Developing Patient Safety
Evidence-Based Care
Recommendations to Improve Child Outcomes

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Conflict of Interest Disclosure

No conflict of interest to disclose.
Objectives

- Discuss development of anticoagulation recommendations which meet the Joint Commission on Accreditation’s National Patient Safety Goals
- Understand how to implement Best Evidence Statements (BESs) into practice to improve patient outcomes
Improving the Safe Use of Medications: Anticoagulant Therapy

- 2008 Joint Commission on Accreditation National Patient Safety Goal
  - Defined anticoagulant management program
- American College of Chest Physicians guidelines
  - Antithrombotic and Thrombolytic Therapy: Evidence-based Guidelines
- Locally-relevant evidence-based pediatric focused set of care recommendations
Interprofessional Team

- Physician
- Pharmacist
- Nurse
- Evidence Methodologist
- Guideline Developer
Evidence-Based Recommendations:

- Based upon systematic search of evidence
- Improve outcomes
  
  *(Bahtsevani, 2004 & Perlstein, 1999)*

- Reduce the likelihood of patient harm
  unsafe practice because standardize approach

- Increase level of reliability that care will be provided correctly and consistently *(Nolan, 2004)*
CHEST Guidelines

- AGREE’d
- Rated >50% in all domains except applicability
- Not change validity
- High quality guidelines
Best Evidence Statements (BES<sup>t</sup>)

- Presentation format of recommendations, discussion and methods of synthesized evidence at the bedside (*McGee 2010*)
- Share dosing and monitoring information
- Evidence-based vs consensus-based
- Specific, unambiguous and behaviorally actionable (*Michie, 2004*)
- Written in accessible and understandable format for effective implementation
**Management of Warfarin Therapy**

**Clinical Question**
- **P (population/problem):** In patients at a pediatric institution requiring long-term systemic anticoagulation with warfarin.
- **I (intervention):** what are the appropriate medication doses and laboratory monitoring parameters to prevent under-anticoagulation and over-anticoagulation complications?
- **O (outcome):**

**Target Population**
- **Inclusion:** Patients receiving warfarin therapy at a pediatric institution
- **Exclusion:** Children less than 5 months of age
  - Patients receiving hemodialysis for renal failure

**Recommendations**
(See Table of Recommendation Strength following references)

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**Laboratory Monitoring**

Laboratory studies required for LMWH therapy

1. It is recommended to use the anti-factor Xa level as a measurement of effective anticoagulation.

**Note:** Cincinnati Children’s Hospital Medical Center (CCHMC) identifies the term “Level” in the clinical laboratory system.

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**Management of Therapeutic Unfractionated Heparin (UFH)**

**Clinical Question**
- **P (population/problem):** In patients at a pediatric institution requiring systemic anticoagulation with unfractionated heparin (UFH) for the prevention or treatment of thromboembolic events.
- **I (intervention):** what are the appropriate medication doses and laboratory monitoring parameters to prevent under-anticoagulation and over-anticoagulation complications?
- **O (outcome):**

**Target Population**
- **Inclusion:** Patients receiving systemic unfractionated heparin therapy at a pediatric institution
- **Exclusion:** Patients on extracorporeal membrane oxygenation (ECMO)
  - Patients receiving heparin flushes/infusions for central catheter patency

**Recommendation(s)**

**Laboratory Monitoring**

1. It is recommended that activated partial thromboplastin time (aPTT) be used as the standard laboratory measurement for the management of UFH therapy as discussed in Table 1. (Cincinnati Children's Hospital Medical Center)
Implementation and Education

- Physicians
- Residents
- Pharmacists
- Nurses
Electronic Medical Record

- Physician’s Orders
  - Order Sets
  - Order Entry

- Medication Administration Record

- Internal Home Pages
  - House staff
  - Pharmacy
  - Clinical Effectiveness
Order Set Instruction

**Heparin Cont. Infusion Orders**

**Medications**

- **Bolus**
  - heparin (HEPARIN) 1,075 Units in DSW 18.75 mL
  - 75 Units/kg x 25 kg = 1,875 Units, 100 units per mL, intravenous, for 10 Minutes, ONCE, Today at 2310, For 1 dose

- **Continuous infusion**
  - Baseline PTT must be checked prior to starting heparin infusion
  - Please order a post PTT lab for 4-6 hours after heparin infusion is started or changed
  - **** Subsequent dosing based upon a PTT response ****
  - **** Please refer to heparin therapy Best Statements ****
    - heparin 100 units/mL IV infusion - Infants < 1 yr = 28 units/kg/hr. Please order a post PTT lab for 4-6 hours after heparin infusion is started or changed
      - 28 Units/kg/hr, intravenous, CONTINUOUS
    - heparin 100 units/mL IV infusion - Children 1 - 16 yrs of age = 20 units/kg/hr. Please order a post PTT lab for 4-6 hours after heparin infusion is started or changed
      - 20 Units/kg/hr, intravenous, CONTINUOUS
    - heparin 100 units/mL IV infusion - Age > 16 yrs and adults = 18 units/kg/hr. Please order a post PTT lab for 4-6 hours after heparin infusion is started or changed
      - 18 Units/kg/hr, intravenous, CONTINUOUS
    - heparin 100 units/mL IV infusion - Special consideration: Neonates post heart surgery
      - 20 Units/kg/hr, intravenous, CONTINUOUS

**Labs**

- CBC with Differential
- Hematocrit
- Hepatic Panel (no GGT)
- GGT
- Protime & INR
- PTT (Act Partial Thromb Time)

- CBC, Hematocrit, Hepatic Panel (no GGT), GGT, Protime & INR, PTT (Act Partial Thromb Time)
- Routine, ONCE First occurrence Today at 2310, Unit Collect, Blood

- 1 of 1 selected

- 5 of 8 selected
**BEST links** are available that take you to the BESts.
Medication Administration Record

Real time access
Challenges

- Share the load
- Senior level physicians
- Skeptics
Final Thoughts

- Summary product – action focused
- Practice affected more completely than just monitoring
- Skeptics became cheerleaders
- www.cincinnatichildrens.org/evidence
Questions?

Thank you!