Clinical Decision Support for Immunizations (CDSi) Project

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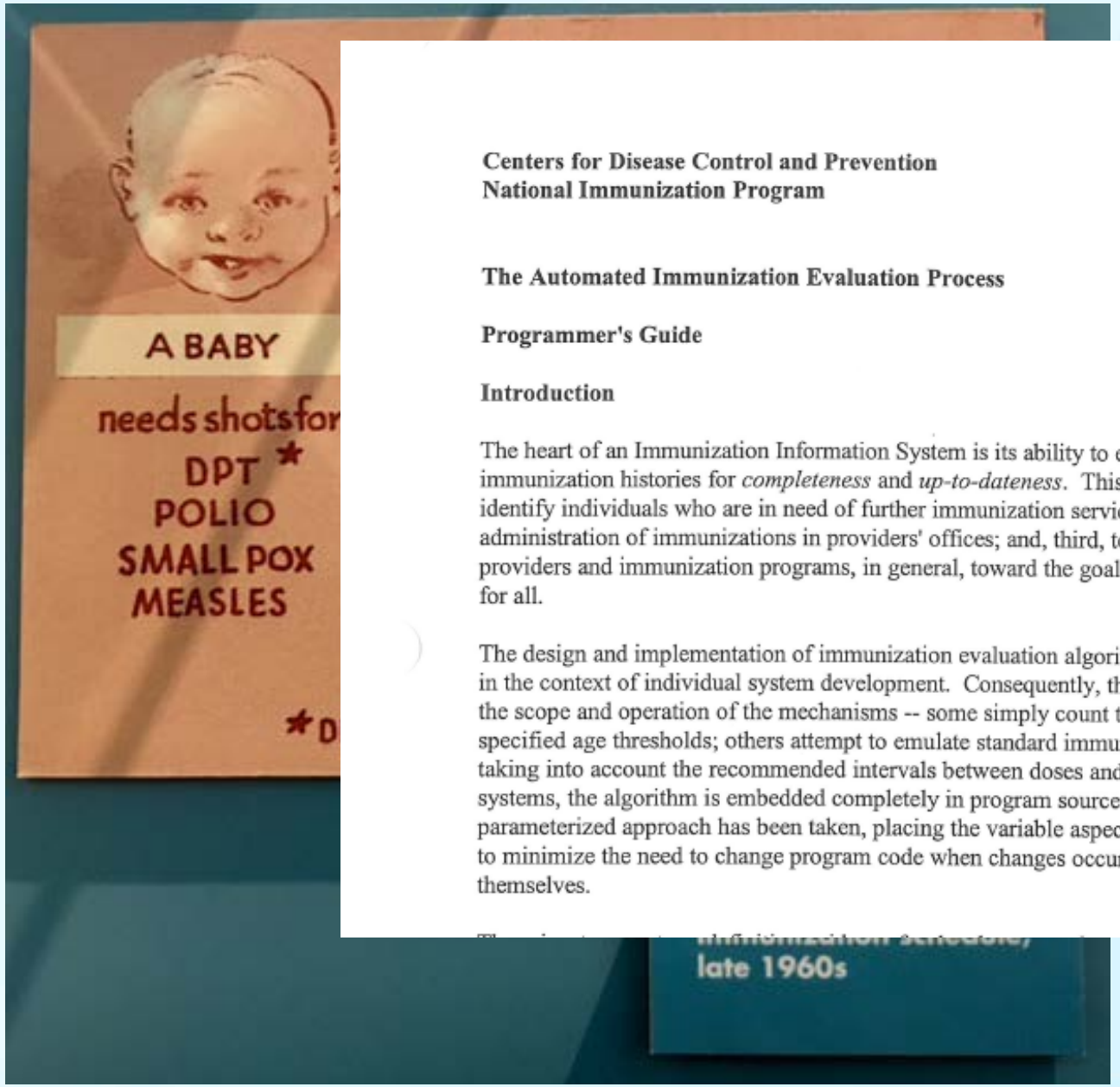


Centers for Disease Control and Prevention
National Immunization Program

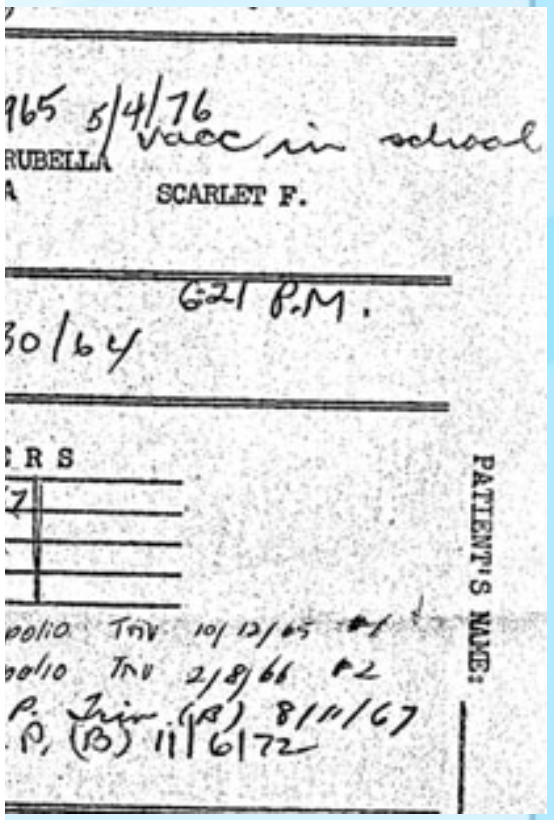
The Automated Immunization Evaluation Process

Programmer's Guide

Introduction

The heart of an Immunization Information System is its ability to evaluate individual immunization histories for *completeness* and *up-to-dateness*. This functionality is used, first, to identify individuals who are in need of further immunization services; second, as a guide to the administration of immunizations in providers' offices; and, third, to assess the progress of providers and immunization programs, in general, toward the goal of complete immunizations for all.

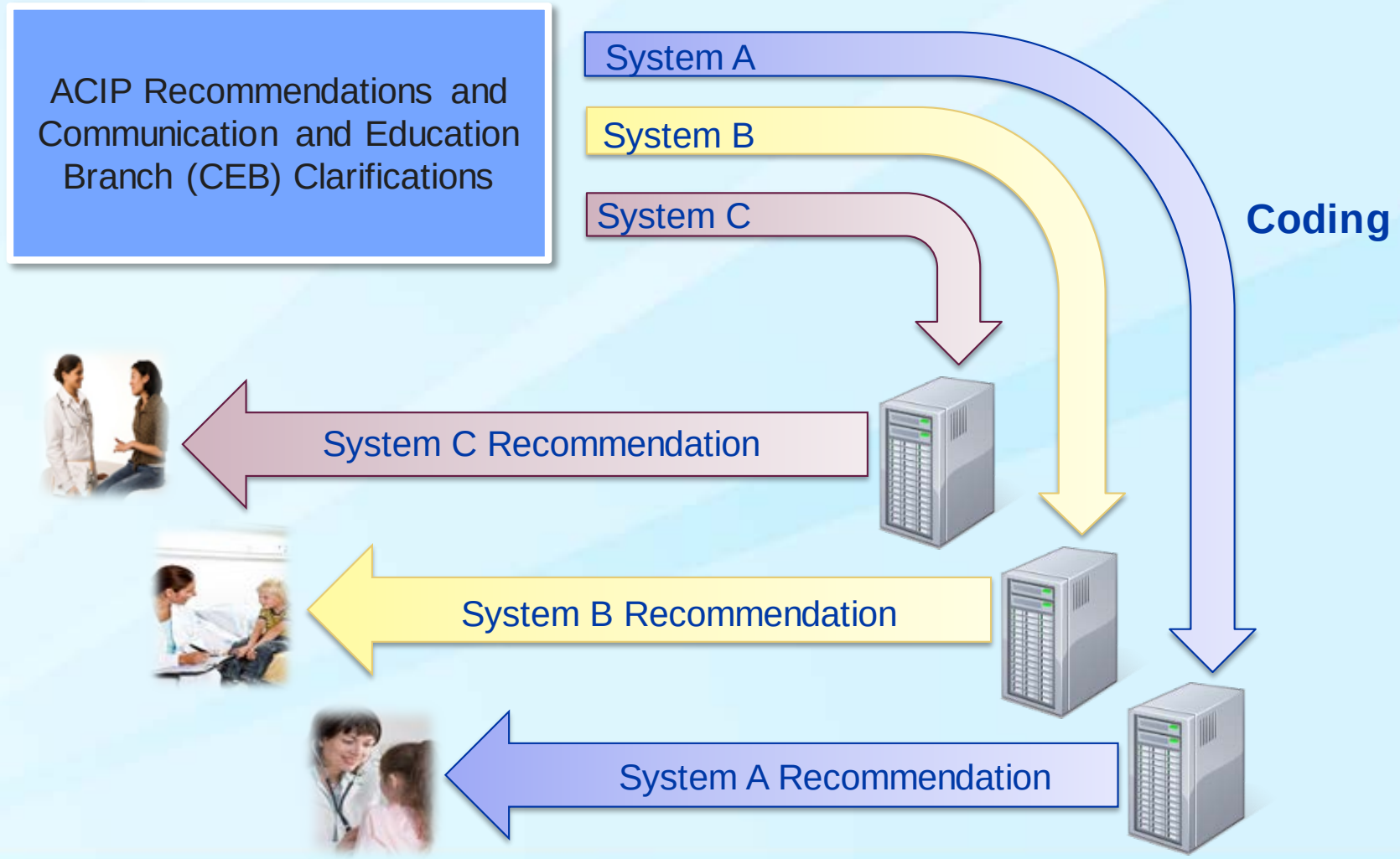
The design and implementation of immunization evaluation algorithms, heretofore, has occurred in the context of individual system development. Consequently, there is considerable variation in the scope and operation of the mechanisms -- some simply count the number of doses received at specified age thresholds; others attempt to emulate standard immunization schedules exactly, by taking into account the recommended intervals between doses and other factors. In some systems, the algorithm is embedded completely in program source code, while, in others, a parameterized approach has been taken, placing the variable aspects of the process in data tables, to minimize the need to change program code when changes occur in the recommendations themselves.



Today's Topics

- Quick Refresh on CDSi Resources
- Updates Since Last Year
- AIRA/CDC Discovery for CDSi Assessment
- Upcoming Work

Form Versus Content (Pre-CDSi)



Form Versus Content (With CDSi)

ACIP Recommendations and Communication and Education Branch (CEB) Clarifications

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CDSi Resources

Coding

Consistent System Recommendations

CDSi resources translate clinical recommendations into technical information

The complete suite of CDSi Resources comprises:

Logic Specification
- Vocabulary
- Business Rules
- Decision Tables
- Processing Definitions
- Domain Model

Supporting Data
- Excel Format
- XML Format
- Release Notes

Test Cases
- Excel Format

Training Materials
- Brochure
- Quick Guides
- Practice Exercises
- Quiz
- Videos

Project Phases

	Phase 1	Phase 2	Phase 3
Foundation	Current ACIP Recommendations		
Scope	Healthy children, birth through 18 years	Healthy people, birth to death	Birth to death, with: • Underlying Conditions which Indicate vaccination, Contraindicate vaccination or provide evidence of Immunity
Resources Created	• Logic Specification • Supporting Data • Test Cases	• Logic Specification • Supporting Data • Test Cases	• Logic Specification • Supporting Data • Test Cases • Code Set for Indications, Contraindications, and Immunities
Publication Date	November 2013 – May 2015 - Release 1.x	June 2015 - Current - Release 2.x	Estimated: first half of 2016 - Release 3.x

Highlights from Release 2.x of CDSi

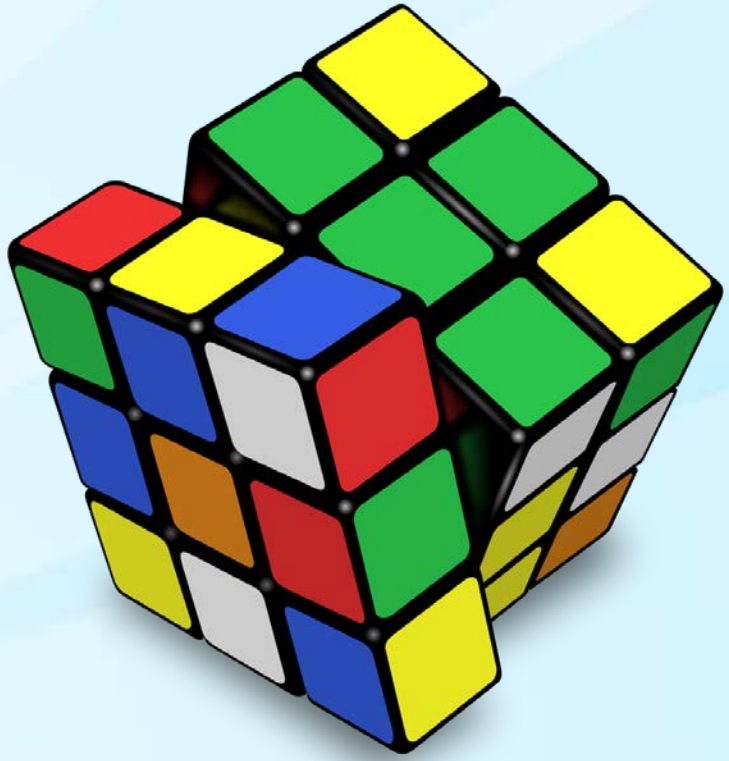
- **Scope Expansion**
  - Routine Recommendations from birth ~~through 18 years~~ to death

- **Reviewed/improved supporting data across all antigens**
- **Incorporated Zoster and adult Pneumococcal recommendations**
- **Improved evidence of immunity logic and supporting data**
- **Updated/created test cases based on expanded scope**
- **Improved and consistent dose skipping documentation**
- **Improved Tdap/Td catch-up**

AIRA/CDC Discovery for CDSi Assessment

- **Development of Report of the AIRA Interoperability Testing Project**
  - Parameters of what could be measured
    - Current CDS technologies
    - Provider needs
    - Data returned from IIS
  - Approach and next step recommendations for CDS engine assessment
- **Interview IIS staff in coming months**
- **Will be contacted by CDSi team members**

Current Challenges



Phase 3 Project Goals

- Take the ACIP recommendations and other supporting materials for “at risk” patients and translate them into codified data that a CDSi engine can use to calculate non-standard vaccinations
- Where possible, each condition should be mapped to external code sets
- Consistency and precision in language is needed for systematic coding

Issues Discovered

- Concept mapping to external codes is incomplete and less than ideal
  - Subtly different language is used across vaccine recommendations for what may (or may not) be the same concept
  - Some concepts are vaguely defined
  - Some conditions may evolve over time
- Not all of the underlying conditions are things that a CDSi engine (or even an EHR) is likely to know

Inconsistent Language

Vaccine	Recommendation Language
Pneumococcal	“Chronic renal failure”
HepB	“Persons with end-stage renal disease”
Influenza	“Renal disorder”

Vaccine	Recommendation Language
Pneumococcal	“Chronic liver disease (including cirrhosis)”
HepA and HepB	“Persons with chronic liver disease”
Influenza	“Hepatic disorder”

Does this represent meaningful variation?
Is cirrhosis included in HepA and HepB?

Inconsistent Language

Vaccine	Recommendation Language
Meningococcal B	"persistent complement component deficiencies, including inherited or chronic deficiencies in C3, C5-9, properdin, factor D, factor H, or who are taking eculizumab (Soliris)"
Pneumococcal	"persistent complement component deficiencies, particularly C1, C2, C3, and C4 deficiencies"

Are these the same conditions?

Vague Terminology

Vaccine	Recommendation Language
Various	“Health care personnel”
Does this include anyone working in a health care facility? Clinicians only? Lab staff? Front end staff?	
HepB	“Public safety worker exposed to blood or infectious body fluids”
What is the definition of "public safety worker"? First responders? Police? Social workers?	
Meningococcal	“Persons at risk during an outbreak”
Does this refer to classes of people (e.g. first responders, clinicians) or activities or environmental conditions?	

Concepts That Evolve Over Time

- **Recommendation Language:**
  - "Taken influenza antiviral medications within the previous 48 hours (e.g. amantadine, rimantadine, zanamivir, or oseltamivir)"
  - "Antimicrobial or antimarial taken within 72 hours"

- **Issues:**
  - **Difficult to code off of the general concept of "antiviral medication."**
  - **Is an exhaustive list possible?**
  - **Could provide textual guidance to a clinician, but would require more work on the provider's part.**

Concepts Not Known to EHR/IIS

- **It may not be reasonable for a patient's record to include certain information**

- **Examples:**
  - *"Not in a long-term, mutually monogamous relationship"*
  - *"Close contact with an international adoptee during the first 60 days"*
  - *"Travel to country with a Yellow Fever vaccination entry requirement"*
  - *"Microbiologists routinely exposed to Neisseria meningitides"*
  - *"Household contact with pregnant woman"*

Solutions

- Highlighted the issues with ACIP:
  - Helping to interpret the existing language
  - Clarifying vague and contradictory text
- Verify alignment with code sets for even seemingly clear concepts
- Future recommendations:
  - Awareness
  - More coordination amongst ACIP workgroups
  - Possible AIRA involvement

Performance Support and Marketing Materials

Available Spring 2016

http://www.cdc.gov/vaccines/programs/iis/cdsi.html

For more information please contact Centers for Disease Control and Prevention

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