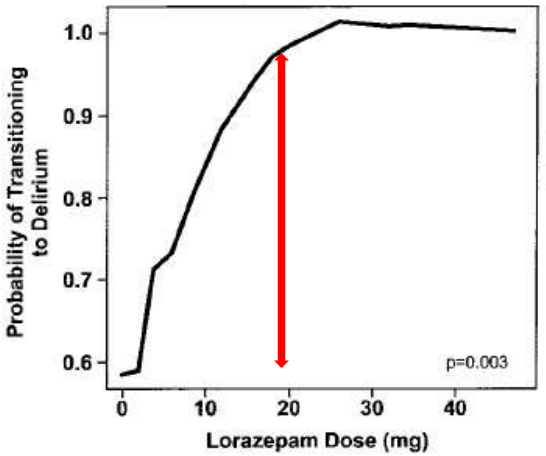


Fig. 1. Lorazepam and the probability of transitioning to delirium. The probability of transitioning to delirium increased with the dose of lorazepam administered in the previous 24 h. This incremental risk was large at low doses and plateaued at around 20 mg/day.

Anesthesiology 2006

Maria Korak-Leiter
Rudolf Likar
Michael Oher
Ernst Trampitsch
Gerda Ziervogel
Joseph V. Levy
Enno C. Freye

Withdrawal following sufentanil/propofol and sufentanil/midazolam

Sedation in surgical ICU patients: correlation with central nervous parameters and endogenous opioids

- group 1(n =14):sufentanil/midazolam
- group 2(n =15): sufentanil/ propofol
- Evaluation : PAM ,FC, the activity of the central nervous system (PES), and the endogenous opioids plasma concentrations (b-endorphin, met-enkephalin).
- Data obtained were correlated with the individual intensities of withdrawal symptoms 6-, 12- and 24 h following sedation.

Int Care Med 2005

Intensive Care Med (2005) 31:380–387
DOI 10.1007/s00134-005-2579-3

ORIGINAL

Maria Korak-Leiter
Rudolf Likar
Michael Oher
Ernst Trampitsch
Gerda Ziervogel
Joseph V. Levy
Enno C. Freye

Withdrawal following sufentanil/propofol and sufentanil/midazolam

Sedation in surgical ICU patients: correlation with central nervous parameters and endogenous opioids

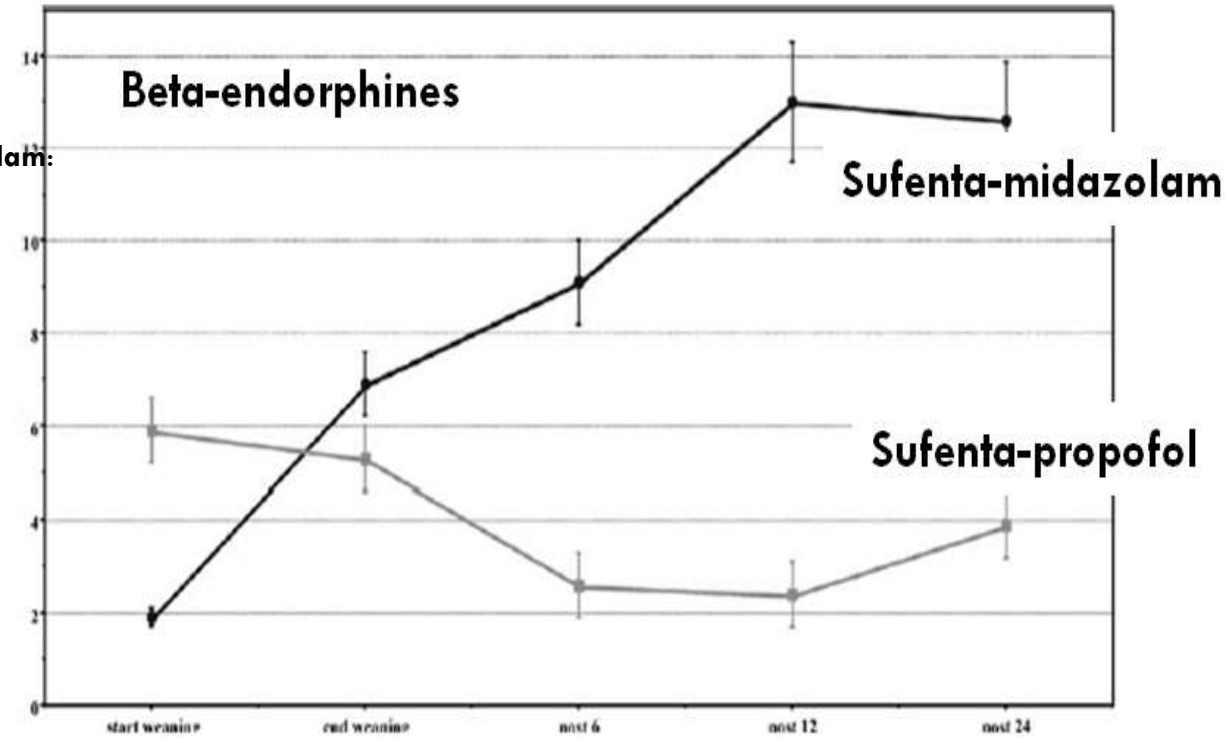
Conclusion:

-synd de sevrage : +++**sufentanil+midazolam**:

-sufentanil: The endorphinergic system is suppressed

-**Following sedation,** abstinence symptoms seem to be related to postinhibitory increased endorphin synthesis.+++**sufentanil/midazolam.**

-an increase in the amplitude PES suggests a postinhibitory excitatory state within the nociceptive system.



Int Care Med 2005

Intensive Care Med (2009) 35:781–795
DOI 10.1007/s00134-009-1397-4

REVIEW

Milagros I. Figueroa-Ramos
Carmen Mabel Arroyo-Novoa
Kathryn A. Lee
Geraldine Padilla
Kathleen A. Puntillo

Sleep and delirium in ICU patients: a review of mechanisms and manifestations

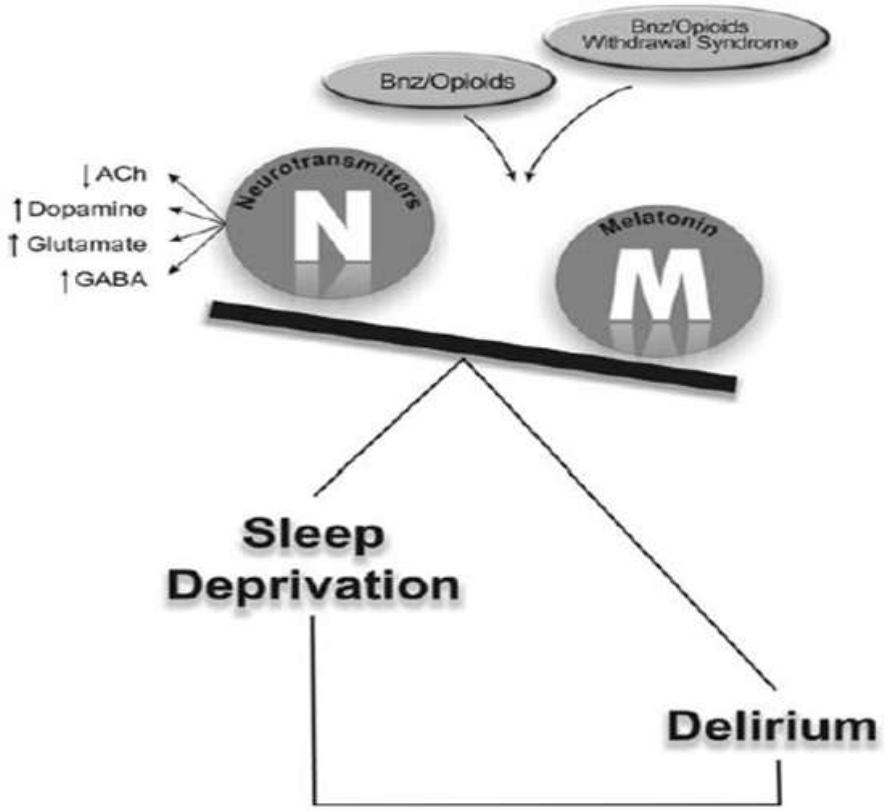
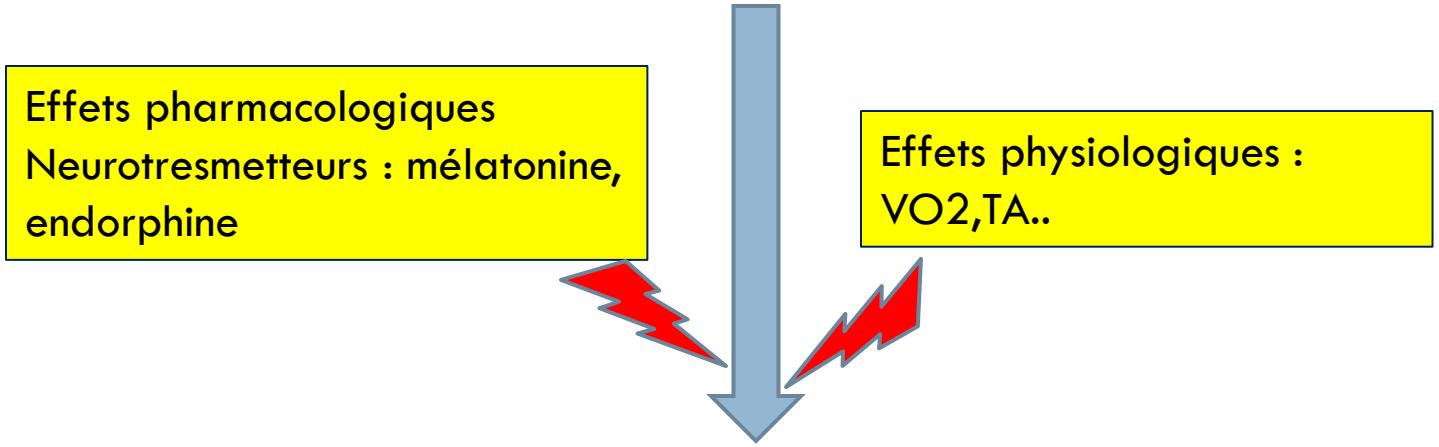


Fig. 7 Benzodiazepine/opioids use and benzodiazepine/opioids withdrawal syndrome can contribute to an imbalance in neurotransmitters and alteration in melatonin production. These can be involved in the relationship between sleep deprivation and delirium. *Bnz* benzodiazepines, *ACh* acetylcholine, *GABA* gamma-amino-butiric-acid, ↑ increase, ↓ decrease

Int Care Med 2009

En résumé…

La sédation + arrêt de la sédation



Perturbations neurocognitives

Les effets indésirables :

-Durant l'administration de la sédation

-A l'arrêt de la sédation

-A distance de la sédation

Intensive Care Med (2004) 30:1066–1072
DOI 10.1007/s00134-004-2193-9

ORIGINAL

Jeffery C. Woods
Lorraine C. Mion
Jason T. Connor
Florence Viray
Lisa Jahan
Cecilia Huber
Renee McHugh
Jeffrey P. Gonzales
James K. Stoller
Alejandro C. Arroliga

Severe agitation among ventilated medical intensive care unit patients: frequency, characteristics and outcomes

23 (16.1%) / 143 enrolled patients exhibited severe agitation.

Agitated patients :

- were younger (hazard ratio [HR] 1.32),
- lower pH (HR 1.55)
- lower PaO2/FIO2 less than 200 mmHg
- longer MICU stays (median 12 versus 5 days, $p<0.0001$)
- more ventilator days (median 14 versus 6, $p<0.0001$).
- self-extubate (26% versus 6%, $p=0.002$).
- **Benzodiazepines, narcotics and neuromuscular blocking agents were administered more frequently and at higher doses**

Int Care Med 2004

à l'arrêt de la sédation

- Le syndrome de sevrage aux agents de sédation et d'analgésie se caractérise par un **syndrome confusionnel** avec **agitation** survenant à l'arrêt de la sédation.

Intensive Care Med (2007) 33:1396–1406
DOI 10.1007/s00134-007-0696-x

Erwin Ista
Monique van Dijk
Claudia Gamel
Dick Tibboel
Matthijs de Hoog

Withdrawal symptoms in children after long-term administration of sedatives and/or analgesics: a literature review. "Assessment remains troublesome"

Table 2 Described signs and symptoms of benzodiazepine and opioid withdrawal in children

	Central nervous system irritability	Gastrointestinal dysfunction	Autonomic dysfunction
Opioids	Increased muscle tone Myoclonus Ataxia Abnormal movements Pupil dilation (> 4 mm) High pitched crying	Vomiting Poor feeding Diarrhea	Tachypnea Yawning Sneezing Hypertension Mottling
Benzodiazepines	Muscle twitching Inconsolable crying Grimacing Jitteriness Visual, auditory hallucinations Disorientation Seizures Movement disorder		Frequent suction required
Opioids and benzodiazepines	Tremor Anxiety Agitation/crying Irritability Insomnia/sleep disturbance Choreoathetoid movements (of upper extremities)		Fever Sweating Tachycardia

2 à 10 jours après l'arrêt

Withdrawal symptoms in critically ill children after long-term administration of sedatives and/or analgesics: A first evaluation*

Erwin Ista, RN, PhD; Monique van Dijk, PhD; Claudia Gamel, RN, PhD; Dick Tibboel, MD, PhD; Matthijs de Hoog, MD, PhD

Info n°1

Fréquence: 10-20-40 %

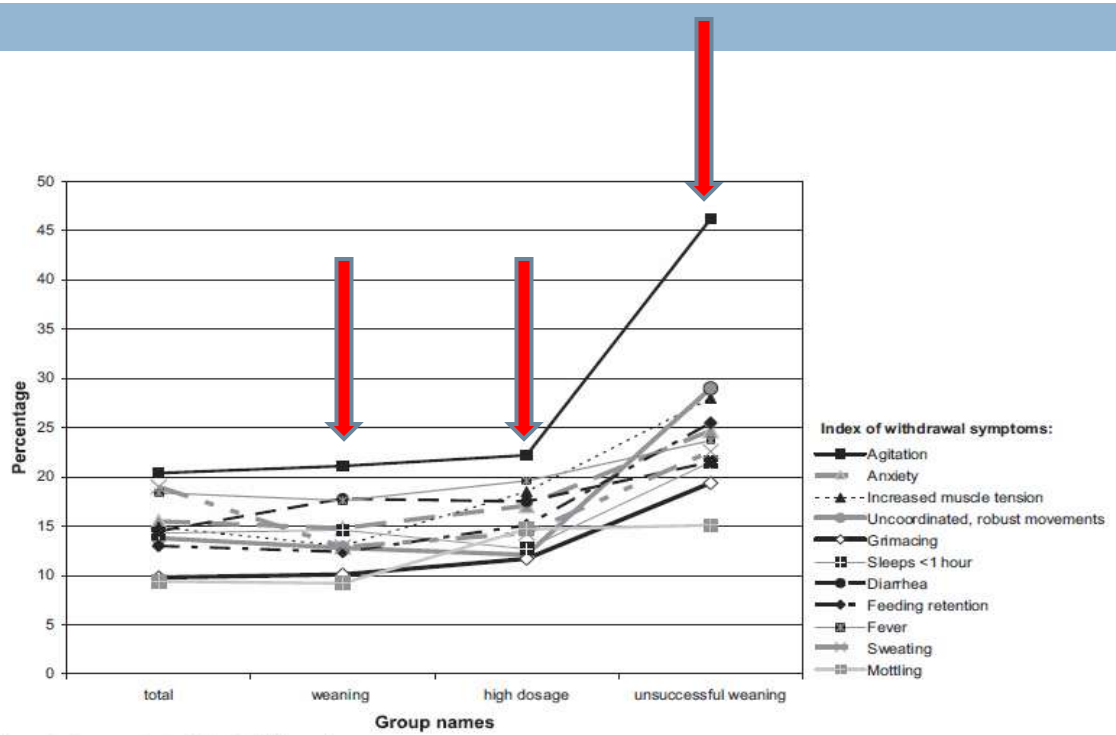


Figure 1. Frequencies (>10%) of withdrawal symptoms.

Info n°2 : Corrélation entre :

dose et durée BZD+opioides Et Survenue du synd sevrage

Crit Care Med 2008

Journal of Critical Care (2011) 26, 113–121

ELSEVIER

Journal of Critical Care

Sedation/Delirium

Toward less sedation in the intensive care unit: A prospective observational study

Diamantino R Salgado MD, MSc, Raphaël Favory MD, PhD, Mateus Goulart MD, Serge Brimioulle MD, PhD, Jean-Louis Vincent MD, PhD*

Department of Intensive Care, Erasme Hospital, Université Libre de Bruxelles, 1070 Brussels, Belgium

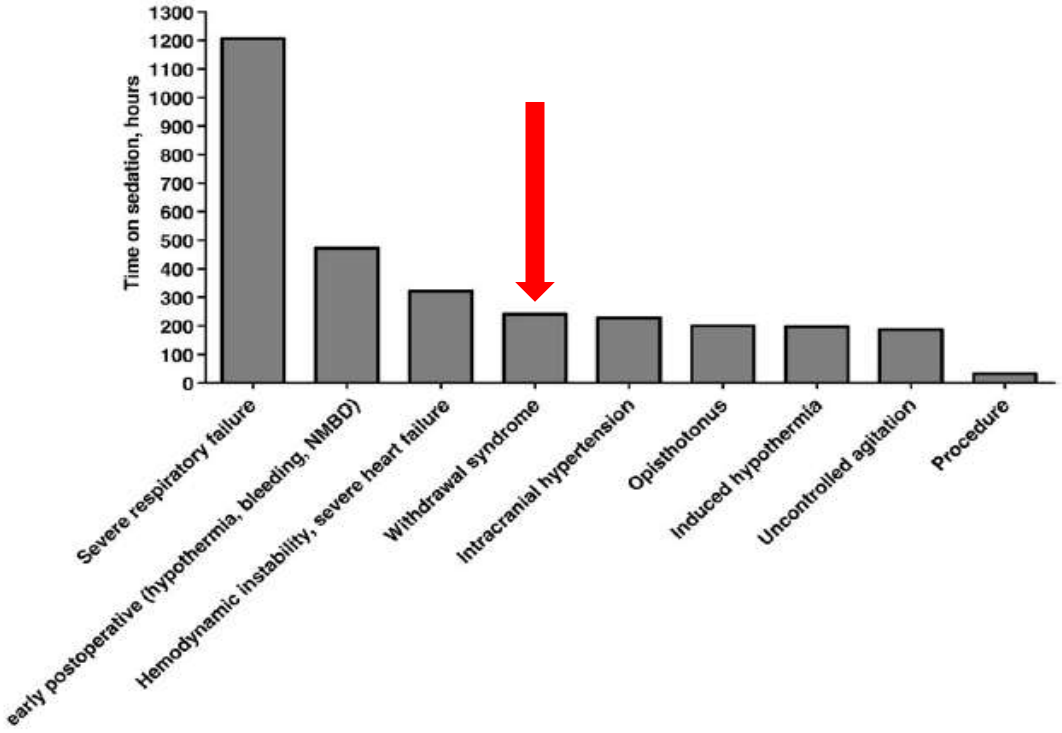


Fig. 1 Cumulative time (hours) on sedation for each indication of sedation.

J Crit Care 2011

Donc le Syndrome de sevrage :

- Fréquence: difficile à apprécier, sous-estimée en raison des difficultés diagnostiques en réanimation.
- Sevrage brutal, l'utilisation de benzodiazépines à demi-vie courte, l'administration de fortes doses et la réversion par le flumazénil ou la naloxone sont des facteurs favorisants.
- Meilleur argument diagnostique : la disparition de la symptomatologie avec la réintroduction de l'agent suspect

Available online at www.sciencedirect.com
ScienceDirect
General Hospital Psychiatry 30 (2008) 421–434
General Hospital Psychiatry

Posttraumatic stress disorder in general intensive care unit survivors: a systematic review☆

Dimitry S. Davydow, M.D.[a,*], Jeneen M. Gifford, M.D.[c], Sanjay V. Desai, M.D.[b], Dale M. Needham, M.D., Ph.D.[d], O. Joseph Bienvenu, M.D., Ph.D.[e]

15 études :Medline, EMBASE, Cochrane Library, CINAHL, PsycINF

Prévalence de l'ESPT : 22%

Survenue de l'ESPT:

- ATCD psy
- BZD
- Expérience effrayante /Délirante
- Mauvaise qualité de vie

Intensive Care Med (2007) 33:978–985
DOI 10.1007/s00134-007-0600-8

ORIGINAL

C. Jones
C. Bäckman
M. Capuzzo
H. Flaatten
C. Rylander
R. D. Griffiths

Precipitants of post-traumatic stress disorder following intensive care: a hypothesis generating study of diversity in care

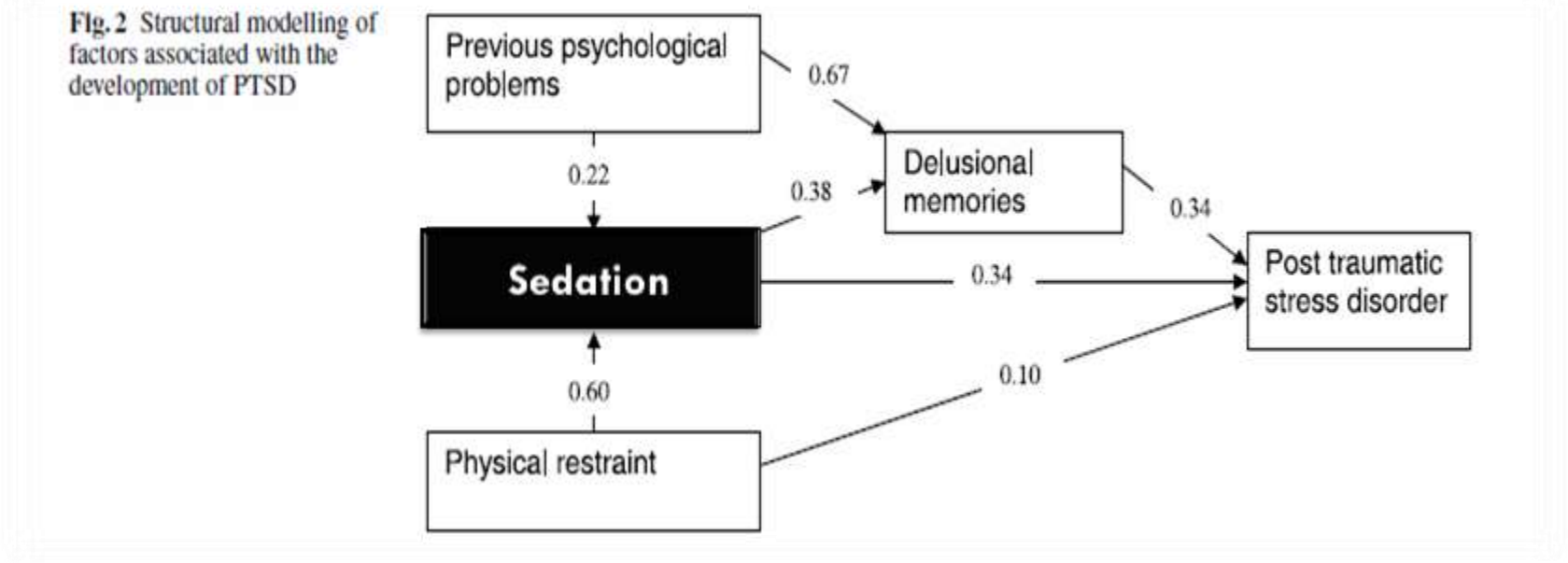


Fig. 2 Structural modelling of factors associated with the development of PTSD

Int Care Med 2007

Des solutions ?

-Prédiction des effets indésirables
-Modalité de sédation
-Le sédatif
-TTT non pharmacologique

Brainstem responses can predict death and delirium in sedated patients in intensive care unit*

Tarek Sharshar, MD, PhD; Raphaël Porcher, PhD; Shidasp Siami, MD; Benjamim Rohaut, MD; Juliette Bailly-Salin, MD; Nicholas S. Hopkinson, MD, PhD; Bernard Clair, MD; Celine Guidoux, MD; Emanuele Iacobone, MD; Romain Sonneville, MD; Andrea Polito, MD; Jerome Aboab, MD; Stephane Gaudry, MD; Olivier Morla, MD; Grégory Amouyal, MD; Julien Azuar, MD; Jérémy Allary, MD; Antoine Vieillard-Baron, MD, PhD; Michel Wolff, MD; Alain Cariou, MD; Djillali Annane, MD, PhD; for the Paris-Ouest Study Group on Neurological Effect of Sedation (POSGNES)

Evaluation de l'état neurologique sous sédation :difficile

Les signes clinique observés sous sédation : évolution à court terme…. ????

<u>LA QUESTION</u> : si les signes d'atteinte du tronc cereb /24 premières h de sédation : en relation avec la mortalité Et l'état neurologique après la sédation

Patients : intubés +sedation /midazolam ± sufentanyl : 3 réanimations

Critères de jugement: GCS, ex paires craniennes , intensive care environment score, reflexe de la toux

Table 6. Adjusted analysis for altered mental status

72 patients **72 patients**

Criteria	Development Set Confusion or Coma: Odds Ratio (95% Confidence Interval)	p	Validation Set Delirium or Coma: Odds Ratio (95% Confidence Interval)	p
Simplified Acute Physiologic Score II at inclusion	1.04 (1.00–1.07)	.058	1.03 (0.99–1.08)	.10
Absent oculocephalic response	4.49 (1.34–15.1)	.015	5.64 (1.63–19.5)	.006
Simplified Acute Physiologic Score II at inclusion	1.04 (1.00–1.07)	.057	1.04 (0.99–1.09)	.088
Medical admission	0.92 (0.21–4.10)	.91	8.26 (1.94–35.2)	.004
Absent oculocephalic response	4.54 (1.34–15.4)	.015	6.10 (1.48–25.1)	.012

Crit Care Med 2011

Randomized trial of light versus deep sedation on mental health after critical illness*

Miriam M. Treggiari, MD, PhD, MPH; Jacques-André Romand, MD, FCCM; N. David Yanez, PhD; Steven A. Deem, MD; Jack Goldberg, PhD; Leonard Hudson, MD; Claudia-Paula Heidegger, MD; Noel S. Weiss, MD, DrPH

Table 3. PTSD, anxiety, and depression in patients randomized to receive sedation goals of Ramsay 1–2 or Ramsay 3–4, at intensive care unit discharge and 4 wks after[a]

Outcome	ICU Discharge			4 Wks After ICU Discharge		
	Ramsay 1–2 n = 57	Ramsay 3–4 n = 52	*p*	Ramsay 1–2 n = 52	Ramsay 3–4 n = 50	*p*
PTSD score,[b] ranks	52 ± 33	57 ± 30	.39	46 ± 29	56 ± 29	.07
PTSD symptom clusters[c]						
Intrusive recollection	19 (41)	13 (36)	.62	9 (20)	9 (23)	.73
Avoidant/numbing	11 (24)	7 (19)	.62	6 (13)	6 (15)	.79
Hyperarousal	19 (41)	16 (44)	.78	5 (11)	10 (26)	.08
Hospital Anxiety and Depression Scale						
Anxiety score	6.4 ± 4.0	7.1 ± 4.6	.37	5.3 ± 4.2	5.0 ± 4.2	.64
Anxiety cases, n (%)	8 (14)	13 (25)	.15	6 (12)	6 (12)	.94
Depression score	5.3 ± 3.4	6.5 ± 4.7	.13	3.4 ± 3.7	3.1 ± 3.7	.72
Depression cases, n (%)	3 (5)	10 (19)	.02	4 (8)	2 (4)	.43

PTSD, posttraumatic stress disorder; ICU, intensive care unit.

[a]Plus and minus values are mean ± standard deviation (SD); [b]scores of the Impact of Event Scale-Revised and the PTSD Symptom Checklist instruments have been normalized by subtracting the mean and dividing by the SD to normalize to the same scale, and then the scores have been ranked; [c]*Diagnostic and Statistical Manual of Mental Disorders-IV-Text Revision* criteria for diagnosis include: scores of *moderately* or above to at least one of the B criterion items (intrusive recollection), to at least three of the C criterion items (avoidant/numbing), and to at least two of the D criterion items (hyperarousal).

Moins de sédation ::↓LOS ↓VM

Pas d'effet sur etat mental des patients ni leur securité

Reducing Deep Sedation and Delirium in Acute Lung Injury Patients: A Quality Improvement Project*

David N. Hager, MD, PhD[1]; Victor D. Dinglas, BS[1,2]; Shilta Subhas, RN[3]; Annette M. Rowden, Pharm D[4]; Karin J. Neufeld, MD, MPH[2,5]; O. Joseph Bienvenu, MD, PhD[2,5]; Pegah Touradji, PhD[2,6]; Elizabeth Colantuoni, PhD[2,7]; Dereddi R.S. Reddy, MD[2,8]; Roy G. Brower, MD[1]; Dale M. Needham, MD, PhD[1,2,6]

TABLE 2. Sedation, Delirium and Activity Status

	Before Quality Improvement $n = 120$	After Quality Improvement $n = 82$	p^a
Sedative infusion (% of MICU d per patient), median (IQR)			
Narcotic	74 (50, 100)	33 (10, 65)	<0.001
Benzodiazepine	70 (46, 94)	22 (0, 50)	<0.001
Median RASS Score per patient, median (IQR)[b]	−4 (−5, −2)	−1.5 (−3, 0)	<0.001
Sedation status[b] (% of MICU d per patient), median (IQR)			
Not sedated (RASS −1, 0, +1)	20 (0, 50)	50 (20, 72)	<0.001
Sedated (RASS −2, −3, −4 or −5)	78 (29, 100)	50 (21, 71)	<0.001
Agitated (RASS >+2)	0 (0, 0)	0 (0, 4)	<0.001
Delirium status[b] (% of MICU d per patient), median (IQR)			
Awake and not delirious	0 (0, 18)	19 (0, 50)	<0.001
Delirious	20 (0, 40)	38 (0, 60)	0.010
Comatose	65 (27, 100)	23 (0, 50)	<0.001

IQR = interquartile range; MICU = medical ICU; RASS = Richmond Agitation Sedation Scale.

[a]*p* values calculated using Wilcoxon rank sum test.

[b]Number of patients excluded due to no RASS/Confusion Assessment Method for ICU (CAM-ICU) assessments conducted on weekends or during one period in which staff were not available: before = 29, after = 4. For patients included in the analyses, the number (%) of assessments not completed during the before and after periods, respectively, is: RASS 93 (10%) and 53 (6%), and CAM-ICU 95 (10%) and 79 (10%).

Conclusion: Through a structured quality improvement process, use of sedative infusions can be substantially decreased and days awake without delirium significantly increased, even in severely ill, mechanically ventilated patients with acute lung injury. (*Crit Care Med* 2013; 41:1435–1442)

Crit Care Med 2013

ELSEVIER

Original Contribution

Adverse events associated with ketamine for procedural sedation in adults

Reuben J. Strayer MD[a,*], Lewis S. Nelson MD[b,c]

Results: Of the 5512 unique citations that were evaluated, 87 met criteria for inclusion. Most studies were performed in the 1970s and published in the anesthesia literature. Contexts, end points, and methodological quality varied widely across studies. Ketamine reliably produces conditions that facilitate the performance of painful procedures. Pharyngeal reflexes are generally preserved and cardiovascular tone stimulated, including a rise in blood pressure and myocardial oxygen demand. Laryngospasm and airway obstruction are reported, and though ketamine is a respiratory stimulant, a brief period of apnea around the time of injection is common. Reports of significant cardiorespiratory adverse events are rare, despite ketamine's frequent use in austere, poorly monitored settings. Dysphoric emergence phenomena occur in 10% to 20% of cases; sedating medications are effective in preventing and managing these reactions.

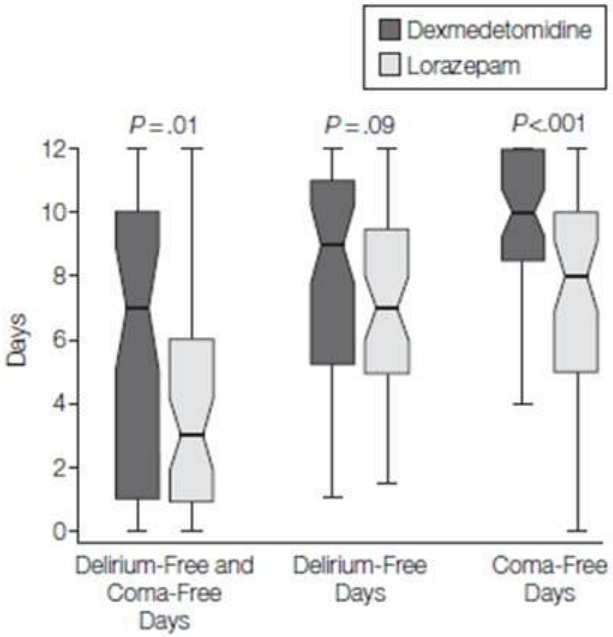
Am J Emerg Med 2008

Effect of Sedation With Dexmedetomidine vs Lorazepam on Acute Brain Dysfunction in Mechanically Ventilated Patients

The MENDS Randomized Controlled Trial

Info 1: moins de délire

Figure 2. Delirium-Free and Coma-Free Days During Study



Info 2: safe

Table 4. Safety Outcomes With Dexmedetomidine vs Lorazepam[a]

Safety Variable While Receiving Study Drug	Dexmedetomidine (n = 52)	Lorazepam (n = 51)	*P* Value
Blood pressure history			
Lowest systolic blood pressure, mm Hg	96 (88-105)	97 (88-102)	.60
Lowest diastolic blood pressure, mm Hg	48 (44-55)	49 (44-54)	.91
Ever systolic blood pressure <80 mm Hg, No. (%)	13 (25)	10 (20)	.51
Hypotensive, d	0 (0-0.2)	0 (0-0)	.51
Vasoactive drug history			
Days received	0 (0-2)	0 (0-3)	.72
Number of vasoactive drugs/d[b]	0 (0-0.6)	0 (0-1)	.55
Ever vasoactive drugs increased, No. (%)	15 (29)	18 (35)	.48
Vasoactive drugs were increased, d	0 (0-1)	0 (0-1)	.73
Heart rate/rhythm, No. (%)			
Ever sinus bradycardia, <60/min	9 (17)	2 (4)	.03
Heart rate <40/min	1 (2)	1 (2)	.99
Ever sinus tachycardia, >100/min	36 (69)	37 (73)	.71
Ever atrial fibrillation	3 (6)	0 (0)	.08
Seizures, No. (%)	2 (4)	1 (2)	.57
Self-extubations, No. (%)	4 (8)	2 (4)	.41

[a] Measured during 120-hour study drug protocol. Median (interquartile range) unless otherwise noted.
[b] Reported as the median of the average number of vasoactive drugs that the patients were administered daily in each group

JAMA. 2007;298(22):2644-2653

Use of intravenous infusion sedation among mechanically ventilated patients in the United States*

Hannah Wunsch, MD, MSc; Jeremy M. Kahn, MD, MSc; Andrew A. Kramer, PhD; Gordon D. Rubenfeld, MD, MSc

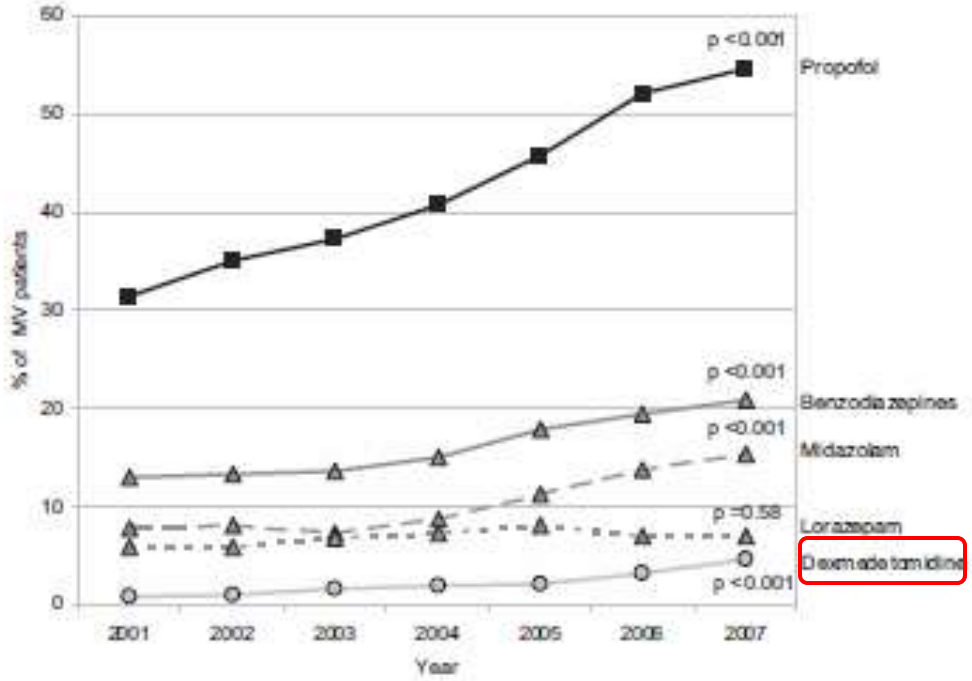


Figure 4. Trends in use of intravenous infusion sedation and types of intravenous infusion sedatives used over 7 yrs for mechanically ventilated (*MV*) patients (2001–2007). *p* Values are for trend over time, using generalized estimating equations to account for changes in intensive care units over time.

Crit Care Med 2009

Peris et al. Critical Care 2011, 15:R41
http://ccforum.com/content/15/1/R41

CRITICAL CARE

RESEARCH Open Access

Early intra-intensive care unit psychological intervention promotes recovery from post traumatic stress disorders, anxiety and depression symptoms in critically ill patients

Adriano Peris[1], Manuela Bonizzoli[1], Dario Iozzelli[2], Maria Luisa Migliaccio[1], Giovanni Zagli[1*], Alberto Bacchereti[2], Marta Debolini[2], Elisetta Vannini[1], Massimo Solaro[1], Ilaria Balzi[1], Elisa Bendoni[1], Ilaria Bacchi[1], Valtere Giovannini[3], Laura Belloni[2]

Abstract

Introduction: Critically ill patients who require intensive care unit (ICU) treatment may experience psychological distress with increasing development of psychological disorders and related morbidity. Our aim was to determine whether intra-ICU clinical psychologist interventions decrease the prevalence of anxiety, depression and posttraumatic stress disorder (PTSD) after 12 months from ICU discharge.

Methods: Our observational study included critical patients admitted before clinical psychologist intervention (control group) and patients who were involved in a clinical psychologist program (intervention group). The Hospital Anxiety and Depression Scale (HADS) and Impact of Event Scale-Revised questionnaires were used to assess the level of posttraumatic stress, anxiety and depression symptoms.

Results: The control and intervention groups showed similar demographic and clinical characteristics. Patients in the intervention group showed lower rates of anxiety (8.9% vs. 17.4%) and depression (6.5% vs. 12.8%) than the control group on the basis of HADS scores, even if the differences were not statistically significant. High risk for PTSD was significantly lower in patients receiving early clinical psychologist support than in the control group (21.1% vs. 57%; $P < 0.0001$). The percentage of patients who needed psychiatric medications at 12 months was significantly higher in the control group than in the patient group (41.7% vs. 8.1%; $P < 0.0001$).

Conclusions: Our results suggest that that early intra-ICU clinical psychologist intervention may help critically ill trauma patients recover from this stressful experience.

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

- **Objective** To test whether listening to self-initiated patient-directed music (PDM) can reduce anxiety and sedative exposure during ventilatory support in critically ill patients
- **Design:** 373 patients from 12 ICUs at 5 hospitals (USA), + VM
- **Interventions : 3 groupes**
  - *Self-initiated PDM (n=126)*
  - *noise-canceling headphones (NCH; n=122),*
  - *usual care (n=125).*
- **Outcomes and Measures :** Daily assessments of anxiety (on 100-mm visual analog scale) and 2 aggregate measures of sedative exposure (intensity and frequency).

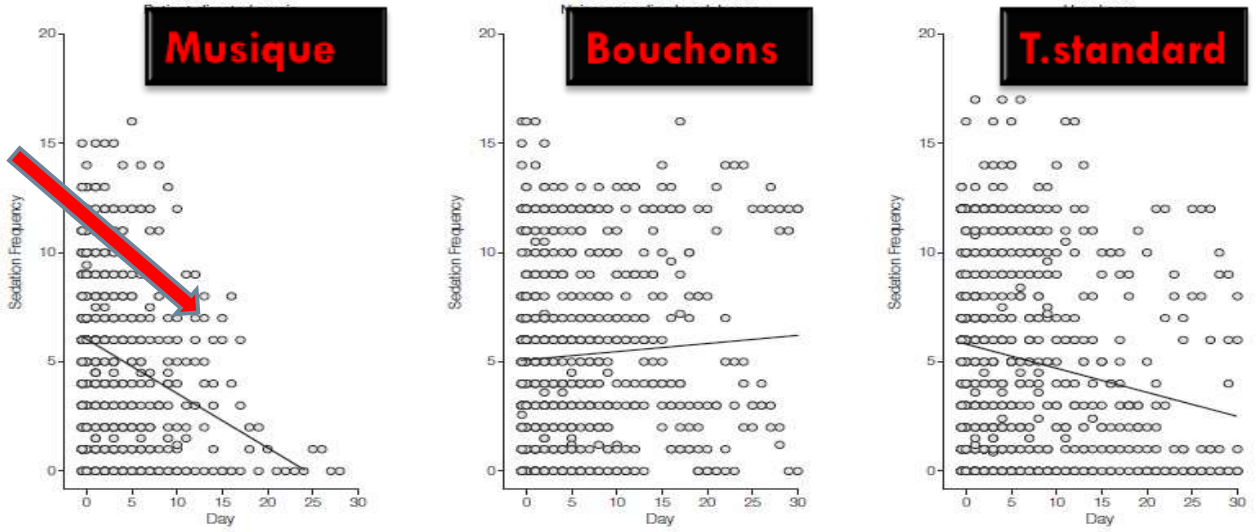
JAMA 20 MAI 2013

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

Figure 4. Sedation Frequency Scatterplots by Group



The diagonal lines are the best fitted lines to demonstrate change over the study period.

Conclusion :PDM **:réduction significative**

1. de l'anxieté
2. de l'usage des sédatifs
3. de l'intensité de la sédation

JAMA 20 MAI 2013

Conclusion

- Eliminer une **cause organique**
- Clinique :
  - Agitation
  - syndrome de sevrage
  - ESPT
- Les fonctions cognitives à distance du séjour en réanimation sont altérées dans un certain nombre de cas. Le rôle de la sédation reste à déterminer.
- **La titration**, l'emploi **de coanalgésiques** permettant l'épargne morphinique, sont les meilleurs garants de la limitation de ces effets secondaires.

Merci