

ANALGESIE LOCOREGIONALE CONTINUE

Après chirurgie Orthopédique ambulatoire

M.D., Ph.D. Axel MAURICE-SZAMBURSKI
Marseille, France

CONFLICT OF INTEREST

- ✓ None

AMBULATORY SURGERY

- Possible for 90% of orthopedic surgery
 - Strongly promoted by health policies around the world
 - Enhanced Recovery protocols expand indications
- Is it worse for the patient ?

Bontemps 2009

PAIN IS STILL A PROBLEM

- Acute pain is still poorly treated
 - 77% adult patients report pain after surgery
Warfield 1995
 - 80% experience moderate to extreme pain
Carr 1999
Rathmell 2006
 - Pain is a major determinant of perioperative experience
Wu 2011
 - Pain leads to hospital readmissions
Jones 2014
- Mc Grath 2004*

NO REVOLUTION IN PAIN TREATMENT

- Many new techniques and drugs in 2 decades
 - But no improvement in pain treatment
 - Scientometric indices show no progress
 - 6 national surveys report unacceptable high rate of pain
- Implementation's needed !

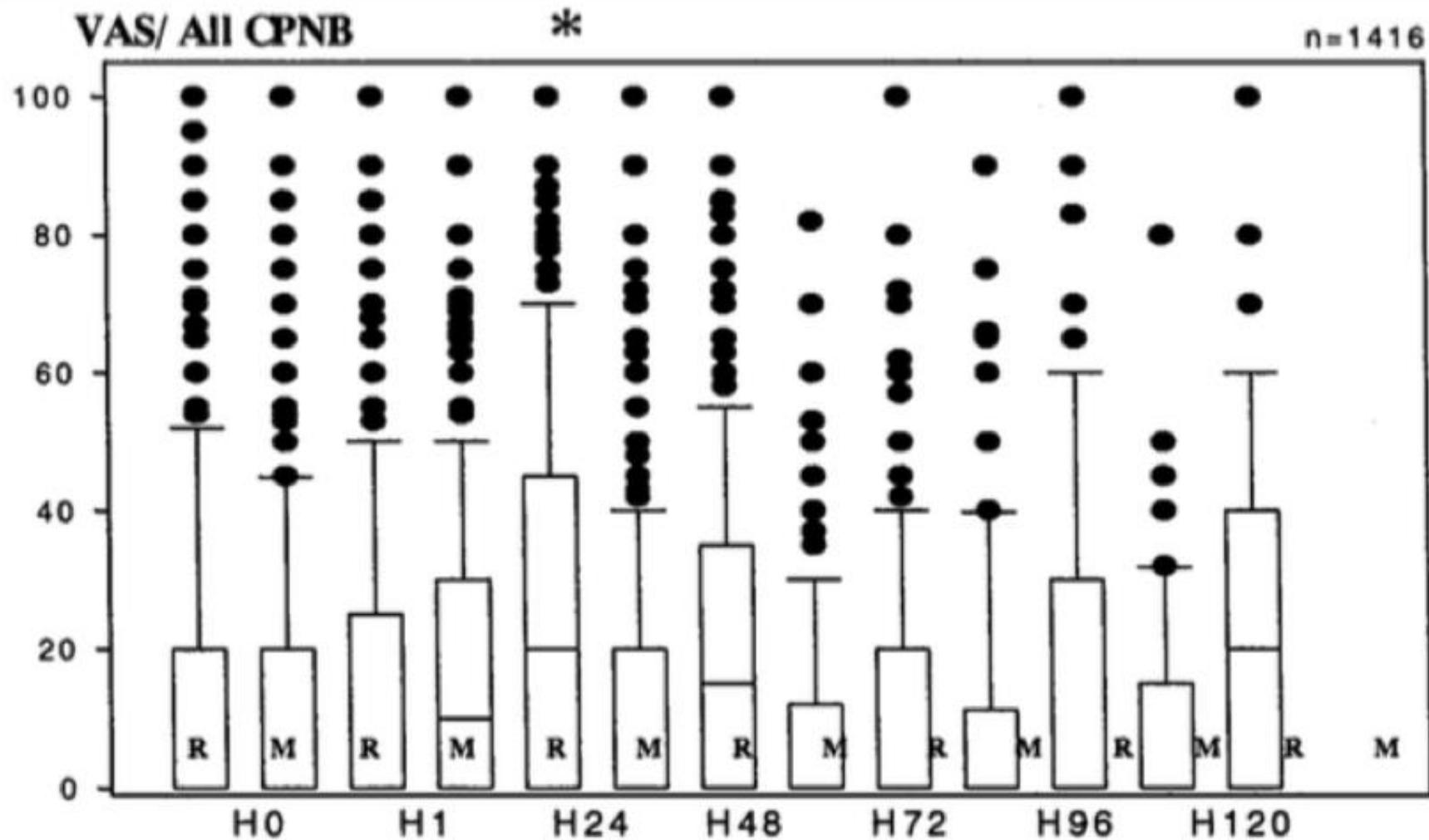
Correl 2014

WE DO HAVE A SOLUTION

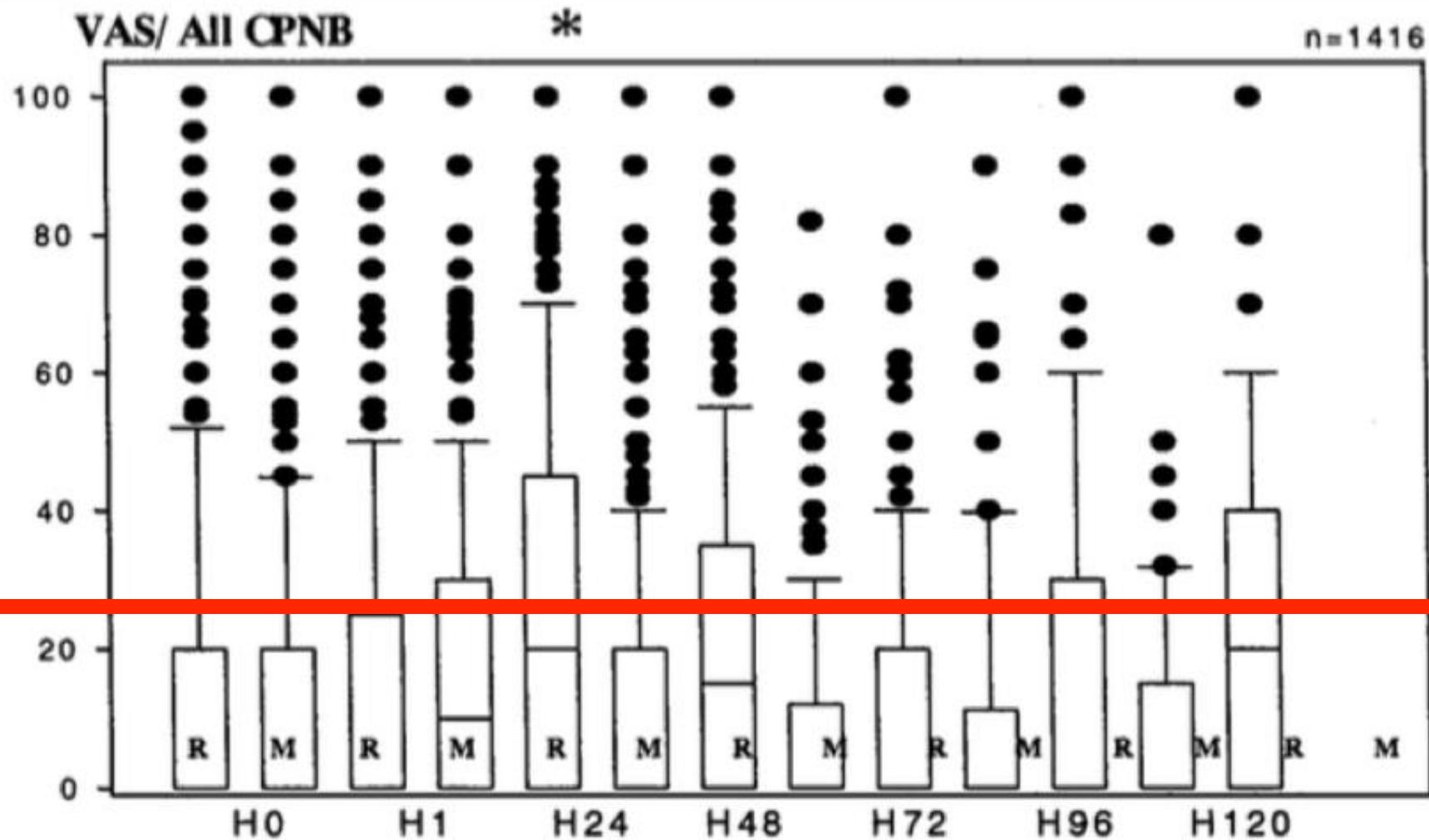
- ✓ Continuous Nerve Blocks have demonstrated efficacy
 - At least, in hospital setting

Richmann 2006

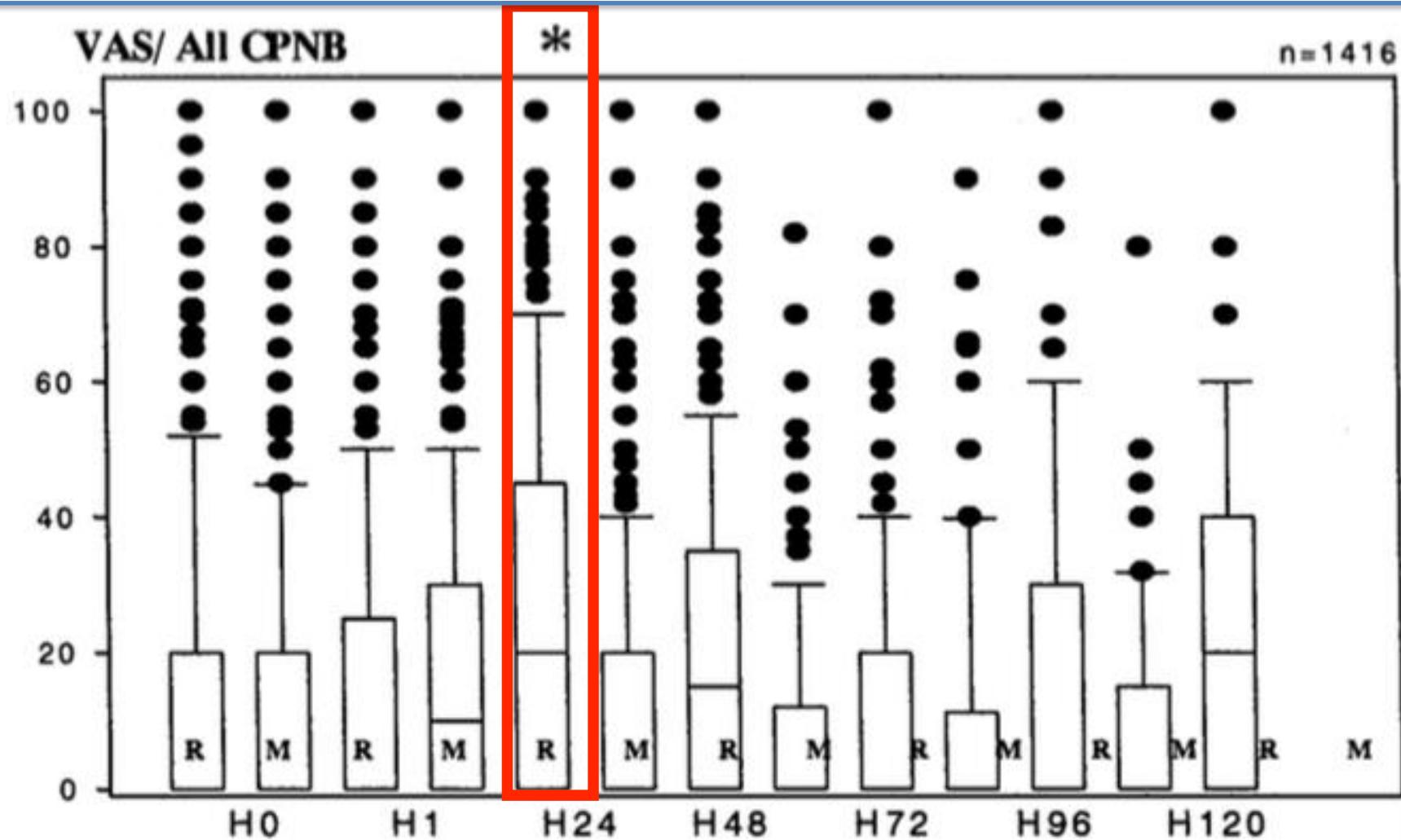
PERINEURAL CATHETER



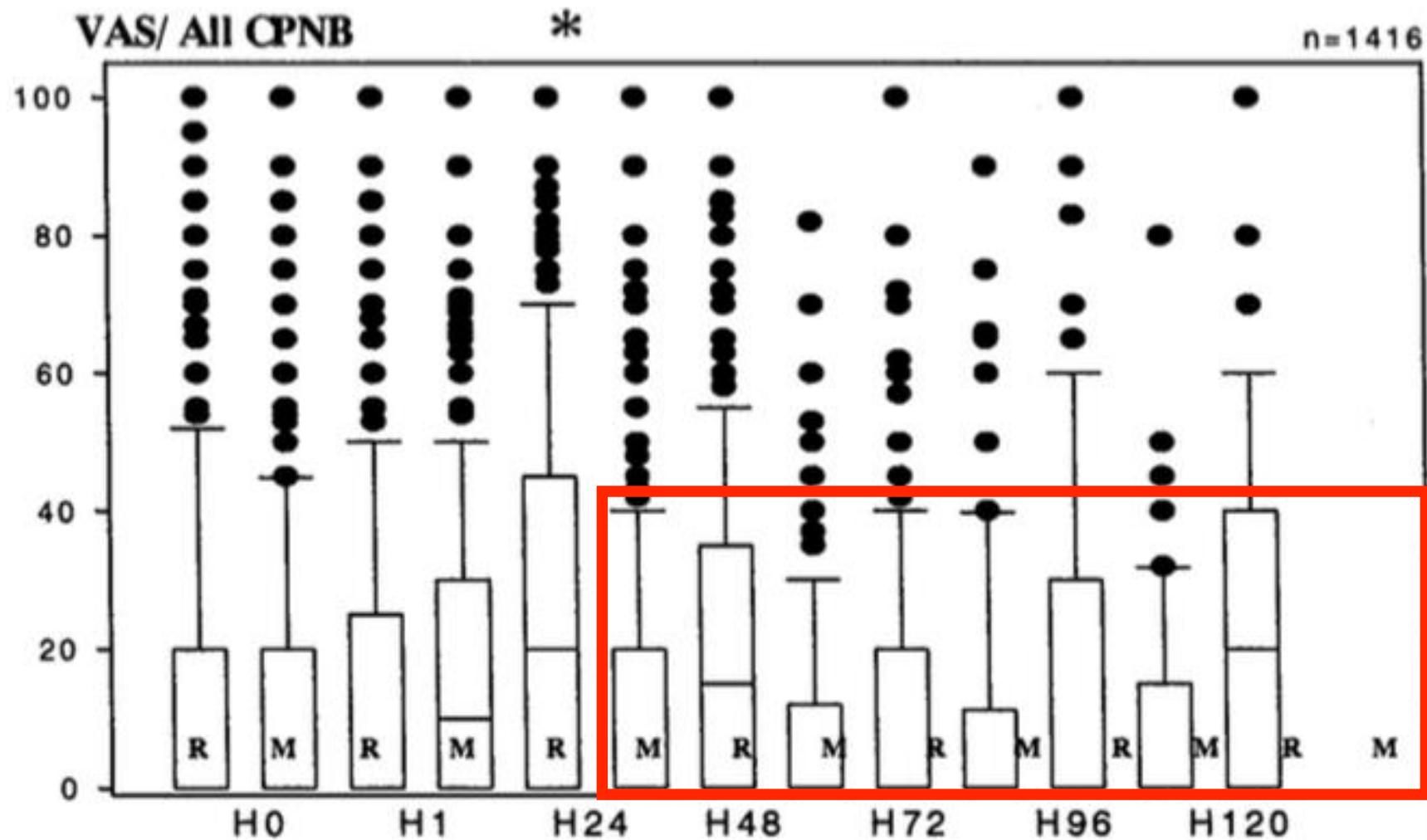
PERINEURAL CATHETER



PERINEURAL CATHETER



PERINEURAL CATHETER



Continuous Peripheral Nerve Blocks at Home: A Review

Brian M. Ilfeld, MD, and F. Kayser Enneking, MD

From the Departments of Anesthesiology and Orthopaedics and Rehabilitation, University of Florida, Gainesville, Florida

information. There is strong evidence suggesting that continuous peripheral nerve blocks provided at home improve postoperative analgesia, sleep quality, and patient satisfaction while decreasing supplemental opioid requirements and opioid-related side effects. In addition,



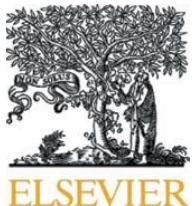
Ultrasound-Guided Regional Anesthesia: Current Concepts and Future Trends

Peter Marhofer, MD*

The scope of ultrasound imaging guidance for regional anesthesia is growing rapidly. Preliminary data, although limited, suggest that ultrasound can improve block success rate and decrease complications. In this review, we describe the basic principles of ultrasound scanning and needling techniques for nerve blocks, highlight some of the data on clinical outcome, discuss specific limitations of ultrasound for regional anesthesia, and speculate on the future direction for physician training and competency assessment with this technology.

(Anesth Analg 2007;104:1265-9)

Vincent W. S. Chan, MD, FRCPC†



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journal homepage: www.arthroplastyjournal.org



Opioid-Based Analgesia: Impact on Total Joint Arthroplasty

Mohamad J. Halawi, MD^a, Tyler J. Vovos, BS^b, Cindy L. Green, PhD^c, Samuel S. Wellman, MD^a, David E. Attarian, MD^a, Michael P. Bolognesi, MD^a

^a Department of Orthopaedic Surgery, Duke University Medical Center, Durham, North Carolina

^b Duke University School of Medicine, Durham, North Carolina

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discharge destination

ABSTRACT

The objective of this study was to characterize the impact of opioid-based analgesia in total joint arthroplasty. The primary outcomes were incidence of in-hospital complications, length of stay, and discharge destination. Six hundred and seventy-three primary total hip and knee arthroplasties were retrospectively reviewed. The incidence of opioid-related adverse drug events was 8.5%, which accounted for 58.2% of all postoperative complications. Age, anesthesia technique, ASA score, and surgery type were significant risk factors for complications. After adjusting for these confounders, opioid-related adverse drug events were significantly associated with increased length of stay ($P < 0.001$) and discharge to extended care facilities ($P = 0.014$).

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Table 3

Adjusted Multivariable Logistic Regression Model Predicting Prolonged Length of Stay (C-Index = 0.853).

Factor	P Value	Odds Ratio (95% Confidence Interval)
Age	0.010	1.02 (1.00–1.04)
ASA score (>2)	0.006	1.82 (1.19–2.78)
Surgery type (THA)	<0.001	17.95 (11.43–28.20)
Anesthesia technique (general)	0.003	1.66 (1.04–2.65)
Gender (female)	<0.001	3.19 (2.05–4.97)
Opioid-Related ADE	<0.001	7.90 (3.63–17.24)

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Perineural Catheter Analgesia as a Routine Method After Ambulatory Surgery—Effective But Unrealistic!

Reg Anesth Pain Med 2012;37: 72–78

Narinder Rawal, MD, PhD

ARE YOU KIDDING ME?



WHAT'S THE PROBLEM ?

- Catheter placement
- Spontaneous removal
- Leakage

CATHETER

Regional Anesthesia & Pain Medicine:

March 2011 - Volume 36 - Issue 2 - pp 171-176

doi: 10.1097/AAP.0b013e31820d431a

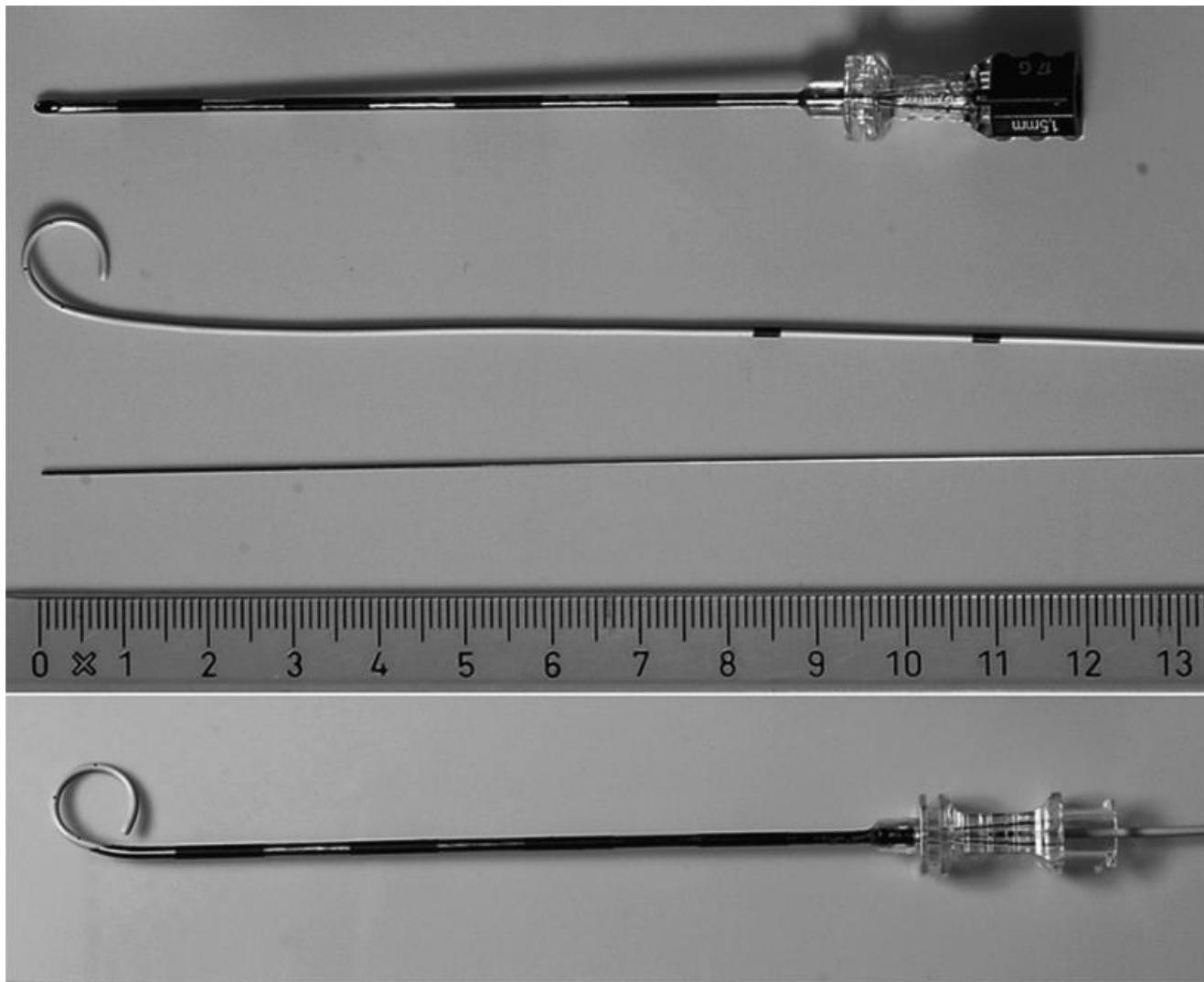
Brief Technical Reports

Newly Designed, Self-Coiling Catheters for Regional Anesthesia-An Imaging Study

Luyet, Cédric MD*; Seiler, Roman*; Herrmann, Gudrun MD†; Hatch, Gary M. MD‡; Ross, Steffen MD‡; Eichenberger, Urs MD*

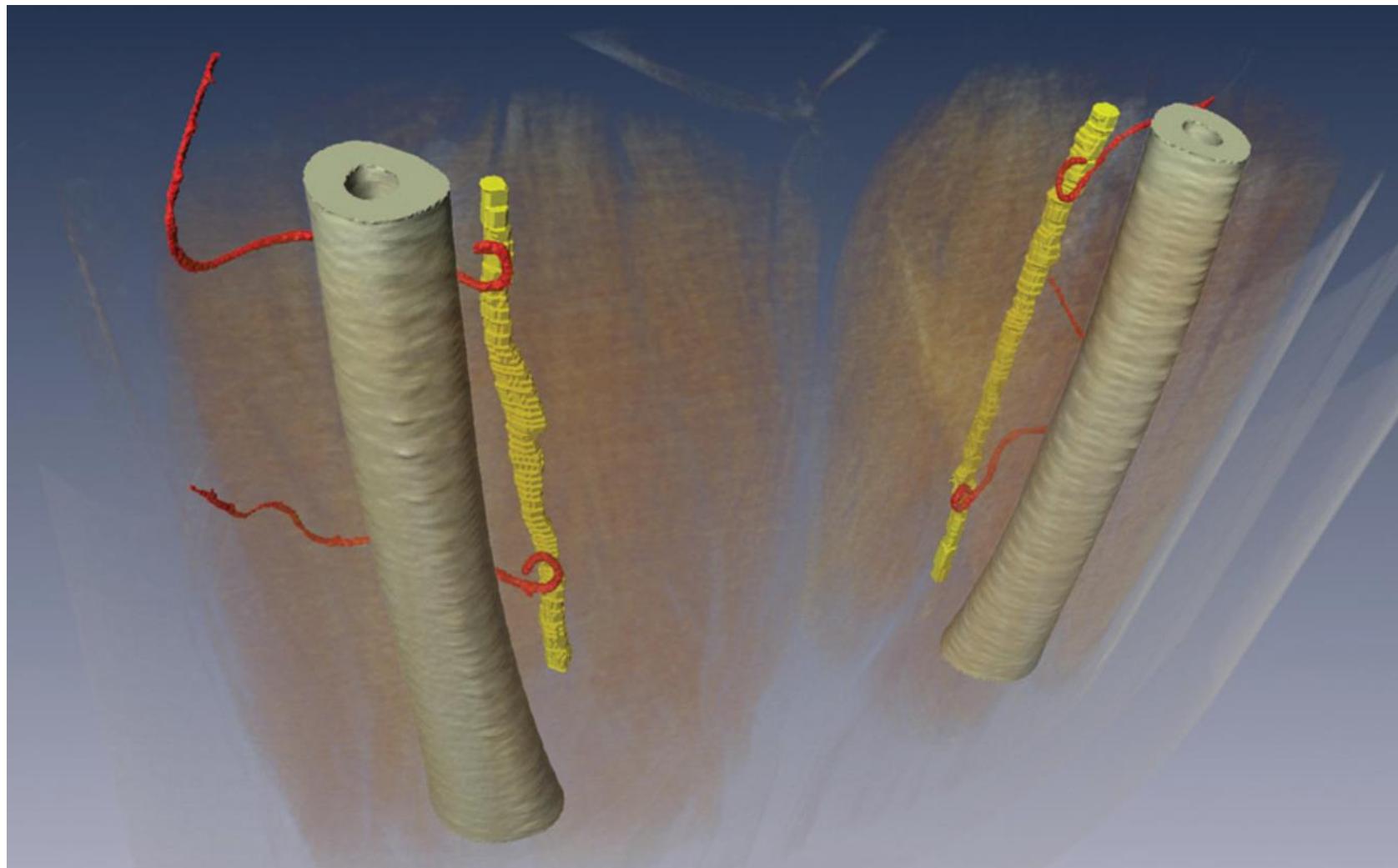
- Pig tail catheter
- Hyper echogenic Tuohy needle

CATHETER

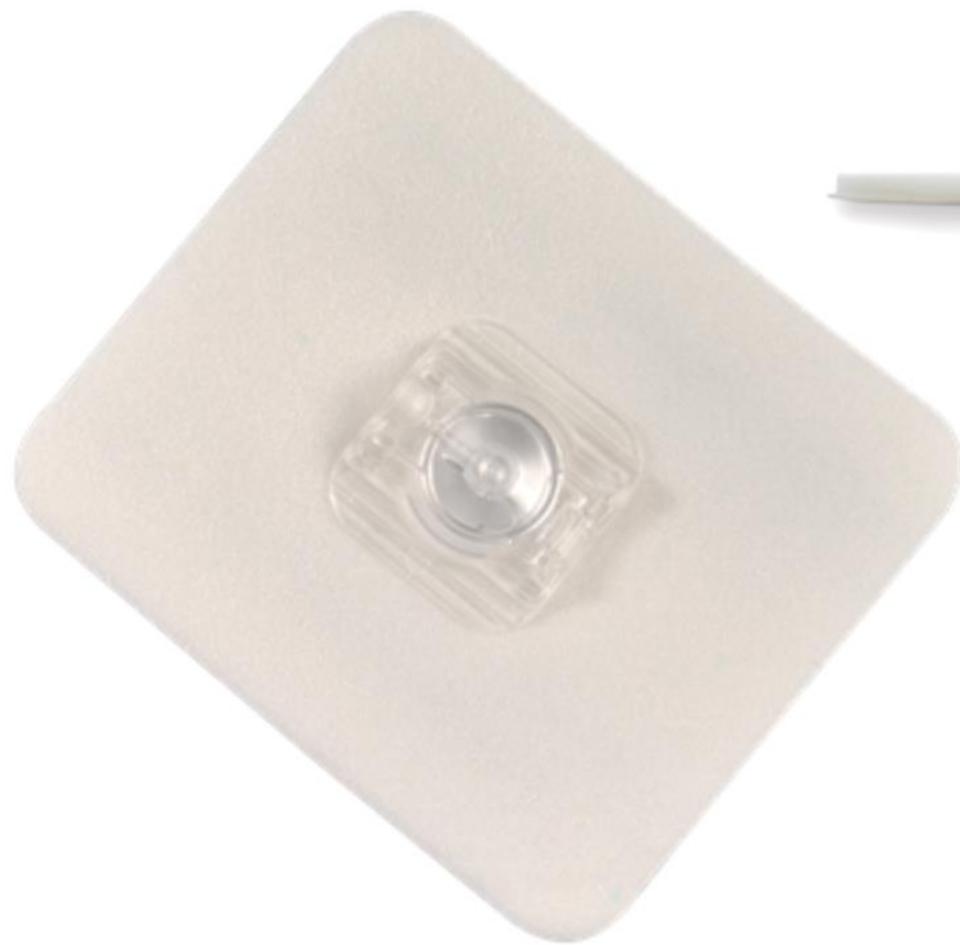


Luyet 2011

CATHETER



CATHETER



« Lockit » Smith Medical

WHAT'S THE PROBLEM ?

- Motor blockade
 - Compromised proprioception
 - Excessive numbness
- The terrifying threat of patient fall...

MOTOR BLOCK

Unicompartimental Knee
Arthroplasty
2 hours after surgery
With Femoral Catheter

- Motor blockade
 - Compromised proprioception
 - Excessive numbness
- The terrifying threat of patient fall...

MOTOR BLOCK

Total Knee Arthroplasty
3 hours after surgery
With Femoral Catheter
VAS = 1

- Motor blockade
 - Compromised proprioception
 - Excessive numbness
- The terrifying threat of patient fall...

WHAT ARE THE PROBLEMS ?

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 - Compromised proprioception
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MOTOR BLOCK

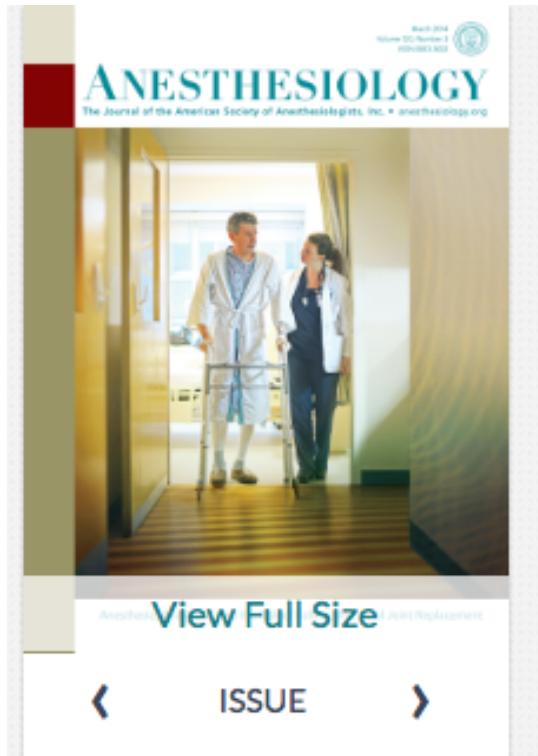
Total Knee Arthroplasty
At Day 1
With Femoral Catheter
 micrel Pump
Medical Devices

- Motor blockade
 - Compromised proprioception
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WHAT ARE THE PROBLEMS ?

- Motor blockade
 - Compromised proprioception
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- The terrifying threat of patient fall...

PATIENT FALLS ?



FREE

Perioperative Medicine | March 2014

Inpatient Falls after Total Knee Arthroplasty: The Role of Anesthesia Type and Peripheral Nerve Blocks

Stavros G. Memtsoudis, M.D., Ph.D., F.C.C.P.; Thomas Danninger, M.D.; Rehana Rasul, M.P.H., M.A.; Jashvant Poeran, M.D., Ph.D.; Philipp Gerner, B.S.; Ottokar Stundner, M.D.; Edward R. Mariano, M.D., M.A.S.; Madhu Mazumdar, Ph.D., M.A., M.S.

PATIENT FALLS

- n= 190 000 patients
 - 400 hospitals
 - Total knee arthroplasty
 - Risk of fall= 1.6%
- Logistic regression

PATIENT FALLS ?

Final Multiple Logistic Regression Model (Adjusted for Year of Procedure and Hospital-fixed Effects through the Hospital Identifier Variable) Displaying OR and 95% CI

	Reference	OR	95% CI
Age category, yr			
<45		0.78	0.54–1.13
55–64	45–54	1.16**	1.00–1.34
65–74		1.46*	1.26–1.68
>75		1.88*	1.63–2.18
Sex			
Female	Male	0.84*	0.78–0.91
Type of anesthesia			
Neuraxial		0.70**	0.56–0.87
Combined	General	1.13	0.98–1.31
Comorbidities/complications			
Electrolyte and fluid abnormalities		1.85*	1.68–2.04
Psychosis	Absence of comorbidity/complication	1.75*	1.45–2.11
Sleep apnea		1.23**	1.08–1.39
Obesity		1.16**	1.06–1.27
Coagulopathy		1.36**	1.13–1.64
Bloodloss anemia		1.22**	1.00–1.49
Interaction			
Anemia, no transfusion		1.43*	1.28–1.59
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* P < 0.001; ** P < 0.01.

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Peripheral nerve blocks did not reach the threshold to be included in the multivariate analysis !

* P < 0.001; ** P < 0.01.

WHAT'S THE (REAL) PROBLEM ?

- Lack of infusion monitoring
 - No feedback from patient pain
 - No feedback from patient bolus demands
- The black hole...

WHAT'S THE (REAL) PROBLEM ?

AUTO-EVALUATION PAR LE PATIENT

Chirurgie..... Chirurgien..... Anesthésiste.....

Cathéter.....

Complément éventuel.....

Dose totale d'AL : Naropeine %.....ml

Prescription : naropeine 0.2% 5ml/h 8ml /h

Coter la douleur de 1 à 10 : 0 = absence de douleur 10 = douleur intolérable

WHAT'S THE (REAL) PROBLEM ?

AUTO-EVALUATION PAR LE PATIENT

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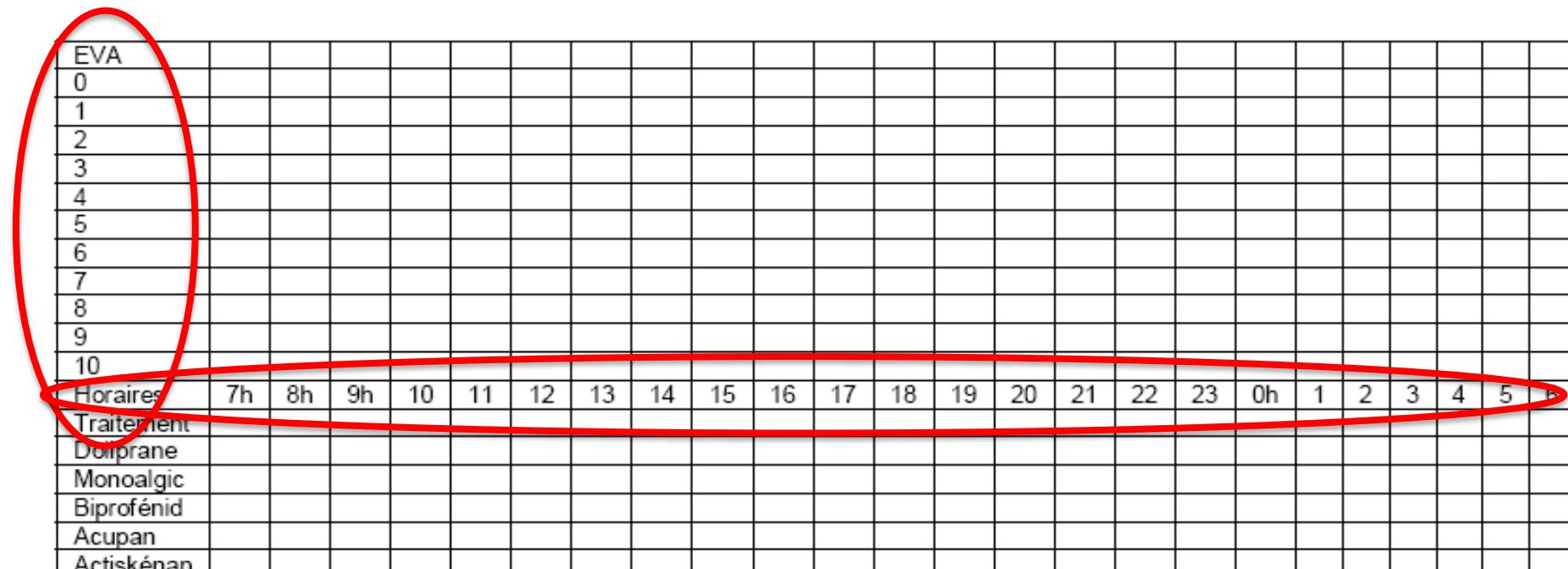
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WHAT'S THE (REAL) PROBLEM ?

Date ____ / ____ / ____ Time ____ : ____	Basal rate ____ mL/hr Bolus ____ ml q ____ min lockout interval Contacted by: _____ MD / RN
<input type="checkbox"/>	Patient or patient's caretaker contacted by phone
<input type="checkbox"/>	Symptoms of local anesthetic toxicity, catheter migration, and infection denied
<input type="checkbox"/>	Appropriate sensory / motor function of affected extremity acknowledged
<input type="checkbox"/>	Surgical pain under control
<input type="checkbox"/>	Patient wishes to continue perineural infusion
<input type="checkbox"/>	Patient wishes to discontinue perineural infusion <input type="checkbox"/> Catheter removed intact
<input type="checkbox"/>	All questions answered
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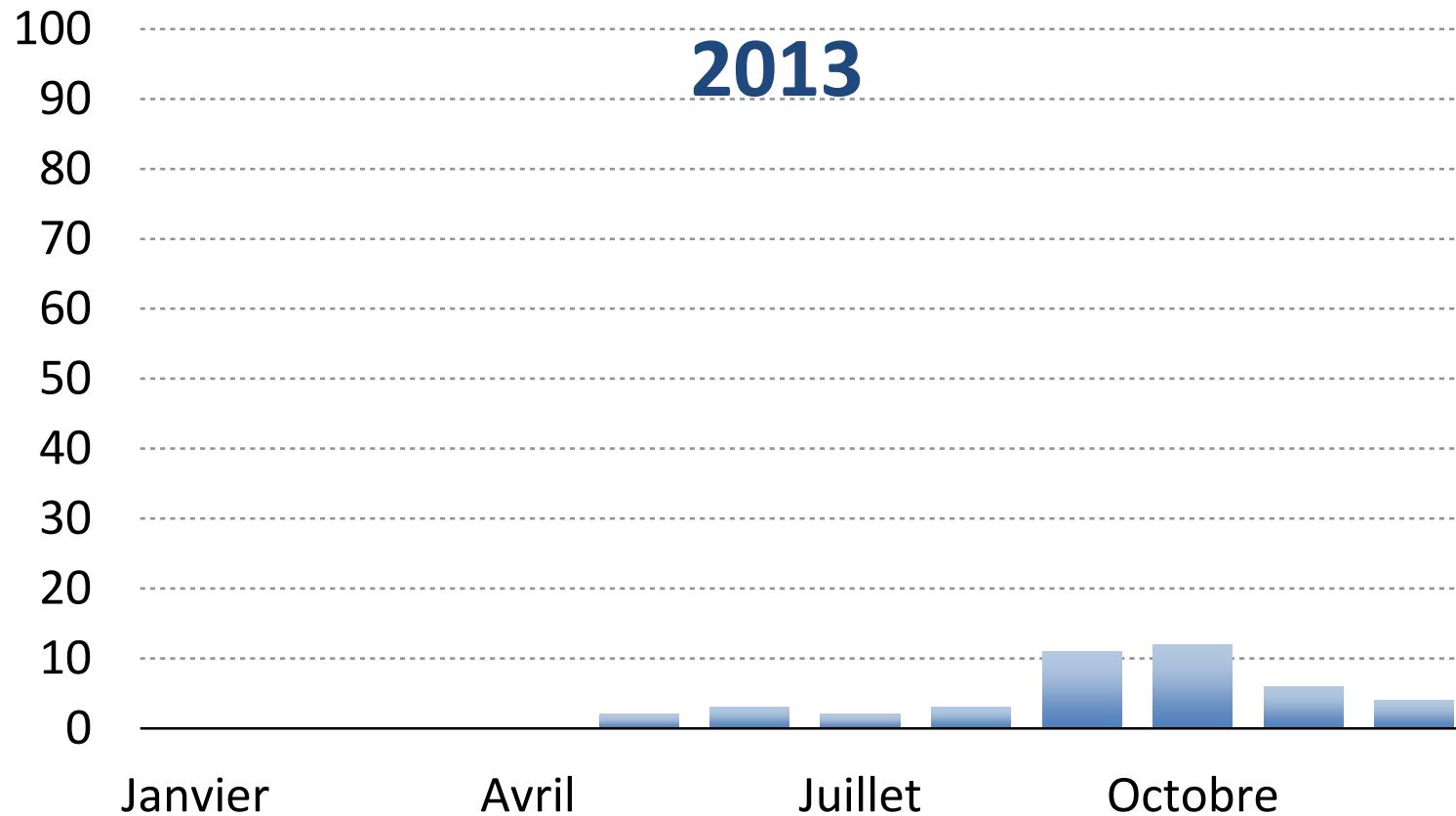
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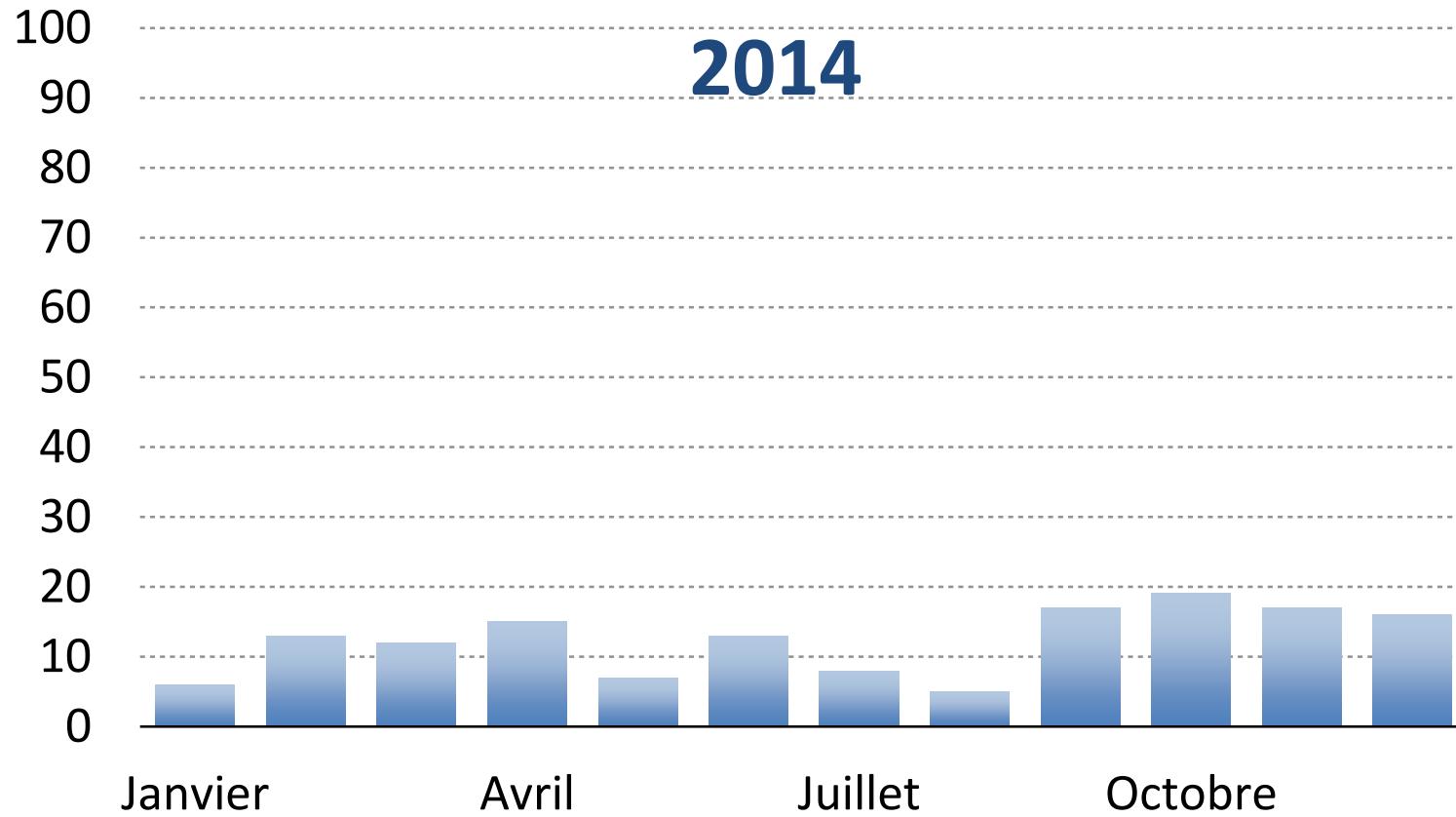
Recherche Google J'ai de la chance

PUMP AT HOME



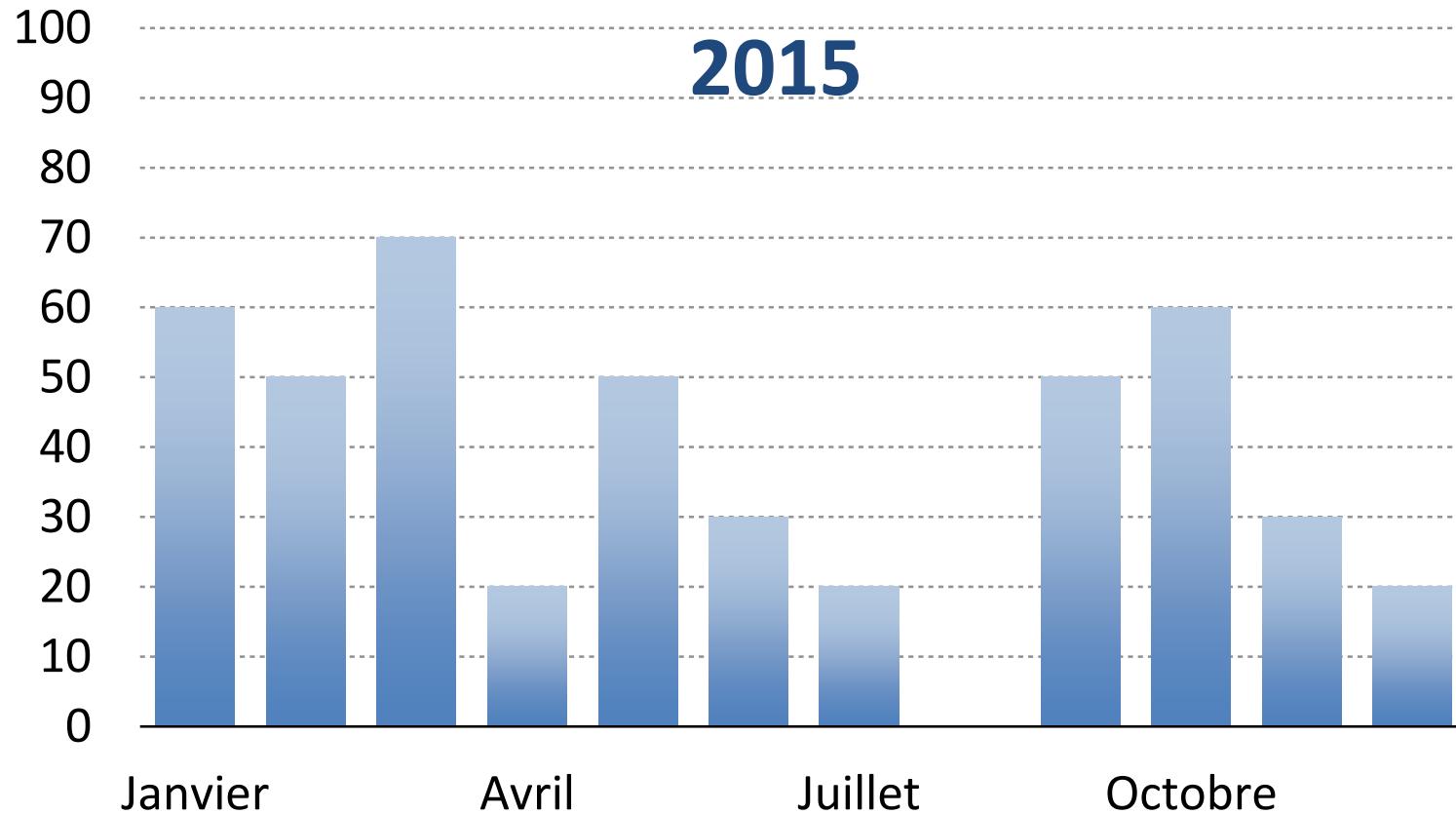
41 patients

PUMP AT HOME



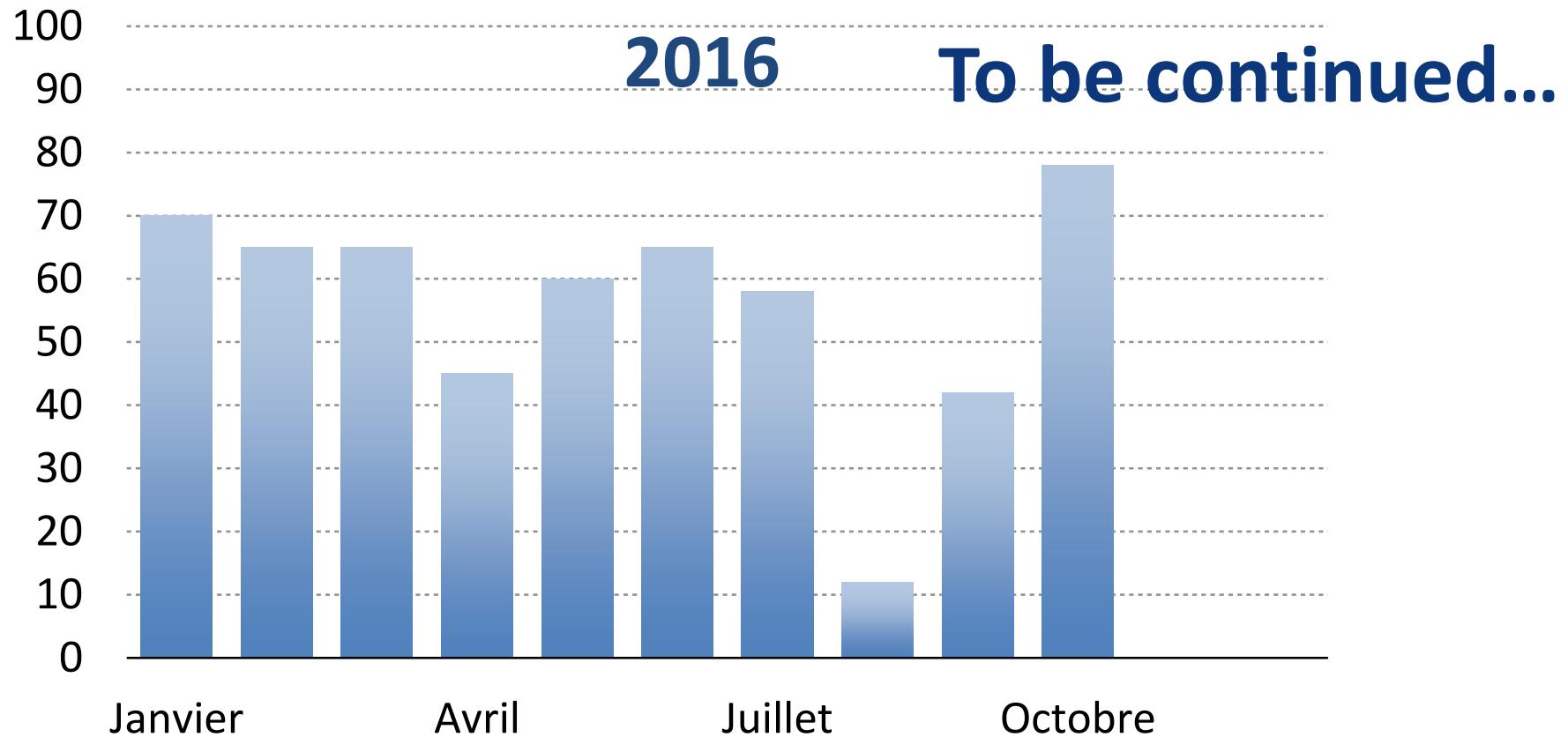
148 patients

PUMP AT HOME



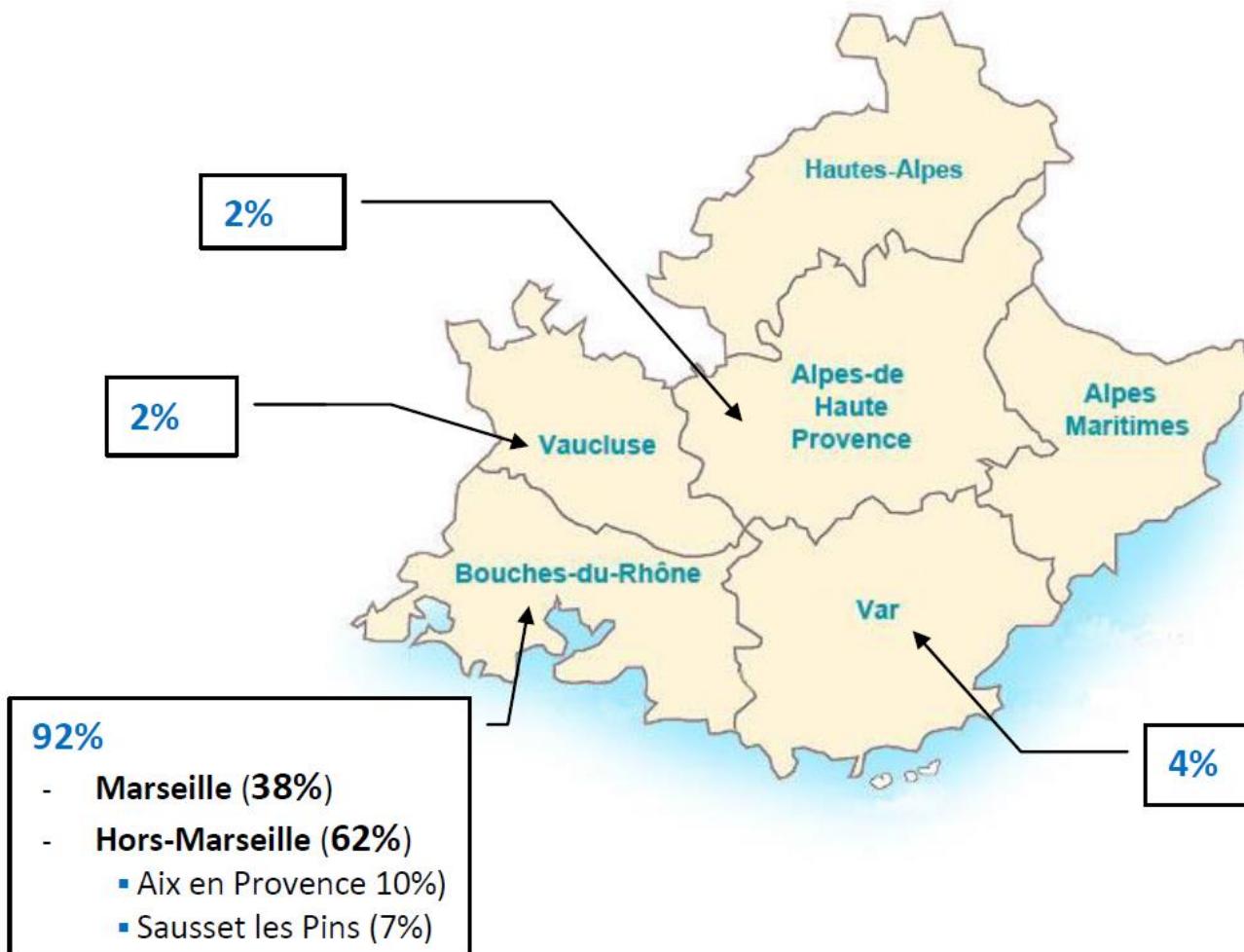
460 patients

PUMP AT HOME



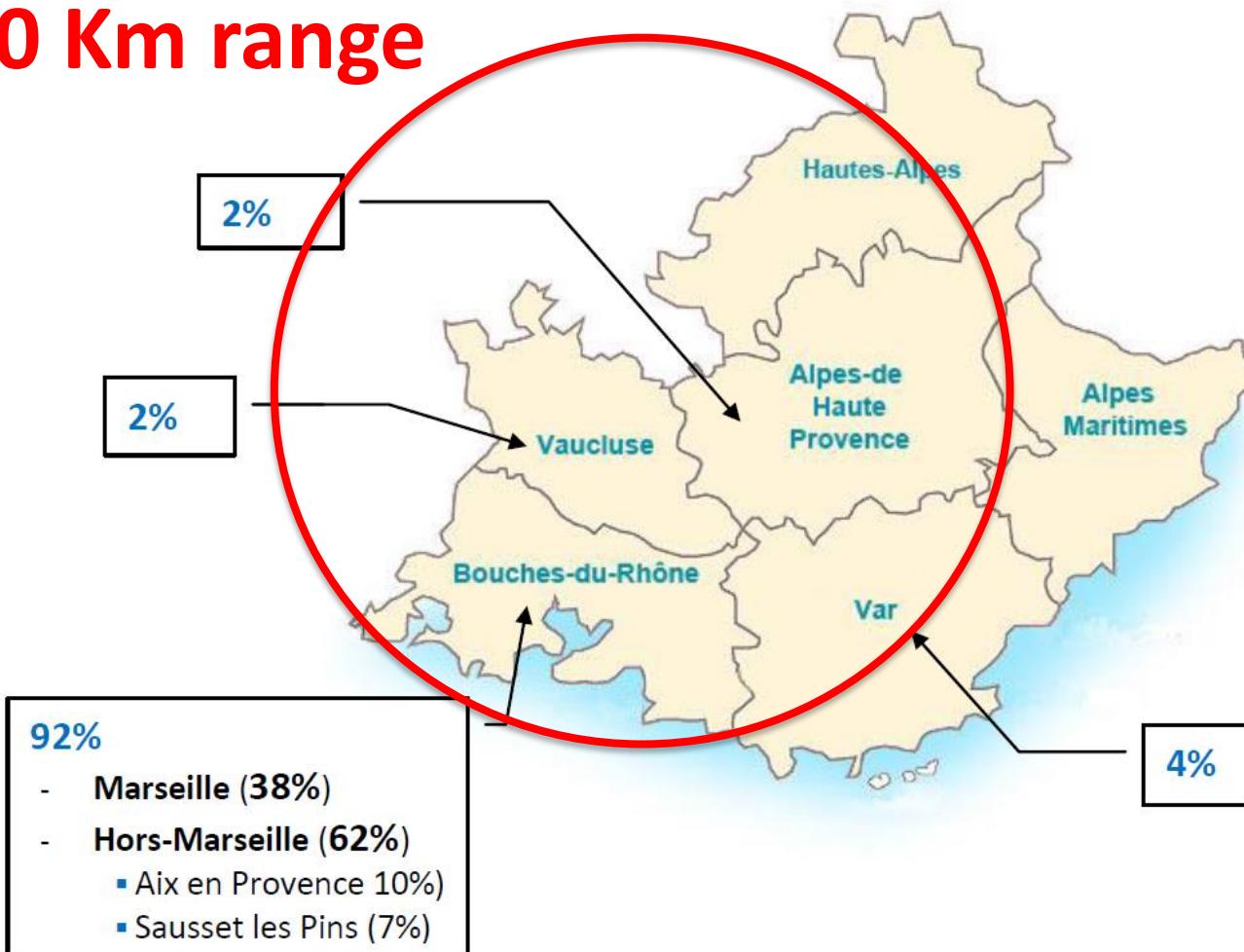
Total : 1 169 patients

GEOGRAPHICAL SPREAD



GEOGRAPHICAL SPREAD

> 200 Km range



BALANCING REALITIES

Potential benefits



Potential problems



Vigilance and expertise

Production pressure

BENEFITS

- Effective pain relief
- Active rehabilitation
- Improved experience

PROBLEMS

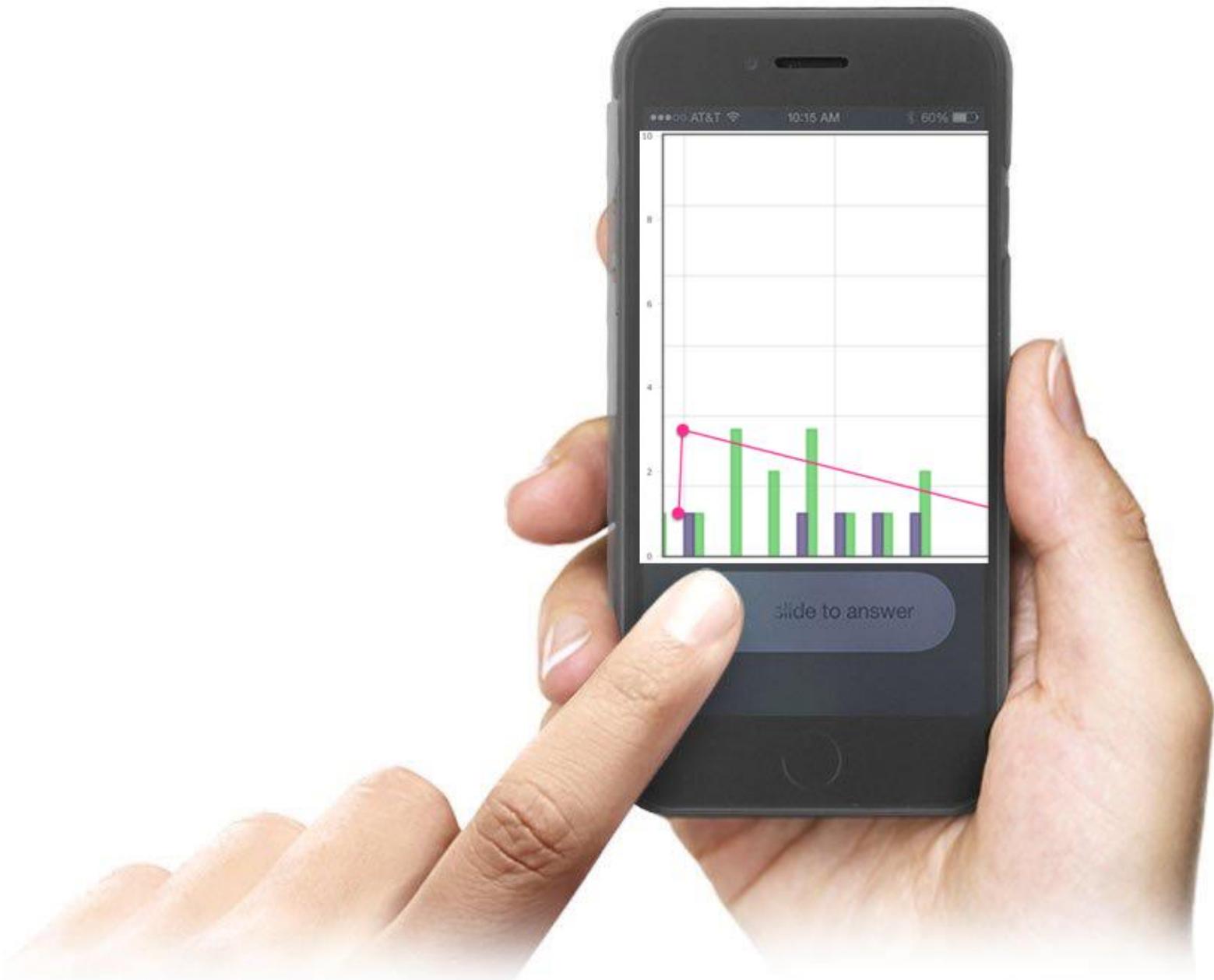
- Excessive numbness
- Motor blockade
- Side effects

ELECTRONIC PUMP



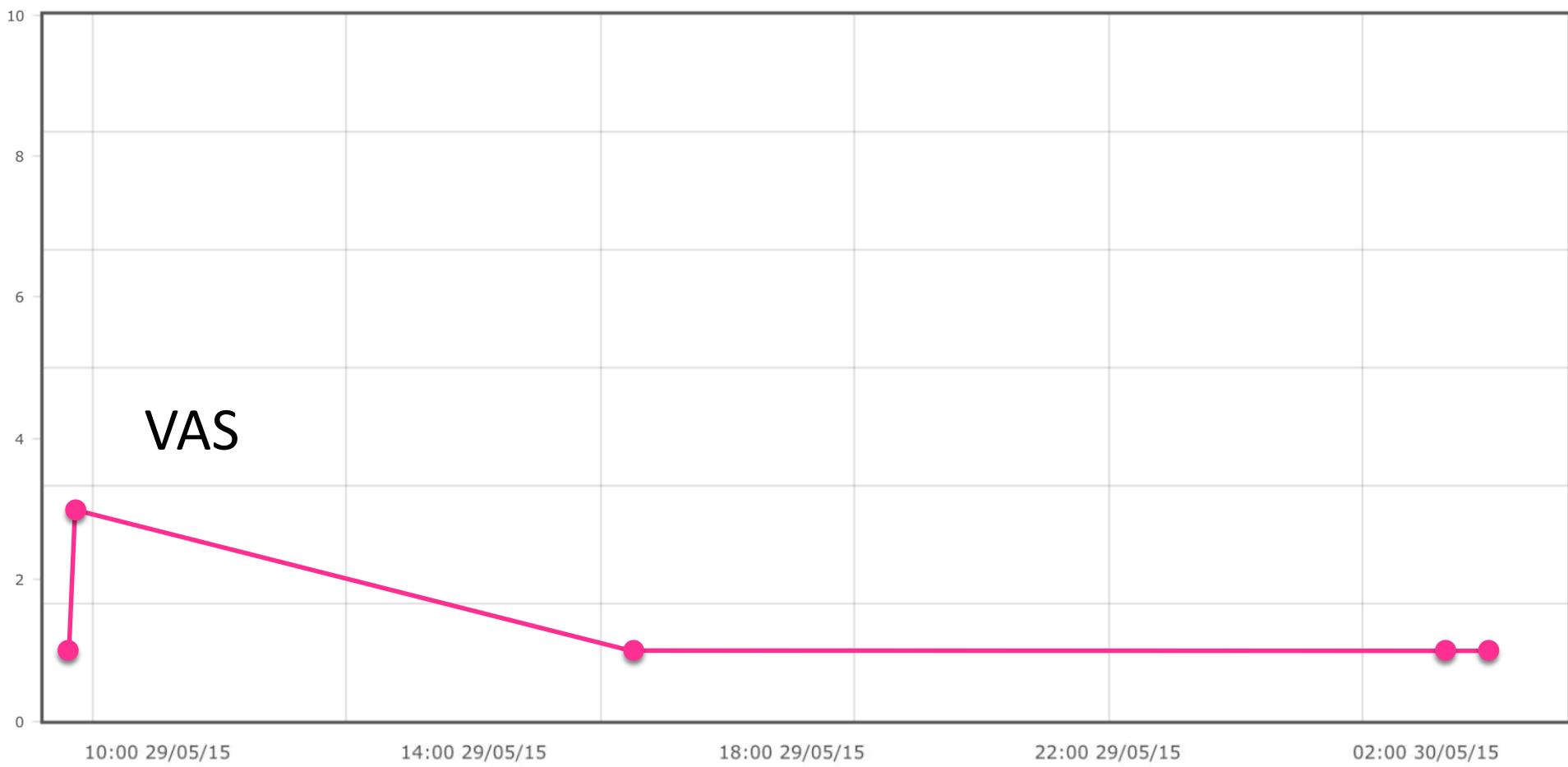
EVERY DAY LIFE

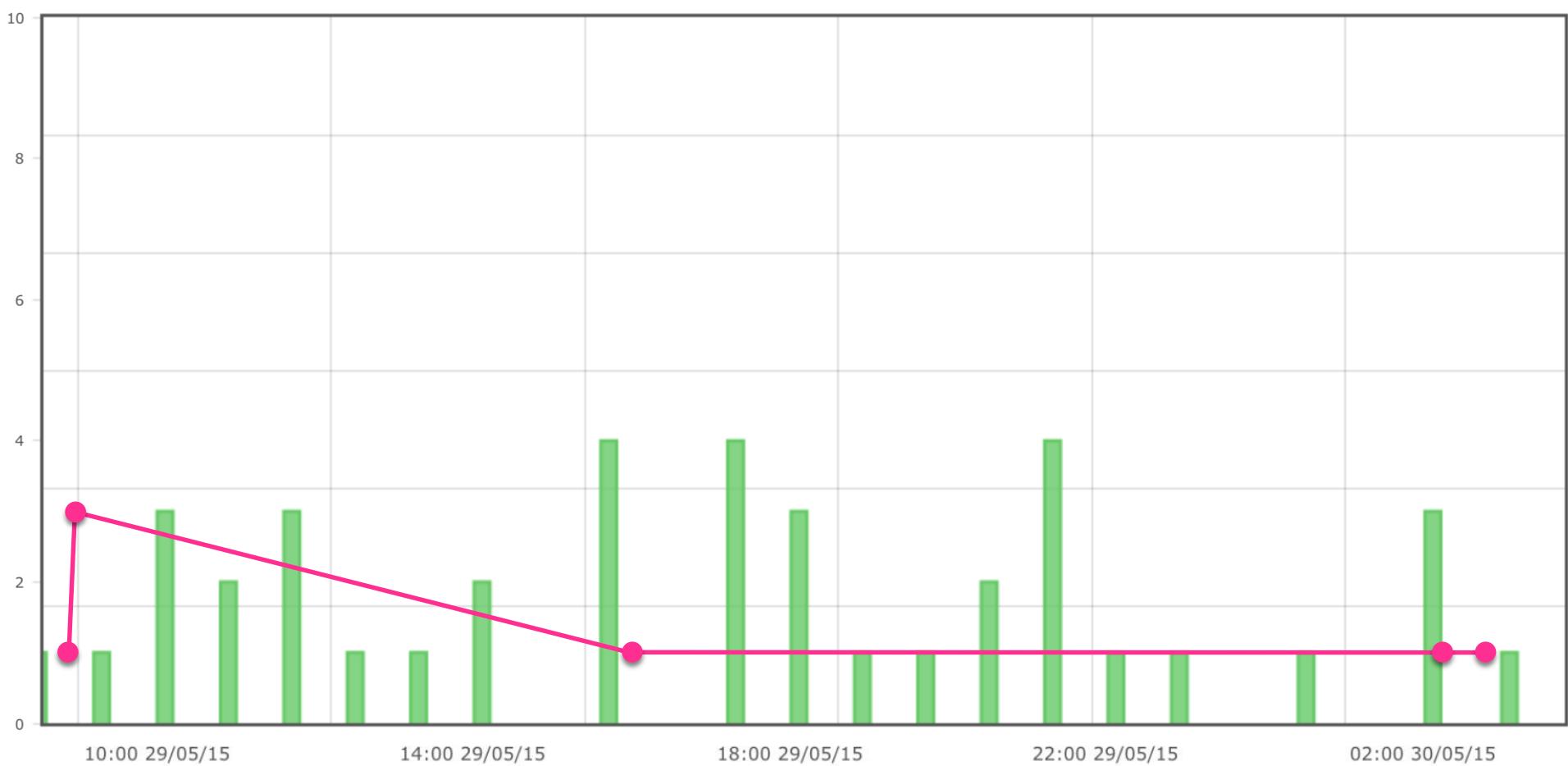


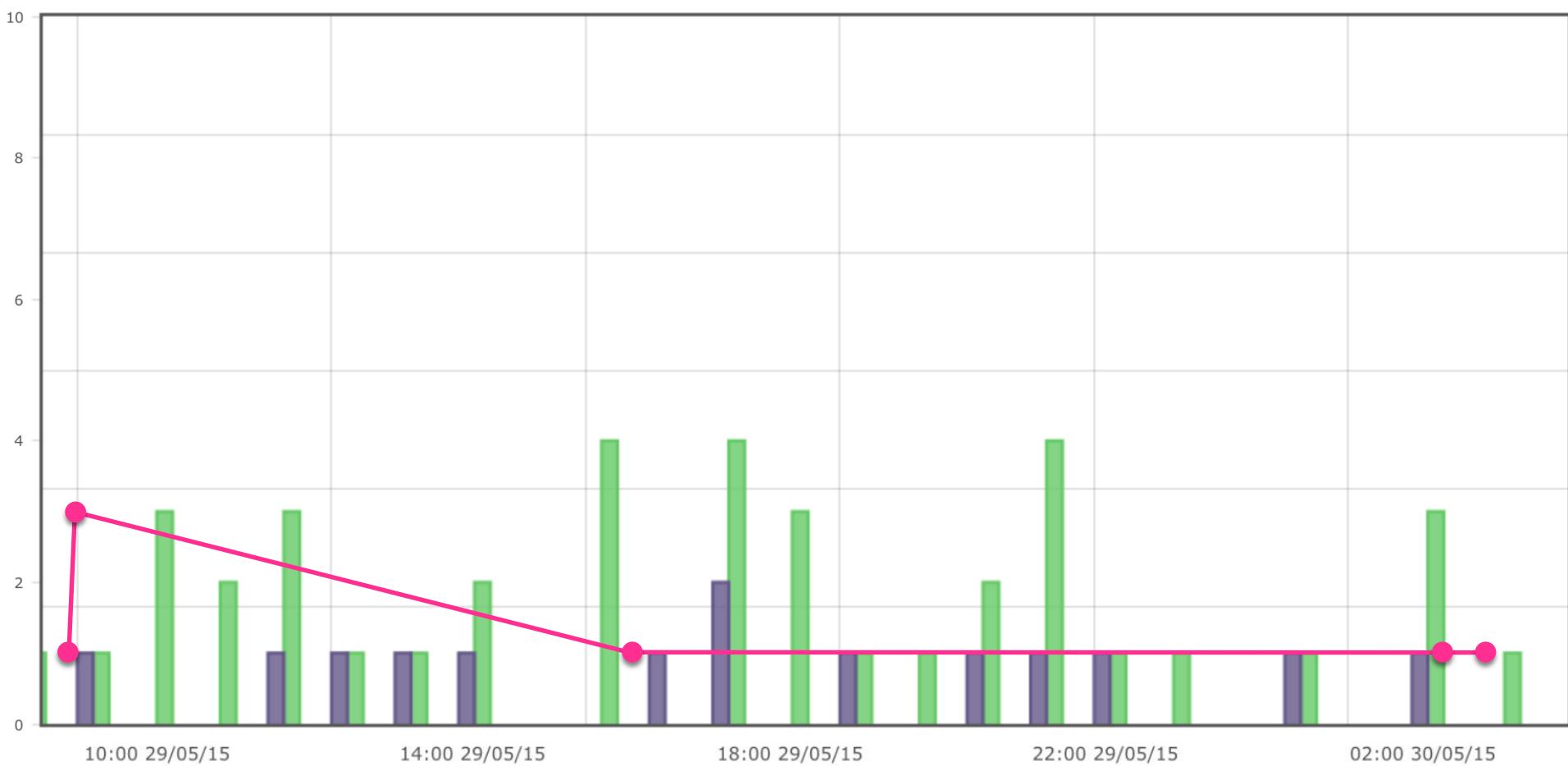


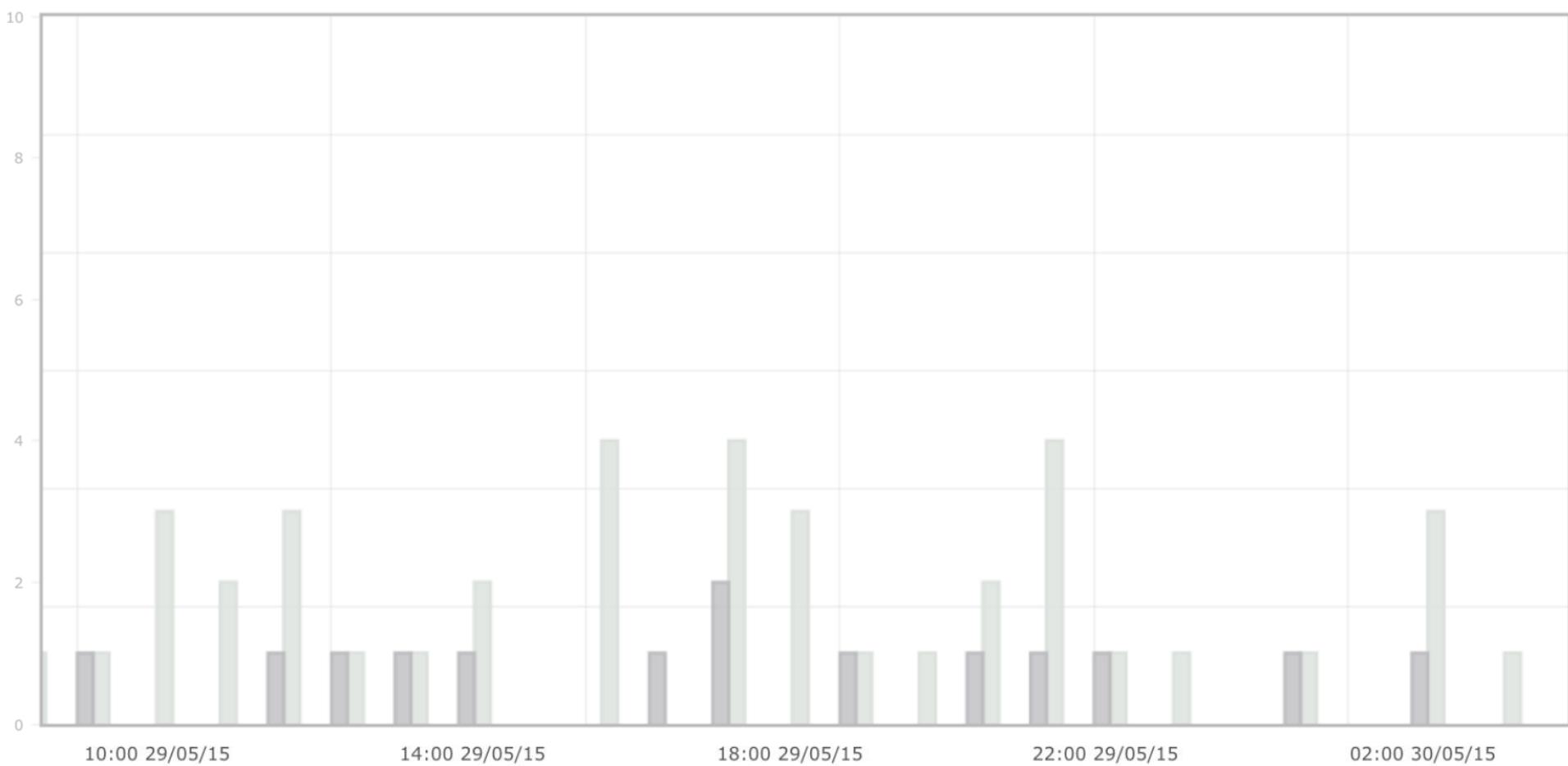
slide to answer

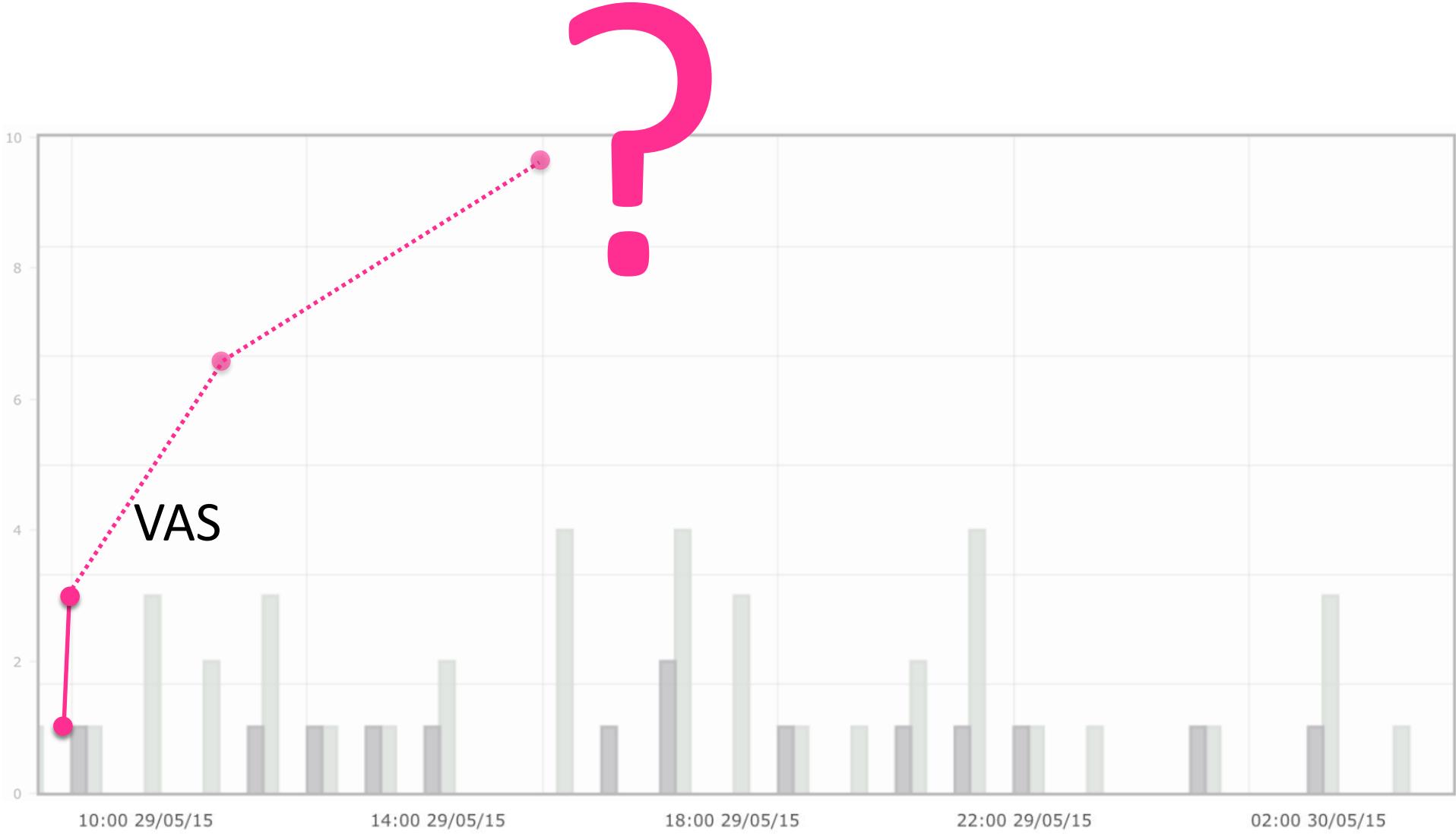
VAS











ELECTRONIC PUMP

- Precise monitoring of local anesthetic treatment
- Patients' feedback for pain and numbness
- SMS alarm to anesthesiologist in case of pain
- SMS alarm to nurse before the end of perfusion
- Dose delivery error detection

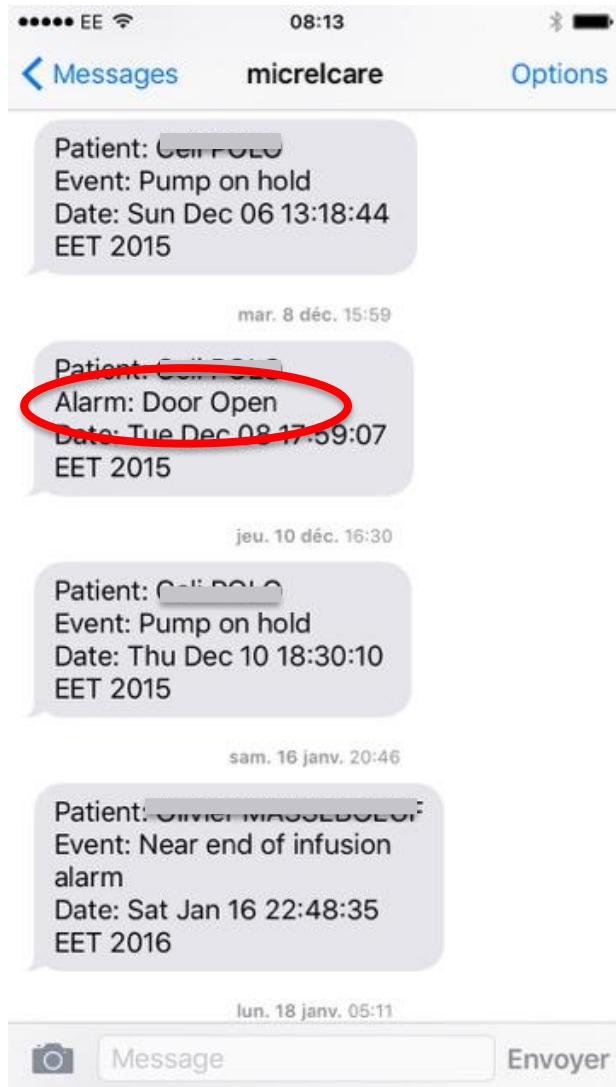
SMS ALARM



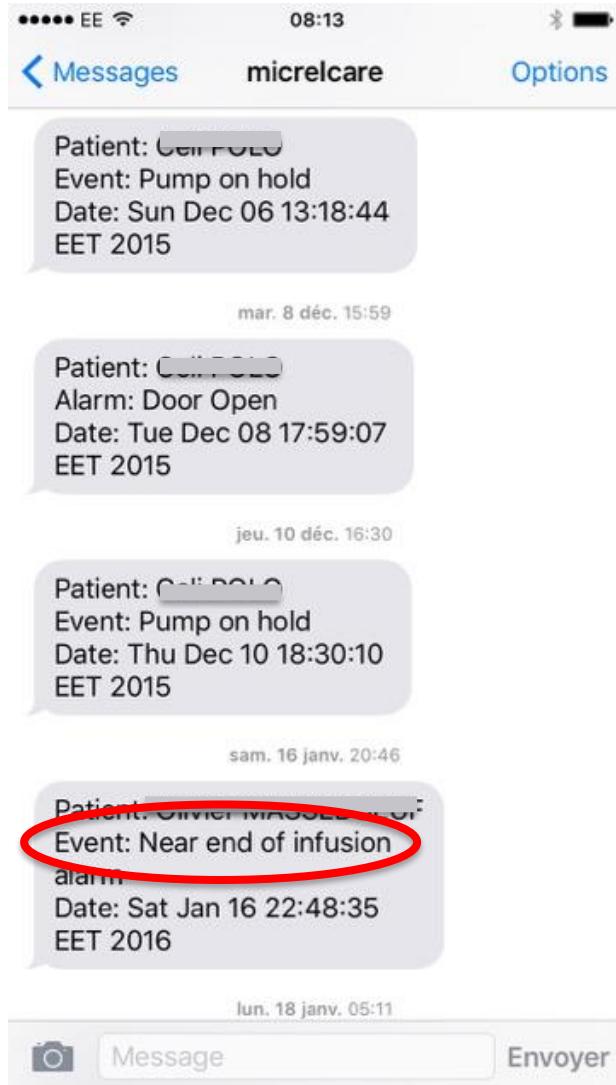
SMS ALARM



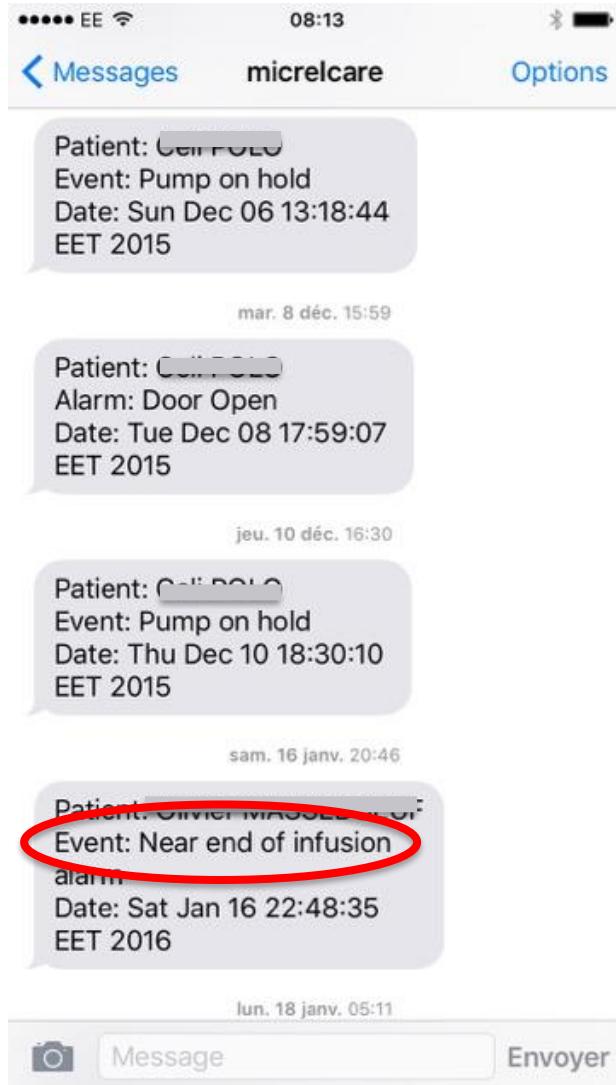
SMS ALARM



SMS ALARM



SMS ALARM



SMS ALARM

***** EE 08:13

Messages micrelcare Options

Patient: Céline POLO
Event: Pump on hold
Date: Sun Dec 06 13:18:44 EET 2015

mar. 8 déc. 15:59

Patient: Céline POLO
Alarm: Door Open
Date: Tue Dec 08 17:59:07 EET 2015

jeu. 10 déc. 16:30

Patient: Céline POLO
Event: Pump on hold
Date: Thu Dec 10 18:30:10 EET 2015

sam. 16 janv. 20:46

Patient: Olivier MASSON
Event: Near end of infusion
alarm

Date: Sat Jan 16 22:48:35 EET 2016

lun. 18 janv. 05:11

Message Envoyer



SMS ALARM

***** EE 08:13

Messages micrelcare

Patient: C-ll PLO
Event: Pump on hold
Date: Sun Dec 06 13:18:44 EET 2015

mar. 8 déc. 15:59

Patient: C-ll PLO
Alarm: Door Open
Date: Tue Dec 08 17:59:07 EET 2015

jeu. 10 déc. 16:30

Patient: C-ll PLO
Event: Pump on hold
Date: Thu Dec 10 18:30:10 EET 2015

sam. 16 janv. 20:46

Patient: Olivier MASSON
Event: Near end of infusion alarm
Date: Sat Jan 16 22:48:35 EET 2016

lun. 18 janv. 05:11

Numero de serie Rythmic:141540335008/10907705PACA Etat de la perfusion le 19 Feb 2016 00:40

Volume deja perfuse 400 ml Fin de perfusion estimee le: 9.6V Fin de Perfusion Cliquer ici pour effacer

Volume restant a perfuser 0 ml

Demarrage Perfusion le 16 Feb 2016 17:02

Traitement/Protocole: NAROPEINE

Volume a perfuser: 200 ml

Debit: 5 ml/H

Bolus: 5 ml

Periode Refractaire: 30 min

Dose limite: 40 ml/4H

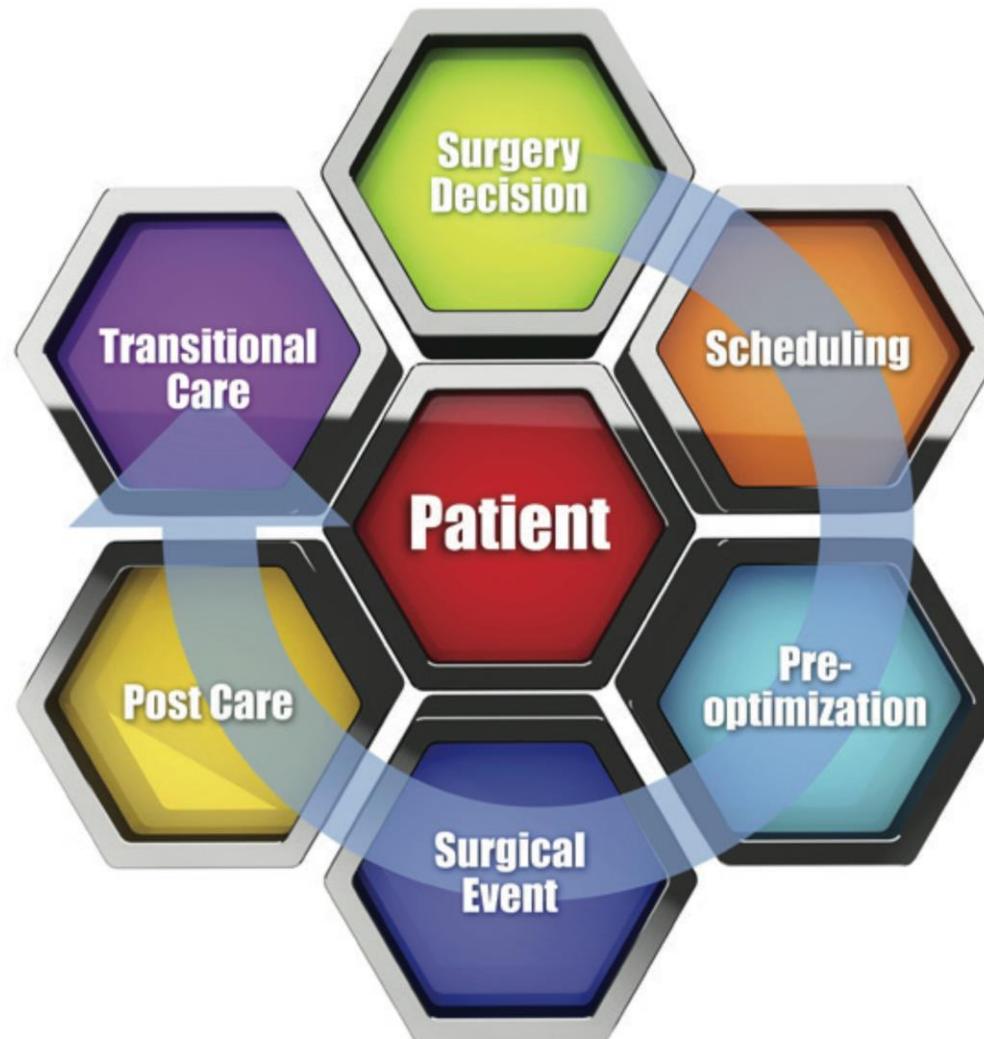
Dose de Charge: 0 ml

Message Envoyer

ELECTRONIC PUMP

- Future electronic pumps will be remotely controlled
 - ✓ Basal rate reduction in case of motor blockade
 - ✓ Bolus rise in case of pain at mobilization
- Early active mobilization
- Early physiotherapy

PERIOPERATIVE SURGICAL HOME



PERIOPERATIVE SURGICAL HOME

EDITORIAL

Pain Management and the Perioperative Surgical Home *Getting the Desired Outcome Right*

James Cyriac, MD, Maxime Cannesson, MD, PhD, and Zeev Kain, MD, MBA

Regional Anesthesia and Pain Medicine • Volume 40, Number 1, January–February 2015

PATIENT EXPERIENCE

100

Maurice-Szamburski 2013

80

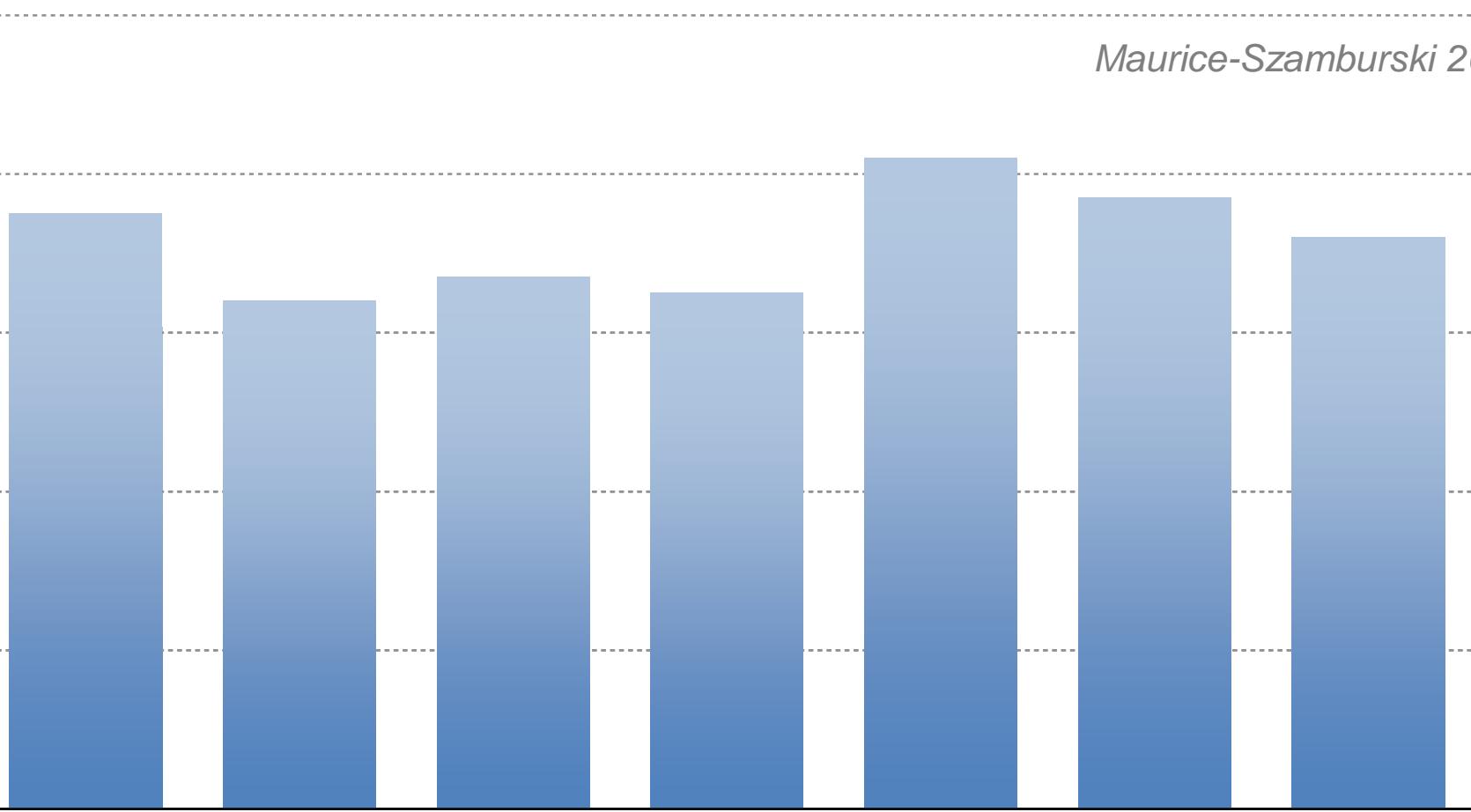
60

40

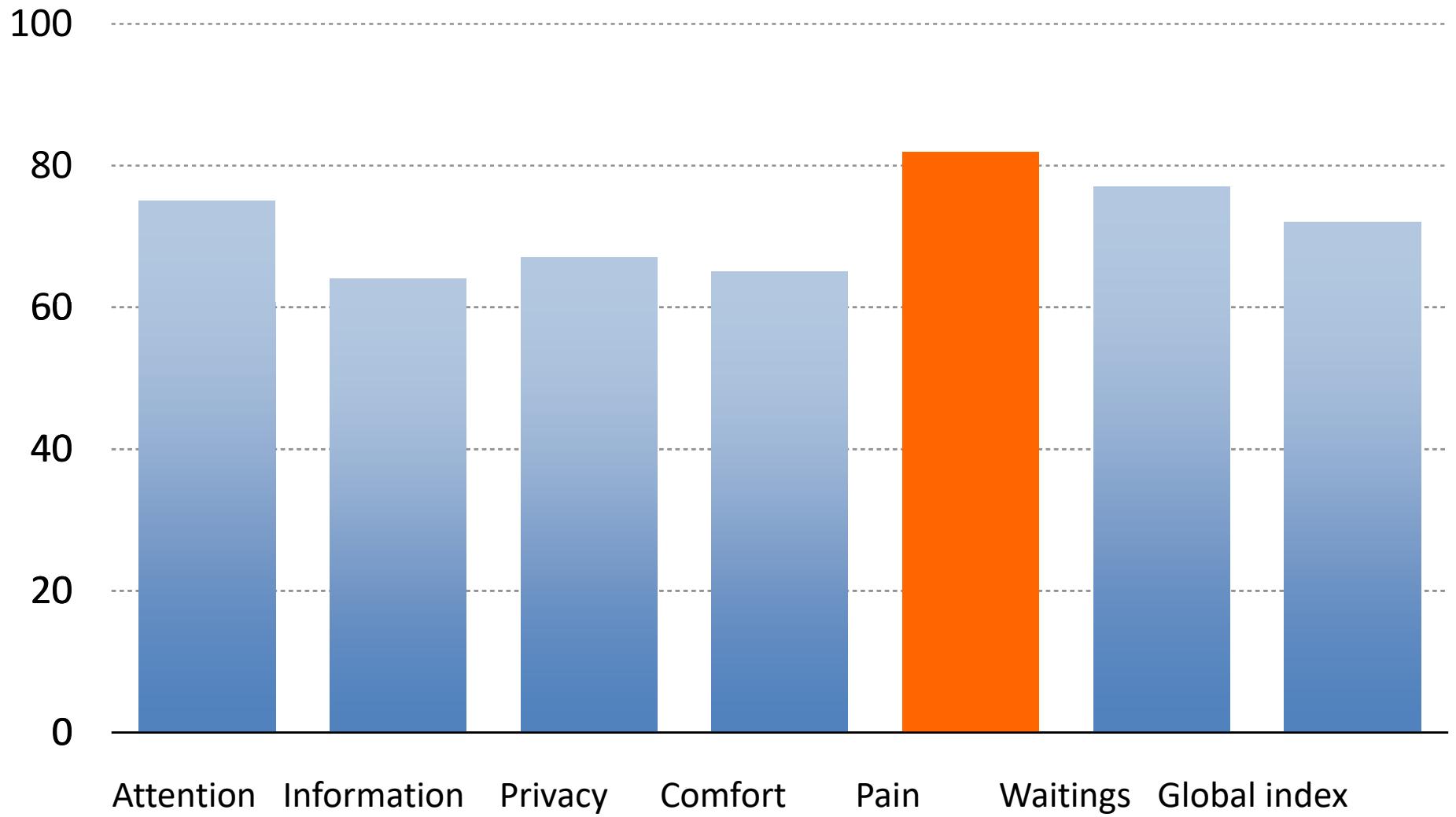
20

0

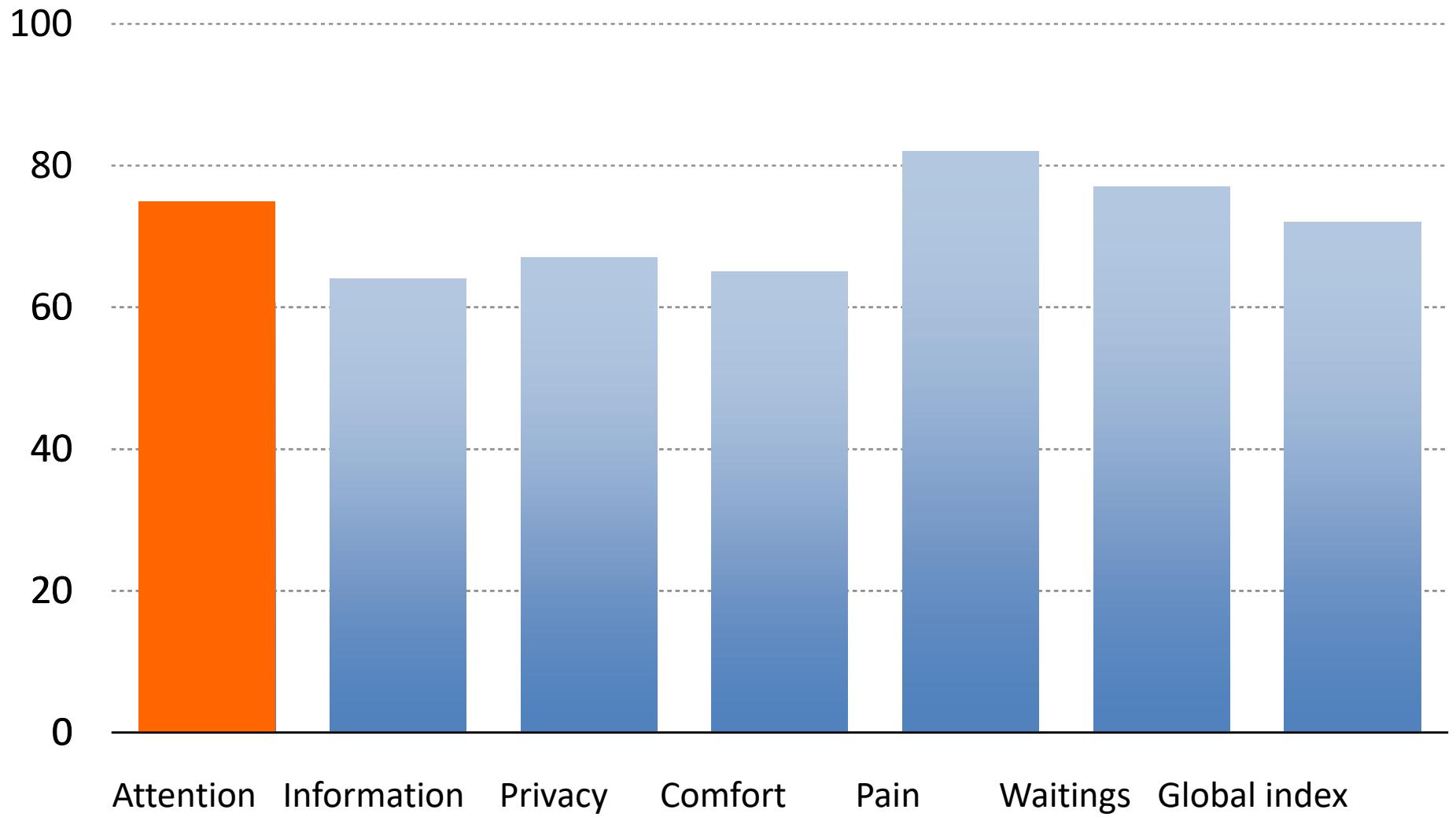
Attention Information Privacy Comfort Pain Waitings Global index



PATIENT EXPERIENCE



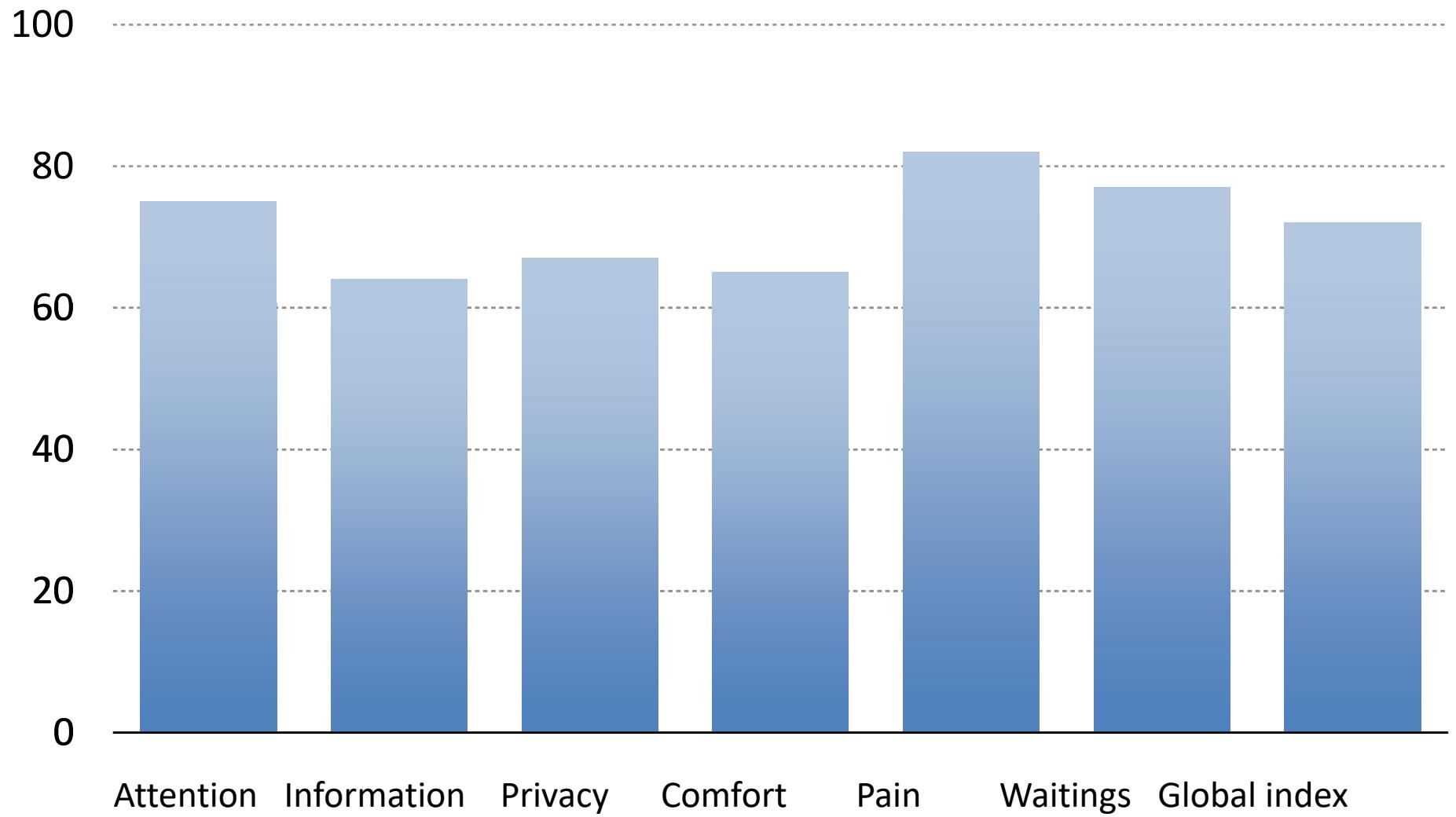
PATIENT EXPERIENCE



ANSWERING PATIENT EXPECTATIONS



PATIENT EXPERIENCE





Regional Anesthesia: *Business Class Pain Management?*

Accepted for publication: February 12, 2014.

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