

Appendixes for Pediatric-Specific Functionality for Electronic Health Records

- Appendix A: Literature Search Strategies
- Appendix B: Key Informant Interviews
- Appendix C: Summary of Key Informant Input
- Appendix D: Screening Forms
- Appendix E: Summary of Consensus Statements
- Appendix F: Ongoing Studies
- Appendix G: Reasons for Exclusion

Appendix A. Search Strategies

Bibliographic Databases

Search Strategies (updated: 8/5/2014)

Table A1. Medline via PubMed

Search terms	Search results
#1 ("pediatrics"[mh] OR "infant"[mh] OR "Child"[mh] OR "adolescent"[mh] OR "child health services"[mh] OR "intensive care units, pediatric"[mh] OR "hospitals, pediatric"[mh])	2850349
#2 (child*[tiab] OR paediatr*[tiab] OR pediater*[tiab] OR adolescent*[tiab] OR neonat*[tiab] OR infant*[tiab])	1535394
#3 Search (#1) OR (#2)	323347
#4 ("Medical records systems, computerized"[mh] OR "decision support systems, clinical"[mh])	28598
#5 (("cpoe"[tiab] OR "computerized physician order entry"[tiab] OR "computerized order entry"[tiab] OR "computer order entry"[tiab] OR "cdss"[tiab] OR "clinical decision support systems"[tiab]) OR (electronic[tiab] AND (health record*[tiab] OR medical record*[tiab])))	13499
#6 Search (#4) OR (#5)	35200
#7 Search (#3) AND (#6)	3299
#8 Limit to publication year >1998	3038

Abbreviations: mh=Medical Subject Heading; tiab=title/abstract word;

Note: Using "medical order entry system" subject heading instead of "medical records systems, computerized" retrieves 2165 records. Using the broader term, "medical records systems, computerized" which encompasses "medical order entry system" and "electronic health records" retrieves an additional 1105 records- many of which may not be relevant to this topic. Cataloguers use the most specific heading available, however in this case, the broader term "medical records systems, computerized" was introduced in 1991, more than a decade before the more specific headings "medical order entry system" and "electronic health records".

Table A2. EMBASE

Search terms	Search results
#1 (pediatric* or child* or infant* or paediatric* or neonat* or adolescen*).mp	3032578
#2 ("computerized provider order entry" or "cpoe" or "electronic health" or "EHR" or "clinical decision support" or "CDS" or "CDSS").mp	18501
#3 #1 AND #2	1475
#4 Limits: NOT Medline, Publication Date: 1999-Current	84

Notes: After duplicates were removed, 75 imported. Total in Endnote Library=3113

Appendix B. Key Informant Interviews

The Vanderbilt Evidence-based Practice Center (EPC) Director and the Agency for Healthcare and Quality (AHRQ) Task Order Officer reviewed the completed Disclosure of Interest forms for each Key Informant. We conducted discussion calls with nine Key Informants, one of whom was an employee of the Centers for Disease Control and Prevention. We were not required to obtain Office of Management and Budget (OMB) clearance for the Key Informant interviews because we included fewer than ten non-government associated participants.

We scheduled calls to include two or more Key Informants based upon availability and concordance of perspectives. The EPC Director and a co-investigator from the project team led each of the Key Informant discussion calls. We held three calls, each lasting 60 minutes. We recorded the discussion calls and distributed a summary to the participants. We organized the discussion summaries Guiding Question for analysis by the authors. The report authors identified key themes from multiple perspectives and noted unique perspectives from Key Informants.

Martha Bergren DNS, RN, NCSN, APHN-BC	Community Health Nursing Program	University of Illinois
Bobbie Byrne MD, MBA	Chief Information Officer	Edwards Health System
Mark A. Del Beccaro MD	Department of Pediatrics	University of Washington
Steve Downs MD, MS	Department of Pediatrics	Indiana University
Alex Fiks MD	Pediatric Research Consortium	Children's Hospital of Philadelphia
Chip Hart	Vendor	Physician's Computer Company
Hetty Khan MS, MGA, RN	Health Informatics	Centers for Disease Control and Prevention
Sue Kressly MD, FAAP	Physician	Kressly Pediatrics
Rita Mary Mangione-Smith MD, MPH	Outcomes Assessment Program and Quality of Care	Seattle Children's Hospital
Andrew Spooner MD, MS	Chief Medical Information Officer	Cincinnati Children's Hospital

Appendix C. Summary of Key Informant Input

GQ1. Description of EHRs

GQ 1A: Are there functionalities that have been identified in the literature and feature more prominently than others as potentially important to achieve for improving children's health?

- Family relationships, patient engagement, age of majority.
- Determine family relationship through subject to subject relationship. Insurance status, etc.
- Tracking last well-child visit
- PPI transition policy, EHR support checklist (Got Transition)

GQ2. Description of the context in which EHRs are implemented

GQ 2A: What is the potential value of pediatric-specific functionalities in the context of care transition, specifically from newborn care to pediatric primary care, from pediatric primary care to pediatric specialist care, and from pediatric primary care to adolescent care?

- Add transition from adolescences to adult to the list of transitions
- Pediatric-specific time units, weight units, weight-based dosing, developmental milestones, growth data, family appropriate education, use of pediatric scales
- Private physician wish list (e.g., immunization logic) is not new or specific to EHR functionality
- Core functionality is difficult
- Lack of standards for clinical circumstance (e.g. there are only two growth charts, but pediatricians want more)

GQ 2B: Are certain pediatric-specific functionalities beneficial for a pediatrician to conduct her work including sick and well-child visits? If so, does this vary by health care setting (e.g. primary care office, specialty care office, school health, and alternative care settings) or by type of visit (e.g., preventive vs. acute care)?

- Language translation
- Food safety, domestic violence,
- Data tied to non-clinical data
- Social service case-management data
- Bright Futures Guidance- not there or not computable. CDSS only 20% compatible (publication by Steve Downs)
- Conformance criteria

GQ2C: What are the challenges to implementing specific functionalities? Are some harder than others to implement by a) vendors; and/or b) pediatric providers?

- Functions align with MU or PCMH and is certification driven
- CQM is vague and broken

(<http://www.ncqa.org/Programs/Recognition/Practices/PatientCenteredMedicalHomePCMH/DuringEarnItPCMH/PCMH2014ISSDataSources.aspx>)

GQ3. Description of the existing evidence

GQ 3A: Is there any evidence that using an EHR adapted for the specific needs of pediatric providers compared with using a “regular” EHR or not using an EHR at all produces a) better quality, including safety and cost outcomes for patients; and/or b) improved workflow or job satisfaction for providers?

- Health information chapter
- Electronic Pediatric Research in Office Settings ePros
(<http://www2.aap.org/pros/epros/eprosa&m.htm>)

GQ 3B: Which pediatric-specific functionalities influence a) patient outcomes (including safety; quality; cost; equity; standardization of care; and/or efficiency); b) the ability of a pediatric provider to conduct work within the EHR; c) improvement of workflow and provider satisfaction; and/or d) involvement of patients and families (including their education and shared decision making)?

- Data of usefulness is mostly unpublished

GQ4. Dissemination and future developments

GQ 4A: How does testability and usability of core functionalities promote or impede dissemination and future development of pediatric EHRs?

- Testing for usability can be difficult
- Real-time contextual support
- Provide specific guidelines, concrete and computable information for translation by vendors
- Decrease burden of reports, order, and care plans.

Appendix D. Screening Forms

Abstract Screening Form

Abstract Screening Form				
<ul style="list-style-type: none"> • <i>If you answer “No” to one or more questions (with the exception of #4) the record is excluded.</i> • <i>If you answer “Yes” or “Cannot Determine” to all questions, the record is promoted for full text screening.</i> • <i>To flag a reference for team review, background, or review of references, check one or more reasons listed at the end of the form.</i> • <i>Use the comments field as needed to enter reference specific notes or questions.</i> • <i>Submit the form to move to the next reference.</i> 				
1. Population is children, aged 21 years or younger	Yes	No	Cannot Determine	X-1
2. Addresses pediatric-specific functionality or feature for an EHR	Yes	No	Cannot Determine	X-2
3. Health care setting (i.e., exclude camp, school, public health, kindergarten settings, etc.)	Yes	No	Cannot Determine	X-3
4. Reports original research	Yes	No	Cannot Determine	Neutral
5. [If #4 is “Yes”]: Addresses Guiding Question(s) 1, 2, 3 and/or 4	Yes	No	Cannot Determine	X-4
5. [If #4 is “No”]: Addresses Guiding Question(s) 1, 2, and/or 4				
GQ 1A. Are there functionalities that have been identified in the literature and feature more prominently than others as potentially important to achieve for improving children’s health?				GQ1A
GQ 2A. What is the potential value of pediatric-specific functionalities in the context of care transition, specifically from newborn care to pediatric primary care, from pediatric primary care to pediatric specialist care, and from pediatric primary care to adolescent care?				GQ2A
GQ 2B. Are certain pediatric-specific functionalities beneficial for a pediatrician to conduct her work including sick and well-child visits? If so, does this vary by health care setting (e.g. primary care office, specialty care office, school health, and alternative care settings) or by type of visit (e.g., preventive vs. acute care)?				GQ2B
GQ 2C. What are the challenges to implementing specific functionalities? Are these harder than others to implement by a) vendors; or b) pediatric providers?				GQ2C
GQ 3A. Is there any evidence that using an EHR adapted for the specific needs of pediatric providers compared with using a “regular” EHR or not using an EHR at all produces: a) better quality, including safety and cost outcomes for patients; or b) improved workflow or job satisfaction for providers?				GQ3A
GQ 3B. Which pediatric-specific functionalities influence: a) patient outcomes (including safety; quality; cost; equity; standardization of care; and efficiency); b) the ability of a pediatric provider to conduct work within the EHR; c) improvement of workflow and provider satisfaction; or d) involvement of patients and families (including their education and shared decision making)?				GQ3B
GQ 4A. How does testability and usability of core functionalities promote or impede dissemination and future development of pediatric EHRs?				GQ4A
Does not address a guiding question				X-4
Retain for: ___ Team Review ___ Background/Discussion ___ Review of References ___ Other				
COMMENTS:				

Note: In Distiller, question #4 uses branching logic to ensure that Guiding Question 3 is addressed by original research. If the answer to #4 is “No” the option for Guiding Question 3 will be hidden.

Full Text Screening Form

Full Text Screening Form		
Senior reviewer decision for study status:	Include	Exclude
<i>If excluded, mark reason(s)</i>		
Not children (i.e. older than 21 years of age)		X-1
Does not address pediatric-specific functionality or feature of an EHR		X-2
Not a healthcare setting of interest		X-3
Not relevant to outpatient setting		X-4
Does not address a Guiding Question		X-5
<i>If included, mark Guiding Question(s)</i>		
GQ 1A. Are there functionalities that have been identified in the literature and feature more prominently than others as potentially important to achieve for improving children's health?		GQ1A
GQ 2A. What is the potential value of pediatric-specific functionalities in the context of care transition, specifically from newborn care to pediatric primary care, from pediatric primary care to pediatric specialist care, and from pediatric primary care to adolescent care?		GQ2A
GQ 2B. Are certain pediatric-specific functionalities beneficial for a pediatrician to conduct her work including sick and well-child visits? If so, does this vary by health care setting (e.g. primary care office, specialty care office, school health, and alternative care settings) or by type of visit (e.g., preventive vs. acute care)?		GQ2B
GQ 2C. What are the challenges to implementing specific functionalities? Are these harder than others to implement by a) vendors; or b) pediatric providers?		GQ2C
GQ 3A. Is there any evidence that using an EHR adapted for the specific needs of pediatric providers compared with using a "regular" EHR or not using an EHR at all produces: a) better quality, including safety and cost outcomes for patients; or b) improved workflow or job satisfaction for providers?		GQ3A
GQ 3B. Which pediatric-specific functionalities influence: a) patient outcomes (including safety; quality; cost; equity; standardization of care; and efficiency); b) the ability of a pediatric provider to conduct work within the EHR; c) improvement of workflow and provider satisfaction; or d) involvement of patients and families (including their education and shared decision making)?		GQ3B
GQ 4A. How does testability and usability of core functionalities promote or impede dissemination and future development of pediatric EHRs?		GQ4A
Does not address a guiding question		X-4
Retain for: ___ Team Review ___ Background/Discussion ___ Review of References ___ Other		
COMMENTS:		

Appendix E. Summary of Consensus Statements

Citation	Title	Notes	Category
Gray et al., 2014 ¹	Recommendations for EHR Use for Delivery of Adolescent Health Care	<ul style="list-style-type: none"> - Global, excluding China and India, EHR usage in 2010. - Adolescent confidentiality protection summarized - Adolescent may forgo healthcare if their privacy is threatened. - No incentive for EHR vendors, in current regulatory environment, to incorporate granular privacy controls in their products. 	Privacy (Adolescents)
Patterson et al., 2013 ²	Enhancing EHR Usability in Pediatric Patient Care: A Scenario-Based Approach	<ul style="list-style-type: none"> - Summary of the NIST 7865 report (see below) Highlights a few selected recommendations for EHR vendors and developers, small-group pediatric practices, and children's hospitals. - Special considerations for pediatric patients from clinical experts - Relevant concepts for human factors engineering from Human Factors experts 	Pediatric-specific norms
Blythe et al., 2012 ³	Standards for Health Information Technology to Ensure Adolescent Privacy	<ul style="list-style-type: none"> - Recommends nine basic principles for 'ideal' EHR - Supports the caution that adolescent may forgo healthcare if privacy is threatened - States that HIPAA not specific to adolescent privacy issues which may result in deferral to state laws regarding minors 	Privacy (Adolescents)
Lowry et al., 2013 ⁴	A Human Factors Guide to Enhance EHR Usability of Critical user Interactions when Supporting Pediatric Patient Care. [NIST.IR.7865]	<ul style="list-style-type: none"> - Highlights the user interactions unique to or salient for pediatric care and - Details the unique features of pediatric patient care, in contrast to general adult patient care including patient physiology, complexity of routine tasks, and limited communication abilities. - Provides conceptual model of unique user-related risks of EHR systems for pediatric patients. - It covers human factors guidance for critical user interactions along 9 themes (patient identification, medications, alerts, growth chart, vaccinations, labs, newborn care, privacy, and radiology) - Suggests opportunities for innovations to consider for specialized child modules that can be used in conjunction with an established EHR. - Appendix covers scenarios citing the potential pitfalls. 	Pediatric-specific norms
ACOG Committee on Adolescent Health Care 2014 ⁵	ACOG Committee Opinion # 599: Adolescent confidentiality and electronic health records	<ul style="list-style-type: none"> - Clarifies that HIPAA privacy rule leaves health care providers with questions about the relationship between HIPAA local applicable laws - Standards lacking for state and other laws pertaining to minor consent, provisions for privacy and services governed by federal laws. - Details the nature and requirement of the adolescent privacy and confidentiality of services consented by a minor 	Privacy (Adolescents)
Gerstle et al., 2007 ⁶	Electronic Prescribing Systems in Pediatrics: The Rationale and Functionality Requirements	<ul style="list-style-type: none"> - Describes the levels and implementation of e-prescribing. - Cites pediatric specific advantages of CPOE - Suggests and provides guidelines, potential barriers, and cautions against potential pitfalls. - Cites benefits of e-prescribing to public health, patient, pharmacists, insurers and providers. 	Medications / CPOE

References

1. Gray SH, Pasternak RH, Gooding HC, et al. Recommendations for electronic health record use for delivery of adolescent health care. *J Adolesc Health*. 2014 Apr;54(4):487-90. PMID: 24656534
2. Patterson ES, Zhang J, Abbott P, et al. Enhancing electronic health record usability in pediatric patient care: a scenario-based approach. *Jt Comm J Qual Patient Saf*. 2013 Mar;39(3):129-35. PMID: 23516763
3. Blythe MJ, Del Beccaro MA. Standards for health information technology to ensure adolescent privacy. *Pediatrics*. 2012 Nov;130(5):987-90. PMID: 23109684
4. Lowry SZ, Quinn MT, Ramaiah M, et al. A human factors guide to enhance her usability of critical user interactions when supporting pediatric patient care. NISTIR 7865. US Department of Commerce: National Institute of Standards and Technology (NIST); 2013.
5. ACOG Committee on Adolescent Health Care. ACOG Committee Opinion no. 599: Adolescent confidentiality and electronic health records. *Obstet Gynecol*. 2014 May;123(5):1148-50. PMID: 24785881
6. Gerstle RS. Electronic prescribing systems in pediatrics: the rationale and functionality requirements. *Pediatrics*. 2007 Jun;119(6):1229-31. PMID: 17545396

Appendix F. Ongoing Studies

A search of ClinicalTrials.gov retrieved 46 records. The table below summarizes the records that were retained as relevant (n=17).

Search strategy: ((EHR) OR (EMR) OR (electronic AND record)) AND (functionality OR HIT OR CPOE OR "decision support" OR "electronic prescribing" OR "order entry" OR "information technology" OR "quality improvement") | Child

Study Name Location Trial Identifier	Sponsors and Collaborators Study Status	Population Disease/Condition Age	Interventions / Groups	Outcomes
An Electronic Decision Support Tool to Improve Outpatient Asthma Care Children's Hospital of Philadelphia NCT01522144	Agency for Healthcare Research and Quality (AHRQ) Children's Hospital of Philadelphia Completed Start: July 2006 Complete: August 2008	<ul style="list-style-type: none"> • Children with a diagnosis of asthma • Age 1 to 18 years 	Behavioral: Computerized decision support	<p>Primary</p> <ul style="list-style-type: none"> • The proportion of patients on appropriate asthma controller medication at the end of the trial <p>Secondary</p> <ul style="list-style-type: none"> • an updated asthma action plan • documentation of spirometry (6 to 18 years) in those with asthma • an updated problem list that reflects an assessment of asthma severity
Better Pediatric Asthma Outcomes Through Chronic Care University of Connecticut Health Center NCT00355069	University of Connecticut Health Center Agency for Healthcare Research and Quality (AHRQ) Completed Start: August 2001 Complete: May 2003	<ul style="list-style-type: none"> • Determined by provider to be asthmatic • Member of Medical Managed Care Organization partner group • Ages 5 to 17 years 	Behavioral: Electronic (computer based) provider feedback tool	<p>Primary</p> <ul style="list-style-type: none"> • Asthma control • Guideline appropriate medicating by providers • Patient knowledge <p>Secondary</p> <ul style="list-style-type: none"> • Self-efficacy • Social support
Child Health Improvement Through Computer Automation (CHICA) Highlighting Study IUMG Clinic System	Indiana University Completed Start: April 2012 Complete: October 2012	<ul style="list-style-type: none"> • Physicians practicing in one of our four study clinics who use CHICA 	<p>Other: Highlight set 1 (two prompts)</p> <p>Other: Highlight Set 2 (two different prompts)</p>	<ul style="list-style-type: none"> • Whether or not prompt was answered

Study Name Location Trial Identifier	Sponsors and Collaborators Study Status	Population Disease/Condition Age	Interventions / Groups	Outcomes
NCT01583101				
Comprehensive Clinical Decision Support (CDS) for the Primary Care of Premature Infants Children's Hospital of Philadelphia	Children's Hospital of Philadelphia National Library of Medicine (NLM) Completed Start: September 2009 Complete: October 2012	<ul style="list-style-type: none"> Premature infants aged 20 weeks to 35 weeks 	Other: Clinical Decision Support Tool	<p>Primary</p> <ul style="list-style-type: none"> Evaluate usability of the intervention <p>Secondary</p> <ul style="list-style-type: none"> Evaluate effect on care process
NCT01478711				
Conversational IT for Better, Safer Pediatric Primary Care Boston Medical Center NCT01188629	Boston Medical Center Agency for Healthcare Research and Quality (AHRQ) Active, not recruiting Start: July 2007 Complete: August 2011	<p>Parents of children will be enrolled in the study if they meet a set of eligibility criteria which includes:</p> <ul style="list-style-type: none"> A primary care patient at Boston Medical Center An English speaking child and parent Ages 0 to 11 years 	<p>Behavioral: Safety Training Behavioral: Personal Health Partner and Counseling</p>	<p>Primary</p> <ul style="list-style-type: none"> Personal Health Partner (PHP) assessment with electronic health record (EHR) data exchange before pediatric primary care visits <p>Secondary</p> <ul style="list-style-type: none"> Personal Health Partner (PHP) pre-visit counseling with post-visit reinforcement
EHR-Based Clinical Decision Support to Improve BP Management in Adolescents HealthPartners Medical Group NCT01760239	HealthPartners Institute for Education and Research National Heart, Lung, and Blood Institute (NHLBI) Recruiting Start: April 2014 Complete: August 2017	<ul style="list-style-type: none"> Pediatric and family medicine providers Ages 12 to 19 years 	Behavioral: Clinical Decision Support	<ul style="list-style-type: none"> Follow up of an elevated blood pressure within recommended interval Recognition of hypertension Appropriate workup for those with hypertension Appropriate Lifestyle Referral Costs of Care
Electronic Health Record (EHR) Decision Support to Improve Outpatient Asthma Care Children's Hospital of Philadelphia NCT00918944	Children's Hospital of Philadelphia Agency for Healthcare Research and Quality (AHRQ) Completed Start: January 2006 Complete: August 2009	<ul style="list-style-type: none"> Known patients with asthma 	<p>Other: Control (passive EHR) Other: Intervention (interactive decision support system)</p>	<p>Primary</p> <ul style="list-style-type: none"> Proportion of persistent asthmatic patients with at least one prescription for a controller medication in each period (baseline and intervention) <p>Secondary</p> <ul style="list-style-type: none"> Proportion of persistent asthmatic patients with 1)an updated asthma

Study Name Location Trial Identifier	Sponsors and Collaborators Study Status	Population Disease/Condition Age	Interventions / Groups	Outcomes
				<ul style="list-style-type: none"> 1)action plan, 2)spirometry as needed 3)problem list with current asthma severity 4)asthma-related quality of life scores 5)absent school and work days.
<p>Evaluation of a Shared Decision Making Portal for Pediatric Asthma</p> <p>Children's Hospital of Philadelphia</p> <p>NCT01715389</p>	<p>Children's Hospital of Philadelphia</p> <p>Active, not recruiting</p> <p>Start: November 2012</p> <p>Complete: November 2014</p>	<ul style="list-style-type: none"> • Parents/legal guardians of children aged 6 to12 years with persistent asthma, currently receiving chronic maintenance therapy, cared for at a study practice, with consistent access to a computer with an internet connection where they feel comfortable accessing MyChart (patient portal) • Clinician at study site 	<p>Other: MyAsthma Patient Portal</p>	<p>Primary</p> <ul style="list-style-type: none"> • Acceptability of the intervention to parents and clinicians <p>Secondary</p> <ul style="list-style-type: none"> • Shared decision making • Parent Activation • Goal Attainment • Asthma-Related Quality of Life • Asthma Control • Asthma-related Utilization • Asthma Medication Adherence/Receipt • Feasibility of Recruitment • Feasibility of Follow-up • Feasibility of Portal Use
<p>Giving Immunizations Through Vaccine Education</p> <p>Children's Hospital of Philadelphia</p> <p>NCT01159093</p>	<p>Children's Hospital of Philadelphia</p> <p>Agency for Healthcare Research and Quality (AHRQ)</p> <p>Completed</p> <p>Start: May 2010</p> <p>Complete: May 2011</p>	<ul style="list-style-type: none"> • All clinicians practicing at participating sites • Parents with an eligible adolescent girl • Adolescent girls aged 11 to 17 years • Has a visit at one of the primary care centers within the last 15 months • Has not completed the teen vaccine series 	<p>Behavioral: Family Decision Support (informational vaccine reminder telephone calls)</p> <p>Behavioral: Clinician Decision Support (an EHR-based decision support mechanism including reminders, education, audit and feedback on vaccination success)</p> <p>Other: Family Decision Support and Clinician Decision Support</p> <p>Other: Control</p>	<p>Primary</p> <ul style="list-style-type: none"> • Rate of HPV vaccination among girls actively cared for at participating sites <p>Secondary</p> <ul style="list-style-type: none"> • Rates of meningococcal and tetanus, diphtheria, and pertussis vaccines among girls in the study
<p>Improving Otitis Media Care With Clinical Decision Support (OMHIT)</p>	<p>Children's Hospital of Philadelphia (CHOP)</p> <p>Agency for Healthcare</p>	<ul style="list-style-type: none"> • All CHOP primary care and ENT practice sites with patients receiving care for otitis 	<p>Other: 3-Part Intervention (A combination of training, an otitis media episode</p>	<p>Primary</p> <ul style="list-style-type: none"> • Quality of otitis media care

Study Name Location Trial Identifier	Sponsors and Collaborators Study Status	Population Disease/Condition Age	Interventions / Groups	Outcomes
Children's Hospital of Philadelphia NCT00581711	Research and Quality (AHRQ) Completed Start: December 2007 Complete: September 2010	media • Ages 2 months to 18 years	grouper, and clinical decision support) Other: 4-Part Intervention (A combination of clinician training, an otitis media episode grouper, clinical decision support, and feedback) Other: 1-part intervention (Provision of feedback on otitis media quality indicators)	Secondary • Clinician adoption of intervention and Resource Utilization
Improving Pediatric Safety and Quality With Health Care Information Technology Massachusetts General Hospital/Partners HealthCare NCT00134823	Massachusetts General Hospital Agency for Healthcare Research and Quality (AHRQ) Completed Start: March 2005 Complete: September 2008	• Partners-affiliated pediatric practice providers utilizing Longitudinal Medical Record (LMR), which is an electronic health record system. Also the parents of the patients of the above noted pediatric providers	Other: weight based dosing decision support	• Impact on rates of medication errors
Improving the Medication Management of Patients With Attention-Deficit Hyperactivity Disorder American Academy of Pediatrics NCT01769300	American Academy of Pediatrics University of Colorado, Denver QED Clinical, Inc. Children's Hospital of Philadelphia Enrolling by invitation Start: January 2013 Complete: August 2014	• Children aged 5 to 12 years diagnosed with Attention-Deficit Hyperactivity Disorder (ADHD)	Behavioral: Clinical decision support for medication titration	Primary • Improvement in symptoms, as measured by the parent-reported Vanderbilt Assessment Scale Secondary • Side effects as reported on the ADHD Vanderbilt Scale
Informing Policy to Implement Pediatric Family Engagement in Meaningful Use Stage 3 PROS PeRC	Children's Hospital of Philadelphia Agency for Healthcare Research and Quality (AHRQ) American Academy of Pediatrics	• Child has a diagnosis of asthma on his/her problem list • Ages 6 to 12 years	Other: MyAsthma Web Portal	Primary • Use of the MyAsthma Portal Survey Secondary • Asthma management

Study Name Location Trial Identifier	Sponsors and Collaborators Study Status	Population Disease/Condition Age	Interventions / Groups	Outcomes
NCT01966068	DARTNet Institute Recruiting Start: October 2013 Complete: September 2014			
Intervention to Improve Adherence in Teen Kidney Transplant Multiple sites NCT01356277	McGill University Health Center Children's Hospital of Philadelphia Children's Hospital Medical Center, Cincinnati Seattle Children's Hospital Washington University Early Recognition Center British Columbia Children's Hospital The Hospital for Sick Children St. Justine's Hospital Recruiting Start: February 2012 Complete: June 2016	<ul style="list-style-type: none"> • At least 3 months post kidney transplant • Ages 11 to 24 years 	Behavioral: Action-focused problem-solving Device: Electronic pillbox monitoring, dosage reminders, and feedback	<ul style="list-style-type: none"> • Taking adherence • Timing adherence • Clinical outcomes • Healthcare system factors
PECARN Emergency Care Registry The Children's Hospital of Colorado Children's National Medical Center Cincinnati Children's Hospital Medical Center Children's Hospital of Philadelphia Data Coordinating Center NCT01657344	Children's Hospital of Philadelphia Agency for Healthcare Research and Quality (AHRQ) Recruiting Start: January 2011 Complete: NR	<ul style="list-style-type: none"> • All patients (0-18) who registered in the ED during 2011 and during a 24 month study period between 2012 and 2015 • All licensed independent practitioners in the ED during 2011 and during a 24 month study period between 2012 and 2015 • Ages 18 years and younger 	NR	Improved performance and decreased variability (variation) of care
Study of Technology to Accelerate Research Harvard Vanguard Medical Associates	Harvard Pilgrim Health Care Brigham and Women's Hospital Cambridge Health Alliance Harvard Vanguard Medical Associates	<ul style="list-style-type: none"> • Child's BMI exceeds the 95th percentile for age and sex (CDC criteria) • Parent can respond to interviews and 	Behavioral: Usual Care Behavioral: Clinician intervention only Behavioral: Clinician intervention plus Direct-to-parent	Primary <ul style="list-style-type: none"> • Change in screening and assessment of childhood obesity at the point of care, including BMI, blood pressure, and laboratory

Study Name Location Trial Identifier	Sponsors and Collaborators Study Status	Population Disease/Condition Age	Interventions / Groups	Outcomes
NCT01537510	Completed Start: December 2010 Complete: September 2013	questionnaires in English • Child has obtained well-child care from HVMA for at least the previous 15 months • Ages 6 to 12 years	communication	screening, and provision of nutrition and physical activity counseling Secondary • Change in Body Mass Index • Change in Health Behaviors • Costs (including clinician and family time) and cost-effectiveness in terms of children's change in BMI and weight-related behaviors
Using Computers to Assist in the Diagnosis and Treatment of Attention-deficit/Hyperactivity Disorder (ADHD) Children's Health Services Research NCT01351064	Indiana University National Library of Medicine (NLM) Completed Start: July 2010 Complete: July 2012	• Ages 5 to 12 years	Other: CHICA ADHD Module	Primary • Number of children diagnosed with ADHD Secondary • Number of children screened for ADHD

Appendix G. Reasons for Exclusion

Exclusion Code	Exclusion Reason	Count
X-1	Not youth	10
X-2	Does not address pediatric-specific functionality or feature of an EHR	135
X-3	Not a health care setting	38
X-4	Not specific to outpatient	51
X-5	Does not address a guiding question	53
X-6	Unavailable/ non-English	3
X-7	Duplicate	1

References with reason(s) for exclusion

1. Electronic medical record could save millions. *Hosp Case Manag* 1999 Dec;7(12):211-2. PMID: 11184598. **X-2**
2. Use guidelines to prepare for children with special needs, or risk tragedy. *ED Manag* 2000 Aug;12(8):85-90, suppl 1-2. PMID: 11186740. **X-5**
3. Immunization information system progress--United States, 2003. *MMWR Morb Mortal Wkly Rep* 2005 Jul 29;54(29):722-4. PMID: 16049421. **X-5**
4. Study: implementation of CPOE can raise mortality. *Healthcare Benchmarks Qual Improv* 2006 Feb;13(2):16-7. PMID: 16544556. **X-2, X-4**
5. Guideline on record-keeping. *Pediatr Dent* 2008;30(7 Suppl):226-33. PMID: 19216426. **X-2**
6. Report urges development in Children's Health IT. *Biomed Instrum Technol* 2009 Sep-Oct;43(5):350. PMID: 19842752. **X-2**
7. Computerized decision support for pediatric meds--effectiveness uncertain. *Health Devices* 2012 Dec;41(12):400-1. PMID: 23444688. **X-2**
8. Abramson EL, Kaushal R; Computerized provider order entry and patient safety. *Pediatr Clin North Am* 2012 Dec;59(6):1247-55. PMID: 23116522. **X-2**
9. Adhikari PD, Parker LA, Binns HJ, et al.; Influence of electronic health records and in-office weight management support resources on childhood obesity care. *Clin Pediatr (Phila)* 2012 Aug;51(8):788-92. PMID: 21576184. **X-2**
10. Aguila A, Valenzuela P; [Experience with electronic files in a university neonatology unit]. *Rev Med Chil* 2005 Feb;133(2):241-5. PMID: 15824836. **X-5**
11. Alvarado MM, Ntaimo L, Banerjee A, et al.; Reducing pediatric medication errors: A survey and taxonomy. *IIE Transactions on Healthcare Systems Engineering* 2012 April;2(2):142-55. PMID: 2013231330. **X-2, X-5**
12. Amirthalingam G, White J, Ramsay M; Measuring childhood vaccine coverage in England: the role of Child Health Information Systems. *Euro Surveill* 2012;17(16) PMID: 22551461. **X-3**
13. Anderson HJ; Avoiding 'alert fatigue'. *Health Data Manag* 2009 Oct;17(10):42. PMID: 19845096. **X-2**
14. Andrews AL, Kazley AS, Basco WT, Jr., et al.; Lower Rates of EMR Use in Rural Hospitals Represent a Previously Unexplored Child Health Disparity. *Hosp Pediatr* 2014 Jul;4(4):211-6. PMID: 24986989. **X-5**
15. Auber BA, Hamel G; Adoption of smart cards in the medical sector: the Canadian experience. *Soc Sci Med* 2001 Oct;53(7):879-94. PMID: 11522135. **X-1**
16. Bellazzi R, Riva A, Montani S, et al.; Application report: preliminary evaluation of the T-IDDM project in Pavia. *Stud Health Technol Inform* 1999;68:99-101. PMID: 10725043. **X-2**
17. Ben Said M, Robel L, Vion E, et al.; Implementation and experimentation of TEDIS: an information system dedicated to patients with pervasive developmental disorders. *Stud Health Technol Inform* 2011;169:270-4. PMID: 21893755. **X-4**
18. Ben Said M, Robel L, Vion E, et al.; TEDIS: an information system dedicated to patients with pervasive developmental disorders. *Stud Health Technol Inform* 2010;160(Pt 1):198-202. PMID: 20841677. **X-5**
19. Berry MD; Healthcare reform: administrative rulemaking. *Issue brief. Issue*

Brief Health Policy Track Serv 2012 Dec 31:1-29. PMID: 23297441. **X-2**

20. Blond MH, Menguy C, Gold F, et al.; [Medical informatics (hospital information systems) in neonatology: reality and insufficiencies]. Arch Pediatr 2000 Nov;7(11):1212-9. PMID: 11109950. **X-3, X-4**

21. Bourgeois FC, Linder J, Johnson SA, et al.; Impact of a computerized template on antibiotic prescribing for acute respiratory infections in children and adolescents. Clin Pediatr (Phila) 2010 Oct;49(10):976-83. PMID: 20724348. **X-2**

22. Burrige AM, Wilson K, Terry D; Support tools for paediatric inpatient prescribers: A review. European Journal of Hospital Pharmacy: Science and Practice 2014 April;21(2):113-7. PMID: 2014160690. **X-4**

23. Caldwell NA, Power B; The pros and cons of electronic prescribing for children. Arch Dis Child 2012 Feb;97(2):124-8. PMID: 21685504. **X-2**

24. Call RJ, Burlison JD, Robertson JJ, et al.; Adverse Drug Event Detection in Pediatric Oncology and Hematology Patients: Using Medication Triggers to Identify Patient Harm in a Specialized Pediatric Patient Population. J Pediatr 2014 Apr 24 PMID: 24768254. **X-4**

25. Canon SJ, Purifoy JA, Heulitt GM, et al.; Results: Survey of pediatric urology electronic medical records-use and perspectives. J Urol 2011 Oct;186(4 Suppl):1740-4. PMID: 21862073. **X-3**

26. Castellanos I, Rellensmann G, Scharf J, et al.; Computerized Physician Order Entry (CPOE) in pediatric and neonatal intensive care: Recommendations how to meet clinical requirements. Appl Clin Inform 2012;3(1):64-79. PMID: 23616901. **X-5**

27. Cerda G, Zatzick D, Wise M, et al.; Computerized registry recording of psychiatric disorders of pediatric patients with burns. J Burn Care Rehabil 2000 Jul-Aug;21(4):368-70; discussion 7. PMID: 10935820. **X-2, X-4**

28. Chen AR, Lehmann CU; Computerized provider order entry in pediatric oncology: design, implementation, and outcomes. J Oncol Pract 2011 Jul;7(4):218-22. PMID: 22043183. **X-2**

29. Chern JJ, Macias CG, Jea A, et al.; Effectiveness of a clinical pathway for patients with cerebrospinal fluid shunt malfunction. J Neurosurg Pediatr 2010 Oct;6(4):318-24. PMID: 20887102. **X-3**

30. Chin TL; Assembling the records puzzle. Health Data Manag 1999 Jan;7(1):36, 8-40. PMID: 10345794. **X-2**

31. Chiu SH, Fitzgerald KM; Electronic medical/health record and pediatric behavioral health providers: progress and problems. Arch Psychiatr Nurs 2013 Apr;27(2):108-9. PMID: 23540522. **X-2**

32. Christensen M; [The use of electronic medical records can contribute in diagnosing a case of battered child]. Ugeskr Laeger 2013 Jan 28;175(5):284-5. PMID: 23369331. **X-2**

33. Coffey C, Wurster LA, Groner J, et al.; A Comparison of Paper Documentation to Electronic Documentation for Trauma Resuscitations at a Level I Pediatric Trauma Center. J Emerg Nurs 2014 Jul 1 PMID: 24996509. **X-4**

34. Coleman NE, Pon S; Quality: performance improvement, teamwork, information technology and protocols. Crit Care Clin 2013 Apr;29(2):129-51. PMID: 23537668. **X-3, X-4**

35. Condren M, Studebaker IJ, John BM; Prescribing errors in a pediatric clinic. Clin Pediatr (Phila) 2010 Jan;49(1):49-53. PMID: 19643978. **X-2**

36. Cook JE; The HITECH Act and electronic health records' limitation in coordinating care for children with complex chronic conditions. J Allied Health 2014 Summer;43(2):117-20. PMID: 24925039. **X-5**

37. Costa FF, Foly LS, Coutinho MP; DataGenno: building a new tool to bridge molecular and clinical genetics. *Appl Clin Genet* 2011;4:45-54. PMID: 23776366. **X-2**
38. Costakos DT; Of lobsters, electronic medical records, and neonatal total parenteral nutrition. *Pediatrics* 2006 Feb;117(2):e328-32. PMID: 16452339. **X-4**
39. Cramer JG; 'We bought the wrong EMR'. *Med Econ* 2010 Feb 5;87(3):28-30. PMID: 20337171. **X-2**
40. Crossno CL, Cartwright JA, Hargrove FR; Using CPOE to improve communication, safety, and policy compliance when ordering pediatric chemotherapy. *Hospital Pharmacy* 2007 April;42(4):368-73. PMID: 2007199187. **X-4**
41. Dattani N, Hardelid P, Davey J, et al.; Accessing electronic administrative health data for research takes time. *Arch Dis Child* 2013 May;98(5):391-2. PMID: 23448863. **X-2**
42. de Jose MI, Jimenez de Ory S, Espiau M, et al.; A new tool for the paediatric HIV research: general data from the Cohort of the Spanish Paediatric HIV Network (CoRISpe). *BMC Infect Dis* 2013;13:2. PMID: 23282073. **X-2**
43. Despotova-Toleva LD; A model of a computer file for the intensive neonatal practice "Neonatal Intensive Computer File". *Folia Med (Plovdiv)* 1999;41(2):38-43. PMID: 10534912. **X-4**
44. Dickens DS, Sinsabaugh D; Impact of computerized prescriber order entry on the incidence of adverse drug events in pediatric inpatients. *Pediatrics* 2008 Sep;122(3):678; author reply -9. PMID: 18762542. **X-3, X-4**
45. Disabato JA, Levisohn P, Hutton L, et al.; Improving transition to adult epilepsy care: Facilitating team communication using clinical decision support in the EMR. *Epilepsy Currents* 2014 January-February;14:151. PMID: 71433137. **X-2**
46. Downing GJ, Zuckerman AE, Coon C, et al.; Enhancing the quality and efficiency of newborn screening programs through the use of health information technology. *Semin Perinatol* 2010 Apr;34(2):156-62. PMID: 20207265. **X-5**
47. Dryden EM, Hardin J, McDonald J, et al.; Provider perspectives on electronic decision supports for obesity prevention. *Clin Pediatr (Phila)* 2012 May;51(5):490-7. PMID: 22330047. **X-2**
48. Duffy FH; Long latency evoked potential database for clinical applications: justification and examples. *Clin EEG Neurosci* 2005 Apr;36(2):88-98. PMID: 15999904. **X-2, X-3**
49. Durand S, Rideau Batista Novais A, Mesnage R, et al.; Validation of nosocomial infection in neonatology: A new method for standardized surveillance. *Am J Infect Control* 2014 Aug;42(8):861-4. PMID: 24930956. **X-3, X-4**
50. Ellis-Davies K, Sakkalou E, Fowler NC, et al.; CUE: the continuous unified electronic diary method. *Behav Res Methods* 2012 Dec;44(4):1063-78. PMID: 22648694. **X-2, X-3**
51. Ellsworth MA, Carey WA, Li M, et al.; Implementation of an electronic data monitoring system decreases the rate of hyperoxic episodes in premature neonates. *J Perinatol* 2013 Sep;33(9):721-4. PMID: 23579491. **X-5**
52. Ewalt DH; Editorial comment. *J Urol* 2011 Oct;186(4 Suppl):1745; discussion PMID: 21862077. **X-2, X-5**
53. Ferranti JM, Horvath MM, Jansen J, et al.; Using a computerized provider order entry system to meet the unique prescribing needs of children: description of an advanced dosing model. *BMC Med Inform Decis Mak* 2011;11:14. PMID: 21338518. **X-5**
54. Figge HL; E-prescribing and the impact on medication dispensing errors. *U.S.* 2012 July; *Pharmacist*. 37(7):31-3. PMID: 2012439730. **X-2**

55. Fiks AG, Grundmeier RW, Margolis B, et al.; Comparative effectiveness research using the electronic medical record: an emerging area of investigation in pediatric primary care. *J Pediatr* 2012 May;160(5):719-24. PMID: 22364853. **X-2**
56. Fine AM, Kalish LA, Forbes P, et al.; Parent-driven technology for decision support in pediatric emergency care. *Jt Comm J Qual Patient Saf* 2009 Jun;35(6):307-15. PMID: 19565690. **X-3, X-4**
57. Finkel E; Caring for kids, with technology by their side. Children's Medical's Durovich sees IT as tool to 'help us do what we do better'. *Mod Healthc* 2011 Jun 13;41(24):25-6. PMID: 21714400. **X-2**
58. Ford-Jones A; Practice Tips. Immunization tracker for primary care physicians. *Can Fam Physician* 1999 Dec;45:2875-6. PMID: 10626053. **X-2**
59. Forrest CB, Fiks AG, Bailey LC, et al.; Improving adherence to otitis media guidelines with clinical decision support and physician feedback. *Pediatrics* 2013 Apr;131(4):e1071-81. PMID: 23478860. **X-2**
60. Frankovich J, Longhurst CA, Sutherland SM; Evidence-based medicine in the EMR era. *N Engl J Med* 2011 Nov 10;365(19):1758-9. PMID: 22047518. **X-2, X-5**
61. Frenn KA, Hendrickson M, Kharbanda AB; Reducing pediatric CT usage through web-based education. *Radiol Manage* 2014 May-Jun;36(3):12-6; quiz 7-8. PMID: 25004681. **X-2**
62. Frize M, Catley C, Walker CR, et al.; Towards a web services infrastructure for perinatal, obstetrical, and neonatal clinical decision support. *Conf Proc IEEE Eng Med Biol Soc* 2004;5:3334-7. PMID: 17270996. **X-2, X-3, X-4**
63. Giannone G; Computer-supported weight-based drug infusion concentrations in the neonatal intensive care unit. *Comput Inform Nurs* 2005 Mar-Apr;23(2):100-5. PMID: 15772511. **X-4**
64. Ginsberg HG; Since Katrina: neonatal and pediatric issues from both sides of the levee. *Pediatrics* 2011 Aug;128 Suppl 1:S15-7. PMID: 21807705. **X-2**
65. Glasper EA, Holmes CW, Brown KL, et al.; Shared records: towards collaborative working with families. *Paediatr Nurs* 2006 Feb;18(1):34-7. PMID: 16518952. **X-5**
66. Goedert J; A real shot in the arm. *Health Data Manag* 2000 Feb;8(2):34, 6, 8. PMID: 11183663. **X-2**
67. Gold J, Reyes-Gastelum D, Turner J, et al.; A quality improvement study using fishbone analysis and an electronic medical records intervention to improve care for children with asthma. *Am J Med Qual* 2014 Jan-Feb;29(1):70-7. PMID: 23574643. **X-2**
68. Gonzalez-Heydrich J, DeMaso DR, Irwin C, et al.; Implementation of an electronic medical record system in a pediatric psychopharmacology program. *Int J Med Inform* 2000 Jul;57(2-3):109-16. PMID: 10961567. **X-3, X-4**
69. Grech V; The impact of information technology on pediatric cardiology: present, past, and future. *Pediatr Cardiol* 2000 Jul-Aug;21(4):324-7. PMID: 10865006. **X-2, X-3**
70. Greenwood JL, Narus SP, Leiser J, et al.; Measuring body mass index according to protocol: how are height and weight obtained? *J Healthc Qual* 2011 May-Jun;33(3):28-36. PMID: 22414017. **X-1, X-2**
71. Grigull L, Betzel C, Schumacher U, et al.; Should paediatricians use a computer to receive diagnostic support?. [German]. *Padiatrische Praxis* 2012 December;79(4):545-55. PMID: 2012749639. **X-2, X-6**
72. Grigull L, Lechner WM; Supporting diagnostic decisions using hybrid and complementary data mining applications: a pilot

study in the pediatric emergency department. *Pediatr Res* 2012 Jun;71(6):725-31. PMID: 22441377. **X-5**

73. Grisso AG, Wright L, Hargrove FR; The Pharmacist's Role in CPOE: A Pediatric Perspective. *Hospital Pharmacy* 2003 November;38(11):1086-9+104. PMID: 2003473077. **X-6**

74. Hadley AM; Progress towards the clinical workstation at the New Children's Hospital. *Health Inf Manag* 1999 Mar-May;29(1):42-3. PMID: 10977172. **X-2**

75. Hagland M; CPOE and patient safety. *Healthc Inform* 2011 Jun;28(6):76-8. PMID: 21736218. **X-2**

76. Hanauer DA, Zheng K; Detecting workflow changes after a CPOE implementation: a sequential pattern analysis approach. *AMIA Annu Symp Proc* 2008:963. PMID: 18999105. **X-4**

77. Hazelzet JA; Computerized physician order entry: friend or foe? *Pediatr Crit Care Med* 2007 May;8(3):304-5. PMID: 17496521. **X-2**

78. Hedden EM, Jessop AB, Field RI; Childhood immunization information system exchange with payers: State and federal policies. *Journal of Managed Care Medicine* 2012;15(3):11-8. PMID: 2012660185. **X-2, X-5**

79. Hicken VN, Thornton SN, Rocha RA; Integration challenges of clinical information systems developed without a shared data dictionary. *Stud Health Technol Inform* 2004;107(Pt 2):1053-7. PMID: 15360973. **X-5**

80. Hing E, Hsiao CJ; State variability in supply of office-based primary care providers: United States, 2012. *NCHS Data Brief* 2014 May(151):1-8. PMID: 24813076. **X-2**

81. Hinman AR, Eichwald J, Linzer D, et al.; Integrating child health information systems. *Am J Public Health* 2005 Nov;95(11):1923-7. PMID: 16195524. **X-2**

82. Hinman AR, Saarlal KN, Ross DA; A vision for child health information systems: developing child health information systems to meet medical care and public health needs. *J Public Health Manag Pract* 2004 Nov;Suppl:S91-8. PMID: 15643366. **X-5**

83. Holmes M; Andrew Szende and the development of the electronic Child Health Network (eCHN). *Healthc Q* 2010;13(3):26-9. PMID: 20523148. **X-2, X-5**

84. Hoyle T, Swanson R; Assessing what child health information systems should be integrated: the Michigan experience. *J Public Health Manag Pract* 2004 Nov;Suppl:S66-71. PMID: 15643362. **X-2**

85. Huff C; Hospital to test if EMR, other innovations boost care for Medicaid kids. *Cook Children's opens a new clinic to 'learn what works and what doesn't'*. *Hosp Health Netw* 2009 Oct;83(10):17. PMID: 19967812. **X-2**

86. Issenman RM, Jaffer IH; Use of voice recognition software in an outpatient pediatric specialty practice. *Pediatrics* 2004 Sep;114(3):e290-3. PMID: 15342888. **X-2**

87. Jackson G; Child abuse: a computerised register 40 years after it was proposed. *Int J Clin Pract* 2013 Mar;67(3):191-2. PMID: 23409684. **X-2**

88. Jacobs B; Hardly child's play: implementing a pediatric-specific, integrated CPOE system. *Midwest pediatric hospital tackles all the hurdles--needs assessment, clinician buy-in, training and measuring results--as it strengthens its patient safety efforts with wireless CPOE*. *Health Manag Technol* 2004 Aug;25(8):30-2. PMID: 15328958. **X-5**

89. Jacobs BR, Hart KW, Rucker DW; Reduction in Clinical Variance Using Targeted Design Changes in Computerized Provider Order Entry (CPOE) Order Sets: Impact on Hospitalized Children with Acute Asthma Exacerbation. *Appl Clin Inform* 2012;3(1):52-63. PMID: 23616900. **X-5**

90. Jacobs JP, Maruszewski B, Tchervenkov CI, et al.; The current status and future directions of efforts to create a global database for the outcomes of therapy for congenital heart disease. *Cardiol Young* 2005 Feb;15 Suppl 1:190-7. PMID: 15934716. **X-2, X-4**
91. Jaspers MW, Steen T, van den Bos C, et al.; The think aloud method: a guide to user interface design. *Int J Med Inform* 2004 Nov;73(11-12):781-95. PMID: 15491929. **X-2, X-5**
92. Jenders RA, Dasgupta B, Mercedes D, et al.; Use of a hospital practice management system to provide initial data for a pediatric immunization registry. *Proc AMIA Symp* 1999:286-90. PMID: 10566366. **X-5**
93. Johnson KE, Beaton SJ, Andrade SE, et al.; Methods of linking mothers and infants using health plan data for studies of pregnancy outcomes. *Pharmacoepidemiol Drug Saf* 2013 Jul;22(7):776-82. PMID: 23596095. **X-5**
94. Johnson KH, Guthrie S; Harnessing the power of student health data: Selecting, using, and implementing electronic school health documentation systems. *NASN Sch Nurse* 2012 Jan;27(1):26-33. PMID: 22720477. **X-2, X-3**
95. Jones JL; Implementing computerized prescriber order entry in a children's hospital. *Am J Health Syst Pharm* 2004 Nov 15;61(22):2425-9. PMID: 15581267. **X-2**
96. Kalra D, Fernando B; Approaches to enhancing the validity of coded data in electronic medical records. *Prim Care Respir J* 2011 Mar;20(1):4-5. PMID: 21060979. **X-2**
97. Kaushal R, Barker KN, Bates DW; How can information technology improve patient safety and reduce medication errors in children's health care? *Arch Pediatr Adolesc Med* 2001 Sep;155(9):1002-7. PMID: 11529801. **X-2**
98. Kelleher KJ, Horwitz SM; Quality of mental health care for children: a familiar storyline. *Med Care* 2006 Dec;44(12):1061-3. PMID: 17122708. **X-2**
99. Kelly B; A records system for kids. *Health Data Manag* 2002 May;10(5):30-2, 4. PMID: 12017101. **X-2**
100. Kemper AR, Uren RL, Clark SJ; Adoption of electronic health records in primary care pediatric practices. *Pediatrics* 2006 Jul;118(1):e20-4. PMID: 16818534. **X-5**
101. Kern LM, Barron Y, Dhopeswarkar RV, et al.; Electronic health records and ambulatory quality of care. *J Gen Intern Med* 2013 Apr;28(4):496-503. PMID: 23054927. **X-2**
102. Kim GR, Lehmann CU; Pediatric aspects of inpatient health information technology systems. *Pediatrics* 2008 Dec;122(6):e1287-96. PMID: 19047228. **X-3, X-4**
103. Kim GR, Miller MR, Ardolino MA, et al.; Capture and classification of problems during CPOE deployment in an academic pediatric center. *AMIA Annu Symp Proc* 2007:414-7. PMID: 18693869. **X-2**
104. Klass P; Disconnected. *N Engl J Med* 2010 Apr 15;362(15):1358-61. PMID: 20393174. **X-2**
105. Knaup P, Wiedemann T, Wolff A, et al.; [Computer-assisted documentation and therapy planning in pediatric oncology--introduction of a nationwide solution]. *Klin Padiatr* 1999 Jul-Aug;211(4):189-91. PMID: 10472547. **X-3**
106. Kramer T, Iliffe S, Bye A, et al.; Testing the feasibility of therapeutic identification of depression in young people in British general practice. *J Adolesc Health* 2013 May;52(5):539-45. PMID: 23608718. **X-2, X-3**
107. Lazou K, Farini M, Koutkias V, et al.; Adverse drug event prevention in neonatal care: a rule-based approach. *Stud Health Technol Inform* 2013;186:170-4. PMID: 23542991. **X-3**
108. Lee EK, Mejia AF, Senior T, et al.; Improving Patient Safety through Medical Alert Management: An Automated Decision Tool to

Reduce Alert Fatigue. AMIA Annu Symp Proc 2010;2010:417-21. PMID: 21347012. **X-2**

109. Lemon V, Stockwell DC; Automated detection of adverse events in children. *Pediatr Clin North Am* 2012 Dec;59(6):1269-78. PMID: 23116524. **X-2**

110. Lenclen R; [Computerized physician order entry softwares for pediatric units]. *Arch Pediatr* 2005 Jun;12(6):918-20. PMID: 15904850. **X-4**

111. Leu MG, O'Connor KG, Marshall R, et al.; Pediatricians' use of health information technology: a national survey. *Pediatrics* 2012 Dec;130(6):e1441-6. PMID: 23166335. **X-2**

112. Levenson D; NIH to include children's genomic data in electronic medical records. *Am J Med Genet A* 2011 Nov;155a(11):ix-x. PMID: 22021228. **X-3, X-4**

113. Li Q, Melton K, Lingren T, et al.; Phenotyping for patient safety: algorithm development for electronic health record based automated adverse event and medical error detection in neonatal intensive care. *J Am Med Inform Assoc* 2014 Jan 8; PMID: 24401171. **X-3, X-4**

114. Lillis K; Automated dosing. Computerized physician order entry reduces risk of medication and dosing errors in neonatal ICU. *Health Manag Technol* 2003 Nov;24(11):36-7. PMID: 14608711. **X-4**

115. Lin M, Brooks TN, Miller AC, et al.; English-based pediatric emergency medicine software improves physician test performance on common pediatric emergencies: A multicenter study in Vietnam. *Western Journal of Emergency Medicine* 2013;14(5):471-6. PMID: 2013748353. **X-2**

116. Lipton J, Hazelzet JA; Clinical decision support systems: Important tools when appropriately used. *Pediatr Crit Care Med* 2009 Jan;10(1):128-9. PMID: 19131870. **X-4**

117. List BA, Ballard JL, Langworthy KS, et al.; Electronic health records in an outpatient

breastfeeding medicine clinic. *J Hum Lact* 2008 Feb;24(1):58-68. PMID: 18281357. **X-2**

118. Litvin CB, Ornstein SM, Wessell AM, et al.; Use of an electronic health record clinical decision support tool to improve antibiotic prescribing for acute respiratory infections: the ABX-TRIP study. *J Gen Intern Med* 2013 Jun;28(6):810-6. PMID: 23117955. **X-1**

119. Livon D, Abaziou JM, Franceschini JC, et al.; The electronic health record of the child, a natural evolution. [French]. *Journal de Pediatrie et de Puericulture* 2005 August;18(5):224-7. PMID: 2005363478. **X-2, X-5**

120. Livon D, Abaziou JM, Franceschini JC, et al.; Electronic health record of children, a natural evolution. [French]. *Actualites Pharmaceutiques* 2006 January(448):10-1. PMID: 2006049302. **X-6**

121. Locke R, Stefano M, Koster A, et al.; Optimizing patient/caregiver satisfaction through quality of communication in the pediatric emergency department. *Pediatr Emerg Care* 2011 Nov;27(11):1016-21. PMID: 22068060. **X-3, X-4**

122. Lomotan EA, Hoeksema LJ, Edmonds DE, et al.; Evaluating the use of a computerized clinical decision support system for asthma by pediatric pulmonologists. *Int J Med Inform* 2012 Mar;81(3):157-65. PMID: 22204897. **X-3**

123. Longhurst C, Sharek P, Hahn J, et al.; Perceived increase in mortality after process and policy changes implemented with computerized physician order entry. *Pediatrics* 2006 Apr;117(4):1450-1; author reply 5-6. PMID: 16585351. **X-4**

124. Longhurst C, Turner S, Burgos AE; Development of a Web-based decision support tool to increase use of neonatal hyperbilirubinemia guidelines. *Jt Comm J Qual Patient Saf* 2009 May;35(5):256-62. PMID: 19480378. **X-3**

125. Lu M, Ownby DR, Zoratti E, et al.; Improving efficiency and reducing costs: Design

of an adaptive, seamless, and enriched pragmatic efficacy trial of an online asthma management program. *Contemp Clin Trials* 2014 May;38(1):19-27. PMID: 24607295. **X-5**

126. Lykowski G, Mahoney D; Computerized provider order entry improves workflow and outcomes. *Nurs Manage* 2004 Feb;35(2):40g-h. PMID: 14767222. **X-4**

127. Matheson A, Diaz A; Getting the record straight: the story of one NACCHO demonstration site's efforts to improve child health. *J Public Health Manag Pract* 2009 Nov-Dec;15(6):535-7. PMID: 19823160. **X-2**

128. Mazars N, Milesi C, Carbajal R, et al.; Implementation of a neonatal pain management module in the computerized physician order entry system. *Ann Intensive Care* 2012;2(1):38. PMID: 22913821. **X-5**

129. McCartney PR; Using technology to promote perinatal patient safety. *J Obstet Gynecol Neonatal Nurs* 2006 May-Jun;35(3):424-31. PMID: 16700694. **X-4**

130. McKenna C, Gaines B, Hatfield C, et al.; Implementation of a screening, brief intervention, and referral to treatment program using the electronic medical record in a pediatric trauma center. *J Trauma Nurs* 2013 Jan-Mar;20(1):16-23. PMID: 23459427. **X-3, X-4**

131. Menachemi N, Brooks RG, Schwalenstocker E, et al.; Use of health information technology by children's hospitals in the United States. *Pediatrics* 2009 Jan;123 Suppl 2:S80-4. PMID: 19088234. **X-5**

132. Mendola P, Mannisto TI, Leishear K, et al.; Neonatal health of infants born to mothers with asthma. *J Allergy Clin Immunol* 2014 Jan;133(1):85-90.e1-4. PMID: 23916153. **X-2**

133. Merrill J, Phillips A, Keeling J, et al.; Effects of automated immunization registry reporting via an electronic health record deployed in community practice settings. *Appl Clin Inform* 2013;4(2):267-75. PMID: 23874363. **X-1, X-2, X-5**

134. Milani S, Buckler JM, Kelnar CJ, et al.; The use of local reference growth charts for clinical use or a universal standard: a balanced appraisal. *J Endocrinol Invest* 2012 Feb;35(2):224-6. PMID: 22490992. **X-2**

135. Miller PL, Frawley SJ, Sayward FG; Exploring three approaches for handling incomplete patient histories in a computer-based guideline for childhood immunization. *Proc AMIA Symp* 1999:878-82. PMID: 10566486. **X-5**

136. Mitchell L; Connecting for children's health. *Paediatr Nurs* 2005 Jul;17(6):24-5. PMID: 16045001. **X-2**

137. Mohr T; The second time around. *Health Manag Technol* 2008 Sep;29(9):22, 4-5. PMID: 18795739. **X-2**

138. Moll HA; Clinical decision support systems in pediatrics: What are we waiting for? [Dutch]. *Tijdschrift voor Kindergeneeskunde* 2007 April;75(2):52-6. PMID: 2007227677. **X-5**

139. Monteagudo-Piqueras O, Marin-Lopez J, Barragan Perez AJ, et al.; [The quality of diagnostic coding: a training need in primary care]. *Aten Primaria* 2013 May;45(5):282. PMID: 23433704. **X-2**

140. Nakamura MM, Harper MB, Jha AK; Change in adoption of electronic health records by US children's hospitals. *Pediatrics* 2013 May;131(5):e1563-75. PMID: 23589808. **X-2, X-3, X-4**

141. Nielsen BA, Baum RA, Soares NS; Navigating ethical issues with electronic health records in developmental-behavioral pediatric practice. *J Dev Behav Pediatr* 2013 Jan;34(1):45-51. PMID: 23275058. **X-2, X-5**

142. O'Connor AC, Kennedy ED, Loomis RJ, et al.; Prospective cost-benefit analysis of a two-dimensional barcode for vaccine production, clinical documentation, and public health

reporting and tracking. *Vaccine* 2013 Jun 28;31(31):3179-86. PMID: 23664988. **X-2**

143. Ostrowska-Nawarycz L, Nawarycz T, Derlecki S, et al.; [Application of computer base standards to pediatrics practice]. *Pol Merkur Lekarski* 2000 Sep;9 Suppl 1:46-8. PMID: 11081346. **X-2**

144. Otero P; [Advantages and risks associated with the use of electronic medical records]. *Arch Argent Pediatr* 2011 Dec;109(6):476-7. PMID: 22231883. **X-2**

145. Paciorowski N, Pruitt C, Lashly D, et al.; Development of performance tracking for a pediatric hospitalist division. *Hosp Pediatr* 2013 Apr;3(2):118-28. PMID: 24340412. **X-5**

146. Pageler NM, Longhurst CA, Wood M, et al.; Use of electronic medical record-enhanced checklist and electronic dashboard to decrease CLABSIs. *Pediatrics* 2014 Mar;133(3):e738-46. PMID: 24567021. **X-4**

147. Palma JP, Van Eaton EG, Longhurst CA; Neonatal Informatics: Information Technology to Support Handoffs in Neonatal Care. *Neoreviews* 2011;2011(12)PMID: 22199463. **X-3, X-4**

148. Paperny DM; Computers and information technology: implications for the 21st century. *Adolesc Med* 2000 Feb;11(1):183-202. PMID: 10640346. **X-2**

149. Pasek TA, Lefcakis LA, O'Malley CK, et al.; Power in documentation: an eProgress note for APNs. *Crit Care Nurse* 2009 Jun;29(3):104, 2-3. PMID: 19487786. **X-2**

150. Patel SJ, Longhurst CA, Lin A, et al.; Integrating the home management plan of care for children with asthma into an electronic medical record. *Jt Comm J Qual Patient Saf* 2012 Aug;38(8):359-65. PMID: 22946253. **X-5**

151. Patel VN, Abramson E, Edwards AM, et al.; Consumer attitudes toward personal health records in a beacon community. *Am J Manag*

Care 2011 Apr;17(4):e104-20. PMID: 21774099. **X-2, X-3**

152. Patwardhan A, Kelleher K, Cunningham D, et al.; Improving the influenza vaccination rate in patients visiting pediatric rheumatology clinics using automatic best practice alert in electronic patient records. *Pediatric Rheumatology* 2012 13 Jul;10PMID: 70982721. **X-7**

153. Pergami P, Thayapararajah SW, Seemaladinne N; West Virginia University Pediatric Stroke Registry: Clinical Description and Risk Factors Identification in Patients From a Rural Area. *Clin Pediatr (Phila)* 2014 Jul 20PMID: 25049311. **X-2**

154. Peverini RL, Beach DS, Wan KW, et al.; Graphical user interface for a neonatal parenteral nutrition decision support system. *Proc AMIA Symp* 2000:650-4. PMID: 11079964. **X-4, X-5**

155. Pevnick JM, Asch SM, Adams JL, et al.; Adoption and use of stand-alone electronic prescribing in a health plan-sponsored initiative. *Am J Manag Care* 2010 Mar;16(3):182-9. PMID: 20225913. **X-1, X-2**

156. Phillips RS; Accessing electronic information for clinical decisions. *Arch Dis Child* 2000 Nov;83(5):373-4. PMID: 11040137. **X-2**

157. Pittman M; Loophole in alert system. *Emerg Nurse* 2013 Mar;20(10):10; discussion PMID: 23586165. **X-2**

158. Porcelli PJ, Rosenbloom ST; Evaluation of a neonatal growth curve designed for an electronic health record. *AMIA Annu Symp Proc* 2006:1066. PMID: 17238685. **X-2**

159. Porter SC, Forbes P, Manzi S, et al.; Patients providing the answers: narrowing the gap in data quality for emergency care. *Qual Saf Health Care* 2010 Oct;19(5):e34. PMID: 20511242. **X-5**

160. Potts AL, Barr FE, Gregory DF, et al.; Computerized physician order entry and

medication errors in a pediatric critical care unit. *Pediatrics* 2004 Jan;113(1 Pt 1):59-63. PMID: 14702449. **X-2, X-3**

161. Pretorius E, Cronje ML, Strydom O; Development of a pediatric cardiac computer aided auscultation decision support system. *Conf Proc IEEE Eng Med Biol Soc* 2010;2010:6078-82. PMID: 21097128. **X-2**

162. Pyles LA, Hines C, Patock M, et al.; Development of a web-based database to manage American College of Emergency Physicians/American Academy of Pediatrics Emergency Information Forms. *Acad Emerg Med* 2005 Mar;12(3):257-61. PMID: 15741591. **X-5**

163. Ramnarayan P, Britto J; Paediatric clinical decision support systems. *Arch Dis Child* 2002 Nov;87(5):361-2. PMID: 12390900. **X-2**

164. Rappaport DI, Collins B, Koster A, et al.; Implementing medication reconciliation in outpatient pediatrics. *Pediatrics* 2011 Dec;128(6):e1600-7. PMID: 22123872. **X-2**

165. Rattay KT, Ramakrishnan M, Atkinson A, et al.; Use of an electronic medical record system to support primary care recommendations to prevent, identify, and manage childhood obesity. *Pediatrics* 2009 Jan;123 Suppl 2:S100-7. PMID: 19088224. **X-2**

166. Reckmann MH, Westbrook JI, Koh Y, et al.; Does computerized provider order entry reduce prescribing errors for hospital inpatients? A systematic review. *J Am Med Inform Assoc* 2009 Sep-Oct;16(5):613-23. PMID: 19567798. **X-3, X-4**

167. Rinke ML, Mikat-Stevens N, Saul R, et al.; Genetic services and attitudes in primary care pediatrics. *Am J Med Genet A* 2014 Feb;164a(2):449-55. PMID: 24254914. **X-5**

168. Rocca MA, Rosenbloom ST, Spooner A, et al.; Development of a domain model for the pediatric growth charting process by mapping to the HL7 Reference Information Model. *AMIA*

Annu Symp Proc 2006:1077. PMID: 17238696. **X-2**

169. Roehrer E, Cummings E, Turner P, et al.; Supporting cystic fibrosis with ICT. *Stud Health Technol Inform* 2013;183:137-41. PMID: 23388270. **X-2**

170. Sainz de la Maza M, Molina N, Gonzalez-Gonzalez LA, et al.; Clinical characteristics of a large cohort of patients with scleritis and episcleritis. *Ophthalmology* 2012 Jan;119(1):43-50. PMID: 21963265. **X-1, X-2**

171. Schau CJ, Rokaw N; A path to medical excellence: steps to improve quality at Asheville Medicine and Pediatrics. *N C Med J* 2014 May-Jun;75(3):184-5. PMID: 24830491. **X-2**

172. Schneck LH; Efficient, enterprising, electronic. Pediatric group stays current with technology. *MGMA Connex* 2009 Nov-Dec;9(10):29-30. PMID: 20058495. **X-2**

173. Schulman J; NICU Notes: A Palm OS and Windows database software product and process to facilitate patient care in the newborn intensive care unit. *AMIA Annu Symp Proc* 2003:999. PMID: 14728502. **X-2**

174. Senior T; Paper to EMR: A successful transition. *Health Manag Technol* 2006 Oct;27(10):40, 2, 5. PMID: 17052104. **X-2**

175. Shaikh U, Nettiksimmons J, Bell RA, et al.; Accuracy of parental report and electronic health record documentation as measures of diet and physical activity counseling. *Acad Pediatr* 2012 Mar-Apr;12(2):81-7. PMID: 22209035. **X-5**

176. Sharifi M, Adams WG, Winickoff JP, et al.; Enhancing the electronic health record to increase counseling and quit-line referral for parents who smoke. *Acad Pediatr* 2014 Sep-Oct;14(5):478-84. PMID: 25169159. **X-2, X-5**

177. Shiffman RN, Brandt CA, Liaw Y, et al.; A design model for computer-based guideline implementation based on information management services. *J Am Med Inform Assoc*

- 1999 Mar-Apr;6(2):99-103. PMID: 10094062. **X-5**
178. Shiffman RN, Liaw Y, Navedo DD, et al.; User satisfaction and frustration with a handheld, pen-based guideline implementation system for asthma. Proc AMIA Symp 1999:940-4. PMID: 10566499. **X-2**
179. Simpson KR; Perinatal acuity tool. MCN Am J Matern Child Nurs 2013 May-Jun;38(3):191. PMID: 23625111. **X-1, X-2, X-3, X-4**
180. Simpson LA; The adolescence of child health services research. JAMA Pediatr 2013 Jun;167(6):509-10. PMID: 23588790. **X-2**
181. Sinha M, Khor KN, Amresh A, et al.; The use of a kiosk-model bilingual self-triage system in the pediatric emergency department. Pediatr Emerg Care 2014 Jan;30(1):63-8. PMID: 24378865. **X-5**
182. Sittig DF, Ash JS, Zhang J, et al.; Lessons from "Unexpected increased mortality after implementation of a commercially sold computerized physician order entry system". Pediatrics 2006 Aug;118(2):797-801. PMID: 16882838. **X-3, X-4**
183. Sloane EB; Using a decision support system tool for healthcare technology assessments. IEEE Eng Med Biol Mag 2004 May-Jun;23(3):42-55. PMID: 15354994. **X-2**
184. Smith SD; Cyber safety net. Minn Med 2008 Nov;91(11):20-1. PMID: 19108539. **X-2**
185. Soderberg LM; Designing and creating a central venous catheter database and electronic charting system. J Intraven Nurs 2001 May-Jun;24(3):159-68. PMID: 11530361. **X-2**
186. Soler D, Baldacchino D, Amato-Gauci A; Pilot of a Child Health Electronic Surveillance System (CHESS) in Malta. Journal of Public Health 2007 June;15(3):199-209. PMID: 2007282859. **X-2**
187. Spellman Kennebeck S, Timm N, Farrell MK, et al.; Impact of electronic health record implementation on patient flow metrics in a pediatric emergency department. J Am Med Inform Assoc 2012 May-Jun;19(3):443-7. PMID: 22052897. **X-3, X-4**
188. Spooner SA; We are still waiting for fully supportive electronic health records in pediatrics. Pediatrics 2012 Dec;130(6):e1674-6. PMID: 23166347. **X-5**
189. Starmer AJ, DUBY JC, Slaw KM, et al.; Pediatrics in the year 2020 and beyond: preparing for plausible futures. Pediatrics 2010 Nov;126(5):971-81. PMID: 20956424. **X-2, X-5**
190. Sterling S, Kline-Simon AH, Wibbelsman C, et al.; Screening for adolescent alcohol and drug use in pediatric health-care settings: predictors and implications for practice and policy. Addict Sci Clin Pract 2012;7:13. PMID: 23186254. **X-2**
191. Stockwell DC, Bisarya H, Classen DC, et al.; Development of an Electronic Pediatric All-Cause Harm Measurement Tool Using a Modified Delphi Method. J Patient Saf 2014 Aug 26; PMID: 25162206. **X-2, X-5**
192. Stockwell DC, Kirkendall E, Muething SE, et al.; Automated adverse event detection collaborative: electronic adverse event identification, classification, and corrective actions across academic pediatric institutions. J Patient Saf 2013 Dec;9(4):203-10. PMID: 24257063. **X-4**
193. Stuart K; You can't get there from here: misplaced incentives can undermine the goals of health care reform in the NICU setting. J Perinatol 2012 Aug;32(8):570-3. PMID: 22842801. **X-5**
194. Subramanyan GS, Yokoe DS, Sharnprapai S, et al.; An algorithm to match registries with minimal disclosure of individual identities. Public Health Rep 1999 Jan-Feb;114(1):91-3. PMID: 9925178. **X-2**

195. Szende A; Ontario's province-wide paediatric electronic health record. *Stud Health Technol Inform* 2009;143:99-103. PMID: 19380922. **X-2**
196. Szynal D; Continuity of kids' care. *Health Data Manag* 2001 Apr;9(4):22-4, 6. PMID: 11310339. **X-2, X-5**
197. Tan K, Dear PR, Newell SJ; Clinical decision support systems for neonatal care. *Cochrane Database Syst Rev* 2005(2):Cd004211. PMID: 15846701. **X-3, X-4**
198. Tarrago R, Nowak JE, Leonard CS, et al.; Reductions in invasive device use and care costs after institution of a daily safety checklist in a pediatric critical care unit. *Jt Comm J Qual Patient Saf* 2014 Jun;40(6):270-8. PMID: 25016675. **X-3, X-4**
199. Telleen S; Developing a state outcomes monitoring system in public health maternal and child health. *J Med Syst* 1999 Jun;23(3):227-38. PMID: 10554738. **X-2**
200. Toll E; A piece of my mind. The cost of technology. *Jama* 2012 Jun 20;307(23):2497-8. PMID: 22797449. **X-2**
201. Toma TS, Rea MF; [The Baby-Friendly Hospital Initiative and the computerized tools for its monitoring and sustainability]. *Rev Panam Salud Publica* 2011 Nov;30(5):505-6. PMID: 22262280. **X-3, X-4**
202. Trotter A, Maier L; Computerized physician order entry system in pediatric inpatients: Prevention of medication errors and adverse drug events. [German]. *Monatsschrift fur Kinderheilkunde* 2009 February;157(2):160-5. PMID: 2009221830. **X-5**
203. Tyler A, Boyer A, Martin S, et al.; Development of a discharge readiness report within the electronic health record-A discharge planning tool. *J Hosp Med* 2014 Aug;9(8):533-9. PMID: 24825848. **X-4**
204. Tyler-Beynum K, Jacobs BR; When less is more: big problem, small change, better outcomes. *Pediatr Crit Care Med* 2013 May;14(4):439-40. PMID: 23648877. **X-4**
205. Upperman JS, Staley P, Friend K, et al.; The introduction of computerized physician order entry and change management in a tertiary pediatric hospital. *Pediatrics* 2005 Nov;116(5):e634-42. PMID: 16263977. **X-2**
206. Upperman JS, Staley P, Friend K, et al.; The impact of hospitalwide computerized physician order entry on medical errors in a pediatric hospital. *J Pediatr Surg* 2005 Jan;40(1):57-9. PMID: 15868559. **X-4**
207. Van Walleggem N, MacDonald CA, Dean HJ; Transition of care for young adults with type 1 and 2 diabetes. *Pediatr Ann* 2012 May;41(5):e16-20. PMID: 22587508. **X-1, X-2**
208. Vardi A, Efrati O, Levin I, et al.; Prevention of potential errors in resuscitation medications orders by means of a computerised physician order entry in paediatric critical care. *Resuscitation* 2007 Jun;73(3):400-6. PMID: 17289249. **X-3, X-4**
209. Ventura ML, Battan AM, Zorloni C, et al.; The electronic medical record: pros and cons. *J Matern Fetal Neonatal Med* 2011 Oct;24 Suppl 1:163-6. PMID: 21942617. **X-3, X-4**
210. Verma SK; The information highway: a threat to medical confidentiality. *Indian Pediatr* 2001 Aug;38(8):884-8. PMID: 11520999. **X-2**
211. Vest JR, Issel LM; Factors related to public health data sharing between local and state health departments. *Health Serv Res* 2014 Feb;49(1 Pt 2):373-91. PMID: 24359636. **X-5**
212. Wang Y, Caggana M, Sango-Jordan M, et al.; Long-term follow-up of children with confirmed newborn screening disorders using record linkage. *Genet Med* 2011 Oct;13(10):881-6. PMID: 21637103. **X-2**
213. Webber EC, Warhurst HM, Smith SS, et al.; Conversion of a single-facility pediatric antimicrobial stewardship program to multi-facility application with computerized provider

- order entry and clinical decision support. *Appl Clin Inform* 2013;4(4):556-68. PMID: 24454582. **X-2, X-4**
214. Weigle CG, Scanlon MC; There's many a slip. *J Pediatr* 2006 Oct;149(4):435-6. PMID: 17011307. **X-2**
215. Weitzman M, Shiffman RN; Information technology and the future of child health care: a revolution is occurring. *Arch Pediatr Adolesc Med* 2001 Sep;155(9):990-1. PMID: 11529798. **X-2**
216. Wetzel G; Pediatric cardiology in a digital world. *Curr Opin Cardiol* 2001 Jul;16(4):265-6. PMID: 11574789. **X-2, X-4**
217. Wong ST, Bernick LA, Portillo C, et al.; Implementing a nurse information system in a nurse-managed primary care practice: a process in progress. *Clin Excell Nurse Pract* 1999 Mar;3(2):123-7. PMID: 10646401. **X-1, X-2**
218. Woodman J, de Lusignan S, Rafi I, et al.; GPs' role in safeguarding children. *Bmj* 2012;345:e4758. PMID: 22802403. **X-2**
219. Worthey E, Bick D, Dimmock D, et al.; Clinical diagnostic whole genome sequencing in a paediatric population: Experience from our WGS genetics clinic. *BMC Proceedings* 2012 Oct;6:S3. PMID: 71478224. **X-2**
220. Wu P, Carroll KN, Gebretsadik T, et al.; The developmental trajectory of pediatric asthma in 3- to-10-year-olds. *J Allergy Clin Immunol* 2012 May;129(5):1397-8. PMID: 22322007. **X-2**
221. Wu ST, Sohn S, Ravikumar KE, et al.; Automated chart review for asthma cohort identification using natural language processing: an exploratory study. *Ann Allergy Asthma Immunol* 2013 Nov;111(5):364-9. PMID: 24125142. **X-2**
222. Zarlengo R; Meaningful use for the pediatrician. *Med Health R I* 2011 Jul;94(7):209-10. PMID: 21894850. **X-5**
223. Zerbe KJ, Allen JG; Integrating outcome measurement with clinical practice: the FACE Recording and Measurement System. Introduction. *Bull Menninger Clin* 1999 Summer;63(3):285-7. PMID: 10452191. **X-1**
224. Zhai H, Brady P, Li Q, et al.; Developing and evaluating a machine learning based algorithm to predict the need of pediatric intensive care unit transfer for newly hospitalized children. *Resuscitation* 2014 Aug;85(8):1065-71. PMID: 24813568. **X-3, X-4**
225. Zhang Y, Levin JE, Padman R; Data-driven order set generation and evaluation in the pediatric environment. *AMIA Annu Symp Proc* 2012;2012:1469-78. PMID: 23304427. **X-2, X-4**
226. Zhong VW, Pfaff ER, Beavers DP, et al.; Use of administrative and electronic health record data for development of automated algorithms for childhood diabetes case ascertainment and type classification: the SEARCH for Diabetes in Youth Study. *Pediatr Diabetes* 2014 Jun 9 PMID: 24913103. **X-5**
227. Zipkin R, Schragger SM, Keefer M, et al.; Improving home management plan of care compliance rates through an electronic asthma action plan. *J Asthma* 2013 Aug;50(6):664-71. PMID: 23574196. **X-5**
228. Zomer-Kooijker K, van Erp FC, Balemans WA, et al.; The expert network and electronic portal for children with respiratory and allergic symptoms: rationale and design. *BMC Pediatr* 2013;13:9. PMID: 23324209. **X-2**
229. Zurhellen W; The coming of age of the electronic office. *Pediatr Ann* 2001 May;30(5):289-97. PMID: 11383469. **X-2**

