RESOURCE AND PATIENT MANAGEMENT SYSTEM

# (VEN)

# Well Child Module (VEN)
# EHR Component Guide

Version 2.6 Patch 2
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# Preface

This document provides a review of the VEN Well Child Components for use in Electronic Health Record (EHR).

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# 1.0 Introduction

## 1.1 Background

From an information systems perspective, well child care is one of the most common yet complex clinical services. Traditionally, the well child record has been captured on a series of special encounter forms—each form corresponding to a specific age from birth through adolescence. For example, several commonly-used record sets contain forms for 2 weeks, 2 months, 4 months, 6 months, 12 months, and so on. Each form in the set contains the age specific guidelines for developmental screening, anticipatory guidance, examinations, immunizations, and nutritional counseling. Ideally, children are scheduled for appointments that correspond to the ages on the encounter forms. As a result, the guidelines and reminders on the form precisely match the age of the child. Experience tells us that this precision is rarely, if ever, achieved. When synchronization is lost, it becomes more difficult to maintain standardized care. What do we do with the child who comes in for six month check up at age eight months? What about the infant who shows up on time for a six month check up, but received incomplete care on the four month visit? How do illness and unusual social circumstances affect the guidelines? How can providers keep up with the hundreds of guidelines that are applied between birth and age 21?

The objective of the Well Child Module (WCM) is to use information technology to standardize well child care throughout Indian Country. To the greatest extent possible, this application facilitates compliance with a set of national guidelines and standards. Current guidelines are provided by a group of senior pediatricians who serve Indian communities. In general, the guidelines are taken from nationally-recognized sources of child-care standards, including Bright Futures, the American Academy of Pediatrics, the Ages and Stages Child Monitoring Program, and the Indian Health Service (IHS) Patient Education Advisory Group.

The WCM leverages the power of information technology (IT) and automated decision support in two specific ways to:

- Capture and encapsulate a complex data set that is collected piecemeal over an extended period of time
- Customize the data collection instrument precisely for each specific well child visit

The WCM is part of a long continuum of Resource and Patient Management System (RPMS) innovations related to the informatics of well child care. This includes the first automated immunization reminders (IHS, 1970), the first comprehensive immunization forecasting system (RPMS, 1995), and the first "intelligent," computer-generated well child care forms (PCC+, 2000).

## 1.2 New Features

This patch contains four new Electronic Health Record (EHR) components:

- Ages and Stages Questionnaire (ASQ)
- Pediatric Growth Grids
- A full set of guidelines for anticipatory guidance, screening exams, laboratory tests, etc.
- Well child patient education

In addition, there is a desktop Knowledgebase Management Component that is available only to the lead pediatric provider(s). This component helps manage the all the guidelines that are applied between birth and age 21.

### 1.2.1 ASQ Screening

The ASQ is a validated, commercial instrument for monitoring childhood development. The ASQ contains a set of 19 age-specific questionnaires. The child's parent answers the questions on the ASQ form and the results are scored by pediatric personnel. The WCM includes a graphical user interface (GUI) desktop component for generating the appropriate ASQ form on a local laser printer. The same component enables the clinic staff to enter the results directly into RPMS at the point of care.

ASQ results are stored as "measurements" and are displayed in a new ASQ measurement panel on the Health Summary, PCC+ form, and EHR. If the child's score is abnormal, you can print specific intervention guidelines for yourself and the parents. In Figure 1-1, the 22-month questionnaire was used. The scores for all five ASQ dimensions are displayed with the passing threshold scores shown in parentheses.

```
          ASQ  COMMUNICATION  GROSS MOTOR  FINE MOTOR  PROB SOLV   PERS-SOCIAL
08/01/06   22        25 (35)      30 (40)   35 (36.5)   40 (36.5)   45 (39.5)
```

Figure 1-1: ASQ measurement example showing actual and passing threshold scores

Other validated development screening tools exist—including the PEDS® instruments used by Arizona pediatricians. New autism screening tools (such as the SARRC Autistic Disorder Screening Kit) are also becoming available. More options will be added to future versions of the WCM.

> **Note**: You can install the WCM without the ASQ component. Tell your site manager to uncheck the ASQ box when he/she installs the WCM on your RPMS server. Later, if you decide to purchase the ASQ CD, the WCM can be reinstalled–this time with the ASQ feature checked.

### 1.2.2 Informal Development Screening

Some sites may not be able to conduct ASQ screening on every well child visit. As a stopgap measure, the WCM can print representative milestones from the Denver Developmental Screening Test (DDST). The child's age determines exactly which milestones are presented, as well as the percentage of children at that age who are expected to pass a particular milestone. Percentages are shown in parentheses. Figure 1-2 is provided as an example.

```
Male  24 months

FINE MOTOR (% at this age)
__ Tower of 2 Cubes (100)
__ Tower of 4 Cubes (90)
__ Tower of 6 Cubes (75)
__ Tower of 8 Cubes (25)

GROSS MOTOR (% at this age)
__ Kick Ball Forward (100)
__ Throw Ball Overhand (75)
__ Jump Up (50)

LANGUAGE (% at this age)
__ Body Parts - 6 (80)
__ Speech 1/2 Understand (70)
__ Speech All Understand (30)

SOCIAL (% at this age)
__ Remove Garment (90)
__ Wash & Dry Hands (60)
```

Figure 1-2: Informal Developmental Screening example

### 1.2.3 Intervention Reminders

Special exams and interventions are due throughout childhood. The WMC provides the following age-specific reminders:

- Special risk exams; such as TB screening
- Age specific exams; such as strabismus, scoliosis
- General screening exams; such as lead levels
- Autism screening questions
- Immunizations (Both history and forecast lists are automatically generated by the computer.)

### 1.2.4 Anticipatory Guidance Suggestions

Anticipatory guidance is a cornerstone of well child care. Thousands of age-specific, general-patient-education topics and nutritional counseling topics are available for display. All topics follow IHS national coding standards. If a topic is selected, the appropriate code is automatically applied. The WCM provides much more detail about patient education activities than any previous RPMS application, including:

- Anticipatory Guidance Topics (20 subcategories such as injury prevention); for example: “Car seat”
- Nutrition Counseling Topics; such as “Limit sugar”

### 1.2.5 Patient Education Documentation

Thus far, the guidelines discussed have been read-only. In addition, the WCM enables you to quickly record well child patient education services including topics discussed, service time, level of understanding and patient education provider. This information can be viewed/updated in the EHR’s traditional patient education component.

### 1.2.6 PCC+ Growth Grids

Patient Care Component Plus (PCC+) growth grids have been available to PCC+ users for over a year. These same grids are available to traditional PCC users using the new desktop component for the clinical workstation. Both growth grids and immunization lists can be printed as patient handouts. Special growth grids used with certain conditions (e.g., trisomy 21) are not yet available in the WCM.

### 1.2.7 ASQ Development Score Measurement Panel

This measurement panel contains the date of measurement, name of ASQ instrument (months), and five individual ASQ scores. By default, it displays up to the last five sets of ASQ results, as shown in Figure 1-3. You can edit the quantity and timeframe using the usual tools for Health Summary maintenance.

```
--------------- MEASUREMENT PANELS (max 5 visits or 2 years) ---------------


            HT    %ile    WT    %ile    BP      HC        VU             VC
07/25/05   69.00   >97  155.00   >97   122/77
07/19/05   67.00   >97  155.00   >97   120/80
02/14/05   66.00   >97  144.00   >97   122/99  18.00
02/07/05   65.00   >97  155.00   >97   122/66  18.00
06/03/04               177.50   >97

           ASQ  COMMUNICATION  GROSS MOTOR  FINE MOTOR  PROB SOLV   PERS-SOCIAL
07/27/05    36   20 (25.2)    45 (30.0)      30 (20.6)   25 (20.4)   40 (25.0)
```

Figure 1-3: ASQ DEVELOPMENT Measurement Panel

The list of guidelines is identical to the list displayed in the Health Summary. The number of guidelines varies depending on patient age and local policies. Typically, some white space is available at the bottom of the list. You can take notes in the white space if extra room is needed. The primary provider should sign this page.

### 1.2.8 Health Summary Component

There is a new Well Child Health Summary component that contains much of the information contained in the new EHR components. This feature provides an alternate, synchronous method to view well child information.

### 1.2.9 Knowledgebase

From the moment a child is born until his/her 21st birthday, there are thousands of age-specific guidelines and reminders that apply to well child care. To make matters even more complicated, the recommended guidelines are constantly updated by pediatric advisory groups and other domain experts. Since very few of us are capable of holding all this information in our heads, the WCM does it for us. All current guidelines and reminders are stored in a master list called the WCM Knowledgebase. The knowledgebase is the heart, soul, and brain of the WCM. The WCM also includes a powerful tool called the Knowledgebase Editor. This GUI tool resembles an Excel spreadsheet. It enables pediatric experts at each site to edit the knowledgebase and thereby determine exactly which age-specific guidelines from the master list will be presented on each visit. The Knowledgebase Editor is a secured component, and only designated users who hold the proper key are allowed access.

# 2.0 Setup Checklist

Please refer to the patch notes for installation of the patch. This is a PCC+ Version 2.6 Patch 1 (VEN). The patch is technically part of the PCC+ application, but its main purpose is to bring the features of PCC+'s WCM to the EHR.

> **Note**: This patch can be installed at any site–including sites that are only running EHR without PCC+. EHR-only sites *do not* need to install and configure traditional PCC+. These sites simply need to install this patch to achieve full WCM functionality. At sites that are running PCC+ alongside the EHR, this patch will not have any affect on traditional PCC+ (except for fixing several bugs documented in the release notes).

More comprehensive information about VEN Version 2.6 can be accessed via the following link: http://www.ihs.gov/Cio/RPMS/PackageDocs/ven/ven_026u.pdf

To use the ASQ feature of the WCM, *each site must purchase an ASQ CD for each location* (building) where the ASQ is to be used. You will not be able to install the ASQ component without this Compact Disk–Read Only Memory (CD ROM) due to copyright and licensing restrictions. The CD must be purchased separately and is not included in the distribution. Each license includes one CD-ROM that contains all ASQ materials and the right to make unlimited, printed copies of those materials within that building. A copy of the CD-ROM must be inserted on your local RPMS server during WCM installation to enable this feature.

Order the CD-ROM online at: http://www.brookespublishing.com.

Once at the Web site, navigate to the store, childhood development, and ASQ 3. Make sure that the package you order includes a CD ROM with Portable Document Format (PDF) files containing all the ASQ data collection forms. Spring 2010 is the item to order (the publisher may change the details at any time).

> **Note**: The WCM can be installed without the ASQ component. Tell your site manager to uncheck the ASQ box when the WCM is installed on your RPMS server. Later, if you decide to purchase the ASQ CD, the WCM can be reinstalled–this time with the ASQ feature checked.

ASQ Note: http://www.brookespublishing.com.

The ASQ component cannot be installed without this CD ROM due to copyright and licensing restrictions. These files must be purchased separately and are not included in the distribution. To meet licensing requirements, you must purchase one copy of the CD for each facility (separate clinic site/hospital complex) where well-child care is provided. Copy the CD contents to the same workstations as the ASQ Manager component.

# 3.0 Fixes and Modifications

Patch 1 fixes several issues encounter in PCC+ 2.6–the traditional PCC+ paper version of the well child module.

1. Users report that PCC+ documents sometimes do not print on the first try and the PCC+ error log gives an "insufficient com memory" error message. A new version of the PCC+ print service included in this patch fixes this issue.

2. Users have reported that on rare occasions, PCC+ may spawn a "runaway" cache process that uses up available memory and central processing unit (CPU) cycles on the RPMS Server. The runaway process is either ^VENPCC1 or ^VENPCCP1. The patch prevents this problem.

3. Users report that they experience printing errors with very large Health Summaries, usually greater than 16,000 KB. This issue is resolved with the patch.

4. Sites that have set up Point of Care laboratory test lists have reported a Massachusetts General Hospital Utility Multiprogramming System (MUMPS) "undef" error code when PCC+ 2.6 is installed. This patch fixes this issue.

# 4.0 Adding Well Child Components to EHR

After installing VEN Version 2.6 Patch 1, there are four additional objects (three if you do not have a license to use ASQ) available in your EHR object repository. These components are added to the EHR framework like any other object.

Four new objects:

- Well Child ASQ (license required)
- Well Child Patient Education
- Well Child Pediatric Growth Charts
- Well Child Reminders List

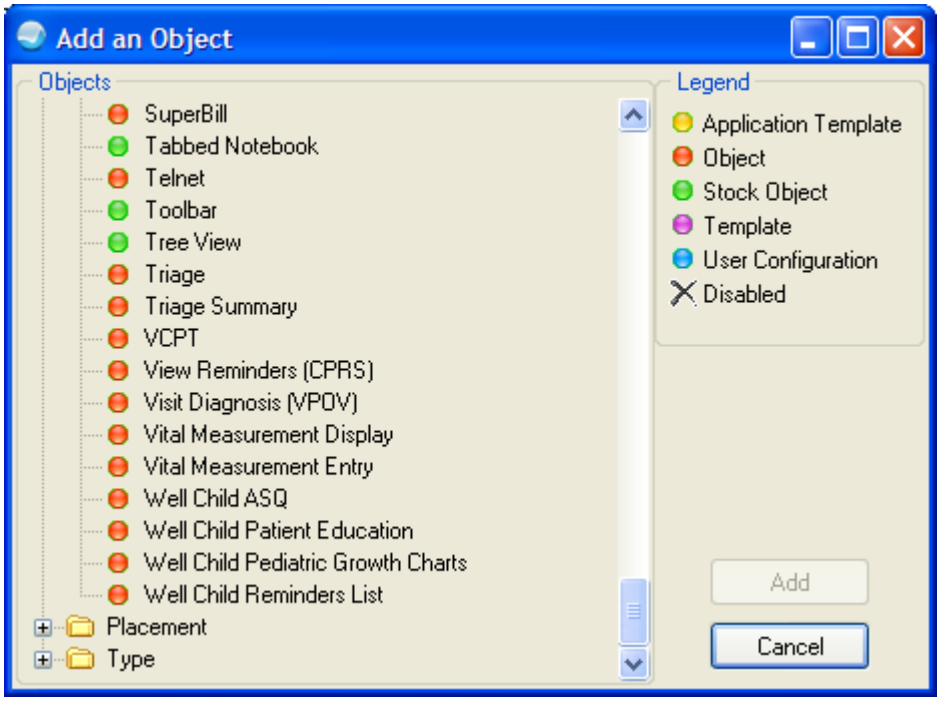


Figure 4-1: **Add an Object** window

## 4.1 Accessing Design Mode

Make sure you are in the EHR application.

Right-click on the top bar to display a contextual menu, and select **Design Mode**.

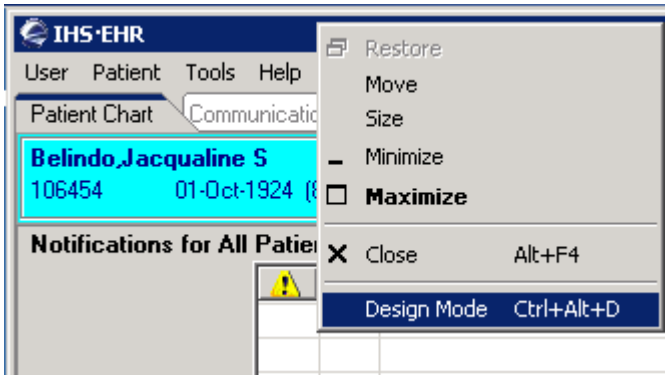


Figure 4-2: Location of Design Mode in EHR

After selecting **Design Mode**, the **Design** menu becomes available. See Figure 4-3 for menu options.

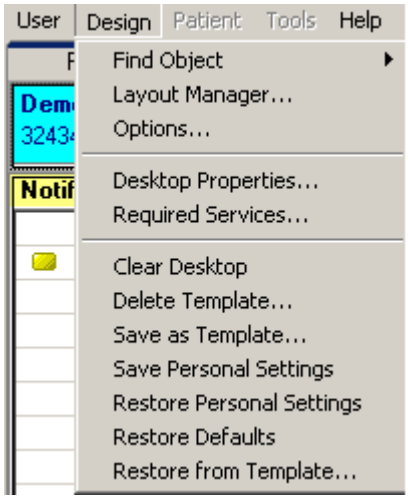


Figure 4-3: **Design** menu options

## 4.2 Layout Manager

Select the **Layout Manager** option in the **Design** menu to edit from one location. Determine where to put the Well Child Components.

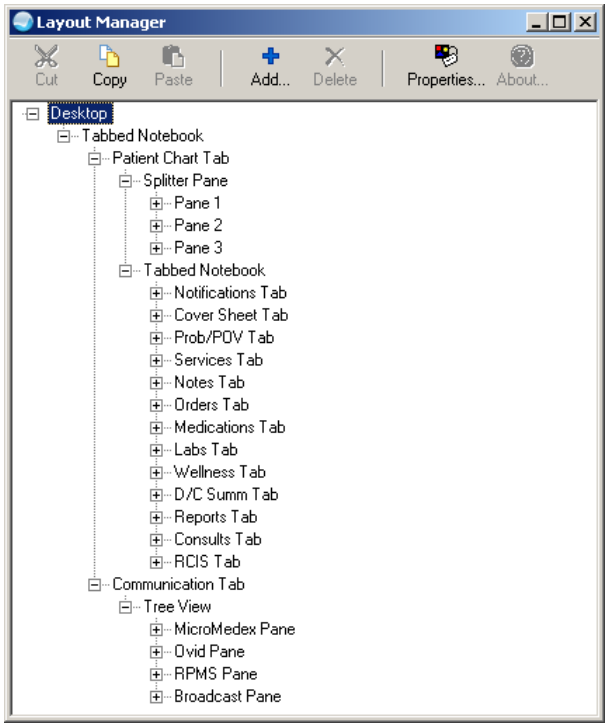


Figure 4-4: **Layout Manager** window

- Add: Use this button to add an object to a particular section. After clicking **Add**, the application displays the **Add an Object** window.

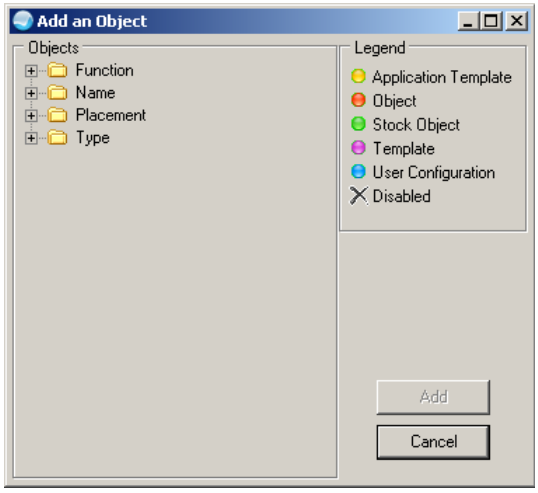


Figure 4-5: **Add an Object** window

Click on the **Name** folder to expand it and display a listing of the objects.

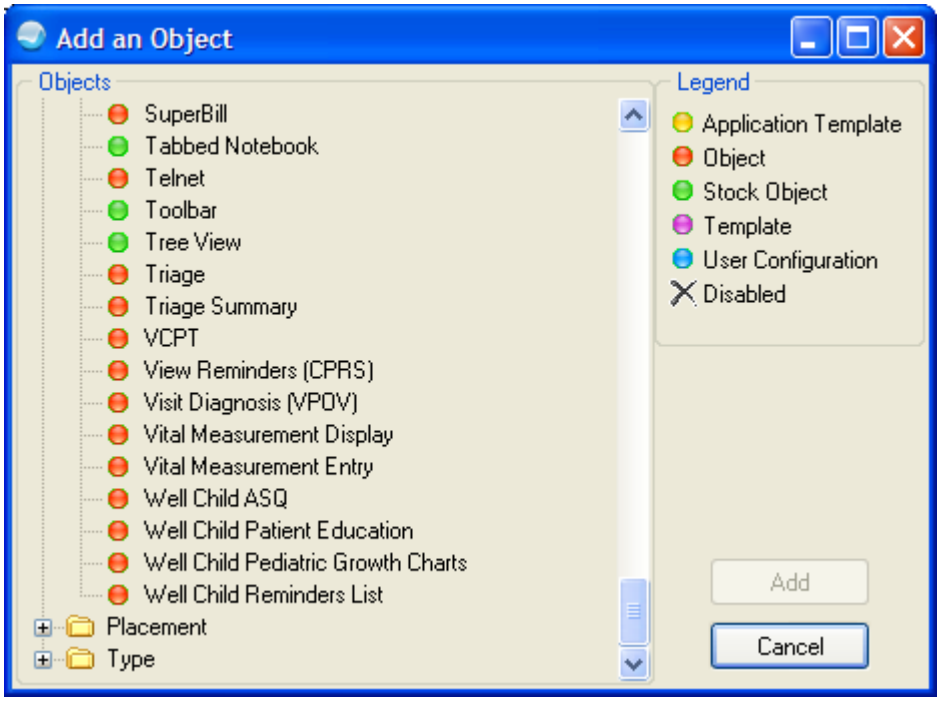


Figure 4-6: Expanded list of objects

From the list, select the Well Child objects and click **Add**.

When complete, save the template and log out of the EHR. Then log in to the EHR.

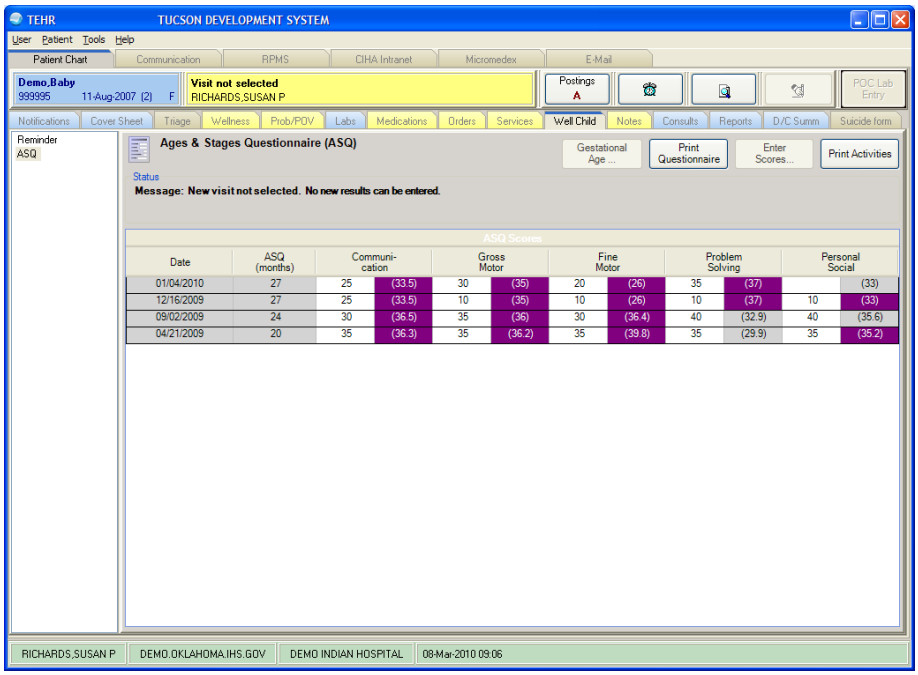


Figure 4-7: Sample layout

Another window displays. See the figure below.

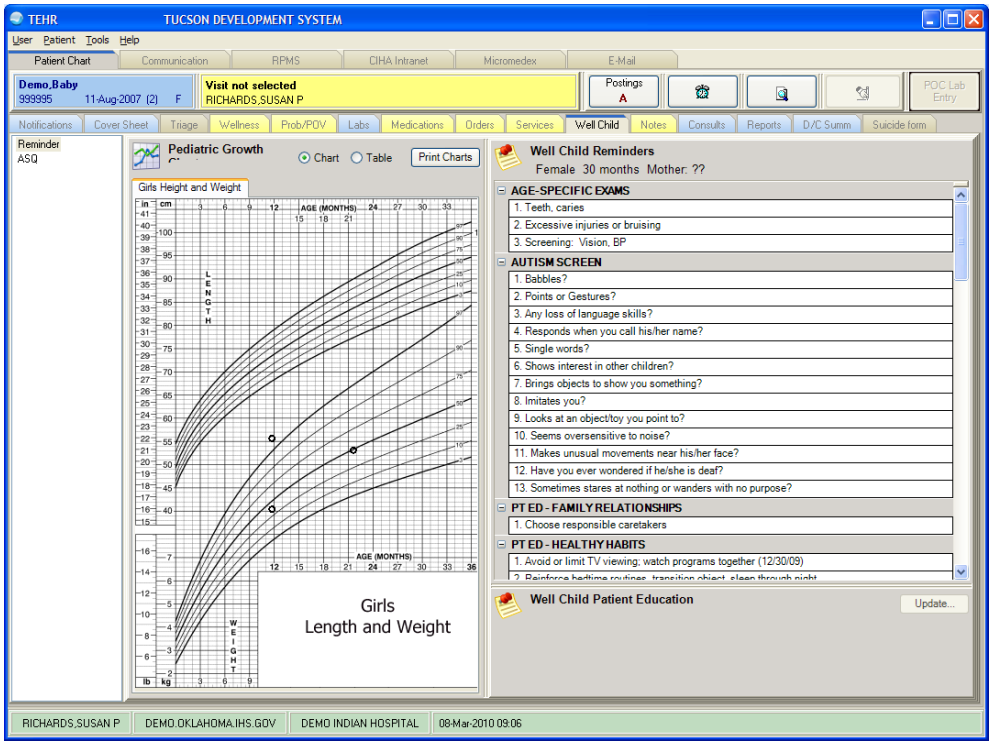


Figure 4-8: Well Child window

# 5.0 Pediatric Growth Charts

The Pediatric Growth Charts object shows growth information about the current patient. You can display the charts, the table data for the charts, and print the charts where the charts display in a PDF document.

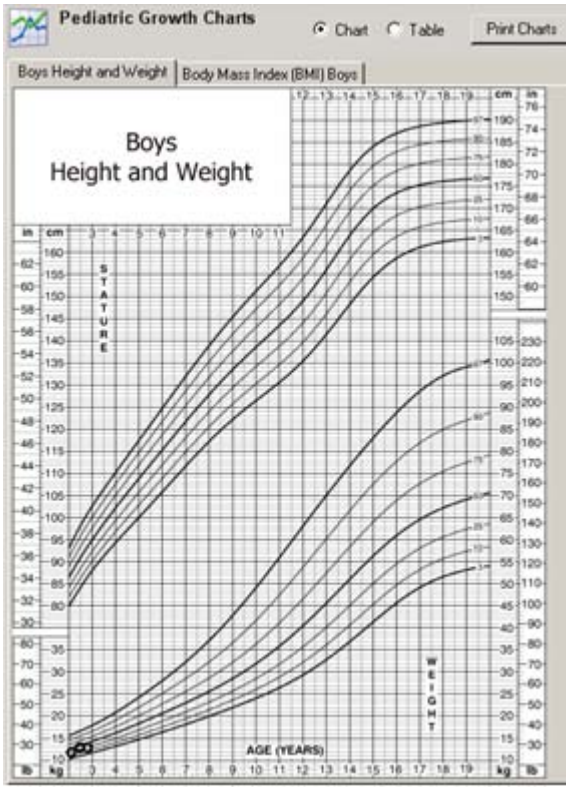


Figure 5-1: Sample Pediatric Growth Charts object

The WCM plots growth measurements directly on the Centers for Disease Control and Prevention (CDC) growth charts, including the CDC Body Mass Index (BMI) chart.

- If the child is over 23 months, view the BMI chart in the component.
- Younger babies get the head circumference chart instead of the BMI.
- The BMI is computed using the standard RPMS algorithm.

## 5.1 Chart Form

The following shows the pediatric growth charts in Chart form.

### 5.1.1 Height and Weight Chart

The default chart view is the height and weight chart.

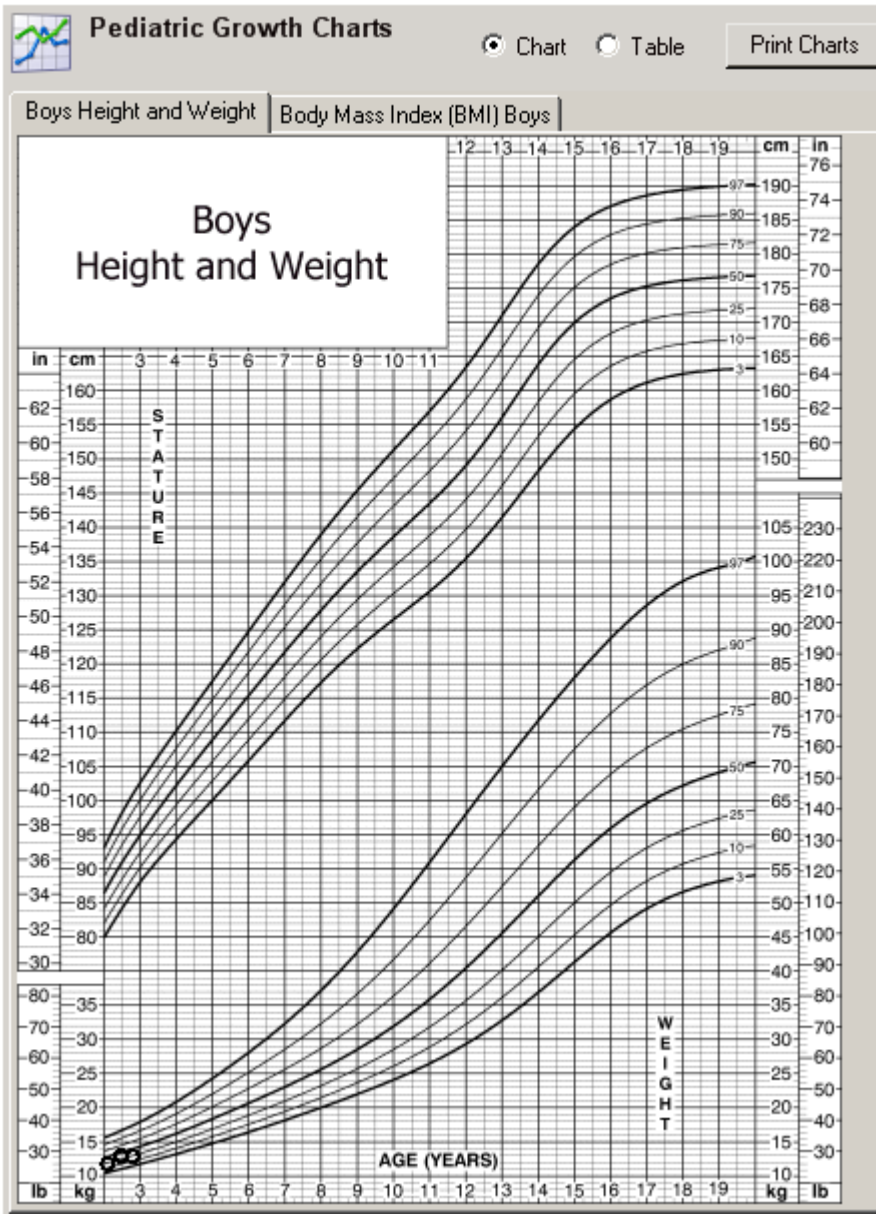


Figure 5-2: Sample child growth chart

### 5.1.2 Body Mass Index Chart Form

Use the Body Mass Index button to display the body mass chart form.

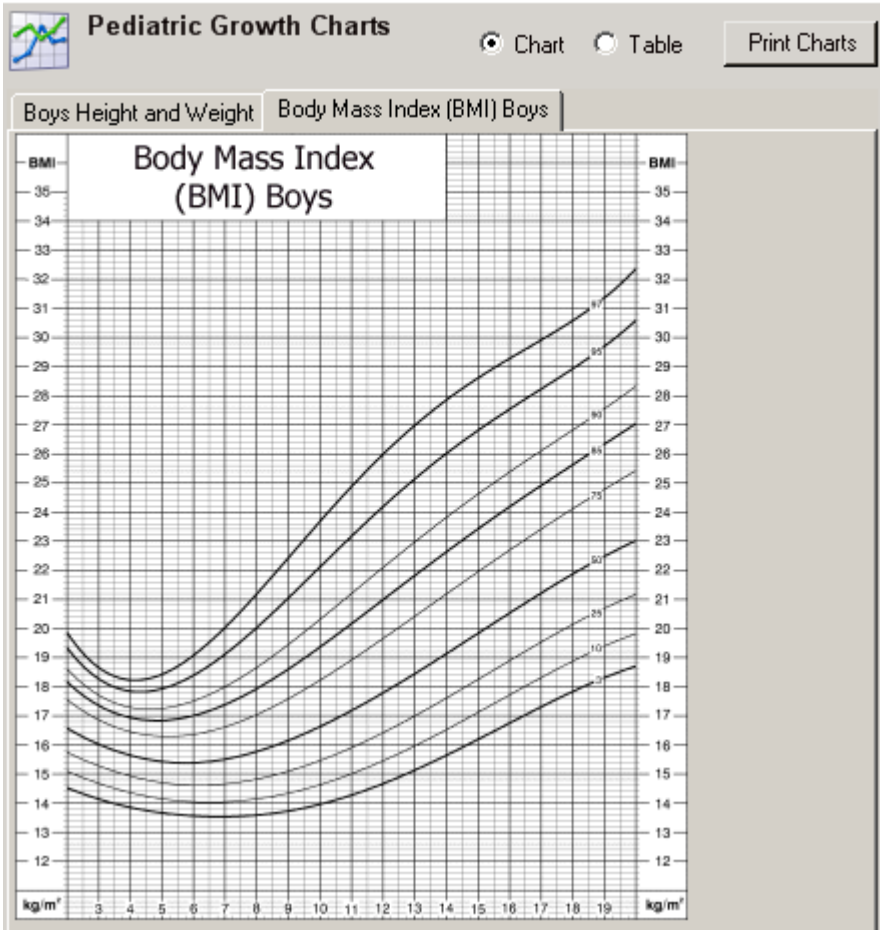


Figure 5-3: Sample BMI chart

## 5.1.3 Head Circumference

Use the Head Circumference button to display the head circumference chart form.

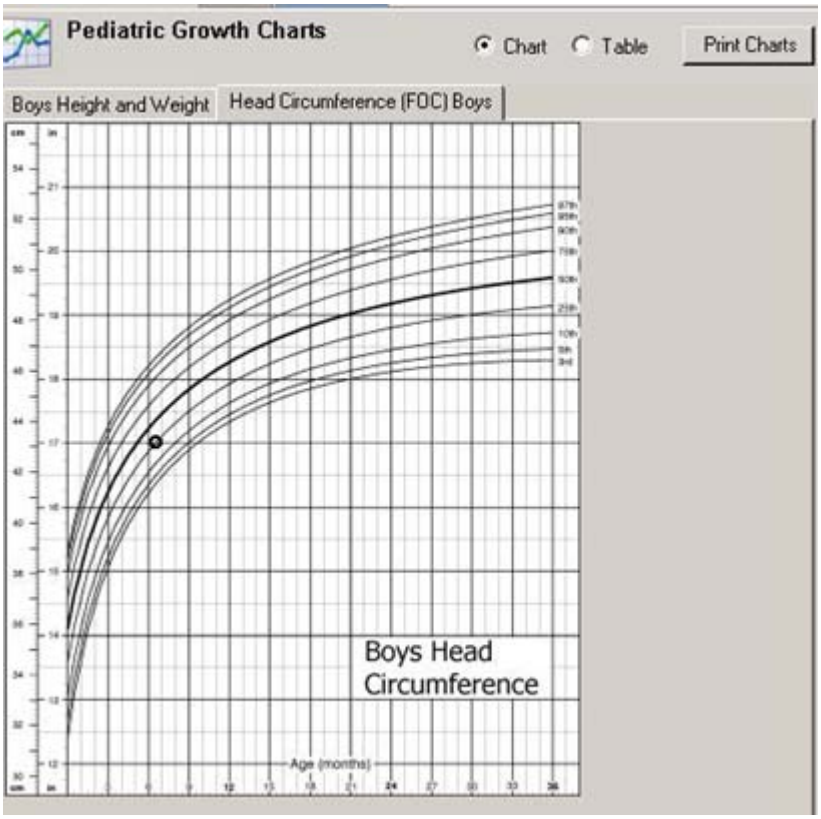


Figure 5-4: Sample Head Circumference Chart

## 5.2 Table Data

The table data displays for any of the chart forms.

### 5.2.1 Table Data for Height and Weight

The table data for height and weight shows age and weight data used.

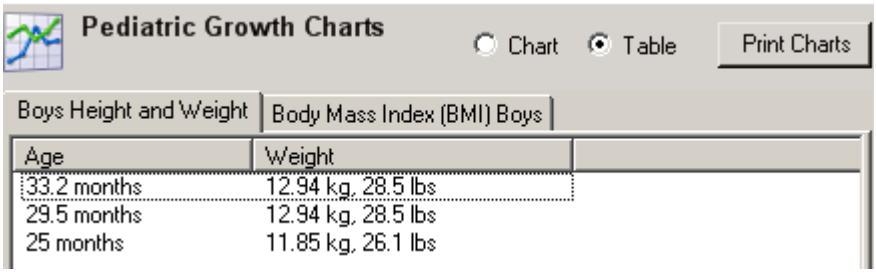


Figure 5-5: Sample Table Data for height and weight

### 5.2.2 Table Data for Body Mass

The table data for body mass shows the Age and BMI for the BMI.

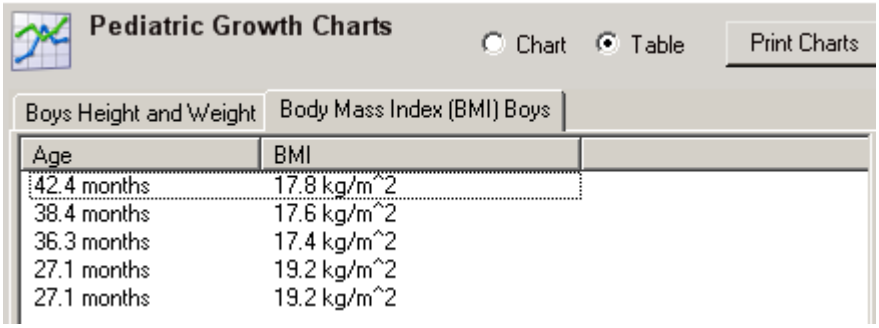


Figure 5-6: Sample Table Data for BMI

### 5.2.3 Table Data for Head Circumference

The table data for head circumference shows Age and Head Circumference (FOC) data used.

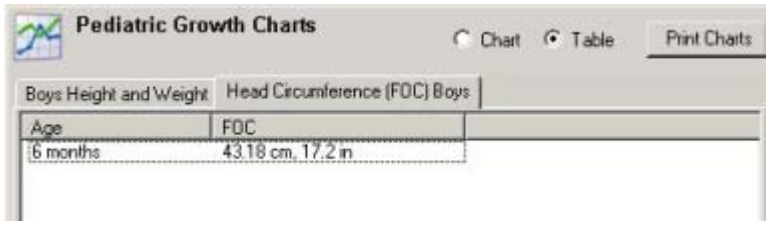


Figure 5-7: Sample Table Data for head circumference

## 5.3 Print Charts

The Print Charts function requires that you have PDF Reader software installed on your local workstation. This function displays the growth chart data in Adobe Acrobat PDF documents. The Adobe application must be loaded to use this feature.

To display the Health Record Number (HRN) on the PDF, do the following: Go into Design Mode (in the RPMS-EHR application) and select the Pediatric Growth Charts component. Right-click on the component to display a contextual menu, and select the **Properties** option. The application displays the Properties for **Well Child Pediatric Growth Charts** dialog box.

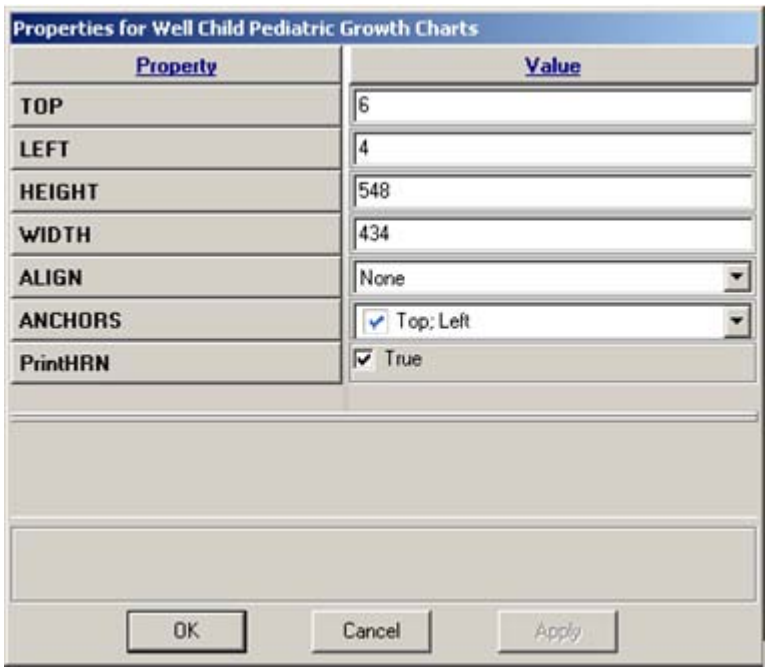


Figure 5-8: **Properties for Well Child Growth Charts** dialog box

The **PrintHRN** Value must be set to True. Exit Design Mode before using the **Print Charts** button.

Below is an example of the HRN showing on the PDF document.

Figure 5-9: Sample HRN number on document

Click **Print Charts** to display the PDF document.

Page one of the PDF document shows the growth charts of the height and weight.

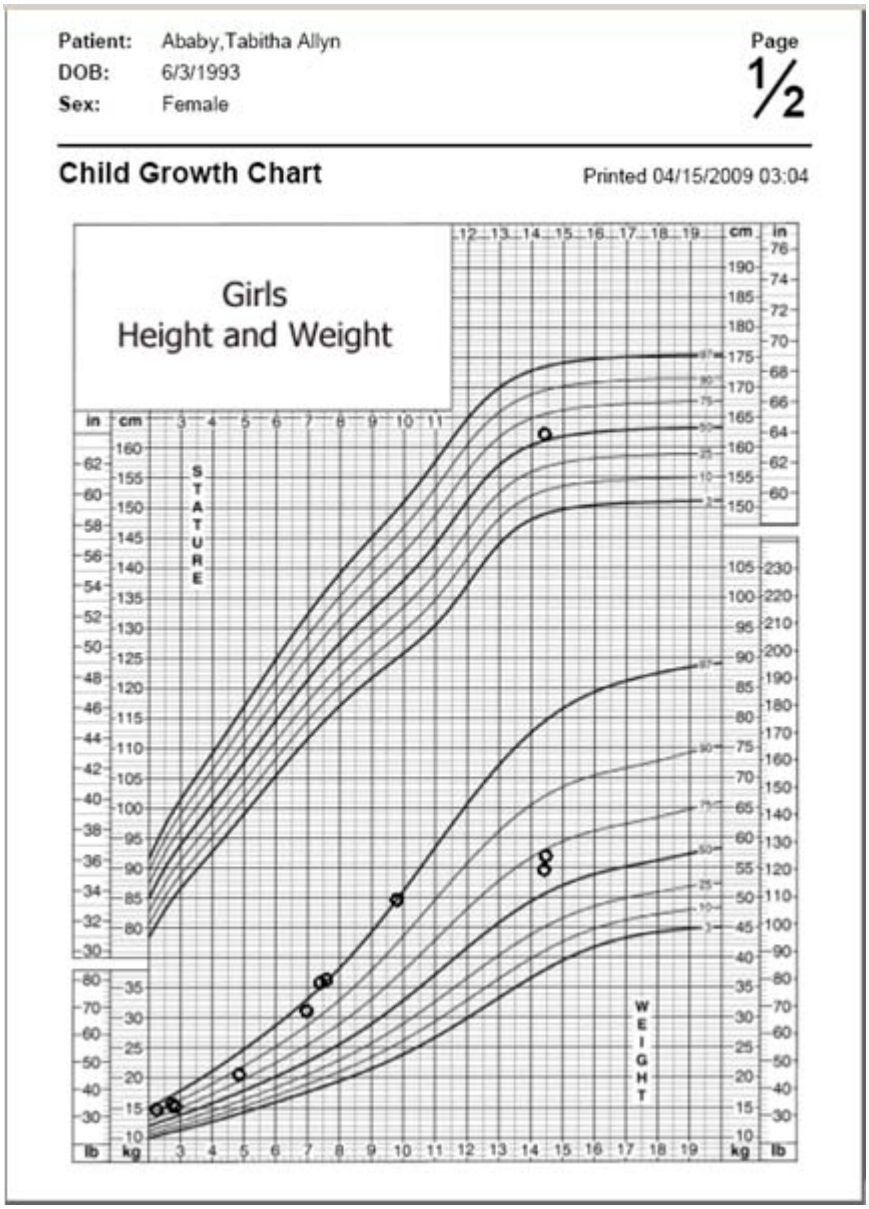


Figure 5-10: Sample Page 1 of the print chart function

Page two of the PDF document can show the growth chart of the body mass (for example).

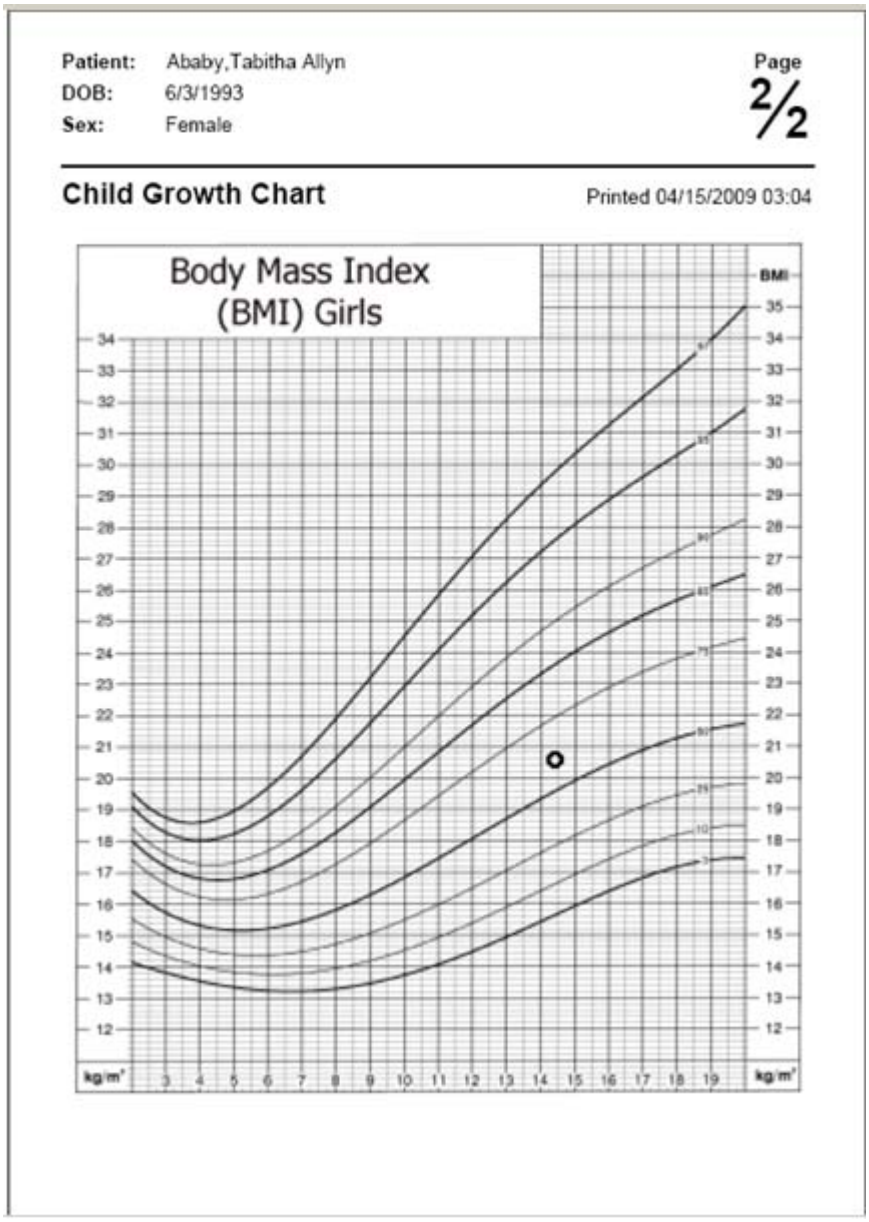


Figure 5-11: Sample Page 2 of the print chart function

# 6.0 Well Child Reminders

The Well Child Reminders object displays the reminders for a well child for the sex and age of the child displayed in the top part of the object. For example, the reminders for a male, age six years, one month are shown below.

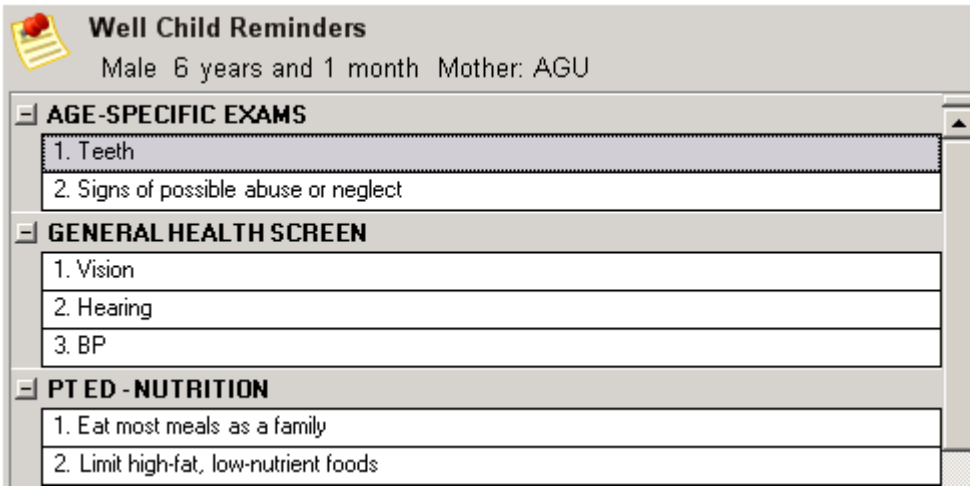


Figure 6-1: Sample **Well Child Reminders** object

Use view-only object to review the reminders under various categories for the child. Reminders vary according the sex and age of the child.

Each category can expand/collapse as needed by clicking the button to the left of the category name. To move up or down on the page, use the scroll bars.

The well child reminders are stored in a master list called the WCM Knowledgebase.

Below are some examples of Well Child Reminders.

## 6.1 Age-Specific Exams

Below is a sample of **Age-Specific Exams** reminders.

Figure 6-2: Sample **Age-Specific Exams** reminders

## 6.2 General Health Screen

Below is a sample **General Health Screen** reminders.

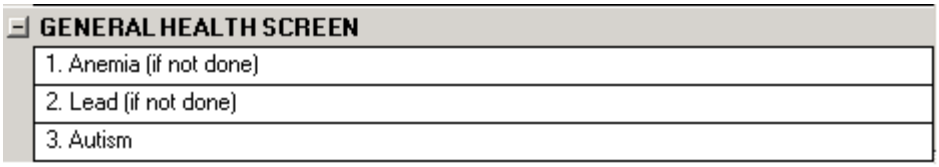


Figure 6-3: Sample **General Health Screen** reminders

## 6.3 Patient Education Nutrition

Below is a sample of Patient Education (**PT ED**) **Nutrition** reminders.

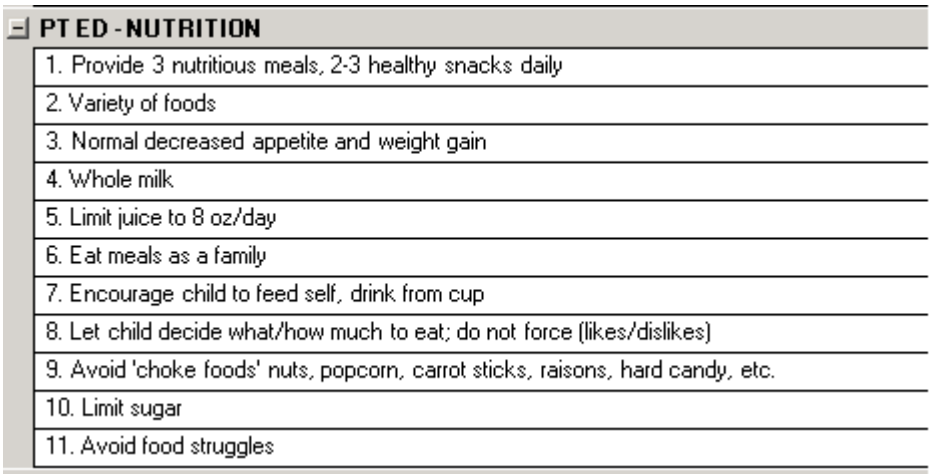


Figure 6-4: Sample **PT ED Nutrition** reminders

## 6.4 Special Risk Screen

Below are the **Special Risk Screen** reminders.

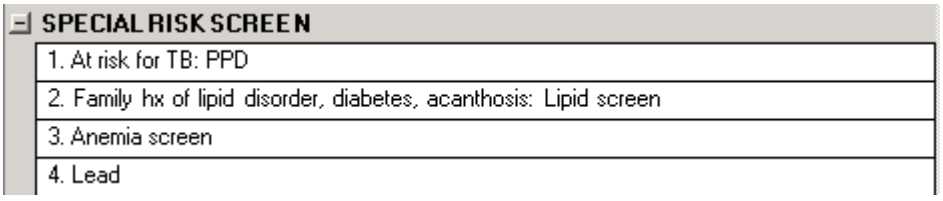


Figure 6-5: Sample **Special Risk Screen** reminders

## 6.5 Behavioral Health Screen

Below are the **Behavioral Health Screen** reminders.

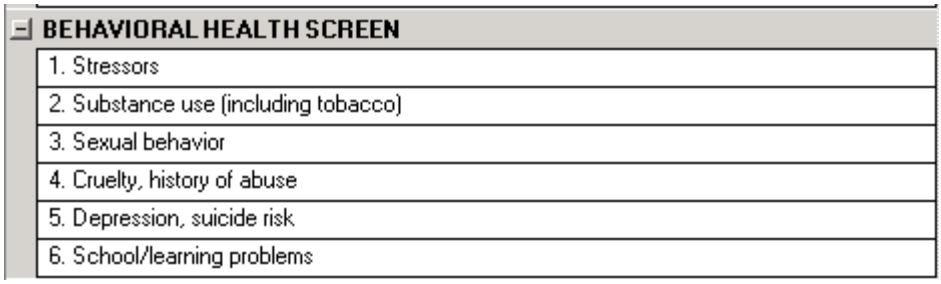


Figure 6-6: Sample **Behavioral Health Screen** reminders

## 6.6 PT ED Social Competence

Below are the **PT ED Social Competence** reminders.

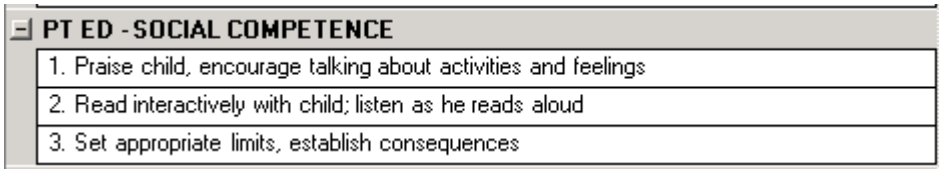


Figure 6-7: Sample **PT ED Social Competence** reminders

## 6.7 PT ED Parent Infant Interact

Below are the **PT ED Parent Infant Interact** reminders.

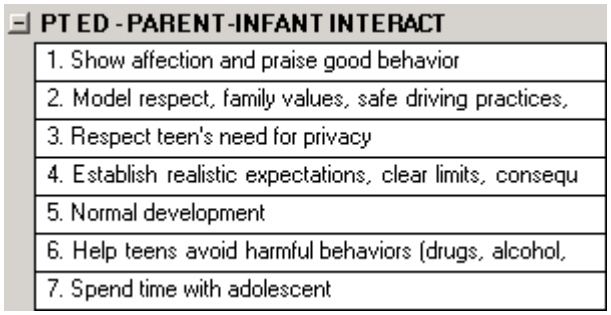


Figure 6-8: Sample **PT ED Parent Infant Interact** reminders

## 6.8 PT ED for the Parents

Below are the **PT ED for the Parents** reminders.

Figure 6-9: Sample **PT ED for the Parents** reminders

## 6.9 PT ED Responsibility

Below are the **PT ED Responsibility** reminders.

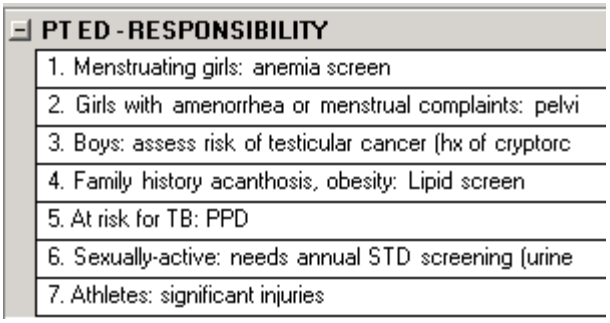


Figure 6-10: Sample **PT ED Responsibility** reminders

# 7.0 Well Child Patient Education

The **Well Child Patient Education** object in the RPMS-EHR application provides a means to update well child patient education.

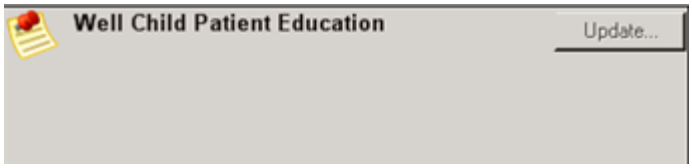


Figure 7-1: **Well Child Patient Education** object

## 7.1 Well Child Patient Education Update

Click Update (on the Well Child Patient Education object) to access the **Well Child Patient Education Update** window.

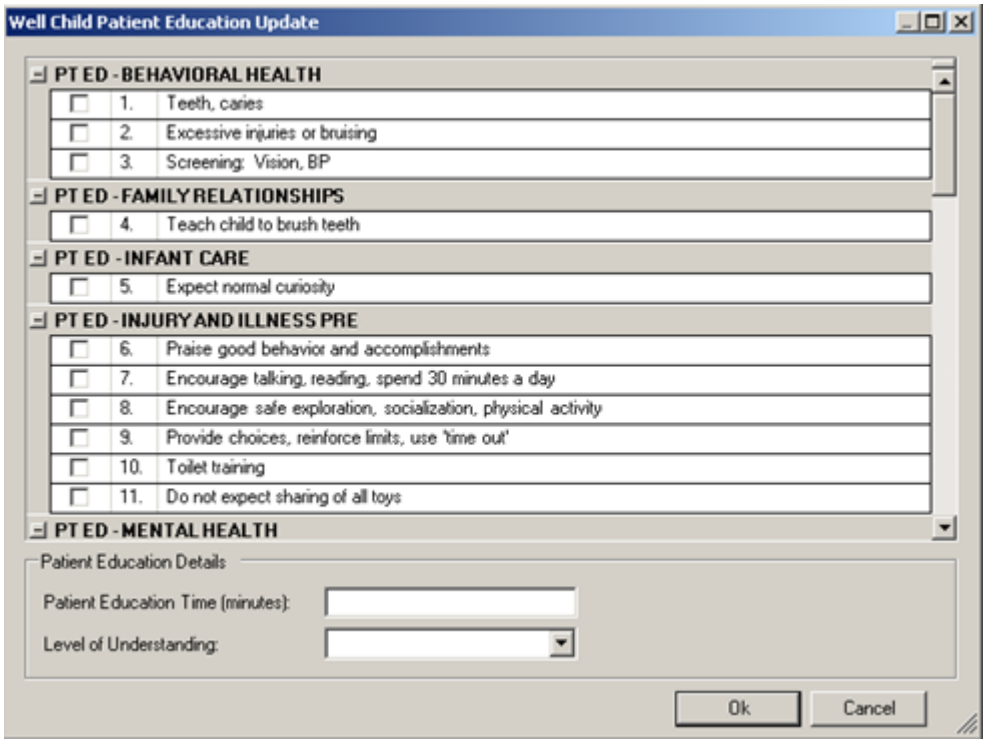


Figure 7-2: Sample **Well Child Patient Education Update** window

Check a patient education subject that was used in encounter, and then complete the **Patient Education Time and Level of Understanding** field.

- **Patient Education Time**: This indicates the number of minutes spent on the patient education. If the patient is a very young child, then the patient education applies to the parents.
- **Level of Understanding**: Use an option from the drop-down list to indicate the level of understanding for the patient education topic.

If more than one subject was checked, then the time will be divided equally among the subjects.

Click **OK** to save the information. The application confirms that the data was saved. (Otherwise, click **Cancel** to not save). The user is returned to the RPMS-EHR application. If **OK** is clicked, the application updates the Patient Education component with the well child patient education.

## 7.2 Patient Education Already Documented

Another well child patient education record can be added by clicking **Update** (again). This time the application displays the date behind the patient education topic that was documented. For example, the figure below shows that Item 13 was documented on 4/21/09.

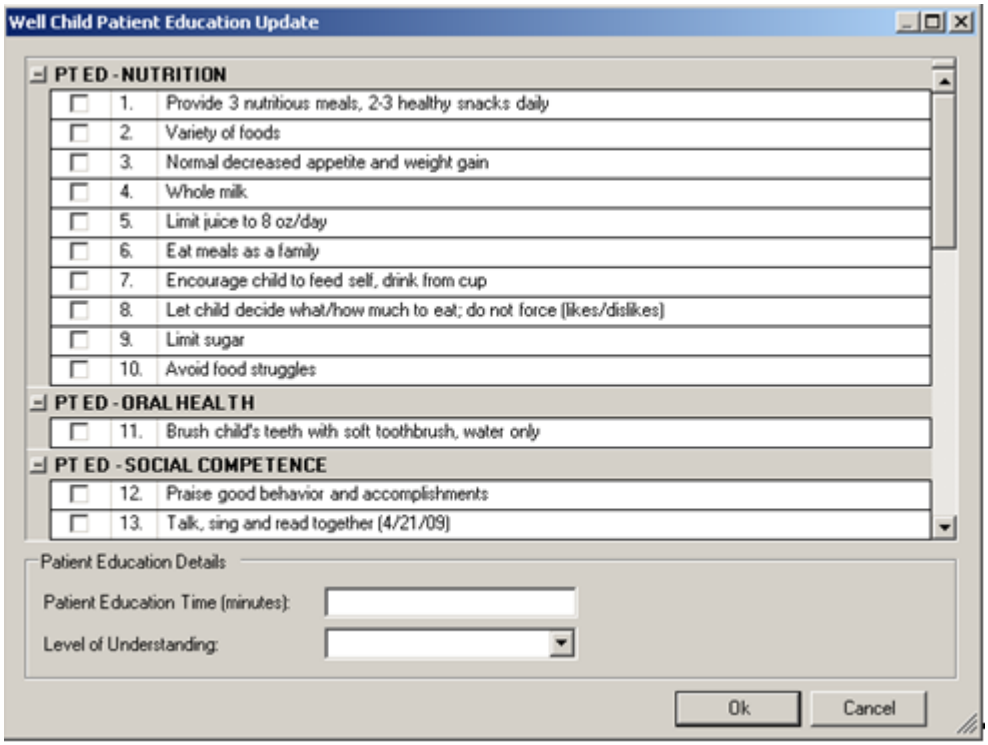


Figure 7-3: Sample **Well Child Patient Education Update** window with data

# 8.0 Well Child Patient Education

The **Well Child Patient Education** object in the RPMS-EHR application provides a means to update well child patient education.

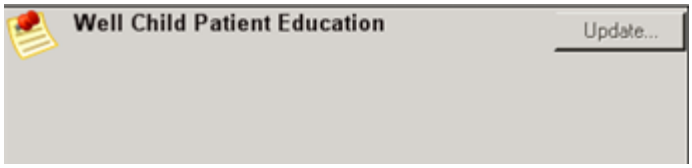


Figure 8-1: **Well Child Patient Education** object

A visit must be selected before Update becomes active.

## 8.1 Well Child Patient Education Update

Click **Update** (on the Well Child Patient Education object) to access the **Well Child Patient Education Update** window.

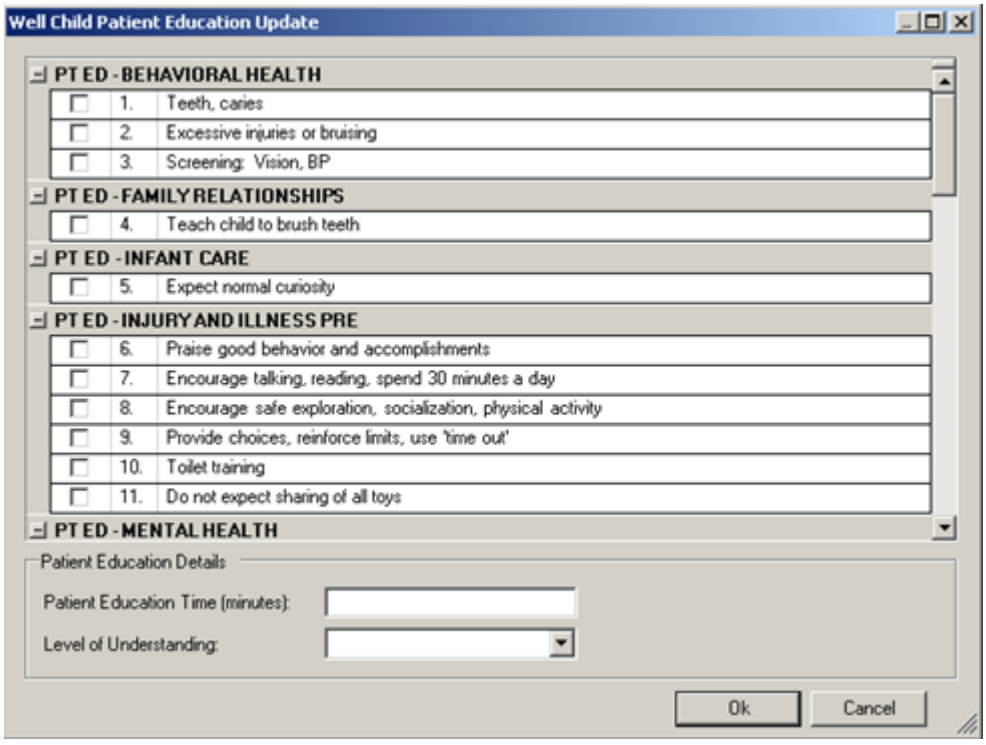


Figure 8-2: Sample **Well Child Patient Education Update** window

Check a patient education subject that was used in encounter, and then complete the **Patient Education Time and Level of Understanding** field.

- **Patient Education Time**: Indicates the number of minutes spent on the patient education. If the patient is a very young child, then the patient education applies to the parents.
- **Level of Understanding**: Use an option from the drop-down list to indicate the level of understanding for the patient education topic.

If more than one subject was checked, then the time will be divided equally among the subjects.

Click **OK** to save the information. The application confirms that the data was saved. (Otherwise, click **Cancel** to not save). The user is returned to the RPMS-EHR application. If **OK** is clicked, the application updates the Patient Education component with the well child patient education.

## 8.2 Patient Education Already Document

Another well child patient education record can be added by clicking **Update** (again). This time the application displays the date behind the patient education topic that was documented. For example, the figure below shows that Item 13 was documented on 4/21/09.

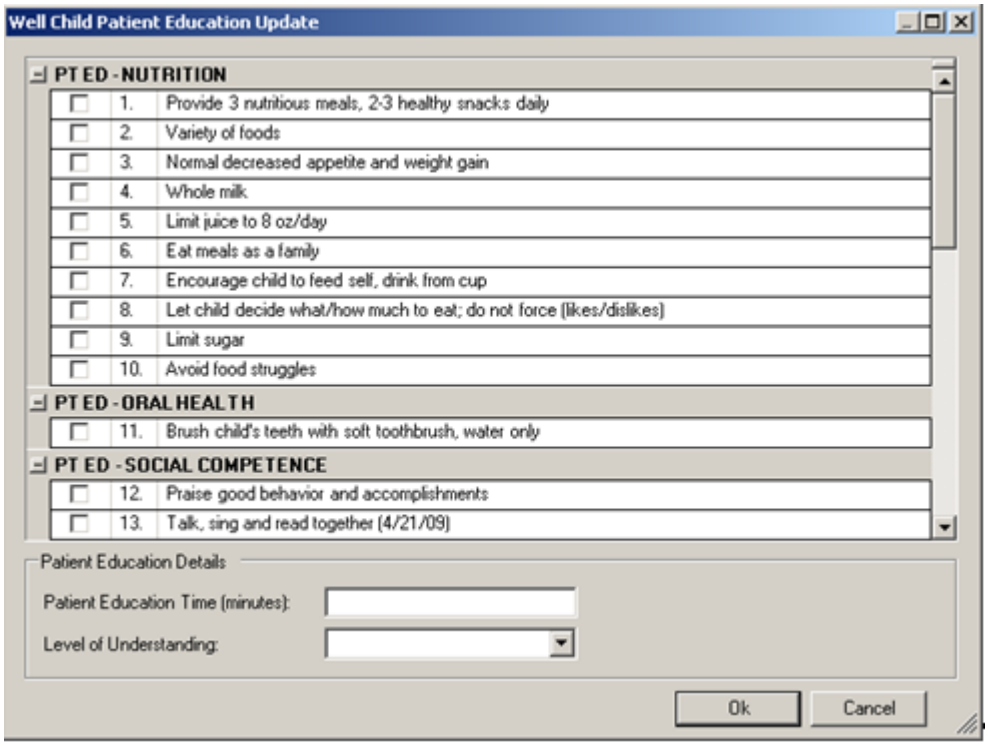


Figure 8-3: Sample **Well Child Patient Education Update** window with data

# Contact Information

If you have any questions or comments regarding this distribution, please contact the OIT Help Desk (IHS).

**Phone:** (505) 248-4371 or (888) 830-7280 (toll free)

**Fax:** (505) 248-4363

**Web:** http://www.ihs.gov/GeneralWeb/HelpCenter/Helpdesk/index.cfm

**E-mail:** support@ihs.gov