Providing an Anticoagulation Service in a Family Health Team

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The Centre for Family Medicine Family Health Team (FHT)
- Kitchener, Ontario
- 11 physicians
- 19,000 patients
- 3 sites:
  - Kitchener – 8 MDs
  - Waterloo – 2 MDs
  - Wellesley – 1 MD

Anticoagulation clinic rationale
1. A way demonstrate clinical pharmacy services at the FHT
   - Educational experience
   - Clinical experience
   - Research experience

Anticoagulation clinic rationale:
2. Warfarin is used for a variety of chronic conditions:
   - Atrial fibrillation
   - Mechanical Heart Valves
   - Treatment and secondary prevention of VTE

Anticoagulation clinic rationale:
3. "Usual care" process of monitoring warfarin therapy is far from ideal
   - Repeat at least monthly

Anticoagulation clinic rationale: Complexities of warfarin therapy
A) Modifiers of INR
   - Patient factors
     - Adherence
     - Diet
     - Disposition
     - Activity level
     - Other
   - Drug/herbal/supplement interactions
     - Hundreds of medications may increase risk of hemorrhage when used with warfarin
Anticoagulation clinic rationale: Complexities of warfarin therapy

B. Management of warfarin during procedures
- Procedures that do not require cessation of warfarin therapy
  - E.g. most dental procedures
- Procedures that may require cessation of warfarin therapy
  - Assessment for possible bridging therapy with UFH/LMWH


C. Ever-changing evidence base
- New “pre-cautions/contraindications”
  - ASA plus warfarin
  - Availability of genetic testing to help guide warfarin initiation
    - CYP 2C9
    - VKOR1
  - Use of oral vitamin K for excessively prolonged INR
  - Vitamin K supplementation for those with INR instability

Wilson SE et al. CMAJ 2004;170(5):821-4

Point-of-Care INR testing
- POC instruments: Analytic performance
  - Excellent precision
  - Good correlation between INR/PT obtained with POC instruments and laboratory assays
- Cost
  - Machine: $500 - 1000
  - Testing strips: $6.00 each
- Quality assurance
  - QA programs available from manufacturer

Heneghan C et al. Lancet 2006;367:404-11

POC Anticoagulation clinic setup
- Staff: Pharmacist and RN
- Days:
  - Every Wednesday in Kitchener 08:00 to 11:30
  - Every second Wednesday afternoon in Wellesley
  - Every second Thursday morning in Waterloo
- No appointments necessary
- Medical directive
  - Clinical pharmacist
  - RN

POC Anticoagulation Clinic: Patient demographics
- n = 150 (September 2007)
- 40% female
- Indication for anticoagulation
  - Atrial fibrillation = 75%
  - Mechanical Heart Valves = 15%
  - Secondary prevention VTE = 10%
Developing a successful clinical service

- Improve/maintain clinical outcomes
- Enhance patient satisfaction
- Enhance provider satisfaction
- Same or lower cost

Quality measure for warfarin therapy: Time in the Therapeutic Range (TTR)

- Various methods to calculate:
  - Fraction of INRs in range
  - Linear interpolation (Rosendaal’s method)
  - Point prevalence (% of tests in range at a given time)

- Usual care TTR
  - 55% in recent systematic review

TTR correlates to clinical events

- Data from Eastern Ontario:
  - Excessively high INRs explained 25% of serious hemorrhages in elderly population
    - Could eliminate 67 serious hemorrhagic events per year
  - Excessively low INRs explained 11% of all thromboemboli in Eastern Ontario elderly population
    - Could eliminate 33 thromboembolic events per year

- Usual care TTR
  - 55% in recent systematic review

Centre for Family Medicine: Quality assurance

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<tr>
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<th>Baseline (Usual care)</th>
<th>6-months post-pharmacist management</th>
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<tr>
<td>% INRs in range</td>
<td>57%</td>
<td>83%</td>
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Centre for Family Medicine: Clinical events

During first 6 months of pharmacist-management:

- One GI bleed (INR = 2.3 at time of bleed)
  - Expected serious haemorrhage rate approximately 3% per year
- No thromboembolic events
  - Expected thromboembolic rate approximately 3% per year
- Two ER visits prevented
  - Vitamin K administered on site for INR > 7

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1 year and 1.5 year follow-up:

- TTR
  - Greater than 75% at all time points
- Clinical events
  - 2 major bleeds (GI hemorrhages, therapeutic INRs)
  - 1 thromboembolic event (non-fatal stroke, INR = 2.5)
Developing a successful clinical service

- Improve/maintain clinical outcomes
- Enhance patient satisfaction
- Enhance provider satisfaction
- Same or lower price

Patient satisfaction results

- N = 32 questionnaires
- All respondents preferred POC testing compared to venipuncture
  - “I enjoy coming to this clinic. At other clinics, I didn’t enjoy going”
- Only suggestion for improvement:
  - Offer it on a second day/week

Developing a successful clinical service

- Improve/maintain clinical outcomes
- Enhance patient satisfaction
- Enhance provider satisfaction
- Same or lower price

Provider satisfaction results

- Physician
- Clinical pharmacist

Developing a successful clinical service

- Improve/maintain clinical outcomes
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Success factors

- Training
  - Education/clinical experience
  - Certification programs
- Software
  - Patient scheduler, TTR calculator
- Auditing
  - TTR benchmarking
- Communication and trust between providers
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