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# Lessons from the TAPS study

## Warfarin: a major cause of threats to patient safety

The Threats to Australian Patient Safety (TAPS) study collected 648 anonymous reports about threats to patient safety from a representative random sample of Australian general practitioners. These contained any events the GPs felt should not have happened, and would not want to happen again, regardless of who was at fault or the outcome of the event. This series of articles presents clinical lessons resulting from the TAPS study.

### Clinical lesson

Warfarin remains a major source of threats to patient safety in general practice. Clinicians who commence a patient on warfarin must take responsibility for also providing education about its risks, and ensure that patients have a clear management plan in place for monitoring the effect of their warfarin dose with regular International Normalised Ratio (INR) testing.

### Case study

A woman, 61 years of age and receiving chemotherapy for ovarian cancer, presented to a hospital emergency department with abdominal pain. She had been discharged from hospital 3 weeks earlier. During this admission she had been commenced on warfarin 5 mg/day due to a thrombosis in a subclavian line. Her INR on discharge was 2.8. She had visited her GP a few days after discharge and had a blood test but was unaware of the results. Her GP had then gone on leave and a locum GP was employed by the practice, but no arrangements had been made for follow up of the patient. The oncology team had organised further blood tests 1 week previously, but these had not included an INR. Her INR was now 12. A computerised tomography scan of her abdomen excluded a retroperitoneal bleed. She was admitted to hospital under a surgical team and treated with intravenous vitamin K and fresh frozen plasma. The patient appeared to have little understanding of warfarin or its monitoring. The patient survived this sequence of errors, which had strong potential for serious harm or death.

### Comment

This report illustrates the need for patient education whenever warfarin therapy is commenced; for every GP who orders an INR to ensure that the result is reviewed and discussed with the patient; and for the dosage and testing regimen to be clearly understood by the patient. Each clinician who is involved in prescribing warfarin should take responsibility for ensuring that INR levels are monitored.

■ **Warfarin is one of the most commonly mentioned medications with respect to causing medical errors, often resulting in serious patient harm and cost to the health system.<sup>1-3</sup> The TAPS study collected 648 anonymous reports about threats to patient safety from a representative random sample of Australian general practitioners. TAPS study participants described warfarin errors in 7% of reports.**

### Errors in warfarin management

There are many examples in the literature of harm associated with the mismanagement of warfarin therapy. An incident monitoring study undertaken in Australian general practice in the mid 1990s published a case study related to warfarin<sup>1</sup> and included a number of recommendations on improving patient education and communication. Around 50% of incidents in this study were related to 'pharmacological management', although the exact number of incidents related to anticoagulant therapy was not reported.<sup>2</sup>

A large Australian study of adverse drug events and medication errors based mainly on hospital data and reports from data collections of the Australian Bureau of Statistics, Institute of Health and Welfare, Council for Health Care Standards and the Patient Safety Foundation was published in 2003. It found that 5% of patients taking warfarin who were admitted to hospital had an INR over 5 on admission, and 1%, 0.05%, and 0.2% suffered abnormal bleeding, cerebral haemorrhage, or death, respectively.<sup>3</sup>

The TAPS study developed a taxonomy, which was used to classify reports of errors<sup>4</sup> from a representative sample of New South Wales GPs.<sup>5</sup> Approximately 38% of reports made in the TAPS study discussed medication errors. Warfarin or INR problems accounted for the largest proportion at 18% of all medication errors, and 7% of all TAPS reports received in the study period. These errors resulted in many serious and costly clinical outcomes, with over 20% resulting in hospitalisation, and a further 7% resulting in the death of a patient.

### Errors relating to warfarin found in the TAPS study

- Poor patient education, lack of understanding or confusion around warfarin therapy
- Failure by GPs to closely monitor INRs in patients newly commenced on warfarin
- Delay in communication to patients of INR results and necessary changes in dosage

Table 1. Lessons in preventing errors relating to warfarin therapy

- Patient education on commencing warfarin is an important responsibility of the clinician who initiates therapy. When therapy commences in hospital, GPs should also reinforce messages relating to safety and monitoring
- Clinicians and patients should clearly record warfarin dosages and INR levels in medical records, which may be electronic, and a patient's personal diary
- Details of when the next INR is due should be discussed with the patient at the same time as the latest result and any dosage change is discussed
- INR results and warfarin dosages should be communicated to the patient on the day of testing, and patients and their carers should be educated to follow up with their treating doctor if this does not occur
- Clinicians must always check for possible interactions or contraindications if a new medication is commenced by a patient taking warfarin
- Hospital discharges involving warfarin should be carefully planned and clearly communicated with the patient and their GP before discharge
- Message systems in the practice should ensure that the GP's instructions have been clearly received and carried out and that the GP receives confirmation after the result is communicated to the patient
- Patient contact details must be kept up-to-date so that an abnormal INR result can be quickly communicated
- Point of care INR testing at the GP's own surgery is encouraged

- Drug interactions with warfarin, particularly when the decision support feature of the GP's computerised prescribing software was not used, such as during a home visit
- Warfarin therapy was commenced in hospital with either no follow up or inadequate follow up arrangements being made for INR testing and review
- Message handling errors in the practice resulted in GPs not realising a result and any necessary dosage change had not been communicated to patients
- Lack of current contact details recorded for patients who had had an INR, meaning that the GP was unable to contact the patient to discuss the result.

Lessons from errors relating to warfarin found in the TAPS study are outlined in *Table 1*.

Conflict of interest: none declared.

### References

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