Experience with decision support system and comfort with topic predict clinicians' responses to alerts and reminders

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Abbreviations: CHICA-Child Health Improvement through Computer Automation; PSF-pre-screener form; PWS-physician worksheet; EHR-electronic health record; AOR-Adjusted Odds Ratio; CI-Confidence Interval

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ABSTRACT

Objective: Clinicians at our institution respond to about half of clinical decision support prompts. We sought to examine factors associated with clinician response to prompts within a computer decision support system (CDSS) as part of a larger ongoing quality improvement effort to optimize CDSS use.

Materials and Methods: We examined patient, prompt, and clinician characteristics associated with clinicians' responses to decision support from the Child Health Improvement through Computer Automation (CHICA) system. We asked pediatricians who were non-users of CHICA to rate decision support topics as 'easy' or 'not easy' to discuss with families. We utilized these ratings and data from July 1, 2009 to January 29, 2013 in a hierarchical regression model to determine whether factors such as comfort with topic content and length of user experience with CHICA contribute to user response.

Results: 414,653 prompts from 22,260 children were examined. The length of time a clinician had been using CHICA was associated with an increased response. Response was more likely for topics rated as 'easy' to discuss. Position of the prompt on the page, clinician gender, child age and race/ethnicity, along with family's preferred language were also predictive of prompt response.

Conclusion: This study highlights several factors associated with prompt response that could be generalized to other HIT applications, including length of exposure to the system, position on the page and comfort with topic content. Incorporating continuous quality improvement efforts when designing and implementing HIT may ensure its use is optimized and provides valuable insight for additional refinements.

BACKGROUND AND SIGNIFICANCE

Primary care clinicians in general, and pediatricians in particular, find themselves having to balance a variety of demands on their time during the brief medical encounter: delivery of health advice, vaccination administration, screening for a variety of health risks, monitoring growth and development, and addressing parental concerns.[1] Health information technology (HIT) has been used to help clinicians handle time demands without sacrificing healthcare quality. At our institution, we have developed and implemented a pediatric computer decision support system (CDSS), the Child Health Improvement through Computer Automation (CHICA) system, to meet this need. CHICA has been operational since 2004 and is currently used in 7 pediatric and adolescent community health clinics affiliated with the Eskenazi Health System in Indianapolis, IN. The system has supported over 270,600 pediatric visits for over 42,000 patients. CHICA provides clinician guidance according to clinical care guidelines during the medical encounter by automating surveillance and screening and generating clinician reminders and educational handouts to supplement brief counseling.[2] CHICA currently includes tailored support for autism, developmental screening, ADHD, maternal depression, smoking cessation, medical-legal issues, and other health risks.[3-9] While the uptake of HIT in pediatrics has been slower when compared to other fields, such as adult medicine,[10] pediatric clinicians working with CHICA have found that it fits within the busy workflow of practice. Thus, clinicians' acceptability and satisfaction towards its use has increased over time.[11]

Despite our successes, studies of our system have shown clinicians respond to alerts from CHICA just under 50% of the time.[12] We have examined patterns of response and found the child's age and the position of the prompt on the physician worksheet predict whether a prompt is answered or ignored.[13] Experiments in which we highlighted key prompts in yellow to

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heighten clinician awareness were not effective.[14] Therefore, we sought to better understand what characteristics of patients, clinicians and prompt messages impacted the likelihood clinicians would respond to the prompt. Specifically, we hypothesized that the clinicians' comfort with the topic content of the prompt and how long the clinician had used CHICA would be associated with increased prompt response. Understanding factors affecting clinician response to alerts might inform quality improvement and technical strategies to support clinicians using HIT.

METHODS

Overview of the CHICA System

The Child Health Improvement through Computer Automation (CHICA) system is an innovative computer decision support system (CDSS) and electronic health record (EHR) which has been described elsewhere.[15-20] Briefly, CHICA provides preventive care and chronic disease management decision support based on clinical guidelines encoded in Arden Syntax rules. CHICA uses an HL7-compliant interface to an existing EHR,[2] but CHICA can also operate as a standalone EHR system.

Once a child is registered for the medical encounter, CHICA produces a tailored pre-screener form (PSF) that contains 20 health risk questions (in English and Spanish) for the parent or patient (if 12 years old or older) to complete. These questions are selected based on previous information contained in the patient's EHR and the age of the patient at the time of the visit. To select just 20 questions, CHICA uses a unique prioritization scheme that takes into account the likelihood and seriousness of the risk as well as the effectiveness of intervening on the risk and the evidence to support it. The PSF is completed in the waiting room before the medical

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encounter. When CHICA was first designed it utilized a scannable and tailored paper-based user interface.[18] Two years ago, the pre-screening process was transitioned to an electronic tablet interface (CHICLET).[21]

Once completed, information captured by the tablet is transmitted wirelessly to CHICA and the collected data are integrated into the EHR. The scannable paper physician worksheet (PWS) is then generated for the clinician to use during the encounter. The PWS has space to record the history and physical exam. It also has six tailored prompts based on information collected from the PSF and information contained in the patient's EHR. See Figure 1 for a sample PWS. Each prompt has up to six check boxes with which the clinician can document his or her response to the alert. CHICA also generates "just in time" (JIT) handouts to supplement counseling for certain prompts or to collect additional information that can be scanned into CHICA. CHICA documents are printed in English on one side and Spanish on the other. After the clinician completes the PWS, the form is scanned back into CHICA and data is integrated within the EHR. The PWS and JITs within CHICA will be completely paperless in the near future so that clinicians can access the PWS and JITs via laptops they bring with them into the clinic room.

Setting and Participants

Data from the PWS (prompt response or not) were extracted for all patients seen from July 1, 2009 to January 29, 2013 from clinic sites using the updated CHICA 2.0 system. During the study timeframe, CHICA had been implemented in 5 clinics in the Eskenazi Health System in Indianapolis, IN.

Data Collection and Analysis

The main outcome of interest was whether the clinician responded to the prompt or not. This was defined as the clinician checking 1 of the 6 available boxes for each prompt on the PWS, indicating a response. We examined patient, prompt and clinician characteristics to explore what factors were associated with clinician response to PWS prompts. At the patient level, we examined child age, race/ethnicity (black, white, Hispanic or unknown), insurance status (Medicaid, commercial or self-pay), and preferred language (English or Spanish) based on which side of the PSF was completed by the caregiver. Insurance status and language preference varied from visit-to-visit for a child and thus these covariates were used as time dependent covariates.

Prompt-level characteristics that were examined included the position of the prompt on the PWS (1st through 6th position) and the comfort rating of the prompt. To determine comfort level, we asked a convenience sample of clinicians at a continuing medical education event to rate their comfort discussing the potential topics included in CHICA on a 5-point Likert-like rating scale (1=completely uncomfortable, 3=neither uncomfortable or comfortable, 5=completely comfortable). Sixteen general pediatricians, all of whom were non-CHICA users, completed the survey and provided ratings. Scores were averaged by topic and then categorized as either easy (greater than or equal to 4.0) or not easy (less than 4.0) to discuss with families.

Lastly, clinician characteristics were also examined and included clinician gender and length of time using CHICA (CHICA maturity). CHICA maturity was calculated as the date the prompt was printed minus the date the physician first used CHICA. The value ranged from 0 to 7 years. CHICA maturity was introduced in the model as a continuous covariate.

Univariate and bivariate statistics in relation to the primary outcome were examined. Each patient had multiple records corresponding to six prompts and multiple visits; therefore, to model

the primary outcome, a repeated measure logistic regression model with generalized estimating equations (GEE) was used where patients were considered nested within clinic. First, univariate GEE models were fitted to assess the unadjusted association of each covariate with the response at a time and significant covariates at p<0.15 were included in the multivariable GEE model. The odds ratios for age were computed by five-year increments for easier interpretation. This study was approved by the Institutional Review Board of the Indiana University School of Medicine.

RESULTS

During the study timeframe, 80 clinicians used CHICA. Among clinicians, 27 (63%) were female, 16 (37%) were male when gender data for those were missing were excluded. The mean exposure time to CHICA was 1.1 year with a standard deviation of 1.0 (range of 0 to 7 years). Approximately 54% of the clinicians worked full-time. Pediatricians comprise the majority of the clinicians in the 5 clinics (77%), combined internal medicine-pediatrics (6%) or other, which include triple board or not reported (17%).

A total of 414,653 prompts from 22,260 children were examined. Overall clinicians responded to 45% of the prompts. Forty nine percent of the patients were female. Approximately half of the patients were African American (54%), a third were Hispanic (32%) and the rest were Caucasian (10%). The average child age was 5 years (standard deviation of 4.7 years and range 0 to 20.9 years).

The average comfort rating of all topics was 4.0 on a 5-point scale (range of 2.8 to 4.9). Based on our cut point of 4.0, 22 routine topics were categorized as 'not easy' to discuss and 33 routine topics were categorized as 'easy' to discuss. Examples of topics rated as 'easy' to discuss with families included anemia, injury prevention, dental care and identification of ADHD

and developmental delays. Topics rated as 'not easy' to discuss included child abuse, maternal depression, autism spectrum disorders, health literacy and intimate partner violence.

Results from the univariate GEE models indicated that, all covariates, except child gender (p=0.9) or insurance (p=0.8), were significantly associated with whether a clinician responded to a prompt or not (p<0.002) (data not shown). Topics rated as 'easy' to discuss with families were more likely to have a clinician response than topics rated as 'not easy' to discuss (p<0.0001).

For the multivariate models, all covariates in the univariate models found to be significantly associated with the outcome were included. Clinicians were less likely to respond to prompts for older children than younger children (AOR 0.98; 95% CI: 0.96-0.99). Prompts were more likely to have a documented response if the child was Hispanic (AOR 1.47; 95% CI: 1.35-1.59) but less likely if the child was white (AOR: 0.89; 95% CI: 0.82-0.97). If a family's preferred language was Spanish, clinicians were more likely to respond to prompts than if the family's preferred language was English (AOR: 1.48; 95% CI: 1.41-1.55). Prompt-level characteristics examined were all significantly associated with prompt response. Prompts found at the top on the PWS were more likely to be responded to then those printed on the bottom of the page (1st prompt position AOR 1.82; 95% CI: 1.78-1.86 vs. 5th position AOR: 1.08; 95% CI: 1.06-1.10). Easy topics were more likely to have a documented response than those categorized as not easy to talk with families (AOR 1.47; 95% CI: 1.45-1.49). Both clinician-level characteristics (gender and exposure to the system/CHICA maturity) were significantly associated with prompt response. The adjusted results of the multivariate models are presented in Table 2.

DISCUSSION

Although computer based clinical decision support can unquestionably improve clinical quality, this improvement is limited by the extent to which clinicians respond to reminders. Our experience, like others, has shown this rate can be low.[12, 22, 23] The present work demonstrates that a thoughtful analysis of who responds to which prompts regarding which patients can help us understand what factors influence clinicians' responses to computer generated alerts.

We found characteristics of the patient, the prompt and the clinician can all influence whether a clinician responds to the prompt. However, why each of these factors influences the likelihood of response deserves careful consideration. For example, physicians are less likely to respond to prompts as children grow older. This may suggest care of younger children is more protocol driven or that older children are more likely to present with other issues that distract from reminders. Perhaps older children are more likely to see more experienced clinicians who rely less on CHICA. Another possibility is that the reminders for older children are less well designed.

The findings that prompts during visits regarding Hispanic children and children from families that speak Spanish may be anomalous. These findings are likely confounded by the clinic setting. Two of the 5 clinics with CHICA see the majority of Spanish speaking families. Among the two, one serves almost entirely Spanish-speaking, Latino immigrants. These clinics in particular work extremely hard to provide a medical home to their families, a model of pediatric healthcare delivery coupled with family-centered care[24]. Moreover, the clinicians at these two clinics are particularly enamored of CHICA and contribute eagerly to its development and improvement. It is possible that this, coupled with the fact that families who receive family-centered care within a medical-home, regardless of race/ethnicity, are more likely to have their

needs addressed.[25, 26] Alternatively, the ability of CHICA to assess parent concerns in Spanish and prompt clinicians in English may make it especially valuable to this population.

The more actionable findings in this study relate to the characteristics of the prompts themselves that increase the likelihood of clinician response. First, as in previous work, [13] we again found that the position of the reminder on the page strongly influences the likelihood of a response. There is a steady gradient from the top left prompt (position #1) to the bottom right (position #6) to the point where the first has nearly twice the odds of being answered as the last. This suggests that the top prompts have greater salience and argues for the concept of alert fatigue.[27-29] Presumably, clinicians start at the top of the page and run out of time, energy, or interest in completing the later prompts, perhaps becoming distracted by other pressing issues in the encounter. An example of a potential technical refinement to ensure all prompts are responded to might be the use of soft stops once the PWS is no longer printed on paper and available entirely in a web-based format.

New is the finding that clinicians are more likely to respond to prompts that an independent group of clinicians rated themselves as "comfortable" addressing. The fact that more of the psychosocial types of topics were rated as 'not easy' to discuss is not unlike other studies that have found these types of health risks to be more challenging to clinicians.[30-33] It was not surprising that these topics are among those that are usually perceived as more sensitive, such as intimate partner violence and child abuse, or too complex to handle within a time-constrained visit.[34] In our previous investigation, more serious topics were more likely to be addressed.[13] This was based on the priority score assigned to each prompt. In this current study, we examined clinician comfort with the topic, which is a different aspect. Although this finding is perhaps, not surprising, it points to the limitation of computer prompting alone to

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affect clinician behavior. Prompts and reminders intended to promote a behavior the physician is not comfortable with should, presumably, be accompanied by education and training that will lower the clinician's threshold to take action. Otherwise the prompt is unlikely to affect care.

The finding that certain types of prompts are more or less likely to be answered by the clinician suggests that alterations to the prioritization score should be considered. If a certain prompt is unlikely to elicit a response, the "effectiveness" term in the corresponding prioritization formula might be decreased based on a decreased probability that the clinician will respond.

Finally clinician characteristics can influence the likelihood of responding to prompts. We observed that male clinicians had 71% higher odds of responding to a given prompt than female clinicians. While we will resist speculating about sex stereotypes and affinity to technology,[35] we will point out that this may be problematic where a growing majority of physicians entering the workforce are female.[36, 37] In fact, women represent about half of medical school graduates.[38] If there are important design differences in prompts to which male and female clinicians are likely to respond, it will be important to have an adequate number of women in medical informatics to influence system designs. Larger studies with more clinicians would allow further investigation to this unexpected, but interesting finding.

It is reassuring to see that experience with CHICA, based on years CHICA has been implemented in the clinic, was associated with a higher rate of response to prompts. This would logically be attributed to becoming used to, and facile with, the system. However, the effect is modest. So experience with the system, while helpful, cannot compensate for a poorly designed system.

As with any research, limitations must be acknowledged. This is a retrospective examination of data collected by one decision support system within our institution. Moreover, our system presents alerts/prompts to clinicians all at once rather than one at a time. Additionally, since the PWS used by CHICA is still paper-based, the system differs from screen-based EHRs that may use soft stops or red text as a way of alerting clinicians. Therefore, our findings may not be generalizable to institutions that use different EHRs. However, we believe that considerations of comfort with topic, length of time exposed to the HIT application, and other patient and clinician characteristics will be of value to communities serving similar populations as ours.

Nonetheless, it is critical to undertake closer examinations of HIT applications after implementation to continually refine and improve upon the system. We undertook this study to continue to refine and improve upon CHICA. In order to ensure any HIT application is used as it was intended, understanding the needs and context in which the system will be implemented have important implications.

CONCLUSION

Understanding factors associated with user response or non-response to timely alerts is one example highlighting the ongoing need to critically examine HIT applications once implemented. This study found additional factors associated with prompt response that point to additional directions for future refinements.

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COMPETING INTERESTS

None

CONTRIBUTORSHIP

NB and SD drafted the survey used to obtain comfort ratings from non-CHICA physicians and drafted and revised the paper. NB is the guarantor for the details contained in the paper. CS is responsible for the biostatistical analysis and worked with NB and SD on interpretation of results. SD and AC wrote the CHICA rules and oversee continual CHICA implementation in the clinics and work closely with the technical team. AC and CS helped to revise the draft paper.

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REFERENCE LIST

1.   Belamarich PF, Gandica R, Stein RE, et al. Drowning in a sea of advice: pediatricians and American Academy of Pediatrics policy statements. Pediatrics. 2006;118(4):e964-78. Epub 2006/10/04.
2.   Anand V, Biondich PG, Liu G, et al. Child Health Improvement through Computer Automation: the CHICA system. Stud Health Technol Inform. 2004;107(Pt 1):187-91. Epub 2004/09/14.
3.   Bauer NS, Sturm LA, Carroll AE, et al. Computer decision support to improve autism screening and care in community pediatric clinics. Infants & Young Children. 2013;26(4):306-17.
4.   Carroll AE, Bauer NS, Dugan TM, et al. Use of a computerized decision aid for ADHD diagnosis: a randomized controlled trial. Pediatrics. 2013;132(3):e623-9. Epub 2013/08/21.
5.   Carroll AE, Bauer NS, Dugan TM, et al. Use of a Computerized Decision Aid for Developmental Surveillance and Screening: A Randomized Clinical Trial. JAMA Pediatr. 2014. Epub 2014/07/16.
6.   Carroll AE, Biondich P, Anand V, et al. A randomized controlled trial of screening for maternal depression with a clinical decision support system. Journal of the American Medical Informatics Association : JAMIA. 2012. Epub 2012/06/30.
7.   Carroll AE, Biondich PG, Anand V, et al. Targeted screening for pediatric conditions with the CHICA system. Journal of the American Medical Informatics Association : JAMIA. 2011;18(4):485-90. Epub 2011/06/16.
8.   Downs SM, Zhu V, Anand V, et al. The CHICA smoking cessation system. AMIA Annu Symp Proc. 2008:166-70. Epub 2008/11/13.
9.   Anand V, Carroll AE, Downs SM. Automated primary care screening in pediatric waiting rooms. Pediatrics. 2012;129(5):e1275-81. Epub 2012/04/18.
10.   Leu MG, O'Connor KG, Marshall R, et al. Pediatricians' use of health information technology: a national survey. Pediatrics. 2012;130(6):e1441-6. Epub 2012/11/21.
11.   Bauer NS, Carroll AE, Downs SM. Understanding the acceptability of a computer decision support system in pediatric primary care. Journal of the American Medical Informatics Association : JAMIA. 2013. Epub 2013/06/22.
12.   Downs SM, Anand V, Dugan TM, et al. You can lead a horse to water: physicians' responses to clinical reminders. AMIA Annu Symp Proc. 2010;2010:167-71. Epub 2011/02/25.
13.   Carroll AE, Anand V, Downs SM. Understanding Why Clinicians Answer or Ignore Clinical Decision Support Prompts. Applied Clinical Informatics. 2012;3:309-17.
14.   Hendrix KS, Downs SM, Carroll AE. Pediatricians' responses to printed clinical reminders: does highlighting prompts improve responsiveness? Acad Pediatr. 2015;15(2):158-64. Epub 2015/01/27.
15.   Anand V, Biondich PG, Liu G, et al. Child Health Improvement through Computer Automation: the CHICA system. Stud Health Technol Inform. 2004;107(Pt 1):187-91. Epub 2004/09/14.

16.   Biondich PG, Anand V, Downs SM, et al. Using adaptive turnaround documents to electronically acquire structured data in clinical settings. AMIA Annu Symp Proc. 2003:86-90. Epub 2004/01/20.

17.   Biondich PG, Downs SM, Anand V, et al. Automating the recognition and prioritization of needed preventive services: early results from the CHICA system. AMIA Annu Symp Proc. 2005:51-5. Epub 2006/06/17.

18.   Downs SM, Biondich PG, Anand V, et al. Using Arden Syntax and adaptive turnaround documents to evaluate clinical guidelines. AMIA Annu Symp Proc. 2006:214-8. Epub 2007/01/24.

19.   Downs SM, Carroll AE, Anand V, et al. Human and system errors, using adaptive turnaround documents to capture data in a busy practice. AMIA Annu Symp Proc. 2005:211-5. Epub 2006/06/17.

20.   Downs SM, Uner H. Expected value prioritization of prompts and reminders. Proceedings / AMIA Annual Symposium AMIA Symposium. 2002:215-9. Epub 2002/12/05.

21.   Anand V, McKee SJ, Dugan TM, et al. Leveraging Electronic Tablets for General Pediatric Care: A Pilot Study. Applied Clinical Informatics. 2015;6(1):15.

22.   El-Kareh RE, Gandhi TK, Poon EG, et al. Actionable reminders did not improve performance over passive reminders for overdue tests in the primary care setting. Journal of the American Medical Informatics Association : JAMIA. 2011;18(2):160-3. Epub 2011/02/01.

23.   McDonald CJ. Protocol-based computer reminders, the quality of care and the non-perfectability of man. N Engl J Med. 1976;295(24):1351-5. Epub 1976/12/09.

24.   The medical home. Pediatrics. 2002;110(1 Pt 1):184-6.

25.   Guerrero AD, Rodriguez MA, Flores G. Disparities in provider elicitation of parents' developmental concerns for US children. Pediatrics. 2011;128(5):901-9. Epub 2011/10/19.

26.   Guerrero AD, Garro N, Chang JT, et al. An update on assessing development in the pediatric office: has anything changed after two policy statements? Acad Pediatr. 2010;10(6):400-4. Epub 2010/11/16.

27.   Russ AL, Zillich AJ, McManus MS, et al. Prescribers' interactions with medication alerts at the point of prescribing: A multi-method, in situ investigation of the human-computer interaction. International journal of medical informatics. 2012;81(4):232-43. Epub 2012/02/03.

28.   Isaac T, Weissman JS, Davis RB, et al. Overrides of medication alerts in ambulatory care. Archives of internal medicine. 2009;169(3):305-11. Epub 2009/02/11.

29.   Embi PJ, Leonard AC. Evaluating alert fatigue over time to EHR-based clinical trial alerts: findings from a randomized controlled study. Journal of the American Medical Informatics Association : JAMIA. 2012;19(e1):e145-8. Epub 2012/04/27.

30.   Fleegler EW, Lieu TA, Wise PH, et al. Families' health-related social problems and missed referral opportunities. Pediatrics. 2007;119(6):e1332-41. Epub 2007/06/05.

31.   Fremont WP, Nastasi R, Newman N, et al. Comfort level of pediatricians and family medicine physicians diagnosing and treating child and adolescent psychiatric disorders. Int J Psychiatry Med. 2008;38(2):153-68. Epub 2008/08/30.

32.   Galuska DA, Fulton JE, Powell KE, et al. Pediatrician counseling about preventive health topics: results from the Physicians' Practices Survey, 1998-1999. Pediatrics. 2002;109(5):E83-3. Epub 2002/05/03.

33.   Gardner W, Kelleher KJ, Wasserman R, et al. Primary care treatment of pediatric psychosocial problems: A study from pediatric research in office settings and ambulatory sentinel practice network. Pediatrics. 2000;106(4):E44. Epub 2000/10/04.

34.   Gabrielsen TP, Farley M, Spear L, et al. Identifying Autism in a Brief Obervation. Pediatrics. 2015
;135(2).

35.   Balka E, editor. Gender and skill in human computer interaciton. CHI '96 Conference Companion on Human Factors in Computing Systems; 1996; Vancouver, British Columbia, Canada: ACM

36.   Pan RJ, Cull WL, Brotherton SE. Pediatric residents' career intentions: data from the leading edge of the pediatrician workforce. Pediatrics. 2002;109(2):182-8. Epub 2002/02/05.

37.   Cull WL, Mulvey HJ, O'Connor KG, et al. Pediatricians working part-time: past, present, and future. Pediatrics. 2002;109(6):1015-20. Epub 2002/06/04.

38.   Roskovensky LB, Grbic D, Matthew D. The Changing Gender Composition of US Medical School Applicants and Matriculants. Washington DC: Association of American Medical Colleges, 2012.

CHICA Physician Encounter Form

#99-2

Patient: Patient, Ima (F)

DOB: 01/14/09 **Age:** 6 yo

Doctor: Doctor Provider

MRN: #99-2

Date: Jan 14 2015

Time: 4:34PM

A | Vital Signs:

Height	in. (	%)
Weight:	kg.(	%)
BMI:	(	%)
Head Circ:	cm.l	%)
Temp:	F (	)
Pulse:		
RR:		
BP:	(	)
Pulse Ox:	%	
Hear (L):	Hear (R):	
Vision (L):	U	
Vision (R):	U	
Weight:		
Prev WT:	(	)

* = Abnormal, U = Uncooperative

Physical Exam: Nl Abnl

	Nl	Abnl
General:	☐	☐
Head:	☐	☐
Skin:	☐	☐
Eyes:	☐	☐
Ears:	☐	☐
Nose / Throat:	☐	☐
Teeth / Gums:	☐	☐
Nodes:	☐	☐
Chest / Lungs:	☐	☐
Heart / Pulses:	☐	☐
Abdomen:	☐	☐
Ext. Genitalia:	☐	☐
Back:	☐	☐
Neuro:	☐	☐
Extremities:	☐	☐

History / Exam Comments:

CC :

Legend:* = Previously Abnl
o = Needs Examination

☐ Special Need Child

☐ Additional notes on back...
☐ Two ID's Checked
☐ Screened for abuse
☐ Discussed physical activity
☐ Discussed healthy diet

Informant: _____

medications: NONE

Allergies: NONE

Pain (0-10): 0

INSTRUCTIONS: Check all applicable boxes. COMPLETELY fill space to right of each box to "uncheck" misfilled boxes.

Reportedly, Ima has a hard time paying attention, makes careless mistakes, has difficulty remaining seated, and these Sx may imply ADHD. Parent and teacher Vanderbilt scales suggested (CPT 96110)

☐ [] H&P with respect to ADHD   ☐ [] Parent Vanderbilt and scan now

☐ [] Vision and hearing screens   ☐ [] Teacher Vandrbit to fax

☐ [] No school/home prob, not ADHD ☐ [] Sched f/u in 2-3 weeks

The AAP has age-specific recommendations for bicycle safety. Please review the following, and check those you review:

☐ [] ALWAYS wear bike helmet   ☐ []

☐ [] Ride ONLY with adult supervision ☐ []

☐ [] Child SHOULDN'T ride in street   ☐ [] N/A, doesn't ride a bike

The AAP has age-specific recommendations for the prevention of poisoning in children. Please review the following, and check those you review

☐ [] Meds/prods have safety caps   ☐ []

☐ [] Poison center # on phone->   ☐ [] 1-800-222-1222

☐ []   ☐ []

The AAP has age-specific recommendations for the prevention of childhood burns and fires. Please review the following, and check those you review:

☐ [] Working smoke detector   ☐ [] Store matches/lighters safely

☐ [] Test batteries monthly   ☐ [] Teach child plan if alarm rings

☐ [] Rec no smoking in house   ☐ [] Teach escape plan (>= 2 exits)

PPD indicated if: Ima spent >1 week in Asia, Africa, Lat. America, E. Europe or she has household contacts with: TB, travel to above areas, or hi-risk (jail, shelter, illegal drugs, HIV)

☐ [] Contact with TB   ☐ [] Exposure to hi-risk country

☐ [] High risk contact   ☐ [] Contact with hi-risk travel

☐ [] PPD 5 TU intradermally ordered ☐ [] No risk factors

The AAP has age-specific recommendations for the prevention of drowning in children. Please review the following, and check those you review:

☐ [] Child wears lifejacket on boat   ☐ []

☐ [] Consider teaching kid to swim   ☐ []

☐ [] Supervise kid while swimming   ☐ []

Assessments and Plan:

Medication Education Performed and/or Counseled on Vaccines: ☐ Y ☐ N ☐ N/A

☐ The medical student acted as a scribe for this note.

Staff: _____

Signature: _____

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Table 1. Patient, prompt and clinician characteristics and clinician PWS response

		Respond	
		No	*Yes*
Patient Characteristics			
Child gender	Male	119853 (55.3)	96731 (44.7)
	Female	109396 (55.2)	88667 (44.8)
Child Race	Black	127974 (60.8)	82558 (39.2)
	Hispanic	62667 (43.9)	79978 (56.1)
	White	27824 (63.2)	16173 (36.8)
	Other/Unknown	10786 (61.7)	6693 (38.3)
Family's Preferred Language	English	184894 (60.9)	118512 (39.1)
	Spanish	44357 (39.9)	66890 (60.1)
Insurance	Medicaid	196347 (55.6)	157058 (44.4)
	Self-pay	22867 (51.7)	21362 (48.3)
	Commercial	10037 (59.0)	6982 (41.0)
Prompt Characteristics <mark>per displayed prompt</mark>			
Position on form	1	35179 (48.6)	37247 (51.4)
	2	35776 (50.1)	35572 (49.9)
	3	38120 (53.9)	32598 (46.1)
	4	39810 (57.1)	29864 (42.9)
	5	40886 (60.9)	26276 (39.1)
	6	39480 (62.4)	23845(37.6)
Comfort with topic content	Not Easy	56105 (62.2)	34128 (37.8)
	Easy	173146 (53.4)	151274 (46.6)
Clinician Characteristics			
Clinician gender	Male	92303 (48.5)	97990 (51.5)
	Female	129770 (61.3)	81775 (38.7)

Table 2. Multivariable GEE models examining patient, prompt and clinician characteristics and clinician response to prompts

	AOR	*95% CI*	*P value*
Patient characteristics			
Race			<0.0001
Black	1.02	0.95-1.10	
White	0.89	0.81-0.97	
Hispanic	1.47	1.36-1.59	
Other	Ref	Ref	
Age (for every 5 year increase)	0.98	0.96-0.99	0.0058
Language			<0.0001
Spanish	1.48	1.41-1.55	
English	Ref	Ref	
Prompt characteristics			
Position on form			<0.0001
1st	1.82	1.78-1.86	
2nd	1.69	1.66-1.73	
3rd	1.47	1.44-1.50	
4th	1.28	1.25-1.30	
5th	1.08	1.06-1.10	
6th	Ref	Ref	
Clinician characteristics			
CHICA maturity	1.07	1.06-1.08	<0.0001
Clinician characteristics x Prompt characteristics			
Male (easy topic vs. not easy topic)	1.37	1.34-1.40	<0.0001
Female (easy topic vs. not easy topic)	1.57	1.54-1.61	<0.0001

AOR: Adjusted Odds Ratio