

Using Clinical Indicators to Improve Inpatient Warfarin Therapy



JED DUFF
PRACTICE IMPROVEMENT FACILITATOR



Project Aim



To increase compliance with best practice warfarin therapy guidelines:

- Comprehensively audit warfarin therapy against current best practice;
- Benchmarking our current practices with comparable organizations;
- Identify and priorities areas for practice improvement;
- Implement improvement strategies and measure practice change.

Why Warfarin?



- In the top 20 most prescribed drugs in Australia
- Difficult drug to use because of its narrow therapeutic window
- Optimal dose varies and depends on many risk factors
- Risk of life-threatening bleeding v risk deadly blood clots
- Third most common drug reported in inpatient medication incidents-after morphine and paracetamol
- Second most common drug reported in ED ADE presentations-after insulin

Background



Evidence of failure to translate research findings into clinical practice:

- 30 - 40% of patients do not get treatments of proven effectiveness
- 20 - 25% of patients get care that is not needed or potentially harmful

Grol, 2001

Evidence-Based



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SUPPLEMENT TO CHEST



For specialists in:

- Pulmonology
- Critical Care
- Sleep Medicine
- Thoracic Surgery
- Cardiorespiratory Interactions
- and related disciplines

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CHEST

Official publication of the American College of Chest Physicians

Antithrombotic and Thrombolytic Therapy: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition)

bjh guideline

Guidelines on oral anticoagulation (warfarin): third edition – 2005 update

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Keywords: warfarin, oral anticoagulation, guideline, vitamin K antagonists.

The British Committee for Standards in Haematology (BCSH) published its third edition of Guidelines on Oral Anticoagulation in 1998 (British Committee for Standards in Haematology, 1998). Most of the recommendations made in 1998 remain unchanged and a fourth edition of the guideline is considered unnecessary at the time of writing (June 2005). However, we draw attention to those areas where new informative data have been published. As in the original guideline, the term 'oral anti-coagulant' used in this update refers to oral vitamin K antagonists (VKA), such as warfarin. New oral non-VKA are currently being evaluated in clinical trials but are not yet licensed for use in the UK. When these drugs become available new guidance will be issued specifically for the use of those drugs.

The guideline group was selected to be representative of UK-based medical experts. The drafting group met and communicated by email. MEDLINE was searched systematically for publications in English from 1998. The writing group convenor (T. Baglin) produced the draft guidelines which were subsequently revised by consensus. The guideline was reviewed by a multidisciplinary sounding board, the BCSH and the British Society for Haematology (BSH) and comments incorporated where appropriate. Criteria used to quote levels and grades of evidence are as in Appendix 3 of the Procedure for Guidelines Commissioned by the BCSH (<http://www.bcsgh-guidelines.com/proccol.asp#App3>).

The target audience for this guideline is healthcare professionals involved in the management of patients receiving oral anticoagulant therapy.

Guideline update

The original paragraph numbering and format used in the 1998 guideline has been retained for ease of comparison. The original Table 1 was modified (Table 1).

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3. Indications for anticoagulation

3.1. Venous thromboembolism

Treatment with oral VKA remains the treatment of choice for the majority of patients with venous thromboembolism (VTE) (van der Heijden *et al.*, 2001). A specific, exceptional patient group in which low-molecular-weight heparin therapy may be advantageous is patients with VTE complicating cancer (Meyer *et al.*, 2002; Lee *et al.*, 2003) (see section 3.3).

Intensity of anticoagulation The Prevention of Recurrent Venous Thromboembolism (PREVENT) trial randomised patients to continue anticoagulation with a reduced target international normalised ratio (INR) of 1.5–2.0 or to take placebo, following an initial period of oral anticoagulation (Baker *et al.*, 2000). The median duration of treatment before randomisation was 6.5 months. Recurrent VTE occurred in the low-intensity warfarin-treated patients at a rate of 2.6/100 patient-years and in patients receiving placebo at a rate of 7.2/100 patient-years (hazard ratio (HR) 0.36, 95% confidence interval (CI) 0.19–0.67). Bleeding rates were not significantly different but the study was not powered to test for differences in bleeding rates.

The Extended Low-intensity Anticoagulation for Thromboembolism (ELATE) investigators randomised patients who had been treated with a target INR of 2.5 for at least 3 months to continue anticoagulation with a reduced target INR of 1.5–1.9 or continue treatment with a target of 2.5 (Keaton *et al.*, 2003). Recurrent VTE occurred in the low-intensity warfarin-treated patients at a rate of 1.6/100 patient-years and in patients receiving conventional treatment with a target INR of 2.5 at a rate of 0.7/100 patient-years (HR 2.6, 95% CI 1.1–7.0). Bleeding rates were not significantly different but the bleeding rate in patients on conventional intensity (0.9/100 patient-years) was lower than the anticipated rate that was used to power the study (3/100 patient-years).

When comparing thrombosis rates in the trials it is evident that there is a dose-response effect. Combining PREVENT and ELATE, the cumulative thrombosis rate at 4 years was 2.9% with a target of 2.5, 7.5% with a target INR range of 1.5–1.9/2.0



Health Care Guideline

The information contained in this *ICSI Health Care Guideline* is intended primarily for health professionals and the following expert audiences:

- physicians, nurses, and other health care professional and provider organizations;
- health plans, health care systems, health care organizations, hospitals and integrated health care systems;
- medical societies and professional societies;
- local government health care policy makers and specialists; and
- managers.

This *ICSI Health Care Guideline* should not be construed as medical advice or medical opinion or as a substitute for the professional judgment of the individual clinician. It is not intended to replace the clinical judgment of the individual clinician. It is intended to assist the clinician in making a decision about the best course of action for a particular patient. It is not intended to be used as a protocol for all patients with a particular condition. An *ICSI Health Care Guideline* and applying it in your individual

ICSI Health Care Guideline is designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinician's judgment or to establish the only approach to a problem.

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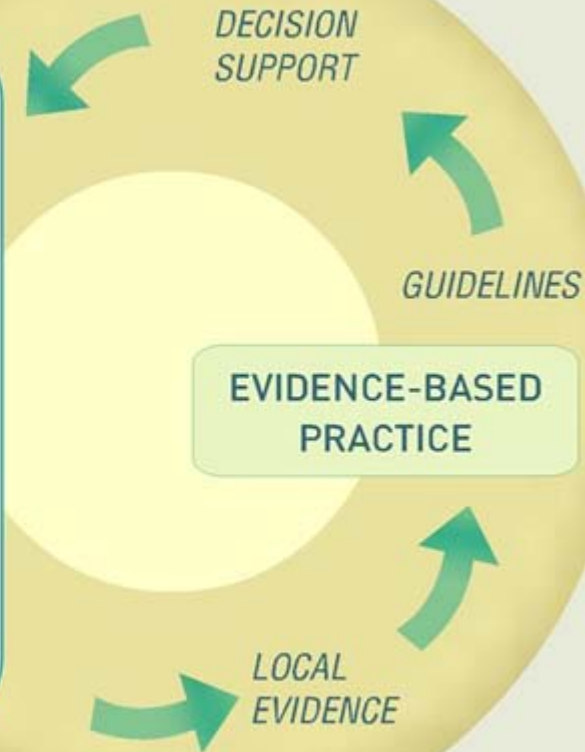
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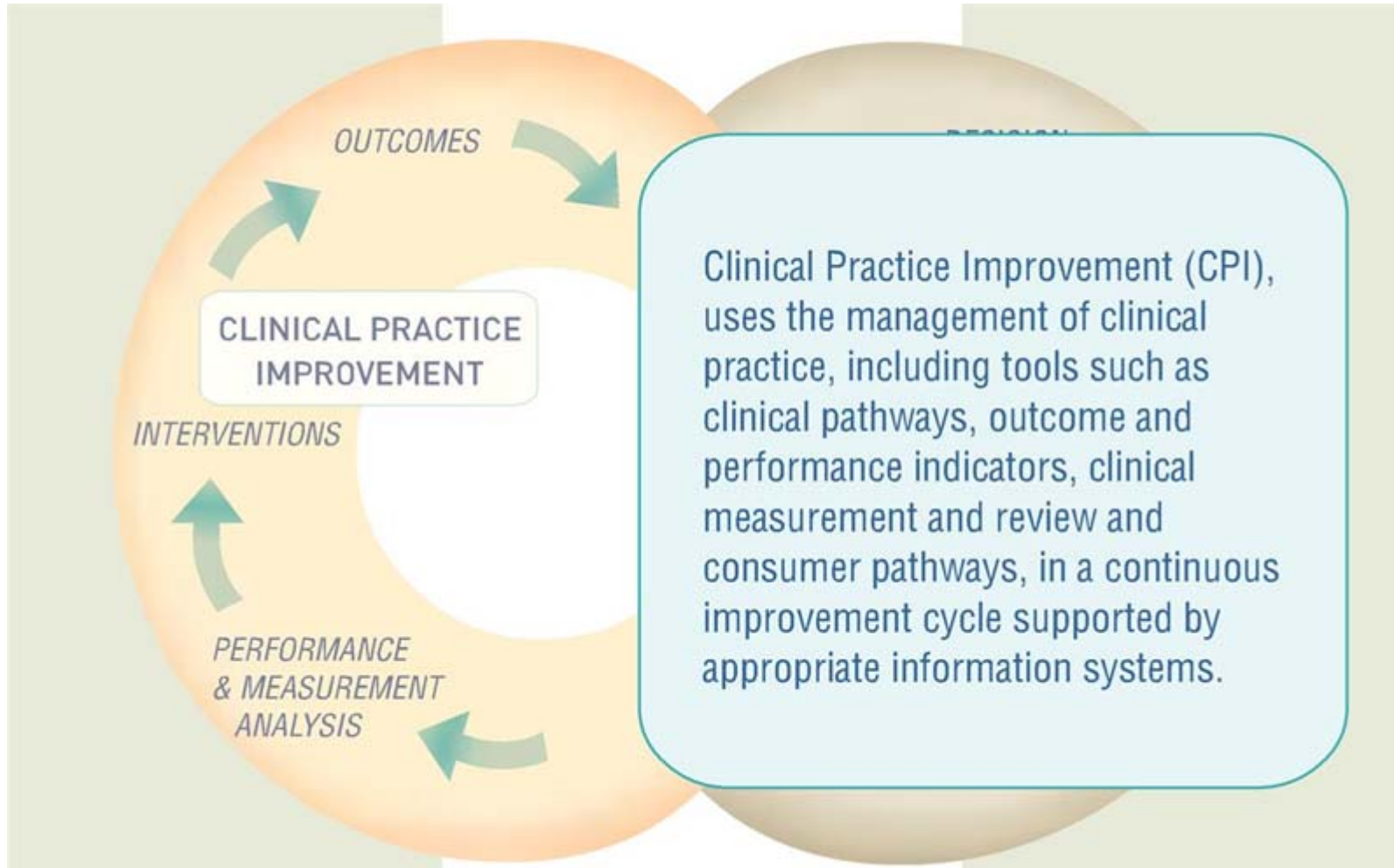
Evidence-Based Practice



Evidence-Based Practice (EBP) involves incorporating best available evidence, based on scientific research, into the clinical decision making process using tools such as clinical practice guidelines, peer reviewed clinical research and direct clinical measurement.

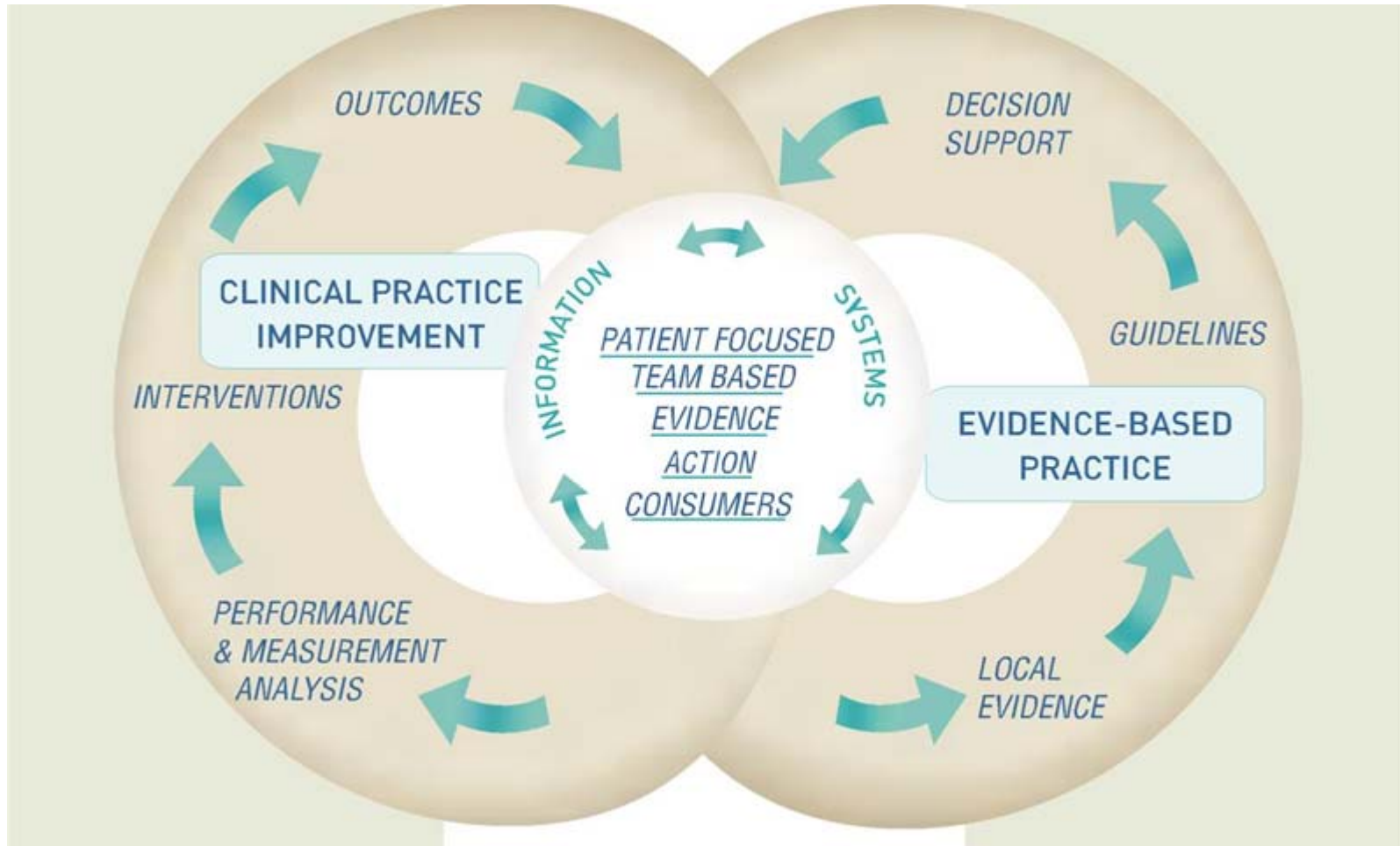


Quality Improvement



Clinical Practice Improvement (CPI), uses the management of clinical practice, including tools such as clinical pathways, outcome and performance indicators, clinical measurement and review and consumer pathways, in a continuous improvement cycle supported by appropriate information systems.

Clinical Practice Improvement



A Quality Use of Medicines Project



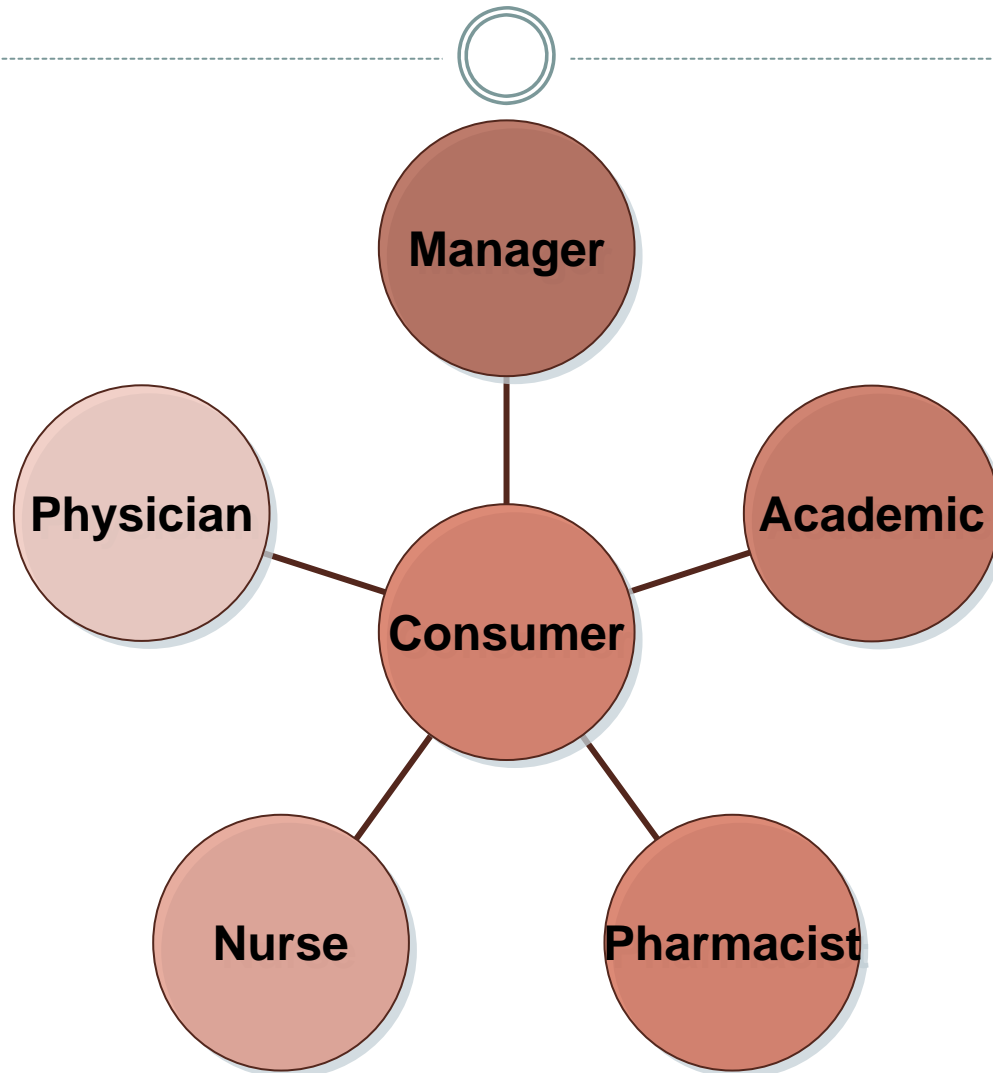
Judicious selection

Appropriate choice

Safe and effective use

- **QUM in hospitals is an important contributor to overall health system performance**
- **Improvements in QUM have the potential to reduce morbidity and mortality as well as improve the overall health of consumers**

Multidisciplinary Team



Clinical Indicators



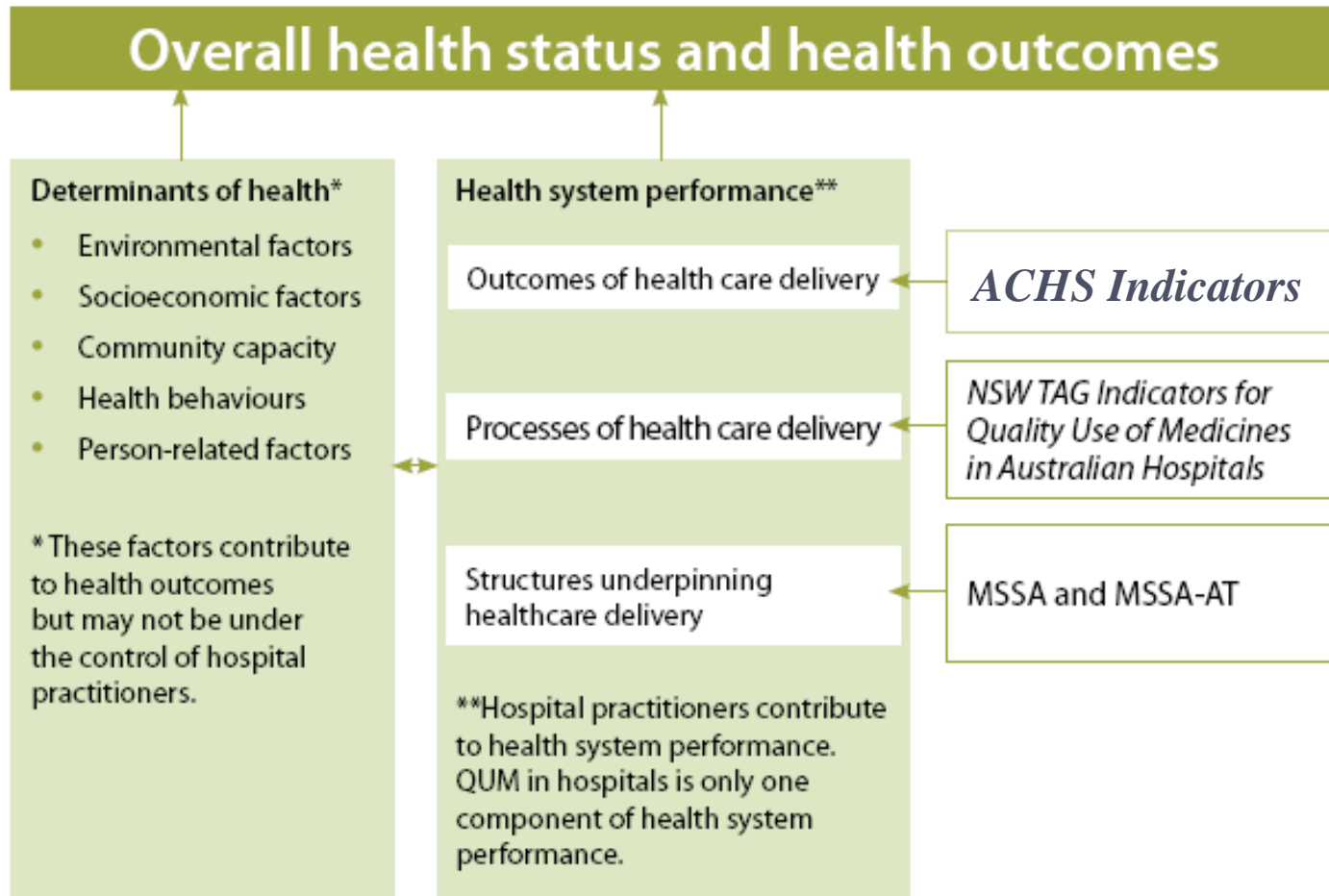
Indicators will measure

- **Structures**
(what is needed)
- **Process**
(what is done)
- **Outcome**
(what is achieved)

Indicators can be used

- **Benchmarking**
- **Measuring improvement**
- **Ongoing surveillance**
- **Improvement intervention (audit & feedback)**

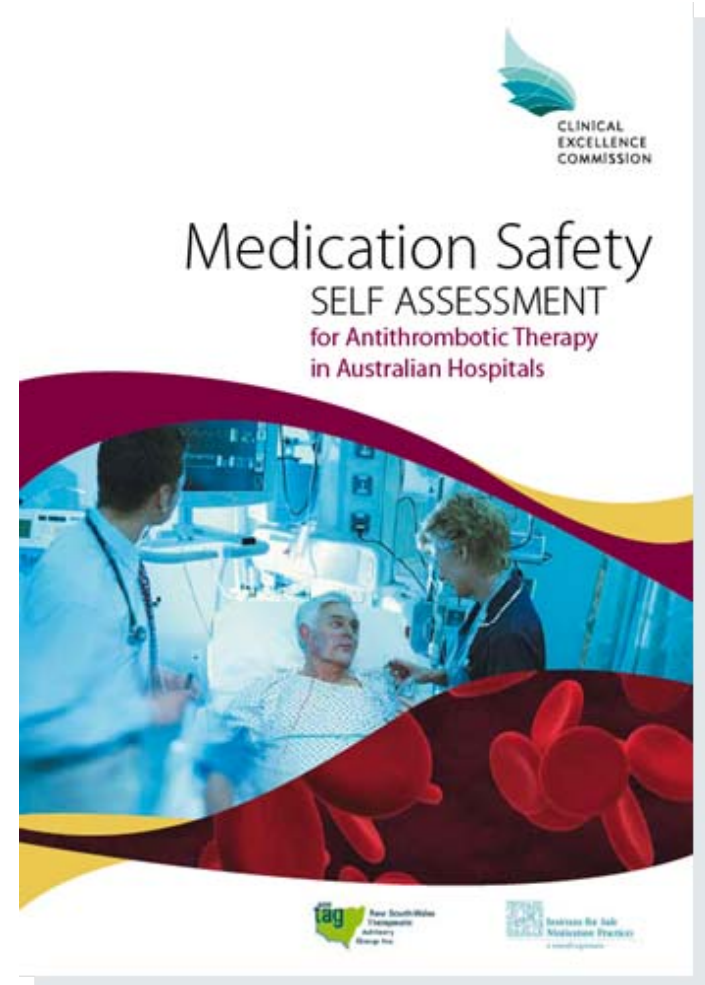
Clinical Indicators



Structures Indicators



1. Patient information
2. Drug information
3. Communication of drug orders and other drug information
4. Drug storage, stock, standardisation and distribution
5. Medication device acquisition, use and monitoring
6. Competency and staff education
7. Patient education
8. Quality processes and risk management



1 PATIENT INFORMATION continued

- A No activity to implement
- B Considered, but not implemented
- C Partially implemented in some or all areas
- D Fully implemented in some areas
- E Fully implemented for all

| SELF ASSESSMENT ITEMS | | A | B | C | D | E |
|------------------------------|--|----------|----------|----------|----------|----------|
| 1.16 | Antithrombotic orders cannot be entered into the pharmacy computer system until the patient's weight and height have been entered. (Weight and height are required fields). | | | | | |
| 1.17 | Prior to initiating antithrombotic therapy, healthcare PRACTITIONERS screen patients for co-existing diseases or conditions (eg., hepatic impairment, hypothyroidism, hyperthyroidism, congestive heart failure, renal failure, hypoalbuminaemia, high vitamin K intake) that could affect the dose requirements for antithrombotic therapy; <u>and</u> , if encountered, these conditions are documented on the medical record and clearly visible to healthcare providers who prescribe, dispense, or administer antithrombotic therapy. | | | | | |
| 1.18 | Prior to initiating antithrombotic therapy, healthcare PRACTITIONERS question patients about recent trauma, surgery, or bleeding problems experienced while receiving any previous antithrombotic therapy; <u>and</u> , if encountered, these conditions are documented on the medical record and clearly visible to healthcare providers who prescribe, dispense, or administer antithrombotic therapy. | | | | | |



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- Home
- Demographics
- Start New Assessment
- Print Your Results ▶
- View Your Results ▶
- Compare Aggregate ▶
- High Level Graphs
- Log Out

Medication Safety Self-Assessment[®] for Antithrombotic Therapy in Australian Hospitals

Australia

NSW

Entire
Australia by

State vs State
in Australia by

Show Graph

TYPE OF GRAPH

- All Key Elements
- All Core Characteristics
- Bed Size
- Organisation Type
- Service Type

- Institutions in Health System
- Location
- Internal/External Management
- Clinical Pharmacy

Filter By

Bed Size: All ▼

Organisation Type: All ▼

Service Type: All ▼

Institutions in Health System: All ▼

Location: All ▼

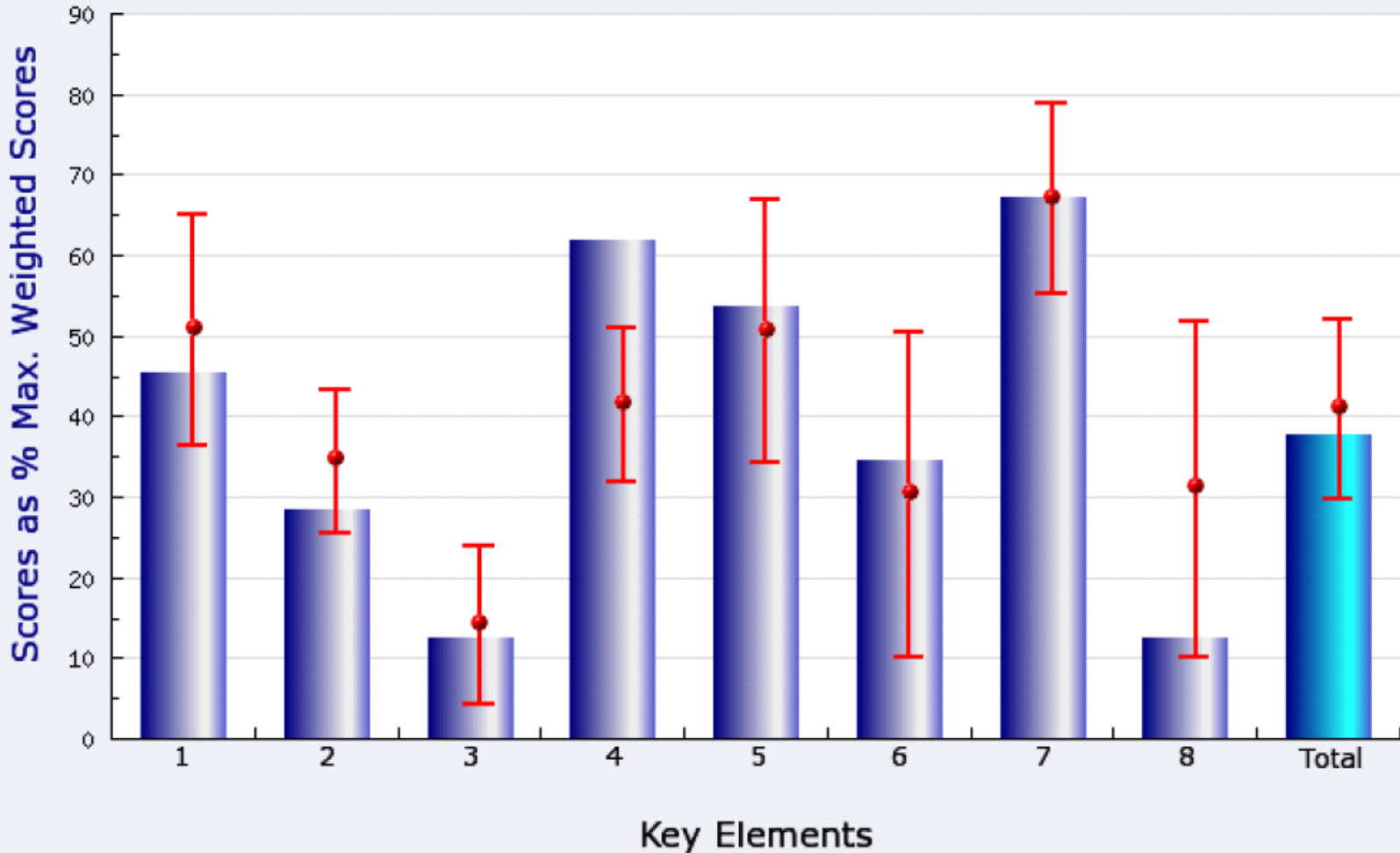
Internal/External Management: All ▼

Clinical Pharmacy: All ▼

Reset

Medication Safety Self-Assessment

Aggregate and User Scores by Key Element

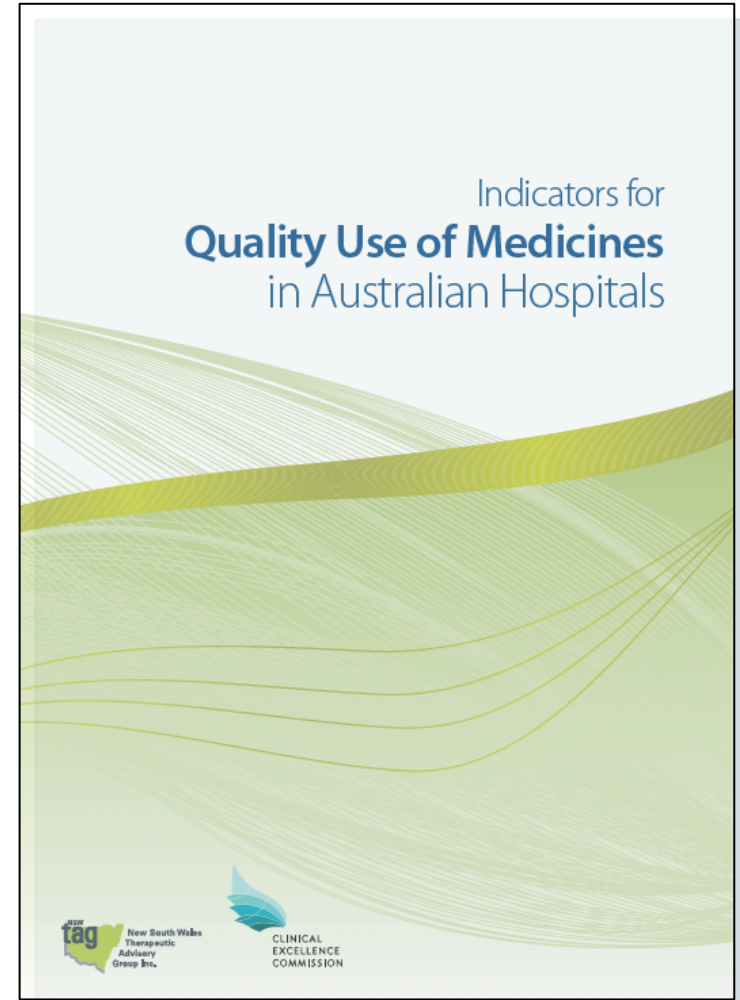


Legend: User Scores (blue bar), Total Score (cyan bar), Std Dev (red error bar), Average Aggregate Data (n=9) (red dot).

Process Indicators



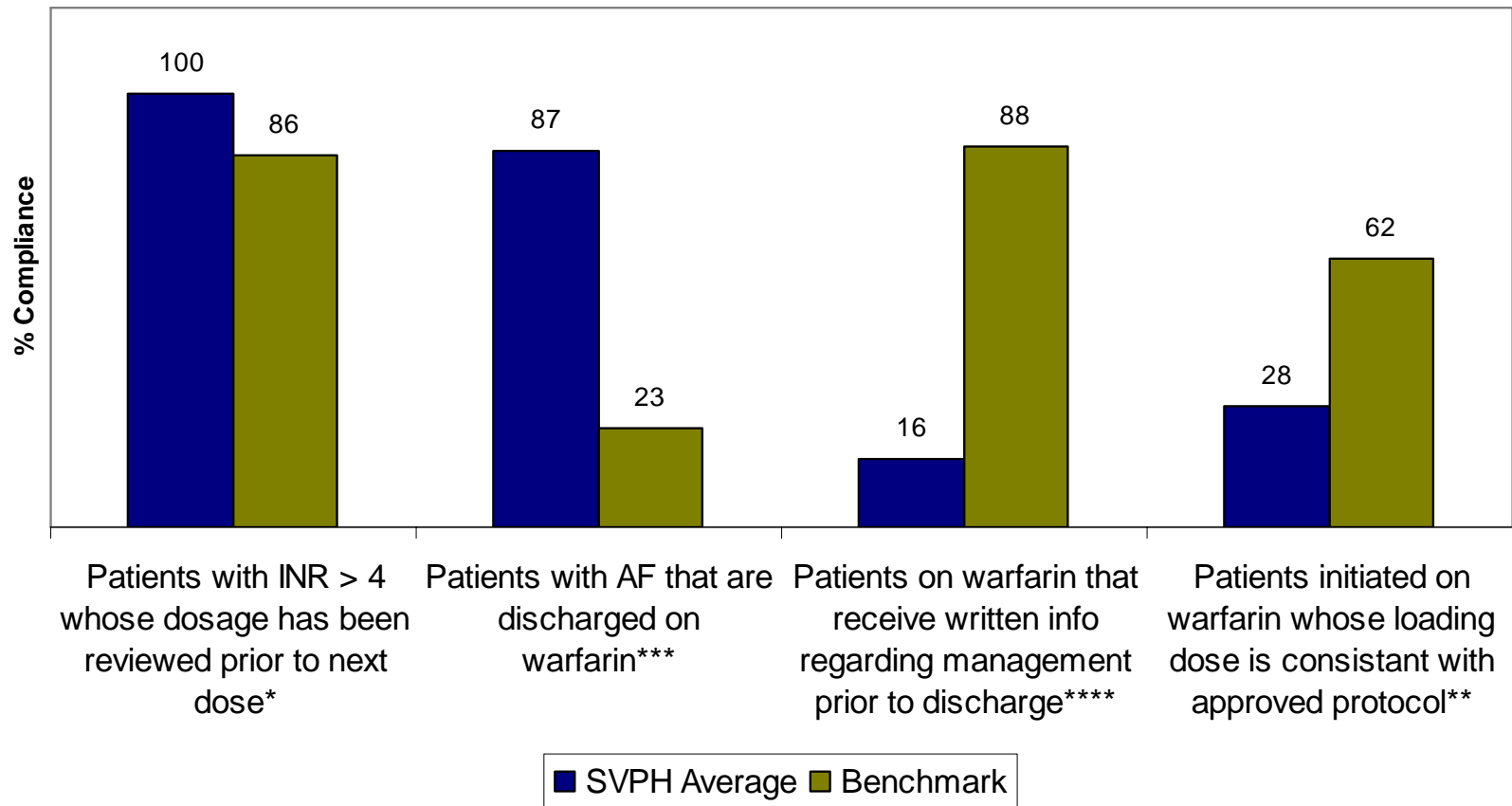
1. Patients prescribed hospital initiated warfarin whose loading doses are consistent with approved protocol
2. Patients with an INR >4 whose dosage has been adjusted or reviewed prior to the next warfarin dose
3. Patients with atrial fibrillation that are discharged on warfarin
4. Patients discharged on warfarin that receive written information regarding warfarin management prior to discharge



Benchmarking



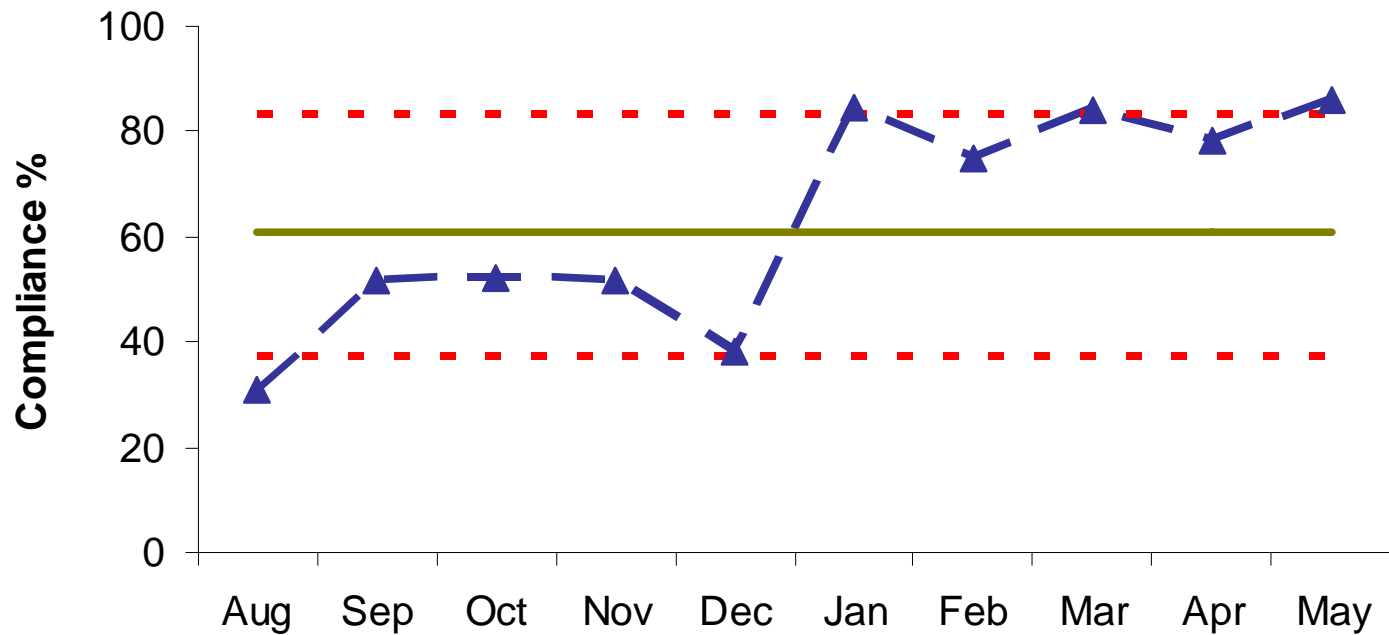
Process Indicator Benchmark



Measuring Improvement



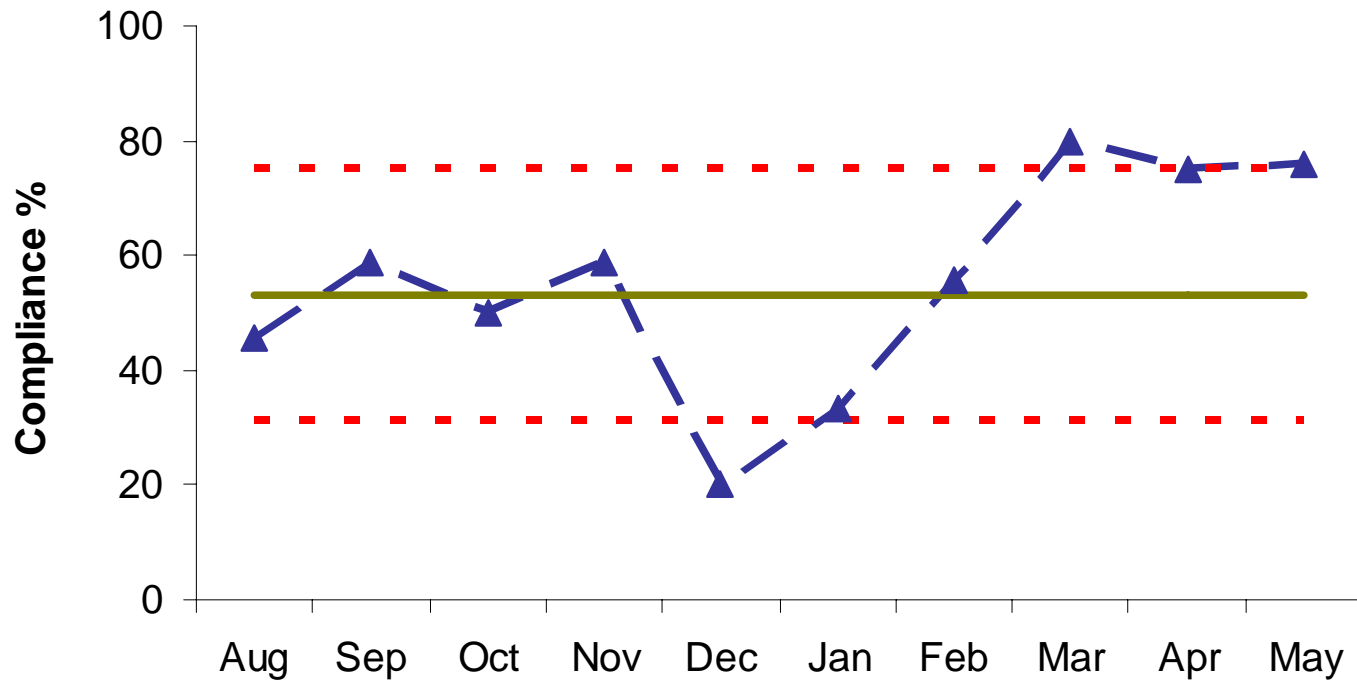
Patients on warfarin that receive written information regarding management prior to discharge



Improvement Intervention



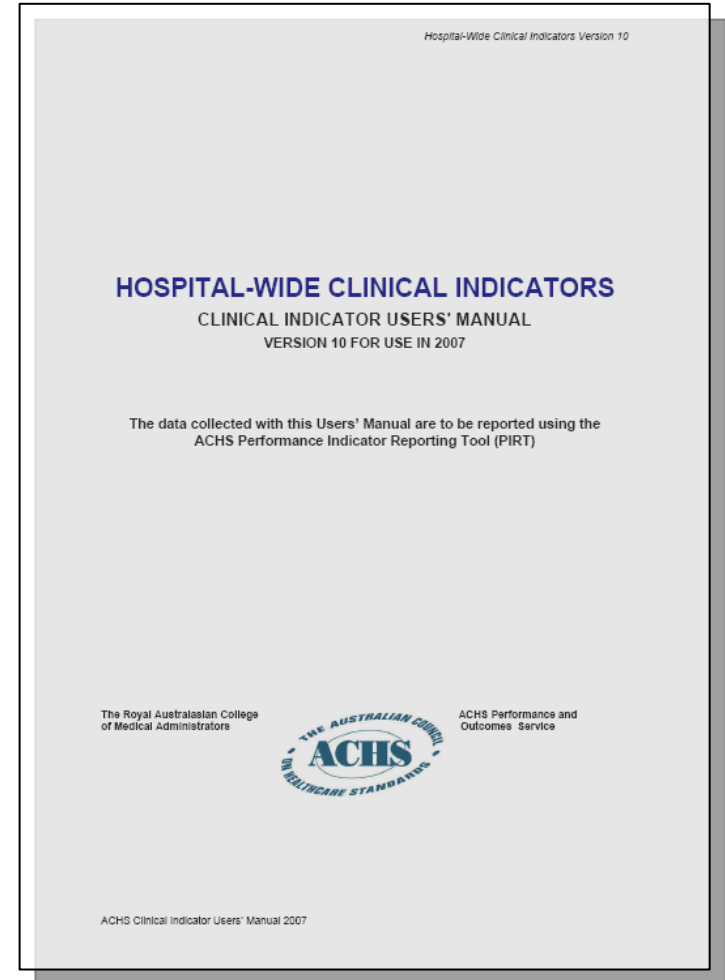
Patients initiated on warfarin whose loading dose is consistent with approved protocol



Outcomes Indicators



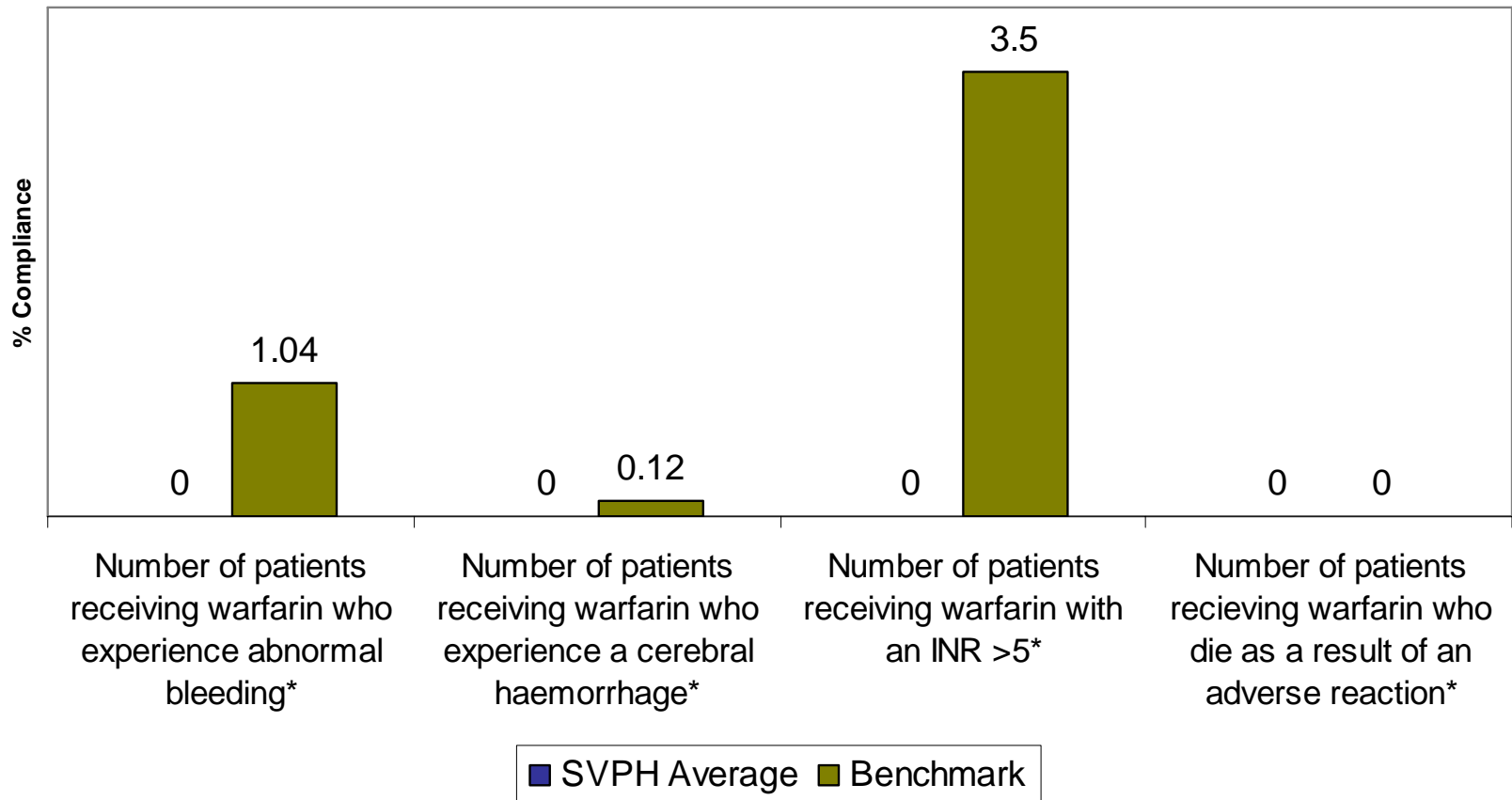
1. Patients receiving warfarin as an inpatient who experience abnormal bleeding
2. Patients receiving warfarin as an inpatient who experience a cerebral hemorrhage
3. Patients receiving warfarin as an inpatient with an INR reading > 5
4. Patients receiving warfarin as an inpatient who die as a result of an adverse reaction



Benchmarking



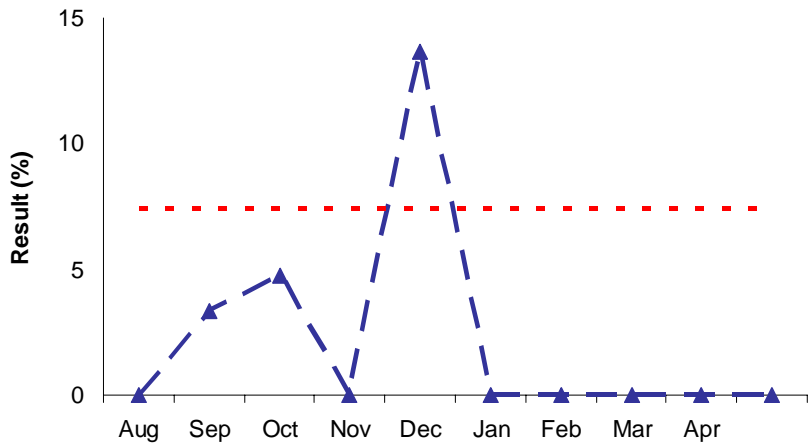
Outcome Indicator Benchmark



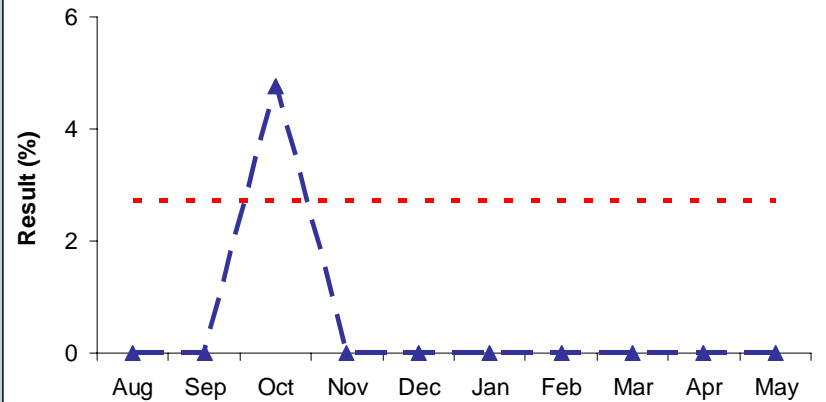
Outcome Measures



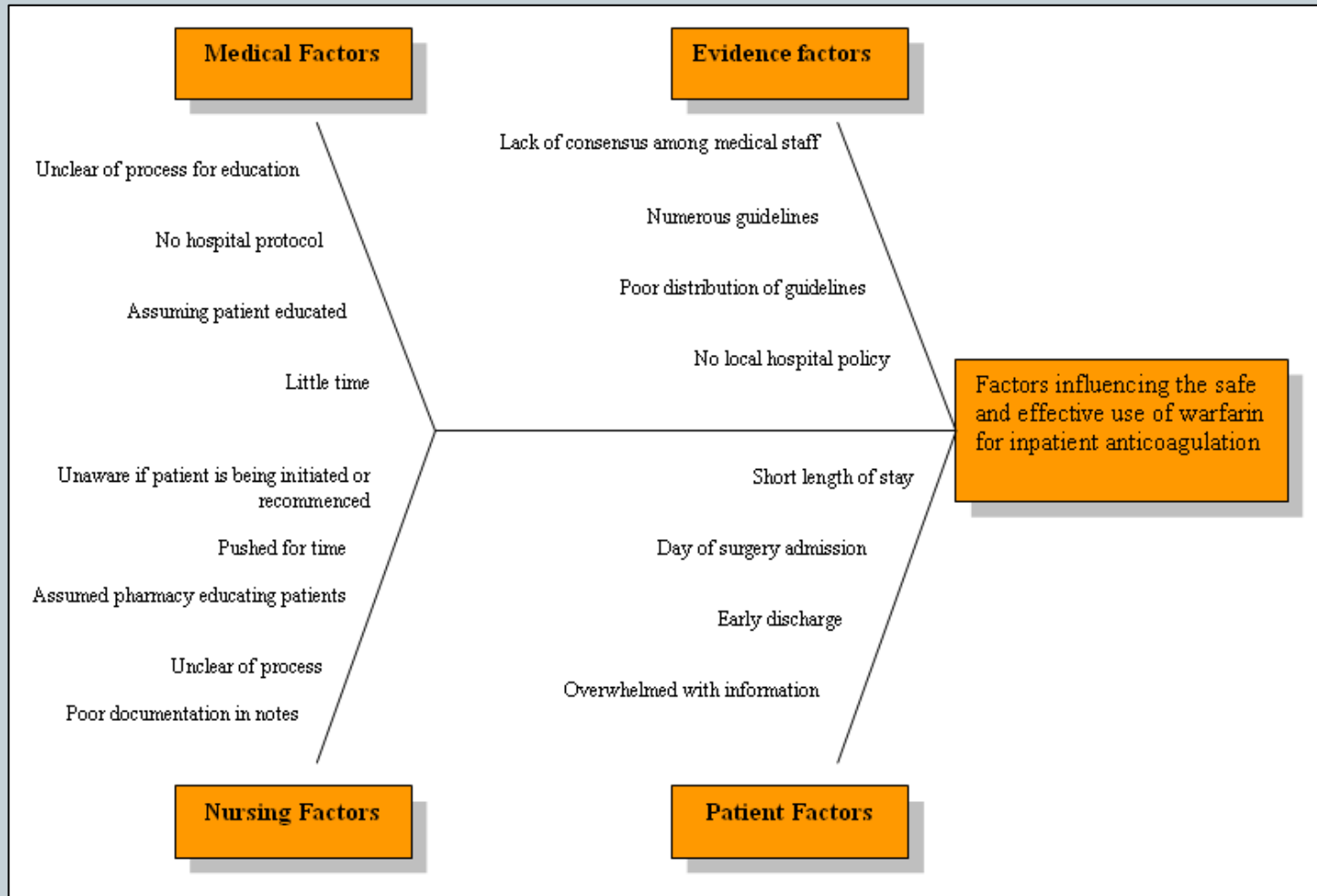
Patients receiving warfarin with an INR >5



Patients receiving warfarin who experience abnormal bleeding



Qualitative Data



Evidence –Based Interventions



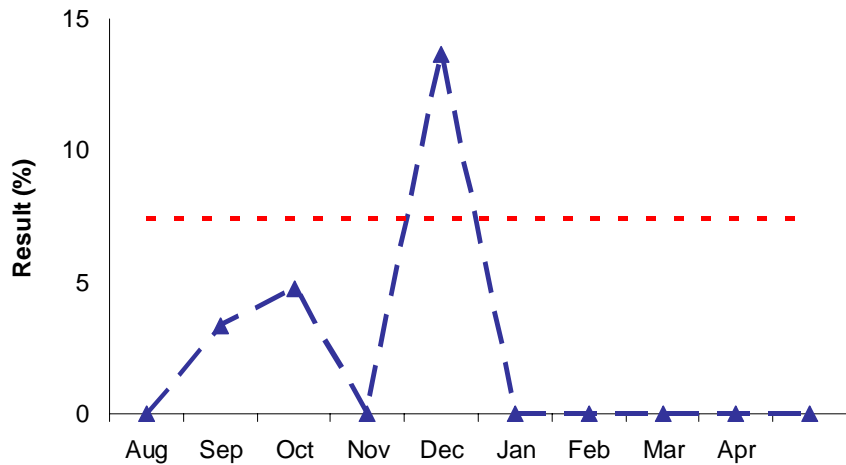
| Generally Effective | Mixed Effect | Modest Effect | Generally Ineffective |
|----------------------------|-----------------------|-------------------------------------|-------------------------------|
| Educational outreach | Audit and feedback | Dissemination of education material | Didactic educational sessions |
| Reminders | Local opinion leaders | | |
| Multifaceted interventions | | | |

Grimshaw (2004)

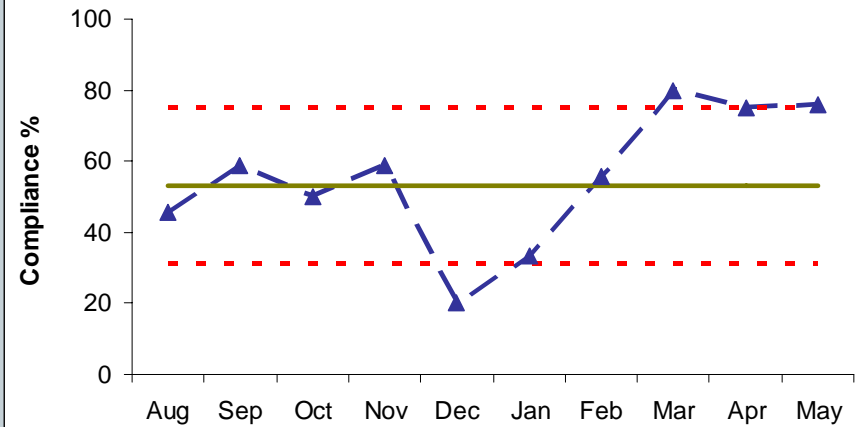
Surveillance



Patients receiving warfarin with an INR >5



Patients initiated on warfarin whose loading dose is consistent with approved protocol





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THANK YOU

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