

# **Electronic Patient Records: A Rhetorical Perspective on the Impact of Changing Media and Interface Design on Professional Practices**

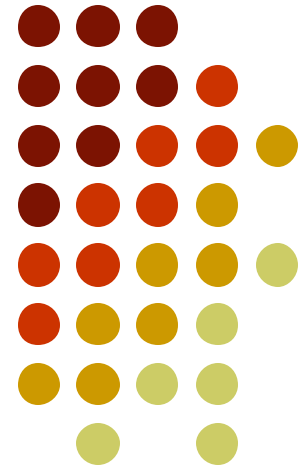
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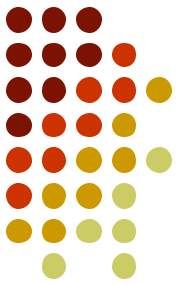
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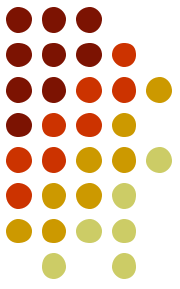
PhD Fellow, Health Care, Technology and Place,  
University of Toronto, CIHR Strategic Initiative





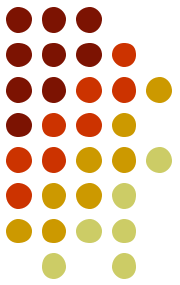
# Overview

- Background in EPRs
- Central Research Question
- Relevant Research Fields/Literatures
- Research Design and Methodology
- Current Project Status
- Conclusions



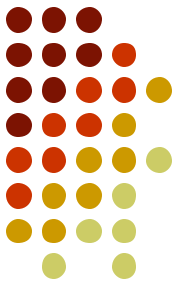
# Background in EPRs

- EPRs are ‘hot topics’
- Generally perceived as beneficial
- Research: EPRs have impact on practices
  - Unexpected, unintentional
    - Patel et al.
  - Contradicting views on the effects of EPRs on healthcare services (+/-)



# Background

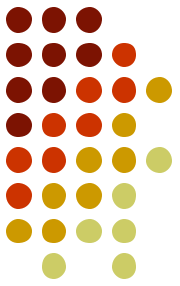
- Berg, 1999
  - EPRs: “reading and writing artifacts”
  - “Transformative power of IT”
  - Technologies are not neutral devices
  - Changes in EPR = changes in content and organization of medical practices
  - EPR form is inseparably entangled with the content of work activities
  - EPRs and professionals enable each other to affect each other



# Background

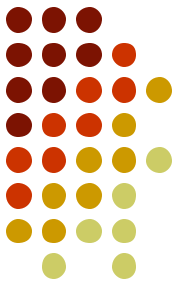
- EPRs have significant impact on professional practices
- Two gaps in this research:
  - Importance of physical context
  - Importance of design context
- EPRs are not ‘black boxes’, nor ‘stand alone systems’
  - Components
  - History of design decisions
  - Work in complex communication settings

# Central Research Questions:



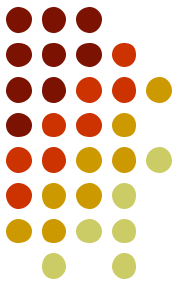
- What is the relationship between EPRs and the communicative work done by professionals in a multimodal healthcare setting?
- How does user-interface design influence the practices of healthcare professionals?

# Relevant Research Fields / Literatures



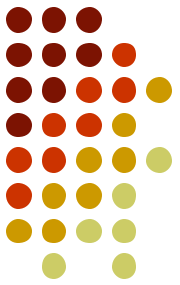
- Effects of advanced IT on cognition, representation and understanding;
- Workplace discourse literature;
- Genre theory;
- Media theory;
- Rhetoric;
- Visual rhetoric.

# Rhetoric



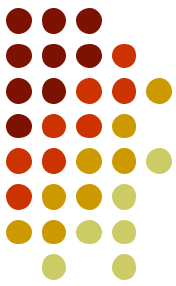
- Meaning is constructed in a context
- Language as socially motivated, having ideological functions
- EPRs and other records reorganize contexts of meaning and reconfigure ideological language use
- Rhetorical analysis = Understand how record text reflects and supports:
  - Specific ways of thinking
  - Specific social roles
  - Specific forms of credible knowledge





# Visual Rhetoric

- Images carry ideological and social meanings
- Visual communication dominates in computer mediated communications
- User-interface is a visual image
- Visual rhetorical analysis = Understand how record visual design reflects and supports:
  - Specific ways of thinking
  - Specific social roles
  - Specific forms of credible knowledge



# An Example Analysis

```
DESKTOP 7000 HCM
File Edit View Help
02002 ON, KRISTINE <NA---><N$>
VARPIO, ALICE
2002 NURSING MASTER GUIDE

CHARTING
▶ CHARTING INDEX
▶ UNSCHEDULED MEDS
▶ SCHEDULED MEDS
▶ RESOURCE / BRAN
  (UNIT 7A ONLY)

▶ PT CARE COMMUNICATION
  (KARDEX INFO)

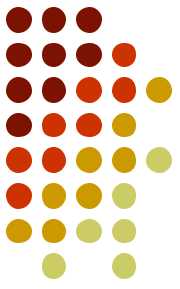
ASSESSMENT FORM
▶ WORKLOAD SCORES
▶ ENTER FOR A NURSE
  *****
▶ REMOVE CHARTING ERROR
▶ LATE CHARTING
▶ PATIENT REPORTS

ADD / DELETE
▶ ALLERGIES
▶ MEDICAL ALERT
▶ ISOLATION CODE
▶ FOOD PREFERENCE
▶ DIAGNOSES
▶ PREEXIST COND 'N
▶ PRE-OP HOLD

▶ LEAVE OF ABSENCE
▶ DISCHARGE / EXPIRE
▶ DISCH INSTRUCTIONS
  (5C & 8C ONLY)
  *****
▶ PT INFO-GRAM
▶ DIET INFO-GRAM

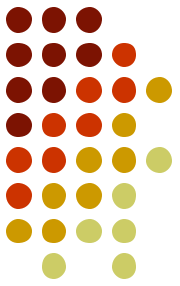
ERR TYPE RETRIEVE REVIEW
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# Relevant Research Fields / Literatures



- Rhetoric
- Visual Rhetoric
- Media Theory
- Cognition theories
- Workplace Discourse theory
- Genre theory

# Central Research Questions:

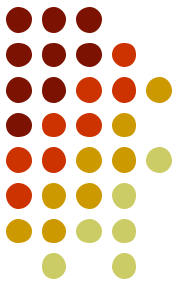


- What is the relationship between EPRs and the communicative work done by professionals in a multimodal healthcare setting?
- How does user-interface design influence the practices of healthcare professionals?

# Research Design & Methodology



- Case study of EPR and other record media use
  - Observations:
    - Non-participant observations of daily interactions with records
    - Descriptive observations → focused observations
    - 60 Hours completed to date
  - Interviews:
    - Semi-structured interviews
    - 12 Interviews completed to date
    - Informal interviews during observations

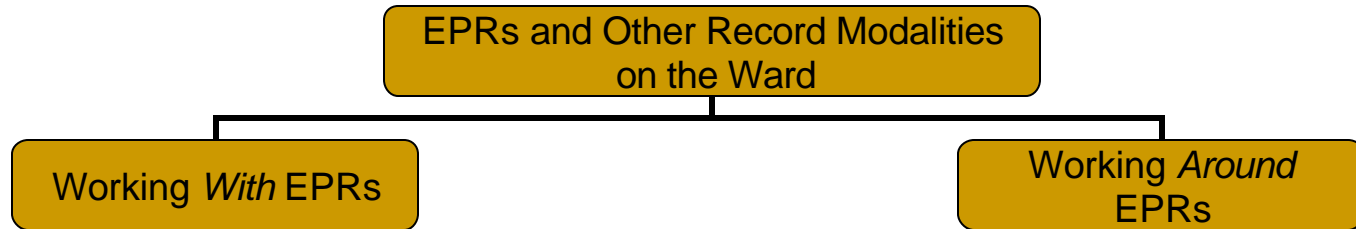
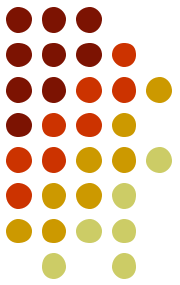


# Research Design & Methodology

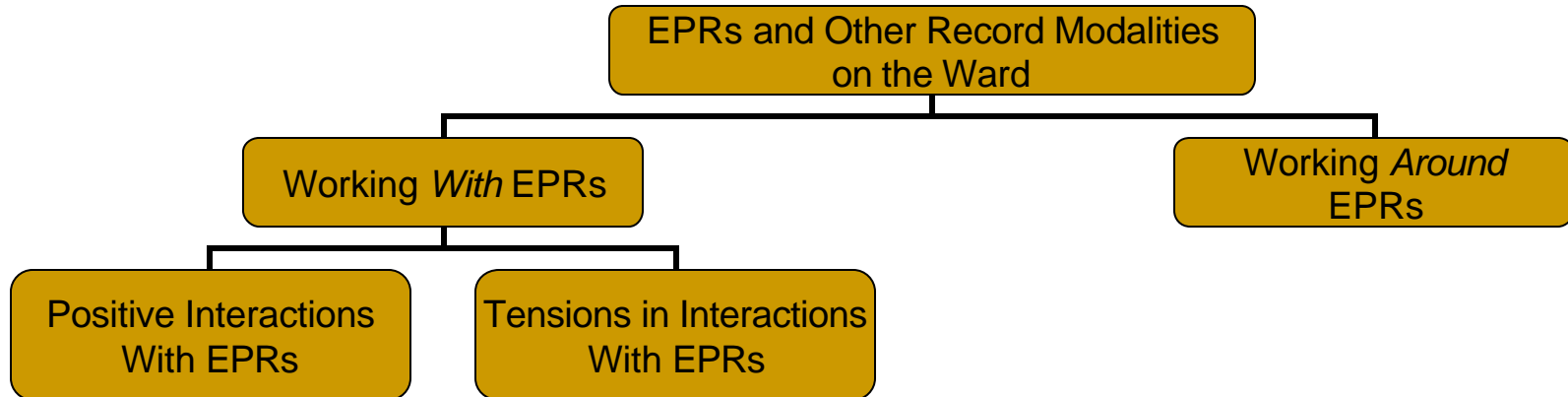
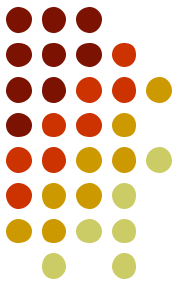
## **Grounded Theory Approach to Analysis**

- Continuous collection and analysis of data
- Theory generation
- Theoretical categories are developed from analysis of the collected data
- Data determines relevant fields/literatures
- Can't choose theoretical lenses (problematic)
- Many available theoretical fields since the analytical tools in any one field may not be relevant

# Preliminary Analysis

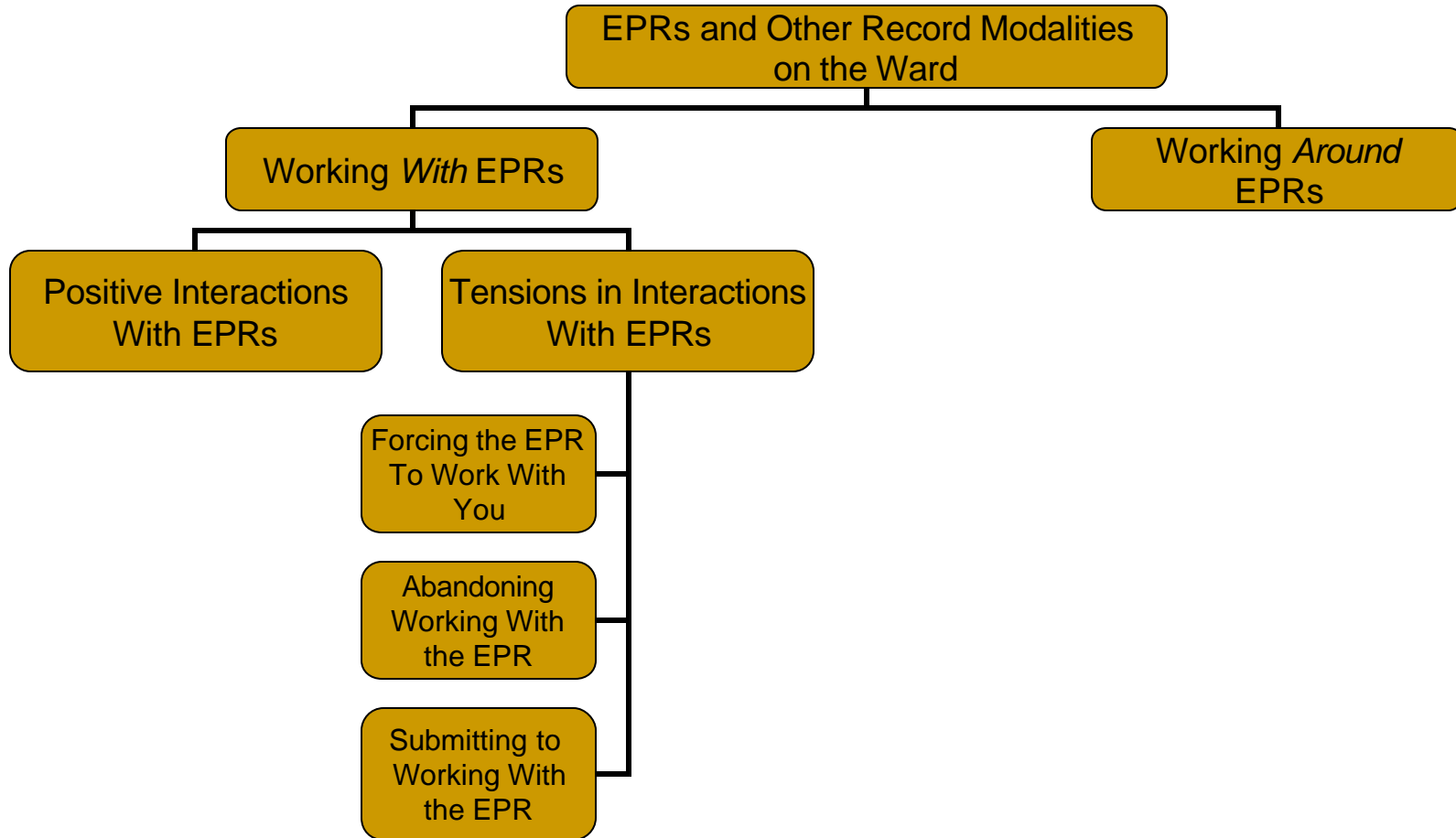
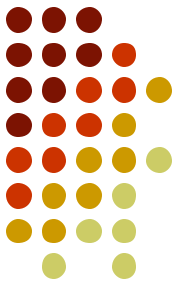


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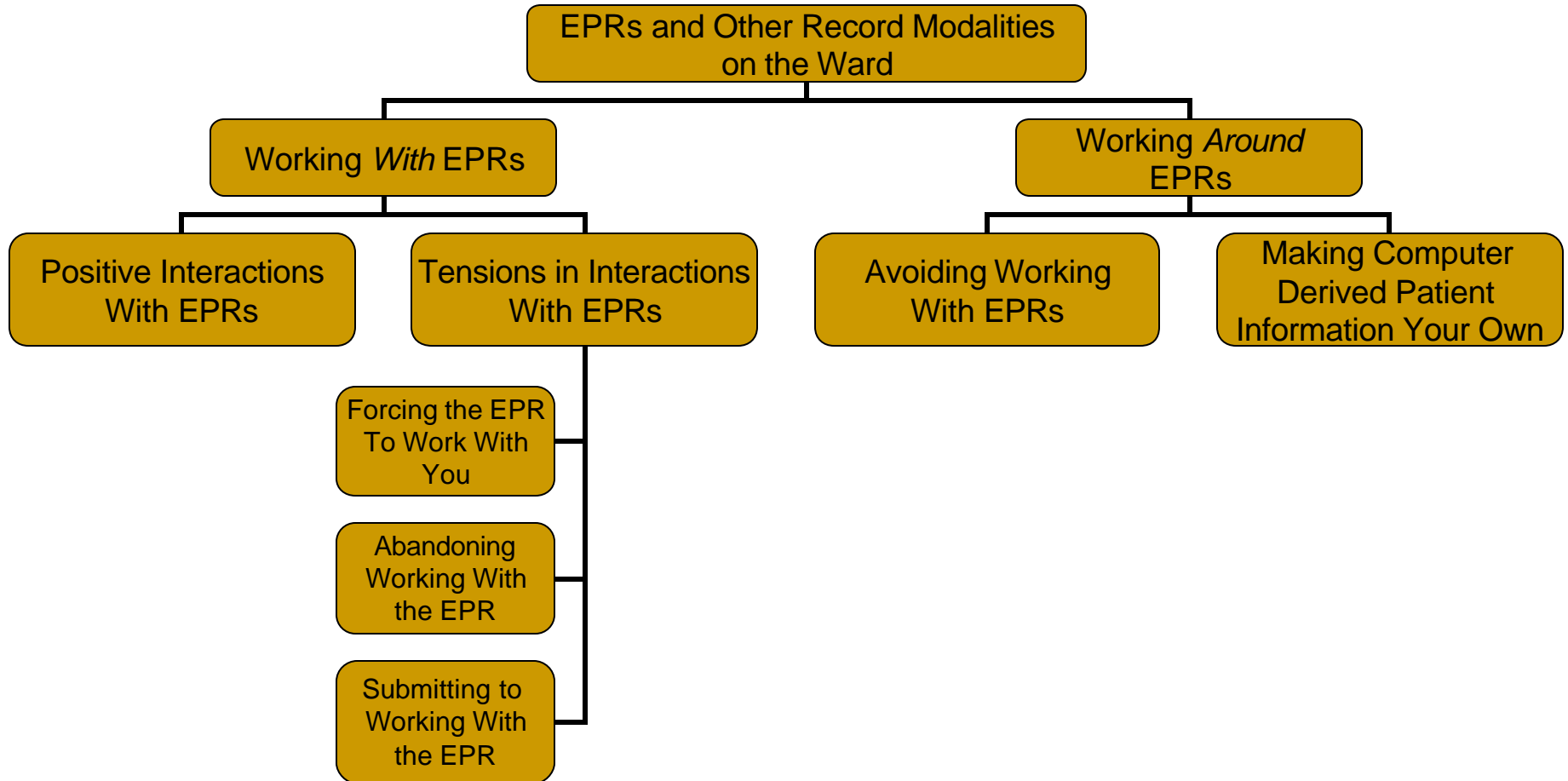
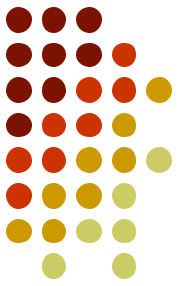




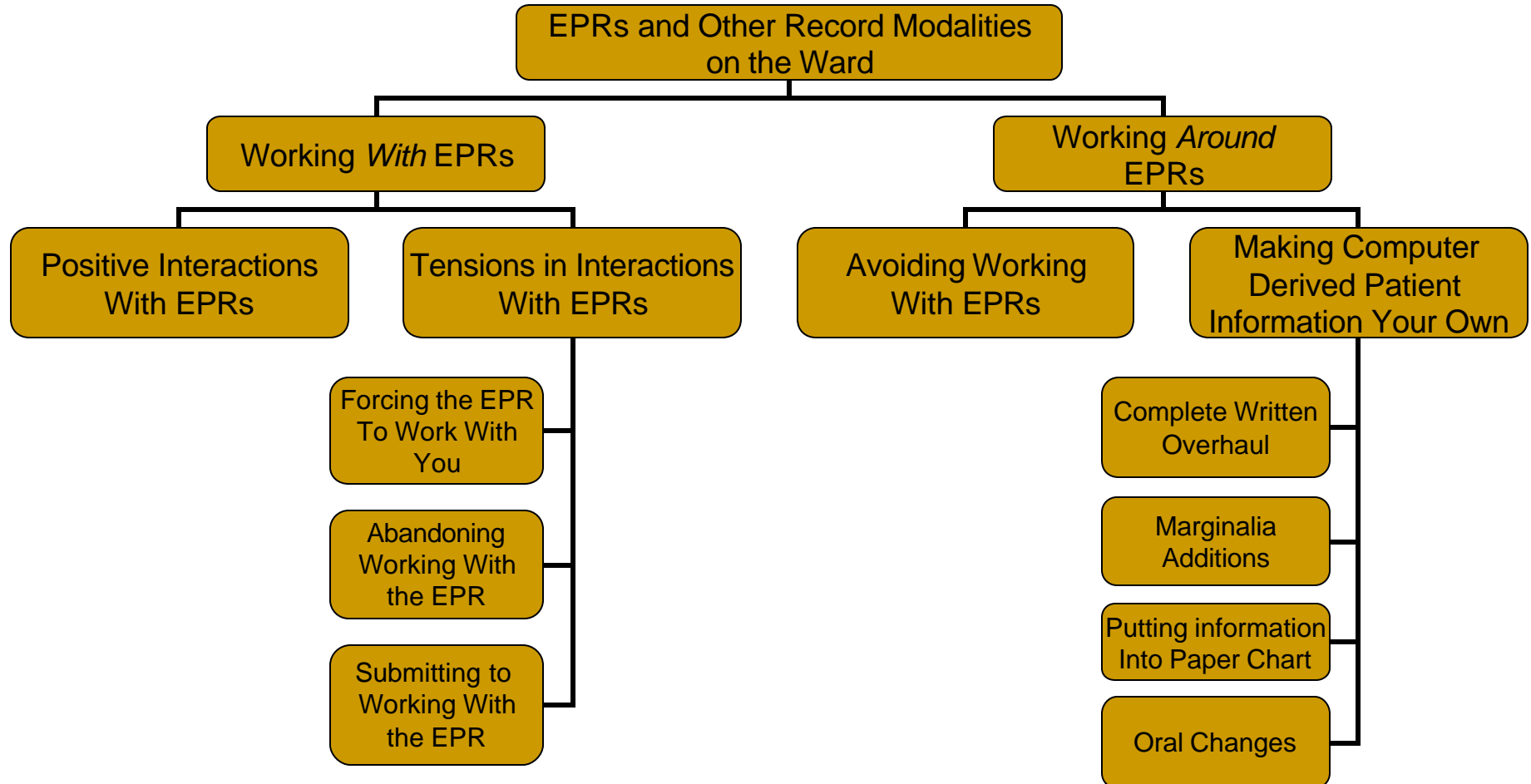
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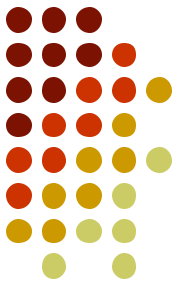


# Preliminary Analysis



# Preliminary Analysis





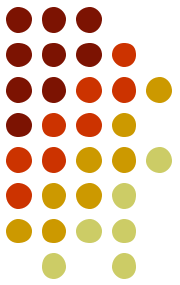
# Preliminary Conclusions

- Importance of oral and paper-based communications
- EPRs support specific social roles
- ‘Workarounds’ will be created when EPRs don’t reflect professional values or workflow
- Decision making done away from EPR
- EPRs vs. the Paper Chart
- EPRs work

# Future Research



- Other EPR designs
- Other physical settings
- Medical Education
- Many others...

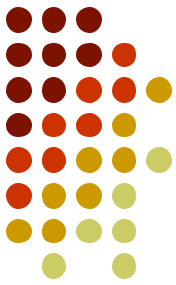


# A Word of Thanks

- Wilson Center for Research in Education, University of Toronto Faculty of Medicine
- Health Care, Technology and Place
- Dr. Catherine Schryer
- Dr. Lorelei Lingard
- Helen Edwards and Daniela Crivianu-Gaita
- Study Participants



# New EPR



**Funnelle, Nita Marie - Sunrise Clinical Manager**

File Registration Edit View GoTo Actions Preferences Tools Help

**Funnelle, Nita Marie** 000100025 / 000005 84y Female  
ICU-3 Delbrook, Ronald

Patient List Orders Results Patient Info Summary

Tracking New Results All results - Performed since 06-Apr-99

**06-Apr-99 12:10 Complete Blood Count**

White Blood Cell Count	9.8	↑	[4.8-10.8 x(10) <sup>3</sup> ]	Final
Red Blood Cell Count	4.67	↓	[4.7-6.1 x(10) <sup>6</sup> ]	Final
Hematocrit	33.7	↑	[36-55 %]	Final
Hemoglobin	13.6	↓	[14-18 gm/dl]	Final
MCV	80		[80-94 fL]	Final
MCH	30		[27-31 pg]	Final
MCHC	34.2		[33-37 gm/dl]	Final
RDW	11.5		[11.5-14.5 %]	Final
Platelet Count	353		[130-400 x(10) <sup>3</sup> ]	Final
Mean Platelet Volume	8.2		[7.4-10.4 fL]	Final
Neutrophils	66.9		[38-70 %]	Final
Lymphocytes	17.1		[21-49 %]	Final
Monocytes	8.3		[2-11 %]	Final
Eosinophils	1.7		[0-7 %]	Final
Basophils	0.2		[0-2 %]	Final

**06-Apr-99 12:10 Electrolytes**

Sodium Level	144		[135-145 mEq/L]	Final
Potassium Level	4.2		[3.3-5.1 mEq/L]	Final
Chloride Level	103		[98-111 mEq/L]	Final
Carbon Dioxide, Total	28		[24-30 mEq/L]	Final
Anion Gap	11		[+/-12 mEq/L mEq/L]	Final

**06-Apr-99 14:10 ECG**

ECG ⊕ Final

**07-Apr-99 07:00 Arterial Blood Gas**

pH Blood	7.33		[7.35-7.45]	Final
pCO <sub>2</sub> Blood	41	↑	[32-40 mmHG]	Final
pO <sub>2</sub> Blood	65		[65-95 mmHG]	Final
Bicarbonate Level	26		[22-26 mEq/L]	Final

Ready Ames, Joan L (MD) SCSMODEL - Master F