

LÉKAŘSKÁ FAKULTA
MASARYKOVY UNIVERZITY
A FAKULTNÍ NEMOCNICE BRNO



**KLINIKA DĚTSKÉ
ANESTEZIOLOGIE
A RESUSCITACE**



ICU delirium – proč mě má zajímat?

Milan Kratochvíl



**FAKULTNÍ
NEMOCNICE
BRNO**

Oběhové selhání

Ventilace

Renální selhání

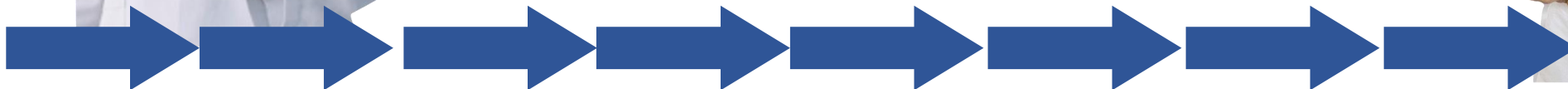
Metabolické selhání

Vnitřní prostředí

Nutrice

Krvácení, trauma

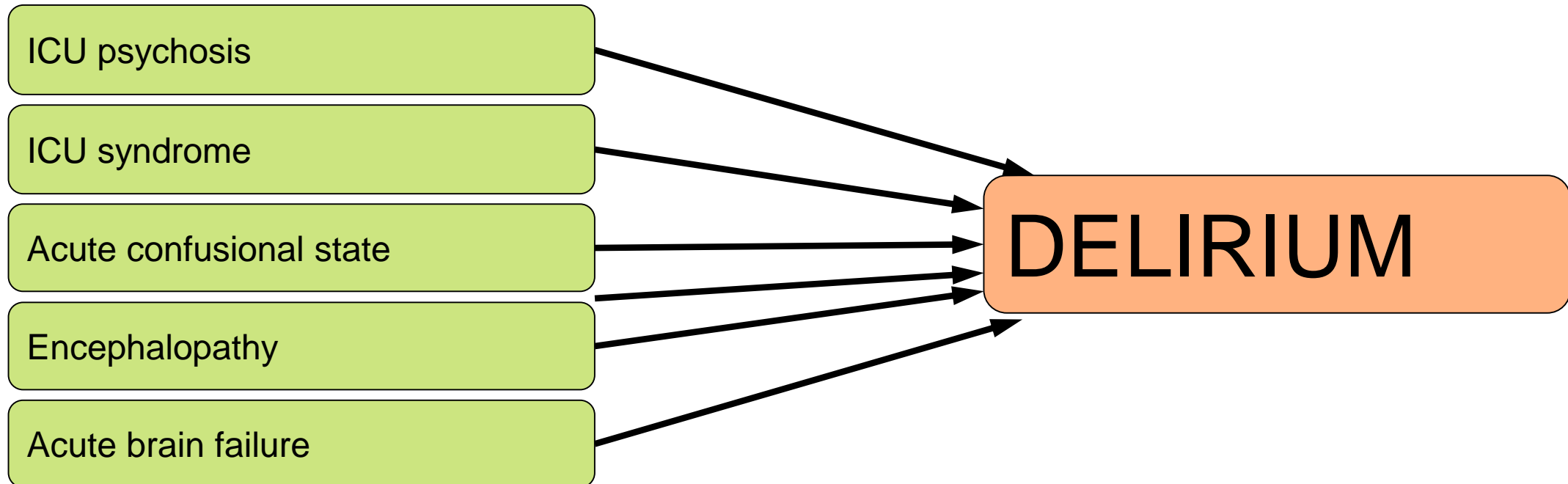
Dlouhodobý výsledek



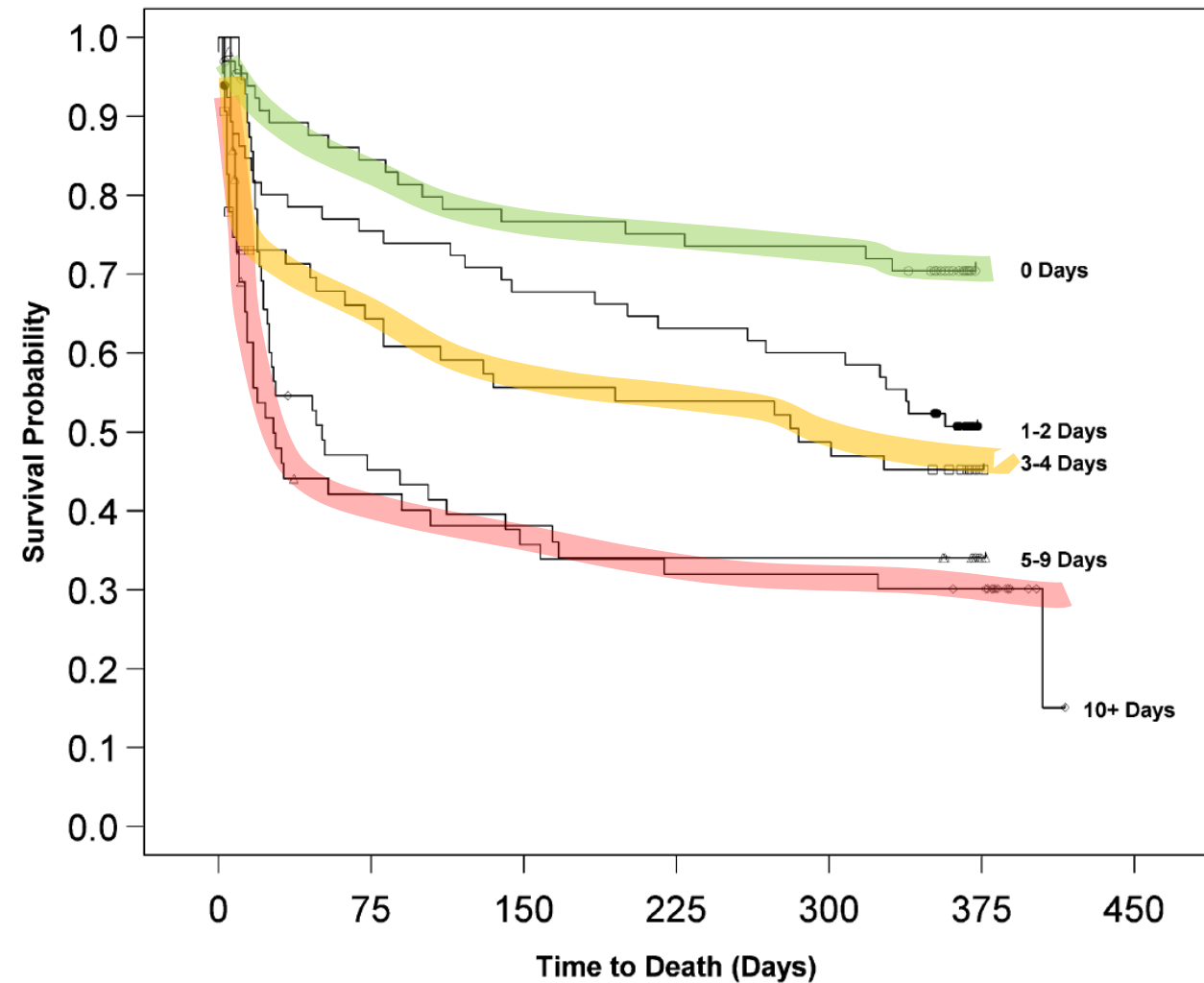
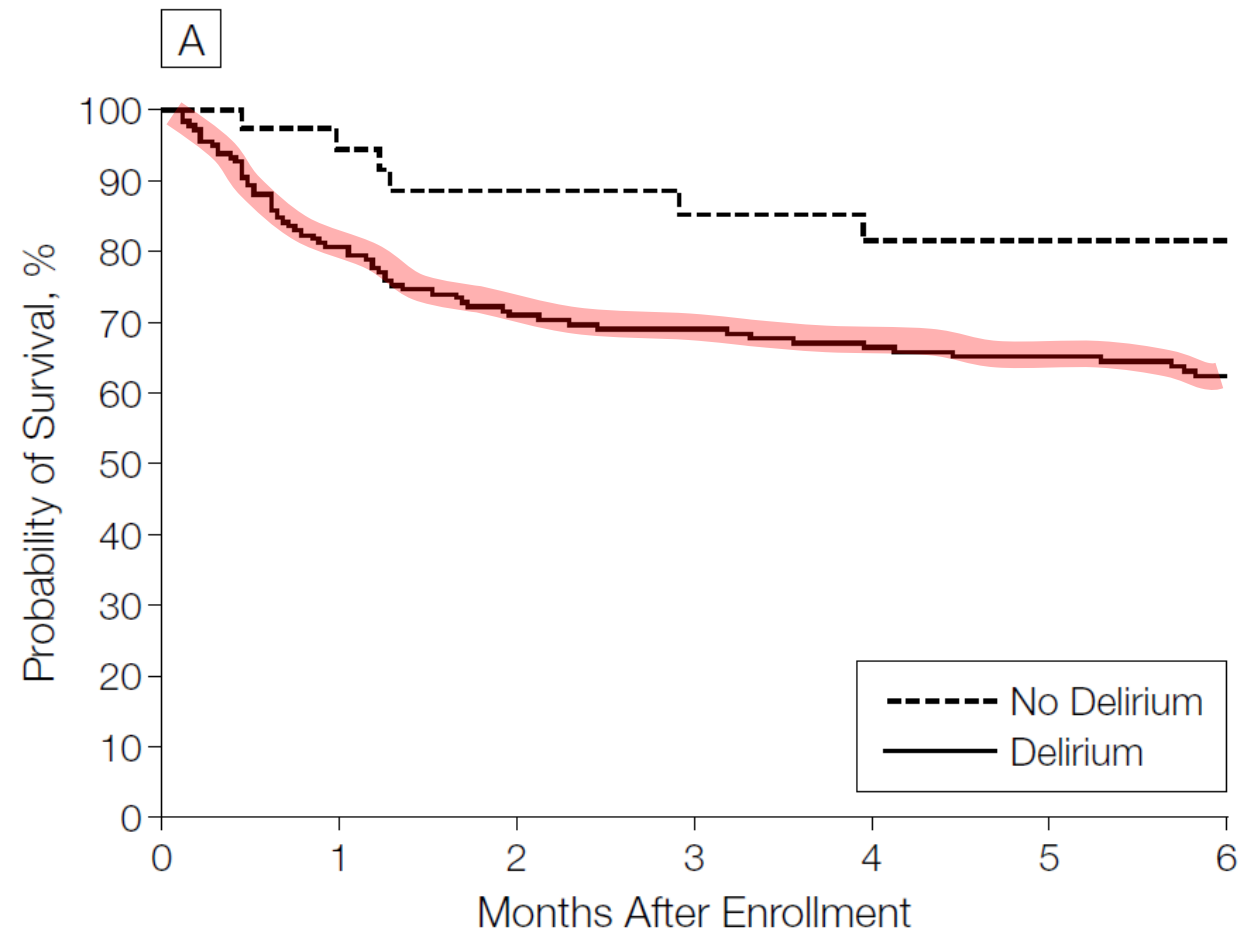
Intensive Care Unit Syndrome

A Dangerous Misnomer

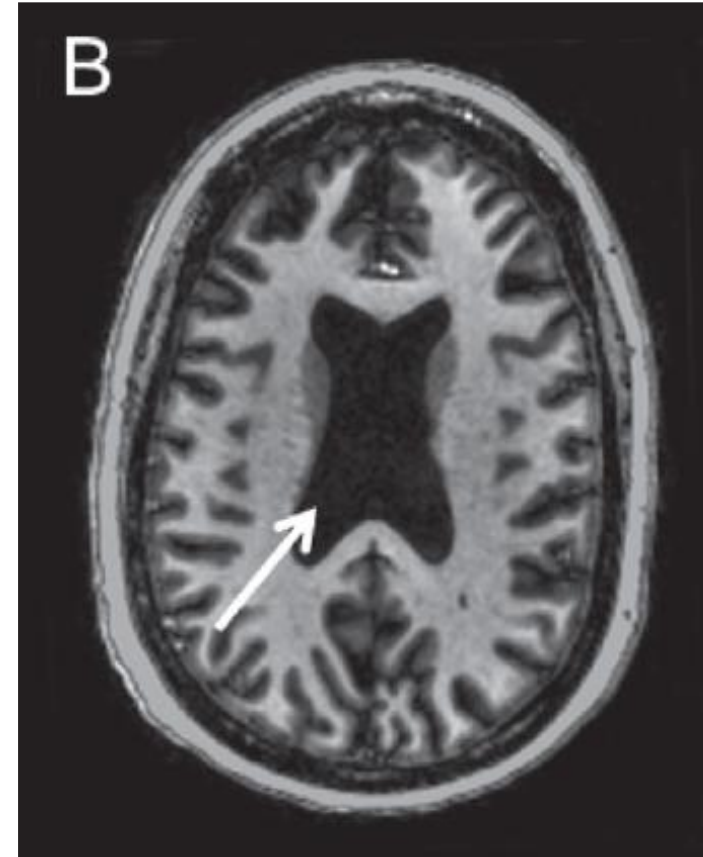
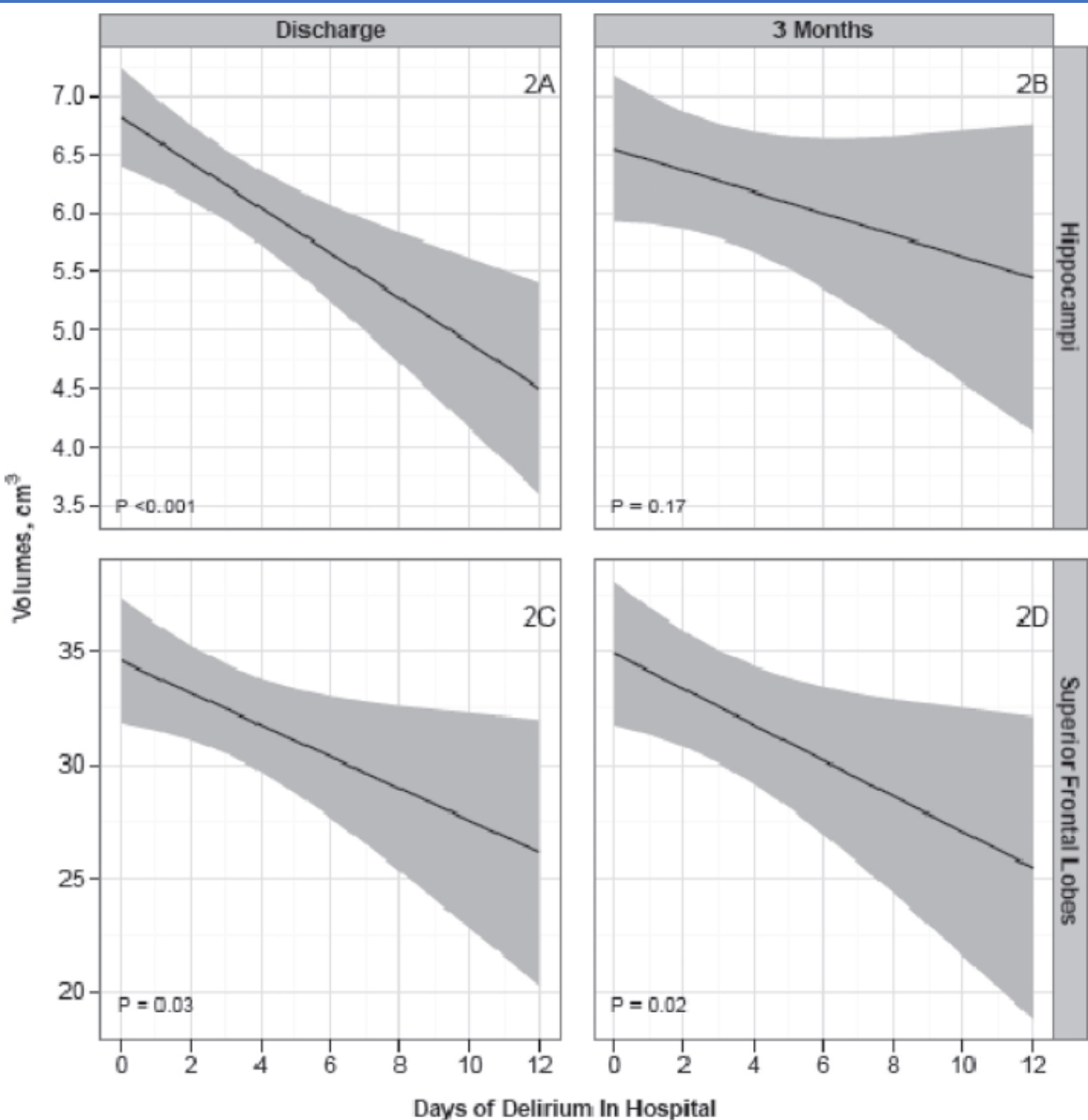
*Brian E. McGuire, MClInPsych, MAPS; Christopher J. Basten, MPsychol, MAPS;
Christopher J. Ryan, MBBS, FRANZCP; John Gallagher, MBBS, FFICANZCA*



Delirium a mortalita

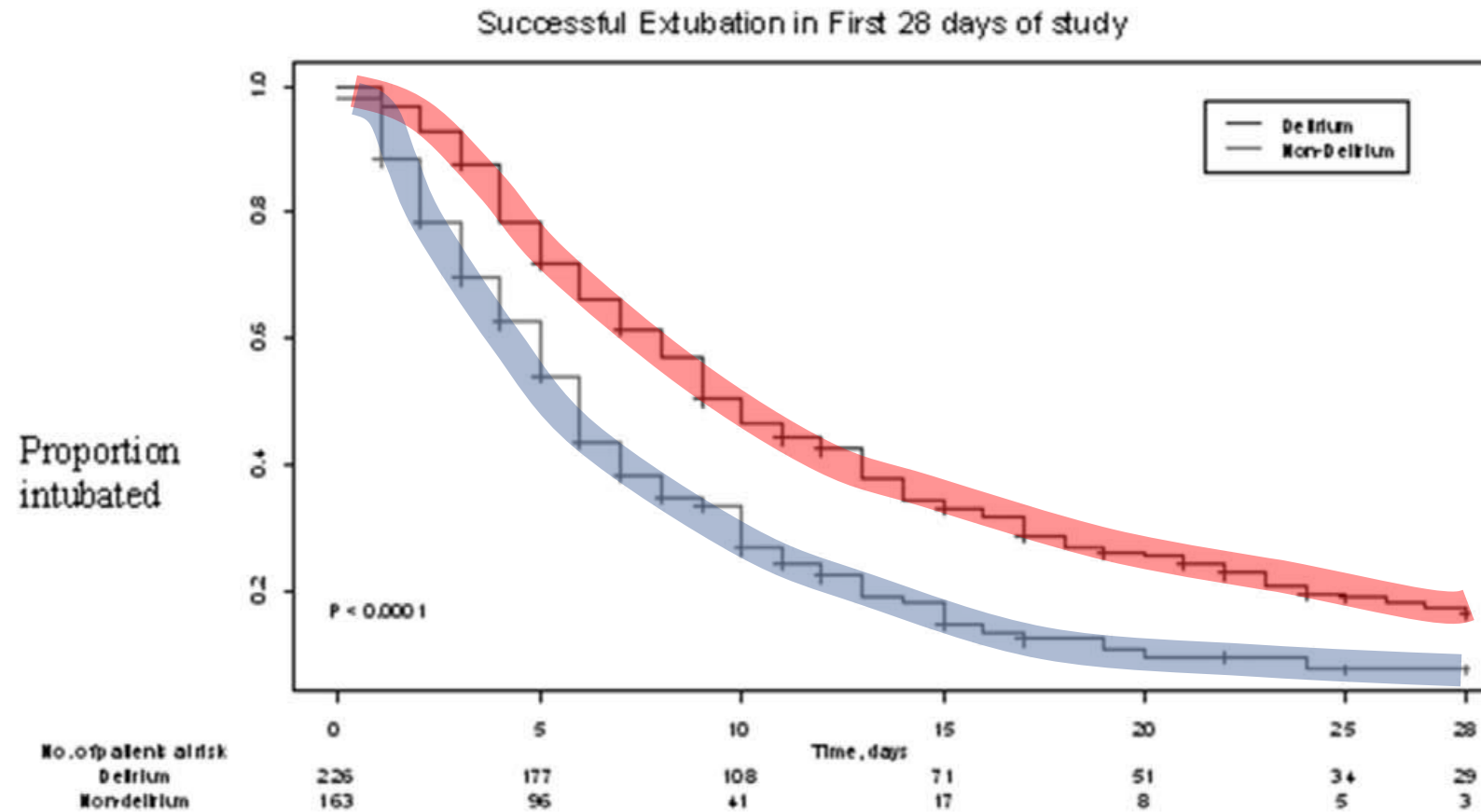


Delirium a mozková atrofie



Variable ^a	ICU Length of stay (days)			Length of hospital stay (days)		
	Beta	95 % C.I.	<i>P</i> Value	Beta	95 % C.I.	<i>P</i> Value
Intercept	1.21	–	–	1.82	–	–
Duration of delirium [#]	1.09	0.95–1.26	0.09	1.18	1.05–1.32	0.006
APACHE II	0.99	0.96–1.02	0.69	1.01	0.98–1.03	0.61
Age	1.00	0.99–1.02	0.25	1.00	0.99–1.00	0.38
Gender	0.95	0.57–1.56	0.82	1.22	0.84–1.75	0.30
Drug days	1.18	1.02–1.34	0.03	1.13	1.01–1.26	0.04

Čas do extubace



Kognitivní dysfunkce

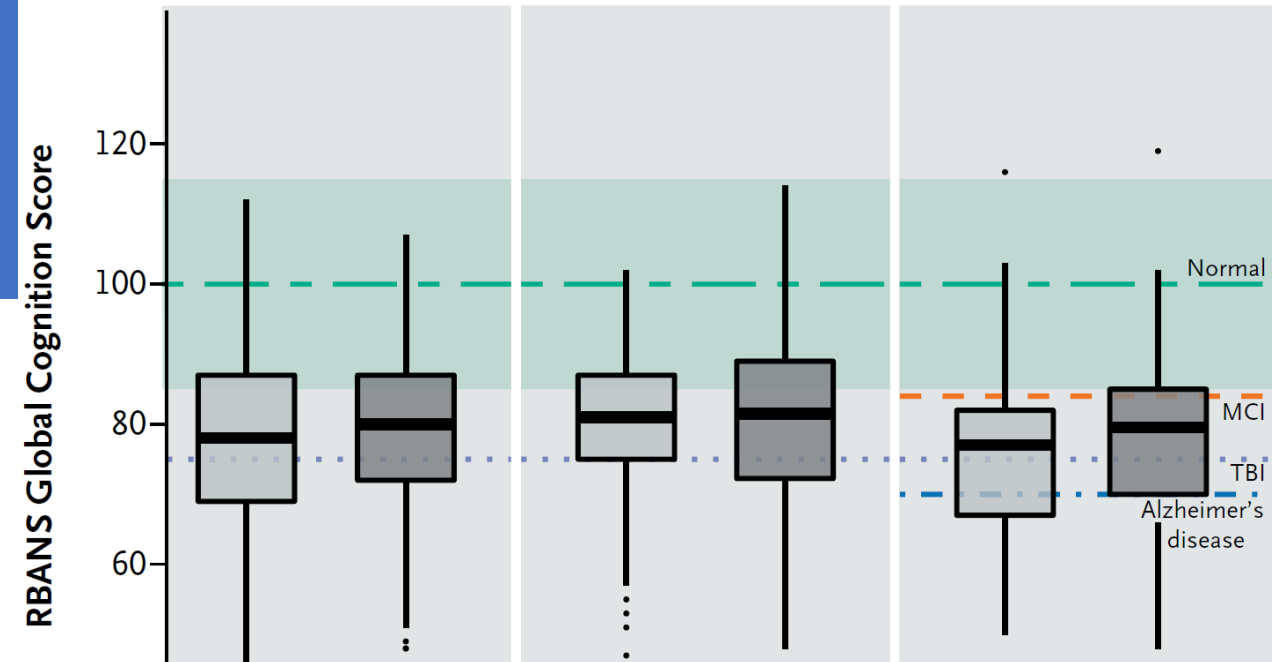
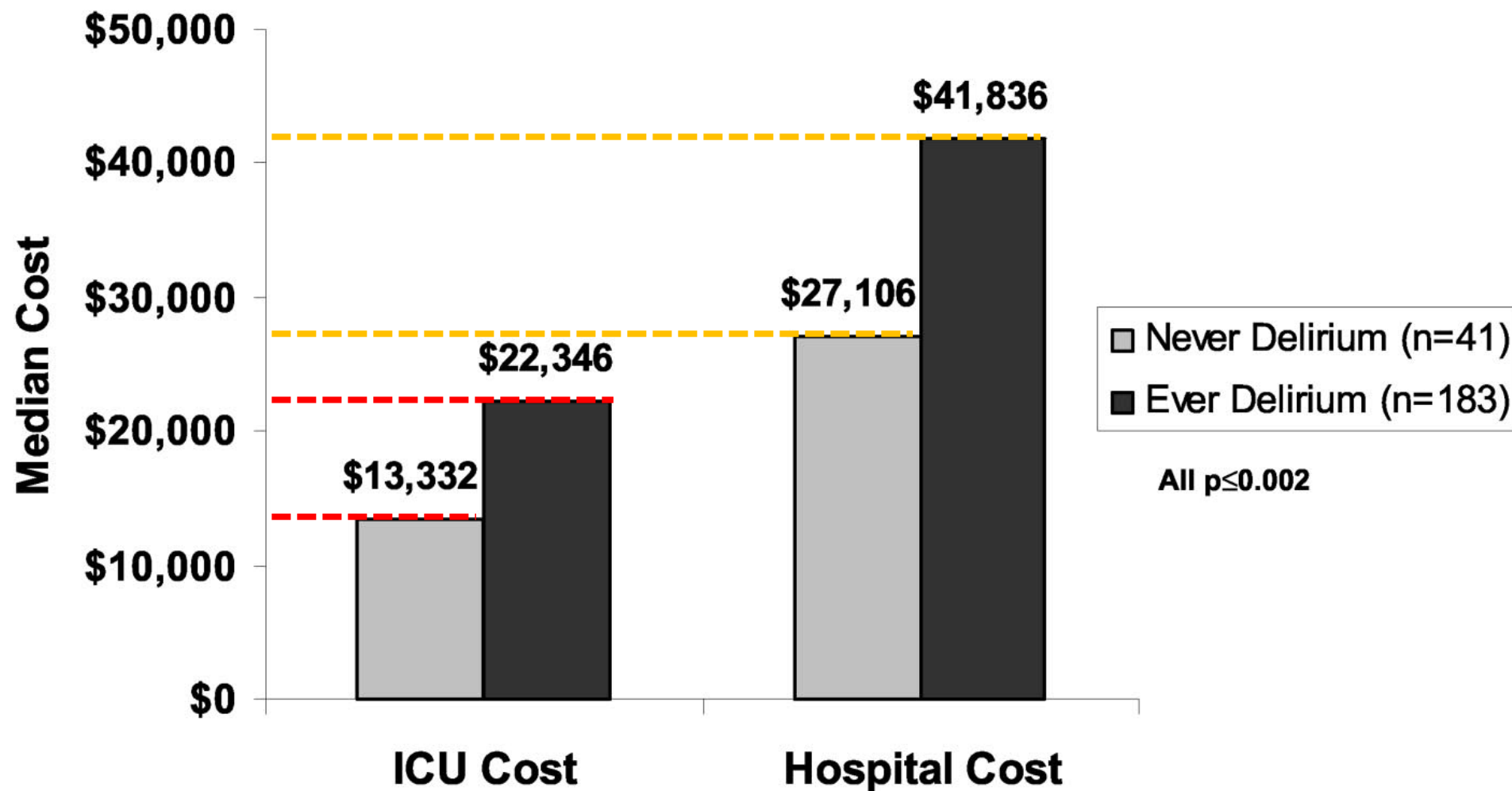


Table 2. Effect of Duration of Delirium, Duration of Coma, and Exposure to Sedative or Analgesic Agents on Global Cognition and Executive Function.*

Independent Variable	Percentile†		RBANS Global Cognition Score				Trails B Executive-Function Score			
	25th	75th	At 3 Mo		At 12 Mo		At 3 Mo		At 12 Mo	
			difference (95% CI)	P value	difference (95% CI)	P value	difference (95% CI)	P value	difference (95% CI)	P value
Duration of delirium (days)	0	5	-6.3 (-10.3 to -2.3)	0.001	-5.6 (-9.5 to -1.8)	0.04	-5.1 (-9.2 to -1.1)	0.004	-6.0 (-10.2 to -1.9)	0.007
Duration of coma (days)	0	4	-1.5 (-7.0 to 4.1)	0.12	1.2 (-3.3 to 5.7)	0.87	-1.6 (-6.1 to 2.9)	0.70	0.9 (-3.8 to 5.6)	0.79
Mean daily dose of sedative or analgesic agent‡										
Benzodiazepine (mg)	0	7.88	0.3 (-2.9 to 3.5)	0.20	-0.4 (-3.9 to 3.0)	0.17	-2.9 (-6.9 to 1.0)	0.04	-0.5 (-4.4 to 3.5)	0.19
Propofol (mg)	0	804	0.5 (-2.2 to 3.3)	0.83	-0.4 (-3.4 to 2.7)	0.96	-1.4 (-4.6 to 1.7)	0.44	-1.7 (-5.1 to 1.7)	0.61
Dexmedetomidine (µg)	0	3826	-4.0 (-11.7 to 3.7)	0.31	-5.7 (-14.1 to 2.8)	0.19	-2.5 (-11.2 to 6.1)	0.57	-0.4 (-9.5 to 8.7)	0.93
Opiate (mg)	13.3	1238.8	3.5 (0.1 to 6.9)	0.14	1.7 (-2.1 to 5.4)	0.04	5.2 (1.4 to 9.1)	0.06	4.6 (0.4 to 8.8)	0.09

Náklady na hospitalizaci



Proč mě má zajímat?

Co to je?

Jak často se s ním setkám?

Jak detekuji delirium?

Jaké má rizikové faktory a jsou
ovlivnitelné?

Jak vůbec vzniká?

DELIRIUM

- Porucha vědomí a kognice (poznávání), která se rozvíjí v průběhu krátkého času (hodiny až dny) a fluktuuje v čase. (American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV)

Kritéria deliria podle DSM – 4

- Porucha vědomí (snížená jasnost vnímání prostředí) se sníženou schopností koncentrace, tenacity, nebo změny pozornosti.
- Změna kognice (např. porucha paměti, desorientace, porucha řeči), nebo rozvoj poruchy vnímání nezpůsobený preexistující, stanovenou, nebo progredující demencí.
- Porucha se rozvíjí v průběhu krátkého času (obvykle hodiny až dny) a fluktuuje v průběhu dne.
- Existuje důkaz v anamnéze, fyzikálním vyšetření a laboratorním vyšetření, že:
 - Porucha je způsobená přímými fyziologickými důsledky nemoci
 - Porucha je způsobená intoxikací psychoaktivní látkou nebo po intoxikaci v rámci syndromu z odnětí
 - Delirium má více etiologií

1. znak: akutní změna, nebo
fluktuující stav vědomí

A

2. znak: porucha pozornosti

A

3. znak: porucha (kvantity
vědomí

nebo



4. znak: porucha
organizace myšlení

CAM-ICU

Feature 1: Acute Onset of Fluctuating Course	Score	Check here if present
<p>Is the pt different than his/her baseline mental status?</p> <p>OR</p> <p>Has the patient has any fluctuation in mental status in the past 24 hours as evidenced by fluctuation on a sedation scale (i.e. RASS), GCS, or previous delirium assessment?</p>	<p>Either question Yes →</p>	<p><input type="checkbox"/></p>
Feature 2: Inattention		
<p>Letters Attention Test (See training manual for alternate Pictures)</p> <p>Directions: Say to the patient, "I am going to read you a series of 10 letters. Whenever you hear the letter "A," indicate by squeezing my hand. Read letters from the following letter list in a normal tone 3 seconds apart.</p> <p>SAVEAHAART</p> <p>Errors are counted when patient fails to squeeze on the letter "A" and when the patient squeezes on any letter other than "A."</p>	<p>Number of Errors > 2 →</p>	<p><input type="checkbox"/></p>
Feature 3: Altered Level of Consciousness		
<p>Present if the Actual RASS score is anything other than alert and calm (zero)</p>	<p>RASS anything other than zero →</p>	<p><input type="checkbox"/></p>
Feature 4: Disorganized Thinking		
<p>Yes/No Questions (See training manual for alternate set of questions)</p> <ol style="list-style-type: none"> 1. Will a stone float on water? 2. Are ther fish in the sea? 3. Does one pound weigh more than two pounds? 4. Can you use a hammer to pound a nail? <p>Errors are counted when the patient incorrectly answers a question.</p> <p>Command</p> <p>Say to patient: 'Hold up this many fingers' (Hold 2 fingers in front of patient)</p> <p>'Now do the same thing with the other hand' (Do not repeat number of fingers)</p> <p>'if pt is unable to move both arms for 2nd part of command ask patient to 'Add one more finer.'</p> <p>An error is counted if patient is unablde to complete the entire command.'</p>	<p>Combined number of errors >1 →</p>	<p><input type="checkbox"/></p>
<p>Overall CAM-ICU</p> <p>Feature 1 plus 2 and either 3 or 4 present = CAM-ICU positive</p>	<p>Criteria Met →</p> <p>Criteria Not Met →</p>	<p><input type="checkbox"/> CAM-ICU Positive (Delirium Present)</p> <p><input type="checkbox"/> CAM-ICU Negative (No Delirium)</p>

Figure 3c: The confusion assessment method for the intensive care unit (CAM-ICU) scale. *Adapted from Ely EW, Margolin R, Francis J, et al., evaluation of delirium in critically ill patients: Validation of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). Crit Care Med 2001;29 (7):1370-1379

Richmond Agitation-Sedation Scale

	Target RASS Value	RASS Description
 +4	Combative	Combative, violent, immediate danger to staff
+3	Very Agitated	Pulls or removes tube(s) or catheter(s); aggressive
+2	Agitated	Frequent non-purposeful movement, fights ventilator
+1	Restless	Anxious, apprehensive but movements are not aggressive or vigorous
0	Alert and Calm	
-1	Drowsy	Not fully alert, but has sustained awakening to voice (eye opening & contact greater than 10 seconds)
 -2	Light Sedation	Briefly awakens to voice (eye opening & contact less than 10 seconds)
-3	Moderate Sedation	Movements or eye opening to voice (but NO eye contact)
-4	Deep Sedation	No response to voice, <u>but</u> has movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

DELIRIUM

- Porucha vědomí a kognice (poznávání), která se rozvíjí v průběhu krátkého času (hodiny až dny) a fluktuuje v čase. (American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV)

Hypoaktivní

- Snížená reaktivita
- Hypoaktivita
- Apatie

Hyperaktivní

- Agitace
- Neklid
- Emoční labilita

Prevalence

DELIRIUM

• 20 – 80%

Hypoaktivní

43,5%

53,9%
Smíšené

Hyperaktivní

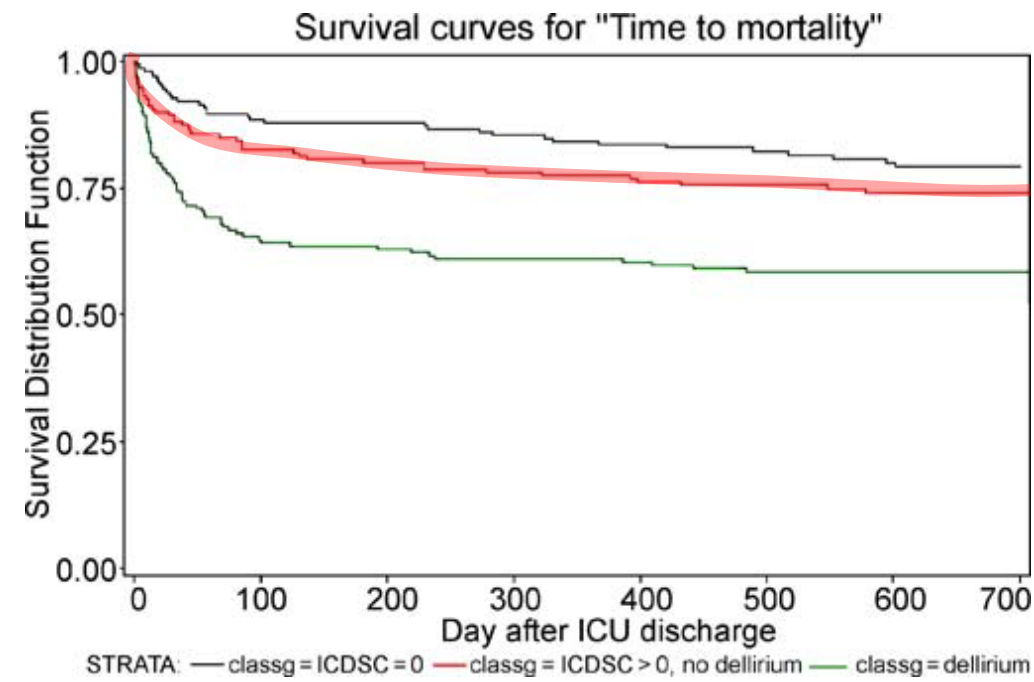
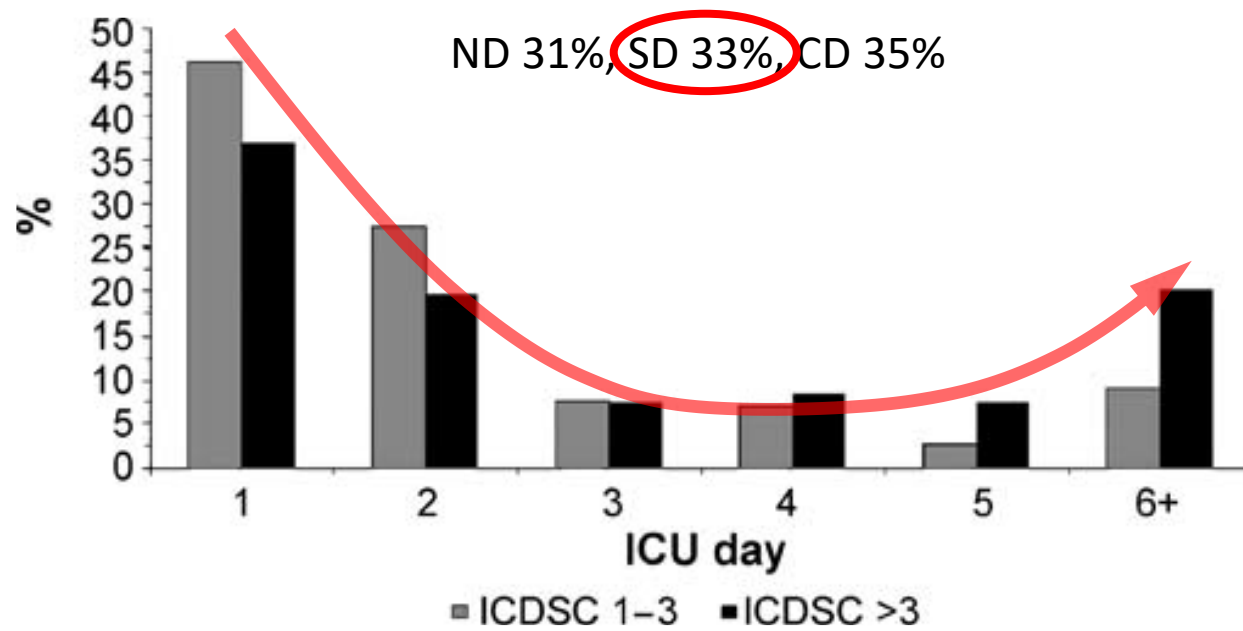
1,6%

Table 3 The scale is completed based on information collected from each entire 8-h shift or from the previous 24 h. Obvious manifestation of an item = 1 point; no manifestation of an item or no assessment possible = 0 point. The score of each item is entered in the corresponding empty box and is 0 or 1

1. Altered level of consciousness:
 - A) No response or B) the need for vigorous stimulation in order to obtain any response signified a severe alteration in the level of consciousness precluding evaluation. If there is coma (A) or stupor (B) most of the time period then a dash (-) is entered and there is no further evaluation during that period.
 - C) Drowsiness or requirement of a mild to moderate stimulation for a response implies an altered level of consciousness and scores 1 point.
 - D) Wakefulness or sleeping state that could easily be aroused is considered normal and scores no point.
 - E) Hypervigilance is rated as an abnormal level of consciousness and scores 1 point.
2. Inattention: Difficulty in following a conversation or instructions. Easily distracted by external stimuli. Difficulty in shifting focuses. Any of these scores 1 point.
3. Disorientation: Any obvious mistake in time, place or person scores 1 point.
4. Hallucination, delusion or psychosis: The unequivocal clinical manifestation of hallucination or of behavior probably due to hallucination (e.g., trying to catch a non-existent object) or delusion. Gross impairment in reality testing. Any of these scores 1 point.
5. Psychomotor agitation or retardation: Hyperactivity requiring the use of additional sedative drugs or restraints in order to control potential danger to oneself or others (e.g., pulling out iv lines, hitting staff). Hypoactivity or clinically noticeable psychomotor slowing. Any of these scores 1 point.
6. Inappropriate speech or mood: Inappropriate, disorganized or incoherent speech. Inappropriate display of emotion related to events or situation. Any of these scores 1 point.
7. Sleep/wake cycle disturbance: Sleeping less than 4 h or waking frequently at night (do not consider wakefulness initiated by medical staff or loud environment). Sleeping during most of the day. Any of these scores 1 point.
8. Symptom fluctuation: Fluctuation of the manifestation of any item or symptom over 24 h (e.g., from one shift to another) scores 1 point.

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Subsyndromal delirium in the ICU: evidence for a disease spectrum

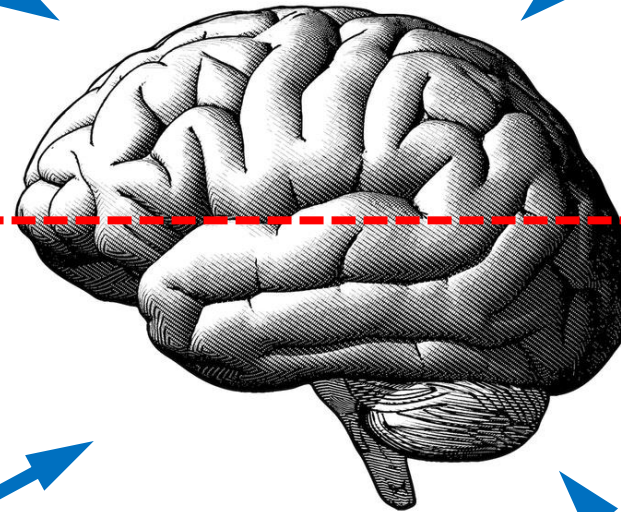


Rizikové faktory

Neovlivnitelné faktory

- Charakteristiky pacienta
- Věk
- Pohlaví
- Alkohol
- Bydlí sám
- Kouření

- Chronická onemocnění
- Predisponující kardiální onemocnění
- Predisponující kognitivní porucha
- Predisponující plicní onemocnění

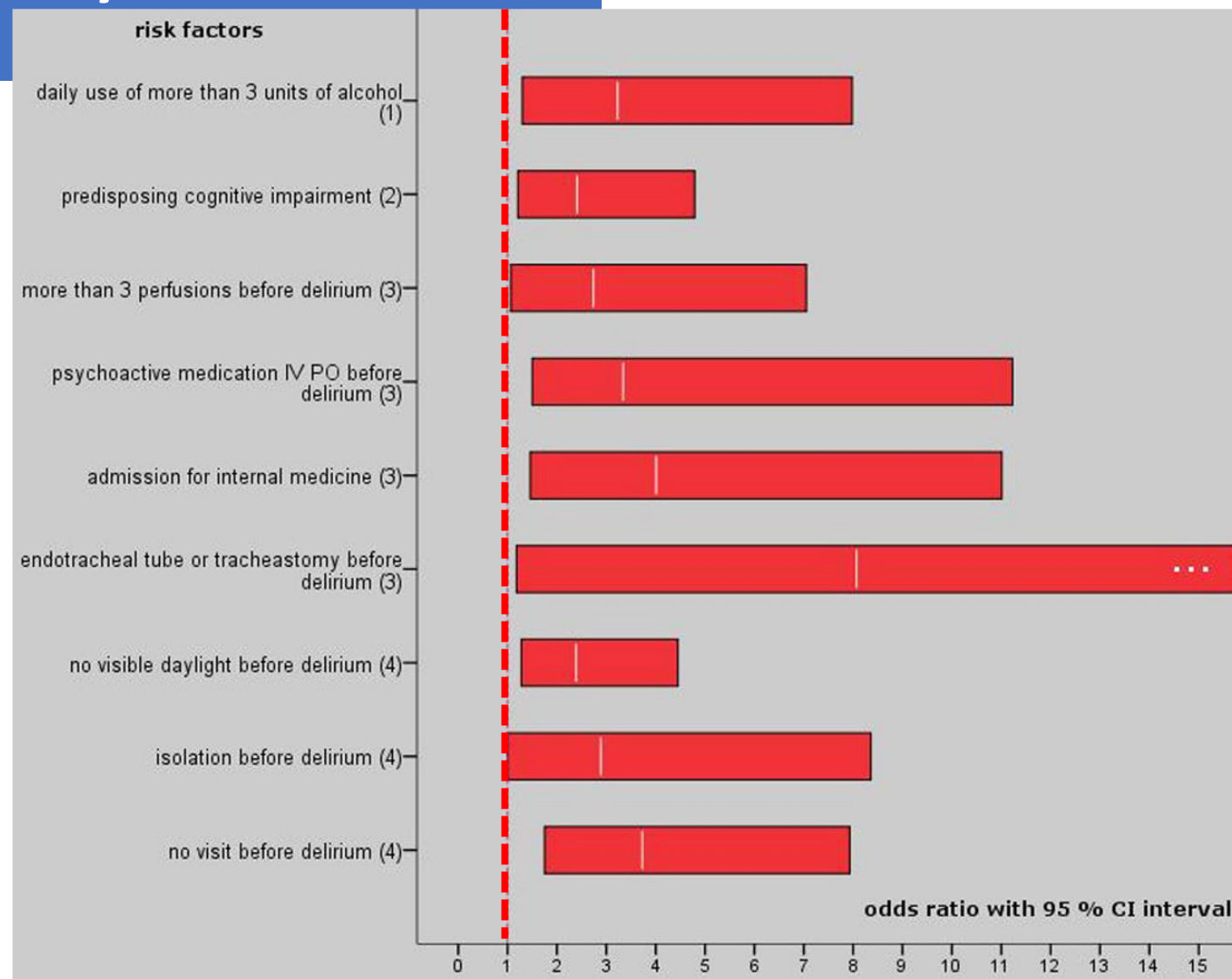


- Prostředí
- Příjem přes ER/transfer
- Izolace pacienta
- Absence návštěv
- Absence denního světla
- Nepřítomnost hodin
- Omezující prostředky

- Akutní nemoc
- LOS
- horečka
- Vysoká predikovaná mortalita
- Interní příjem
- Bez normálního jídla
- Sedace
- Psychoaktivní medikace
- katétry

Potenciálně
ovlivnitelné faktory

Rizikové faktory



Rizikové faktory

Factors related to patient characteristics

	n		Mean (SD) or %		P*	univariate	multivariate
	D	ND	D	ND		OR (CI)	OR (CI)
age in years (mean, SD)	155	368	65.0 (16.4)	63.7 (14.6)	0.36	1.01 (0.99 to 1.02)	
age more than 65	91/155	202/368	55%	59%	0.24	1.17 (0.80 to 1.71)	
gender masculine	90/155	220/368	58%	60%	0.40	0.93 (0.64 to 1.36)	
living single at home	45/114	38/68	56%	40%	0.02	1.94 (1.06 to 3.57)	
units of alcohol per day	58	172	3.2 (5.2)	2.1 (3.9)	0.09	1.05 (0.99 to 1.12)	
daily use of alcohol	44/142	94/354	31%	27%	0.19	1.24 (0.81 to 1.90)	
daily use of more than three units of alcohol	21/58	32/172	36%	19%	0.01	2.48 (1.29 to 4.80)	3.23 (1.30 to 7.98)
number of cigarettes per day	46	175	11.4 (13.6)	6.4 (9.6)	0.02	1.04 (1.01 to 1.07)	
daily smoking	33/153	98/366	22%	27%	0.13	0.75 (0.48 to 1.18)	
daily smoking of more than 10 cigarettes	22/46	54/174	48%	31%	0.03	2.04 (1.05 to 3.95)	

Environmentální faktory a delirium

Environmental factors

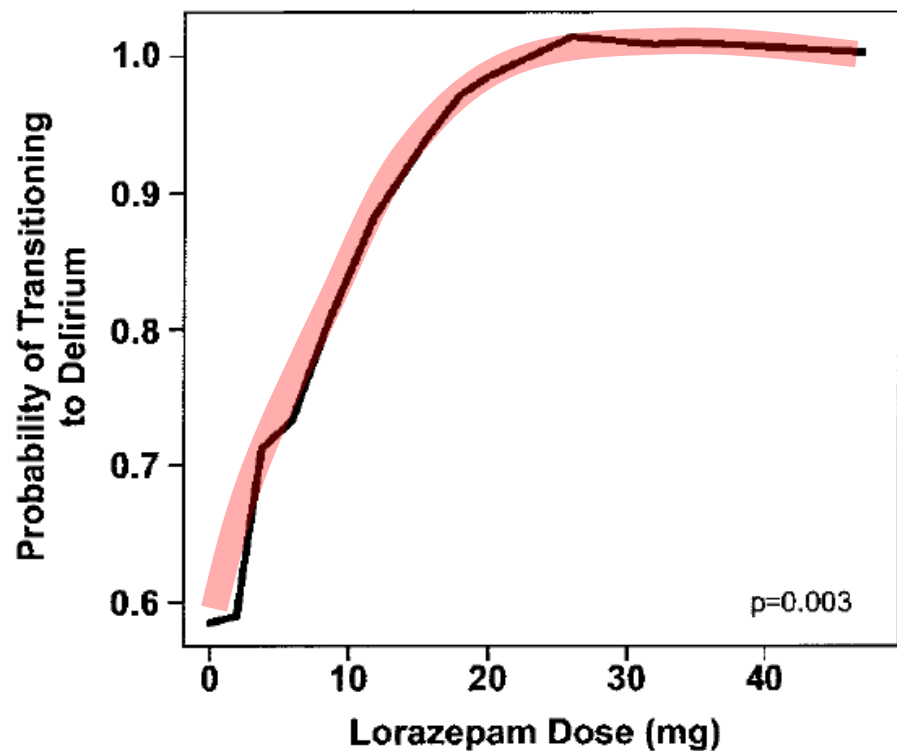
	n		mean (SD) or %			univariate	multivariate
	D	ND	D	ND	P*	OR (CI)	OR (CI)
admission via emergency room	60/118	119/259	51%	46%	0.22	1.22 (0.79 to 1.88)	
admission via transfer	36/118	47/259	31%	18%	0.006	1.98 (1.20 to 3.28)	
open room in intensive care	52/149	98/359	35%	27%	0.055	1.43 (0.95 to 2.15)	
isolation	16/155	11/368	10%	3%	0.001	3.74 (1.69 to 8.25)	2.89 (1.00 to 8.36)
no visible daylight	70/155	118/368	45%	32%	0.003	1.75 (1.19 to 2.56)	2.39 (1.28 to 4.45)
no clock present or visible	19/155	36/368	12%	10%	0.243	1.29 (0.71 to 2.33)	
number of visitors	88	168	2.4 (1.9)	2.5 (2.0)	0.70	0.97 (0.85 to 1.11)	
no visit	27/96	21/173	28%	12%	0.001	2.83 (1.50 to 5.36)	3.73 (1.75 to 7.93)
physical restraints	25/66	4/226	38%	2%	<0.001	33.84 (11.19 to 102.36)	

Imobilizace a delirium

TABLE 2. Variables Associated With Delirium, Multivariate Analysis (226 Delirium vs 163 No Delirium)

Variable	Hazard Ratio	95% CI	<i>p</i>
Age (yr)			
< 40	Reference	Reference	
41–65	0.92	0.59, 1.43	0.71
66–80	0.91	0.53, 1.56	0.73
> 80	0.85	0.38, 1.88	0.69
Acute Physiology and Chronic Health Evaluation II			
< 19	Reference	Reference	
19–24	0.94	0.63, 1.42	0.78
24–29	0.98	0.63, 1.55	0.95
> 29	0.64	0.38, 1.09	0.098
Tobacco	1.40	0.96, 2.06	0.08
Alcohol (two or more drinks per day)	1.18	0.69, 1.99	0.54
Neurologic condition ^a	0.86	0.52, 1.41	0.55
Cardiac disease ^b	1.33	0.64, 2.76	0.44
Randomization group ^c	0.94	0.68, 1.29	0.69
Coma ^d	0.55	0.25, 1.22	0.14
Renal replacement	1.05	0.63, 1.73	0.86
Physical restraint ^e	1.87	1.33, 2.63	0.0003
Total midazolam (1 mg increase) ^f	0.998	0.997, 1.0	0.049
Total fentanyl (0.1 mg increase) ^g	1.0	1.0, 1.0	0.87
Antipsychotic use in ICU	1.67	1.01, 2.77	0.047

Sedativa a delirium

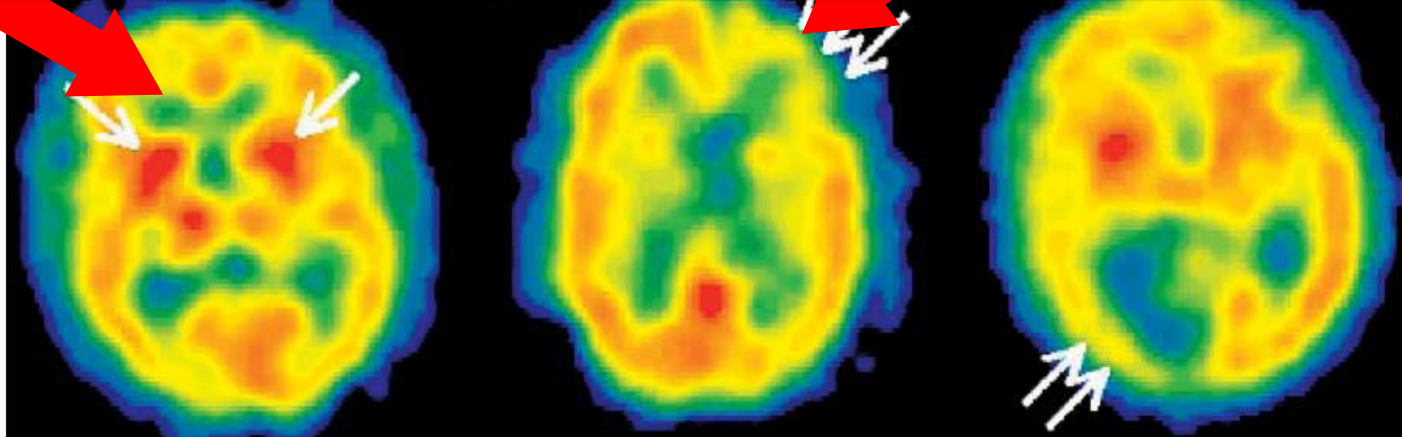
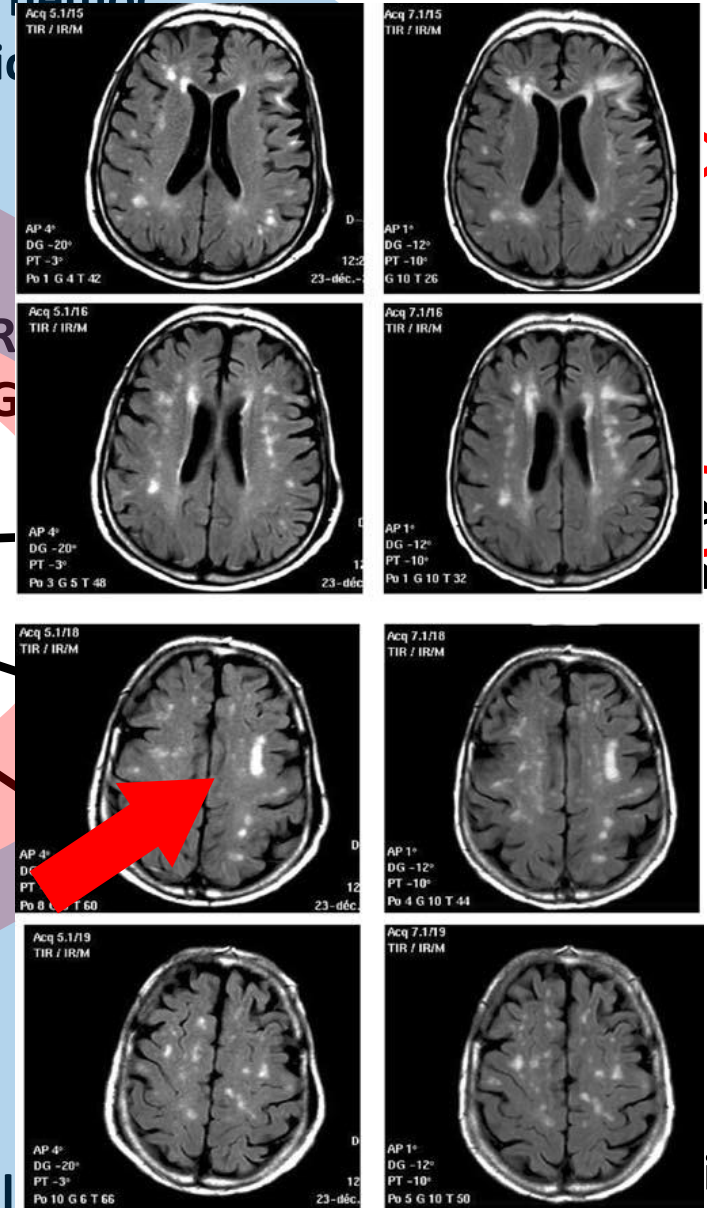
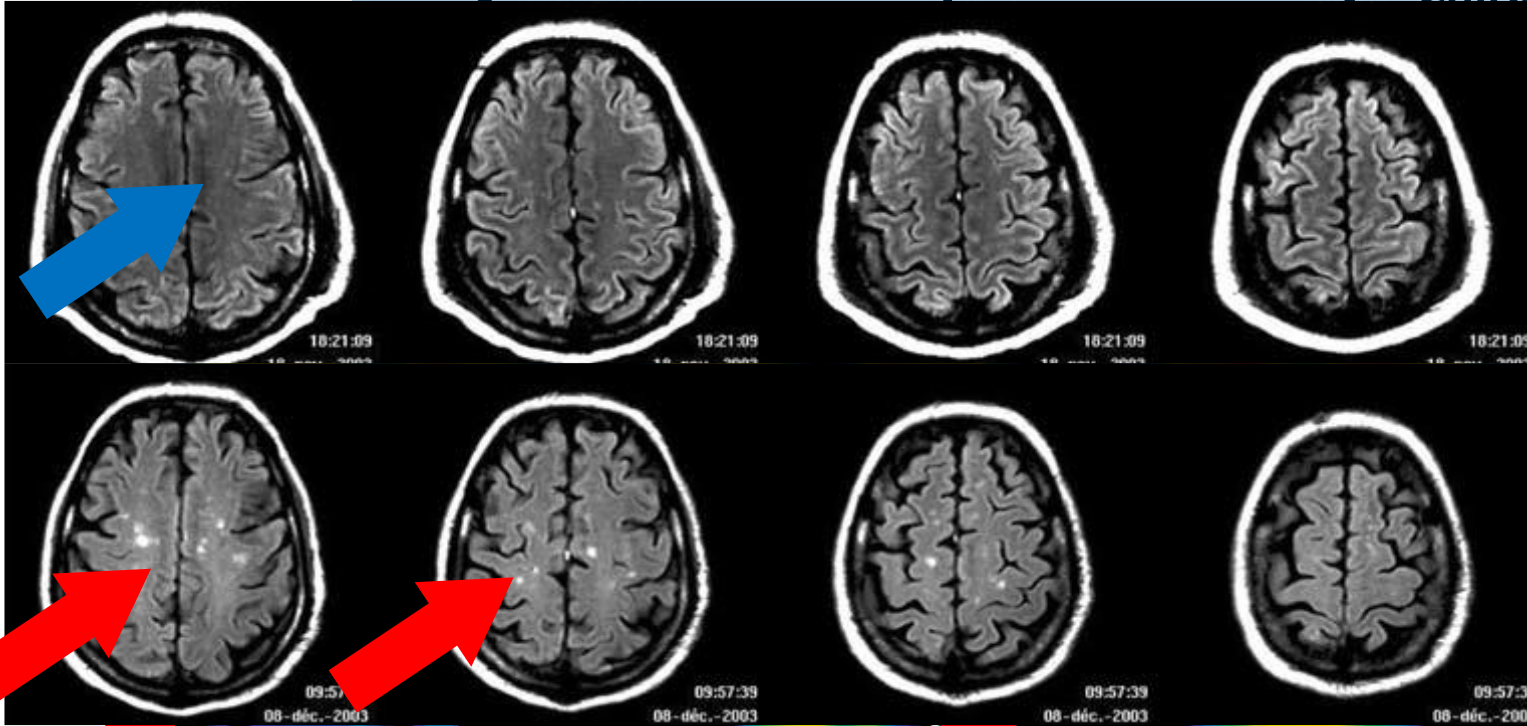


Medication	Transitioning to Delirium Only Odds Ratio (95% CI)	P Value
Lorazepam	1.2 (1.1–1.4)	0.003
Midazolam	1.7 (0.9–3.2)	0.09
Fentanyl	1.2 (1.0–1.5)	0.09
Morphine	1.1 (0.9–1.2)	0.24
Propofol	1.2 (0.9–1.7)	0.18

Medikace
CMP

Medikace
Odnětí alkoholu

Medikace
Kritická nemoc
Chirurgie



Interní onemocnění
Chirurgické onemocnění

Odnětí alkoholu

Cushingův syndrom
Operace

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Co si s tím počnu?



Děkuji za pozornost

A pojďme dál