MELBOURNE HEALTH

Melbourne Health's Experience with VTE Prevention and Anticoagulant Management

Medicines Roundtable 2019

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VTE Prevention

What was the issue?

2013

- **Implementation of the following (based on NHMRC guidelines):**
  - VTE Prevention procedure, VTE Risk Screen Form (with clinical guidelines) and VTE prophylaxis section on the National Inpatient Medication Chart (NIMC)

2014

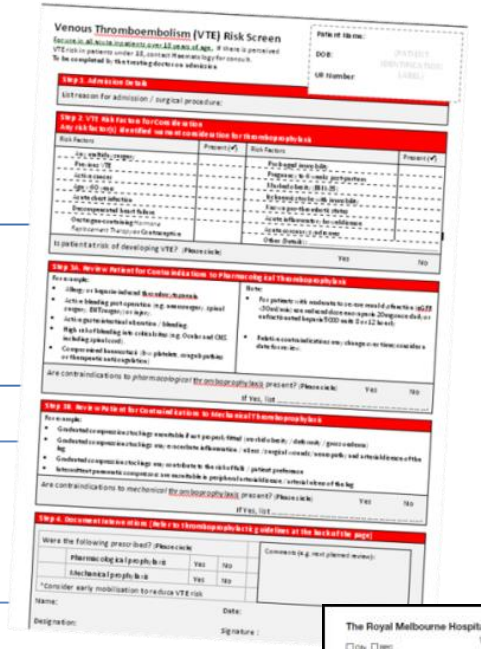
- **Ongoing low compliance and awareness of VTE Risk Screen process**
  - Completion of VTE Risk Screen Form = **14%**[1]
  - Appropriateness of VTE prophylaxis prescribing = **76%**[2]

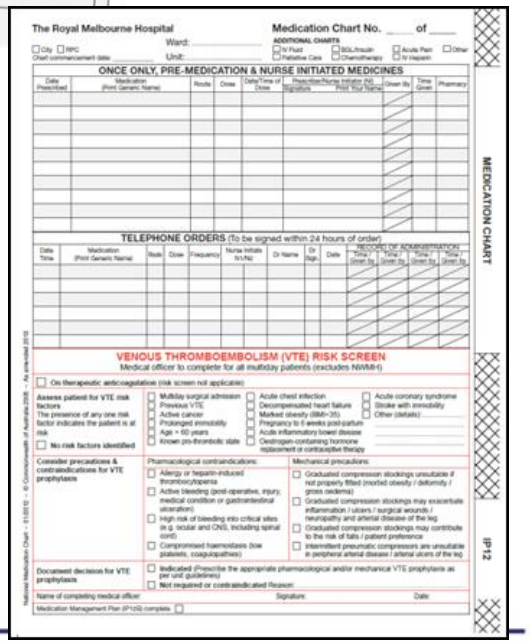
2015

- **VTE Risk Screen integrated onto the front of the NIMC**
- **Continued low compliance and awareness of VTE Risk Screen process**
  - Completion of VTE Risk Screen Tool on NIMC = **18-23%**[3]

2016

- **Low VTE Risk Screen compliance and awareness escalated to the hospital Executive**
  - Became a key priority area for improvement by the organisation

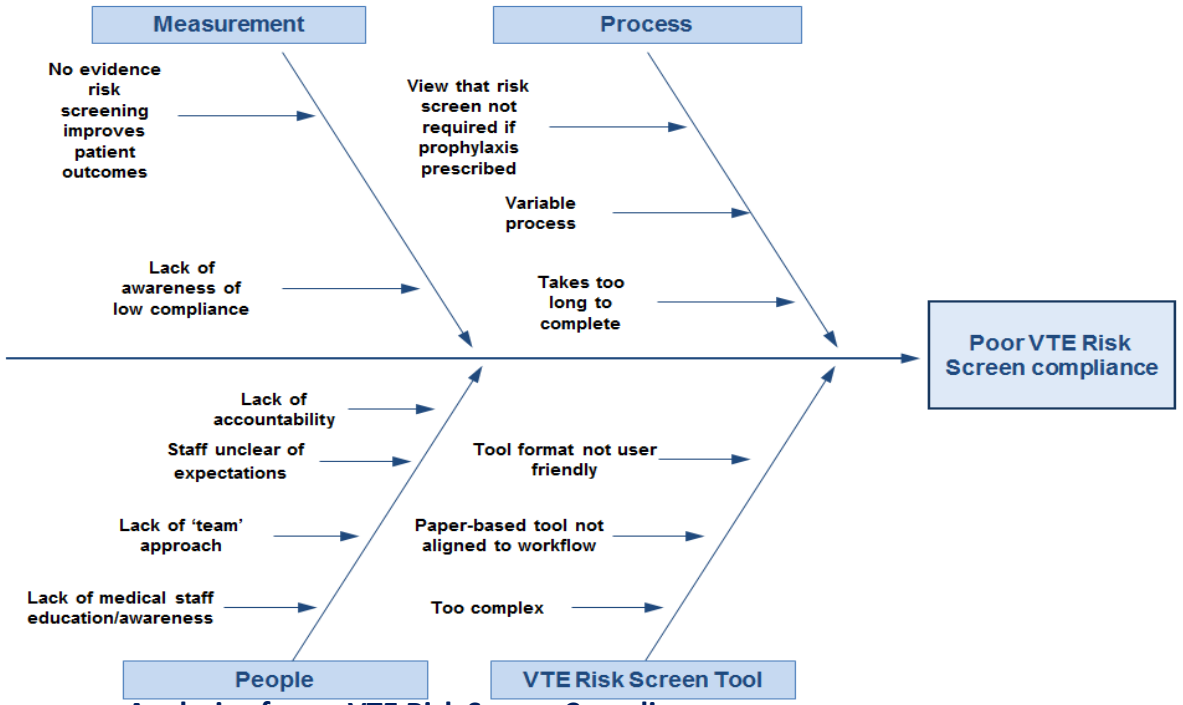




Data sources: 1. RMH Bedside Clinical Audit 2. VTE Clinical Audit 3. RMH Interdisciplinary Documentation Audit

What we aimed to do

- To raise awareness of the organisation's VTE Prevention procedure and VTE Clinical Guideline
- To improve compliance with completion of the VTE Risk Screen (target 85%)
- To review VTE Risk Screen Tool based on feedback from prescribers (junior and senior medical staff) to identify barriers to usability and compliance



Analysis of poor VTE Risk Screen Compliance

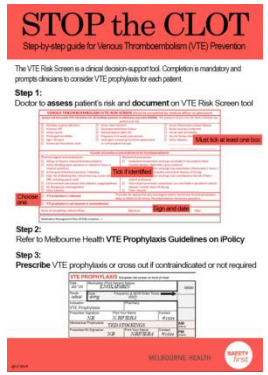
What we did (intervention period)

Intervention period (March – May 2016)

- **Intensive 10 week audit and feedback period to improve compliance**
- **VTE risk screen data collected weekly by clinical pharmacists for 10 weeks** (~400 medication charts per week across 23 wards and 39 units)
- **Electronic auditing system utilised for data capture, analysis and reporting**

AWARENESS

- Posters
- Clinical Audit webpage on intranet
- Newsletter
- Executive walk arounds
- Unit clinical meeting
- ‘Knowing How You’re Doing' boards



EDUCATION

- Multidisciplinary education – face-to-face; online for all clinical staff
- Patient Safety Heads of Units forums

FEEDBACK

- Weekly medication chart auditing and feedback at organisational, divisional, unit and ward level
- Feedback to Divisional Directors, Heads of Units, Nurse Unit Managers, and Pharmacists
- Clinicians encouraged to ‘Speak Up’ if VTE Risk Screen incomplete

because we care

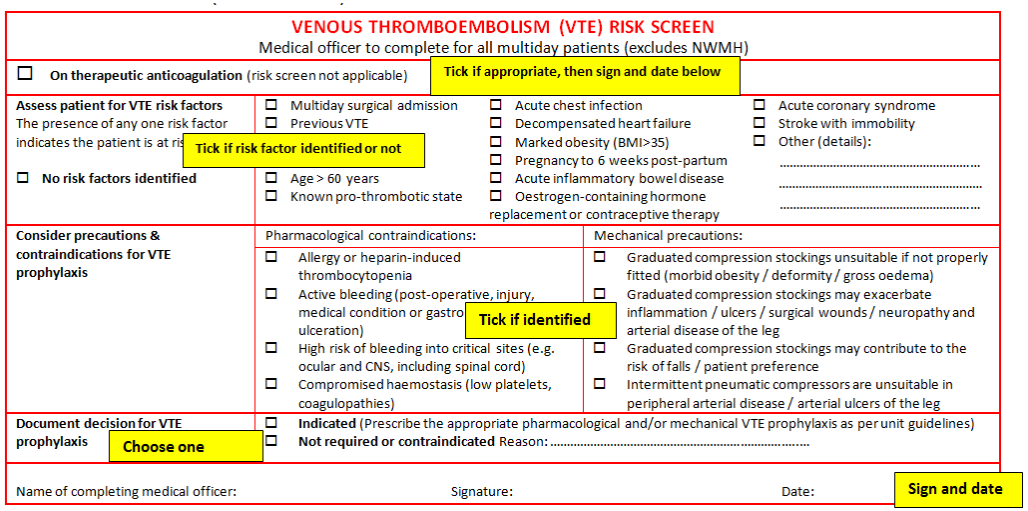
SPEAK UP FOR SAFETY™ AND OUR VALUES

SAFETY™ C.O.D.E.

What we did (sustain period)

Sustain period (July 2016 to present)

- Quarterly independent Pharmacist VTE audits; Monthly Medical VTE audits
- VTE Prevention Intervention Bundle developed
- Continued results dissemination and visibility
- Peer to peer learning encouraged from high performing areas
- Multidisciplinary meetings with Executive for lowest performing units



VENOUS THROMBOEMBOLISM (VTE) RISK SCREEN

Medical officer to complete for all multiday patients (excludes NWMH)

☐ **On therapeutic anticoagulation** (risk screen not applicable) — Tick if appropriate, then sign and date below

Assess patient for VTE risk factors
The presence of any one risk factor indicates the patient is at ri — Tick if risk factor identified or not

☐ **No risk factors identified**

☐ Multiday surgical admission
☐ Previous VTE
☐ Age > 60 years
☐ Known pro-thrombotic state
☐ Acute chest infection
☐ Decompensated heart failure
☐ Marked obesity (BMI>35)
☐ Pregnancy to 6 weeks post-partum
☐ Acute inflammatory bowel disease
☐ Oestrogen-containing hormone replacement or contraceptive therapy
☐ Acute coronary syndrome
☐ Stroke with immobility
☐ Other (details): .....

Consider precautions & contraindications for VTE prophylaxis

Pharmacological contraindications:
☐ Allergy or heparin-induced thrombocytopenia
☐ Active bleeding (post-operative, injury, medical condition or gastro — Tick if identified
ulceration)
☐ High risk of bleeding into critical sites (e.g. ocular and CNS, including spinal cord)
☐ Compromised haemostasis (low platelets, coagulopathies)

Mechanical precautions:
☐ Graduated compression stockings unsuitable if not properly fitted (morbid obesity / deformity / gross oedema)
☐ Graduated compression stockings may exacerbate inflammation / ulcers / surgical wounds / neuropathy and arterial disease of the leg
☐ Graduated compression stockings may contribute to the risk of falls / patient preference
☐ Intermittent pneumatic compressors are unsuitable in peripheral arterial disease / arterial ulcers of the leg

Document decision for VTE prophylaxis — Choose one
☐ **Indicated** (Prescribe the appropriate pharmacological and/or mechanical VTE prophylaxis as per unit guidelines)
☐ **Not required or contraindicated** Reason: .....

Name of completing medical officer: Signature: Date: — Sign and date

Current VTE Risk Screen Tool on NIMC

Team Approach

- Prompts/reminders to medical staff during daily ward rounds
- Follow up by pharmacists/nursing staff
- Pharmacist education on VTE risk screen – unit level, intern and HMO group education, orientation
- Displaying audit results in ward area,
- Discussing audit results with MDT members

Unit-based strategies

- HOU discusses compliance at unit clinical meeting
- HOU checks sample of medication charts, and communicates results to unit residents and registrars
- Local monitoring by medical staff with monthly auditing and feedback to unit staff

VTE Risk Screen Intervention Bundle

Notification/Escalation

- 'Speaking Up' – providing feedback to treating clinician if VTE Risk screen not completed
- Notification to local resident/registrar by nurse/pharmacist and/or escalation to senior medical staff/Head of Unit
- Use of the weCare feedback app to escalate non-compliance

Organisational monitoring

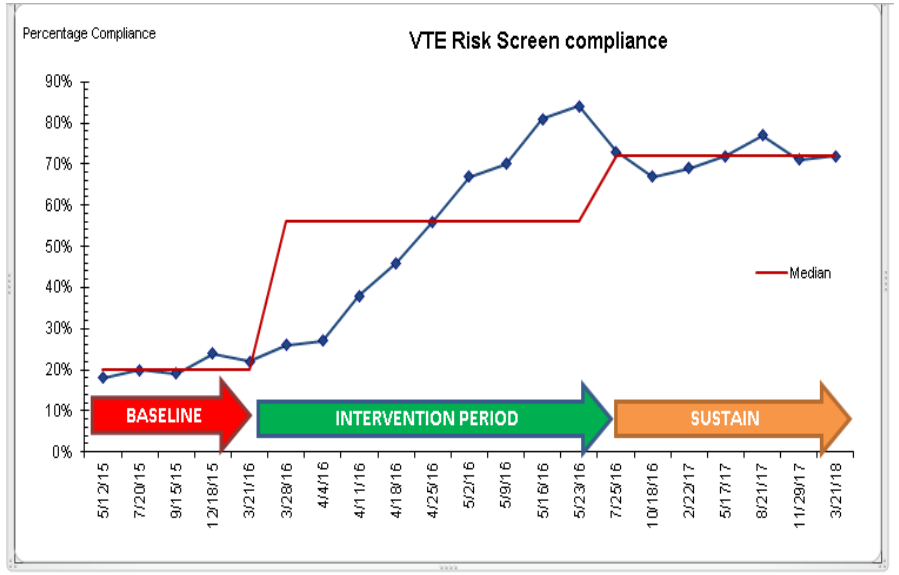
- Quarterly organisational audits of VTE Risk Screen compliance
- Annual organisational audit of appropriateness of VTE Prophylaxis
- Dashboard reporting of monthly hospital-acquired VTE data

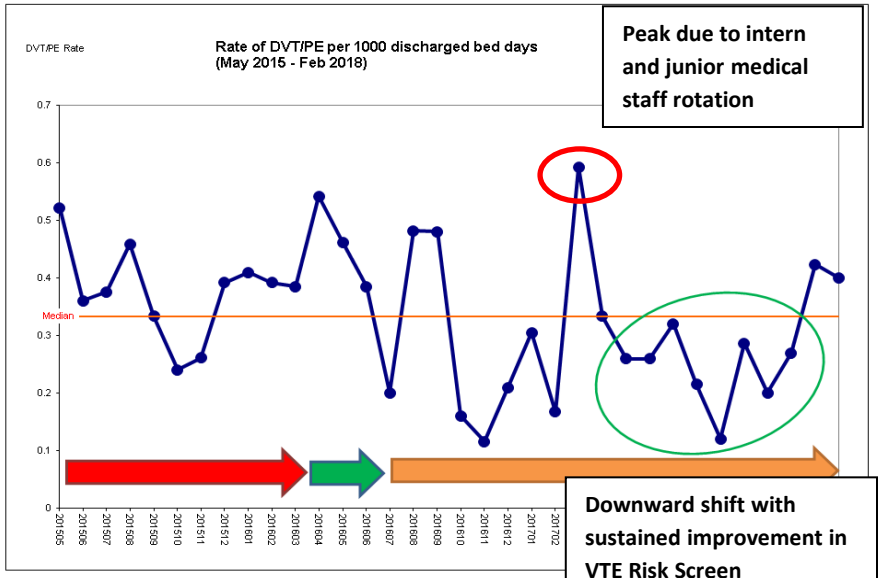
What were the outcomes?

Outcome measure – monthly coded data for hospital associated DVT and PE episodes

Process measure – VTE Risk Screen compliance (%) – measured bimonthly at baseline, weekly during intervention period and quarterly during sustain period

Balancing measures – monthly coded data for readmissions with DVT/PE within 28 days of discharge & bleeding complications





Bimonthly data collection

Weekly data collection

Quarterly data collection

- improved VTE Risk Screen compliance from 22% to 84%
- sustained improved median VTE Risk screening compliance
- reduction in hospital-associated VTE episodes seen as a downward shift in the run chart
- no change to balancing measures during the intervention and sustain period

What were the outcomes?

- Audit conducted by 10 anaesthetists across acute wards, excluding ED, SSU, ICU, medical wards to test association between VTE risk screening and prescribing appropriate VTE prophylaxis
- Auditors provided with education on audit, screening and prescribing process, including clinical scenarios to "standard set"

Performance results	% Performance
% of patients who have completed VTE risk screen with appropriate prophylaxis	81%
% patients who have NOT completed VTE risk screen but with appropriate prophylaxis	70%

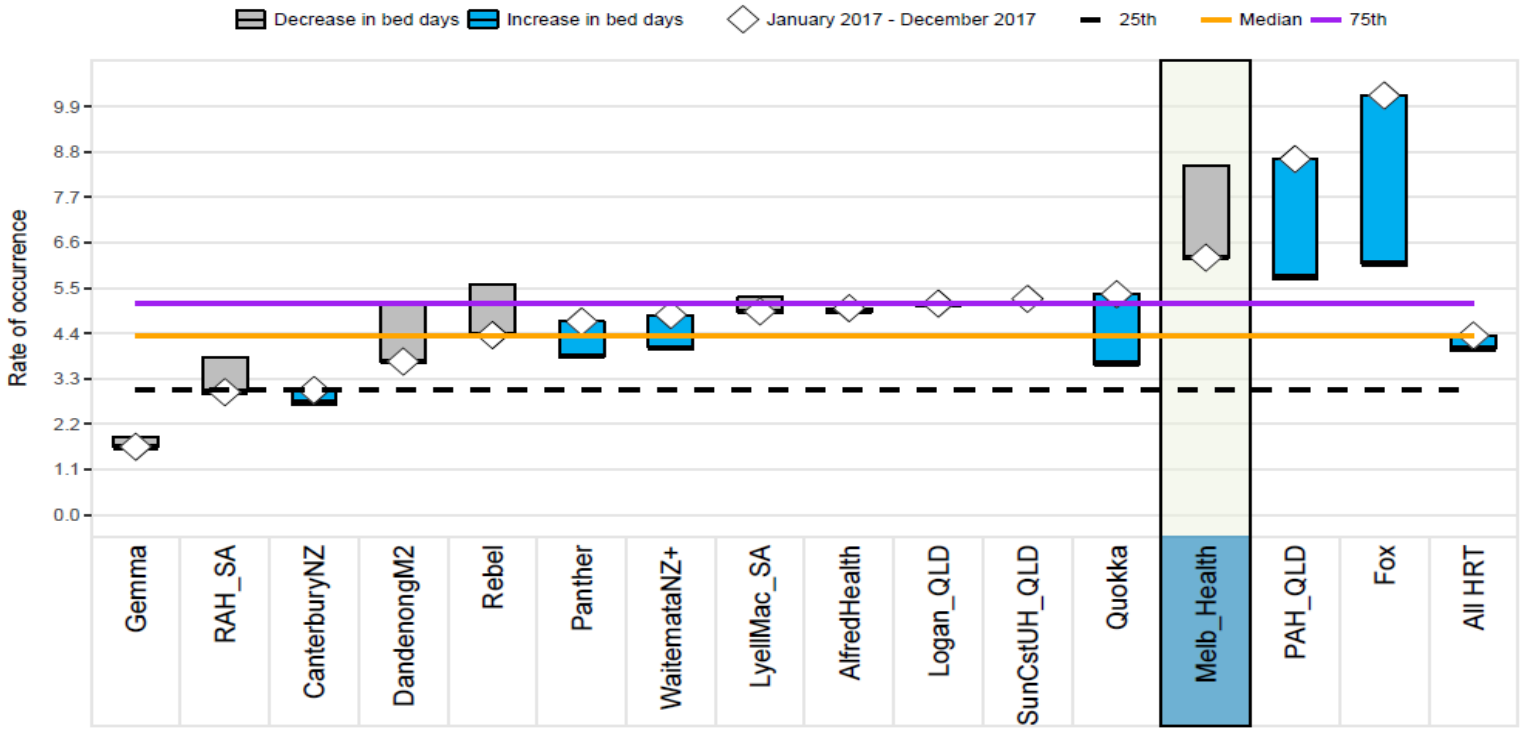
When VTE risk screen incomplete, more likely to NOT have a VTE prophylaxis prescribed

Anticoagulant Management

What was the issue?

Melb_Health | Jan 2017 - Dec 2017 | Adverse Effects |

- Melb_Health coded Anticoagulants adverse effects 6.23 times per 10,000 bed days, compared to the All HRT's rate of 4.35 per 10,000 bed days



	Gemma	RAH_SA	CanterburyNZ	DandenongM2	Rebel	Panther	WaitemataNZ+	LyellMac_SA	AlfredHealth	Logan_QLD	SunCstUH_QLD	Quokka	Melb_Health	PAH_QLD	Fox	All HRT
Adverse effect codes	19	66	102	59	28	121	110	61	122	37	48	49	119	161	154	5,656
Rate per 10k bed days	1.65	2.97	3.02	3.72	4.36	4.69	4.84	4.93	5.01	5.12	5.24	5.35	6.23	8.62	10.17	4.35
Adverse effect ALOS	15.2	19.0	12.3	18.9	9.0	19.5	10.5	11.8	19.9	13.2	15.0	11.4	16.6	17.1	16.2	15.7

*Y44.2 - Anticoagulants causing adverse effects in therapeutic use

What was the issue?

All medication incidents reported (Jul-Oct 2018)

Medication Name	Medication Incidents
other	44
oxycodone	40
paracetamol	38
enoxaparin sodium	33
olanzapine	27
iohexol	24
clozapine	20
diazepam	17
insulin glargine	16
quetiapine	15
frusemide	14
valproic acid	14
naloxone	14
buprenorphine	12
risperidone	12
insulin aspart	11
lorazepam	11
ketamine	11
pantoprazole	11
Total	779

High risk medication incidents reported (Jul-Oct 2018)

Medication Name	High Risk Medication Incidents
oxycodone	40
enoxaparin sodium	33
insulin glargine	16
buprenorphine	12
insulin aspart	11
ketamine	11
warfarin	11
fentanyl	11
tramadol	9
potassium chloride	9
morphine	9
heparin sodium	9
paracetamol + codeine	7
methotrexate	6
insulin neutral human	6
dabigatran	5
potassium	4
methadone	4
rivaroxaban	4
Total	232

*Note: apixaban is not listed in VHIMS (reported as 'other')

What was the issue?

Incident 1: Patient was administered **apixaban** with therapeutic **enoxaparin** which contributed to a R) CFA aneurysm and large retroperitoneal bleed with haemorrhagic shock

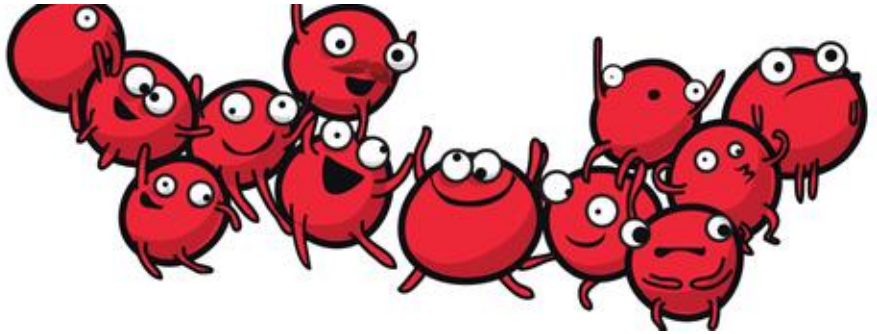
Incident 2: Patient administered therapeutic **enoxaparin**, delayed anti-Xa level and decline in Hb and renal function not recognised contributing to large right retroperitoneal bleed

Incident 3: Dabigatran administered in AKI (CrCl =22mL/min) with therapeutic **enoxaparin** in a patient receiving regional analgesia (Idarucizumab administered for reversal)

Incident 4: Apixaban 20mg daily prescribed and administered to patient with prophylactic **enoxaparin** in AKI (CrCl = 14mL/min), minor bleeding

What was the issue?

- Key themes from incidents:
  - **Direct Oral Anticoagulants (DOACs)!**
    - DOAC prescribed and administered with therapeutic anticoagulation or VTE prophylaxis
    - DOAC prescribed and administered when contraindicated
    - DOAC prescribed and administered at incorrect dose
  - Recognition of deterioration in renal function

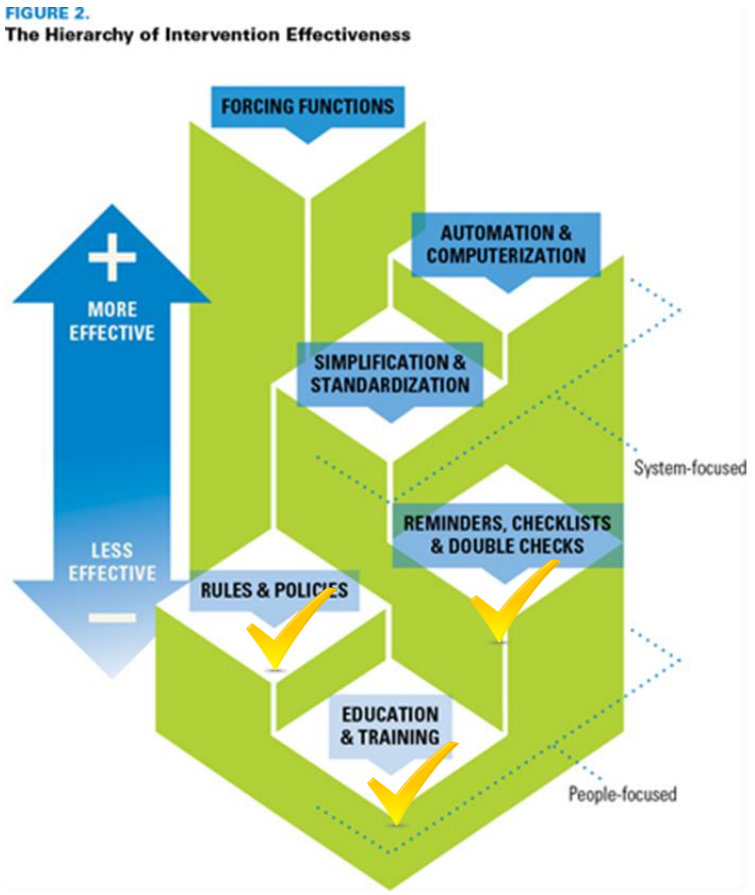


What we aimed to do

- Aim for zero Incident Severity Rating (ISR) 1 and 2 medication incidents
- Prevent error-related harm
- Increase awareness:
  - nursing, medical and pharmacy

What we did

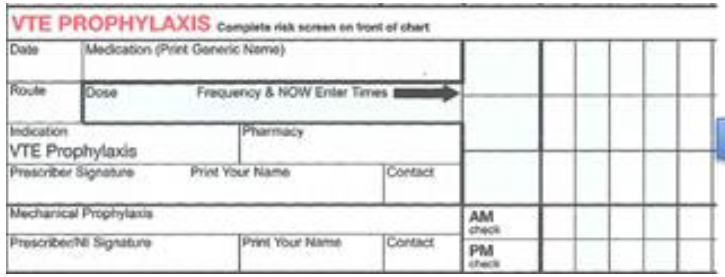
- **Reviewed safety strategies from other organisations**
- **Education**
  - Morbidity and Mortality Grand Round
  - Patient Safety Bulletin
  - Cases circulated at Head of Units meeting
  - Anticoagulant Medication Safety Standard of the Month
  - Nursing in-service presentations
  - Covered in orientation (nursing/medical)
  - Target prescribing education in areas most frequently prescribed
  - Medication FAQs presentation (interns)
- **Procedures and medication guidelines**
  - Update to Enoxaparin Medication Guideline
  - VTE working group updating procedures relating to VTE
  - Development of peri-operative procedure for anticoagulants

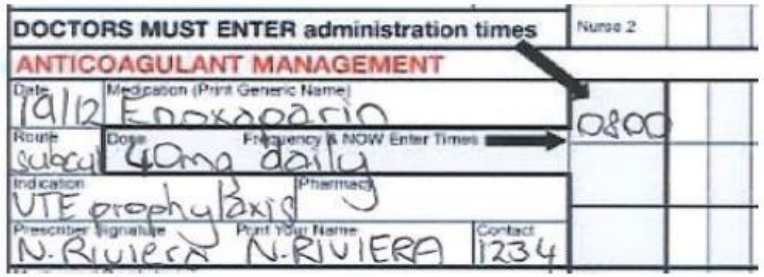


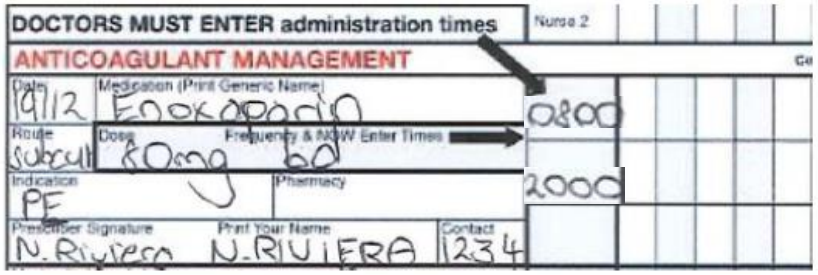
Ref: Cafazzo JA, St-Cyr O. From Discovery to Design: The Evolution of Human Factors in Healthcare. Healthcare Quarterly 2012 April, 15, 24-29

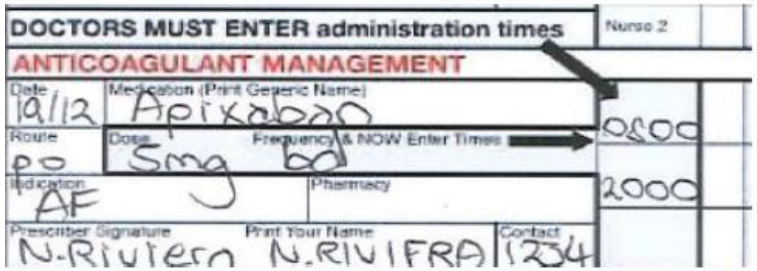
What we did

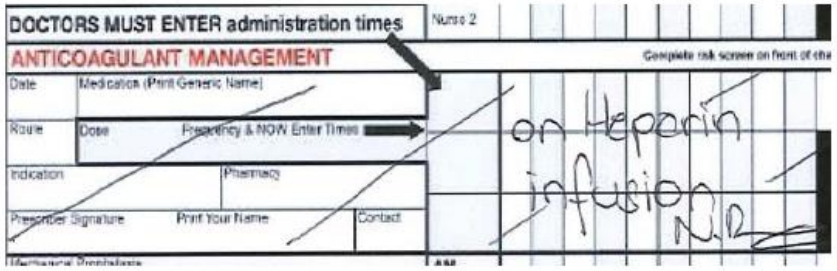
- VTE prophylaxis section changed to Anticoagulant Management section

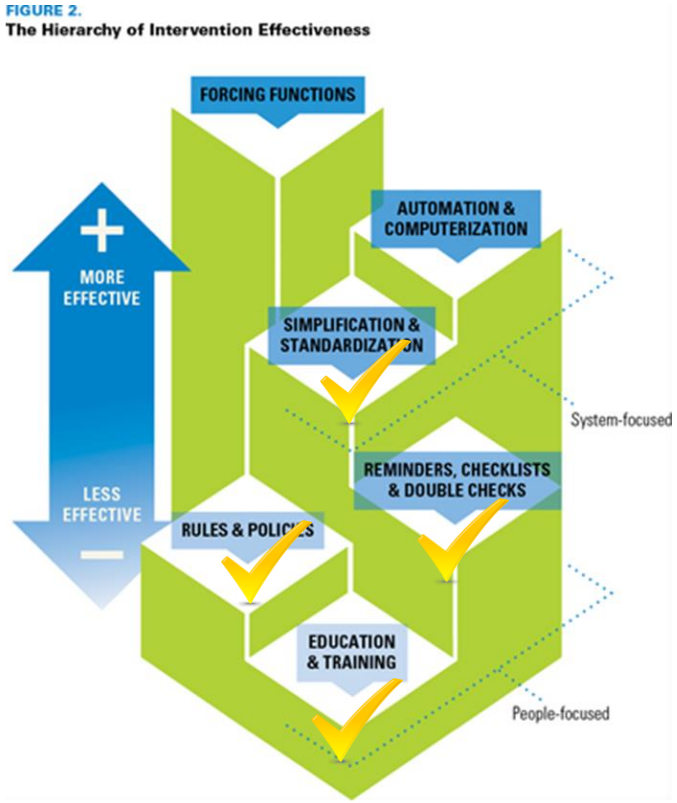












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What were the outcomes?

- **ZERO** ISR 1 or 2 incidents since intervention reported via Riskman
- **96.4%** (245)/(254) correct use of 'anticoagulant management' section of chart
- Incidents reported:
  - May (rollout):
    - Enoxaparin + apixaban co-administered (1 x stat + 1 x reg)
    - Enoxaparin + apixaban co-administered (enoxaparin not ceased)
  - June: NIL
  - July:
    - Enoxaparin + dabigatran co-administered (dabigatran prescribed in regular section)

What we learnt

Organisational focus with a multi-pronged approach to VTE prevention can lead to increased VTE risk screening compliance and reduced VTE rates

- **Key factors for success**
- Dedicated resource to drive VTE auditing and improvement processes
- Provision of audit results and feedback in a timely manner AND at multiple levels
- A clear directive from senior hospital managers
- Strong medical leadership and commitment

This allowed a shift in organisational priority to address anticoagulant management

- **Key factors for success**
- Robust incident review process
- Strong engagement from senior hospital managers to change medication chart
- A clear directive from senior hospital managers
- Strong medical leadership and commitment

Acknowledgements

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