INTRAOPERATIVE MONITORING (in elective neurosurgery)

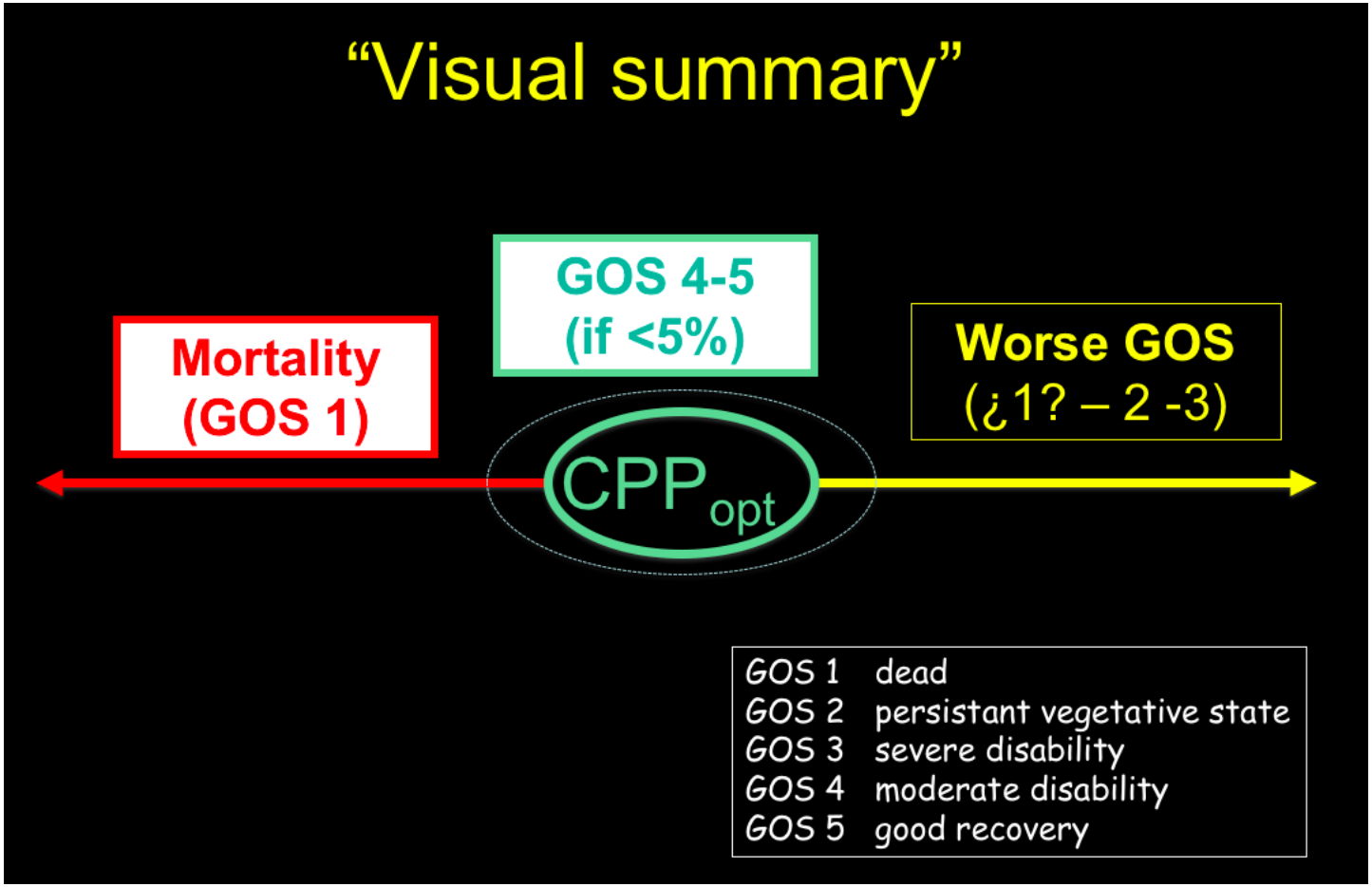
Dr Nicolás de Riva
Neuroanesthesia Division
Anesthesiology Department
Hospital Clinic de Barcelona

Estada retribuida per a ampliació d'estudis ("Permisos sabàtics") Convocatòria 2010.

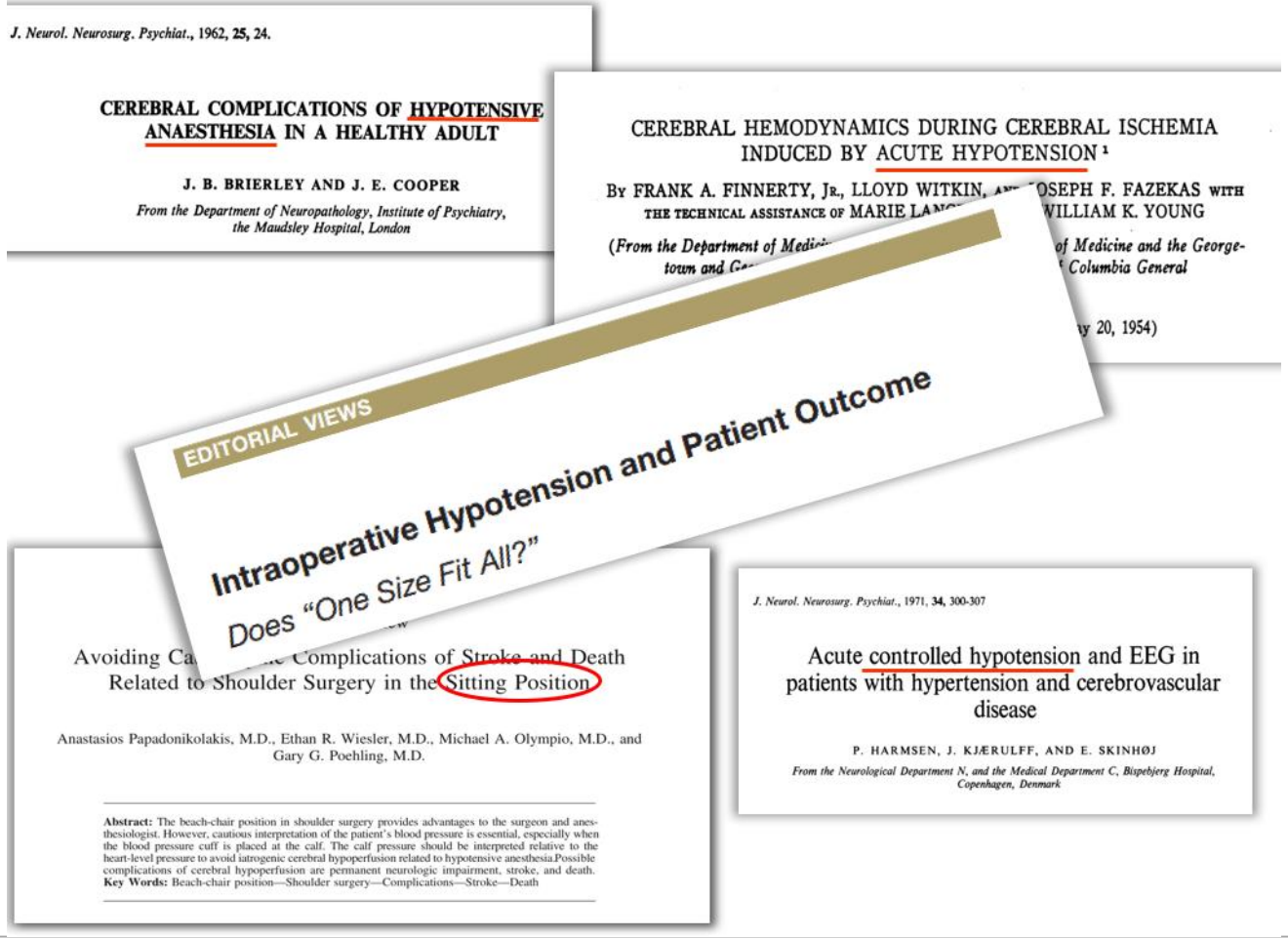
Gonzalo de Riva Solla, Nicolás	Especialista	Anestesiologia i Reanimació	Dir Mèdica	Neuromonitoratge multimodal avançat: aplicabilitat intraoperatòria i a cures intensives de malats neurocrítics	Addenbrooke's Hospital, Cambridge, UK	01/01/2011	31/12/2011	12

Honorary Clinical Fellow, **2011**

CLÍNIC BARCELONA Hospital Universitari



Steiner LA at al. Crit Care Med. 2002 Apr;30(4):733-8



J. Neurol. Neurosurg. Psychiat., 1962, 25, 24.

CEREBRAL COMPLICATIONS OF HYPOTENSIVE ANAESTHESIA IN A HEALTHY ADULT

J. B. BRIERLEY AND J. E. COOPER

From the Department of Neuropathology, Institute of Psychiatry, the Maudsley Hospital, London

CEREBRAL HEMODYNAMICS DURING CEREBRAL ISCHEMIA INDUCED BY ACUTE HYPOTENSION [1]

By FRANK A. FINNERTY, Jr., LLOYD WITKIN, [illegible] JOSEPH F. FAZEKAS with the technical assistance of MARIE LA[illegible] WILLIAM K. YOUNG

(From the Department of Medici[illegible] of Medicine and the George-town and Ge[illegible] Columbia General

[illegible]y 20, 1954)

EDITORIAL VIEWS

Intraoperative Hypotension and Patient Outcome

Does "One Size Fit All?"

Avoiding Ca[illegible] Complications of Stroke and Death Related to Shoulder Surgery in the Sitting Position

Anastasios Papadonikolakis, M.D., Ethan R. Wiesler, M.D., Michael A. Olympio, M.D., and Gary G. Poehling, M.D.

Abstract: The beach-chair position in shoulder surgery provides advantages to the surgeon and anesthesiologist. However, cautious interpretation of the patient's blood pressure is essential, especially when the blood pressure cuff is placed at the calf. The calf pressure should be interpreted relative to the heart-level pressure to avoid iatrogenic cerebral hypoperfusion related to hypotensive anesthesia.Possible complications of cerebral hypoperfusion are permanent neurologic impairment, stroke, and death.
Key Words: Beach-chair position—Shoulder surgery—Complications—Stroke—Death

J. Neurol. Neurosurg. Psychiat., 1971, 34, 300-307

Acute controlled hypotension and EEG in patients with hypertension and cerebrovascular disease

P. HARMSEN, J. KJÆRULFF, AND E. SKINHØJ

From the Neurological Department N, and the Medical Department C, Bispebjerg Hospital, Copenhagen, Denmark

CLÍNIC BARCELONA Hospital Universitari

Cerebral Perfusion Pressure Below 60 mm Hg is Common in the Intraoperative Setting

Laurel E. Moore, MD, Milad Sharifpour, MS, Amy Shanks, MS, Sachin Kheterpal, MD, MBA, Kevin K. Tremper, MD, PhD, and George A. Mashour, MD, PhD

J Neurosurg Anesthesiol • Volume 24, Number 1, January 2012

TABLE 3. Frequency of CPP <60 mm Hg

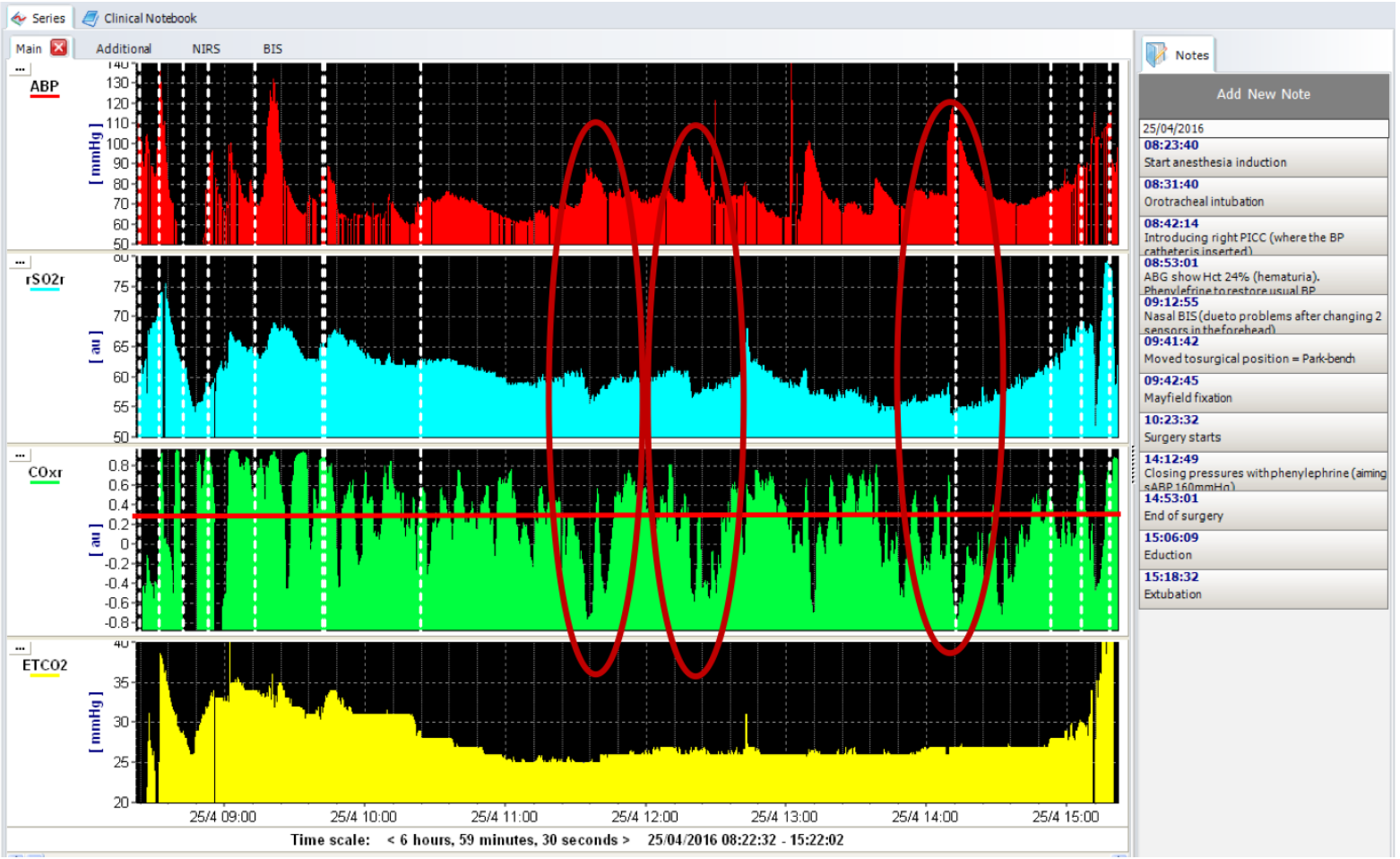
	CPP < 60 mm Hg	CPP ≥ 60 mm Hg	*P*
Neurosurgery (N = 88)			
Frequency	65 (74%)	23 (26%)	
Median ICP (mm Hg)	9 (8)	5 (9)	0.001
Median CPP (mm Hg)	69 (14)	84 (10)	< 0.001
Trauma (N = 67)			
Frequency	55 (82%)	12 (18%)	
Median ICP (mm Hg)	17 (9)	9 (13)	0.009
Median CPP (mm Hg)	63 (16)	78 (15)	< 0.001

Number (%) or median (interquartile range) is shown.

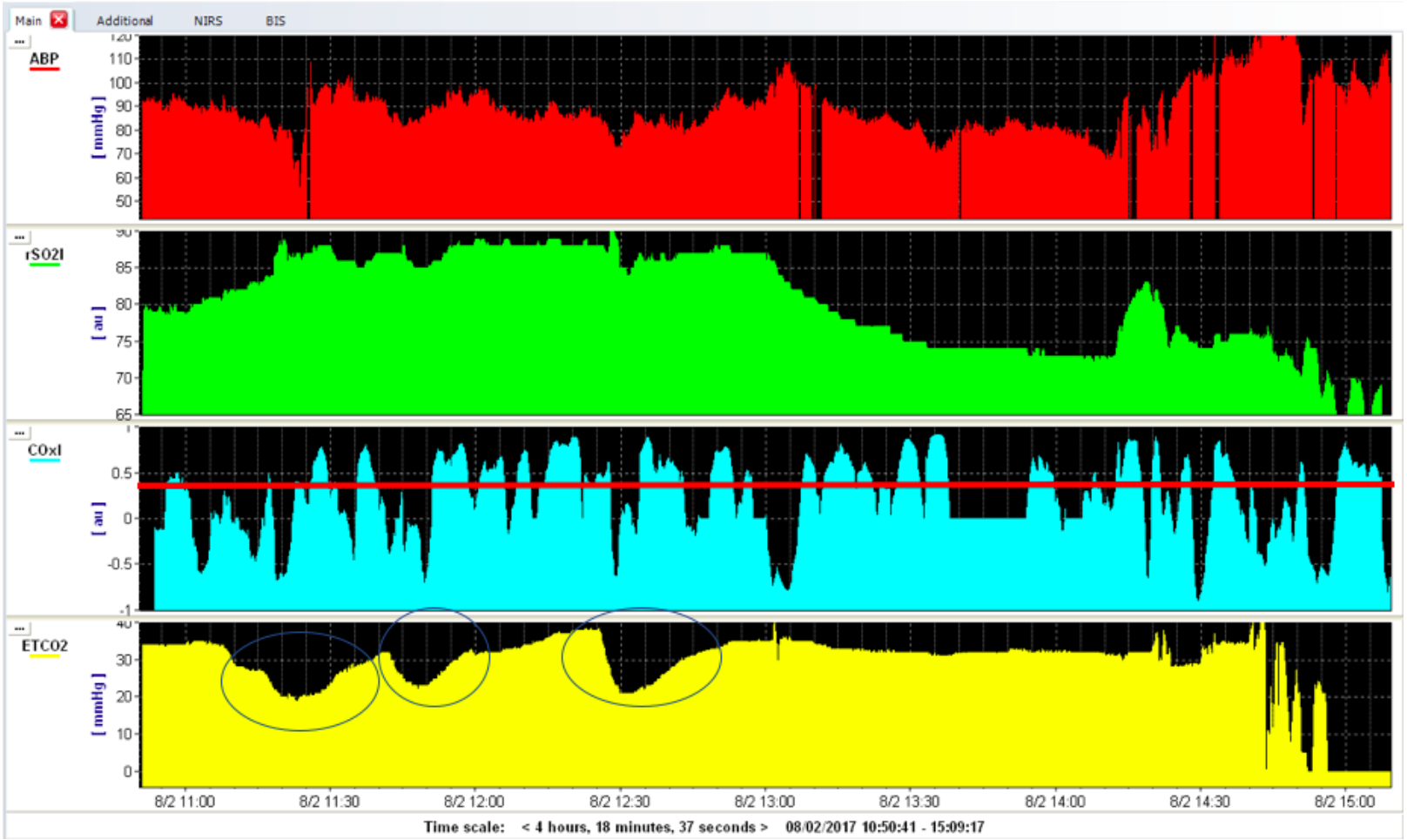
Median cerebral perfusion pressure (CPP) and intracranial pressure (ICP) data for patients having at least one 5-minute epoch with CPP < 60 mm Hg versus patients with continuous median CPP ≥ 60 mm Hg. The median ICP and CPP were calculated for each 5-minute epoch over the monitoring period to determine the value reported. Note that the overall median CPP in each group was ≥ 60 mm Hg, despite the frequency of 5-minute epochs in which the CPP was < 60 mm Hg.

2015 = ICM+™ Setting in Elective Neurosurgery Theatre

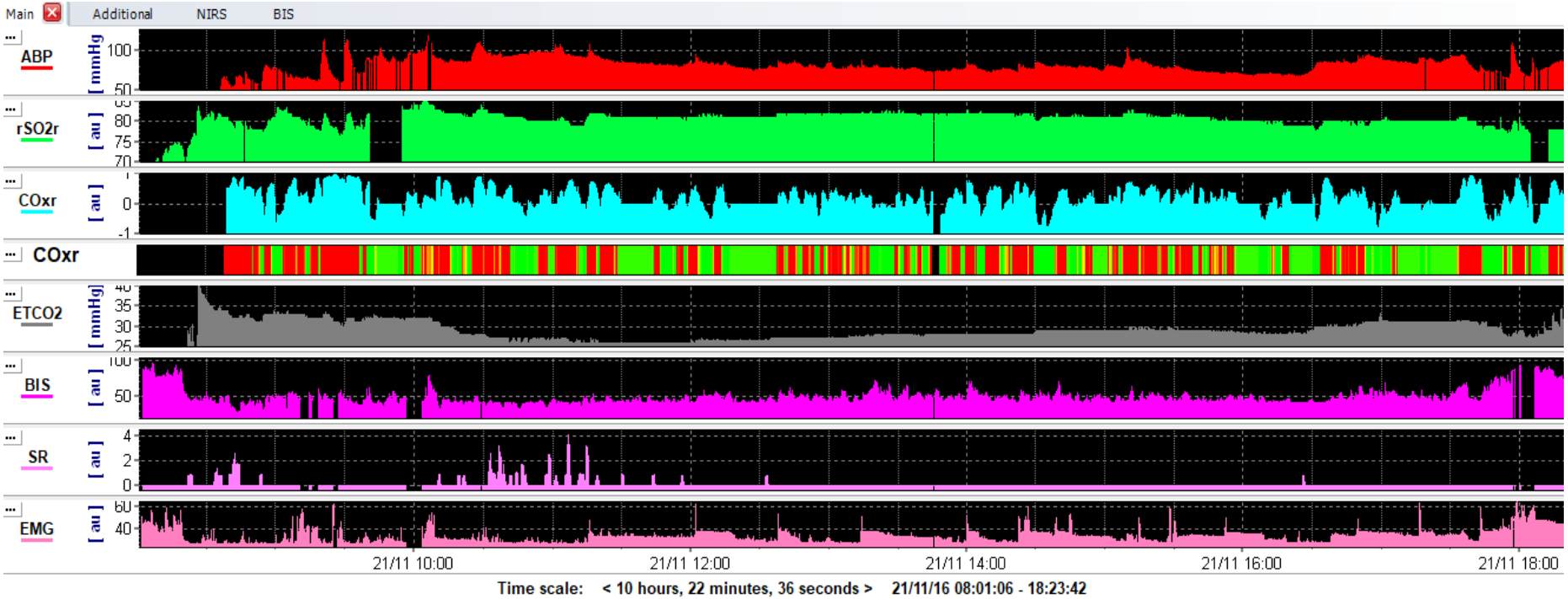
‘How much monitoring time do we need?’



81 y/o, HTN (ref 120/80 mmHg) ➔ Right CPA tumour

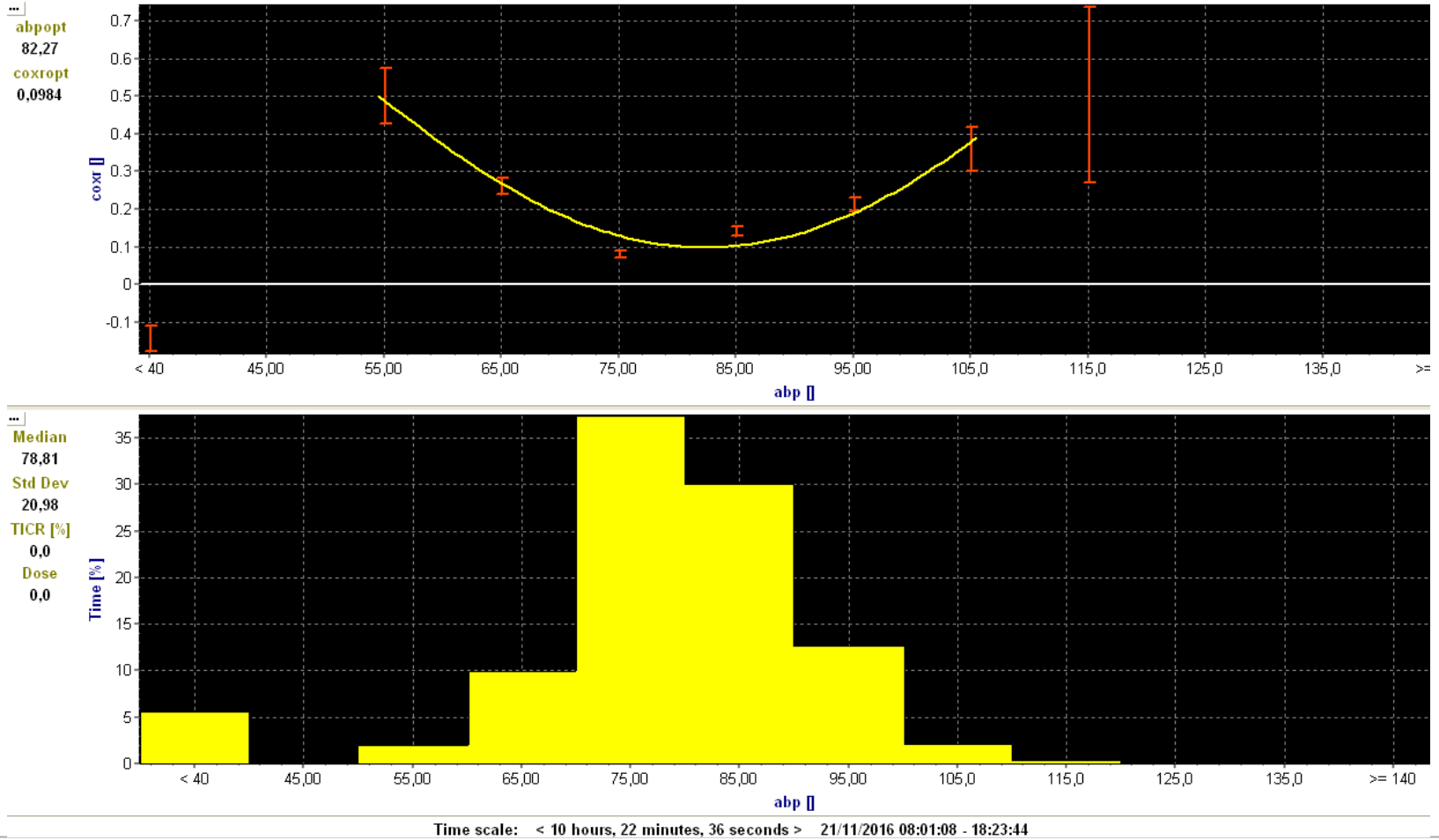


Sitting surgery ➔ Venous air embolisms (3 episodes)



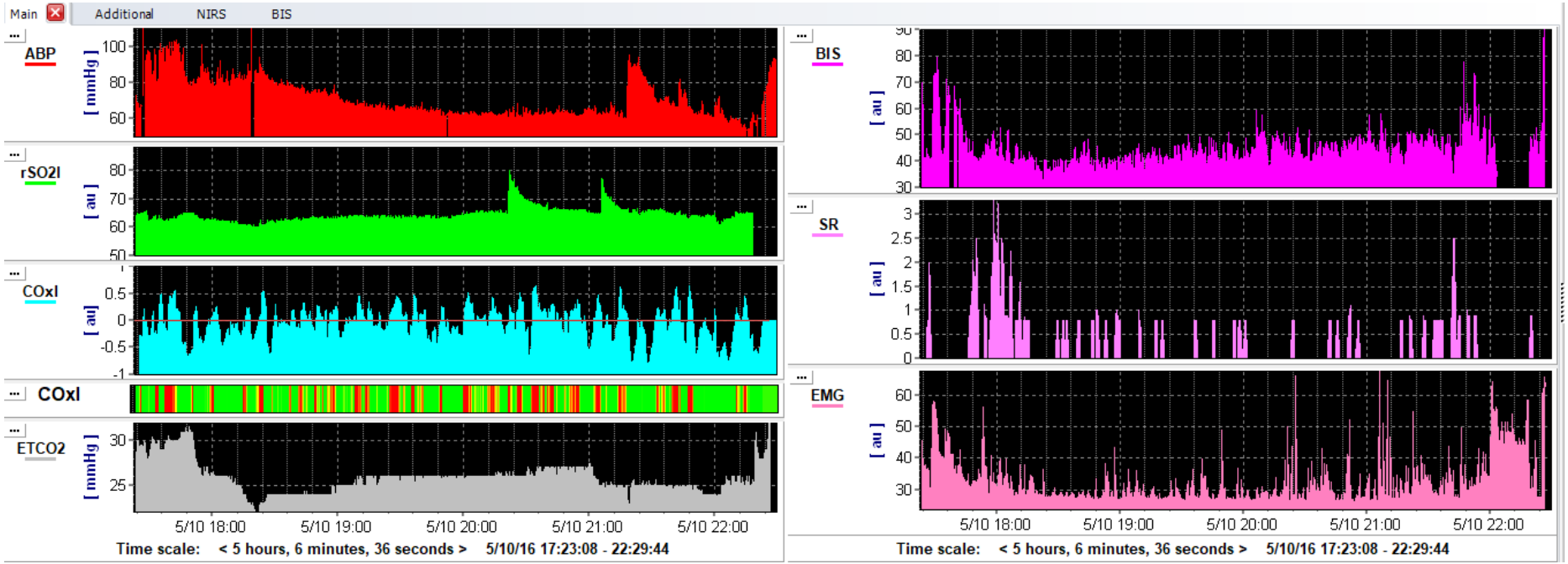
8h surgery = 10h monitoring ➔ No NMBA (acoustic neuroma)

CLÍNIC BARCELONA Hospital Universitari

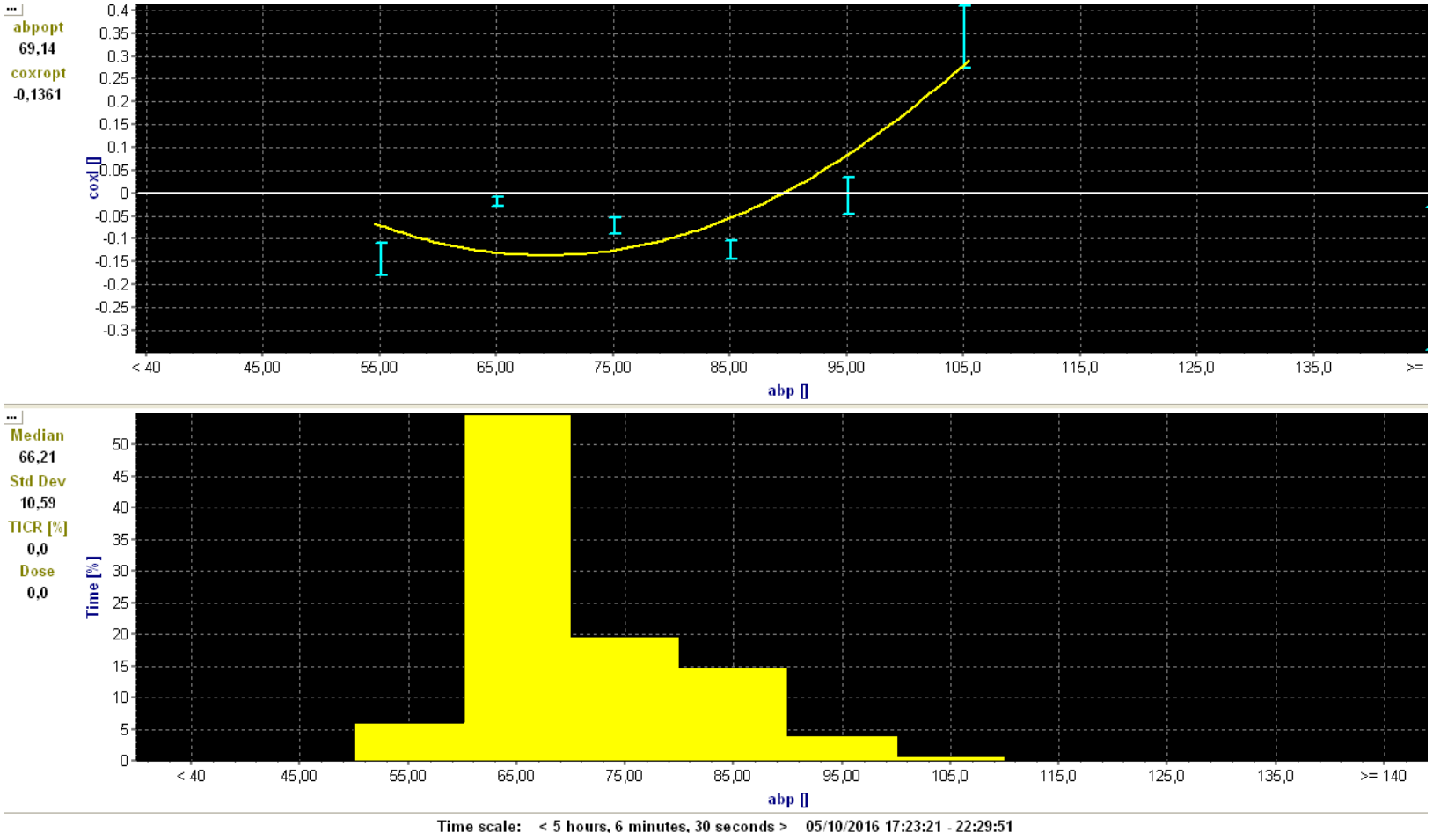


8h surgery = 10h monitoring ➔ No NMBA (acoustic neuroma)

CLÍNIC BARCELONA Hospital Universitari



Left MCA & Right ACA Aneurysm Clipping



Left MCA & Right ACA Aneurysm Clipping

HYPOTHESIS

Using NIRS to calculate COx ('cerebral oximetry index') allows the retrospective calculation of the **ABP_{OPT}** in patients undergoing elective neurosurgeries under general total intravenous anaesthesia (TIVA)

AIMS

1. To describe the possibility to monitor intraoperative CA non-invasively in elective neurosurgery (COx index).

2. To determine the possibility to monitor individual ABP_{OPT}

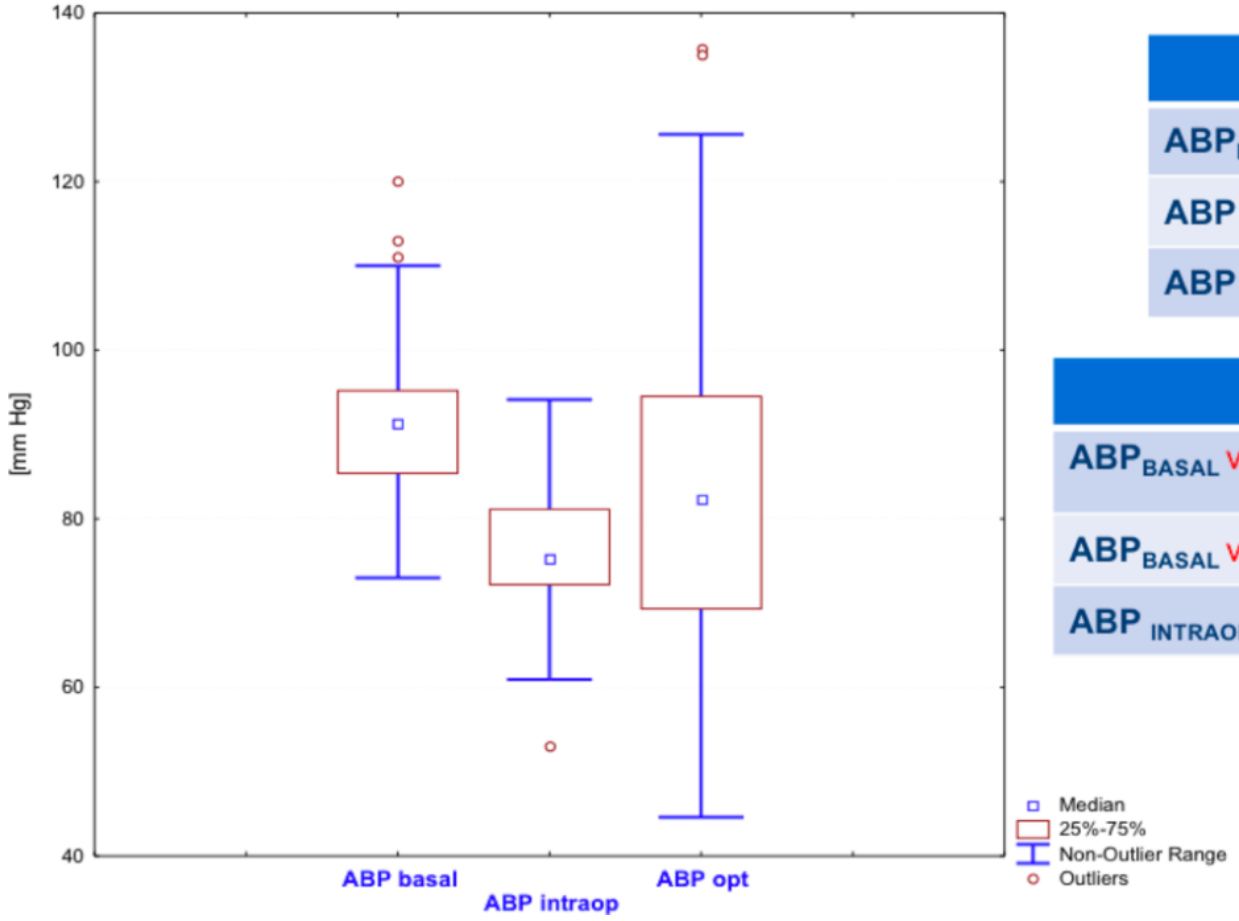
3. To analyze the relation between ABP_{OPT} and $ABP_{INTRAOP}$

AIMS

4. To analyze differences between ABP_{BASAL} (preop), $ABP_{INTRAOP}$ and ABP_{OPT}

5. To analyze differences between surgeries

(Supratentorial vs Infratentorial vs Vascular vs Spinal)



	mm Hg
ABP_{BASAL}	91.29 ± 9.67
$ABP_{INTRAOP}$	75.99 ± 8.35
ABP_{OPT}	83.93 ± 19.95

	p
ABP_{BASAL} VS $ABP_{INTRAOP}$	0.001*
ABP_{BASAL} VS ABP_{OPT}	0.008*
$ABP_{INTRAOP}$ VS ABP_{OPT}	0.003*

n = 50

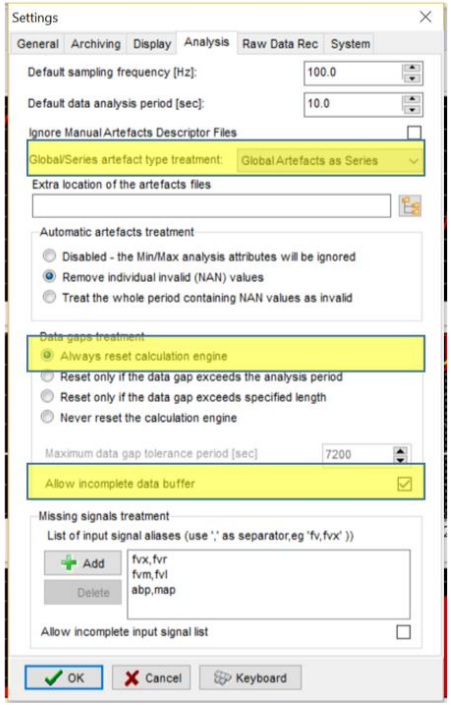
CIRUGÍA (n = 50)	$ABP_{INTRAOP}$ < ABP_{OPT} – 5%	$ABP_{INTRAOP}$ es ABP_{OPT} ± 5%	$ABP_{INTRAOP}$ > ABP_{OPT} + 5%
Supratentorial (n = 22)	54.5% (12)	18% (4)	27.3% (6)
Infratentorial (n = 15)	53.3% (8)	26.7% (4)	20% (3)
Vascular (n = 7)	71.4% (5)	14.3% (1)	14.3% (1)
Raquis (n = 6)	33.3% (2)	33.3% (2)	33.3% (2)

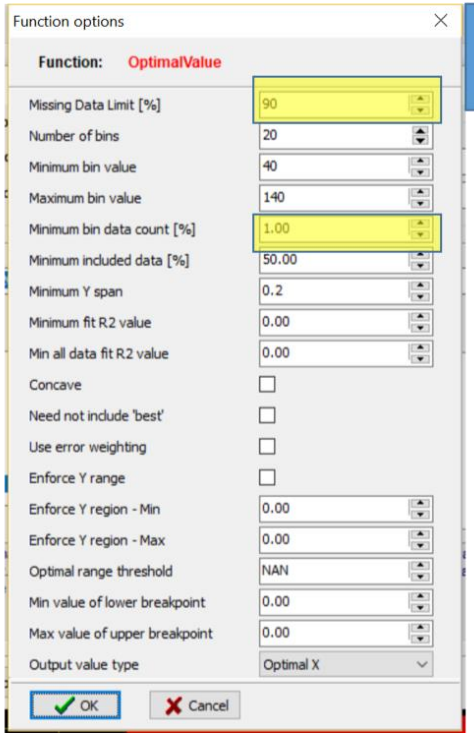
‘Are we calculating ABP_{OPT} the right way?’

‘Are we calculating ABP_{OPT} the right way?’

- Single window
- Multi-flexi window (Leuven)

One single expanding window trend



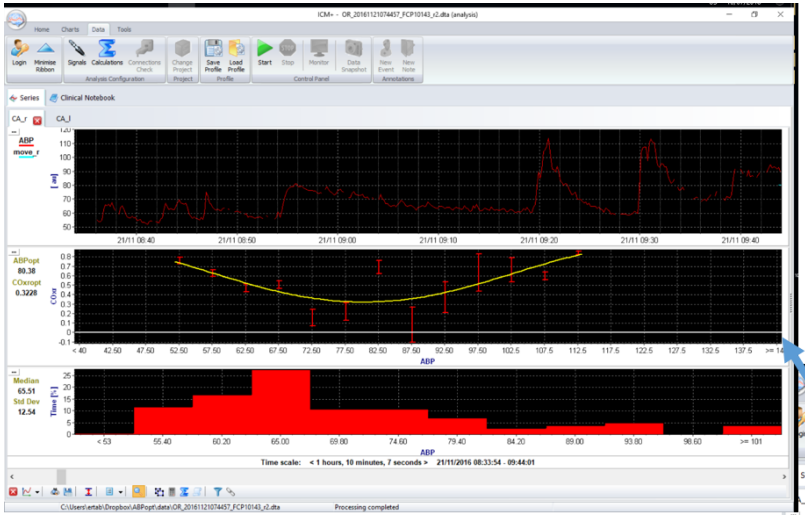


ABPopt_exp

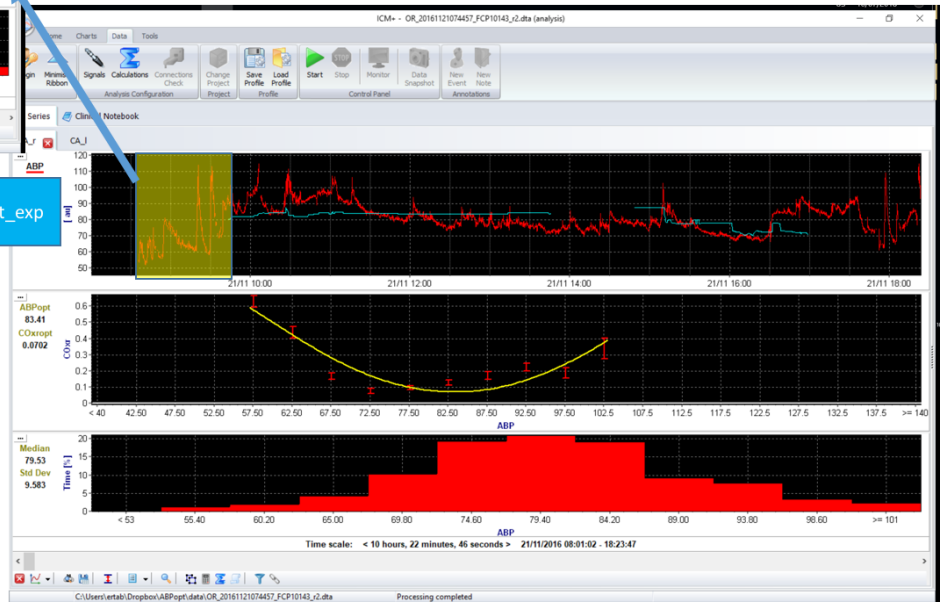
Calculation period: 36000 sec
Update: 10 sec

Arguments: ABP, CoxI/r

Thanks to Erta Beqiri



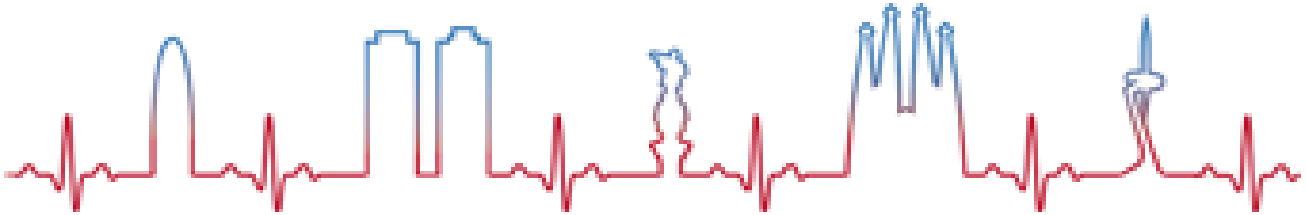
ABPopt_exp



Thanks to Erta Beqiri

CLÍNIC BARCELONA Hospital Universitari

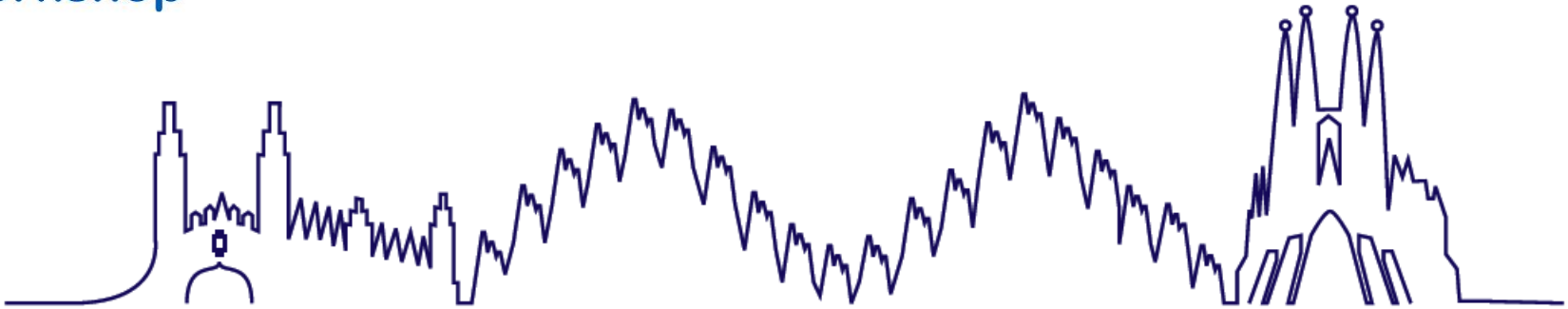

60
0.2
126/70
98
36.4
35
71
65
Dräger
Primus



SCARTD 2016, Barcelona

“One size does not fit all”

ICM+ workshop



“One size does not fit all”