Incorporating Bright Futures Into Electronic Health Records

Faculty for this session:

- S. Trent Rosenbloom, MD, MPH, FAAP
- Susan Kressly, MD, FAAP
- Ellen Link, MD, FAAP
- George Phillips, MD, FAAP
- Chip Hart
Faculty Disclosure Information

- In the past 12 months, I have no relevant financial relationships with the manufacturer(s) of any commercial product(s) and/or provider(s) of commercial services discussed in this CME activity.

- We do not intend to discuss an unapproved/investigative use of a commercial product/device in this presentation.
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- Faculty Disclosure Information - clarifications
  - Dr. Rosenbloom recently participated as a consultant on the AAP’s Electronic Translation of Academy Clinical Content Initiative (eTACC).
  - This panel will discuss the Bright Futures guidelines. Bright Futures is a commercial entity, sold for profit. This panel does not intend to promote the sale of Bright Futures products.
Bright Futures* is a program supported by the AAP to standardize an approach to health maintenance and supervision.

*Bright Futures: Guidelines for Health Supervision of Infants, Children and Adolescents, Third Edition

Designed to standardize an approach to health supervision in children (often described as “well-child care”)

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- Bright Futures includes guidelines for:
  - pediatric clinical and social screening
  - health supervision and promotion
  - developmental assessment
An associated Tool and Resource Kit includes:

- pre-visit patient/parent questionnaires
- standardized clinical documentation forms
- screening and assessment tools
- patient/parent handouts
The current version of Bright Futures has been accepted across the nation by:

- a majority of healthcare providers, operating in a wide variety of practice settings
- health insurers as a standard of care for pediatric preventive care
- the Early Periodic Screening, Diagnosis, and Treatment (EPSDT) Program*

*the child health component of Medicaid, covering 26 million children
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- Pediatric documentation may be standardized using templates based on Bright Futures, as sanctioned by AAP.
- Accurately documenting clinical care using Bright Futures has become central to many quality and performance initiatives.

Bright Futures has become a de facto standard
Currently Pediatricians typically document against Bright Futures on paper-based forms.

Bright Futures does not currently exist in a form that is easily integrated into electronic health record systems.
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- Any EHR system vendor or developer wishing to implement Bright Futures does so independently.

- Individual vendors have put in the effort to translate Bright Futures into a reusable, electronic format.

*there has been no effort to standardize this process*
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- Today’s panel will discuss different perspectives covering efforts to integrate Bright Futures content into EHR systems
  - Susan Kressly, Kressly Pediatrics, Warrington PA
  - Ellen Link & George Phillips, University of Iowa Children’s Hospital, Iowa City IA
  - Chip Hart, PCC, Burlington VT
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Panel Discussion here
In Summary:

- Bright Futures content is widely used
- Practices and vendors want to include Bright Futures into their EHR systems
- Incorporating Bright Futures into an EHR system is difficult and time-intensive
- There is interest in a standardized, centralized approach to disseminating Bright Futures content
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- **AAP’s eTACC initiative**
  
  *(Electronic Translation of Academy Clinical Content)*

- **Goal:** develop a mechanism and process to assist in the translation of key Academy clinical content into formats suitable for use within electronic systems

- **Group assembled in August, 2011**
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- Organized by the AAP CHIC
  (Child Health Informatics Center)

- Discovery Phase:
  - September through December, 2011
  - involved review of Bright Futures content and extraction of actionable guidelines
  - considered recommendations from the AAP Vendor Consortium held in the summer, 2011
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- Led by Chris Lehmann, MD
- Consultants:
  - Bill Adams, MD
  - Steve Downs, MD
  - Michael Leu, MD
  - S. Trent Rosenbloom, MD MPH
- Supported by Jennifer Mansour & Vanessa Shorte from the AAP
The eTACC team reviewed:
- Bright Futures content
- Guideline implementation models
- Web services designs and practices

*e.g.*, review guidelines for a 4 month old visit to identify actionable items

*e.g.*, create an ontology of action types and actionable items
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- Arden-esque code for guidelines, example:

  Tuberculosis
  This is an Arden Syntax rule (pseudocode) for generating an alert for the doc to obtain and record a skin test
  Maintenance:
  Title: Tuberculosis;
  Version: 0.1;
  Institution: American Academy of Pediatrics;
  Author: /* S. Trent Rosenbloom */;
  Specialist: Pediatrics;
  Date: 2012-02-16T11:00:00-0400;
  Validation: /*Don’t need anything here yet */ ;
  Library:
  Purpose: BRIGHT FUTURES VISITS: A1, 6, 12, 18 MONTH; ANNUALLY BEGINNING AT THE 2 YEAR VISIT
Tuberculosis cont.

Rationale:
Children who should have annual Tuberculin Skin Test:
• Children infected with HIV
• Incarcerated adolescents

Validated Questions for Determining Risk of Latent Tuberculosis Infection in Children in the United States
• Has a family member or contact had tuberculosis disease?
• Has a family member had a positive tuberculin skin test?
• Was your child born in a high-risk country (countries other than the United States, Canada, Australia, New Zealand, or Western European countries)?
• Has your child traveled (had contact with resident populations) to a high-risk country for more than 1 week?
Tuberculosis cont.

Explanation: The rule searches for any indication of any of these risk factors in the EHR. If present, the rule fires, asking for Tuberculosis screening.;

Keywords: /* This makes searching much easier later on. */;


Links:
Tuberculosis cont.

Knowledge:
Type: data_driven;
Data:
HxHIV := Read Last {HIV from EHR};
HxIncarceration := Read {Incarceration from EHR}; /*This “read” statement will
return a list. */
Dx := Read {DischargeDx from EHR};
FHx := Read {Family History from EHR};
SocHx := {CountryOfBirth from EHR};
;
Priority: 1;
Evoke: Registration event /* e.g., HL7 ADT message received */
;
Tuberculosis cont.

Logic:
If (HxHIV = TRUE) or (042 is in Dx) or/*Human immunodeficiency virus [HIV] disease*/ (V08 is in Dx) or/*Asymptomatic human immunodeficiency virus [HIV] infection status*/ (795.71 is in Dx) or/*Nonspecific serologic evidence of human immunodeficiency virus [HIV]*/ ("Tuberculosis" is in FHx) or ("TB" is in FHx) or ("Positive PPD" is in FHx) or ("Recent Travel to High Risk Country" is in SocHx) or ("Born in High Risk Country" is in SocHx) or Then conclude TRUE;
Else conclude FALSE
;;
Tuberculosis cont.

Action:
Write ("The patient has a risk factor for Tuberculosis. Screen for Tuberculosis.");
Store (PPD_date, PPD_location);
;;
end:
Obviously, a long, technical example.

To construct, will need:

- Ontology of all necessary clinical data elements
  - International Classification of Diseases
  - SNOMED CT
  - LOINC
  - Others

- User interfaces that allow structured documentation of these elements AND / OR smart text processing
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- To construct, will need (cont):
  - Knowledge engineers
  - Centralized hosting model, with curation
  - Web services model(s) for dissemination
  - Vendor buy-in
Some lessons learned through the eTACC

- useful to get vendor feedback when you are building things for them
- vendors wanted executable code where they could subscribe to AAP maintained content
- vendors liked the simple web service provided by CDC (patient information)
More lessons learned through the eTACC

- Test cases and verification look like they will be important especially in environment of multiple different (competing?) web services
- Bright Futures authors will need to review clinical decision support rules prior to rollout to ensure accuracy of translation

- None of this work is trivial
Discussion

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