Costos de l'anestèsia

"Quant costa lo que faig servir?
¿Quant val lo que faig?"

Nicolás de Riva Solla

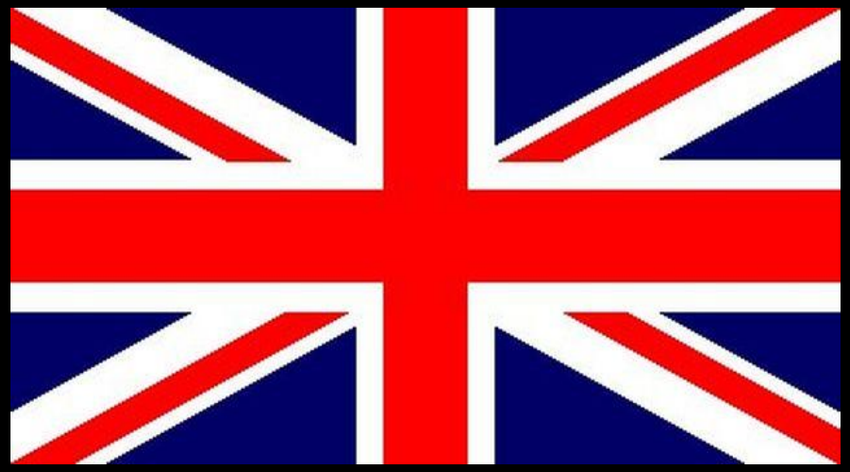
Especialista Sènior
Servei d'Anestesiologia
Hospital Clínic

Dilluns 7 Octubre 2013

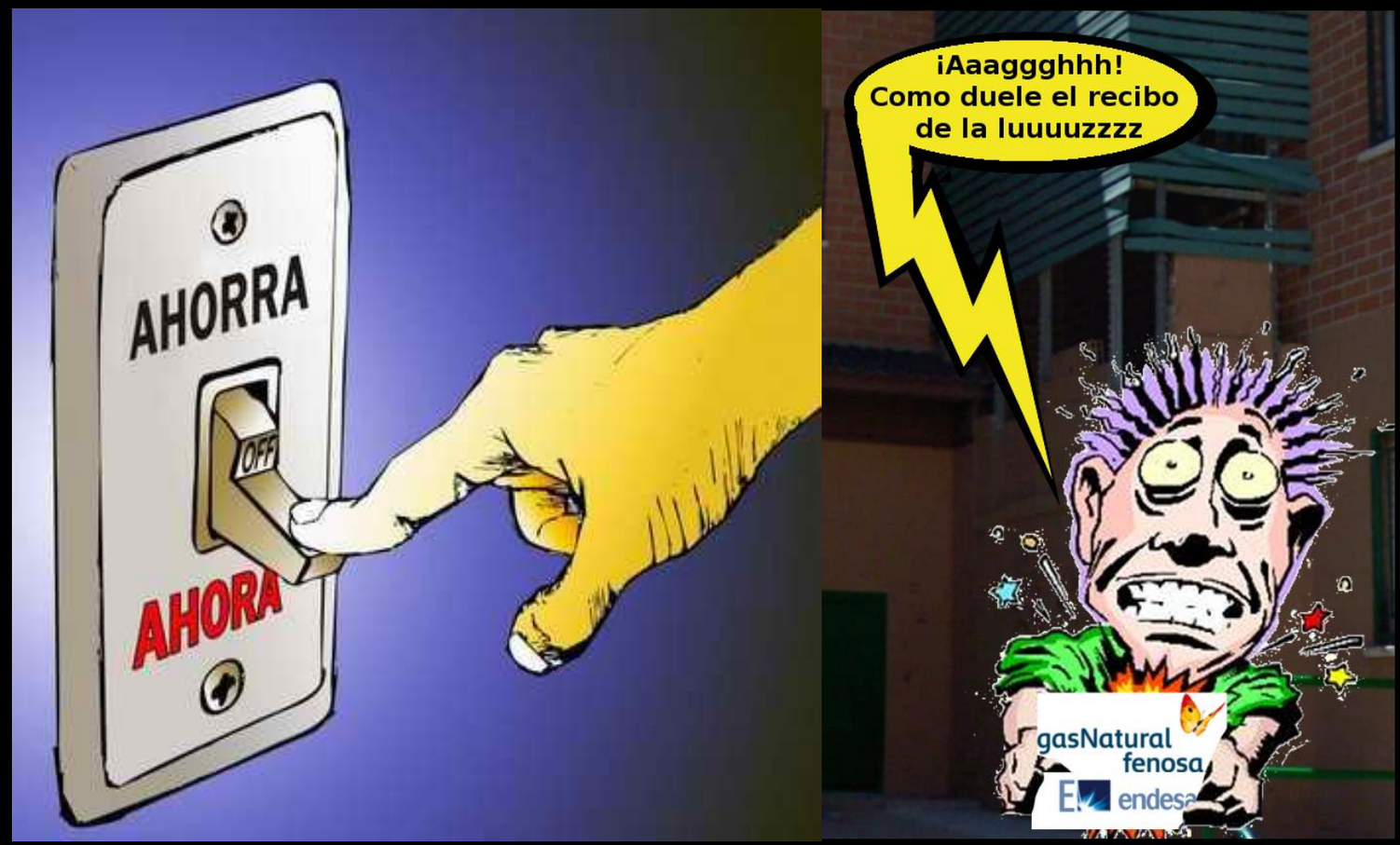
1975

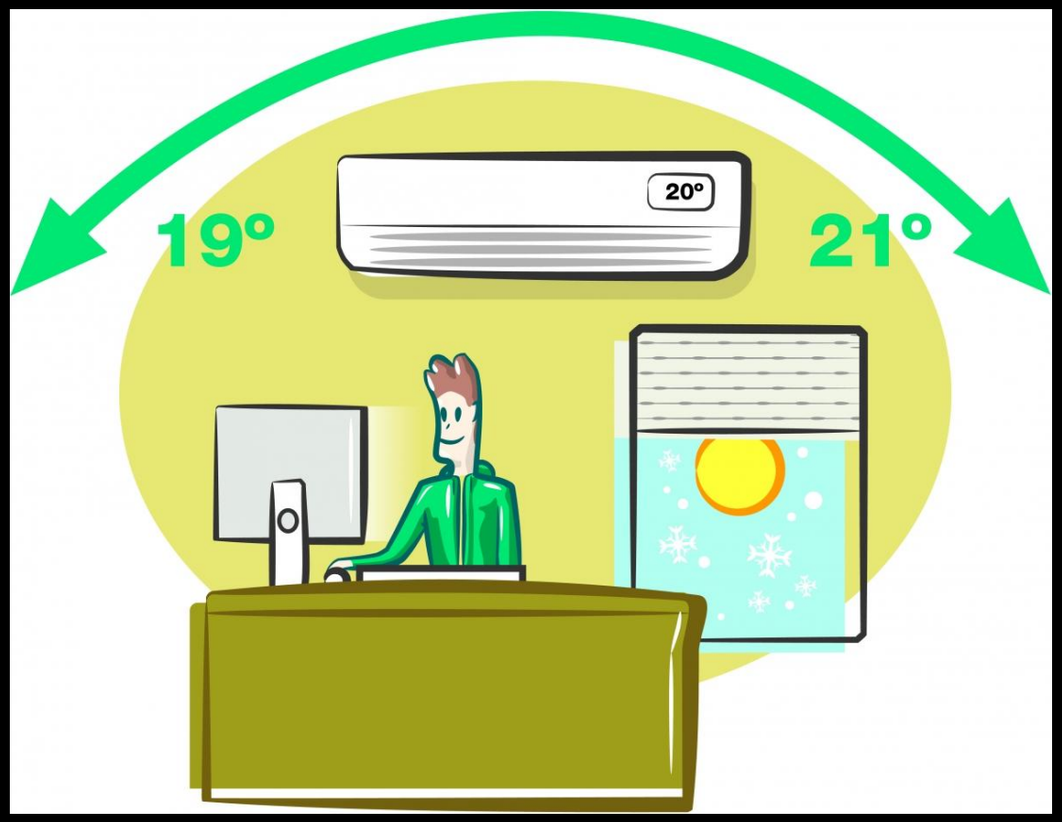
Es un problema cultural

Una qüestió
CULTURAL



Als llocs públics també!!





6ena temporada:

Diumenge 10 juny 2012

1.897.000 espectadors (11% share)

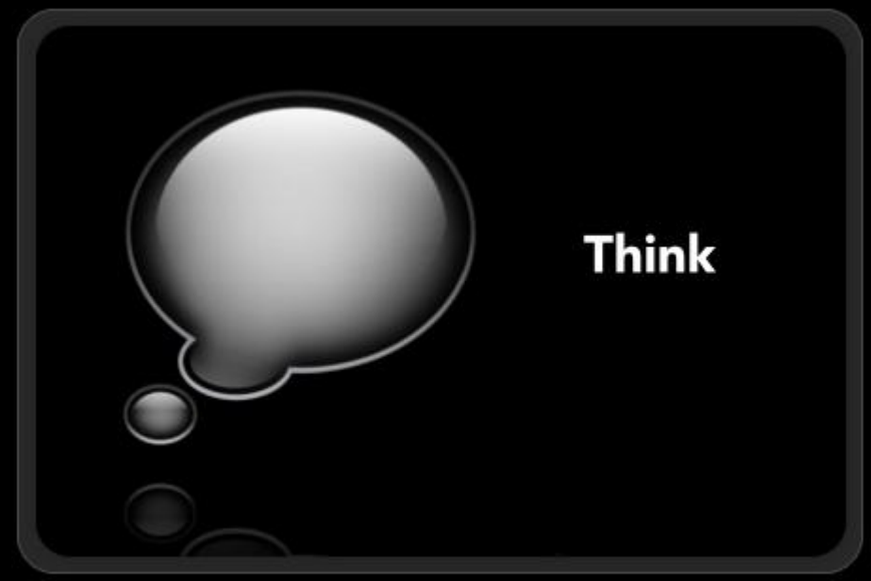

MÁS VALE PEDIR PERDÓN QUE PEDIR PERMISO
HISTORIAS ÍNTIMAS DE
Salvados
por JORDI ÉVOLE
y el equipo del programa
prólogo de
QUIM MONZÓ
Planeta


ECONOMÍA
DEL BIEN COMÚN
Un modelo de economía con futuro

Es un problema cultural

QUE PRETEN AQUESTA SESSIÓ

1. Informar
2. Reflexionar
3. Prendre consciència



"The issues of
provider education
& awareness with respect to costs
& ethical considerations
in ensuring well-being of patients
go hand in hand"
(Rinehardt)

QUE NO ES AQUESTA SESSIÓ

1. Un judici

2. Dir lo que s'ha de fer

"The issues of
provider education
& awareness with respect to costs
& ethical considerations
in ensuring well-being of patients
go hand in hand"
(Rinehardt)

Editorial

Cost Containment in the Operating Room: Who Is Responsible?

Paul F. White, PhD, MD, FFARACS,*
Linda D. White, BSN, MS†

Department of Anesthesiology and Pain Management, University of Texas Southwestern Medical Center, Dallas, TX; and Ambulatory Anesthesia Research Foundation, Dallas, TX

J Clin Anesth 1994,6:351-356

EDITORIAL

CURRENT OPINION

Money, money, money

Brian Pollard

Curr Opin Anaesth 2012,25:175-177

- ✓ Hi ha una despesa inevitable
- ✓ Ningú acceptaria reduir la seguretat per estalviar una mica de diners
- ✓ A més a més gastem poc

Órgano científico de la Sociedad Española de Anestesiología, Reanimación y Terapéutica del dolor

ISSN: 0034-9356

Revista Española de Anestesiología y Reanimación

Spanish Journal of Anesthesiology and Critical Care

Rev Esp Anestesiol Reanim. 2013;60(3):121–123

Revista Española de Anestesiología y Reanimación

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EDITORIAL

Cómo ahorrar en anestesia en tiempos de crisis

How to make savings in anaesthesia in times of financial crisis

A. Villalonga

Servicio de Anestesiología, Reanimación y Terapéutica del Dolor, Hospital Universitari de Girona Doctor Josep Trueta, Girona, España

La sanidad, como algunos podrían esperar, no ha quedado al margen de la grave crisis económica. En nuestro país, los recortes en las partidas destinadas a salud ya fueron patentes el año 2012, en alguna comunidad incluso se iniciaron el año anterior, y seguirán en el presente año. Está claro que la tónica en el futuro próximo va a ser la misma, recortar y seguir recortando gastos, y no sabemos ni cuánto ni hasta cuándo, pues si siguen las mismas tendencias, en uno o 2 años las clases pasivas, parados y jubilados, superarán a las activas. Hace décadas que se anunciaba que nuestro modelo sanitario era insostenible, pero, como cada año se iban aumentando los presupuestos, veíamos lejano el cumplimiento de esa funesta profecía. La crisis de los 90 en España, mucho menos grave y más breve que la actual, provocó preocupación en nuestro sector y que aparecieran algunos trabajos en nuestra revista relacionados con la economía[1,2], pero enseguida la inquietud pasó y vinieron unos años de una opulencia que, a posteriori, se ha visto que era ficticia. Ahora todo indica que al fin se está cumpliendo aquella fatídica previsión, y que será imposible volver a los tiempos pasados en los que teníamos una sanidad totalmente gratuita y universal en prestaciones y para todo el mundo sin excepciones.

A los servicios de anestesia nos afecta la crisis como a cualquier otro, en primer lugar en la disminución de nuestros sueldos, en la dificultad para mantener las plantillas o recursos humanos, con el riesgo de tener que hacer más trabajo con menos efectivos, y también en los recursos materiales de que disponemos.

Todos nos preguntamos: ¿qué podemos hacer ante esta situación? Es difícil dar una respuesta a esta cuestión, pues gran parte del problema y de las posibles soluciones nos sobrepasan. Les corresponde a los dirigentes políticos y a las autoridades sanitarias decidir qué han de recortar. Pero sí que nos toca ver la mejor manera de capear el temporal y tratar de salir lo menos perjudicado. Por ello, aquí me centraré en lo que está al alcance de nuestras posibilidades en el trabajo del día a día.

Los servicios de anestesia, queramos o no, aunque no seamos los culpables de la crisis, nos veremos obligados cada vez más a controlar los gastos, pues todos estamos afectados por la dictadura de los hechos, y el hecho flagrante es que no hay liquidez. No sirve argumentar que otros servicios gastan más, y que a veces se despilfarran recursos, el que otros hagan las cosas mal no es excusa para cometer los mismos desmanes. Tampoco vale el argumento de que los gastos de anestesia son pequeños en relación con otras partidas, es decir, que serían «el chocolate del loro». El problema es que hay «muchos loros comiendo chocolate», y claramente ahora toca comer otra alimentación más barata, pues la suma de muchos pocos puede llegar a ser una cantidad astronómica.

Una de las consecuencias positivas de la crisis será un mayor control en los gastos y, consecuentemente, evitar los derroches. Rápidamente se impondrá la gestión de los recursos a todos los niveles y la contabilidad cada vez más fina, de forma que se sepa qué se gasta, quién lo gasta, en qué y cómo. En general, las entidades privadas en este aspecto suelen ir por delante y conocen mejor los gastos de los procesos concretos que realizan, en la sanidad pública todavía queda mucho por hacer. Muchos centros públicos desconocen los precios reales de sus productos y técnicas, algo tan elemental como saber lo que cuesta una radiografía o un electrocardiograma, no digamos ya una determinada intervención quirúrgica. Muchos responsables de servicio desconocen los gastos propios de personal, de farmacia, fungibles y otros más difíciles de contabilizar atribuibles al

Correos electrónicos: antoniovillalonga@gmail.com, avillalonga@comg.cat

Villalonga A, Rev Esp Anestesiol Reanim.2013 Mar; 60(3) 121-3

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Cómo funciona la economía

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- Entender las consecuencias de la política económica de los gobiernos
- Reconocer las causas de la crisis y cómo prevenir futuros desastres

Leopoldo Abadía
Ex profesor del IESE y autor del best-seller La crisis Ninja y otros misterios de la economía actual

Juliol 2000 - Novembre 2004

MIR HOSPITAL CLÍNIC

Desembre 2004 - Febrer 2006 (14 mesos)

—

F.E.A. HUPA (MADRID)

Gener - Desembre 2011 (12 mesos)

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

10	**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

King's College y "The Backs", Sept 2010

HONORARY CLINICAL FELLOW

Etapa #1

Clinical Fellow NCCU

Gen - Jul 2011

Etapa #2

Research Academical Neurosurgery Unit

Jun - Des 2011

Etapa #3

Observer
NeuroTheatres

Oct - Dic 2011

NCCU

Neurosciences Critical Care Unit (Des 2000)

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  Llits: 13 UCI / 8 HDU (intermedis)
  Ratio infermeria 1:1 / 1:2

- ✓ 900-1000 pacients / any (75% neurocrítics)
  - ✓ 120 HSA
  - ✓ 100 TCE

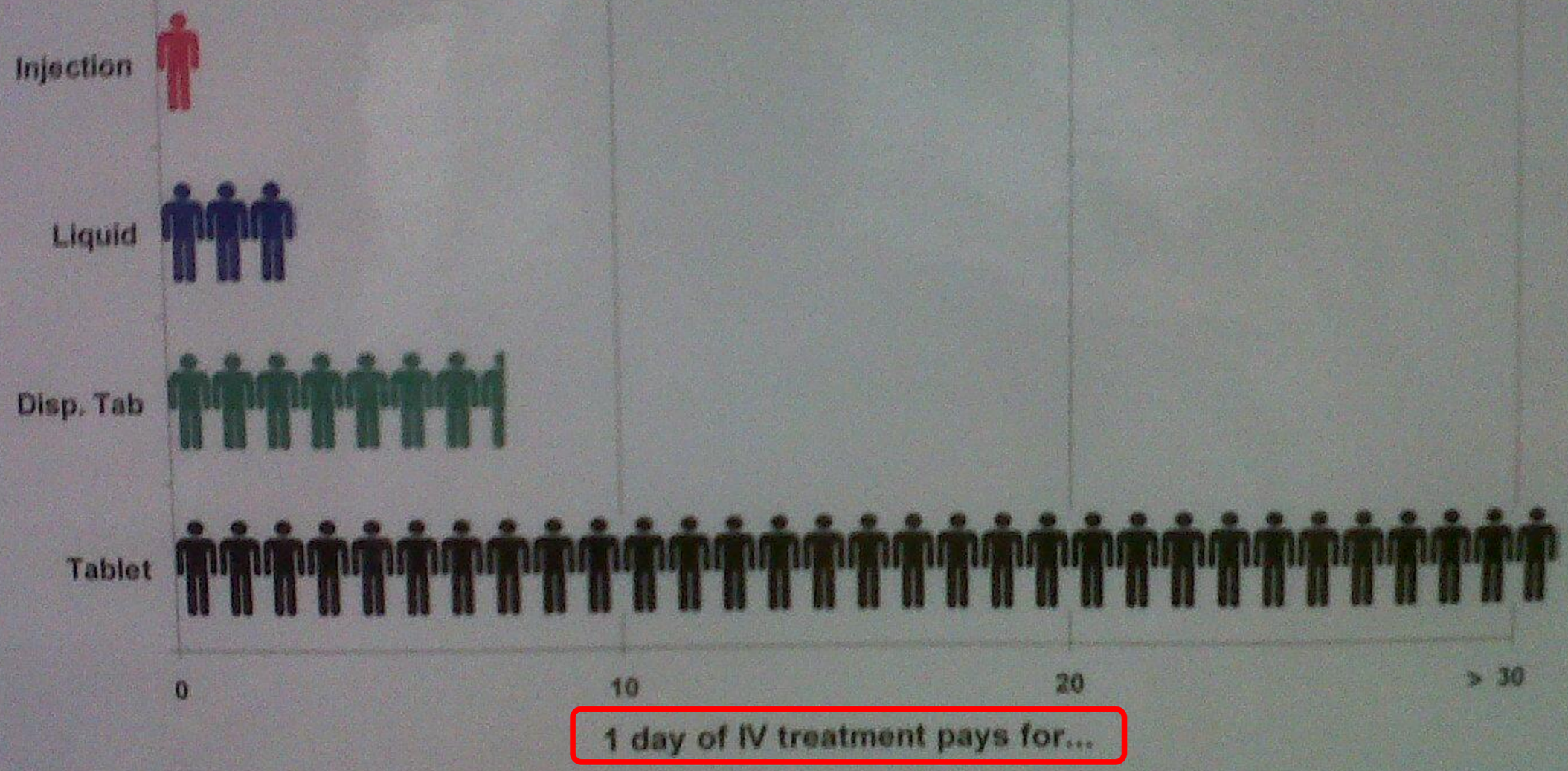
  Wolfson Brain Imaging Center (PET/RM)

Prof David K Menon

Could Your Patient Receive their Medicines via the PO/NG Route Instead of IV?

Most medicines are far cheaper when given in tablet, capsule or liquid form than as an injection

Relative Costs of Various Forms of Paracetamol



Cost in £/hour when 1 MAC dialled on the vaporiser

Fresh gas flow L/min	Isoflurane	Sevoflurane	Desflurane	Fresh gas flow L/min	Isoflurane	Sevoflurane	Desflurane
6.00	0.72	11.20	31.27	2.00	0.24	3.73	10.42
5.00	0.60	9.34	26.06	1.00	0.12	1.87	5.21
4.00	0.48	7.47	20.84	0.50	0.06	0.93	2.61
3.00	0.36	5.60	15.63	0.25	0.03	0.47	1.30

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RECORDANT CONCEPTES...

Eficàcia

Capacitat d' assolir l'efecte
que s'espera o es desitja al
realitzar una acció

Eficiència

Us racional dels medis
per assolir un objectiu predeterminat

Complir un objectiu
amb els mínims recursos disponibles i temps

Efectivitat

Capacitat per produir l'efecte desitjat

+ Sense
disminuir la
seguretat

REVIEW

Costs and wastes in anesthesia care

Elena K. Rinehardt and Murali Sivarajan

Purpose of review
The current economic climate has put pressure on healthcare systems and providers, including anesthesiologists, to minimize costs without sacrificing patient safety. In this review, we discuss costs associated with anesthesia care, including medications and intraoperative monitoring, and suggest ways to reduce wastes and overall expenditure.

Recent findings
Significant amount, perhaps 20–50%, of drugs drawn up are never used but discarded as whole ampoules or vials. There has been a progressive shift to using more expensive inhalational agents and total intravenous anesthesia in the last 10 years. Highest drug costs are associated with total intravenous anesthesia protocols, which are five to 10 times more expensive than administering sevoflurane or desflurane with premedication using antiemetics. Among the inhalational agents, usage costs of sevoflurane and desflurane are 10 and 25 times, respectively, that of isoflurane. Bispectral index monitoring, which requires use of an expensive proprietary electrode is no better, perhaps even less effective, than titration of inhalational agents using end tidal anesthetic concentration to monitor depth of anesthesia and prevent intraoperative awareness.

Summary
Anesthesia medications comprise a significant proportion of hospital pharmacy budgets. Average anesthesia-related cost reductions of US$ 13–30 per cases multiplied by 25 million anesthetics administered annually in the USA has the potential to yield savings of US$ 350–750 million. Bispectral index monitoring during inhalational anesthesia adds to the cost without providing any benefit.

Keywords
anesthesia, drug costs, drug waste, pharmacoeconomics

Curr Opin Anesthesiol 2012, 25:221–225

Curr Opin Anesthesiol 2012, 25:221–225

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La 1ª qüestió...

¿Sabem el cost dels...
fàrmacs ?

La resposta...

1988-1993

¿Quant costen…?

els cristaloids

	Preu per unitat (IVA 8%)	Nº unitats (Gen-Jul 2012)	Despesa total
SF 0.9%	0,71-0,79 €	25 765	29 755 €
Ringer	0,7 €	9 944	6 957 €
Ringer lactato	0,70-0,85 €	2 427	1 943 €
Isofundin	1,42 €	---	---
Ringer acetat	2,03 €	5 569	11 287 €

NOTA IMPORTANT: *Aquest preus son aproximats i varien en funció de diferents factors*

¿Quant costen...?

els col·loids

	Preu per unitat (IVA 8%)	Nº unitats (Gen-Jul 2012)	Despesa total
Gelatines	3,82 €	---	--- €
HES 6%	7,66 €	9 944	6 957 €
HES 6% en Ringer acetat	8,17 €	2427	1 943 €
PPL 5% 250 - 500mL	32 - 63,94 €	12 + 846	???
SAB 20% 50 - 100mL	20 - 40 €	621	14 707 €

NOTA IMPORTANT: Aquest preus son aproximats i varien en funció de diferents factors

¿Quant costen…?

Hipnòtics i mòrfics

	Preu per unitat (IVA 8%)	Nº unitats (Gen-Jul 2012)	Despesa total
Propofol 2% 50 mL	5,48 €	299	1 638 €
Propofol 2% 50 mL (precargada)	12,19 €	1 006	12 053 €
Fentanilo	0,42 €	9 188	3 922 €
Remifentanilo 2 mg	6,41 €	2 132	13 686 €
Remifentanilo 5 mg	16,1 €	438	7 051 €

NOTA IMPORTANT: *Aquest preus son aproximats i varien en funció de diferents factors*

¿Quant costen…?

Halogenats

	Preu per unitat (€/mL)	Nº unitats (Gen-Jul 2012)	Despesa total
Isofluorane 250 mL	60,80 € (0.24)	---	---
Desfluorane 240 mL	69,64 € (0.29)	387	26 749 €
Sevofluorane 250 mL	110,81 € (0.44)	243	26 927 €

NOTA IMPORTANT: Aquest preus son aproximats i varien en funció de diferents factors

¿Quant costen…?

Relaxants musculars

	Preu per unitat (IVA 8%)	Nº unitats (Gen-Jul 2012)	Despesa total
Atracuri	1,36 €	1052	1 433 €
Vecuroni	1,87 €	---	---
Rocuroni	2,03 €	6972	14 072 €
Cissatracuri	3,94 €	1578	6 247 €

NOTA IMPORTANT: *Aquest preus son aproximats i varien en funció de diferents factors*

¿Quant costen…?

Reversió BNM

	Preu per unitat (IVA 8%)	Nº unitats (Gen-Jul 2012)	Despesa total
Neostigmina 2.5mg + Atropina 1mg	0,60 €	---	---
Sugammadex 2 mL	71,16 €	404	28 745 €
Sugammadex 5 mL	177,83 €	1	177,83 €

NOTA IMPORTANT: Aquest preus son aproximats i varien en funció de diferents factors

¿Quant costen…?

Vasoactius

	Preu per unitat (IVA 8%)	Nº unitats (Gen-Jul 2012)	Despesa total
Efedrina	3,48 €	3 300	11 491 €
Fenilefrina 1%	18,19 €	618	11 240 €
Dopamina	0,43 €	209	
Dobutamina	1,19 €	433	
Noradrenalina	2,48 €	2 223	

NOTA IMPORTANT: Aquest preus son aproximats i varien en funció de diferents factors

¿Quant costen…?

Analgèsics

	Preu per unitat (IVA 8%)	Nº unitats (Gen-Jul 2012)
Paracetamol 1g	0,87 €	8 964
Metamizol	0,06 €	1 386
Dexketoprofé	0,81 €	7 246
Tramadol 100mg	0,16 €	
Metadona i Cl mòrfic	0,18 €	

NOTA IMPORTANT: Aquest preus son aproximats i varien en funció de diferents factors

Could Your Patient Receive their Medicines via the PO/NG Route Instead of IV?

Most medicines are far cheaper when given in tablet, capsule or liquid form than as an injection

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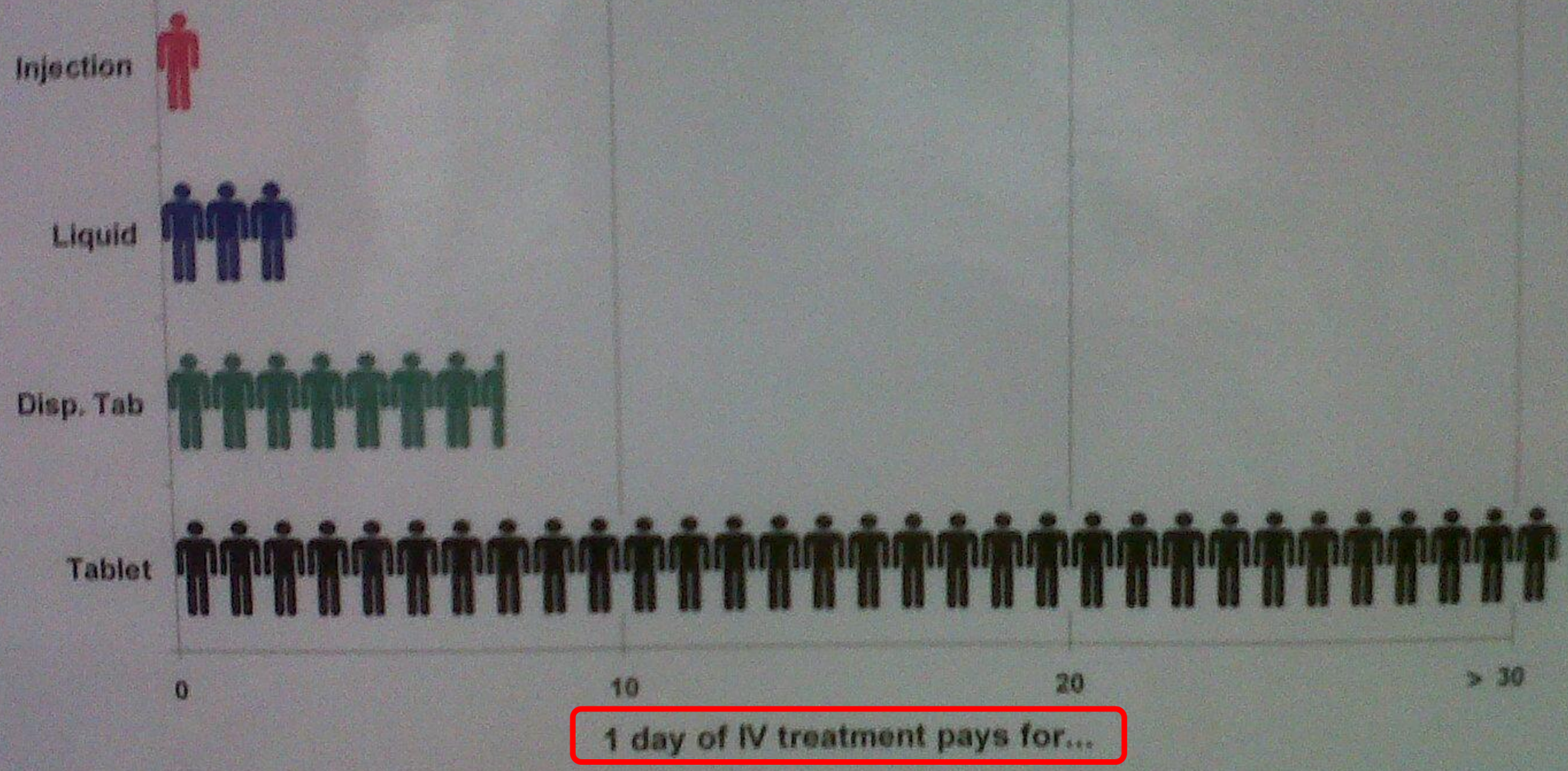


	EV	Oral
Paracetamol	0,87 €	0.03 €
Dexketoprofé	0,83 €	0,19 €
Ranitidina	0,20 €	0.06 €
Pantoprazol	0,41 €	0,01 €
Fenitoina	0,35 €	0,02 €
Levetiracetam	8,52 €	0,52 €
Nimodipino	5,08 €	0,18 €

NOTA IMPORTANT: Aquest preus son aproximats i varien en funció de diferents factors

2ona pregunta...

¿Sabem quant valen...
els materials ?

2ª resposta...

¿Quant costa...?

Anestèsia regional

	Preu per unitat (IVA 8%)	Nº unitats (Gen-Jul 2012)
Stimuplex	12,95 €	1 925
Yale 20-26G	0,63 €	
Yale 27G	1,51 €	1 290
Puntes de llapis (25-27G)	5,53	325
Set peridural	15,16 €	

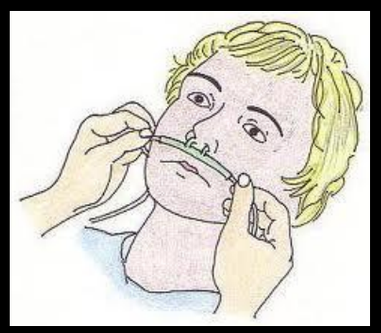
	Preu per unitat (IVA 8%)	Nº unitats (Gen-Jul 2012)
Bupiv 0,5%	0,32 €	2 395
Ropiv 0,2%	1,47 €	1 191
Levobupiv 0,5%	2,28 €	1 139

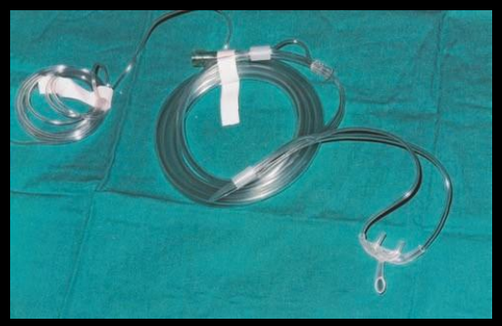
NOTA IMPORTANT: Aquest preus son aproximats i varien en funció de diferents factors

¿Quant costa…?

"Oxigenació"

	Preu por unidad (IVA 8%)	Nº unitats (Ene-Jul 2012)
Lentilles	0,28 €	5 992
Lentilles con CO_2	6,52 €	620
Ventimask®	1,29 €	672

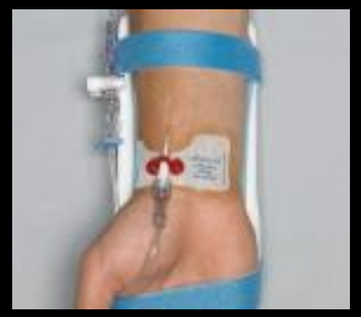




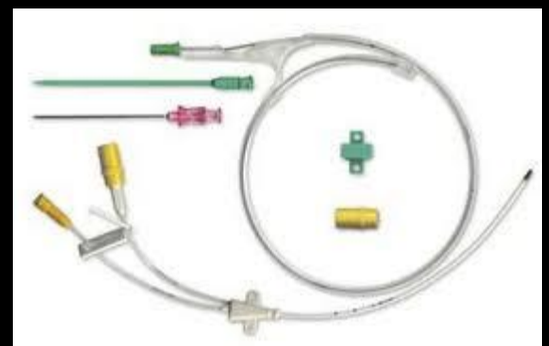
NOTA IMPORTANT: *Aquest preus son aproximats i varien en funció de diferents factors*

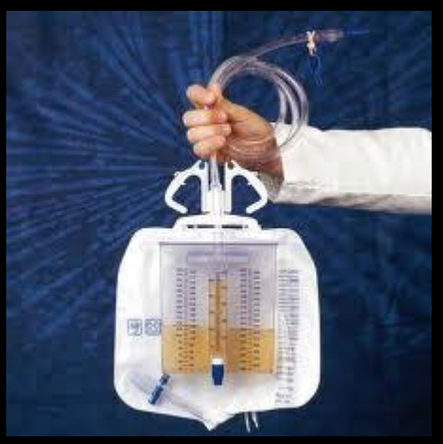
¿Quant costa…?

Catèters



	Preu per unitat (IVA 8%)
Arterial	9,58 €
"Drum"	8,59 €
CVC (2 o 3 luces)	10,49 €
Bossa orina	0,58
"Urimeter"	6,84





NOTA IMPORTANT: Aquest preus son aproximats i varien en funció de diferents factors

Rev Esp Anestesiol Reanim. 1995 Mar;42(3):103-6.

[Level of information on prices in an anesthesia department].

[Article in Spanish]

Muñoz-Ramón JM, Esplá AF.

Servicio de Anestesiología y Reanimación, Hospital La Paz, Madrid.

Abstract

The rationalization of health care spending has high priority in these times of economic difficulty. Anesthesiologists can contribute to more efficient use of resources and therefore must be well aware of the cost of the products they use. This study aims to evaluate their knowledge of the cost of commonly used products. Seventy-eight anesthesiologists with varying levels of experience and from different levels in the hierarchy were questioned about the cost of 20 products, drugs and disposable items commonly used in their work. The physicians were within 50% of the real price of 4 of the 11 drugs studied and were 100% right about 3 drugs. The respondents were 100% correct about 2 of the disposable items studied but did not give estimates within 50% of real cost for any of the remaining 7 items. Neither position in the hierarchy nor years of experience was related to degree of correctness in pricing the products studied. Awareness of the prices of commonly used products, particularly of disposable material, was low in the population of anesthesiologists studied.

Anaesthesia. 1993 Oct;48(10):906-9.

Anaesthesia: cheap at twice the price? Staff awareness, cost comparisons and recommendations for economic savings.

Bailey CR, Ruggier R, Cashman JN.

Department of Anaesthetics, St Georges Hospital, Tooting, London.

¿Quant costen…?

Analítiques	Preu per unitat (IVA 8%)
Hemograma	6,1 €
Bioquímica	10,3 €
Coagulació	19,2 €
Troponina I	23 €

Radiologia	Preu per unitat (IVA 8%)
Rx tòrax (portàtil)	33 €
Eco abdominal	110 €
TAC cranial	127 €
RM cranial	210 €

NOTA IMPORTANT: Aquest preus son aproximats i varien en funció de diferents factors

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11531	ARTERIOGRAFIA DE LA MAMARIA INTERNA	2.327,00
11532	ARTERIOGAFIA CON CO2	2.327,00
9975	QUIMIONUCLEOLISIS 1 NIVEL	2.327,00
9976	QUIMIONUCLEOLISIS 2 NIVELES	3.955,90
9977	QUIMIONUCLEOLISIS 3 NIVELES	5.119,40
9901	ANGIOGRAFIA MEDULAR	2.327,00
9710	ANGIOGRAFIA DIGITAL SELECTIVA NEURO RÀDIO	1.454,00
9907	CATETERISMO SENOS PETROSOS BILATERAL	1.454,00

Curr Opin Anesthesiol 2012, 25:221–225

REVIEW

Costs and wastes in anesthesia care

Elena K. Rinehardt and Murali Sivarajan

Recent findings

Significant amount, perhaps 20–50%, of drugs drawn up are never used but discarded as whole ampoules or vials. There has been a progressive shift to using more expensive inhalational agents and total intravenous anesthesia in the last 10 years. Highest drug costs are associated with total intravenous anesthesia protocols, which are five to 10 times more expensive than administering sevoflurane or desflurane with premedication using antiemetics. Among the inhalational agents, usage costs of sevoflurane and desflurane are 10 and 25 times, respectively, that of isoflurane. Bispectral index monitoring, which requires use of an expensive proprietary electrode is no better, perhaps even less effective, than titration of inhalational agents using end tidal anesthetic concentration to monitor depth of anesthesia and prevent intraoperative awareness.

Desaprofitament de fàrmacs anestèsics

- Alt (fins a 40%) e infraestimat (dificultat metodològica d'estudi)
  - Discrepàncies entre lo retirat (tipo Pyxis®) i lo administrat a pacients
  - Revisant les escombraries
- Necessitat de auditories internes (exemple de Seattle):
  - Propofol 25%; rocuroni 10%; glicopirrolat 5%
  - En 21/164 de TIVAs sobra > 30% de propofol

Anesth Analg 2000; 91:921-924
J Clin Anesth 2001; 19:491-497
Anesth Analg 2007; 105:1061-1065

TIVA vs inhalatòria

- Estudios 1995-2000 = TIVA más cara (pero propofol bajo patente)
- No estudios recientes de TIVA Propo+Remi vs Sevo/Desflurane
- Incidencia de NVPO similar entre TIVA vs halogenados + profilaxis
- "TIVA ➔ despertar más rápido (5-10' = no aprovechable)
  < tiempo en URPA (= no aprovechable, nunca estudiado)
- Gastos extras: fungibles, bombas TCI, más eliminación de residuos
- Indicaciones específicas para TIVA = AHORRO

Anesth Analg 2000; 91:921-924
J Clin Anesth 2001; 19:491-497
Anesth Analg 2007; 105:1061-1065

TIVA vs inhalatòria

[redacted] Paraphrasing Tremper, 'the accounting approach is to add all the minutes saved in all the operating rooms and say we have several hours of unutilized time, enough time for an additional operation, which would be fine if the operation could be spread across all the operating rooms' [redacted]

Tremper KK. Who are you going to fire?
Anesth Analg 2010; 110:278-279

Curr Opin Anesthesiol 2012, 25:221–225

REVIEW

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Table 1. Estimated cost per minimum alveolar concentration hour (US$) of inhaled anesthetic agents

Fresh gas flow (l/min)	Isoflurane	Sevoflurane	Desflurane
0.5	0.12	1.30	3.03
1	0.24	2.60	6.05
2	0.48	5.20	12.10

Adapted with permission from [11▪] and modified to reflect current purchase prices of inhalational agents at the authors' institution. Isoflurane, US$ 0.07/ml; sevoflurane, US$ 0.40/ml; desflurane, US$ 0.51/ml.

Cost in £/hour when 1 MAC dialled on the vaporiser

Fresh gas flow L/min	Isoflurane	Sevoflurane	Desflurane
2.00	0.24	3.73	10.42
1.00	0.12	1.87	5.21
0.50	0.06	0.93	2.61

Changing Patterns in Anesthetic Fresh Gas Flow Rates Over 5 Years in a Teaching Hospital

R. Ross Kennedy, MB ChB, PhD, FANZCA

Richard A. French, MB, BS, FANZCA

BACKGROUND: Reducing anesthetic fresh gas flows can reduce volatile anesthetic consumption without affecting drug delivery to the patient. Delivery systems with electronic flow transducers permit the simple and accurate collection of fresh gas flow information. In a 2001 audit of fresh gas flow, we found little response to interventions designed to foster more efficient use of fresh gas. We compared current practice with our earlier results.

METHODS: Flow data were collected in areas with a mix of general and acute surgery in March and November 2001, and again during 2006, by recording directly from the Datex ADU to a computer every 10 s. We extracted the distribution of flow rates when a volatile anesthetic was being administered. Data collection in March 2001 and 2006 was not advertised.

RESULTS: In 2001, the mean flow rates were 1.95 and 2.1 L/min with a median flow of 1.5 L/min. In 2006, the mean was 1.27 and the median in the range 0.5–1.0 L/min. Isoflurane use decreased from 47% in 2001 to 4% in 2006.

CONCLUSIONS: Fresh gas flows used in our department have decreased by 35% over 4 years. Although the absolute change in flow rate is not large, this represents potential annual savings of more than $US130,000. This occurred without specific initiatives, suggesting an evolution in practice towards lower fresh gas flow. Improvements in equipment and monitoring, including a locally developed system, which displays forward predictions of end-tidal and effect-site vapor concentrations, may be factors in this change.

(Anesth Analg 2008;106:1487–90)

Kennedy RR, Anesth Analg.2008;106:1487-90

Monitoratge intraoperatori - BIS

"BIS minimitza el risc de despertar intraoperatori"
(pràctica defensiva als EUA, no reconeguda com monitoratge essencial per la ASA)

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 13, 2008 VOL. 358 NO. 11

Anesthesia Awareness and the Bispectral Index

Michael S. Avidan, M.B., B.Ch., Lini Zhang, M.D., Beth A. Burnside, B.A., Kevin J. Finkel, M.D., Adam C. Searleman, B.S., Jacqueline A. Selvidge, B.S., Leif Saager, M.D., Michelle S. Turner, B.S., Srikar Rao, B.A., Michael Bottros, M.D., Charles Hantler, M.D., Eric Jacobsohn, M.B., Ch.B., and Alex S. Evers, M.D.

N Engl J Med 2008;358:1097-108.

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B-UNAWARE trial

- ✓ 2000 pacients
- ✓ Aleatoritzats: BIS 40-60 vs ETAC 0.7-1.3 MAC
- ✓ BIS no disminueix el consum d'halogenats

N Engl J Med 2008;358:1097-108.

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 AUGUST 18, 2011 VOL. 365 NO. 7

Prevention of Intraoperative Awareness in a High-Risk Surgical Population

Michael S. Avidan, M.B., B.Ch., Eric Jacobsohn, M.B., Ch.B., David Glick, M.D., M.B.A., Beth A. Burnside, B.A., Lini Zhang, M.D., Alex Villafranca, M.S., Leah Karl, B.A., Saima Kamal, M.D., Brian Torres, B.S.N., Michael O'Connor, M.D., Alex S. Evers, M.D., Stephen Gradwohl, B.S., Nan Lin, Ph.D., Ben J. Palanca, M.D., Ph.D., and George A. Mashour, M.D., Ph.D., for the BAG-RECALL Research Group.*

BAG-RECALL trial

(Bis or Anesthetic Gas to REduce Anesthetic reCALL)

- ✓ 6000 pacients amb alt risc de despertar intraoperatori
- ✓ Aleatoritzats: BIS 40-60 7 / 2861
  ETAC 0.7-1.3 MAC 2 / 2852
- ✓ BIS costa 17 $ (= 15 € en HCB) vs ETAC de franc

N Engl J Med 2011;365:591-600.

Cost-effectiveness of bispectral index monitoring

Matthew A. Klopman and Peter S. Sebel

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Current Opinion in Anesthesiology 2011, 24:177–181

Purpose of review

In the current era of limited resources, organizations are evaluating the cost-effectiveness of their care. To analyze the cost-effectiveness of a physiologic monitor, one must first determine what negative outcome will be reduced or what positive outcome will be promoted. For example, if one was studying the cost-effectiveness of the pulse oximeter, it would be important to state whether the endpoint is prevention of hypoxic events or prevention of myocardial infarction. One would then need outcome data demonstrating the incidence of the chosen endpoint with and without the monitor. With these data, one can begin to construct a model for cost-effectiveness. Like many medical technologies, the bispectral index (BIS) monitor has recently been the subject of several articles which study its cost-effectiveness. This review examines the rationale of cost-effectiveness analyses and their application specifically to the BIS monitor.

Recent findings

The BIS monitor has been shown in multiple prospective randomized studies to positively affect several important aspects of an anesthetic. Use of the BIS monitor results in less use of hypnotic anesthetic drugs, decreased time to extubation, decreased incidence of nausea and vomiting, and decreased intraoperative awareness. These benefits are achieved for an additional cost of around five dollars per anesthetic. In addition, there is an emerging body of literature demonstrating an association between low intraoperative BIS readings and decreasing intermediate-term survival in both noncardiac and cardiac surgical patients.

Summary

Given the trivial cost of the BIS and the proven benefits demonstrated in prospective randomized studies, we consider its use justified in every general anesthetic.

Prevention of Intraoperative Awareness with Explicit Recall in an Unselected Surgical Population

A Randomized Comparative Effectiveness Trial

George A. Mashour, M.D., Ph.D.,* Amy Shanks, M.S.,†
Kevin K. Tremper, Ph.D., M.D.,‡ Sachin Kheterpal, M.D., M.B.A.,§
Christopher R. Turner, M.D., Ph.D., M.B.A.,‖ Satya Krishna Ramachandran, M.D., F.R.C.A.,§
Paul Picton, M.D., F.R.C.A.,§ Christa Schueller, B.S.,# Michelle Morris, M.S.,**
John C. Vandervest, B.S.,†† Nan Lin, Ph.D.,‡‡ Michael S. Avidan, M.B., B.Ch.§§

2012
ANESTHESIOLOGY
The Journal of the American Society of Anesthesiologists, Inc. • anesthesiology.org

What We Already Know about This Topic

- Intraoperative awareness with explicit recall occurs in 0.15% of surgical cases
- Randomized trials of bispectral index monitoring have focused on high-risk patients, but few data are available in an unselected surgical population

What This Article Tells Us That Is New

- In this large effectiveness study (n = 21,601), no significant difference in intraoperative awareness with explicit recall was detected between bispectral index and anesthetic concentration protocols (0.08 *vs.* 0.12%, *P* = 0.48) but, by *post hoc* analysis, bispectral index monitoring may decrease intraoperative awareness compared with routine care without a protocol

Anesthesiology 2012 Oct;117(4):717-725

	Preu per unitat (IVA 8%)	Nº unitats (Ene-Jul 2012)	Despesa total
BIS	**14,99 €**	4 850	72 725,25
Somanetics® (cada sensor)	92,56 €	360	33 321

NOTA IMPORTANT: *Aquest preus son aproximats i varien en funció de diferents factors*

CURRENT OPINION

Costs and wastes in anesthesia care

Elena K. Rinehardt and Murali Sivarajan

Curr Opin Anesthesiol 2012, 25:221–225

Ethics, economics and outcome

KEY POINTS

- Current practice patterns in the USA indicate that approximately US$ 13–30 worth of anesthetic drugs are wasted in each case.
- Total intravenous anesthesia is 10–100 times more expensive than inhalational anesthesia.
- Sevoflurane and desflurane anesthesia are 10 and 25 times more expensive, respectively, when compared to isoflurane anesthesia.
- There has been no study to indicate that earlier recovery from anesthesia results in cost savings in the postanesthesia care unit.
- Bispectral index monitoring, which requires an expensive proprietary electrode is no better, perhaps less effective, than monitoring minimum alveolar concentration equivalents of end tidal anesthetic concentration.


POR QUÉ HABLARÁ TODO EL MUNDO DE SANIDAD GRATUITA SI A MÍ ME LA DESCUENTAN TODOS LOS MESES DE LA NÓMINA

Autopreguntas

- ¿Quanta medicació es llança?
- Plantejar-se:
  - ✓ BIS per totes las AG? ¿NIRS sempre bilateral?
  - ✓ Diprifusor® ? TIVA només quan estigui indicat
  - ✓ KA o PNI continua? ¿"drum" o CVC? ¿Urimeter?
  - ✓ ¿Revisar profilaxi antibiòtica?
  - ✓ GN con $ETCO_2$ es pot reduir?
  - ✓ Definir lo "rutinari"
  - ✓ Conèixer lo "excepcional"
  - ✓ **QUANT POSSIBLE → MEDICACIÓ VIA ORAL**

Conscienciació i canvi cultural

"Most anesthesia care providers lack knowledge of drug costs and the magnitude of wastes"

"All of these factors in cost reduction and cost effectiveness must be communicated to anesthesia care providers"

"The effect of provider education tends to be short-lived and needs to be periodically reinforced"

J Clin Anesth 1998; 10:416-424
Anesthesiology 1997; 86: 1170-1196


VIDRO
PAPEL
al
METAL


reciclar es de sabios

"PRINCIPI DE LA ECONOMIA DOMÈSTICA"

La qualitat te un preu

VS

Concloent…

REVIEW

Curr Opin Anesthesiol 2012, 25:221–225

Costs and wastes in anesthesia care

Elena K. Rinehardt and Murali Sivarajan

- Difícil estimar % del pressupost de Farmàcia hospitalària
- 13-30 $ de despesa innecessari / pacient
- Revisar protocols pot disminuir > 30$ /pacient (J Clin Anest 1998)

Summary

Anesthesia medications comprise a significant proportion of hospital pharmacy budgets. Average anesthesia-related cost reductions of US$ 13–30 per cases multiplied by 25 million anesthetics administered annually in the USA has the potential to yield savings of US$ 350–750 million. Bispectral index monitoring during inhalational anesthesia adds to the cost without providing any benefit.

SAP - Procediments 2011

IQs diarias (promedi Maig 2012)	70
AG	9 041
ALR	5 405
AFQ 2011	32 254

Molt barats,
però molts procediments

La Conclusió més important…

1) Exercici de responsabilitat individual

2) La qualitat no està en el preu

3) Gestors som tots

"The issues of provider education & awareness
with respect to costs & ethical considerations
in ensuring well-being of patients
go hand in hand"
(Rinehardt)

Gràcies per l'atenció

Agraïments al Dr J Ribas i a la Sra María Lombraña