Making a difference in practice –
A case study
Bath RUH CAT service

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Bath RUH CAT service

• Baseline audit
• Implementation of service
• 3 month evaluation
• Ongoing improvement
Management of CAT: complex

- Drug-drug interactions with systemic therapy
- Thrombocytopenia
- Clot extension
- Renal / hepatic impairment
- Duration
- Anorexia, nausea & vomiting
- Type of tumour
Baseline audit

• 2017 – 3 months
• 29 patients
• Findings
  – Inconsistent
  – Unsafe
  – Variability in where patients presented
  – No standardised follow up
  – No standardised decision making
Baseline Audit

**Figure 1**: 33% patients on dalteparin had appropriate dose reduction at 1 month

- 4 (33%)
- 8 (66%)

**Figure 2**: 8% patients had treatment plan communicated to GP

- 1 (8%)
- 11 (92%)

- Existing shared care guideline between RUH & CCG not followed
Setting up service

• Pharmacist / specialist nurse led
• Haematology Consultant
• CAT guideline and pathway
• Electronic referral
• Telephone clinic one, three and six months
• Updated shared care guideline
- Patient information leaflet
- Referral form
Patient presents with CAT or CRT

- Baseline bloods (FBC, LFTs, U+Es and coagulation) + weight.
- 30 days supply of dalteparin.
- Referral to CAT clinic (referral form on RUH website) via email.
- PIL given to patient (if available) - ensure patient has basic understanding of rationale for treatment.
- Ensure patient or carer able to administer dalteparin.
- Ensure patient has a sharps bin/ aware of how to dispose.
- For patients where dalteparin is impractical or contraindicated then treatment with a direct oral anticoagulant (DOAC) can be considered – not licenced.

1 month review (Done by anticoagulation team via CAT telephone clinic)

- Education (pathophysiology of CAT/CRT, administration, length of treatment).
- Check bloods (FBC, LFTs + U+Es) + weight.
- Ensure patient has a sharps bin/ aware of how to dispose.
- Compliance and possible side effects.
- How to obtain further supply of dalteparin.
- Complete shared care agreement paper work - liaise with GP.
- Arrange follow up appointment with the anticoagulation team at 3/12 or 6/12.
- Education (risk of future VTE, signs and symptoms).

3 / 6 month review (Done by anticoagulation team via CAT telephone clinic in conjunction with oncology team)

- Assess need for ongoing anticoagulation.
- Discuss current diseases status.
- Discuss options for ongoing anticoagulation (may be with a DOAC. unlicensed) or LMWH (unlicensed beyond 6 months) and liaise with GP.
- Education (risk of future VTE, signs and symptoms).
3 month evaluation

- 38 out of 44 patients (86%) with a new diagnosis of CAT referred.
- Treatment plan & agreement to participate in shared care, (where appropriate) communicated to the GP in 100% of patients (N = 38).
- 100% of patients on dalteparin dose reduced at 1 month
- Expenditure on dalteparin reduced by an average of £1500 a month due to increased uptake of the shared care agreement.
3 month evaluation

Breakdown of indications requiring intervention by the CAT clinic team (N = 16).
3 month evaluation

- **Patient feedback (N=13)**
- 92% of patients felt they had received sufficient information concerning their diagnosis and treatment. 100% of patients felt they were given sufficient time to ask questions and express any concerns.
- "I was surprised by how good a service it was. The Anticoagulation Team were in contact with my Oncologist, other Healthcare Professionals and my GP. It took the stress out of an already stressful situation'
Development of service

- Uptake of DOACs
- Education & training
- Apixaban prophylaxis
DOACS

• *HOKUSAI-VTE-cancer* (December 2017)
  – edoxaban non-inferior to LMWH in the treatment of CAT.

• *Select-D* trial (July 2018)
  – treatment with rivaroxaban in CAT non-inferior to LMWH

• *ADAM-VTE* (ASH Dec 2018)
  – Apixaban associated with fewer major bleeding events & fewer recurrent VTE compared to LMWH
LMWH

• Use in patients with high risk of bleeding
  – Luminal gastrointestinal cancers with intact primary
  – Cancers of genitourinary tract / bladder
  – Nephrostomy tubes
  – Active gastrointestinal mucosal abnormalities eg DU / gastritis / oesophagitis / colitis
Cancer patient with symptomatic or incidental DVT or PE*

Does the patient have (1) drug-drug interactions with DOACs; or (2) a high risk of bleeding?

No

Initiate anticoagulant treatment with DOAC (edoxaban or rivaroxaban)**

Consider extended anticoagulant treatment beyond 6 months if the cancer is still active †

Yes

Initiate anticoagulant treatment with LMWH
Apixaban to prevent VTE in patients with cancer (AVERT)

• Study aim
  • To assess efficacy of apixaban thromboprophylaxis in ambulatory patients with cancer at intermediate to high risk for venous thromboembolism (VTE) (Khorana score ≥ 2)

• Study design
  • Randomised, placebo-controlled, double blind study
  • Apixaban 2.5mg BD (n=288) vs. placebo (n=275)
  • Treatment period of 180 days
# The Khorana score

<table>
<thead>
<tr>
<th>Variable</th>
<th>Score</th>
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<tbody>
<tr>
<td>Very high-risk tumor (stomach, pancreas)</td>
<td>2</td>
</tr>
<tr>
<td>High-risk tumor (lung, gynecologic, genitourinary excluding prostate)</td>
<td>1</td>
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<tr>
<td>Hemoglobin level $&lt;100$ g/L or use of red cell growth factors</td>
<td>1</td>
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<tr>
<td>Prechemotherapy leukocyte count $&gt;11 \times 10^9$/L</td>
<td></td>
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<tr>
<td>Prechemotherapy platelet count $350 \times 10^9$/L or greater</td>
<td>1</td>
</tr>
<tr>
<td>Body mass index $35 \text{ kg/m}^2$ or greater</td>
<td>1</td>
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A score of 0 = low-risk category. A score of 1–2 = intermediate-risk category. A score of $>2$ = very high-risk category.


• AVERT inclusion criteria
  • Newly diagnosed cancer or remission
  • Starting chemo (intent to treat for ≥ 3 months)
  • Khorana score of ≥ 2, age > 18 years
• AVERT exclusion criteria
  • High bleeding risk, hepatic disease, SCC/BCC, leukaemia or myeloproliferative neoplasm, stem cell transplant, life expectancy < 6 months, GFR < 30ml/min, platelet count < 50, weight < 40kg (+ regular contraindications as per SPC)
AVERT: principle findings

• The primary efficacy outcome, VTE (proximal DVT or PE), occurred in 4.2% of the apixaban group compared with 10.2% of the placebo group (p < 0.001).
• The primary safety outcome, major bleeding, occurred in 3.5% of the apixaban group compared with 1.8% of placebo group (p = 0.046).
• The secondary outcome, all-cause mortality, was 12.2% in the apixaban group vs. 9.8% in the placebo group (p = not significant).
VTE prophylaxis

• Pancreatic Carcinoma CAT diagnosis

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<tr>
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<th>June-Dec 2017</th>
<th>2018</th>
<th>Jan – April 2019</th>
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<tr>
<td>Number pancreatic CAT</td>
<td>5</td>
<td>13</td>
<td>1</td>
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CAT service

- Safer
- Better care for patients
- Advice – up to date
- Individualised treatment & shared care decision making
- Interdisciplinary working
- Health resource
  - RUH satellite pharmacy cost saving on LMWH
  - 30K for 2018 vs 2017
  - Reduction in VTE events
Clinician feedback

“The CAT service is invaluable to our patients and has improved patient safety, prescribing to guidelines, keeping up to date with changes in the area and patient experience”
References


3) Young A, et al. Comparison of an Oral Factor Xa Inhibitor with LMWH in Patients with Cancer With Venous Thromboembolism: Results of a Randomized Trial (SELECT-D). JCO. 2018; 36:2017-2023

