Quality and Cost of Inpatient Advanced Practice Provider Led Care

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Presentation Outline

- 1. Study design and background
- 2. My lit review process and findings

Background

- Hospital executives increasingly rely on advanced practice providers (APPs) to meet the growing demands of both inpatient and outpatient care.
- APPs= NPs and PAs
- With the restriction on residents' work hours by the ACGME in 2011, hospitals have been hiring more APP's
- Most people associate APP's with out-patient settings, but nearly one-third of the APP workforce practices in the hospital

Significance

- Previous studies have evaluated the outcomes and cost differences for patients cared for by APPs versus physicians, particularly in primary care.
  - Adding APPs to inpatient teams improves outcomes and costs.
  - APP care management interventions can have clinical and economic advantages.
- Little is known about the value of APP-led models of care in inpatient settings

Project Overview

- Current natural experiment occurring at HUP: in hematology/oncology unit, patients are assigned, based on availability, to either an APP-led care team or the usual resident/attending service.
- Allows us to test differences in outcomes, costs, and value.

- Objectives:
  - Effectively target APP-led care and traditional house staff care to the patients that can most benefit from each model of care
  - Allow HUP to realize the greatest value for patient-centered care

Project Objective

- This strategy will allow us to transparently identify specific subgroups of patients for whom any advantage of **APP-led** care is particularly pronounced.
- Goal: not to identify better model of care but to identify the value of APP-led care
- Goal: determine whether certain patients benefit from 1 or the other
- Will help effectively target APP-led care and traditional house staff care to the patients that can most benefit from each model of care
- Will allow the institution to realize the greatest value for patient-centered care.

Study Design

- APP's for the purpose of this study are defined as **nurse practitioners** and **physician assistants**
- Focus on HUP model where APPs are leading all aspects of care
  - **Team** includes: physician who rounds with the team daily, clinical nurses, pharmacists, social workers, case managers, and physical and occupational therapists
  - **Identical** house staff team- residents not APPs

Study Design

- To account for any residual differences after assignment, we will use advanced matching methods to match patients on detailed clinical and demographic characteristics.

- This strategy will also allow us to identify specific subgroups of patients for whom any advantage of APP-led care is particularly pronounced.

Specific Aims

- **Aim 1**. To determine whether there is an outcome, cost, and value advantage for hematology/oncology patients cared for under an APP-led service versus usual house staff care.
- **Aim 2**. To determine whether particular clinical subgroups exist for which any outcome, cost, and value benefit is more pronounced for APP-led care.

Patient Outcomes	Cost	Value
• 30-day mortality • Complications (e.g., infection) • Length of stay • Discharge before noon • ICU utilization • 30-day unplanned readmissions • Patient satisfaction	Hospital costs	Ratio of each outcome by cost

Study Design and Methods

- Design: Retrospective quasi-experimental
- Sample: All hematology/oncology patients eligible for admission to APP-led care or house staff led care from March 2017- present
- Data source
  - EHR
  - Hospital billing system
- Patient characteristics
  - Demographic factors
  - Clinical characteristics

Team Assignment

- Patient assignment to which team is determined by EHR data
- Many patients switch
  - Especially if admitted from outside hospital or the ER
  - Define team assignments by level of exposure to APP led service
  - Ex. 80% of time / care from APPs-> APP assigned patient

My Role

- *"**Research syntheses** focus on empirical studies and seek to summarize past research by drawing overall conclusions from many separate investigations that address related or identical hypotheses. The research synthesist's goal is to present the state of knowledge concerning the relation(s) of interest and to highlight important issues that research has left unresolved." Cooper, p. 4*

Key Elements of a Systematic Review

- A structured, retrospective, systematic process involving several steps :

1. Formulate the question
2. Establish inclusion/exclusion criteria
3. Develop a search strategy/perform search
4. Use an unbiased selection and abstraction process
5. Data extraction/Critical appraisal of data
6. Synthesize the data from included studies
7. Interpret the results/draw conclusions

Step 1: Formulate the Question

1. What literature exists about Advanced practice providers (APRNs and/or physician assistants) practicing in inpatient settings and patient outcomes?
2. Impact on patient outcomes, cost, and / or value of care

Step 2: Establish Inclusion/Exclusion Criteria

- **P** = Patient/problem/population
  - Patients receiving care in inpatient settings
- **I**= Intervention (or Cause, Prognosis, or Phenomenon of Interest)
  - Care received by/ practice of advanced practice providers
- **C** = Comparison, control, or comparator (optional)
  - Attending physician/ resident (house staff model)
- **O**= Outcome
  - Patient outcomes, cost, value of care

Step 3: Develop a Search Strategy/ Perform Search

Keywords by Concept	Synonyms/Variations	MeSH Terms
Patients (inpatient settings)	Patient OR patients Inpatient OR inpatients	Patients Inpatients Hospitalization?
Advanced practice providers	"Nurse practitioner" OR "Nurse practitioners" "Physician assistant" OR "Physician assistants" "Advanced practice"	Physician Assistants Advanced Practice Nursing ➔ Nurse Practitioners Nurse midwives Nurse anesthetists Clinical nurse specialists
Care/Practice		Delivery of Health Care
(Patient) Outcomes	Impact "patient outcome" OR "patient outcomes"	Health Impact Assessment Outcome and Process Assessment (Health Care) ➔ Outcome Assessment (Health Care) ➔ Patient Outcome Assessment

Step 4: Use an unbiased selection and abstraction process- MeSH Terms

Keywords by Concept	Synonyms/Variations	MeSH Terms
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Step 5+6: Data Extraction/ Synthesize Relevant Data

Study	Sample	Results	Implications
	functional status measure.		
Nurse practitioners' and physicians' care activities and clinical outcomes with an inpatient geriatric population.	A descriptive comparative research design involved random selection of 100 inpatient ge riatric patients and a convenience sample of 17 professional providers who staffed three hospital units. A 1-month study period produced retrospective and prospective data for analysis.	Self-reports concerning 10 primary activity categories indicated that NPs spent a higher percentage of time doing progress notes and care planning than did physicians (28% versus 15%, p = .011) and that physicians spent more time on literature reviews (5% versus 1%, p = .008). When prioritizing care activities, NPs ranked advance directive discussion higher than did physicians (2nd versus 7th, p = .036), a	NPs provide effective care to hospitalized geriatric patients, particularly to those who are older and sicker.

Step 7: Interpret the Results, Draw Conclusions, and make Recommendations for Future Research

- Setting: Oncology, Anesthesia, Stroke Unit, general medical service, intermediate care, and ICU
- Trends:
  - Length of Stay: Mixed evidence, need follow up
  - Cost:
    - Per Day: Consistently lower for APP's
    - Overall: mixed evidence, need follow up study
      - 2 studies with higher overall cost due to longer LOS
- Mortality: no difference

Summary

- Many articles found similar health outcomes, costs and resource utilization for APPs and physicians
- Some articles examined physician-led models of care that integrate APPs into inpatient teams
- Fewer articles examined APP-led models of care

Synthesis

- Role of APPS in inpatient care has been validated in other settings
  - Gen med wards
  - ICU
  - Trauma service
  - Inpatient oncology units (most recent)
- Similar overall survival irrespective of type of inpatient provider
- Includes potential clinical benefits associated with implementation of APPs, such as decreased cost

What Our Study Adds

- Evidence suggests that addition of APPs to inpatient teams can improve patient outcomes and decrease cost; less is known about APP-led inpatient teams
- HUP is unique because APPs on the inpatient heme/onc service lead all aspects of care
- A limitation of some previous studies is failure to account for patient acuity/severity of illness
- Our study is designed to ensure comparable patient populations through advanced multivariate matching

References

1. Health Resources and Services Administration. (2014). Highlights From the 2012 National Sample Survey of Nurse Practitioners. Rockville, MD: Division of Nursing, Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Services.
2. Newhouse, R. P., Stanik-Hutt, J., White, K. M., Johantgen, M., Bass, E. B., Zangaro, G., . . . Heindel, L. (2011). Advanced practice nurse outcomes 1990-2008: A systematic review. *Nursing Economic$, 29*(5), 1.
3. Guthrie, C. (2015). The use of inpatient nurse practitioners and their effect on patient outcomes: literature review. *Journal of Pediatric Surgical Nursing, 4*(3), 97-102.
4. Robles, L., Slogoff, M., Ladwig-Scott, E., Zank, D., Larson, M. K., Aranha, G., & Shoup, M. (2011). The addition of a nurse practitioner to an inpatient surgical team results in improved use of resources. *Surgery, 150*(4), 711-717.
5. Chen, C., McNeese-Smith, D., Cowan, M., Upenieks, V., & Afifi, A. (2009). Evaluation of a nurse practitioner-led care management model in reducing inpatient drug utilization and cost. *Nursing Economics, 27*(3), 160.
6. Pioro, M. H., Landefeld, C. S., Brennan, P. F., Daly, B., Fortinsky, R. H., Kim, U., & Rosenthal, G. E. (2001). Outcomes-based trial of an inpatient nurse practitioner service for general medical patients. *Journal of Evaluation in Clinical Practice, 7*(1), 21-33.