



Five Articles That Will Change Your Practice 2009

Michael Quinn, MD
Division of Emergency Medicine
Children's National Medical Center
Washington, DC

Article Review



- Not Journal Club
- Not Breaking News
- Not Earth-Shattering

But . . .

- Practical
- Common
- Technology and Practice



Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study

Kupperman N, et al. *The Lancet*, Vol 374, Iss 9696, 1160 - 1170, 3 Oct 2009

Identifying Children at Very Low Risk for Clinically Important TBI



- **Intent: Decrease unnecessary radiation exposure**
- **Derived and validated a prediction rule for clinically important TBI**
 - Under 2 years old
 - 2 years and older

Identifying Children at Very Low Risk for Clinically Important TBI



- **Definition: Clinically Important TBI**
 - Death
 - Neurosurgery
 - Intubation
 - Hospital admission > 2 nights

Identifying Children at Very Low Risk for Clinically Important TBI



- Study Population 42 412; < 18y, GCS 14-15.
- 14 969 had CT
- 376 had ciTBI (0.9%); 60 had surgery(0.1%)
- Derivation of Rule
 - 8502 under 2; 25283 over 2
- Validation of Rule
 - 2216 under 2; 6411 over 2

Identifying Children at Very Low Risk for Clinically Important TBI



- Prediction Rule age < 2 years
 - Normal MS
 - No scalp hematoma *except* frontal hematoma
 - No LOC or LOC < 5 sec
 - Non-severe mechanism,
 - No palpable fracture,
 - Acting Normal per caretakers
 - (NPV 100%; Sensitivity 100%)

Identifying Children at Very Low Risk for Clinically Important TBI



- Prediction Rule age ≥ 2 years
 - Normal MS
 - No LOC
 - No vomiting
 - Non-severe injury
 - No basilar fracture
 - No severe headache
 - (NPV 99.95%; Sensitivity 96.8%)

What Does this study have to offer?



- Evidence-based clinical guidelines that are simple but effective
 - Identified Significant % of Study Patients who had CT
 - 24.1% under 2 (167 of 694)
 - 20.1% over 2 (446 of 2223)
 - Augments and Improves Current Practice
- The question of radiation exposure not directly addressed

How will this study change your practice?



- **Step 1: Decrease the use of CT in low-risk head injury among PEM providers**
- **Step 2: Increase the frequency of referral to PEM providers of low-risk head injury**
 - Increase use of CT?
- **Step 3: Hasten the advent of new technology**
 - “Fast MRI”
 - Serum Markers of TBI: Protein S 100-B
- **Step 4: Focus on Concussion, not Anatomy**



The Utility of Bedside Ultrasonography in Identifying Fractures and Guiding Fracture Reduction in Children

Patel et al. Pediatric Emergency Care

Issue: Volume 25(4), April 2009, pp 221-225

Bedside US in Fracture Identification and Reduction



- Extremity fracture, ages 2 to 17
- Sonogram used to evaluate
- Radiographs used to guide management
- US compared to Radiography *post hoc*
 - Fracture identification
 - Need for reduction
 - Adequacy of reduction

Bedside US in Fracture Identification and Reduction



- 33 pts, age 9.1, 66 bones studied, 56 upper extremity. Fractures 59.1%
- Radiographs v US
 - Identification: agreement 95.5%
 - Need for reduction: 92.3%
 - Adequacy of reduction: 92.3 %

What Does this Study Have to Offer?



- Good comparison in effectiveness in new modality
- Innovative use of incompletely evolved modality
- Avoidance of radiation exposure
- Puts diagnostic/therapeutic method in hands of the bedside provider.

How will this study change your practice?



- Decrease use of radiographs in common problem
- Decrease sedation use (slightly)
- Empower bedside practitioner
- Improve patient satisfaction



An evaluation of the advandx Staphylococcus aureus/CNS PNA FISH assay

Hensley DM, Tapia R, Encina Y Clin Lab Sci.
2009 Winter;22(1):30-3.

Evaluation of advandx *S. aureus* FISH assay



- **Intent:** Compare this assay to standard microbiological identification techniques, i.e. “Culture and Sensitivity”
- **FISH: Fluorescent in situ Hybridization**
 - Related to DNA-polymerization
 - A probe molecule is manufactured to target DNA or RNA
 - Probe is fluorescent-tagged
 - Target pre-determined
- **Technology still developing**

Evaluation of advandx *S. aureus* FISH assay



- Blood cultures from adult patients
 - 301 samples: Positive culture and Gram stain for gram + cocci in clusters
- Organism Identification Performed
 - Standard methods
 - FISH assay

Evaluation of advandx *S. aureus* FISH assay



- Overall agreement 96.7%
- FISH Sens 96%, Spec 100%: *S aureus*
- FISH Sens 96%, Spec 96%: CNS
- 7 CNS positive cultures: missed
- Misidentified 7 other cultures

What This Study Has to Offer



- **Promise of Future Improvements**
 - Reliability
 - Applicability
- **Rapid ability to identify pathogens**
 - Presence
 - Species
 - Antimicrobial Susceptibility

How Will This Study Change Your Practice?



- Patients with tissue infections will get:
 - Rapid diagnosis
 - Rapid specific antimicrobial therapy
- Increasing Antimicrobial Resistance
- Emerging Pathogens



Intranasal midazolam therapy for pediatric status epilepticus

Timothy R. Wolfe, MD and Thomas C. Macfarlane, MD
American Journal of Emergency Medicine - **Volume 24,**
Issue 3 (May 2006)

Intranasal Midazolam for Status Epilepticus



- Review article
- Assesses recent research comparing various methods of benzodiazepine administration for treatment of status epilepticus
 - IV diazepam is the standard
 - Efficacy, Safety, Accessibility, Cost considered

Intranasal Midazolam for Status Epilepticus



- **IN midazolam compares with PR diazepam**
 - Efficacy identical
 - Onset more rapid with midazolam
 - Cost much less with midazolam
- **IN midazolam compares with IV Lorazepam**
 - Efficacy identical
 - Midazolam onset more rapid.

What Does this study have to offer?



- **Alternative modality with**
 - High efficacy
 - Decreased cost
 - Ease of storage and administration
 - Safety

How will this study change your practice?



- Improve rapidity of treatment
- Decrease need for IV access
- Decrease cost for patients, EMS systems
- Part of wave of alternative-route medication administration
 - IN
 - Buccal
 - Transdermal
 - Subcutaneous



That'll Be \$418 For Use of the Examining Room 'Facility Fees' Are Taking Many Patients by Surprise

Young, K. The Washington Post 10/06/2009

What Does this study have to offer?



- **Hospital-owned physician practices and outpatient clinics**
 - Increasing utilization by patients
 - Stricter regulation cause higher cost
- **Fees not covered by private insurers**
 - Usually billed to deductibles
- **Arguments rage on both sides:**
 - Why?
 - What does it mean?

How will this study change your practice?



- Not a new occurrence in EM
- Increased patient awareness of specific costs involved
- Upfront Price Lists
- Negotiating a la carte services



Conclusion

References



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- Hensley DM, Tapia R, Encina Y *Clin Lab Sci.* 2009 Winter;22(1):30-3.
- Timothy R. Wolfe, MD and Thomas C. Macfarlane, MD *American Journal of Emergency Medicine* - Volume 24, Issue 3 (May 2006)
- Young, K. *The Washington Post* 10/06/2009