

1.5 Percentage of patients with an INR above 4 whose dosage has been adjusted or reviewed prior to the next warfarin dose

Purpose

This indicator addresses the effectiveness of processes for timely and effective monitoring of high risk medicines such as warfarin.

Background and evidence

Warfarin has a narrow therapeutic index, thus monitoring therapy is critical to prevent harm. The anticoagulant effect of warfarin is monitored by calculating the International Normalised Ratio (INR) – a ratio of the patient's prothrombin time to the mean normal prothrombin time.¹ For most patients requiring warfarin, the target INR range is between 2 and 3.^{1,2}

Bleeding is the most common and serious complication of warfarin² and there is a strong relationship between INR levels and bleeding.³ The risk of bleeding is markedly increased once the INR exceeds 4.⁴

To reduce bleeding risk, dosage adjustment is often needed, particularly for those patients newly initiated on warfarin and/or other medication. This includes patients on warfarin who are hospitalised for conditions not related to the requirement for warfarin. However, watchful waiting is an acceptable alternative in patients with mildly elevated INR.⁵ Therefore in some cases it may be appropriate that no dosage adjustment occurs, although regular review is mandatory.

Key definitions

Adjusted is defined as dose reduction or dose omission and must be documented on the medication chart.

Reviewed means there is explicit documentation on the medication chart or in another pre-determined section of the medical record that a high INR has been noted and that dosage adjustment is not required.

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Data collection for local monitoring

Recommended sample selection: Random sample of patients over a one month period who have an INR result above 4. Patients may be identified from laboratory records. Each patient with a raised INR should be counted only once. Random means each patient has an equal chance of inclusion in the audit.

Recommended sample size: 30 patients with an INR above 4 over a one month period (or all patients if less than 30 patients are identified). Collecting a larger sample where possible will increase the sensitivity of the data.

Recommended methodology: Review of medical records, laboratory reports, medication charts and other components of the patient record. Count each patient once only.

Data collection for inter-hospital comparison

This indicator may be suitable for inter-hospital comparison. In this case, definitions, sampling methods and guidelines for audit and reporting need to be agreed in advance in consultation with the coordinating agency.

Indicator calculation

$$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$$

Numerator = Number of patients with INR above 4 whose dosage has been adjusted or reviewed prior to the next warfarin dose

Denominator = Number of patients with INR above 4 in sample.

Limitations and interpretation

Data collection for this indicator relies on documentation in the medical record, especially for demonstration of dosage review. Good documentation supports quality patient care⁶ and is a critical component of management for potentially toxic medicines such as warfarin. Poor communication can result in adverse drug events.⁷ Thus it is assumed that absence of explicit documentation means no review took place.

Further information

The *Medication Safety Self Assessment for Antithrombotic Therapy in Australian hospitals*⁸ (MSSA-AT) can help identify potential strategies for improvement with this and other indicators. The MSSA-AT encourages development of robust systems for safe prescribing, dispensing, administration and monitoring of antithrombotic therapy. MSSA-AT is available at www.cec.health.nsw.gov.au

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