

Discerning the Bright Futures of Electronic Health Records



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Competent practices of this decade are seeking or have found electronic health records (EHR) for use in the primary care setting. Families may rightly ask if their children's health records are as clear and accurate as their monthly bank statement, because clarity and accuracy are appropriate markers of quality. Adolescents might look with disdain at the hand-written note; that same adolescent can text a succinct note on her mobile phone using only her dominant thumb. Finally, clinicians demand record-keeping tools as clear as their credit card statements or frequent flier miles summary. Why should it be so

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Dr. Hagan has disclosed that he holds a small stock interest in the Physicians' Computer Company, which has an electronic health record product in development.

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much easier to discern a finance charge or a free flight than check a DPT?

Even neatly written paper charts suffer limitations readily corrected by electronic record-keeping. Paper charts are placed in one location (often a big one in terms of valuable office square footage) and will not readily support more than one office location or even two users in different sections of the same office or clinic. Paper charts invite operator variation, and while clinicians typically eschew forms and “cookbooks,” they agree that some level of consistency is essential. New procedures require new content, and electronic records may be more readily adaptable. For example, if a practice decides to begin plotting BMI in a paper chart, the BMI form adds more paper and requires new calculation of old height and weight data, if it can be found. The electronic chart may just add a new BMI feature, which calculates in real time and gathers old heights and weights to create a BMI curve from age 2 years to 18 years.

EHRs have come slowly to primary care, for both children and adults. Expense is a common barrier. The perceived lack of systems appropriate to the tasks of primary care complicates implementation decisions. It is certain that not every electronic record will be appropriate for primary care use, especially for primary pediatric and adolescent care. It is also certain that busy clinicians trained in pediatrics might not have the savvy or training in data management to competently assess or comfortably decide upon an EHR system. Early adapters have been larger multi-specialty settings or individual clinicians with a special interest or perceived expertise in informatics. However, primary care clinicians in pediatrics, family medicine, and internal medicine often complain loudly about the system their practice or clinic administrator selected.

What about primary care sets specific demands on an EHR system? Earlier systems may do a great job with lab data

SIDEBAR.

What is Bright Futures?

Bright Futures is a set of principles, strategies and tools that are theory-based, evidence-driven, and systems-oriented, that can be used to improve the health and well-being of all children through culturally appropriate interventions that address the current and emerging health promotion needs at the family, policy, community, and health systems levels.

From the AAP Bright Futures Education Center Project Advisory Committee

and tabulation of procedures or long dictations, domains of the specialist, but a poor job with documenting care over time or cataloging health promotion opportunities and activities, the world of primary care. Pediatric primary care is high-volume practice, both in number of patients and number of diagnoses. Consider the different record-keeping needs of a cardiologist who does a few things on a few patients each day, as opposed to a primary care clinic with many patients and many different problems. It is a lot to ask for one charting system to serve both. One would be appropriately wary of choosing a system not piloted in a primary care setting.

THE BRIGHT FUTURES GUIDELINES

The newly available *Bright Futures Guidelines for the Health Supervision of Infants, Children, and Adolescents*, third edition,¹ describes the 31 primary care visits recommended for American children from birth to 21 years of age. Published by the American Academy of Pediatrics (AAP) in a cooperative agreement with the U.S. Department of Health and Human Services' Maternal and Child Health Bureau, the guidelines are the work of experts in pediatrics, family medicine, and adolescent medicine, with the key contributions of pediatric nurse practitioners and other experts in oral health, mental health, and nutrition, and the essential input of families. *Bright Futures*, third edition, describes a system of care (see Sidebar) and the guidelines contain content and process for the important health super-

vision visits. Both the content and the proposed process of the Bright Futures visits are well suited to EHR.

THE BRIGHT FUTURES VISIT

The health supervision visit with a healthy child or adolescent and his/her family may have many goals with multiple opportunities. In spite of previous guidelines, consistency among practitioners is not certain. The visits catalogued in the *Bright Futures*, third edition, guidelines follow a construct and format intended to assert the primacy of the family agenda, impart consistency of content, and assure the opportunity for practitioners to create with families individual encounters that are community relevant and culturally competent.

Four tasks are to be accomplished in the health supervision visit: disease detection, disease prevention, health promotion, and anticipatory guidance.² Clinician behavior in these visits reflects training, review of literature including expert opinion and guidelines, community needs and standards, and certainly individual beliefs and passions. Disease might be detected by a thorough physical examination. Indeed, a complete exam is included in each Bright Futures visit and components of the exam important for a certain aged child or adolescent are highlighted. But the routine physical will not prevent disease or promote health, and while the exam might be enhanced by a running dialogue of anticipatory guidance, how relevant the topics that are chosen is important. So there's much more to the well child visit

than the “checkup.” The visit format found in the *Bright Futures*, third edition, guidelines provides a formula to address these tasks.

The time with the child and family, or with the adolescent alone, begins with an interval history and a solicitation of family or youth concerns. This component of the intervention is essential if the patient agenda is to be addressed. The forthcoming *Bright Futures Toolkit*³ includes visit-specific questionnaires to assist in the acquisition of this information, and the opportunity for enhanced

topics relevant to health, development, safety, and other topics appropriate to the child’s age and stage of development or anticipated to soon be relevant. There are many topics that could be discussed. How can they be chosen for importance to a particular child, in his family, in his community, and at his stage of development? A legitimate criticism of all previous guidelines is their encyclopedic approach to anticipatory guidance: if it could be done, then include it. Choice was left to the clinician, inviting excellence in care for thoughtful clinicians

to the Visits” section of the *Bright Futures Guidelines*.¹

ASSESSING ELECTRONIC HEALTH RECORD PACKAGES

There is no existing service or system to certify a particular product as being “Bright Futures compatible.” Lacking such certification, it is the responsibility

Even neatly written paper charts suffer limitations readily corrected by electronic record keeping.

data sharing through electronic media is obvious, either in advance or contemporaneously. The family visit may be more efficient if the questionnaires are completed in advance.

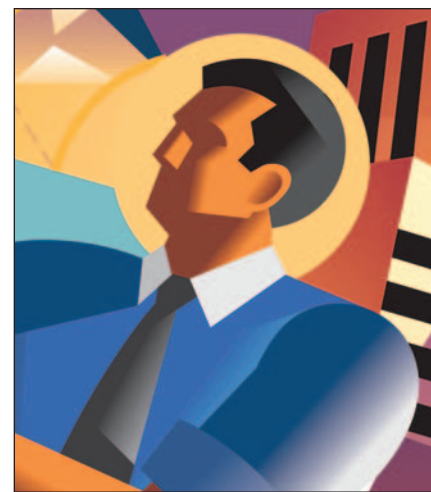
Each visit includes a number of screening tasks, generally related to disease detection and prevention. Some screening is universal (eg, newborn metabolic and hearing screening, or lead screening at age 1 year). Other screening is selective, based on risk assessment. Selective screening questions and tools are also found in the *Bright Futures Toolkit* as part of the pre-visit questionnaires described above. Screening tables conveniently display for practitioners the current standard of care and recommendations of key experts. Where available, evidence in support of screening is presented, as is the rationale for recommended screening and risk-assessment questions.

The major, if not gargantuan, task of any well child visit is the delivery of relevant, essential and appropriate anticipatory guidance. Brazelton⁴ described anticipatory guidance as the discussions with families and patients of certain

without time pressures who enjoy interactive relationships with families. But this approach also tempted the oversight of important issues, as few practices enjoy such time freedom.

In *Bright Futures*, third edition, the expert panel authors were asked to prioritize anticipatory guidance topics for each age visit. Experts took the long view — topics need not be covered at every visit. Rather, a compendium of anticipatory guidance would be addressed over time. This allows the practitioner the input of experts, as topics might be arranged to be delivered in sequential visits.

Anticipatory guidance topics are listed by topic and sub-topic, and relevant information for the clinician is presented. Sample questions are provided, offering suggested wording for issues, both easy and difficult to discuss. Responses to positive queries are also included. The *Bright Futures Toolkit* will provide a Preventive Services Prompting Sheet, allowing documentation of content covered in visits over the relationship with the child. This format is described in detail in the “Introduction



of the clinician to assess such claims. Clinician input to management decisions regarding EHR products is essential. Although few clinicians may have the informatics background or financial savvy to make a final project decision, even fewer computer experts know pediatrics. Certainly not all administrators understand the exam room realities of primary care service delivery to children and adolescents. In large practices, the choice of an EHR vendor must be a shared decision among clinician, administrator, and information technologist. Smaller practices are urged to consult knowledgeable sources or colleagues and not to simply rely on vendor claims when choosing among competing EHR systems. The AAP’s Section on Computers and Other Technologies⁵ is a trusted resource, and the KLAS report⁶ is often recommended.

Before assessing an EHR package, it is essential to assess the practice seek-

ing to employ an EHR. Without an understanding of a practice's function and processes, it is difficult to evaluate how an EHR could improve practice function or enhance practice processes. An EHR cannot be expected to create a good practice, but it can make good practices better. The wise practice will implement Bright Futures components, and then shop for an EHR. The goal is to say to the EHR company, "We are a Bright Futures practice. Show me how your EHR will help us practice better." Without clearly knowing how your practice functions and what you wish from automation, all EHR proposals will look good.

Thus, it is an error to attempt to mold a practice to a health record. Just as the record documents the visit, the record should follow the visit. Plainly, the visit drives the EHR, not the reverse. Concomitantly, the EHR serves the visit, not the reverse. The biggest mistake practices make when purchasing an EHR is to figure out what they need after they buy it.

THE CASE FOR THE BRIGHT FUTURES ELECTRONIC HEALTH RECORD

The Bright Futures Visit is powered to improve the work of the health supervision visit by updating content, enabling family input, capitalizing on the relationship over multiple visits, and otherwise capturing new efficiencies. Much of this important work is further enhanced by careful record-keeping, but to attain maximal efficiency, the contribution of an electronic method is welcome.

What should the Bright Futures-compatible Electronic Health Record do? Put simply, it should do what we clinicians do. The ideal EHR for primary well child care will assist in the tasks of that care and give that care greater efficiency, accuracy, and relevance. The task of the EHR should be the work of the visit. For what tasks can we look to EHR?

The Bright Futures Visits were constructed as a platform for efficient care in a time-limited visit. As such, the visit

SIDEBAR.

Implementation of a Computerized Healthcare System in a Busy Pediatric Practice

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This article is a brief commentary on my experience of implementing the Department of Defense (DoD) computerized healthcare system, AHLTA, into a busy clinical pediatric practice. It is offered as a case study in the spirit of helping others as they undertake their own EMR/EHR transformation. I am a general pediatrician in the U.S. Navy and was recently assigned as General Pediatrics Division Officer of one of the busiest outpatient clinics in the Navy, the Naval Medical Center San Diego, San Diego, California. Our clinic handles approximately 70,000 outpatient pediatric visits per year, with approximately 11 full-time equivalents. We are open weekdays, weekends, and every holiday except Christmas Day and Thanksgiving Day. With seven civilian pediatricians, five civilian pediatric nurse practitioners, five military general pediatricians, 22 pediatric residents, and a host of internal and external rotating residents, medical students, nurse practitioners,

physician assistants, and nursing students, implementation of an electronic medical record was no small task.

AHLTA has been in development for many years, but implementation was directly related to a 1997 presidential directive mandating a centralized, longitudinal patient health record across the DoD enterprise. Implementation began at some military sites in early 2004 but became a major focus of Naval Medical Center San Diego in 2005. The hospital administration provided tremendous support for training and implementing this program within the various clinics. AHLTA is linked to our existing electronic record, referred to as the Composite Health Care System (CHCS). In CHCS, we already had the existing ability to order and review laboratory or radiology tests, medications (through our pharmacy system), and consults. AHLTA is now the most robust electronic healthcare record system in the world. Currently, AHLTA has more than 70 million encounters for 9 million patient worldwide. It has been reported that AHLTA processes in one week what most major healthcare record systems do in a year; this is obviously related to the fact that AHLTA has been implemented by all U.S. military services worldwide.

We initiated a timeline for the transition process, with the initial phase to include training of all personnel. During implementation of AHLTA, appointments were dropped from four to three patients per hour to allow providers time to learn the new system. Obviously, this required buy-in from our

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department and the Command in order to justify a decrease in access for our patients. After initial classroom training on the system, on-the-job trainers were also available intermittently within the clinic over a period of several months.

Subsequent to initial implementation, our clinic underwent a major initiative for business process transformation (BPT) surrounding the use of the new electronic medical record. Major success of this initiative was due in part to our multidisciplinary approach. Our clinic organized a team to focus on BPT. This team included clinician providers, nursing staff, other ancillary support staff, and clerical staff. We examined current processes and identified “low hanging fruit,” or processes that could easily be adjusted to integrate the new system’s usage. We also looked at processes that had a more global impact and would be more difficult to adjust, but were in need of change. Our transformation focused on three main areas: Immunizations, Procedures, and Patient Flow. Other issues that were identified more globally were related to inpatient and outpatient communication as well as naming conventions in multiple systems affecting the unified electronic healthcare record.

A major focus within our clinic was patient flow and standardization of patient care and documentation. Out of our BPT team came numerous and very helpful changes. For instance, the majority of our providers now use uniform encounter templates within the electronic healthcare record to document specific visits. These templates have all been adjusted to include common diagnoses codes, as well as codes for common procedures and therapies. Within our clinic we adapted a universal check-in sheet to follow the patient throughout the clinic and serve as a “place holder” now that we no longer

have hard-copy medical records. On this paper sheet all vital signs are documented prior to their input into the system and our providers order necessary labs, x-rays, medications, or immunizations; our support staff then uniformly and consistently enter these in the AHLTA system. We streamlined this process by decreasing extraneous documentation in other systems, and by training all staff on the appropriate use of AHLTA. By clearly outlining roles and responsibilities of staff members at different stages of the patient encounter, each individual knows his/her role in patient flow and in AHLTA documentation. Providers were spared from certain tedious tasks, thus improving their ability to care directly for patients and to communicate appropriate medical information in the electronic medical record.

Now that we have been using the system for several years, we see the benefits of electronic documentation on a daily basis. Not only do we have the ability to view legible notes written within our own clinic, but also we can view notes from other clinics around the world, where our patients were seen previously. We also have the ability to view laboratory values and x-ray results, as well as sub-specialist consults within the system. At our clinic and our hospital, we developed systems to scan extraneous information into the AHLTA system. For instance, all inpatient discharge information or procedure records are scanned into a section of AHLTA. All consults completed at non-DoD facilities that are returned to our clinic or our hospital are scanned into the system, so that they can be viewed easily by healthcare providers. The system also has a module for telephone consultation with patients. Through using specifically designed templates, we are now able to capture not only telephone consults completed

by providers, but also those completed by our busy clinic nurse triage line. The robust immunization module built into the system is a tremendous asset and tool to allow us to capture vaccines administered in different clinics throughout the DoD system.

After the implementation of the AHLTA system, we closely looked at our patient flow through the clinic and the management of our individual provider appointment templates. By balancing individual provider appointment templates with well-child visits, routine visits and acute visits, individual patient procedures were then balanced throughout the day, allowing for improved flow. We also began staggering appointment times to decrease a backlog of patients at points of check-in or vital signs.

Despite initial hesitation and discomfort with a new system, and many changes, all providers within the general pediatrics clinic at Naval Medical Center San Diego now effectively use and rely on the AHLTA system. Our clinic has been recognized within our Command and within the Navy for the process of business transformation used to fully implement and effectively utilize this new system. As we anticipate and experience ongoing upgrades and changes to the system, our clinic will continue to strive to utilize this robust electronic healthcare system to provide the best, most comprehensive care to our patients, who are cared for worldwide at DoD healthcare facilities. Capturing workload via CPT coding improved, access has been challenged, and a research database for clinical questions and quality improvement now exists to support our training program and clinical practice. It wasn’t easy, but it has been and will continue to be worthwhile it as we now integrate the AAP’s *Bright Futures Health Supervision Guidelines*.

platform can serve as a template for a new class of EHR. Tasks of the Visit involve sorting of information and tasks are often repetitive. In this milieu, EHR outperforms paper record-keeping and can bring efficiency not only in charting but also to patient care.

Automation would provide consistency of documentation for the clinic or practice



and immediately improve efficiency of the following tasks of the Bright Futures Visit:

- Acquiring history (relevant family medical history)
- Identifying and incorporating the family agenda
- Data collection and calculation (growth parameters, calculation of body mass index, plotting growth charts, and blood pressure percentile for age and height)
- Risk assessment for selective screening
- Documentation of universal and selective screening
- Selection of anticipatory guidance materials (documentation of guidance given, documentation of actions taken)
- Generation of family information materials identified in the visit as important
- Determining immunization status and needs (link to state immunization registry)
- Documentation of services or identified needs over time

In addition, to be relevant to the needs of primary care practices or clin-

ics, the office system should also provide the following:

- Patient scheduling
- Patient recall capabilities (recall by age or time, recall by condition, diagnosis, Children with Special Health Care Needs)
- School forms (sports participation, medication administration, immunization, diagnosis certification for special education)
- Billing linked to services documented
- Statistical capabilities (financial data,

and staff efficiency, and cumbersome paper forms could be avoided. A process would also be needed for time-of-visit completion for patients who scheduled at the last minute or who neglected to complete the questionnaire pre-visit.

Parent and youth agenda items, along with positive findings from the pre-visit questionnaire, will serve as the beginning of the electronic chart note for the visit.

- Screening tables, age-specific:
 - Universal screening and
 - Selective screening

Consider the different record keeping needs of a cardiologist who does a few things on a few patients each day, as opposed to a primary care clinic with many patients and many different problems. It is a lot to ask for one charting system to serve both.

patient demographics, practice demographics, research questions).

AN IDEAL EHR USING THE BRIGHT FUTURES GUIDELINES

Following the *Bright Futures Guidelines* for individual visits, an ideal EHR would allow the clinician-enhanced efficiencies incorporating the following components:

- Pre-visit questionnaire function, incorporating
 - Solicitation of parent or youth concerns and agenda,
 - New patient or interval history,
 - Selective screening risk assessment questions, and
 - Anticipatory guidance queries, to assist in the choice of anticipatory guidance topics.

Many practices may choose electronic media as a new opportunity to obtain patient and family information prior to the visit. The pre-visit questionnaire could be completed via e-mail days in advance of a scheduled visit. Pre-completion would enhance physician, nurse,

Selective screening actions are determined from the screening risk assessment questions included in the pre-visit questionnaire. Higher functioning EHR systems will direct necessary selective screening as already determined. Screening tasks can then be completed prior to the clinician's encounter with the patient.

Screening tasks and findings will be added to the developing electronic chart note:

- Physical examination documentation (specific visit physical exam special components as listed in the *Bright Futures Guidelines* are to be highlighted).

Positive or significant physical findings will require documentation, followed by an assessment and plan.

- Anticipatory Guidance
 - Catalogued by Bright Futures guidelines visit priority, and
 - Arranged by positive Anticipatory Guidance queries from the pre-visit questionnaire.

A method will be needed to chart anticipatory guidance topics discussed in

the electronic chart note. Longer conversations or patient-specific recommendations will also require documentation.

Anticipatory Guidance is an ongoing process. Discussions from previous visits might not be repeated, or they may be reinforced. Topics not covered at one visit may be covered at future visits, provided there is a reminder mechanism. Many practices use a hard copy Preventive Services Prompting Sheet, an often cumbersome double charting mechanism ripe for electronic enhancement.

- Documentation for patients and families
 - Height, weight and BMI, with percentiles,
 - Summary of Anticipatory Guidance priorities,
 - Immunization forms,
 - School or sports forms,
 - Handouts, and
 - References.

Many of these items will be found or referenced in the *Bright Futures Toolkit*.³ Higher level EHRs will allow customization of the family handout from the electronic chart note.

NEXT STEPS

The release of the *Bright Futures Guidelines*, third edition, is a rare self-reflection opportunity for clinics and practices. As practices evaluate where they are and determine where they wish to be, the *Bright Futures Guidelines* supported by an electronic health record-keeping system can foster desired change and health system improvement.

What steps should be taken? Clinicians must decide how they wish to change their practices. Necessary procedural changes must be addressed. The

*Bright Futures Toolkit*³ includes change tools to assist in this important work.

Now a practice or clinic is ready to evaluate EHR systems. Clinicians can query vendors concerning the integration of *Bright Futures Guidelines* into the proposed EHR system. Clinicians can demonstrate to vendors what they do, and demand information on how the proposed system will make their work more effective and more efficient. With these important steps, practitioners and administrators are empowered to decide upon the best EHR system for their practice.

WHAT ABOUT EXISTING ELECTRONIC HEALTH RECORD SYSTEMS?

For clinics and practices already using an EHR system, the new *Bright Futures Guidelines* can become the practice benchmark for primary care health supervision services. Does the practice measure well against these standards? How does the existing record-keeping system enhance services? Where are the necessities or the opportunities for practice change? Can the EHR system support this change? Does it inhibit necessary enhancements of care? Can the system be updated? How responsive is the EHR vendor to change?

SUMMARY

The recent release of the *Bright Futures Guidelines*, third edition, brings new opportunity and new power to our work with children and their families. Pediatricians, with their colleague nurse practitioners and family physicians, now address “new morbidities” of behavioral and psychosocial problems,⁷ developmental

disabilities, and environmental stressors, in addition to the traditional morbidities of infection or malnutrition. Properly designed EHRs can add efficiency to this important work. Schor⁸ has discussed the changing nature of the health supervision encounter. If these well child visits are to remain relevant and vibrant, if clinicians are to effectively address the physical, emotional, and social health needs of our children and adolescents, new models of data management are essential. This is the challenge in the development of electronic health records for the primary care of children and youth.

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