Anestesia y Tromboprofilaxis Diferencias entre fármacos

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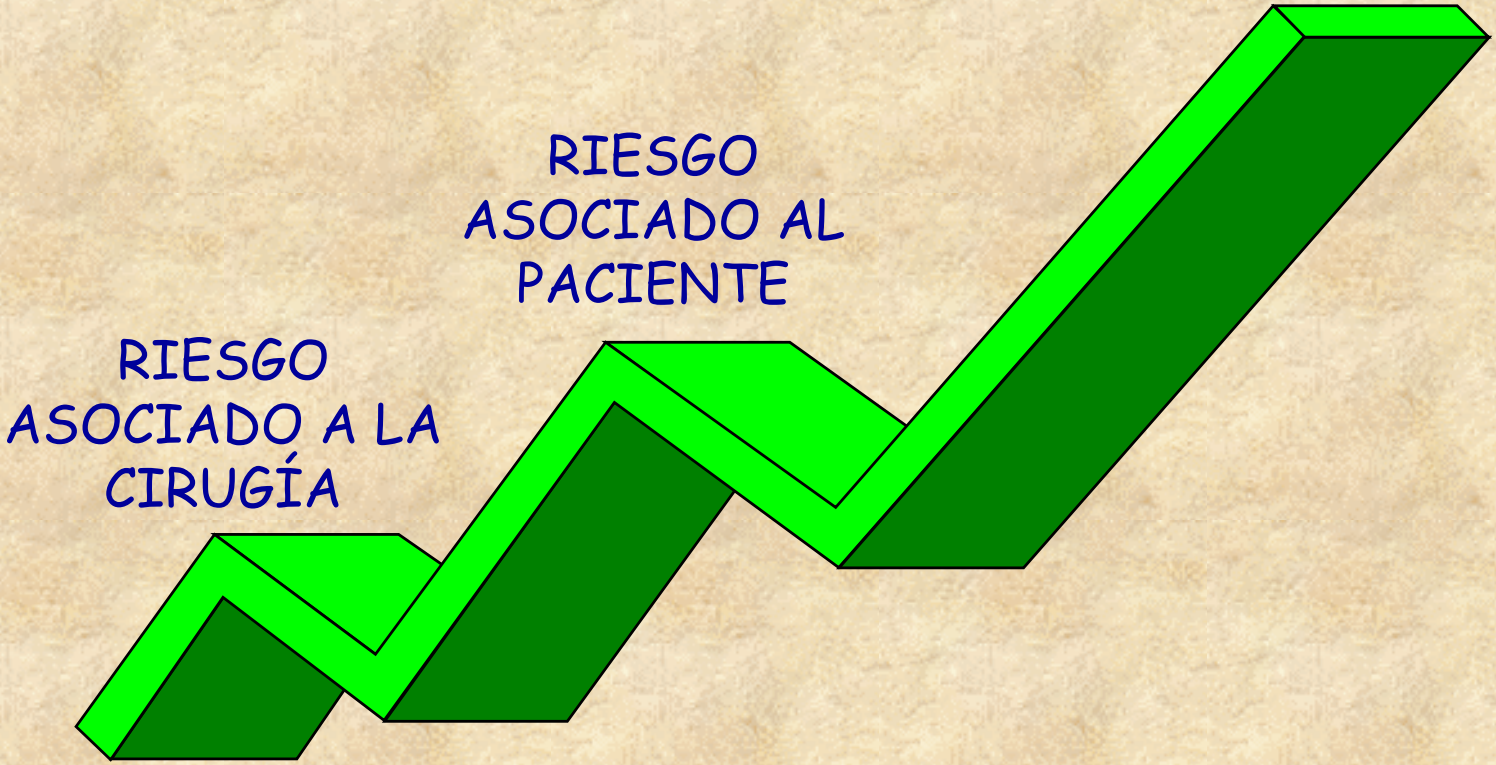
Necesidad de tromboprofilaxis

Alto riesgo de desarrollo de TVP
en el perioperatorio de muchas intervenciones

Muy buena relación beneficio/coste de
los métodos de tromboprofilaxis

Existe un "consenso" en las mejores modalidades
de tromboprofilaxis

Estratificación del riesgo



Estratificación del riesgo

Riesgo asociado a la cirugía	+ Riesgo asociado al paciente	= Riesgo de tromboembolismo
1	1	Bajo
	2	Moderado
	3	
2	1	
	2	
	3	Alto
3	1	
	2	
	3	Muy alto

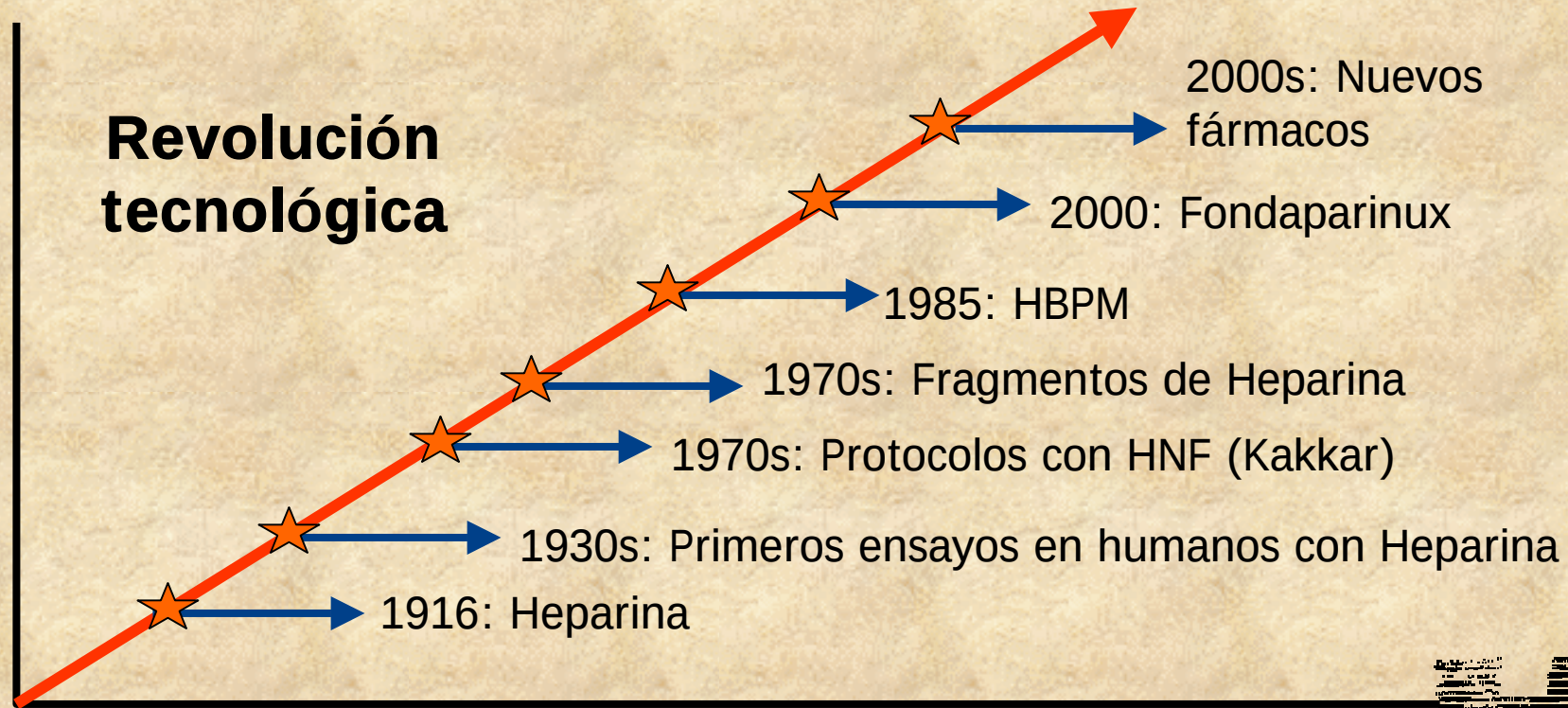
Métodos de profilaxis

Puntos clave

SEGURIDAD	**Sangrado** **Problemas de pared** **Infección** **Otros efectos secundarios**
EFICACIA	**Episodios asintomáticos** **Episodios sintomáticos** **Muerte**
COSTE-EFECTIVIDAD	**Global** **Paciente-por-paciente** **Consecuencias del uso generalizado**

Métodos de profilaxis

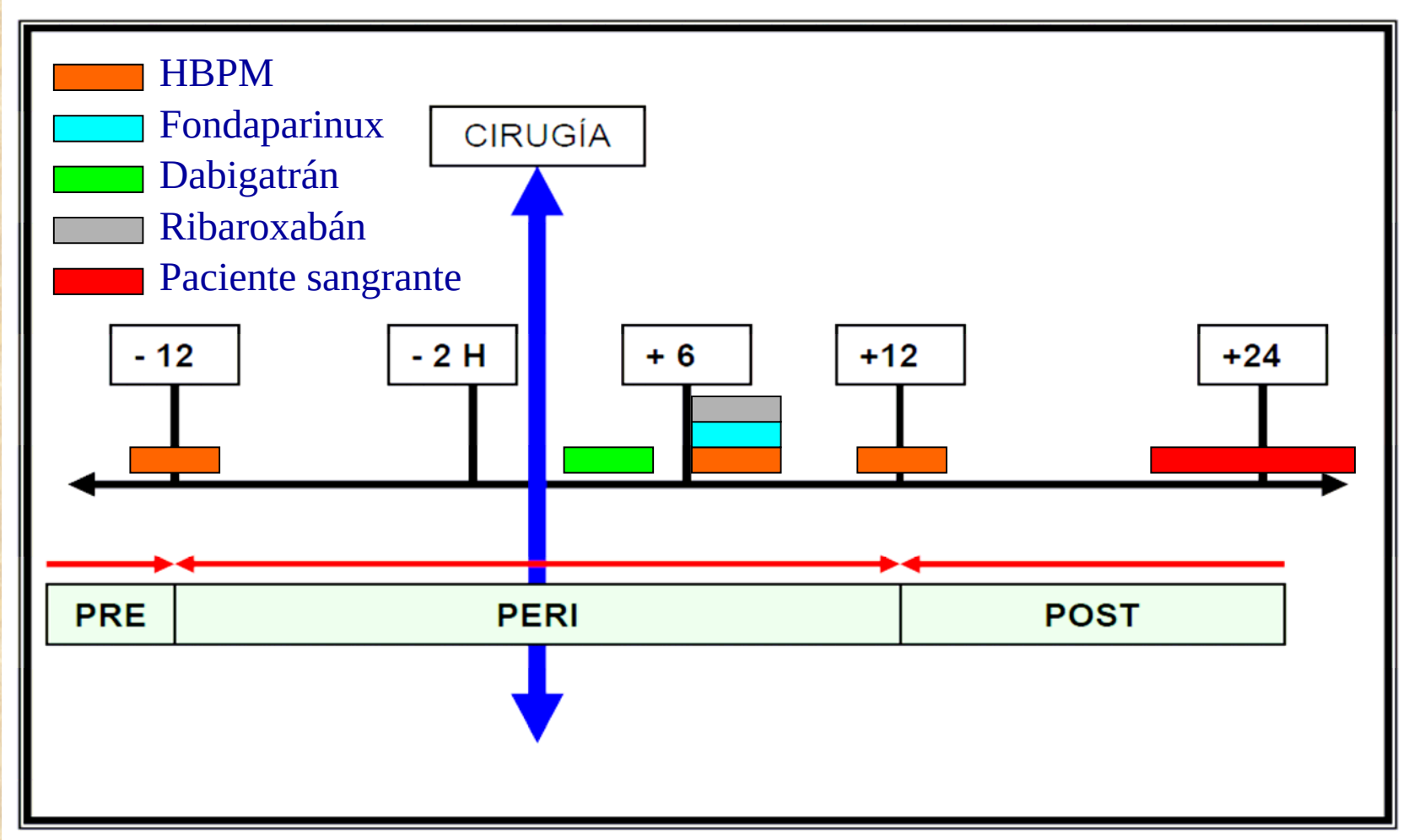
MÉTODOS FARMACOLÓGICOS



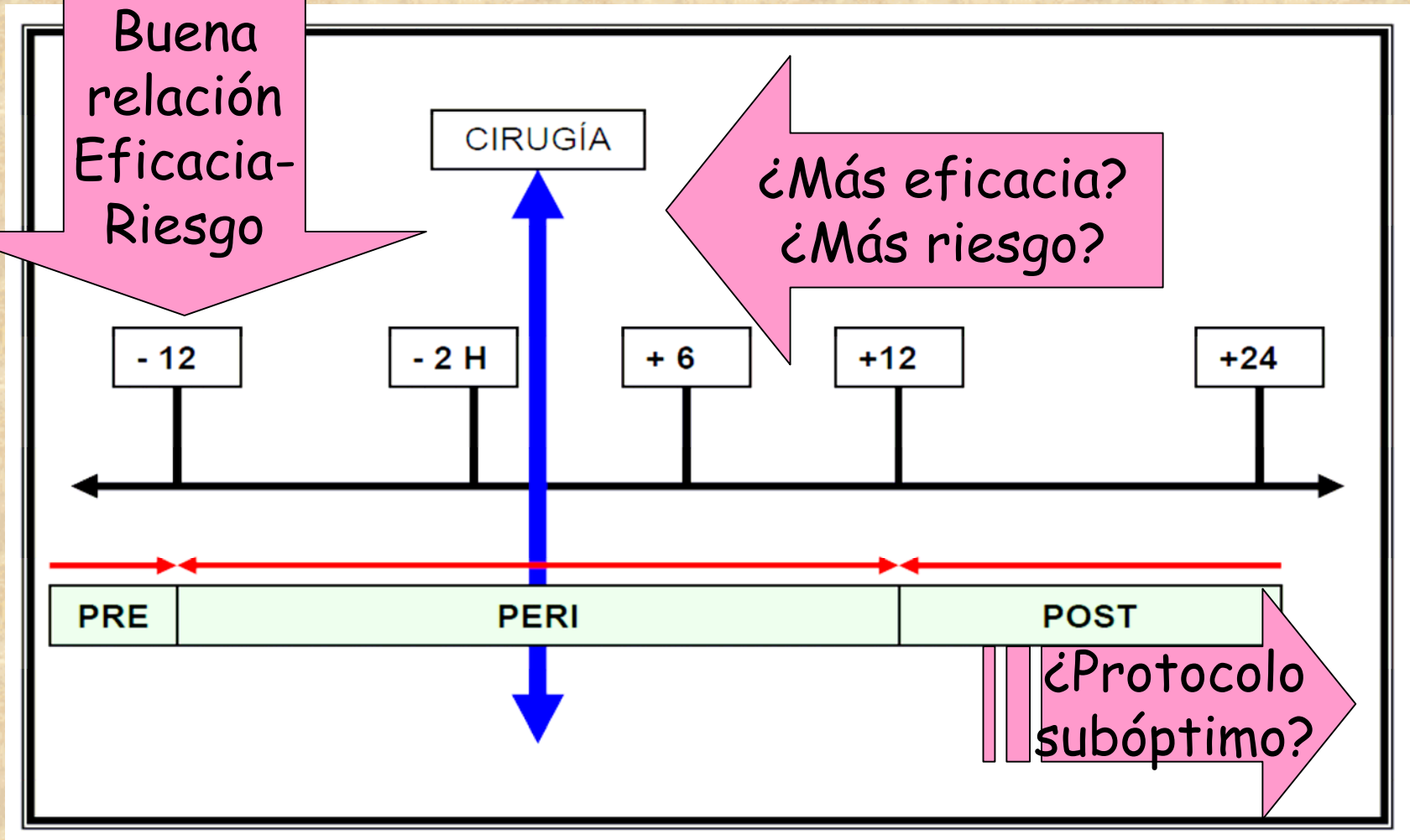
Recomendación de profilaxis

CATEGORÍA	PROFILAXIS RECOMENDADA
BAJO RIESGO	Movilización precoz. No profilaxis específica necesaria
MODERADO RIESGO	HBPM (≤ 3.400 UI/24 h) Medias de compresión elástica o CNI (de preferencia en pacientes de alto riesgo hemorrágico)
ALTO RIESGO	HBPM (> 3.400 UI/24 h) CNI inicialmente en pacientes de alto riesgo hemorrágico)
MUY ALTO RIESGO	Fondaparinux (2,5 mg/24 h) HBPM (> 3.400 UI/24 h) AO (INR objetivo 2,5) Medias de compresión elástica o CNI como complemento de cualquiera de las anteriores medidas farmacológicas

Cirugía: Momento de inicio



Cirugía: Momento de inicio



Técnica anestésica y profilaxis

European Journal of Anaesthesiology 2007; **24:** 387–398

doi: 10.1017/S0265021506001918

Review

Anticlotting drugs and regional anaesthetic and analgesic techniques: comparative update of the safety recommendations

J. V. Llau[*], J. De Andrés[†], C. Gomar[¶], A. Gómez-Luque[‡], F. Hidalgo[§], L. M. Torres[‖]

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Summary

The wide use of anticlotting drugs by patients scheduled for surgery is a challenge for the anaesthesiologist when considering a regional anaesthesia technique. This practice seems safe if there is an appropriate management based on safety intervals established according to the pharmacology of the drug and the regional technique. Some anaesthesiology societies have published recommendations for the safe practice of regional anaesthesia with the simultaneous use of anticoagulants (heparin, low molecular weight heparins, oral anticoagulants (OA), fondaparinux and others) and antiplatelet agents (aspirin, clopidogrel, ticlopidine, argatroban and others). One of the most recent guidelines has been published by the Spanish Society of Anaesthesia and Critical Care. This article reviews these recommendations and compares them with others published in the last years. The recommendations are similar, but some interesting differences can be observed and need to be considered. A European consensus in this setting would probably be necessary.

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Técnica anestésica y profilaxis

Anaesthesia, 2007, 62, pages 1154–1160 doi:10.1111/j.1365-2044.2007.05195.x

REVIEW ARTICLE

Selected new antithrombotic agents and neuraxial anaesthesia for major orthopaedic surgery: management strategies

N. Rosencher,[1] M.-P. Bonnet[1] and D. I. Sessler[2]

Summary

We propose recommendations to reduce the risk of haemorrhagic events associated with regional anaesthesia in patients treated with newer anticoagulants after orthopaedic surgery. The risk/benefit ratio should be individualised for each patient according to the type and dose of anticoagulant, the type of regional anaesthesia and patient risk factors. Neuraxial anaesthetic management strategy can be based on the pharmacokinetic properties of specific anticoagulants, including the time required to reach maximal concentration, half-life, and dose regimen. Central neuraxial blocks should not be performed and epidural catheters should not be removed until at least two half-lives after the last injection of anticoagulant, the half-life depending on renal function. After removing a catheter or after a haemorrhagic puncture, the timing of the next anticoagulant injection should be based on the time required for an anticoagulant dose to reach maximum activity. Vigilance remains paramount during the initial days after removal of a neuraxial catheter.

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Table 1 Pharmacokinetics of anticoagulants in patients with normal creatinine clearance.

Medication	Half-life; h	T_{max}; h
UFH IV [38]	1–2	Immediately
UFH SC [38]	8–12	2–2.5
LMWH SC [38]	4–7	3–4
Fondaparinux SC [32]	17–20	1–2
Dabigatran (oral) [34]	14–17	2–4
Rivaroxaban (oral) [23,36,39]	7–9	2–4

UFH, unfractionated heparin; LMWH, low molecular weight heparin; T_{max}, time to reach maximal plasma concentration or maximal anticoagulant activity; SC, subcutaneous; iv, intravenous.

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Técnica anestésica: HBPM

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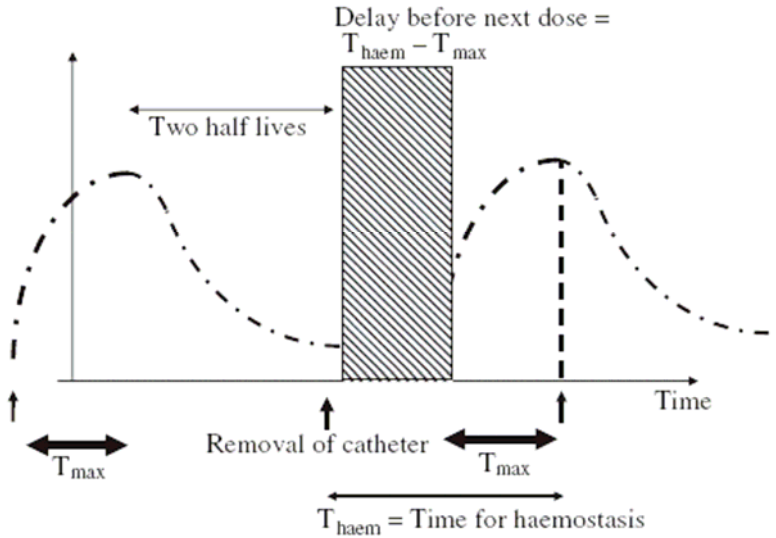
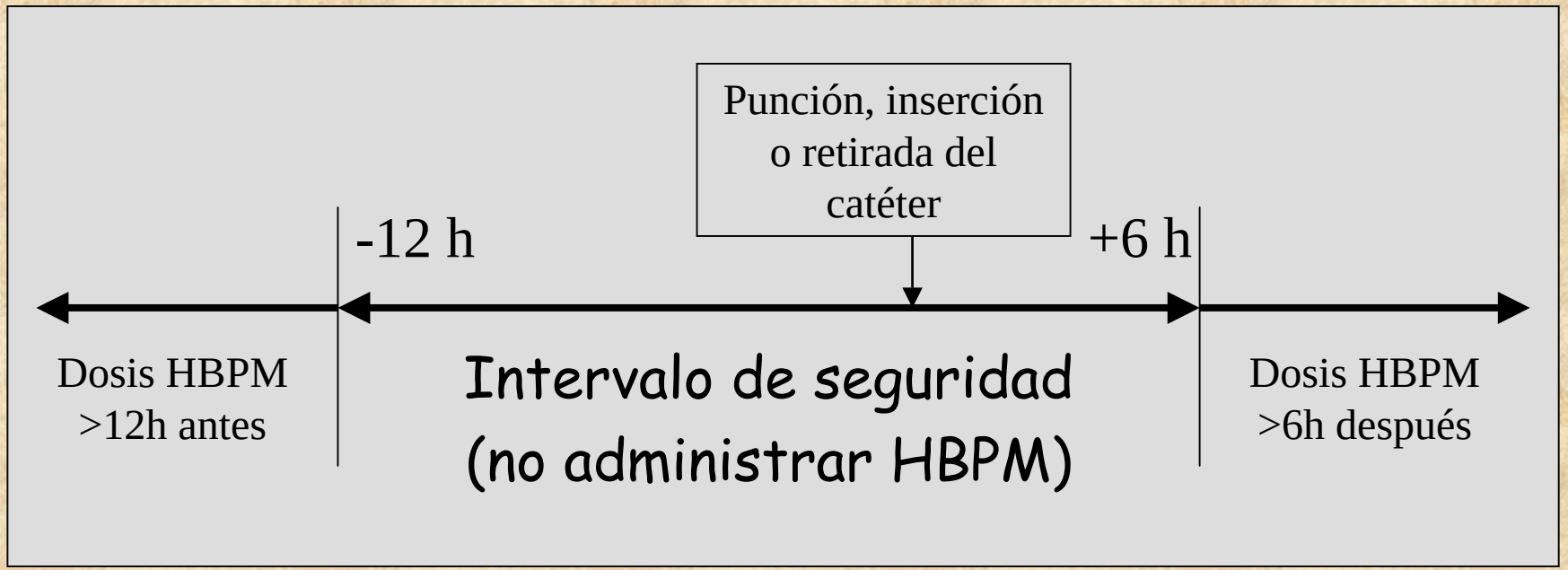


Figure 2 The half-life of the anticoagulant in this example is 4–5 h and T_{max} is 4 h (as for LMWH). Catheter removal should thus be delayed at least 10 h and, because safety time should be at least 8 h, the next injection should be at least 4 h after withdrawing the catheter (i.e. 8 h – T_{max}).

Técnica anestésica: HBPM



Intervalo de seguridad para las HBPM en pacientes a los que se realiza una técnica anestésica locorregional
(con la colaboración de la Dra. Raquel Ferrandis)

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Técnica anestésica: Fondaparinux

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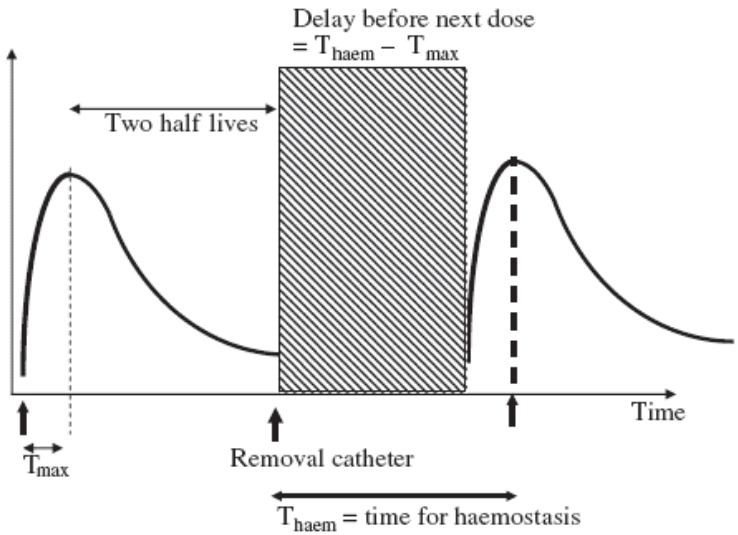

Figure 1 The half-life of the anticoagulant in this example is 17 h and T_{max} is 1 h (as for fondaparinux). Catheter removal should thus be delayed at least 36 h and, because safety time should be at least 8 h, the next injection should at least 7 h after withdrawing the catheter (i.e. 8 h – T_{max}).

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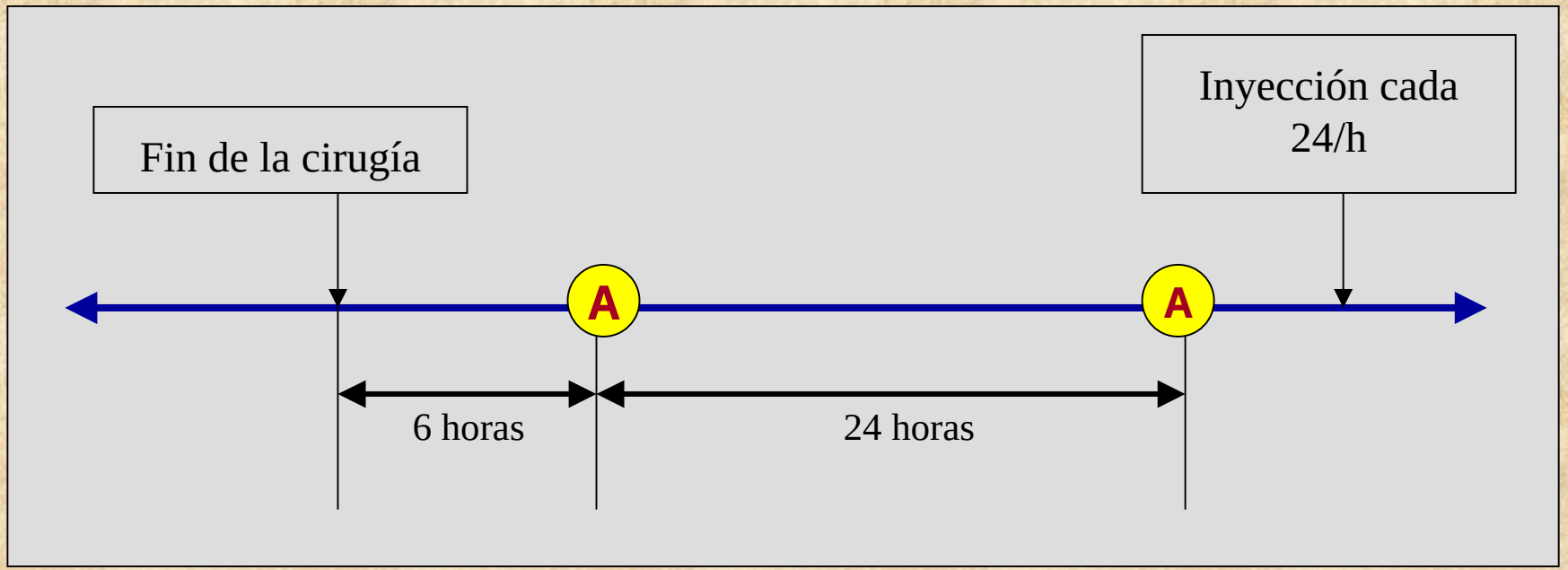
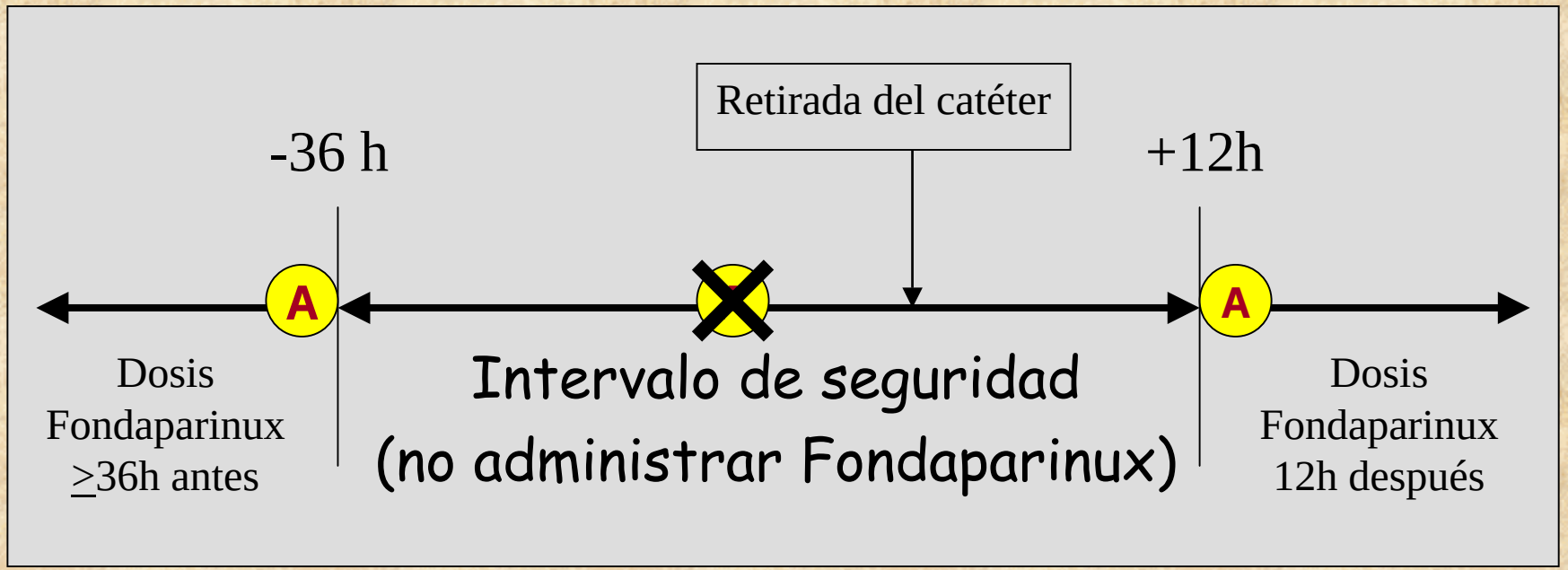
Técnica anestésica: Fondaparinux



Recomendaciones de manejo de la tromboprofilaxis con Arixtra en el caso de que la técnica anestésica empleada sea GENERAL o SUBARACNOIDEA ÚNICA

Técnica anestésica: Fondaparinux



Intervalo de seguridad propuesto en los pacientes en los que se emplee fondaparinux y se realice una técnica anestesica con catéter

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Técnica anestésica: AO (Sintrom)

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Review

Anticlotting drugs and regional anaesthetic and analgesic techniques: comparative update of the safety recommendations

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Table 5. Recommendations for regional anaesthesia in patients receiving oral anticoagulants (OA) (acenocoumarol/warfarin).

	SEDAR (acenocoumarol)	ASRA (warfarin)	DGAI (acenocoumarol)	ÖGARI (acenocumarol)	BARA (depending on the drug)
Suspension	3–5 days before	4–5 days before	—	1–2 days before	—
Monitoring	Always INR	Always INR	Always INR	Always INR	Always INR
Puncture with/without catheter following OA	INR ⩽ 1.5	'Normal' INR	INR < 1.4	INR < 1.4	CI if therapeutic
Removal of the catheter	INR ⩽ 1.5	INR < 1.5	—	—	INR < 1.4
Initiation of OA following removal of the catheter	Immediate	Immediate	Immediate	Immediate	—

SEDAR: Sociedad Española de Anestesiología y Reanimación; ASRA: American Society of Regional Anaesthesia; DGAI: Deutsche Gesellschaft für Anaesthesiologie und Intensivmedizin; ÖGARI: Österreichischen Gesellschaft für Anästhesiologie und Intensivmedizin; BARA: Belgian Association for Regional Anaesthesia.

INR < 1.5-1.4

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Técnica anestésica: AO (Sintrom)

Terapia puente y anestesia

(Rev. Esp. Anestesiol. Reanim. 2005; 52: 413-420) **ARTÍCULO ESPECIAL**

Guía clínica de fármacos inhibidores de la hemostasia y anestesia regional neuroaxial

Sociedad Española de Anestesiología-Reanimación y Terapéutica del Dolor. Sección de Hemostasia, Medicina Transfusional y Fluidoterapia Perioperatoria.

Grupo de Redacción: J. V. Llau Pitarch, J. de Andrés Ibáñez, C. Gomar Sancho, A. Gómez Luque, F. Hidalgo Martínez, L. M. Torres Morera.

Manejo de la anticoagulación con anticoagulantes orales en el periodo perioperatorio[13]

Situación clínica (*)	Recomendación
Riesgo bajo de tromboembolismo	Retirar AO 3-5 días antes de cirugía. Intervenir si INR ≤ 1,5-1,3(**). HBPM profiláctica en postoperatorio y reinicio de AO en las primeras 24 h.
Riesgo intermedio de tromboembolismo	Retirar AO 3-5 días antes de cirugía e iniciar HBPM profiláctica. Intervenir si INR ≤1,5-1, 3(**). HBPM profiláctica en postoperatorio y reinicio de AO en las primeras 24 h.
Riesgo alto de tromboembolismo	Retirar AO 3-5 días antes de cirugía e iniciar HBPM terapéutica (última dosis 24h antes de cirugía) o HNF 800-1000 UI/h ev. (suspender 4-6h antes). Intervenir si INR ≤1,5-1,3(**) y TTPa ≤1,5 veces el control. HBPM terapéutica en postoperatorio y reinicio de AO en las primeras 24 h.

(*)Riesgo de tromboembolismo en relación a origen cardiaco y venoso.
(**) La necesidad de la mayor tendencia a la normalización del INR dependerá del riesgo hemorrágico inherente a la intervención quirúrgica

Técnica anestésica: AO (Sintrom)

Terapia puente y anestesia

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Table 3. Recommendations for regional anaesthesia in patients receiving LMWH.

	SEDAR	ASRA	DGAI	ÖGARI	BARA
Puncture with or without catheter after:					
Prophylactic LMWH	12 h	10–12 h	10–12 h	12 h	12 h
Therapeutic LMWH	24 h	24 h	—	24 h	24 h
LMWH following non-traumatic puncture with or without catheter	6 h	6–8 h	4 h	4 h	4 h
Removal of the catheter following LMWH	12 h	10–12 h	12 h	—	12 h
LMWH following removal of the catheter	6 h	>2 h	—	—	>4 h

SEDAR: Sociedad Española de Anestesiología y Reanimación; ASRA: American Society of Regional Anaesthesia; DGAI: Deutsche Gesellschaft für Anaesthesiologie und Intensivmedizin; ÖGARI: Österreichischen Gesellschaft für Anästhesiologie und Intensivmedizin; BARA: Belgian Association for Regional Anaesthesia; LMWH: low molecular weight heparins.

Técnica anestésica: Nuevos fármacos

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Dabigatran etexilate

As the pharmacokinetic properties of this drug are established, we can speculate about its management with regional anaesthesia, which should be similar to that suggested for fondaparinux. Indeed, with dabigatran an indwelling epidural catheter should not be removed before 36 h (at least two half-lives) after the previous dose, and the next dose should not be given any sooner than 12 h after catheter removal. There thus needs to be a window of 48 h between two doses. In practice, this can be achieved by skipping one dose.

Técnica anestésica: Nuevos fármacos

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Rivaroxaban

Because the pharmacokinetic properties of this drug are known [36], we can speculate about its management in conjunction with regional anaesthesia, which should be similar to that proposed for LMWH in Europe. Indeed with rivaroxaban, an indwelling epidural catheter should be removed at least 20 h (at least two half-lives) after the previous dose, and the next dose should be given 6 h after catheter removal.

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Recomendaciones generales

- Uso de métodos mecánicos en pacientes de riesgo hemorrágico y en combinación con los farmacológicos en pacientes de alto riesgo

- En pacientes quirúrgicos que reciben anestesia neuraxial es necesario mantener los tiempos de seguridad establecidos para minimizar el riesgo de hematoma espinal. Esta ventana de seguridad depende de cada fármaco y está basada en su farmacocinética, vida media y dosificación

Recomendaciones generales

- La profilaxis farmacológica se debe ajustar según la estratificación de riesgo trombótico de cada paciente

- En los pacientes de muy alto riesgo, la administración de una HBPM, Fondaparinux o, en un futuro, uno de los nuevos fármacos antitrombóticos como Dabigatrán o Ribaroxabán, es imperativa y debe formar parte del tratamiento habitual en estos pacientes

Muchas gracias por vuestra atención

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