



Réhabilitation après chirurgie orthopédique



Problématique de la réhabilitation postopératoire

Pourquoi et comment une intervention techniquement réussie peut-elle aboutir à un mauvais résultat fonctionnel ?

Kehlet, BJA 1997



Comment obtenir qu'une intervention techniquement réussie aboutisse à un bon résultat fonctionnel ?

Comment assurer une récupération rapide des fonctions altérées par l'intervention ?

Facteurs contribuant au retard de réhabilitation post-opératoire

- Immobilisation
- Nausées/vomissement/iléus
- Troubles du sommeil/fatigue
- Dysfonctions d'organe

Wilmore, BMJ, 2001

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Wilmore, BMJ, 2001

Conséquences de l'immobilité

- **Générales**

- Phlébites, embolies pulmonaires
- Encombrement bronchique
- Escarres de décubitus
- Augmentation de la fatigue postopératoire

- **Altérations portant sur un membre opéré**

- Contracture musculaire réflexe (quadriceps et chirurgie du genou)
- Atrophie musculaire
- Enraidissement articulaire
- Limitation de la flexion
- Fragilisation osseuse

Altérations précoces: 3-5 jours

➤ **Mobilisation = objectif prioritaire de la réhabilitation postopératoire** (Kehlet, BJA 1997; 78: 606-17)

Mobilisation précoce = Objectif prioritaire

- **Précocité de la mobilisation**

Utilisation d'un arthromoteur débutée à 30° et augmentée de 10°/jour

- Diminution hémarthrose post-opératoire
- Récupération plus rapide des amplitudes articulaires
- Marche plus rapide entre 6 et 10 jours : 36 vs 21 m
- Diminution de la durée d'hospitalisation : 11.7 vs 14.5 jours
- Moindre coût : 25891 vs 27762 \$
- Evolution fonctionnelle identique à 4 mois

Colwell Clin Orth 1992

Munin JAMA 1998

Facteurs contribuant au retard de réhabilitation post-opératoire

- Immobilisation

1. Douleur

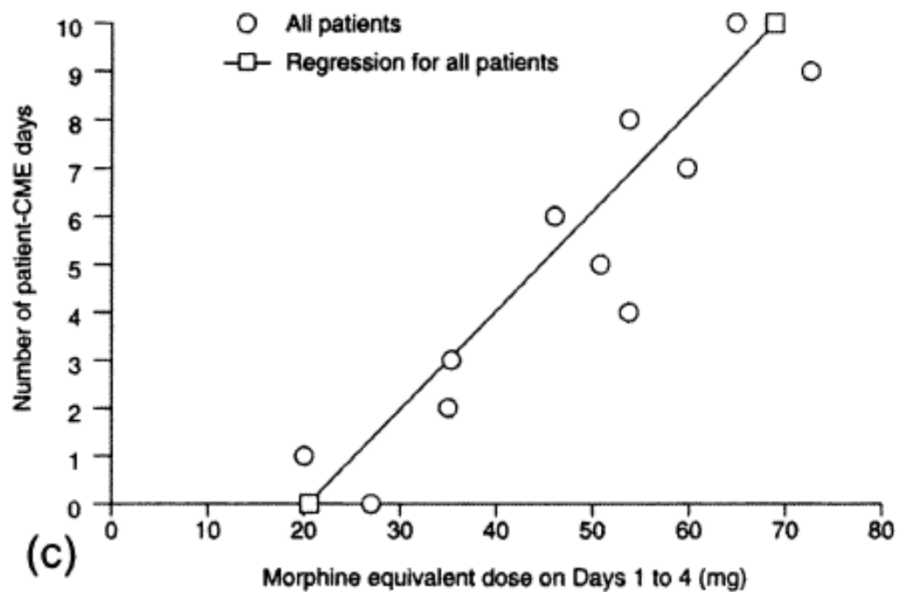
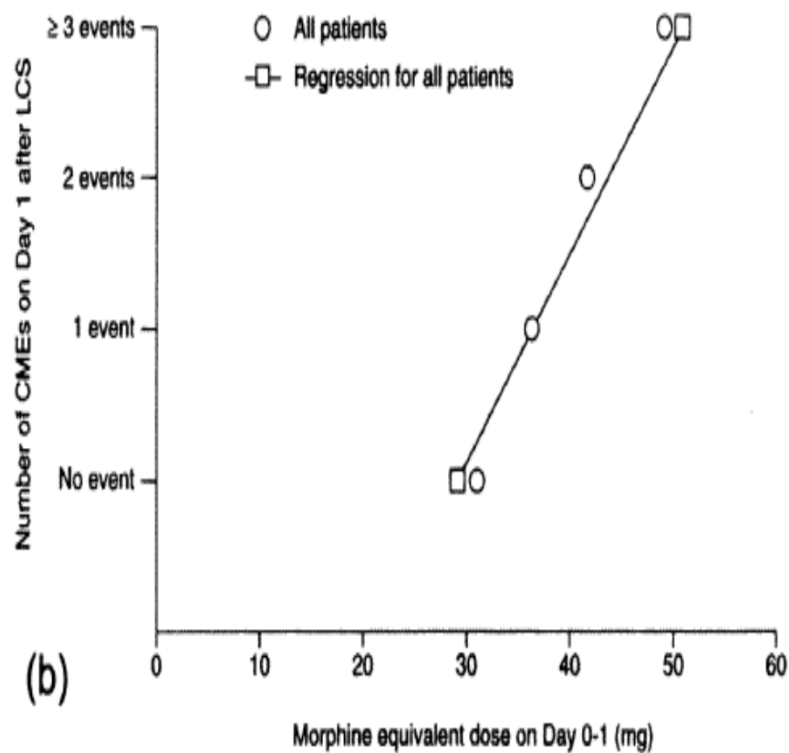
- Nausées/vomissement/iléus
- Troubles du sommeil/fatigue
- Dysfonctions d'organe

Wilmore, BMJ, 2001

Douleur

- Anesthésiste: Antalgiques systémiques, ALR
- Chirurgien: techniques chirurgicales, infiltrations
- Kiné: Cryothérapie, drainage
- IDE

Utilisation des morphiniques



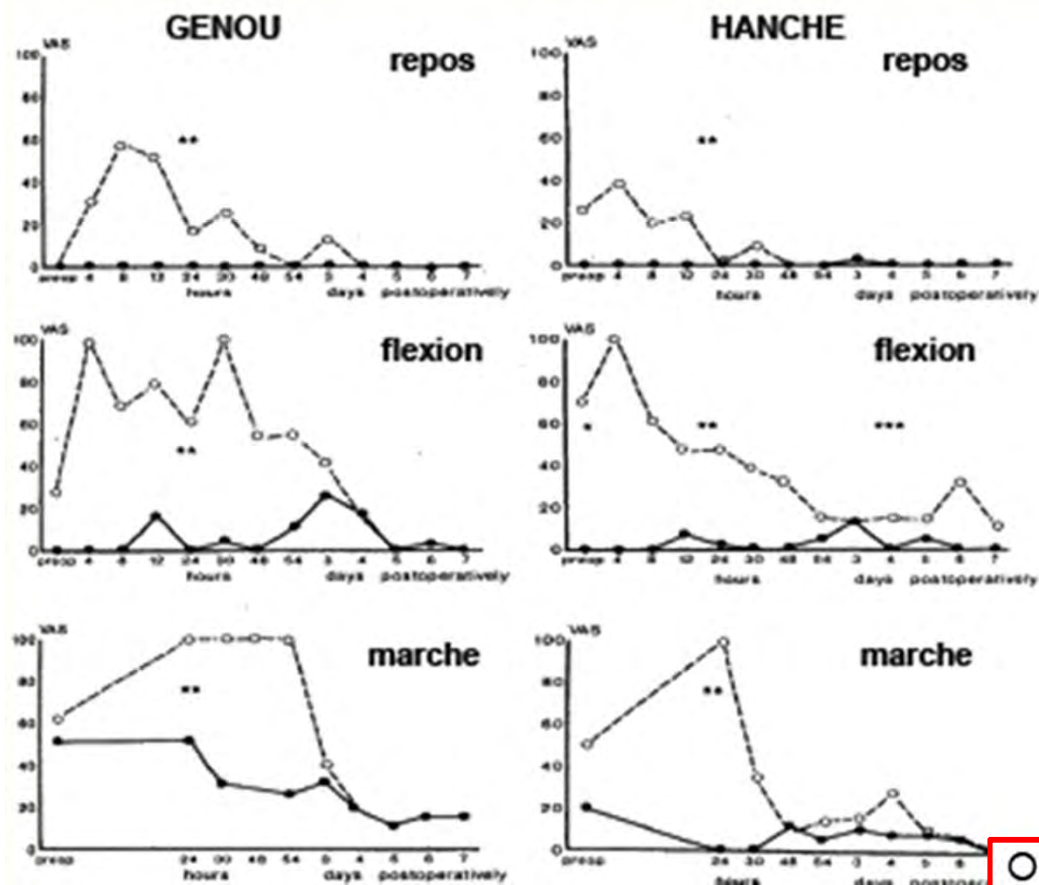
Zhao, Journal of pain and symptom management, 2004

opioid-sparing after hip surgery

Paracetamol	20-40%	Fischer hb , Anaesthesia 2005
Nefopam	35 %	du Manoir, Br J Anaesth 2004
NSAID	30-50 %	Fenton C , Drugs 2004
Ketamine	40 %	kapfer B ; Anesth Analg 2005

Analgesie multimodale!!!!!!!!!!!!!!

ALR et chirurgie prothétique



○ Morphine systémique
● APD Bupi 0,125%- morphine

Groupe ALR:

- Moins de douleur au repos
- Moins de douleur de mobilisation
- Pas plus de mobilisation!!!!

PTG: Single shoot + programme rééducation

- **30 patients, âge moyen 66 ans**
- **2 groupes :**
 - Bloc fémoral (Bupivacaïne 40 ml)
 - PCA morphine
- **Rééducation progressive :**
 - Marche : J1 = 10 pas, J2 = 30 pas, J3 = 60 pas
 - Flexion passive : J2 = 50-60°, J3 = 60-70°, J4 = 70-90°
- **Critères de sortie :**
 - Marche 80 pas
 - Flexion > 70°
 - EVA < 40 mm à la marche
 - Absence de complications

PTG: Single shoot + programme rééducation

➤ Bloc : meilleure analgésie à la mobilisation

	Bloc fémoral	PCA morphine	p
Durée de séjour (médiane, [extrêmes])	3 j [3-5]	4 j [3-6]	< 0,05
Marche 10 pas à J1	93 %	47 %	< 0,05
Degrés de flexion à J2 (médiane)	70 °	60 °	< 0,05
Nombre de pas à la sortie (moyenne ± dév.stand.)	166 ± 37	117 ± 24	< 0,05
Flexion à la sortie (médiane)	76 °	71 °	Non significatif

Les bénéfices d'un bloc par injection unique sont limités dans le temps

PTG: KT vs Single shot

	SFNB	CFNB	P Value
VAS _R			
4 h	2.6 (1.6)	2.1 (1.6)	NS
8 h	2.8 (1.4)	2.7 (1.3)	NS
12 h	2.4 (1.2)	2.4 (1.2)	NS
POD 1 _{AM}	3.3 (1.6)	1.7 (1.4)	0.002*
POD 1 _{PM}	3.8 (1.5)	1.7 (1.5)	0.0001*
POD 2 _{AM}	3.2 (1.1)	0.9 (1.3)	<0.0001*
POD 2 _{PM}	3.3 (1.8)	1.3 (1.4)	0.0004*
POD 3 _{AM}	2.6 (1.4)	1.7 (1.5)	0.06
VAS _{PT}			
POD 1	6.3 (1.9)	4.7 (1.7)	0.01*
POD 2	6.1 (1.5)	3.9 (1.9)	0.0005*

Groupe KT:

-moins de douleur à J1

-moins de douleur à J2

Table 4. Systemic Analgesic Requirements Through the Morning of POD 3

	SFNB	CFNB	P value
Morphine IV-PCA (mg)	25 (12)	16 (10)	0.02*
Oxycodone (mg)			
POD 1	40 (14)	15 (12)	<0.0001*
POD 2	43 (22)	20 (12)	0.0004*
POD 3	26 (19)	10 (6)	0.002*
Total	109 (39)	45 (20)	<0.0001*

Values are mean ($\pm$ SD).

* $P < 0.05$ significant.

CFNB = continuous femoral nerve block; SFNB = single-injection femoral nerve block; IV-PCA = IV patient-controlled analgesia; POD 1 = first day after surgery; POD 2 = second day after surgery; POD 3 = third day after surgery.

Salinas, Anesth Analg, 2006

PTG: KT vs Single shot

Table 5. Hospital Length of Stay, Intermediate and Long-Term Functional Outcome

	SFNB	CFNB
Hospital LOS (days)	3.9 (0.6)	3.8 (0.3)
6-wk Knee Flexion	102° (12)	108° (11)
12-wk Knee Flexion	113° (10)	117° (10)

Values are mean ($\pm$ SD). There were no significant differences between the two groups CFNB = continuous femoral nerve block; SFNB = single-injection femoral nerve block; LOS = length of stay in days including day of surgery, with discharge on the third day after surgery equivalent to a LOS of 4 days.

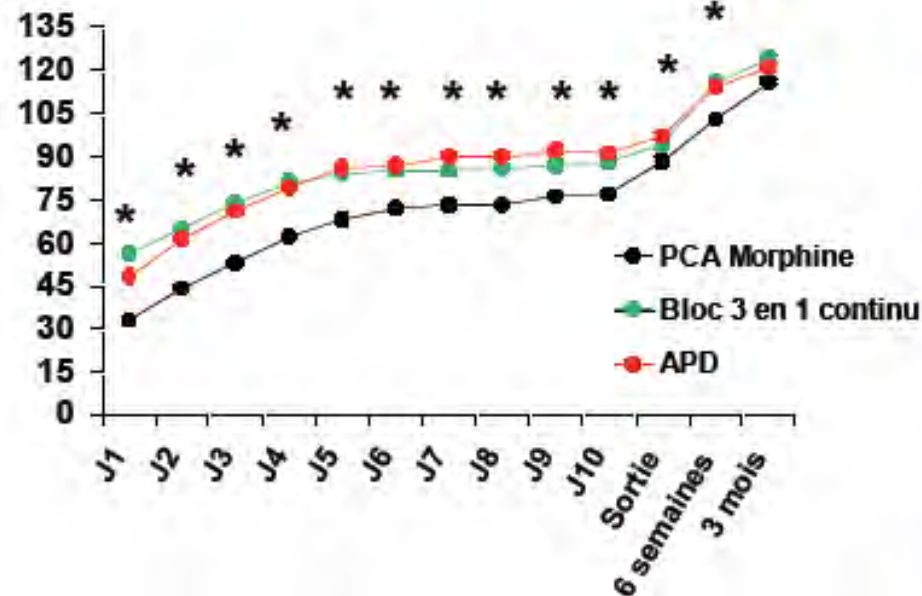
Groupe KT:

-moins de douleur à J1

-moins de douleur à J2

-aucune différence en
terme de réhabilitation

PTG: KT + programme rééducation



- ✓ 3 groupes de 15 patients
- ✓ Analgésie pendant 48 heures
- ✓ Mobilisation passive continue en postopératoire immédiat, pendant 72 heures
- ✓ A partir de J1 : mobilisation active assistée par kiné
- ✓ Patients encouragés rester hors du lit le plus possible

ALR continue + programme de rééducation: bénéfice sur réhabilitation

PTG: KT + programme rééducation

- **56 patients, 18-75 ans, chirurgie majeure du genou (Prothèses)**
- **Analgésie postopératoire pendant 48 heures :**
 - ✓ PCA morphine
 - ✓ Ou APD : lidocaïne continue $\pm$ bolus morphine
 - ✓ Ou Cathéter fémoral continu : lidocaïne + clonidine + morphine
- **Antalgiques associés : paracétamol, kétoprofène $\pm$ morphine SC**
- **Mobilisation :**
 - ✓ Arthromoteur 12 heures/jour à partir de J1
 - ✓ Augmentation progressive de la flexion : 40° à J1, 50° à J2, ...
- **Sortie à J7 puis centre de rééducation jusqu'à flexion à 110°**

PTG: KT + programme rééducation

Objectif de flexion de 50° à 48 heures : Atteint uniquement sous ALR

		PCA morphine	Cath. fémoral	APD
Flexion (degrés)	J 5	60 (50 - 70) *	80 (65 - 85)	85 (75 - 100)
	J 7 (sortie)	80 (65 - 90) *	90 (70 - 95)	90 (75 - 100)
En médiane	1 mois	90 (85 - 100)	95 (95 - 100)	105 (100 - 120)
(25^e -75^e percentile)	3 mois	125 (100 - 125)	125 (100 - 125)	130 (115 - 130)

* = p < 0,05 PCA vs technique d'ALR

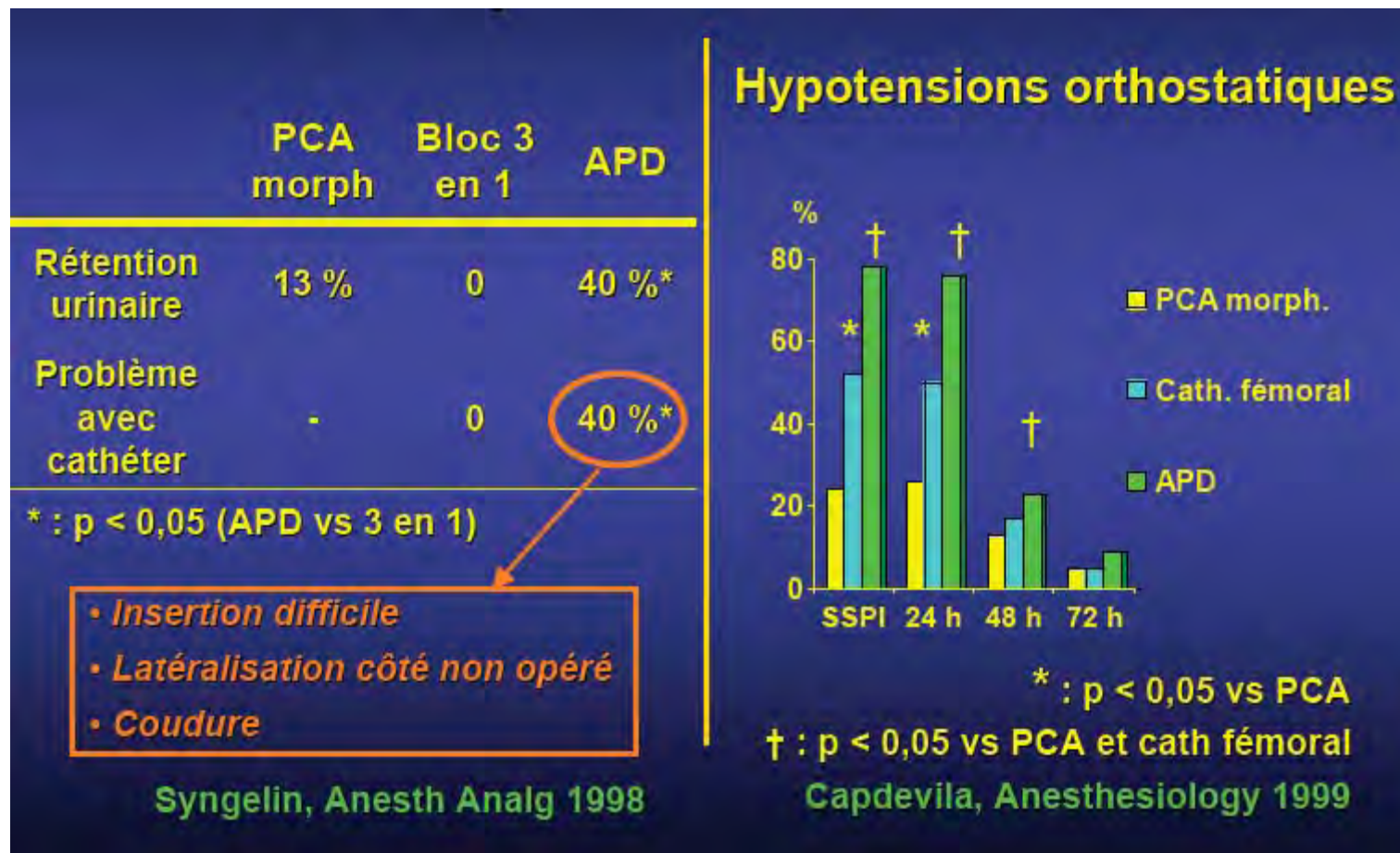
**Durée de séjour en centre
de rééducation (jours)**

En médiane (extrêmes)

PCA morphine	50 (30-80) *
Analgesie péridurale	37 (30-45)
Cathéter fémoral	40 (31-60)

* = p < 0,05 PCA vs technique d'ALR

Pourquoi la péridurale a été oubliée?

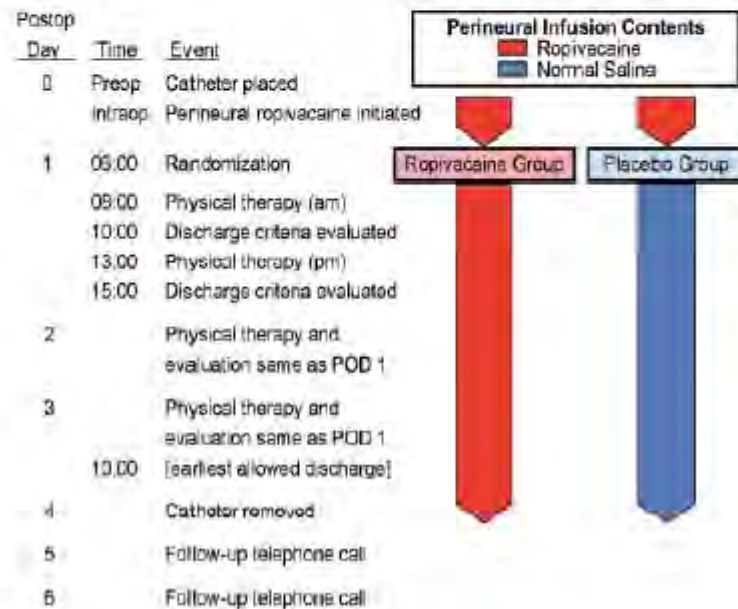


Ambulatory Continuous Femoral Nerve Blocks Decrease Time to Discharge Readiness after Tricompartment Total Knee Arthroplasty

Anesthesiology 2008; 108:703-15

A Randomized, Triple-masked, Placebo-controlled Study

Brian M. Ilfeld, M.D., M.S.,* Linda T. Le, M.D.,† R. Scott Meyer, M.D.,‡ Edward R. Mariano, M.D.,§ Krista Vandembome, Ph.D., P.T.,|| Pamela W. Duncan, Ph.D., P.T.,# Daniel L. Sessler, M.D.,** F. Kayser Enneking, M.D.,†† Jonathan J. Shuster, Ph.D.,‡‡ Douglas W. Theriaque, M.S.,§§ Linda F. Berry, R.N.,||| Eugene H. Spadoni, P.T.,## Peter F. Gearen, M.D.,***



A 0.2% ropivacaine infusion was initiated *via* the femoral catheter with a basal rate of 8 ml/h, a patient-controlled bolus dose of 4 ml and a lockout of 30 min.

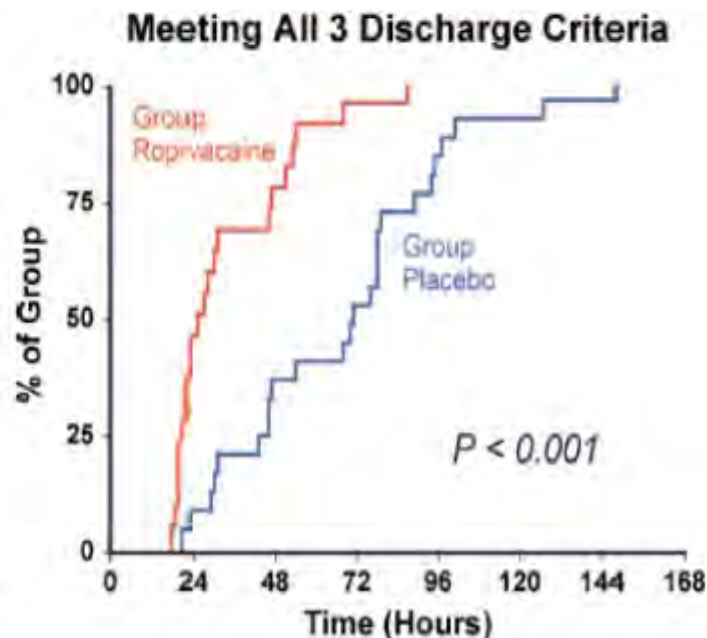
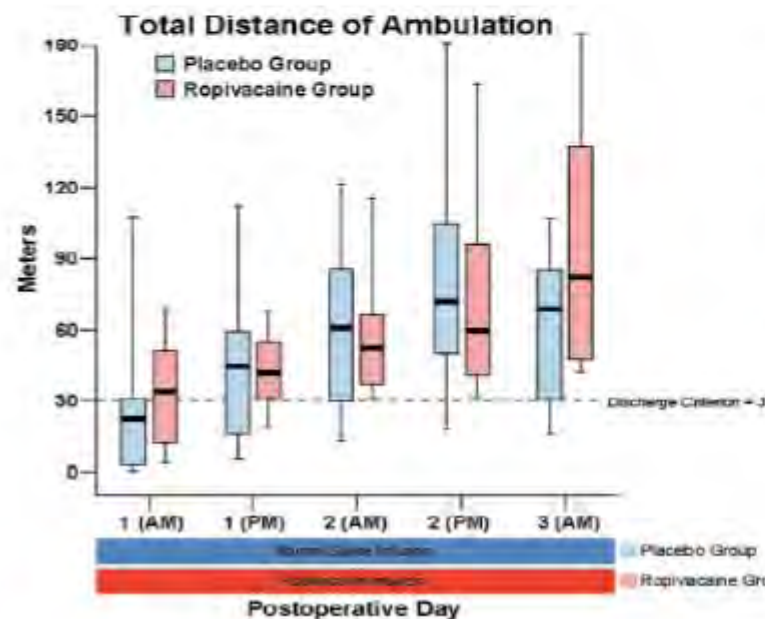
At 18:00 on POD 2 (36 h after randomization), a portable infusion pump (Pain Pump 2 Blockaid; Stryker Instruments, Kalamazoo, MI) containing 400 ml of the same study solution (basal 5 ml/h regardless of previous basal rate, bolus 4 ml, lockout 60 min) replaced the previous infusion pump.

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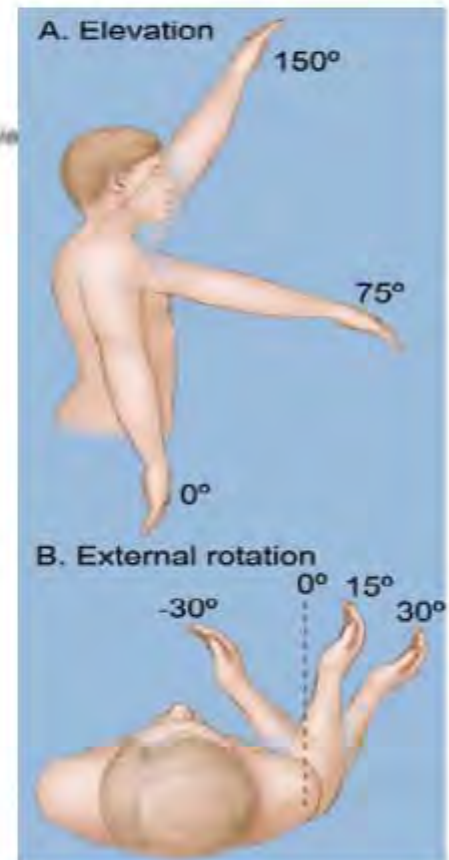
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Ambulatory Continuous Interscalene Nerve Blocks Decrease the Time to Discharge Readiness after Total Shoulder Arthroplasty

A Randomized, Triple-masked, Placebo-controlled Study

Brian M. Lofeld, M.D., M.S.,* Krista Vandenberg, Ph.D., P.T.,† Pamela W. Duncan, Ph.D., P.T.,‡ Darin F. Kayser Enneking, M.D.,|| Jonathan J. Shuster, Ph.D.,# Douglas W. Theriaque, M.S.,**
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Que faire? Analgésie

Réhabilitation à domicile : Quelle Analgésie ?

- Développement actuel : chirurgie en ambulatoire ou hospitalisation courte (Wilmore-Kehlet, BMJ 2001)
- A domicile : Douleurs sévères, perte du bénéfice de la réhabilitation initiale couverte par analgésie efficace
- Entretien d'analgésie par voie locorégionale à domicile ?
 - Chirurgie orthopédique, cathéters péri-nerveux :
 - ✓ Itfeld, Anesthesiology 2002
 - ✓ Rawal, Anesthesiology 2002
 - ✓ White, Anesth-Analg 2003
 - ✓ Capdevila, Anesth Analg 2003
 - Autres chirurgies : à développer



Le KT est-il la solution idéale????

- KT = 1 tuyau de plus!!!!
- Advujants????????????????



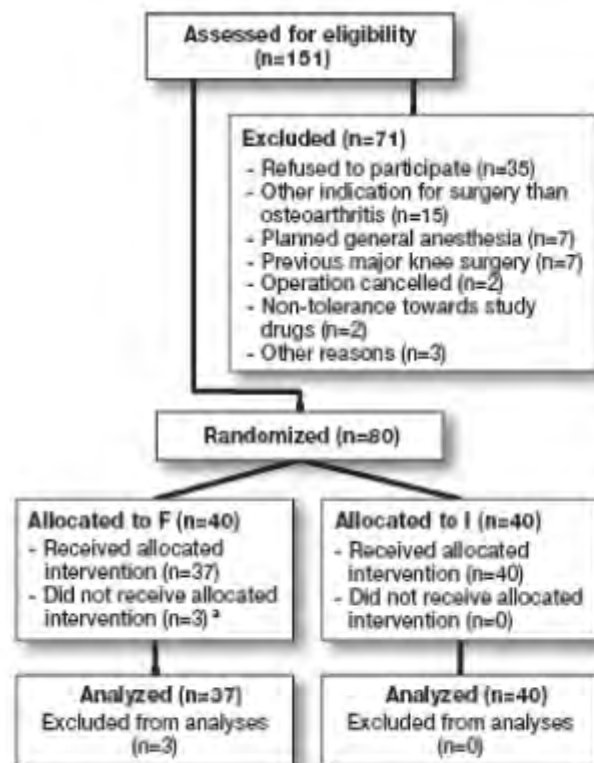
Existe-t-il une alternative à l'ALR?

Comparison of peri- and intraarticular analgesia with femoral nerve block after total knee arthroplasty

A randomized clinical trial

Acta Orthopaedica 2007; 78 (2): 172–179

Karen Toftdahl¹, Lone Nikolajsen¹, Viggo Haraldsted¹, Frank Madsen², Else K Tonnesen¹ and Kjeld Soballe²



Bloc F:

20 mL ropivacaine (10 mg/mL) was injected through the needle (after negative aspiration test for blood) and subsequently a 20-gauge catheter was introduced 4–8 cm into the femoral sheath. In the recovery room, the femoral nerve catheter was connected to an infusion pump, and 10 mL/h ropivacaine (2 mg/mL) was infused for 48 h. If needed, a bolus of 20 mL could be given through the pump once every 8 h. 4 mg morphine (0.4 mg/mL) and 50 mg bupivacaine (5 mg/mL) was given intraarticularly through the drain after skin closure.

Intra A:

Extensive infiltration of the surgical site with a solution of 150 mL ropivacaine (2 mg/mL), 1 mL ketorolac (30 mg/mL), and 1 mL epinephrine (0.5 mg/mL). The solution was given in 3 × 50 mL syringes. The first 100 mL was given after cementing of the modular prosthesis, before installing the polyethylene part: 50 mL into the posterior part of the capsule and in the intercondylar area and 50 mL into the anterior part of the capsule, the collateral ligaments, and along the femur and tibia.

After closure of the capsule, the remaining 50 mL was infiltrated into the subcutaneous tissue. At 10 p.m. or the day of surgery, a solution of 20 mL ropivacaine (10 mg/mL), 1 mL ketorolac (30 mg/mL), and 1 mL epinephrine (0.5 mg/mL) was injected into the intraarticular catheter. A second dose was given the following morning, 30 min before physiotherapy or at 10 a.m. at the latest. The catheter was removed immediately after the second bolus.

Existe-t-il une alternative à l'ALR?

Outcome	Group F	Group I	P-value
Number of patients reporting pain scores ≥ 3 from surgery to the evening of POD 1 ^a (9 measurements in all), n/N ^b			
0–2 times	25/37	28/38	0.06
3–5 times	11/37	7/38	
6–9 times	1/37	3/38	
Median pain score (NRS) when worst during physical therapy (IQR ^c), N			
POD 1	5.0 (3–7), 35	3.0 (1–5), 38	0.001
POD 2	4.5 (2–6), 34	4.0 (3–6), 37	0.7
Mobilization POD 1			
Able to walk > 3 meters, n/N	7/37	29/39	< 0.001
Able to hold quadriceps tension for > 5 sec, n/N	18/36	30/37	0.002
Median extension defect (IQR), N	10° (5–15), 37	5° (0–10), 40	0.008
Flexion > 90°, n/N	18/37	24/39	0.3
Mobilization POD 2			
Able to walk > 3 meters, n/N	25/36	35/39	0.02
Able to lift leg for > 5 sec, n/N	22/36	31/37	0.01
Median extension defect (IQR), N	5° (0–10), 37	5° (0–10), 39	0.2
Flexion > 90°, n/N	17/36	24/40	0.5

Existe-t-il une alternative à l'ALR?

British Journal of Anaesthesia 105 (2): 185–95 (2010)
Advance Access publication 14 June 2010 - doi:10.1093/bja/aeq112

BJA

PAIN

Analgesia and functional outcome after total knee arthroplasty: periarticular infiltration vs continuous femoral nerve block

F. Carli^{1*}, A. Clemente¹, J. F. Asenjo¹, D. J. Kim¹, G. Mistraretti³, M. Gomarasca³, A. Morabito⁴ and M. Tanzer²

-40 subjects undergoing TKA were enrolled in this RCT receiving 48 h postop analgesia with either periarticular infiltration of LA (group I) or continuous femoral nerve block (group F)

-Breakthrough pain relief was achieved with PCA morphine

-Early (POD 1-3) and late (6 weeks) functional walk capacity, degree of physical activity, health-related quality of life and clinical indicators of knee function were measured



Figure 1. Infiltration of the anterior part of the capsule.

Existe-t-il une alternative à l'ALR?

Results (1)

Table 2 Rescue analgesic morphine and pain intensity presented as median (IQR). Morphine consumption values were transformed into normal distributions and analysed with repeated-measures regressions for general linear models. NRS comparisons were made by repeated-measures Poisson's regressions. NRS, numeric rating scale; POD, postoperative day

Variables	Periarticular infiltration (n=20)	Femoral block (n=20)	P-value between groups
Patient-controlled analgesia (morphine mg)			
POD1	26.0 (13.0–43.0)	14.5 (6.5–31.1)	0.02
POD2	22.5 (11.0–33.5)	12.0 (2.5–26.0)	
P-value within groups	<0.01		

Table 3 Early functional outcomes reported as mean (s.d.) or median (IQR), according to the raw variable distribution. All non-normally distributed variables were transformed into normal distributions for analysis. All comparisons were made by repeated-measures regressions for general linear models. POD, postoperative day

Variables	Periarticular infiltration (n=20)	Femoral block (n=20)	P-value between groups
2 min walking test (m)			
POD1	14.7 (6.2)	11.2 (7.7)	0.27
POD2	21.8 (9.5)	19.1 (12.5)	
POD3	30.6 (12.3)	26.9 (15.6)	
P-value within groups	<0.01		

Table 4 Late functional outcomes presented as mean (SD) or median (IQR). Comparisons were made by Student's t-test or Wilcoxon's rank sum test, when appropriate. Tests for matched data were used for within-group analysis, whereas tests for unmatched data were used between groups. CHAMPS, Community Health Activities Model Program for Seniors; SF-12, short-form health-related quality of life; PCS, physical component summary; MCS, mental component summary; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index.

Variables	Periarticular infiltration (n=20)	Femoral block (n=20)	P-value between groups
6 min walk test (m)			
Preoperative	229.0 (89.3)	231.6 (81.3)	0.93
6 weeks	248.0 (87.4)	267.5 (82.3)	0.48
P-value within groups	0.38	0.01	
CHAMPS (kcal kg ⁻¹ week ⁻¹)			
Preoperative	20.4 (4.9–49.2)	23.0 (7.9–46.1)	0.59
6 weeks	29.5 (16.3–56.9)	54.2 (13.4–89.3)	0.28
P-value within groups	0.19	0.03	
SF-12			
Preoperative PCS	30 (26–35)	32 (27–36)	0.37
6 weeks PCS	42.4 (11.1)	43.2 (8.9)	0.79
P-value within groups	0.01	0.01	
Preoperative MCS	51.6 (11.4)	51.2 (10.9)	0.92
6 weeks MCS	57 (48–61)	56 (53–58)	0.79
P-value within groups	0.33	0.11	
Knee Society evaluation			
Preoperative	92.2 (24.0)	95.3 (27.4)	0.71
6 weeks	137.7 (33.7)	156.6 (24.2)	0.05
P-value within groups	0.01	<0.01	
WOMAC			
Preoperative	53.7 (14.7)	52.0 (13.6)	0.71
6 weeks	28.0 (14.2)	19.7 (10.6)	0.04
P-value within groups	<0.01	<0.01	
Maximal knee movement (°)			
Preoperative extension	5 (0–11)	10 (0–10)	0.80
6 weeks extension	0 (0–1)	0 (0–0)	0.40
P-value within groups	0.02	0.01	
Preoperative flexion	116 (111–120)	117 (110–120)	0.94
6 weeks flexion	107 (98–114)	110 (105–118)	0.15
P-value within groups	<0.01	0.49	

Conclusions

Continuous femoral block provided superior analgesia over the periarticular infiltration of high volume of local anaesthetics and was associated with more favourable recovery of walking capacity, physical activity, and knee function.

Carli F et al. Br J Anaesth 2010

Analgésie Kiné

Effet d'un programme **postopératoire** ?

Cryothérapie, « Drainage » Ibrahim T et al, Knee 2005 ;12(1):21-3.

- réduction inflammation et hématome
- vasoconstriction locale => métabolisme réduit
- analgésie par effet inhibiteur thermique
- comment l'appliquer ?

Barry S et al, Physiother Res Int 2003;8(3):111-20

Stimulation Electrique Transcutanée

- **résultat négatif**

Breit R et al, J Arthroplasty 2004 ;19(1):45-8

Facteurs contribuant au retard de réhabilitation post-opératoire

- Immobilisation

1. Douleur
2. Anémie

- Nausées/vomissement/iléus

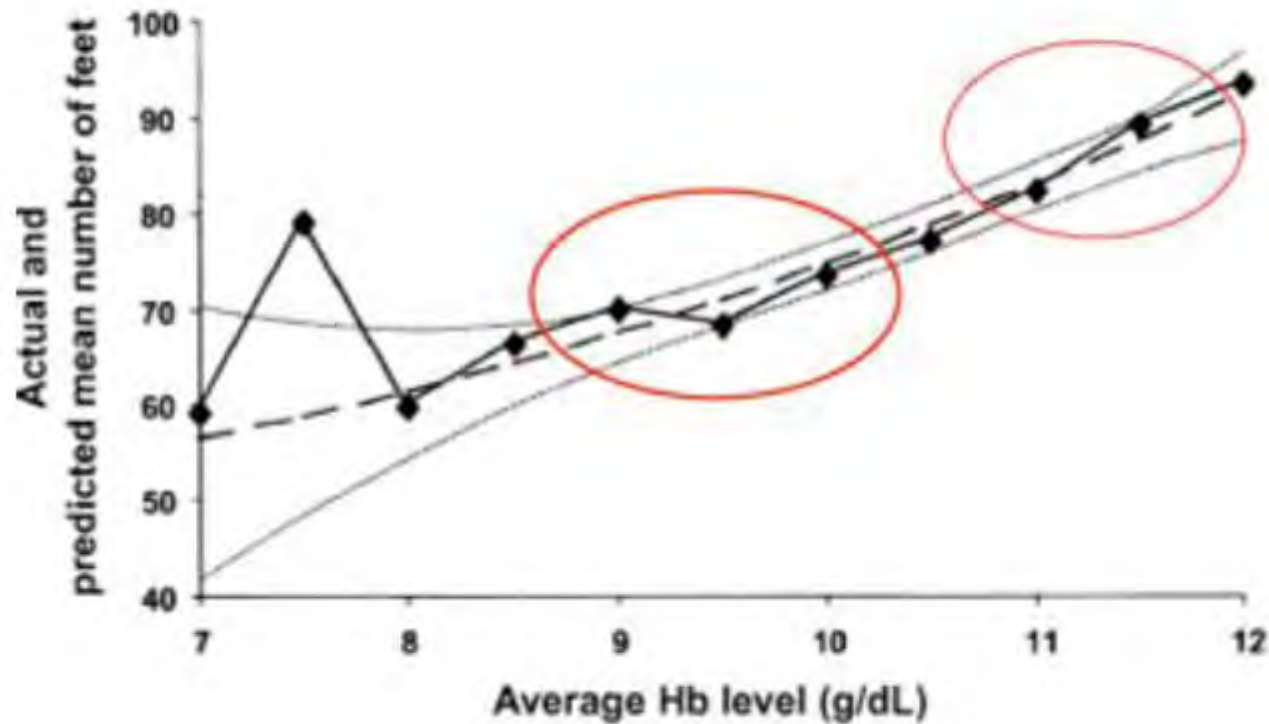
- Troubles du sommeil/fatigue

- Dysfonctions d'organe

Wilmore, BMJ, 2001

Mobilisation, puisqu'on en parle!!

Réhabilitation : hémoglobine



Lawrence VA et al , Transfusion 2003

Role of preoperative anemia for risk of transfusion and postoperative morbidity in fast-track hip and knee arthroplasty

TABLE 4. Multivariate logistic regression models displaying adjusted risk estimates of LOS of more than 5 days or readmission within 90 days in preoperative anemic patients before and after adjusting for RBC transfusion during primary admission

Characteristic	Number (%)	Readmission < 90 days			LOS > 5 days		
		Number of events (%)	Adjusted OR (95% CI)	p value	Number of events (%)	Adjusted OR (95% CI)	p value
Model 1*							
Preoperative anemia							
Yes	662 (13)	85 (13)	1.4 (1.1-1.8)	<0.05	90 (14)	2.5 (1.9-3.4)	<0.001
No	4503 (87)	351 (8)	1 (reference)		199 (4)	1 (reference)	
Model 2†							
Preoperative anemia							
Yes	662 (13)	85 (13)	1.1 (0.8-1.5)	0.48	90 (14)	1.1 (1.0-2.0)	0.03
No	4503 (87)	351 (8)	1 (reference)		199 (4)	1 (reference)	
RBC transfusion							
Yes	572 (11)	107 (19)	2.2 (1.7-2.9)	<0.001	143 (25)	6.9 (5.9-9.3)	<0.001
No	4593 (89)	329 (7)	1 (reference)		146 (3)	1 (reference)	
Stratified by RBC transfusion‡							
RBC transfusion							
Preoperative anemia	209				56 (27)	0.9 (0.6-1.5)	0.78
No preoperative anemia	363				87 (24)	1 (reference)	
No RBC transfusion							
Preoperative anemia	453				34 (8)	2.3 (1.5-3.6)	<0.001
No preoperative anemia	4140				112 (3)	1 (reference)	

* Adjusted for preoperative risk factors with a univariate significance level of less than 0.25.

† Extended model adjusted for preoperative risk factors plus RBC transfusion during primary admission.

‡ Significant interaction for RBC transfusion and anemia for LOS of more than 5 days (p = 0.01).

Preoperative use of epoietin beta in total hip replacement: a prospective study

Day	Low Hb + EPO group	
	Hb	Ht
D ₋₃₀	120 ± 8 (99–129)	–
D ₋₁	149 ± 13 (123–176)	45.6 ± 3.4 (40.3–53.3)
D ₊₁	111 ± 10 (91–138)	33.8 ± 3.2 (28.3–40.9)
D ₊₅	107 ± 10 (88–136)	32.9 ± 3 (28.4–40.8)

Facteurs contribuant au retard de réhabilitation post-opératoire

- Immobilisation

1. Douleur
2. Anémie
3. menottes

- Nausées/vomissement/iléus

- Troubles du sommeil/fatigue

- Dysfonctions d'organe

Wilmore, BMJ, 2001

Mobilisation, puisqu'on en parle!!

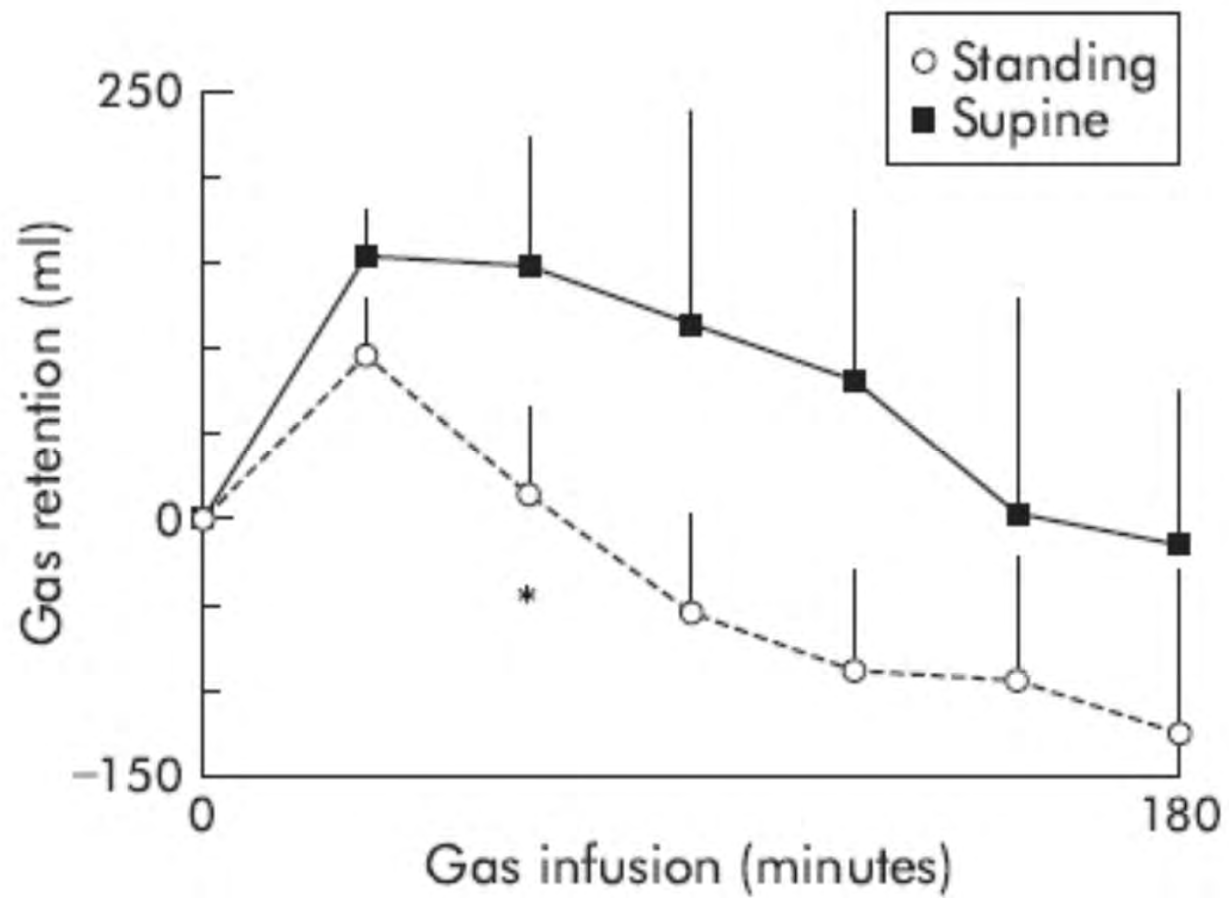
- Redons, drains
- Ablation sonde urinaire
- Ablation VVP dès que possible
- Intérêt des adjuvants
- Descoper si possible



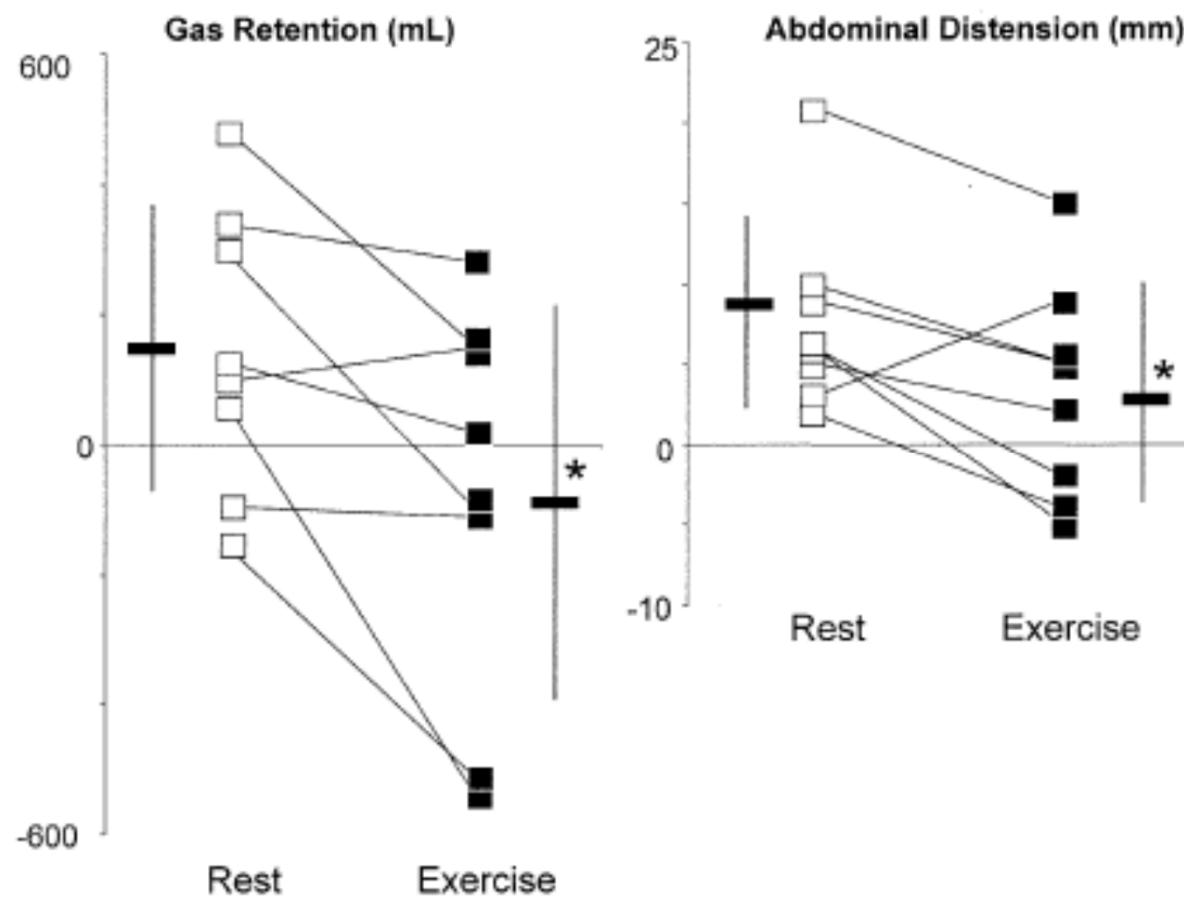
Facteurs contribuant au retard de réhabilitation post-opératoire

- Immobilisation
- Nausées/vomissement/iléus
 - 1. Mobilisation
 - 2. Epargne morphinique
- Troubles du sommeil/fatigue
- Dysfonctions d'organe

Wilmore, BMJ, 2001



Dainese, Gut, 2003

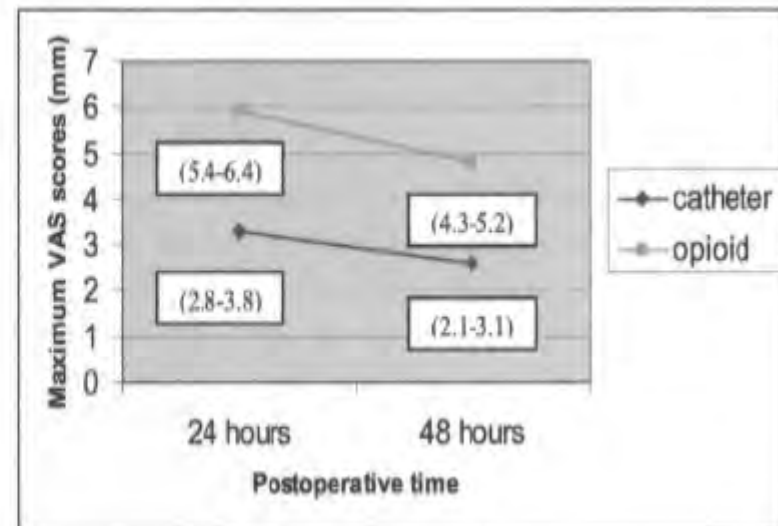
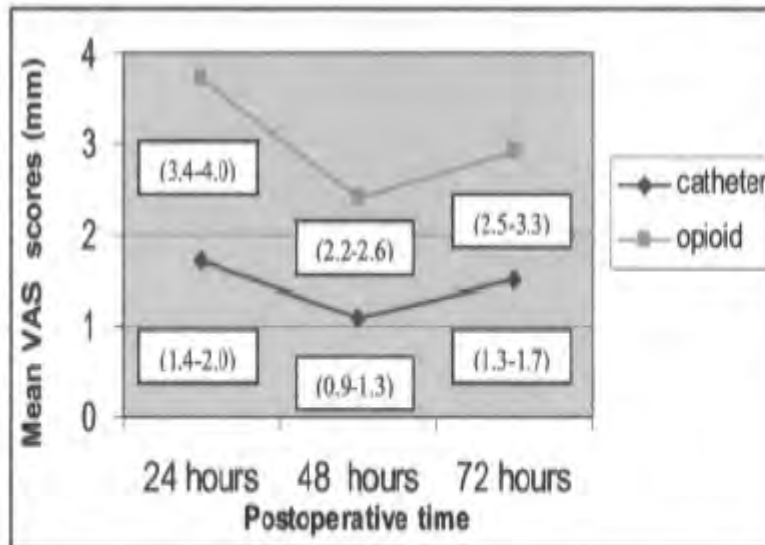


Dainese, Am J Med, 2004

Does Continuous Peripheral Nerve Block Provide Superior Pain Control to Opioids? A Meta-Analysis

Jeffrey M. Richman, MD*, Spencer S. Liu, MD†, Genevieve Courpas, BA*, Robert Wong, MD*, Andrew J. Rowlingson, BA*, John McGready, MS†, Seth R. Cohen, BSc, and Christopher L. Wu, MD*

Nineteen articles; 603 patients



Does Continuous Peripheral Nerve Block Provide Superior Pain Control to Opioids? A Meta-Analysis

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Table 6. Side Effects

Side effects	Catheter	Opioid	P value	Odds ratio	NNT
Nausea/vomiting	38/182 (20.9%)	95/195 (48.7%)	<0.001	0.28	4
Sedation	12/45 (26.7%)	23/44 (52.3%)	<0.012	0.33	4
Pruritus	11/113 (9.7%)	29/109 (26.6%)	<0.001	0.30	6
Sensory/motor block	22/70 (31.4%)	9/60 (15.0%)	<0.023	0.39	

Facteurs contribuant au retard de réhabilitation post-opératoire

- Immobilisation
- Nausées/vomissement/iléus
- Troubles du sommeil/fatigue
- Dysfonctions d'organe

Wilmore, BMJ, 2001

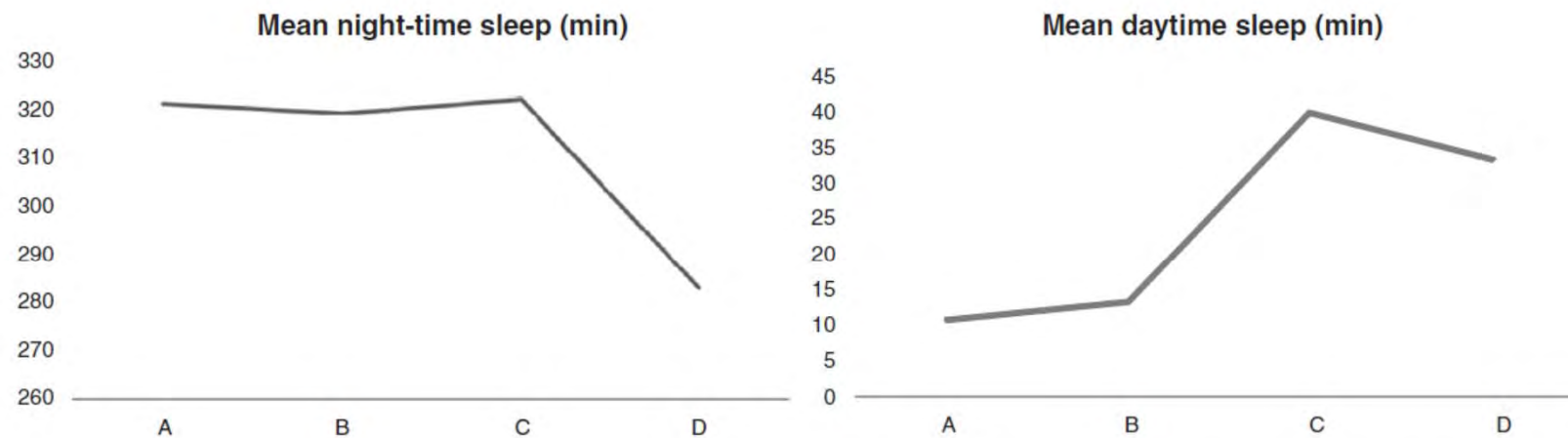
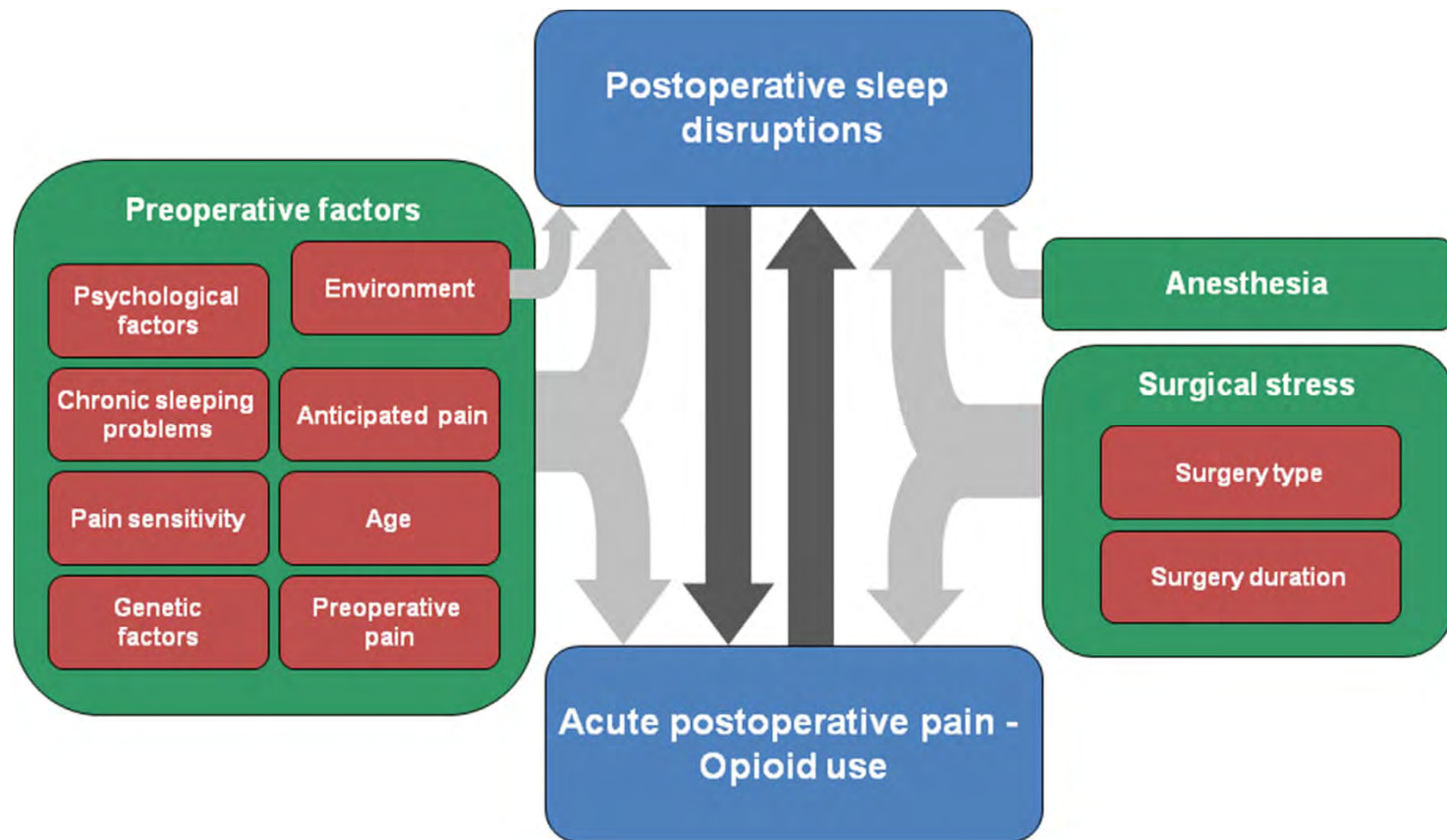


Fig. 2. Development of activity, pain and sleep parameters according to time periods; preoperatively (A), during hospitalisation (B), about 4 days postoperatively at home (C), about 6 days postoperatively at home (D).

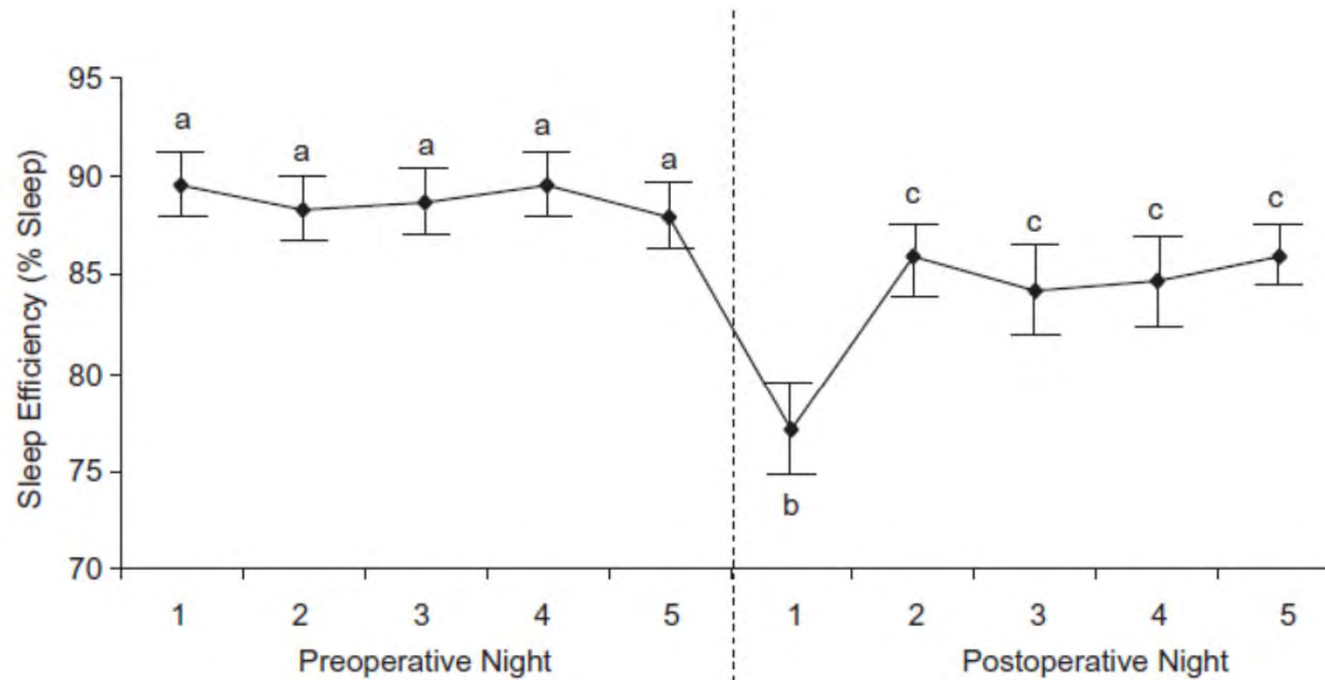
Facteurs contribuant au retard de réhabilitation post-opératoire

- Immobilisation
- Nausées/vomissement/iléus
- Troubles du sommeil/fatigue
 - 1. Douleur
 - 2. Mobilisation
 - 3. Anxiété
- Dysfonctions d'organe

Wilmore, BMJ, 2001



Chouchou, Sleep Medicine reviews, 2013



Note. Different subscripts indicate significant differences at $p < 0.001$; Children spent post-operative night 1 in hospital

Maclaren, Journal of Pediatric Psychology, 2008

	Whole sample <i>n</i> = 55	No sleep decrement <i>n</i> = 38	Sleep decrement <i>n</i> = 17
Child age	8.05 (1.79)	7.87 (1.77)	8.47 (1.77)
Presurgery sleep efficiency	88.79 (5.57)	88.12 (5.72)	90.29 (5.07)
Hours spent in bed (outside nighttime)	5.21 (2.68)	5.44 (2.89)	4.69 (2.13)
Child temperament (EAS)			
Emotionality	11.28 (3.86)	11.11 (3.42)	11.64 (4.76)
Activity	14.02 (4.54)	13.86 (4.20)	14.35 (5.35)
Sociability	18.85 (2.57)	19.37 (2.53)	17.71 (2.31)**
Child anxiety (m-YPAS)			
Holding	29.24 (12.01)	30.91 (13.55)	25.61 (6.70)
Induction	33.45 (16.19)	26.96 (10.0)	36.52 (17.71)**
Parent anxiety (STAI)			
Trait	37.11 (6.51)	37.03 (6.45)	37.31 (6.88)
State in holding	38.61 (10.09)	38.06 (10.23)	39.75 (10.02)
Pain			
Parent-report (PPMP nights 2–5)	5.48 (2.44)	4.84 (2.01)	6.88 (2.74)**
Child report (Oucher nights 2–5)	16.68 (8.14)	16.39 (8.22)	17.32 (8.17)
Medication administration inpatient (mg/kg morphine, night 1)	14.89 (8.67)	16.32 (9.54)	11.86 (5.59)
Medication administration at home (mg/kg tylenol nights 2–5)	8.40 (7.51)	7.74 (7.59)	9.88 (7.36)

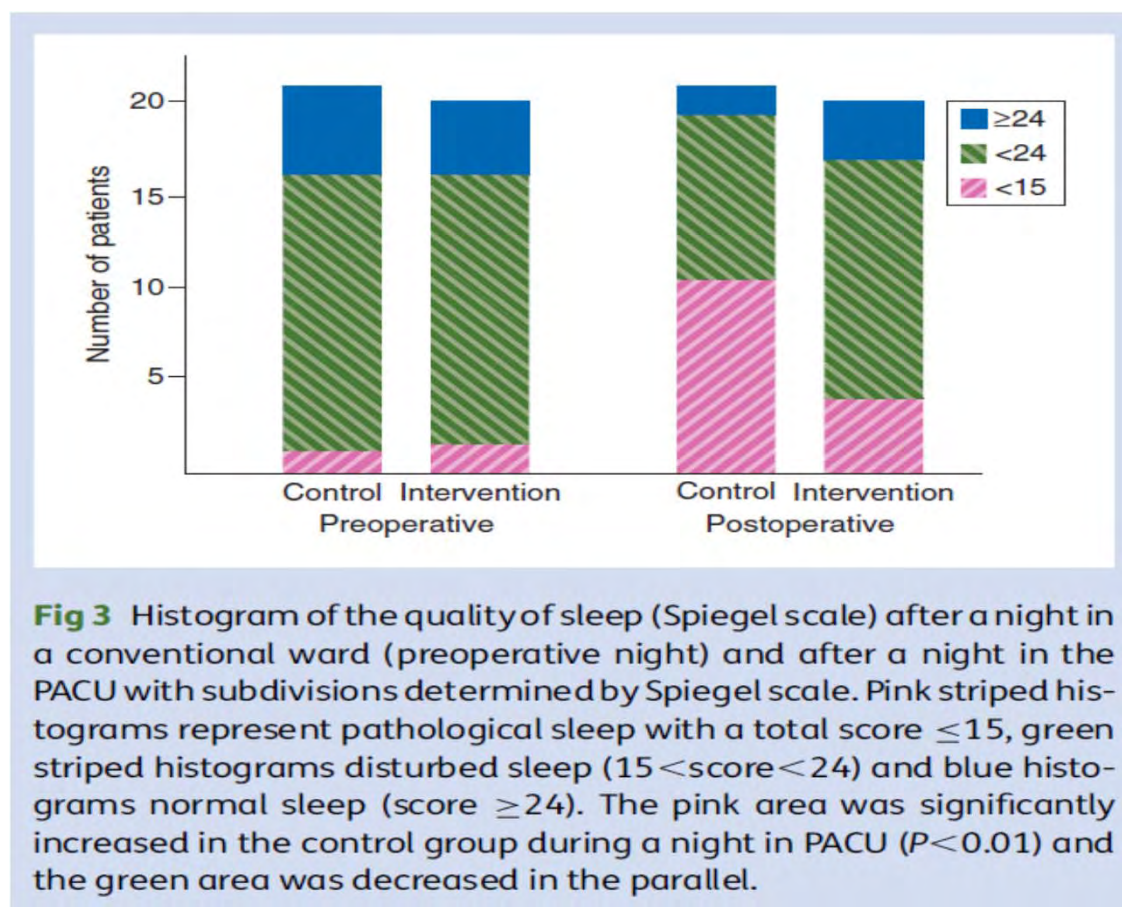
Maclaren, Journal of Pediatric Psychology, 2008

Effet d'un programme de rééducation **préopératoire** sur le postopératoire ?

- Réduction anxiolyse *Ackerman IN et al, Aust J Physiother 2004;50:25-30*
Cochrane Database Syst Rev. 2004;(1):CD003526

Earplugs and eye masks vs routine care prevent sleep impairment in post-anaesthesia care unit: a randomized study

M. Le Guen^{1*}, A. Nicolas-Robin², C. Lebard², I. Arnulf³ and O. Langeron²

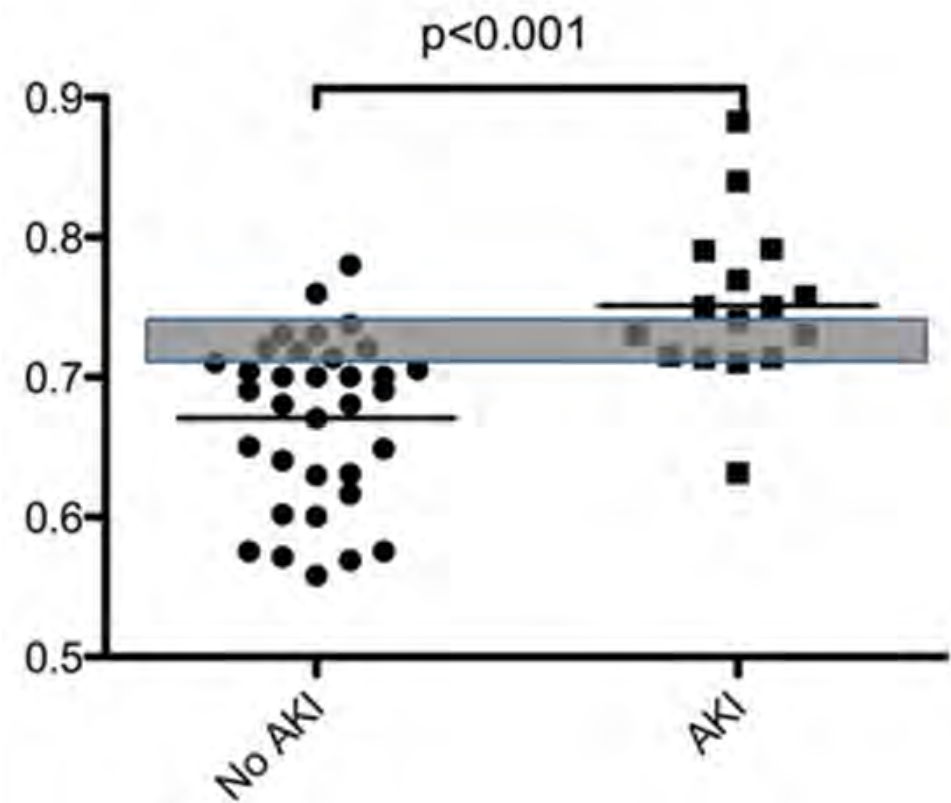
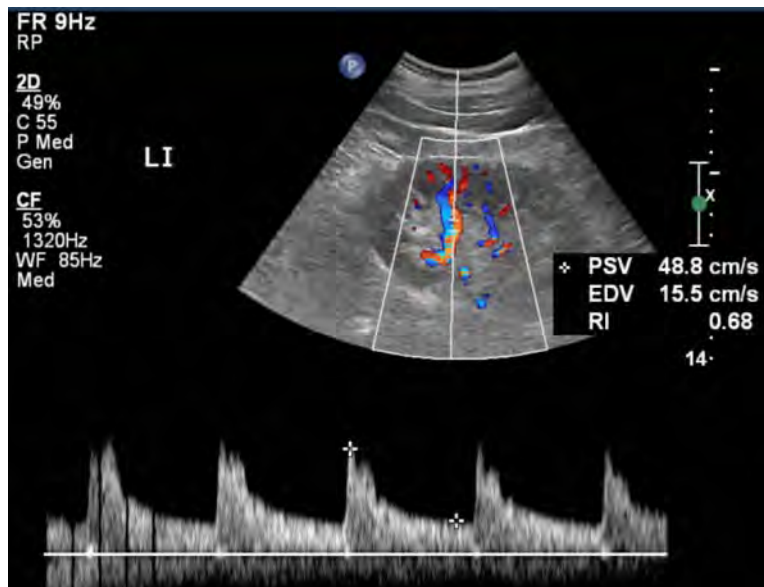
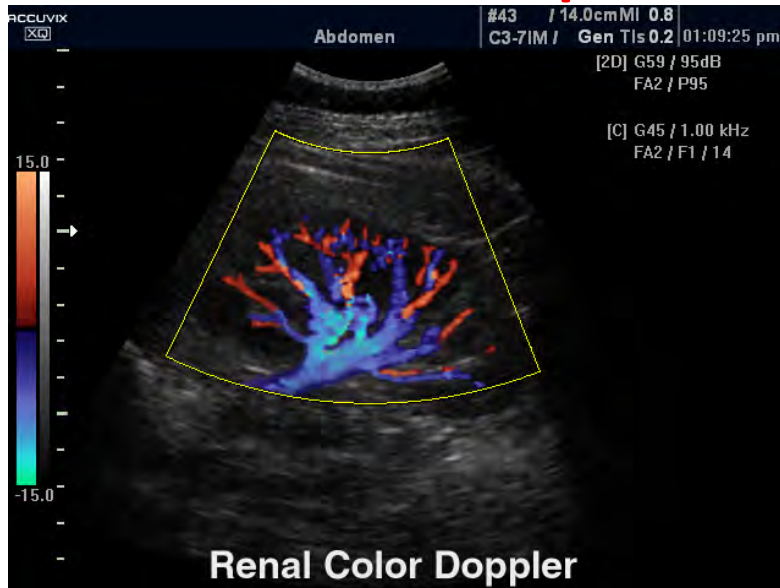


Facteurs contribuant au retard de réhabilitation post-opératoire

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Wilmore, BMJ, 2001

Détection précoce dysfonction rénale



Marty P, EJA, 2014

Détection précoce dysfonction rénale

	Population générale	Répondeur	Non répondeur	p
PAM (moyenne $\pm$ DS)	81.7 $\pm$ 11	82.1 $\pm$ 11.5	80.7 $\pm$ 9.7	0.82
-T0	85 $\pm$ 12.2	85 $\pm$ 9.9	87.7 $\pm$ 17.5	0.32
-T1				
FC, bpm	76.5 $\pm$ 12.8	76.9 $\pm$ 13.6	75.25 $\pm$ 10.7	0.86
-T0	75.4 $\pm$ 10.6	75.7 $\pm$ 11.1	74.5 $\pm$ 9.4	0.96
-T1				
DC, L/min	4.48 $\pm$ 1.85	4.52 $\pm$ 2.09	4.4 $\pm$ 0.89	0.59
-T0	4.85 $\pm$ 1.16*	4.8 $\pm$ 1.3*	4.96 $\pm$ 0.85*	0.3
-T1				
Variation DC, %	15.4	15.5	15.4	0.56
IR:				
-T0	0.722 $\pm$ 0.031	0.718 $\pm$ 0.032	0.732 $\pm$ 0.028	0.32
-T1	0.711 $\pm$ 0.045*	0.698 $\pm$ 0.029*	0.728 $\pm$ 0.029	0.0001
IRA post- opératoire n (%)	10 (22)	3 (8.8)	7 (58.3)	0.0004

Intérêt d'un parcours de soins codifié

La fracture du fémur

A comprehensive hip fracture program reduces complication rates and mortality.

Pedersen SJ et al *J Am Geriatr Soc.* 2008;56(10):1831-8

- “ The fast-track treatment and care program included a switch from systemic opiates to a local femoral nerve catheter block; an earlier assessment by the anesthesiologist; and a more-systematic approach to nutrition, fluid and oxygen therapy, and urinary retention.
- In the intervention group, the rate of any in-hospital postoperative complication was reduced from 33% to 20% ($P=.002$). Rates of confusion ($P=.02$), pneumonia ($P=.03$), and urinary tract infection ($P<.001$) were lower in the intervention group than in the control group
- Length of stay was 15.8 days in the control group, versus 9.7 days in the intervention group ($P<.001$). 12-month mortality was 23% in the control group versus 12% in the intervention group ($P=.02$). ”

The Effectiveness of a Geriatric Hip Fracture Clinical Pathway in Reducing Hospital and Rehabilitation Length of Stay and Improving Short-Term Mortality Rates

Table I. ASA Score Trend From 2007 to 2010.

	2007	2008	2009	2010
ASA1 (%)	1.43	0.57	2.69	2.38
ASA2 (%)	53.05	40.46	44.91	32.28
ASA3 (%)	45.16	58.69	51.05	64.02
ASA4 (%)	0.36	0.28	0.9	1.32

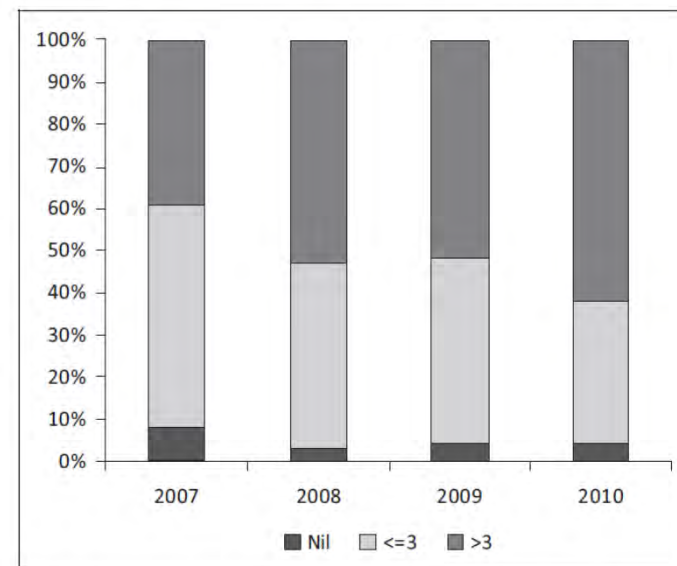


Figure 2. The number of comorbidities for patients with hip fracture, in the years 2007 to 2010.

The Effectiveness of a Geriatric Hip Fracture Clinical Pathway in Reducing Hospital and Rehabilitation Length of Stay and Improving Short-Term Mortality Rates

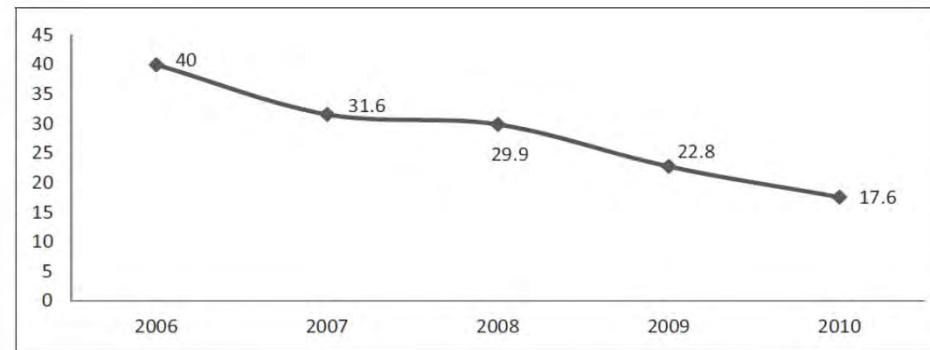
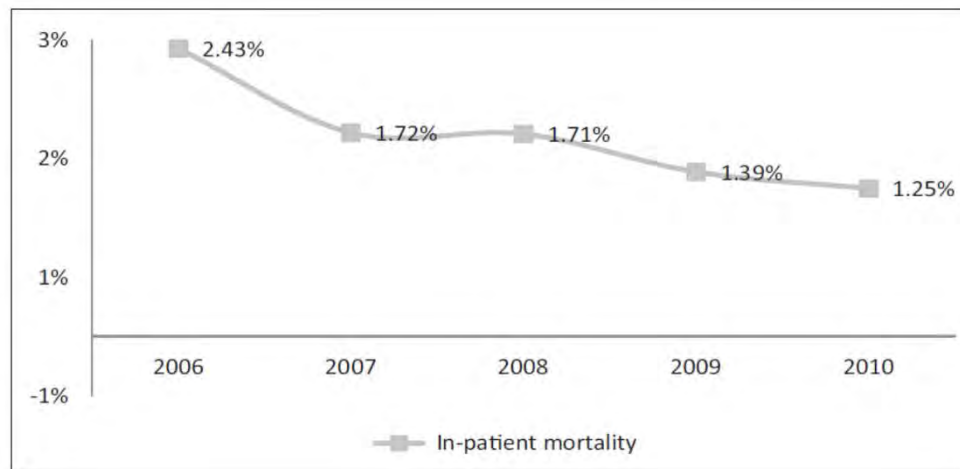


Figure 4. The average length of stay in the rehabilitation hospital in terms of days during the period 2006 to 2010.



Un travail de groupe



