

Evidence Leveling: Electronic Health Record (EHR) Choice for Perceived Nursing Benefit, Usability, Acceptance, & Satisfaction

Deborah Judd - DNP, FNP-C
Weber State University
Kay Sackett - EdD, RN
Frontier Nursing University



Objectives: Integrative Review

- ❑ Evaluate and 'level' evidence for (EHR)
 - ❑ RN meaningful use as defined by perceived nursing benefit, ease of use, acceptance, and satisfaction

- ❑ Disseminate findings/themes:
 - ❑ Mandated meaningful use
 - ❑ Nursing specialty domainunique documentation / taxonomy requirements





Objectives: Meaningful Use, Domain, & Theoretical Framework

- ❑ Demonstrate application/Substantiation
 - ❑ Adapted Melnyk/Fine-Overholt Hierarchy and Whittemore/Knafl Integrative Methodology

- ❑ Examine how participation in Systems Life Cycle enhances perceived nurse-user benefit // satisfaction

- ❑ List theoretical technology and/or nursing frameworks for future research



ROL, Levels of Evidence and RN Perceptions of EHRs

EASE OF USE	BENEFIT	ACCEPTANCE	SATISFACTION
<p>Need to be involved in planning & implementation (Systems Life Cycle)</p>	<p>Nurses need to be involved in planning & implementation (Systems Life Cycle)</p>	<p>Nurses need to be involved in planning & implementation (Systems Life Cycle)</p>	<p>Nurses need to be involved in planning & implementation (Systems Life Cycle)</p>
<p>Recognize unpredictable nature nursing workload</p> <p>Non-linear documentation needs and holistic care of human beings</p>	<p>Complex information available</p> <p>Immediate access enhances decision-making and safety of care</p>	<p>Workflow assessments establish patterns of care</p> <p>Location of technology</p> <p>Special considerations nursing care focus & elimination duplicate nursing documentation</p>	<p>RN/NP satisfaction absent in literature</p> <p>Exception of CDSS, CPOE and eMAR applications.</p>
<p>Nursing a Specialty Domain</p> <p>Complex interventions/activity not easily recorded or retrieved</p>	<p>Need for standardized nomenclature, taxonomy, nursing data sets to enhance</p> <p>Technological documentation design and usefulness</p>	<p>Necessity of assessments specific to nursing</p> <p>Inclusive of quality of life, psychological need, pain, care coordination, education, collaboration, etc.</p>	<p>Small qualitative and observational studies needed.</p> <p>This study validated:</p> <p>Access factors for satisfaction</p> <p>Acceptance of technology</p> <p>Relevant nursing domain issues</p>

Review of Literature (ROL) *Whittemore/Knafl Methodology*

Fall 2010 ROL

Google, Government links, meaningful use E-zines, MedScape, Medline, CINAHL
n = 11,793 resources
NO NURS STUDIES*

2011 Periodic ROL

MeSH 'electronic health record' AND 'nurs*' n= 977
Modifiers: 5 years, reviews, & abstracts

2011 ROL: n= 639

Filter "AND" nurs* efficacy; nurs* use; nurs* informatics; nurs* work
n= 5 without relevancy to EHR utilization by nurses (RN/NP)

2013 ROL (n=101; less duplicates n=45; n=15; Relevancy TBD;
Spring periodic review n=45; n=25 potential relevancy TBD

2012 – 2103 Periodic ROL

Boolean 'AND' nurs* 'NOT' physician/clinician: CINAHL; PubMed; MedScape; MEDLINE; Cochrane; Wiley Online; Google Scholar: n=101

2011-2012 ROL:

MATNEY SEARCH: nurs* taxonomy, clinical systems, data-knowledge: n=13;
STAGGERS SEARCH: nurs* usability (task/context specific) n=34; **OTHER:** n = 9 (minimal relevancy)

Summer 2013

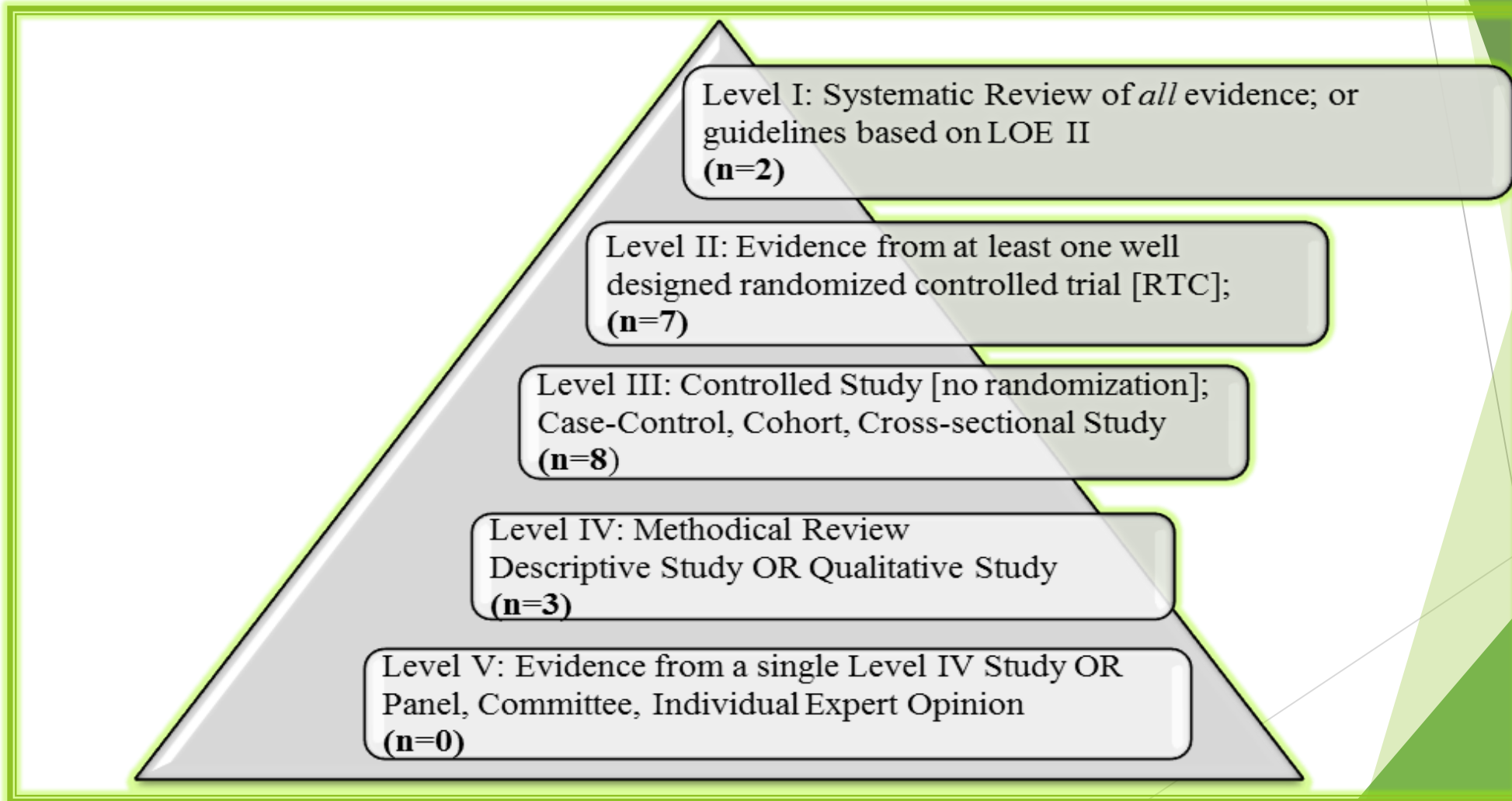
40 papers analyzed
Continue periodic ROL; n=10 new papers

Aug to Oct 2013: Periodic review; n=68; n= 58 selected for inclusion (RN/clinician)

ROL table (n=18) NURSE ONLY criteria

LOE determined; gaps; themes; relevancy; use; assumption non-nurs* barrier, benefit, acceptance; satisfaction studies apply

Evidence Leveling: Melnik/Fine-Overholt Evidence Hierarchy



(Adapted from Fineout-Overholt, Melnyk, & Schultz, 2005, p.338)

Data Evaluation / Evidence Review

Identified Themes

Satisfaction = S
Ease of use = EU
Usability = US
Efficiency = EF
Benefit = BF
Acceptance = A
Barrier = BR
Facilitator = F



Belief Elicitation

Subjective perception which may or may not be congruent with satisfaction reality experienced by RNs/NPs

Table 1: Summary EHR & Nurse Meaningful Use (MU) Evidence

CITATION	CLASSIFICATION	FINDINGS	LOE	THEME
<i>Hyun, et al. (2009)</i>	Mixed Method	n=4 RN experts; n=?? staff RNs Docmnt: Import; Author; Browse; Expert; Ptclmp; PctC	II	BF - BF - A
<i>Poissant, et al. (2005)</i>	Systematic Review	n=23 papers (RN/MD) Prcpt time efficient; ease of access; retrieval	I	E - F - BR
<i>Staggers, et al. (2010)</i>	Longitudinal Mix-Method	n=14 MD; 3 NP ease; error; fatigue; workflow; AmbC	II	
<i>Staggers, (2009)</i>	Systematic Review	n=11,916 records; n=34 articles human factors; Docmnt satisfaction /usability	I	S - EF - EU
<i>Keenan & Yakel, (2005)</i>	Pilot Paper	n=ICU; RNs one unit/12mo Docmnt discipline specific; unique needs; OBS	III	EU - BF - F
<i>Carayon, et al. (2011)</i>	Longitudinal	n=121 (3mo); n=161 (12mo) - - [time comparison] Prcpt; usability; Acceptance Model; Ptclmpl; survey	II	S - EF - US - F
<i>MacNeela & Hyde (2006)</i>	Cross-sectional	nursing minimum data sets (NMDS); conceptual; language; psychosocial; domain	III	S - BF - EU - EF
<i>Heyes, et al., (2012)</i>	Review Analysis	RNs collect data; productivity; nurs* language need RN engagement	IV	EU - BR
<i>Moreland, et al., (2012)</i>	ROL	n=719 (initial) n=117 (6 mo.) RN satisfaction eMAR; Docmnt benefit; satisfaction, workload	III	S - EU - BF
<i>Carrington & Effken, (2011)</i>	Expert Panel	n=37 RNs ActC; efficiency; barriers; satisfaction; ease; usability	III	US - BF - BR
<i>Kelley, et al., (2011)</i>	Survey	n=18 articles ActC; RN satisfaction; Prcpt; barrier; attitude	II	S - EU - BR - F
<i>DesRoches et al., (2008)</i>	Longitudinal	n = 1392 - RN responses minimal EHR function; little RN data use & benefit	II	US - A - E - BF
<i>Huryk, (2010)</i>	Qualitative Descriptive	N=13 article; Trends RN attitude/system design	II	EU - A
<i>Plemmons, et al., (2012)</i>	Integrative Review	n=396 patient AmbC; language; template creation; resources to outcome; psychosocial; Docmnt	III	US - EF - A - TH
<i>Bossen, et al., (2013)</i>	Mixed Method	n=244 (MD, RN, PT) - interdisciplinary	II	S - BR - F - A
<i>Dillon, et al., (2005)</i>	Survey	data: relevancy, comprehensive, precise; templates	III / II	S - BF - BR - A
<i>Moody, et al., (2004)</i>	Regression	n=140 surveys -- RN attitude	IV	S - EU - EF
<i>Kossmann & Scheidenhelm, (2008)</i>	Survey Descriptive	variables predictive adoption; impact; factor analysis	III	S - BR - BF - A
<i>Sockolow et al., (2011)</i>	Mix-Method	n=100 RNs (Magnet Hospital)	II	S - EU - TH

Five Dimensions Barrier or Facilitator



1 -- User: attribute, learning ability, & receptiveness

2 -- System: hardware, software, function, support

3 -- Organization: time allowance, institutional integration

4 -- Environment: physical space, technology layout, wireless, equipment

5 -- General Control: choice of features, meaningful use, user domain, templates, documentation

RESULTS ROL

Integrative review
substantiates nursing
literature scarcity

Ascertain magnitude of
human, environmental,
technology factors upon
usability

- ▶ Anecdotal nursing study corroborates limited nursing & EHR literature
- ▶ Findings add to body of knowledge regarding meaningful benefit



RESULTS:

ENSURE INTUITIVE MEANINGFUL HIT USE



- ▶ Identified usability themes
- ▶ Human or other factors
- ▶ Recognition of barriers or facilitators
- ▶ Strategies for adoption and utilization

- ▶ ensure intuitive and meaningful HIT use.

Evidence examination

Attitude / Experience Factors



www.shutterstock.com - 126212801

Positive or Negative Factors
Pre-implementation preparation

Ease of use

User/patient outcomes

Nursing support

Technology requisite for nurses

System efficiency

RESULTS

► Familiarity with any EHR System:

Over time improved system usability and adoption



► Design of healthcare system technology

Lacks RN -- meaningful use templates

Nursing screens specific for domain / context

RESULTS

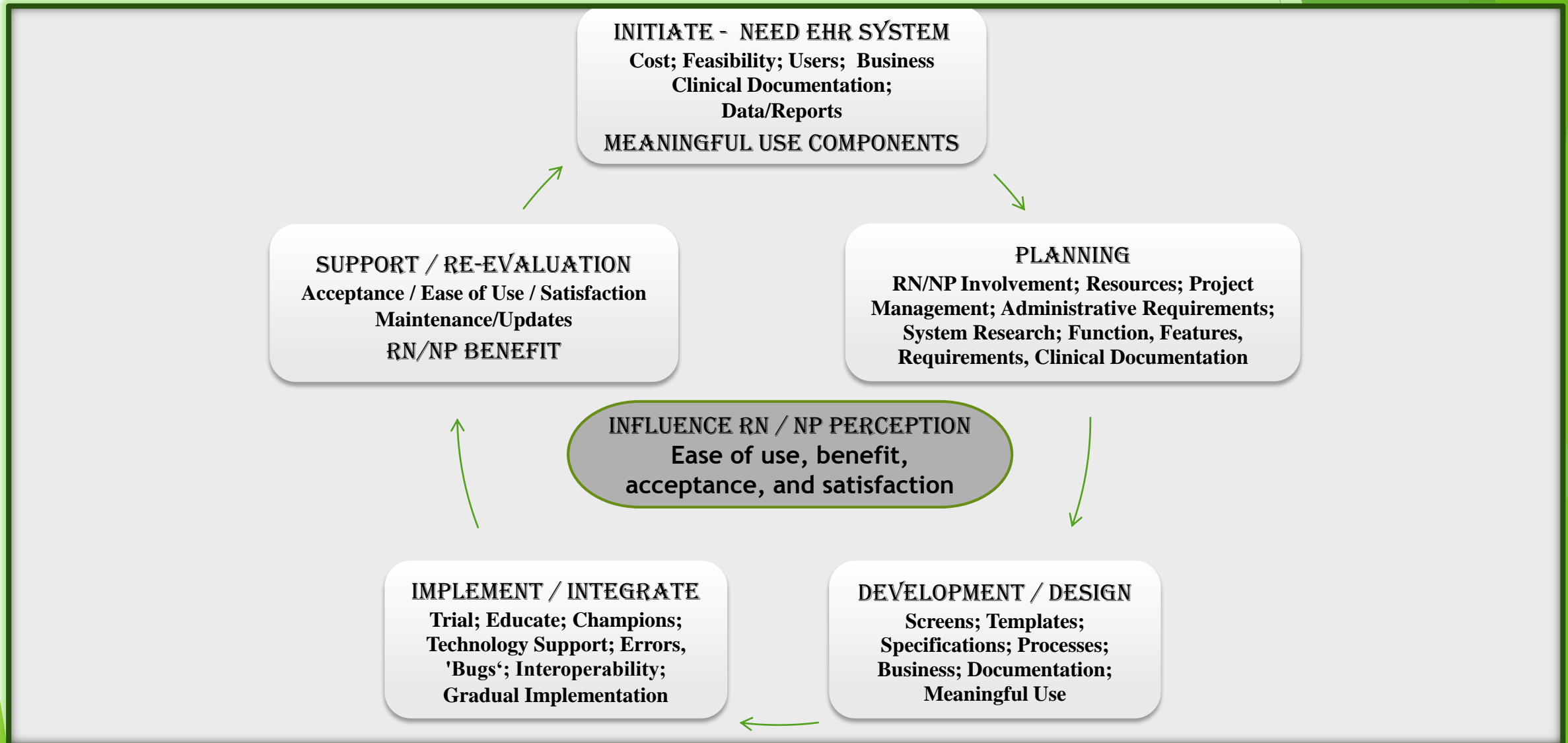
EHR satisfaction necessitates RNs understand HOW:

- Taxonomy
- Technology Principles
- Discipline Specific Templates
- *Systems Life Cycle* Participation

INFLUENCE ACCEPTANCE



Systems Life Cycle -- Nursing a Specialty Domain



(Adapted from Thede & Sewell, 2010, p. 330)

What were the **GOALS**
and **EXPECTATIONS**
originally set forth?

Has the **EHR MET** the **GOALS**
and **EXPECTATIONS**
originally set forth ...

What have been the **key**
challenges to success?

What have been the **key**
benefits to success?

Anecdotal Study (*n=28 nurses*)



FOUR ASPECTS

Quality of Care

Patient Safety

Unexpected Outcomes

Other Issues



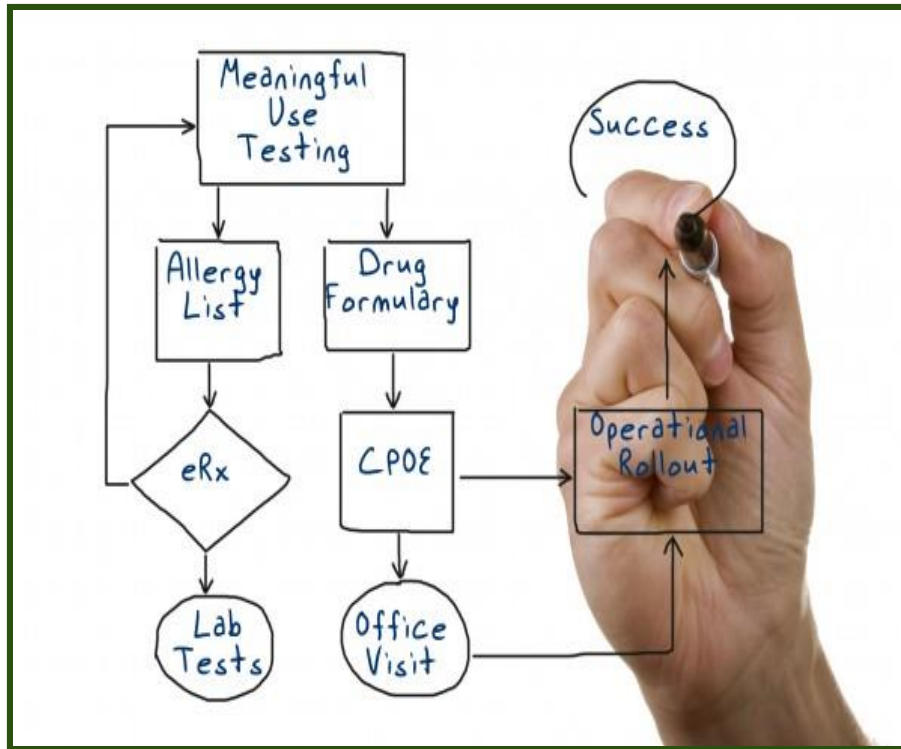


Usability:
Major factor in HIT
adoption and/or satisfaction
Longitudinal comparison (ROL)



**Technology Acceptance
Perception Model
Davis (1989)**

KEY CHALLENGES



Workflow

Too much to figure out
Best place to document
Time

Communication deficit
Unknown expectations
Deficient support
Independent work-around
Who responsible to chart?

Patient patterns / rooming / alerts
Immunization problems
(pediatric)

Inadequate summary screens

Decision-support
Lost data captured
E-Scribing
Based on protocols
Order entry - legible

Better billing - charted correctly
Information - access/retrieval
Statistics / reports

Safety enhancement
Quality improvement (over time)

KEY Benefits



What GOALS ! Nurses report

Don't recall any



Reports
Billing
Accuracy
Meaningful Use
Cost saving
Research
Safety
Quality Care
Mandated

*We thought we
were to be part
of the choice...*



Patient safety Quality of Care Nursing



Functionality



Time

Eye contact

Caught in process

No attention to patient

Don't understand system

Too many clicks

Patients wait too long

Prescription decision support

Nurses Perceptions How goals Met?

“Told we had to use this by this date and to do that by another date ... use it and we want you to use it ... do this step this month, this step next month ... there was never any this is why we're going to do it. ”



Software Functionality

Information Quality

Perceived Worth (time/effort)

Data (correctness / completeness)

RN/NP Involvement (EHR system)

Technology Impact (patient outcomes)

Unintended RN/NP: Consequence / Benefit

Ease of Use RN Declared Facilitators

>>

Barriers

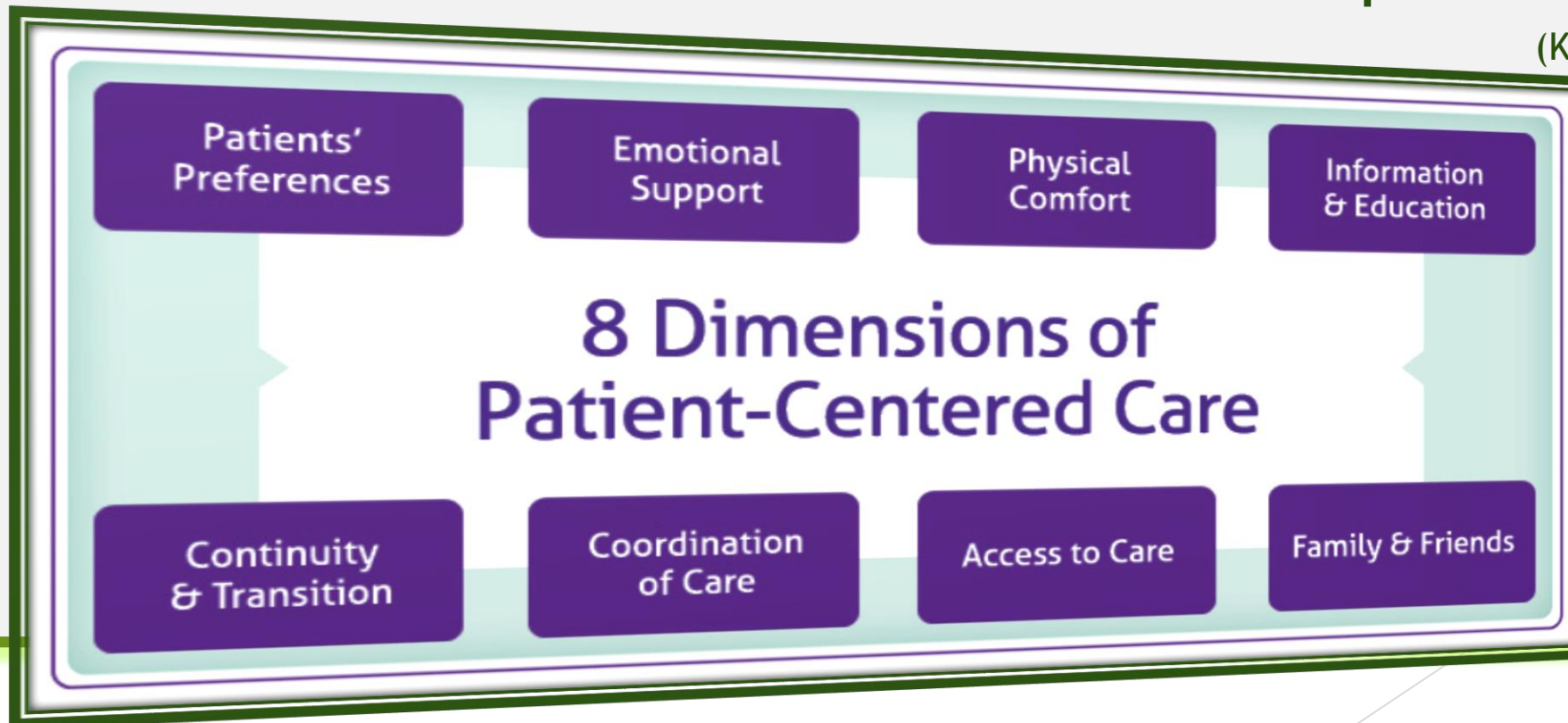


(Holden 2011, Sockolow 2011; Carrington 2011; Rupp 2013)

Nurse Satisfaction *precedes* Holistic patient centered care

Nursing leadership determined
nurse satisfaction an essential
indicator of patient care quality

(Kossmann & Scheidenhelm, 2008)



- ▶ **Melnyk's Hierarchy Quantitative**
- ▶ **Nurses: RNs & APRNs**
- ▶ **APRNs use it differently**
- ▶ **Focus groups designed to assess both groups**
- ▶ **NP groups less participation**
- ▶ **Time factor (lunch/location)**
- ▶ **NP offsite - attempted Skype - unable to utilize that**

Project Challenges

NP: EHR ANECDOTAL COMMENTS

“Timely documentation process
with predetermined phrases/sentences good”

BUT it takes a lot of time if you change them in
any way”

Initial HPI much time

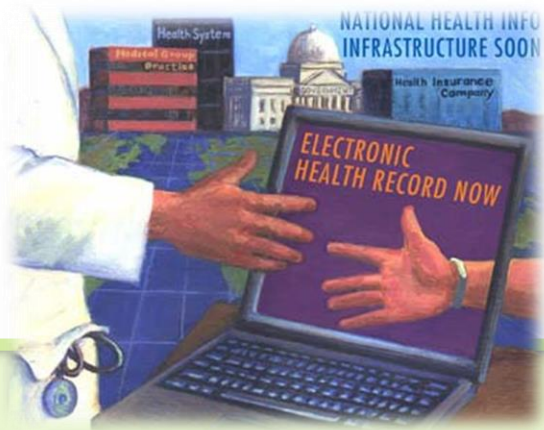
Have to look at everything very carefully”

I really like/prefer narrative versus check boxes
although check boxes do help to be compliant.

“In peds for example medications and eScribe
come up with precautions”

“NextGen calculates your billing code after you
have indicated or filled out all of the appropriate
information”

“It is very organized and it addresses everything
that needs to be addressed for the patient”



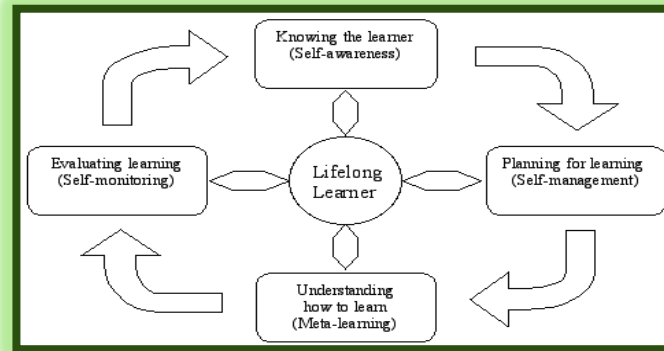
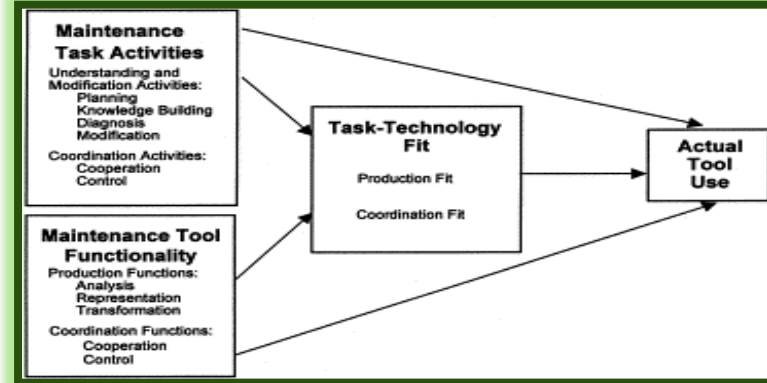
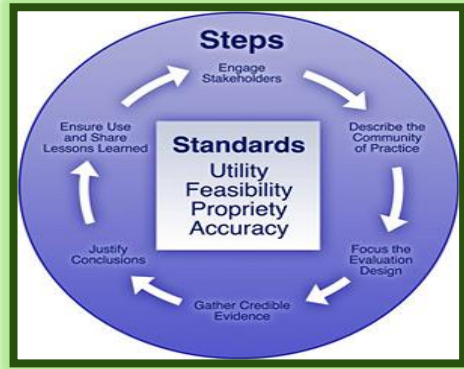
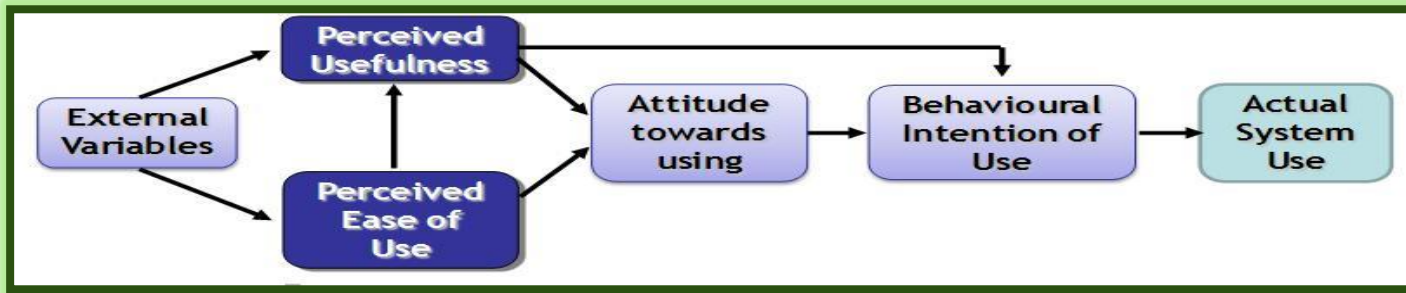
Future Directions...

...organizations, “do not yet know how best to design, implement, and use” health information technology:

They proposed an organizational framework that designates attention to “technology, use, environment, outcomes, and temporality” essential for implementation and expected outcomes

(Rippen, Pan, Russel, Bryne, & Swift, 2013, p. e1)





Prospective
Theoretical
Frameworks

Technology Acceptance Model
(TAM)

Transformational Learning Theory

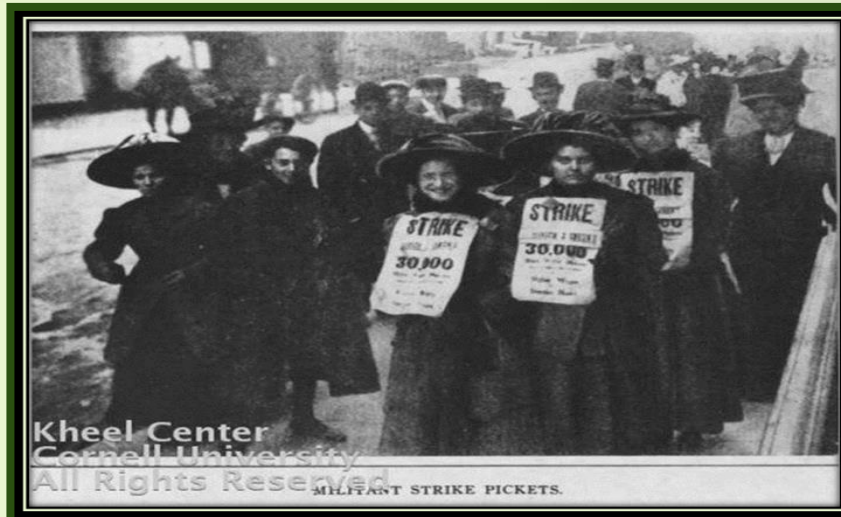
Task-Technology Fit (TTF) Model

Health Information Technology
Reference-Based Evaluation
Framework (HITREF)

Foundation of Knowledge Model

Novice to Expert Theory

Innovation & Passion = Change



Donahue (1996) pp. 2-3



Nursing

The oldest of arts and the youngest
of professions ...

An epic of many stages ...
an integral part of societal
movement

... the genesis of nursing
is an episode in the history of
women

Disclosures

- ❑ STTI gifting
 - ❑ NU NU - Weber State
 - ❑ CC - University of Alabama
- ❑ Marriott Faculty Development Award
- ❑ No University affiliation/influence/support

Deborah Judd

djudd@weber.edu

Kay Sackett

Kay.Sackett@Frontier.edu

