Information Integration Model in Critical Care Settings: Role of Electronic Health Records

Dinesh Gottipati, BTech[1], Vickie Nguyen, MA[1] , Sahiti Myneni, MSE[1], Khalid F.Almoosa, MD[1, 2], Thomas G. Kannampallil, MS[1], Vimla L. Patel, PhD, DSc[3]

[1] School of Biomedical Informatics, [2] Divisions of Critical Care, Pulmonary and Sleep Medicine, UTHealth-Houston, TX, USA, [3] New York Academy of Medicine, NY, USA

INTRODUCTION

- Information integration critical to clinical care
- Large amounts of heterogeneous data
- Fragmentation contributes to medical errors [1].
- Information integration can mitigates these errors [2, 3].

Aims:

- Characterize information integration model in a Medical Intensive Care Unit (MICU)
- Determine impact on physician activities and patient safety.

METHOD

- Ethnographic observations (4 x 2 hours)
- Shadowing (4 x 1.5 hours each)
- Qualitative coding with emergent categories:
  - Practitioners
  - Information resources
  - Activities
- Understood the workflow and information needs of physicians and residents.
- In addition, shadowing enabled us to learn more about the nature of data intensive activities, technology and electronic health record (EHR) usage.
- Data analysis performed in in terms of
  - "information modules" generated
  - the role of clinicians who collect, use, and access information for day-to-day care activities, and
  - interactions between clinicians and technology

RESULTS & DISCUSSION

We developed a model of clinical information flow and integration in MICU. Figures 1and 2 give an overview of data dependent activities and technology used by clinicians during patient care.

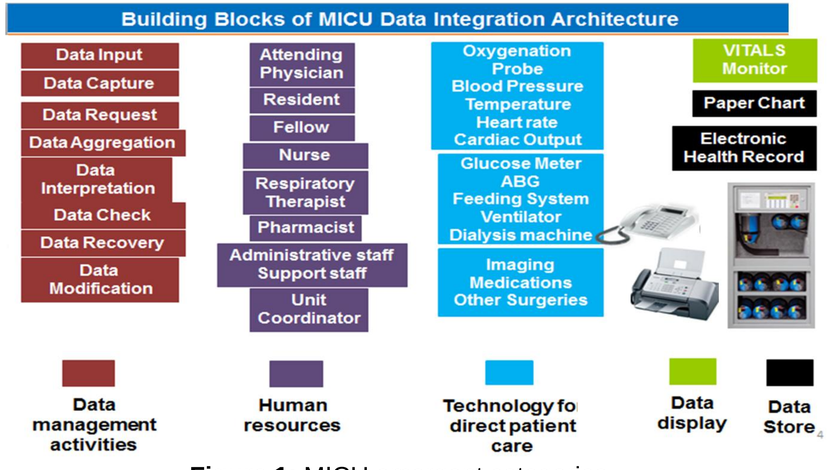

Figure 1: MICU emergent categories

- Characterized physician and resident workflow and information needs.
- Shadowing revealed the nature of data intensive activities, technology and electronic health record (EHR) usage.
- ***Information integration and interpretation:*** *Residents/fellows integrated information chunks from heterogeneous sources to develop "case summary"*
- ***Integration tasks were case dependent and decision-specific.***
- ***Technology underutilization:*** *Sub-optimal use of support technologies such as order entry systems to minimize redundancy and cognitive load*
- ***EHR = "data store":*** *used primarily as a bridge between patient's bedside and physician's workbench.*

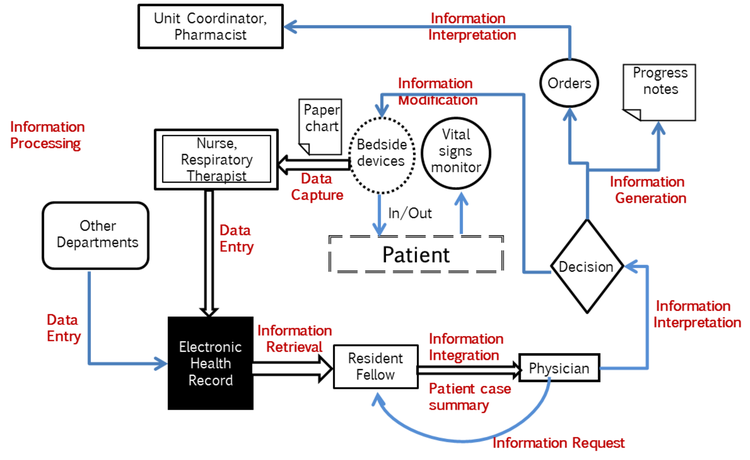

Figure 2: Information flow and integration model in MICU

- ***Complexity in critical care****:* Emerging workflow activities and information created significant barriers for effective information integration.

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ACKNOWLEDGEMENT

This research was supported by an award from James S McDonnell Foundation (220020152).