



# Enhancing the clinical decision making skills of nurse practitioners

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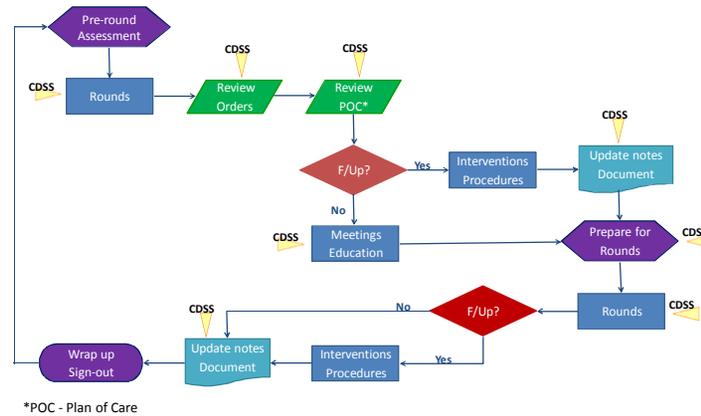
## Background/Significance

NeuroCritical care is a rapidly evolving subspecialty managing primary brain injury patients while seeking to mitigate or prevent secondary brain injury and maintaining acceptable patient quality of life. This requires swift, evidence-based practice (EBP) decisions by nurse practitioners (NP's) seeking to halt irreversible neurologic deterioration. In 2001, the Institute of Medicine emphasized the importance of EBP to parallel evidence-based management. Clinical decision support systems (CDSS) have been adopted throughout intensive care units to assist providers' in the identification and prevention of risk factors affecting patient safety while supporting the use of EBP and guidelines that improve outcomes. In an effort to obtain current best evidence, providers search a variety of databases to support the clinical decision making process. Unfortunately, performing a search can be extremely time consuming, the literature result may be irrelevant or overwhelming, and searches are usually not tailored to patient or user needs. Many times selected subspecialties are not well known and a new provider must be agile in locating evidence. An evidence retrieval application available on a mobile device could provide the nurse practitioner with timely access to resources with minimal disruption to routine workflow. The ability to make quick decisions at the point of care is paramount, therefore, it is of prime importance to assess the utility of mobile evidence retrieval applications and subsequently evaluate how research information is translated for decision making to improve patient care..

## Leadership Goals

- Lead change in Maryland's Health Care System through translation of evidence into practice utilizing CDSS's to improve care and patient outcomes.
- Address policy related to meaningful use objectives and use of CDSS's to support EBP.
- Collaborate between health care organizations and academia to design a more effective and efficient health care delivery model using CDSS's.
- Develop individual leadership role in project management, collaboration, communication, and research to include application for external funding.

## Conceptual Workflow Design



## Project Aims

- Aim 1:** Prepare and implement two different evidence-based retrieval applications (ERA) on mobile devices for NP's to access during patient care activities.
- Aim 2:** Assess the utilization and usefulness of each mobile ERA.
- Aim 3:** Evaluate how the mobile ERA affects clinical decision making behaviors of NP's,
- Aim 4:** Identify enhancers, barriers, and recommendations related to using the mobile ERA's.

## Methods

### Design

- Quality Improvement Project (Pilot)

### Setting

- Large Medical Center - 22 bed NeuroCritical Care Unit (NCCU)

### Sample

- 13 NCCU Nurse Practitioners

### Interventions

- Two evidence based retrieval applications
- Evidence-Based Practice InfoBot: patient focus
- Clinical Question Answering (CQA): population focus
- Procedures**
- Tablets: Icons with direct link to each application
- NP's will use the search tools each day to support decision making at the point of care during clinical rounds, in the unit or at the bedside.
- Data collection on utilization, enhancers, barriers, recommendations for improvement, and impact on patient care.

## Next Steps

### Pre-implementation

- Customize app's for NCCU use
- Set-up links and devices (to include security)

### Education

- Conduct application and procedures training

### Implementation

- September 2016

### Evaluation – 3 methods

- Utilization data automatically tracked via the app's
- Survey data on outcome of use
- Follow-up focus groups at one and six months

## Evidence Retrieval Applications

**EBP InfoBot**

**Medications**

- acetaminophen
- Lampridin topical
- clindamycin
- cyclosporin
- Lidocaine

**Pill Box images**

Zithor 4 MG Oral Tablet  
Zithor (azithromycin dihydrate) 4 MG Oral Tablet  
Zithor (azithromycin dihydrate) 8 MG Oral Tablet

**MedlinePlus**

SEVERE APLASTIC ANEMIA

VERY SEVERE APLASTIC ANEMIA

Outcome of adult severe or very severe aplastic anemia treated with immunosuppressive therapy compared with bone marrow transplantation: multicenter trial. *Int J Hematol* 2009

check spelling has abstract

Unrelated HLA-mismatched cord aplastic anemia? *Rinoto Ketsu*

Outcome of adult severe or very severe aplastic anemia treated with immunosuppressive therapy compared with bone marrow transplantation: multicenter trial. *Int J Hematol* 2009

Patient age, sex, initial platelet count, etiology, or treatment regimen did not significantly affect survival. Cox regression analysis showed low AUC to be the only pretreatment variable significantly associated with poor survival (P = .000). These results suggest that ISA can achieve a high response rate and long-term survival among patients with adult AA, regardless of disease severity.

Fludarabine, cyclophosphamide, and etoposide in relapsed aplastic anemia: a phase II study. *Int J Hematol* 2009

First-line matched related donor transplantation in severe aplastic anemia: a phase II study. *Int J Hematol* 2009

**Clinical Question Answering**

CQA-1.0 beta

Search

Population: Stroke

Problem: aspirin

Comparison: aspirin

Outcome: Task

Results:

Outcomes and costs of left atrial appendage closure from randomized controlled trial and real-world experience relative to oral anticoagulation. *Stroke* 2015

Problems: fibrillation atrial; Interventions: anticoagulation; aspirin; warfarin

The procedure success rate was 95% (93/102). Anticoagulation therapy was successfully stopped in 91.2% (83/102) of implanted patients by 12 months. Registry study LAAC stroke and major bleeding rates were significantly lower than PROTECT AF results: mean absolute difference of stroke, 0.69% (P = 0.02) and major bleeding, 5.44% (P = 0.001).

Stroke vs. Coronary Artery Disease before Coronary Artery Bypass. *Stroke* 2015

Problems: vascular accidents brain; disorder of coronary artery; Interventions: aspirin; Strength: A

A generalisability event occurred in 202 patients in the aspirin group (9.3%) and in 215 patients in the placebo group (20.4%) (relative risk, 0.94; 95% confidence interval, 0.80 to 1.12; P=0.50). Major hemorrhage leading to hospitalization occurred in 0.9% of patients in the aspirin group and in 2.1% of patients in the placebo group (P=0.75), and cardiac mortality occurred in 0.1% and 0.4%, respectively (P=0.00). Among patients undergoing coronary artery bypass, the administration of preoperative aspirin resulted in a lower risk of death or thrombotic complications but a higher risk of bleeding than that with placebo.

Substrate and design of CYP2C19: a novel inhibitor. *Drug Metab Dispos* 2015

Problems: ischemia; Interventions: anticoagulation; aspirin; clopidogrel

However, exploratory studies suggest that this is associated with a higher rate of major bleeding without a decrease in thrombotic complications. Secondary net clinical benefit outcome is freedom from the composite of cardiovascular death, non-procedure-related bleeding, myocardial infarction, or stroke at 1 year. The primary outcome is analyzed for superiority, whereas the secondary outcome is analyzed for noninferiority.

Eye Movement Transients Results in Changes in ECG and NIH Stroke Scale in Subjects Suffering from Acute Middle Cerebral Artery Ischemic Stroke: A Randomized Control Trial. *Stroke* 2015

Problems: suffering; Interventions: aspirin

There was strong statistical and qualitative significant improvement in all outcome measures for the group of stroke patients undergoing EMT. Such improvement was not observed for the control group. Most likely, the addition of EMT to a NCCU intensive stroke treatment paradigm has demonstrated statistically significant changes in outcome measures and is a low cost, safe, and effective complement to standard treatment.

Left atrial ablation versus placebo in high-risk patients with non-ST segment elevation acute coronary syndromes managed with current coronary artery bypass graft surgery. *A* *Stroke* 2015

Problems: vascular accidents brain; myocardial infarct; Interventions: bypass graft; aspirin; Strength: A

Patients were randomized to receive placebo (n=100) or aspirin (n=100) for 12 months follow-up. There was a significant difference between both groups regarding postoperative MI (22% vs. 8%, P=0.03). Postoperative use of aspirin vs. placebo is linked to significantly reduced 12-month MACE rate in patients with NSTEMI-ACS requiring urgent CABG, while a simultaneously seems not to confer a greater risk of postoperative bleeding.

## CQA

## Patient vs. Population