

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

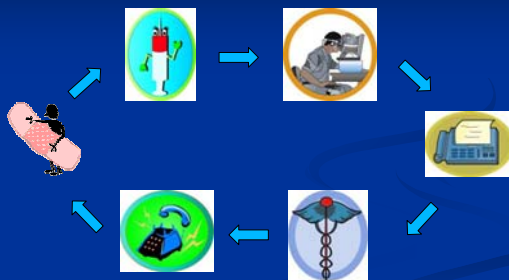
1. A way demonstrate clinical pharmacy services at the FHT
 - Educational experience
 - Clinical experience
 - Research experience

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



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

Perry DJ et al. British Dental Journal 2007;203:389-93.

Anticoagulation clinic rationale: Complexities of warfarin therapy

- 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

Dentali F et al. Arch Intern Med 2007;167:117-124.
Wilson SE et al. CMAJ 2004;170(5):821-4

Anticoagulation clinics: POC instruments



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

1. van Walraven C et al. Chest 2006; 129:1155-1166
 2. van Walraven C et al. Chest 2007;131:1508-15
 3. Schmitt et al. J Thromb Thrombolysis 2003;15:213-6

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

van Walraven C et al. Chest 2006; 129:1155-1166;
 van Walraven C Chest 2007;131:1508-15.

Centre for Family Medicine: Quality assurance

	Baseline (Usual care)	6-months post-pharmacist management	
% INRs in range	57%	83%	p<0.001

Nagge J. Poster presentation, CSHP Banff Seminar, March 2008

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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- Enhance provider satisfaction
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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

Acknowledgements

- School of Pharmacy, University of Waterloo
- Ontario Medical Association
- HealthForce Ontario
- Jennifer McFadden, R.N.
- Drs. Joe Lee, Linda Lee, Mike Lee-Poy, John Pefanis, John Yee, Alex Kolbasnik, Heather Dixon, Peter Whitby, Neil Arya, Brian Finn