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## Special article

# Antithrombotic treatment consensus protocol (anticoagulation and antiplatelet therapy) during the perioperative and periprocedural period in neurosurgery<sup>☆</sup>



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## ABSTRACT

The use of antithrombotic medication (antiplatelet and/or anticoagulant therapy) is widespread. Currently, the management of neurosurgical patients receiving this type of therapy continues to be a problem of special importance.

Patients receiving antithrombotic treatment may need neurosurgical care because of bleeding secondary to such treatment, non-haemorrhagic neurosurgical lesions requiring urgent attention, or simply elective neurosurgical procedures.

In addition, the consequences of reintroducing early (bleeding or rebleeding) or late (thrombotic or thromboembolic) anticoagulation can be devastating.

In this paper we present the antithrombotic treatment consensus protocol during the perioperative and periprocedural period, both in emergent surgery and in elective neurosurgical procedures.

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## Protocolo de consenso en el tratamiento antitrombótico (anticoagulación y antiagregación) durante el periodo perioperatorio y periprocedimiento en neurocirugía

### RESUMEN

#### Palabras clave:

Tratamiento antitrombótico  
Anticoagulantes  
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Neurocirugía

El uso de medicación antitrombótica (antiagregante y/o anticoagulante) se encuentra ampliamente extendido. El manejo de los pacientes neuroquirúrgicos que reciben este tipo de terapia continúa siendo, a día de hoy, un problema de especial importancia.

Los pacientes en tratamiento antitrombótico pueden necesitar atención neuroquirúrgica bien por presentar sangrados secundarios a dicho tratamiento, lesiones neuroquirúrgicas no hemorrágicas pero que precisen intervención urgente, o simplemente procedimientos neuroquirúrgicos electivos.

Además, las consecuencias de la reintroducción de la anticoagulación temprana (sangrado o resangrado) o tardía (trombóticas o tromboembólicas) pueden ser devastadoras.

En este documento presentamos el protocolo de consenso en el tratamiento antitrombótico durante el periodo perioperatorio y periprocedimiento, tanto en cirugía emergente como en procedimientos electivos de neurocirugía.

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### Introduction

The use of antiplatelet and anticoagulant therapy in the general population has increased over the past decade, mainly because of the ageing population.<sup>1,2</sup> In 2006, 5% of the Spanish population was taking some type of antiplatelet or anticoagulant therapy, with an annual increase of 0.26% between 1992 and 2006. Globally, 4.24% of the population was receiving oral antiplatelet therapy, 0.52% oral anticoagulant therapy and 0.3% was being treated with heparin and its derivatives.<sup>1</sup> If this growth had remained constant over that period, the estimated prevalence of use of antiplatelet or anticoagulant therapy at the beginning of this year would have reached 7.7% of the general population, with 6.4% taking antiplatelet drugs, 0.8% anticoagulant drugs and 0.5% heparin and its derivatives. These figures could be even higher since, in a recent study published by Boned-Ombuena et al., the prevalence of oral anticoagulant therapy in a representative adult population of the Valencian Community was 1.3%.<sup>3</sup> Prevalence seems to significantly increase from the age of 60, reaching 7.3% in males over the age of 80 years.

In view of the data outlined above, we can assume that more than 3.5 million Spaniards are currently taking antiplatelet or anticoagulant therapy. Therefore, we can estimate that more than 5000 neurosurgical procedures are performed each year in patients receiving anticoagulant or antiplatelet therapy. These figures justify standardisation of the procedure to be followed during the perioperative period in this type of patient.

### Standard protocol for cerebral or spinal haemorrhage in patients receiving antithrombotic therapy

#### Standard protocol for cerebral or spinal haemorrhage in patients receiving anticoagulant therapy

Urgency, the time required to reverse anticoagulation and the period during which the patient must remain without anticoagulants are still controversial issues. For example, the time required to reverse anticoagulation with high doses of vitamin K is longer than the time required using prothrombin complex concentrates and could render patients resistant to restarting anticoagulants for several days. On the other hand, anticoagulant therapy reversal is faster and more effective in patients treated with prothrombin complex concentrates, but the thrombotic risk may be higher.

Hawryluk et al. performed a review in 2010 based on 63 publications, indicating that haemorrhagic complications after restarting anticoagulant therapy are more common within the first 24–72 h. They identified age (younger people), traumatic cause, subdural haematoma and failure to reverse anticoagulation as risk factors.<sup>4</sup> Thromboembolic complications are delayed (>72 h) and are more common in younger patients and those with spinal haemorrhage, multiple haemorrhages and non-traumatic causes.

#### Proposed consensus protocol

Fig. 1 shows the proposed algorithm for cerebral or spinal haemorrhage in patients receiving antithrombotic therapy.

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