CHADIS

Evidence-based, Shared Decisions.

A comprehensive web-based screening, decision support and patient engagement system.

www.CHADIS.com

Leadership

Barbara Howard, MD- President, TCH Inc. and Co-creator of CHADIS

- Developmental-behavioral pediatrician trained at Harvard University
- Assistant Professor, The Johns Hopkins University School of Medicine
- Past president of the international Society for Developmental and Behavioral Pediatrics
- Contributing author for Bright Futures, DSM-PC; Bright Futures in Practice,
- AAP C Anderson Aldridge Award for contribution in Child Development

Raymond Sturner, MD- Director, Non-profit Center and Co-creator of CHADIS

- Developmental-behavioral pediatrician trained at Yale University
- Associate Professor, The Johns Hopkins University School of Medicine
- Former Director of the Developmental and Behavioral Pediatrics Fellowship at Johns Hopkins
- Former Director Child Development Unit, Duke U.
- PI for over 100 "research grant years."

Christopher Daly, MHS- COO

- COO and CFO in healthcare, life science, and higher education.
- Founder of successful businesses
- Board of Directors, Entrepreneurial Accelerator
- Advisor to corporate business innovation groups.
- MBA Certificate in Technology & Entrepreneurship, University of Tennessee-Chattanooga.

Sharissa Epps- Director of Global Partnerships & Product Strategy

- Implementation Specialist for 100's of CHADIS installations
- Expert on EHR-CHADIS integration

Benefits of Patient Reported Outcomes (aka Patient Generated Health Data)

For Patients

- More accurate data
- Better patient–clinician communication
- More shared decision making
- Improved satisfaction
- Reduced ED use
- Improved quality of life
- Longer survival (e.g., advanced cancers)

For Doctors "..lets me be a doctor again"

- Improved satisfaction
- Reduced burden, time
- Increased income

One Secure Web System
to collect patient and provider data from all sites

- Health: Assists all aspects of care (child & adult)
- Education: Screen and share data for Childcare and Education
- Behavioral Health: Facilitates, documents & shares for Integrated Behavioral Healthcare
- Social Determinants of Health: Screens, addresses, refers and tracks
- Public Health: Population health level deidentified data, registries, automated statistical control charts

CHADIS: A Clinical Process Support System

Pre-Visit

- Data collection from patients, parents and teachers using >600 tools, including all recommended by AAP

Visit:

- Moment of care decision support for clinicians
- Scored results
- Graphics
- Patient Specific Templates
- Referral & Tracking

Post-visit:

- For Patients
  - Patient Education in MemoryBook Care Portal
  - Monitoring for tracking outcomes
  - Patient-specific resources
- For Clinicians
  - Clinician education
  - QI feedback with MOC-4 credits
  - Automated result charting

CHADIS Snapshot

- \> 2.3 million parents enrolled
- \>135,000 patients screened per month
- In 45 states and 10 countries
- \>3000 clinicians
- \>9 million questionnaires submitted
- EHR integrations:
  - Allscripts, Office Practicum, athena, eCW, EPIC
  - Pending completion: PCC
  - Installations: Cerner, Centricity
  - Integration partner Redox
- Built with $18.7 million SBIR funding

The CHADIS Solution

- Parent and teen separately take *pre-visit* online questionnaires

- Clinician reviews results, can share graphics with family

- Clinician may use decision support for documentation; "teleprompters"; treatment plans

- Clinician may select handouts, resources from links that go to Care Portal or print

- Clinician may exchange findings with school or mental health provider online

- Education materials automatically populate MemoryBook Care Portal

- Clinician bills insurance, earns Board credits

Comprehensive Library of Questionnaires (e.g. of >600)

INFANT & YOUNG CHILD
- Ages & Stages Questionnaires® Third Ed. (ASQ-3™)
- Modified Checklist for Autism in Toddlers (M-CHAT) & Follow-up
- Infant Development Inventory (IDI)
- ASQ:Socioemotional-2

SCHOOL AGE
- Pediatric Symptom Checklist (17 items)
- Vanderbilt Parent Revised
- Vanderbilt Follow-up, Parent Informant
- CHADIS - DSM 5
- Strengths & Difficulties Questionnaires & FA
- SCARED: Parent and Child
- CBCL

ADOLESCENT
- Pediatric Symptom Checklist - Youth
- Patient Health Questionnaire 2, 9, A
- CRAFFT
- Kutcher Adolescent Depression Scale
- CES-DC (depression)
- CHAMPS (Adolescent Risk Behaviors)

TEACHER DATA
- Vanderbilt Teacher Revised & Follow Up
- School Intervention Questionnaire

QUALITY MONITORING
- Provider-level Promoting Healthy Development Survey

GENERAL HEALTH
- CHADIS Visit Priorities
- Early Periodic Screening Diagnosis and Treatment (EPSDT)
- Family Medical History
- Family Cardiac History
- Safety & Guidance Topics (Bright Futures)
- Brenner FIT (Obesity and Nutrition)
- Healthy Kids
- PACCI, ACT and others (Asthma monitoring)

FAMILY / ENVIRONMENT
- Edinburgh Postnatal Depression Scale
- McMaster Family Assessment Device, General Functioning Scale
- Adverse Childhood Experiences (ACE)
- Partner Violence Screen
- Safe Environment for Every Kid (SEEK)
- Adverse and Positive Childhood Experiences
- NCCares306
- Family Assessment of Safety & Stress (SEEK+)

ADULT HEALTH/MENTAL HEALTH
- Medicare Wellness
- Falls Risk
- AUDIT
- PRAPARE

CHADIS Assists:

- Health, dev., social-emo., family issue detection, referral, follow up, monitoring, & tracking
 (NC "unable to track at risk screens for follow-up, population management")

- Patient/Parent education

- Care Coordination and consented data sharing with education and health providers

- Documentation of care and results

- Quality Improvement: Providers earn MOC-4 credit; Clinic/system access QI metrics

- Payment for quality reimbursement models

- Reduced health care costs

- Documentation of population health

Patient Input Options- Device & Language

Computer

Tablet

Smartphone

-Patient choose language- English, Spanish, French, others by request

-Clinicians see results in English (can see in language used as well)

CHADIS: Uses in Different Levels of Healthcare

Individual Patient Care
- Validated screens
- Data collection
- Documentation
- Decision support for clinicians
- Resources for patients
- Monitoring
- Referral & Tracking
- Added income

Clinics/Networks
- QA metrics for negotiating rates
- Social Determinants for Value Based Payments
- Referral & Tracking
- Outcomes

Population Health
- Uniform database
- Automated registries
- Automated graphs
- Needs assessments in the course of care

Health & Mental Healthcare

Health & Mental Healthcare

- Screening & diagnostic tools- Child, teen, adult and family
- Decreased documentation
- Patient and staff education
- Patient resources automated and selected
- Care Portal for notes, handouts, resources
- Data sharing with online consent to coordinate care
- Between visit monitoring prompted by text or email (also billable)
- QA and MOC-4 graphics automated
- Increases income

Patient Regular Entry View
e.g. ASQ for Development

Questionnaire for: Gus Green

While your baby is on his back, does he move his head from side to side?

- ● Yes
- ○ Sometimes
- ○ Not yet

After holding her head up while on her tummy, does your baby lay her head back down on the floor, rather than let it drop or fall forward?

- ● Yes
- ○ Sometimes
- ○ Not yet

When your baby is on his tummy, does he hold his head up so that his chin is about 3 inches from the floor for at least 15 seconds?

- ○ Yes
- ○ Sometimes
- ● Not yet

When your baby is on her tummy, does she hold her head straight up, looking around? *(She can rest on her arms while doing this.)*

- ○ Yes
- ○ Sometimes
- ● Not yet

When you hold him in a sitting position, does your baby hold his head steady?

- ○ Yes

Tablet/Kiosk View

chris | Cambiar al español | Switch to 中文 | My Profile | Help | Logout

Modified Checklist for Autism in Toddlers (M-CHAT) - Question 19 of 23.

19. Does your child try to attract your attention to his/her own activity?

Yes

No

M-CHAT © 1999 Robins, Fein, & Barton

Next »   Save & Quit   Quit

CHADIS Summary Report

Visit on 11/15/09

Name	Allen Autism	Reason for Visit	Well-child
DOB	4/11/2008	Gender	Male
Report Date	11/15/2009	Report Age	1 year 7 m
Today's Date	11/15/2009	Age Today	1 year 7 m

Concerns from Pre-visit Questionnaires

- Being social
- Development

Challenging parts: Worrying about his/her health

Best parts: Help from family/friends

Questionnaires

Alert	Questionnaire	Completed	Respondent	Provisional Result						Responses
				Pass	Fail	Disorder	Problem	Variation	Challenge	
**	Ages & Stages Questionnaires®: 18 months ?	11/15/2009	Mother	4					1	Preview Include
**	CHADIS 0-3: All Domains ?	11/15/2009	Mother		2				7	Preview Include
**	EPSDT (Health Risk) ?	11/15/2009	Mother						1	Preview Include
	Guidance Topics ?	11/15/2009	Mother							Preview Include
**	Important Information About Your Child ?	11/15/2009	Mother						2	Preview Include
***	Modified Checklist for Autism in Toddlers (M-CHAT) ?	11/15/2009	Mother		1					Preview Include
	Safety (Ages 0-11 Years) ?	11/15/2009	Mother						1	Preview Include

Current Autism/DD Screen Accuracy: 18 mos.
Autism (ASD), Devel. Delay (DD)

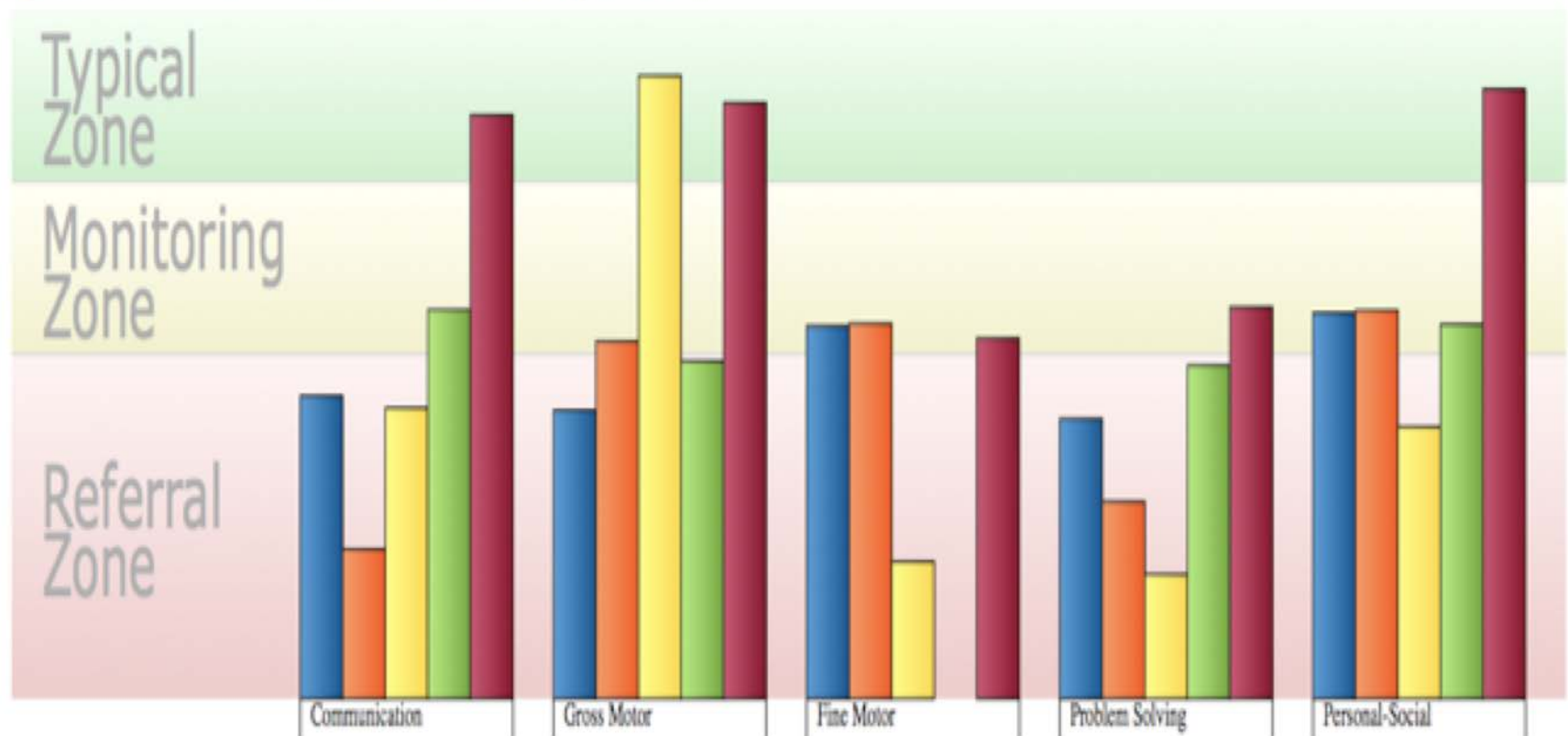|	CURRENT STANDARD		
	ASD M-CHAT-R	ASD M-CHAT-R/F	DD ASQ
Sensitivity	.730	.317	.393
Specificity	.658	.896	.848
PPV	.280	.357	.573
NPV	.930	.878	.728

CHADIS Machine Learning Accuracy for ASD, DD and ASD and/or DD at 18 months

	ASD (*AUC=0.94*)	DD (*AUC=0.90*)	ASD/DD Combined
Sensitivity	.938	.893	.935
Specificity	.874	.787	.806
PPV	.577	.610	.674
NPV	.987	.952	.967

Developmental Screening Results: ASQ-3

Charts

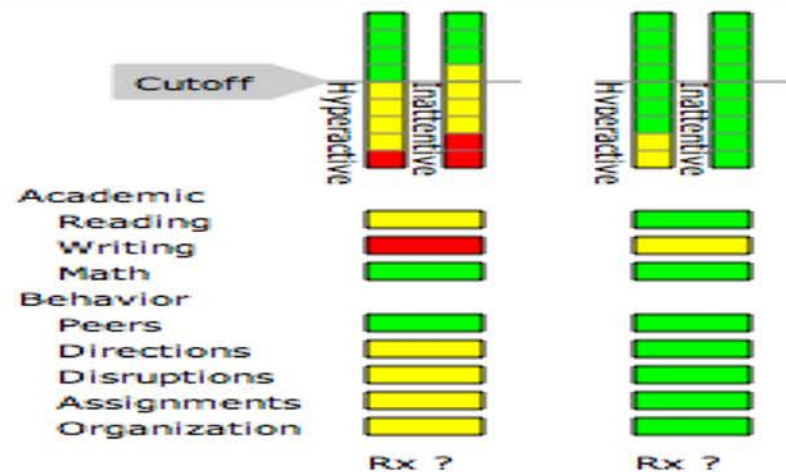Ages & Stages Questionnaires®, Third Edition (ASQ-3™) Comparison Chart
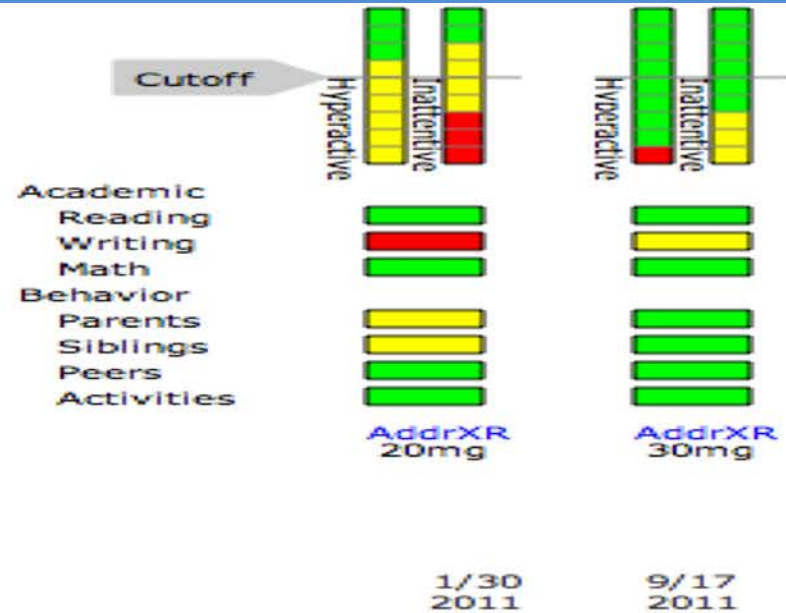
MemoryBook Care Portal for Parent Education and Resources

Care Portal: Visit Notes

Patient-Specific Suggestions from Links

Note from Barbara Howard   Close

You reported that in the past month you have felt very little interest or pleasure in things you used to enjoy. Many people go through periods of feeling this way. There are some steps you can take to help yourself improve how you feel.
For instance, pushing yourself to spend a little time each day doing something you used to enjoy could help improve how you feel.
Click here to read about more strategies you can try. Often times, people need outside help to help them find joy in life again. A good place to start is talking to your doctors and getting referrals for a mental health professional.
Click Parental Depression Local Resources to check and see if your doctor has recommended local professionals or programs that should be helpful: If not, call the office.

OK

Local & National Resource links

CHADIS®
Memory Book & Care Portal

Current Memory Books | Alerts

Welcome Barbara Howard | CHADIS | logout | Patient:Gus Green

Viewing Information available to:
Mom Green

| Memory Book | Notices | Visit Notes ⁷ | Resources ¹⁰ | Find Resources | About |

Suggest a Resource

Give Us Feedback!

My Resources

Search Memory Book... | Search

| Type	Name	Description
Info for Parent (From Dr. Barbara Howard)	**What to do When Food is Running Low**	**Parent handout**
Private, Non-Profit (From Dr. Barbara Howard)	**Parents Anonymous, Inc**	**National organization dedicated to preventing child abuse and providing parent education and support. Local organizations operate separately.**
Book (From Dr. Barbara Howard)	**1-2-3 Magic: Effective Discipline for Children 2-12** **Author:**	**"This revised edition of the award-winning 1-2-3 Magic program addresses the difficult task of child discipline with humor, keen insight, and proven ...**
Info for Parent (From Dr. Barbara Howard)	**Seek Discipline Handout**	**Seek Discipline Handout**
Info for Parent (From Dr. Barbara Howard)	**Seek Food Handout**	**Seek Food Handout**
Info for Parent (From Dr. Barbara Howard)	**Seek Depression Issues Handout**	**Seek Depression Issues Handout**

Improve Care and Reduce Costs

- Early detection of problems reduces costs to address

- Care coordination and data sharing reduces duplication

- Tracking outcomes provides QA

- Automated documentation saves time and costs

- Improve outcomes reduces costs

 e.g. Asthma care

Asthma Severity/Control & Adherence

Asthma PACCI Results History

Worse ↑
Sum Score

Better ↓

19
15
10
5
0

2/19/16   6/27/16   8/12/16
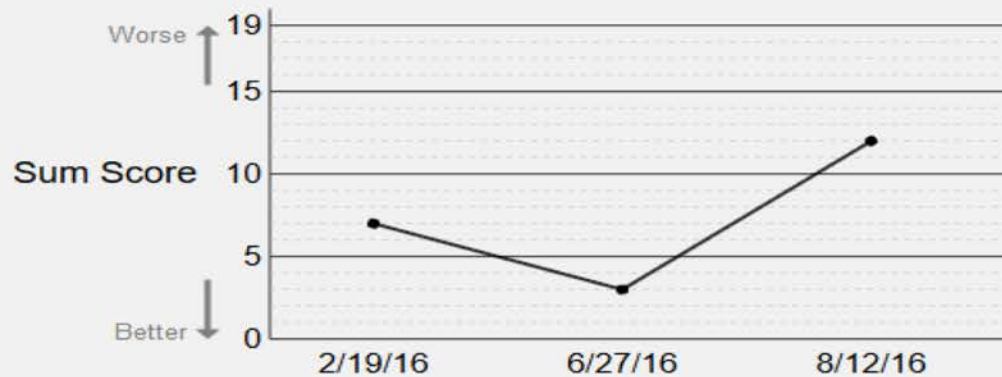
Controller Adherence - Rx

- Rx — Takes controllers all days
- Rx — 5-6 days/wk
- Rx — 3-4 days/wk
- Rx — 0-2 days/wk
- ✕ — None Prescribed

Interventions - Last 3 Months

- Steroid Used
- H — Hospitalization
- + — Urgent Care Visit

For more information about these severity/control ratings and the PACCI, please see PACCI information.

Partly Controlled   Partly Controlled   Uncontrolled
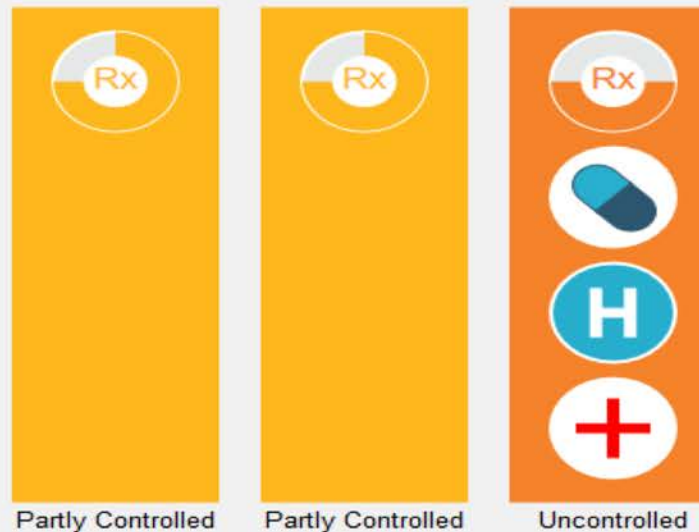
Severity/Control (Severity shown if not on controller medication)

- Intermittent/Well Controlled
- Mild Persistent/Partly Controlled
- Moderate Persistent/Uncontrolled
- Severe Persistent/Very Poorly Controlled

"Click to view" Video of Inhaler Technique Bill 94664 for inhaler technique education

Asthma Gadgets: How to Use a Spacer without a Mask

There are 2 major techniques when using a tube spacer. The choice depends on whether the spacer is being used with a mask (for infants and toddlers) or without mask. This video demonstrates the proper use of the spacer without a mask.

Prepopulated Asthma Action Plan saved in Care Portal &/or print. Editable remotely.

Keep this plan with you at all times and be sure that someone has a copy wherever the child spends time (ex: the nurse at school or daycare, coach at extracurricular activities, other family members, etc.).

Green Zone - Daily Plan when feeling well

When a child is FEELING GOOD it is called Green Zone. Symptoms: Not coughing, wheezing, short of breath, or chest tightness; Can play, exercise, sleep all night; Can do all usual activities; Needing rescue medicine less than twice a week!

Peak flow 80 - 100% of personal best

Daily Controller Medicine: Keep using daily controller medicine:

- Fluticasone/Flovent MDI 220 mcg[Dosage: _____2 puffs_____ Frequency: _____1 time/day_____]

Triggers: Avoid any smoke and avoid Plant pollen, Molds, Animals, Dust or dust mites to help prevent asthma attacks.

Exercise: Use rescue medicine 15 minutes before exercise (see list from rescue medicines).

When to call the doctor:

- Call the doctor for more medicine before you run out.

On Red Alert Days (poor air quality) limit outdoor exercise.

Always use a spacer or holding chamber like Aerochamber with pump inhalers. Rinse mouth after using a controller medicine.

Yellow Zone - Sick Plan to add to the Daily Plan if there is wheezing, cough, tight chest or short of breath

Starting to get sick is called YELLOW CAUTION ZONE. Symptoms: Coughing, wheezing, chest tight, or short of breath; Waking up at night; Trouble doing usual activities like eating; Signs of a cold; Needing rescue medicine more than 2 times a week.

Asthma Randomized Control Trial Results

National cluster randomized trial with 24 practices and 4860 children with asthma. Module created with 10 asthma experts.

Module user group had:

- Significantly fewer asthma attacks: less rescue medicine and steroid burst use
- Significantly fewer asthma visits to doctor
- More children appropriately treated with controller medication (increased revenue from improved CQM)
- More children with stable asthma control
- Trend towards fewer ED visits and hospitalizations
- Linked PACCI to visit priorities increased evidence-based care during routine visits plus documentation for paid -25 extender
- PACCI tool is paid under 96160 (health screen) and 96910 (monitoring)

Billing Codes supported by CHADIS

CPT Code	Definition	Examples	Ave. Payment (natnl sample of 1000 pediatricians*)
96110	*Developmental Screening* with scoring; documentation per standardized instrument	ASQ-3; M-CHAT	$10.04*
96127	*Brief emotional/behavioral assessment* with scoring; documentation per standardized instrument	Vanderbilt; PHQ-9; PSC	$6.32*
96160	*Health risk of patient* fbo patient	CRAFFT; ACT	$4.15*
96161	*Health risk for caregiver* fbo patient	EPDS; SEEK	$4.51*
96111	*Standardized Diagnostic assessment by clinician*	CARS	$97.48*
94664	Demonstration and/or evaluation of inhaler techniques	Asthma Inhaler video	$15.41 (limited data)
99091	*Monitoring* between visits with consent of patient during a visit	Range of requirements not yet well defined	no data yet

CHADIS Payment Calculator

Click to review or edit the average reimbursement per CPT code

Select a region or state to set the values to the reimbursement for that region.

North Carolina

Although default values are provided for your convenience, you may change the values in the areas below.

Average reimbursement per administration of a 96110 tool (ASQ-3; M-CHAT):	$ 8.49
Average reimbursement per administration of a 96127 tool (Vanderbilt; PHQ-9; PSC):	$ 4.25
Average reimbursement per administration of a 96160 tool (CRAFFT; ACT):	$ 3.74
Average reimbursement per administration of a 96161 tool (EPDS; SEEK):	$ 3.74
Average reimbursement per administration of a 96112 tool (CARS):	$ 108.62
Average reimbursement per administration of a 94664 tool (Asthma Inhaler video):	$ 11.12

Calculate Payments

Payment estimate is: $ 34155

Referral and Care Coordination Tools

- Refer the pediatric patient and family members to medical providers or community agencies – receiving providers have approval to **reach out to the patients**
- Send and receive referrals by email or fax
- Document parent/guardian consent for referral (verbal or written)
- Share CHADIS reports, comments, status-of-service updates
- Automatic notifications regarding ongoing referrals

Patient Referral

Status	Accepted Track Appointment Mark Consultation as Done
Referral Code	26ab5b6f57cd28073e3bf3219367c7b7
Patient	Steve Jones
	Contact: Sally Jones
	Contact Phone: (555) 138-1889
	Contact Email: sallyjones@email-email.com
	Insurance: Aetna
Referred By	Genna Doctor1
	Boothbay, a, MD, US
Referred To	Test Office, Baltimore, MD, US
Consent	Verbal Consent obtained by Genna Doctor1 on 10/31/17
Relevant Report	View
Comments	

Genna Doctor1 10/31/17 10:52 AM EDT
Comment when Creating Referral: This patient needs help with behavior issues.

Silvia Specialist 10/31/17 10:54 AM EDT
Comment when Accepting Referral: Thank you for your referral. I look forward to meeting the patient and discussing behavioral therapies

Comments (optional)

Both the referring and the receiving physicians will be able to see these comments.

[Post Comment] [Track Appointment] [Mark Consultation as Done]

Quality Improvement and Population Health Data

Quality Improvement – Maintenance of Certification (MOC) credits

- Quality Improvement (QI) is proven methodology for changing processes, including in health care
- CHADIS: the only health IT company certified by the American Board of Medical Specialties to provide Maintenance of Certification- Part 4 QI in Practice credits
  - Pediatrics, Family Medicine, Internal Medicine, Psychiatry
- Patient generated data + doctor's decisions in CHADIS w/o additional data collection
  - Physicians attend 3 CME sessions about QI by webinar
  - Most include quiz for extra CME
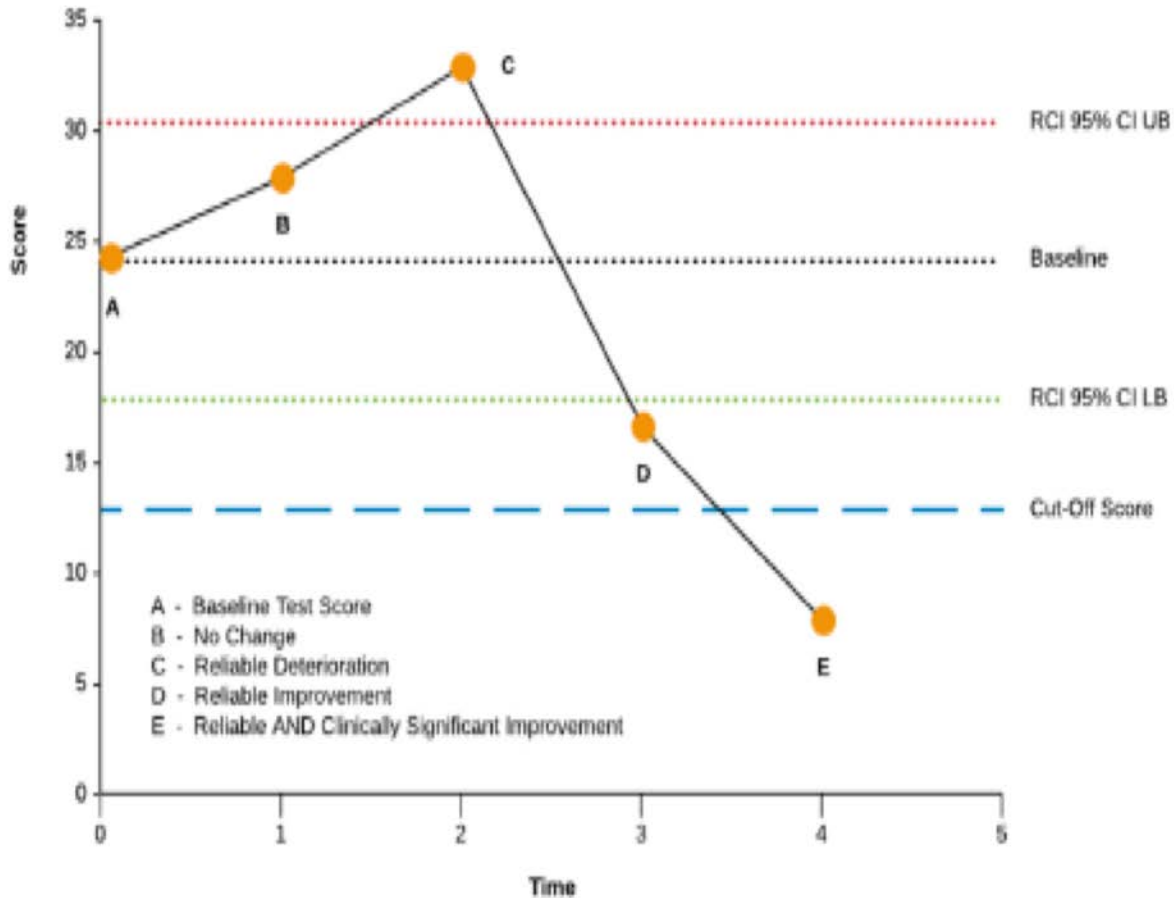 - 5 programs available, custom programs possible

Registry & Reports
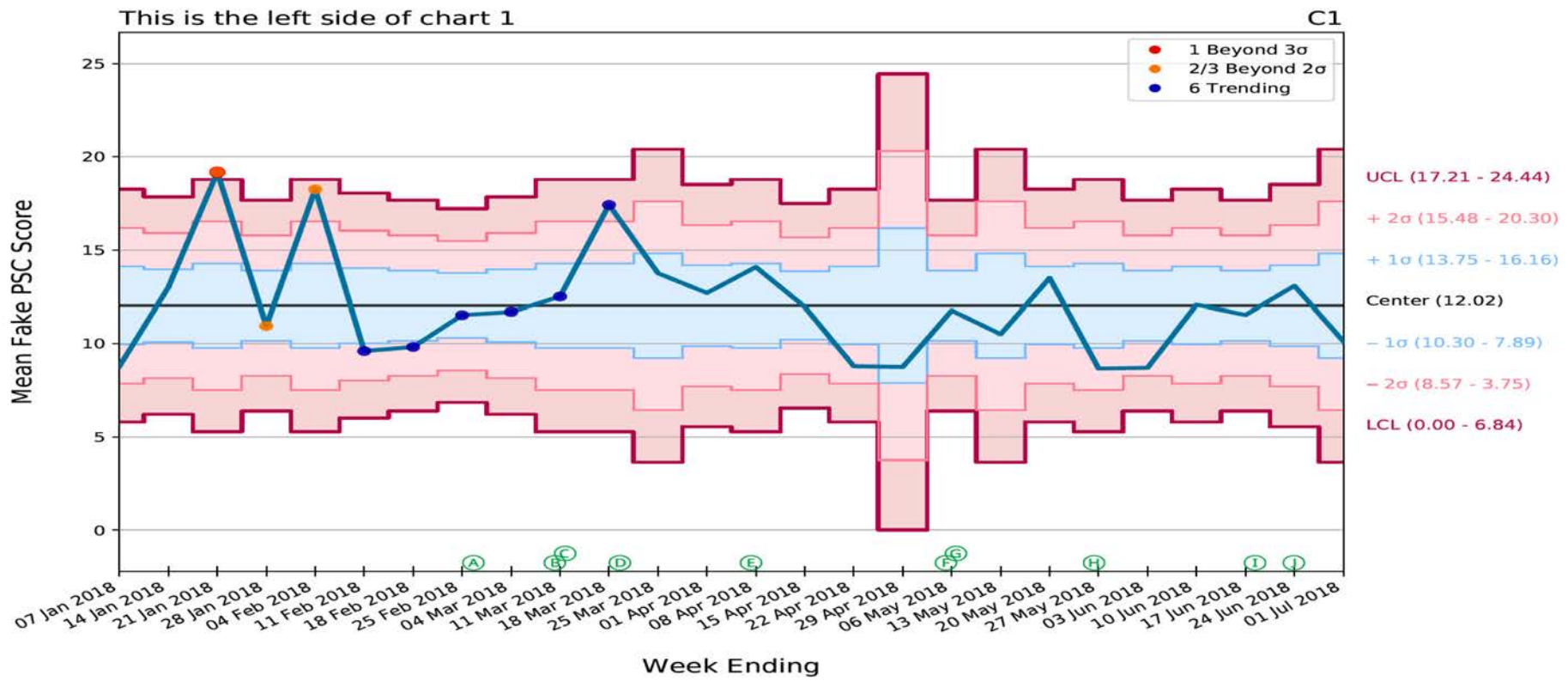
Positive cases for Ages & Stages Questionnaires®

From 2008-11-01 through 2008-11-29

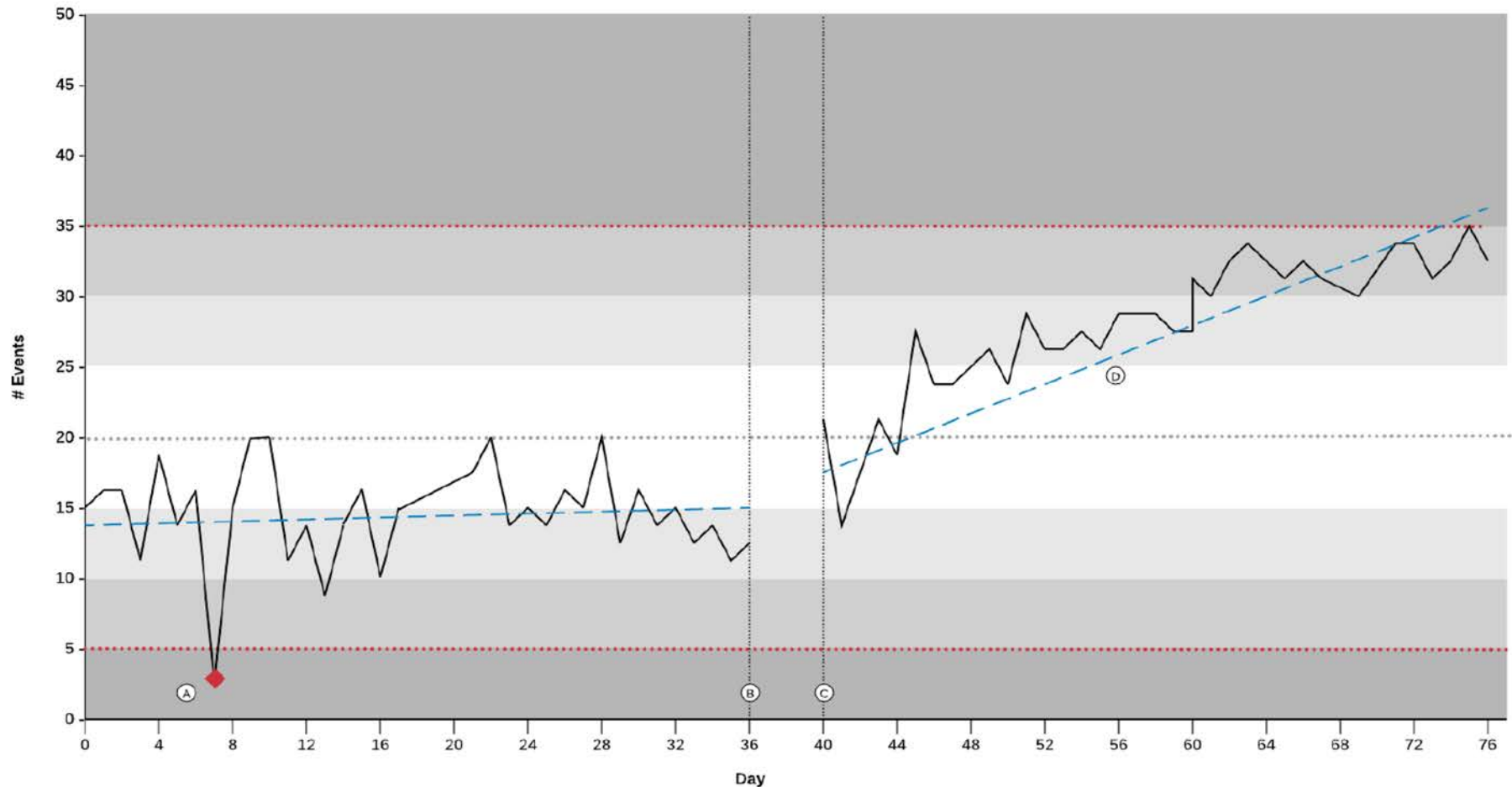| Patient ID	Doctor	Patient	Date	Diagnosis
25863	Howard, Barbara	Suppressed	2008-11-22	Child does not talk like peers: He does not seem to converse. He will answer factual questions but when we try to engage him in conversation, it is more difficult for him.
965	Kasych, Kevin	Suppressed	2008-11-06	Child does not talk like peers: little behind on speech, but is making much progress
4151	Kumar, Gaurav	Suppressed	2008-11-05	Child does not talk like peers: I think her expressive language is slowly emerging. She is labeling items more but she mostly uses words that begin with /d/.
10649	Silver-Isenstadt, Ari	Suppressed	2008-12-29	Child age outside limit for 6 month ASQ
24862	Silver-Isenstadt, Ari	Suppressed	2008-11-05	Positive screen for fine motor delay (cut score <= 30.7); Score: 10
24862	Silver-Isenstadt, Ari	Suppressed	2008-11-05	Positive screen for personal-social delay (cut score <= 38.7); Score: 35
24838	Silver-Isenstadt, Ari	Suppressed	2008-11-05	Child's feet not flat when helped to stand: She will try to stand, but not flat footed....
3733	Silver-Isenstadt, Ari	Suppressed	2008-11-03	Positive screen for personal-social delay (cut score <= 20.1); Score: 5
2154	Silver-Isenstadt, Ari	Suppressed	2008-11-02	Positive screen for problem solving delay (cut score <= 25.2); Score: 25
2562	Silver-Isenstadt, Ari	Suppressed	2008-11-16	Positive screen for communication delay (cut score <= 34.5); Score: 30
2562	Silver-Isenstadt, Ari	Suppressed	2008-11-16	Child does not talk like peers: We think he is behind.
2562	Silver-Isenstadt, Ari	Suppressed	2008-11-16	Parent cannot understand most of what child says:
2562	Silver-Isenstadt, Ari	Suppressed	2008-11-16	Child does not walk, run, climb like peers: He doesn't run.
25066	Silver-Isenstadt, Ari	Suppressed	2008-11-10	Positive screen for communication delay (cut score <= 36.7); Score: 35

Reliable Change Control Charts for QI & Research

A - Baseline Test Score
B - No Change
C - Reliable Deterioration
D - Reliable Improvement
E - Reliable AND Clinically Significant Improvement

Example QI chart for average (X Bar) scores

Interrupted Time Series for QI Trials by Clinic

Marker	Day	Note
Ⓐ	7	Outlier - Greater than 3 standard deviations below the mean.
Ⓑ	36	Start of training intervention and implementation of automated reminders.
Ⓒ	40	End of training intervention and implementation of automated reminders.
Ⓓ	40	ITS - Slope and intercept of second series are significantly different from first series.

CHADIS

Comprehensive Web-based Screening,
Decision Support &
Patient Engagement

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