

Approaches to Screening in Childhood



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Disclaimer

These comments reflect my thoughts, not necessarily those of the American Academy of Pediatrics (AAP), the Evidence Review Group, or any other organization.

Learning Objectives

- Summarize general prevention strategies
- Construct approaches for primary care prevention
- Relate approaches in primary care to newborn screening
- Evaluate approaches to primary care prevention
- Explain the importance of process and outcome measures
- Navigate the process from recommendation to implementation

Levels of Prevention

- Primordial
 - Avoid the risk factors early in life
- Primary
 - Avoid the condition by elimination of disease agent or increasing resistance
- Secondary
 - Address the condition early, before symptoms
- Tertiary
 - Reduce the harms of the condition

Preventive Services

- Delivered to individuals who are asymptomatic or unrecognized to have the condition
- Range of services
 - Counseling
 - Preventive Medications
 - Screening

Screening vs. Surveillance

- Screening
 - Case detection at a single point in time
- Surveillance
 - Individual ongoing, longitudinal evaluation
 - Based on following trajectories
 - Different than public health surveillance, using data for public health practice

Sources of Recommendations

- Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit
 - Advisory Committee on Immunization Practices
 - Advisory Committee on Heritable Disorders in Newborns and Children
 - Bright Futures / AAP
 - US Preventive Services Task Force
 - The Community Guide
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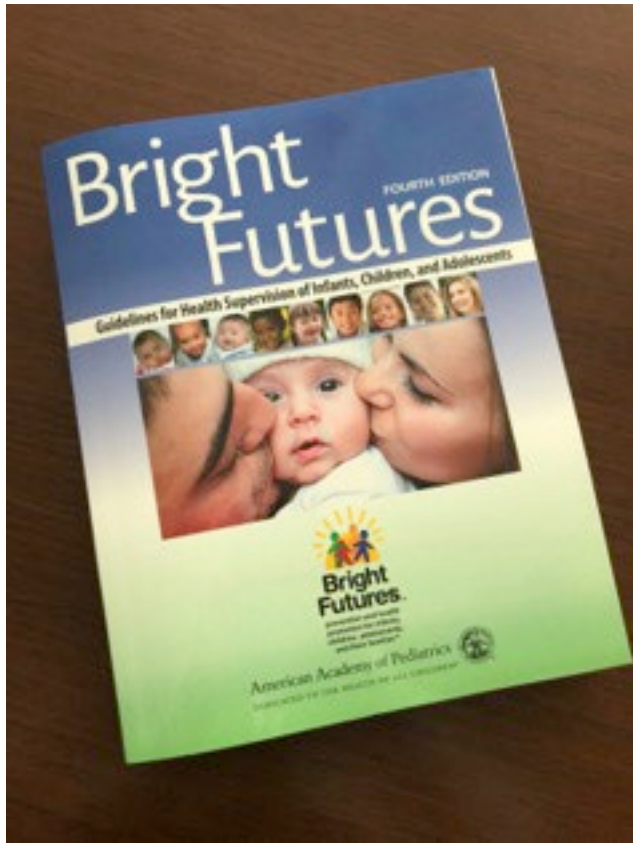
Bright Futures

- Cooperative agreement between the Maternal and Child Health Bureau and the AAP
- Evidence informed
- Periodicity schedule
 - expected preventive services
- Book
 - how to implement comprehensive well-child care

AAP Care Delivery Periodicity Schedule

	INFANCY									EARLY CHILDHOOD							MIDDLE CHILDHOOD						ADOLESCENCE														
	AGE ¹	Prenatal ²	Newborn ³	3-5 d ⁴	By 1 mo	2 mo	4 mo	6 mo	9 mo	12 mo	15 mo	18 mo	24 mo	30 mo	3 y	4 y	5 y	6 y	7 y	8 y	9 y	10 y	11 y	12 y	13 y	14 y	15 y	16 y	17 y	18 y	19 y	20 y	21 y				
HISTORY	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Initial/Interval																																					
MEASUREMENTS																																					
Length/Height and Weight		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Head Circumference		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Weight for Length		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Body Mass Index ⁵		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Blood Pressure ⁶		★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
SENSORY SCREENING																																					
Vision ⁷		★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	●	●	★	●	★	●	★	●	★	●	★	●	★	●	★	●	★	●	★		
Hearing		● ⁸	● ⁹	→	★	★	★	★	★	★	★	★	★	★	★	★	●	●	★	●	★	●	★	●	★	●	★	●	★	●	★	●	★	●	★		
DEVELOPMENTAL/SOCIAL/BEHAVIORAL/MENTAL HEALTH																																					
Maternal Depression Screening ¹¹					●	●	●	●																													
Developmental Screening ¹²								●				●		●																							
Autism Spectrum Disorder Screening ¹³											●	●																									
Developmental Surveillance		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Behavioral/Social/Emotional Screening ¹⁴		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Tobacco, Alcohol, or Drug Use Assessment ¹⁵																							★	★	★	★	★	★	★	★	★	★	★	★	★	★	
Depression and Suicide Risk Screening ¹⁶																							●	●	●	●	●	●	●	●	●	●	●	●	●	●	
PHYSICAL EXAMINATION¹⁷		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
PROCEDURES¹⁸																																					
Newborn Blood		● ¹⁹	● ²⁰	→																																	
Newborn Bilirubin ²¹		●																																			
Critical Congenital Heart Defect ²²		●																																			
Immunization ²³		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Anemia ²⁴						★				★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	
Lead ²⁵						★	★	★	● or ★ ²⁶	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	
Tuberculosis ²⁷				★		★			★			★		★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	
Dyslipidemia ²⁸												★			★			★		★	←	●	→	★	★	★	★	★	★	★	★	★	★	★	★		
Sexually Transmitted Infections ²⁹																							★	★	★	★	★	★	★	★	★	★	★	★	★	★	
HIV ³⁰																							★	★	★	★	●	→	→	→	→	→	→	→			
Hepatitis B Virus Infection ³¹		★																																			
Hepatitis C Virus Infection ³²																																					
Sudden Cardiac Arrest/Death ³³																							★	→	→	→	→	→	→	→	→	→	→	→	→	→	
Cervical Dysplasia ³⁴																																				●	
ORAL HEALTH³⁵								● ³⁶	★		★	★	★	★	★	★	★	★																			
Fluoride Varnish ³⁷								←	●	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	
Fluoride Supplementation ³⁸								★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
ANTICIPATORY GUIDANCE	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

<https://www.aap.org/en/practice-management/care-delivery-approaches/periodicity-schedule/>



- 32 age-specific visits (including a prenatal visit)
- Focus on eliciting caregiver concerns, child development, and positive reinforcement

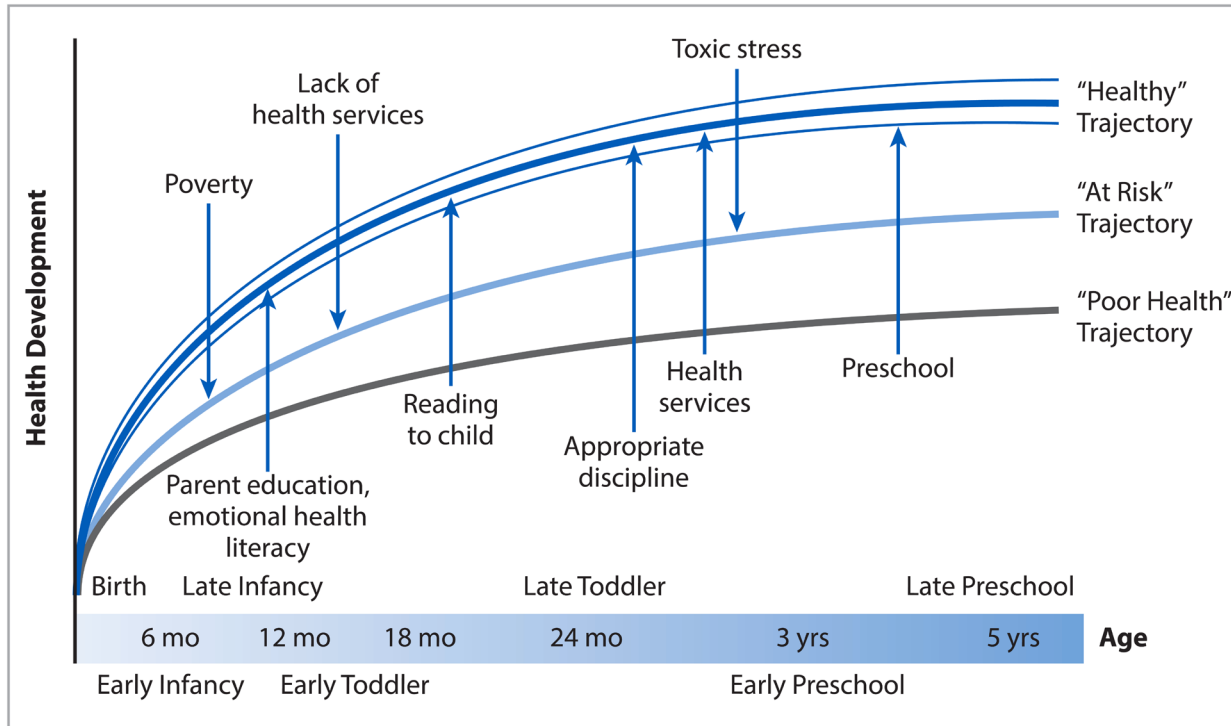
Health Promotion Themes

- Lifelong health for families and communities
- Family support
- Health for children and youth with special healthcare needs
- Healthy development
- Mental Health
- Healthy weight
- Healthy nutrition
- Physical activity
- Oral health
- Sexual development and sexuality
- Healthy and safe use of social media
- Safety and injury prevention

Visit Structure

- Solicitation of parent and child concerns
- Surveillance and screening
- Assessment of strengths
- Age-based visit priorities

Keep a Life-Course Perspective



Social Determinants of Health

“Social determinants of health (SDOH) are the conditions in the environments where people are born, live, learn, work, play, worship and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.

SDOH can be grouped into 5 domains:

- Economic stability
- Education Access and Quality
- Health Care Access and Quality
- Neighborhood and Build Environment
- Social and Community Context.”

I prefer and will use “social drivers of health.” I also talk separately about social needs and SDOH.

<https://health.gov/healthypeople/priority-areas/social-determinants-health>

U.S. Preventive Services Task Force

The mission of the USPSTF is to improve the health of all Americans by making evidence-based recommendations about clinical preventive services and health promotion.

U.S. Preventive Services Task Force

- Established in 1984
 - Independent 16-member panel
 - Family medicine, internal medicine, nursing, OB/GYN, pediatrics
 - 4-year terms
 - Appointed by AHRQ Director with guidance from Chair and Vice Chairs
 - Rigorous review of conflicts of interest
 - Supported by AHRQ
-

Grades

Grade	Definition	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer or provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.	Read the clinical considerations section of USPSTF Recommendation Statement. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.



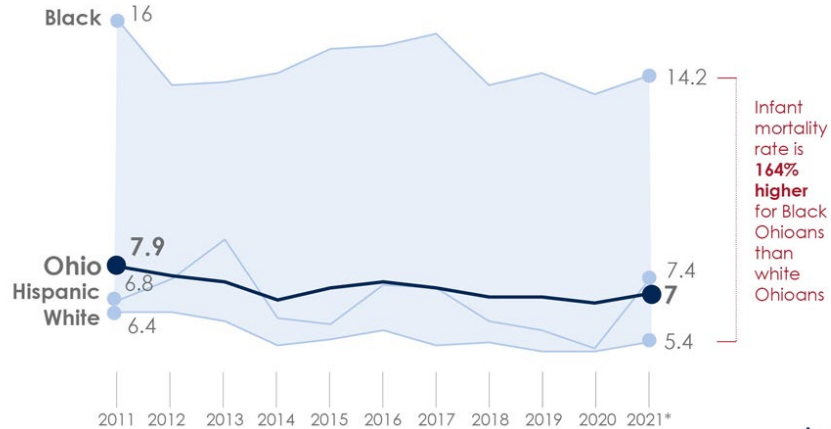
Newborn Screening vs. Well-Child Care Visit Screening

- Newborn Screening
 - Early infancy
 - Once or twice and done
 - Near universal access to screening
 - Only option is whether to be screened
 - Public health involvement through at least diagnostic confirmation
- Well-Child Care Visit
 - Any age
 - Repeated, and can be informed by surveillance and other personal factors
 - Not universal (access, variations in quality)
 - Opportunity for shared decision making
 - Generally, no public health involvement

Opportunities to Address Disparities

Racial gaps in infant mortality have persisted over past decade

Number of infant deaths per 1,000 births, by race and ethnicity, 2011-2021*



*At the time this data was pulled (2/6/2023), the 2021 data year was marked as partial and may be incomplete.
Source: Ohio Department of Health, Public Health Information Warehouse, Birth Resident and Mortality datasets

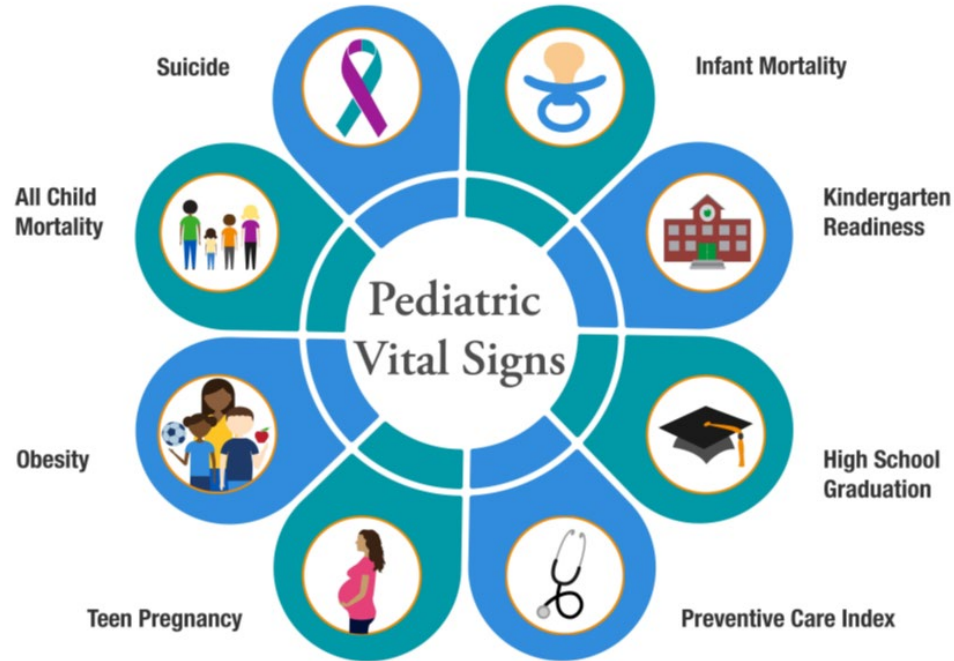


Death Rate: 2015-2017

United States	Rate per 100,000		
Cause of Death	Ages 1-4	Ages 5-14	Ages 15-19
Birth Defects	2.7	0.9	0.9
Cancer	2.2	2.1	2.7
Diseases of the Heart	0.8	0.5	1.4
Homicide	2.1	0.7	8.3
Influenza and Pneumonia	0.6	0.2	0.3
Suicide	N/A	1.1	10.5
Unintentional Injuries	7.9	3.8	19.0

Kidsdata.org

The Vital Signs Project

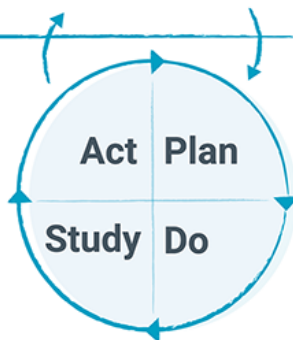


Approach To Quality Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

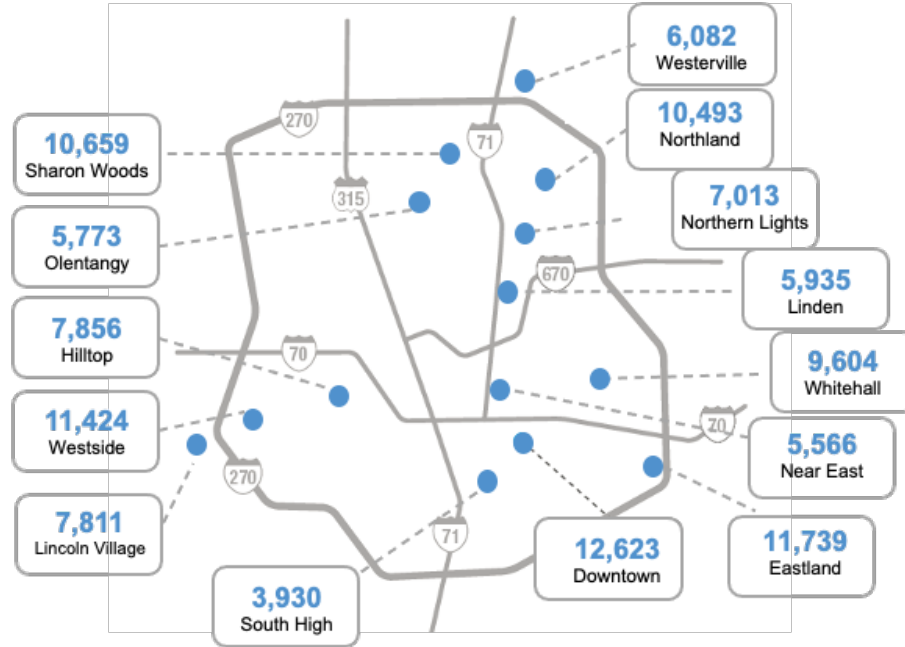
What change can we make that will result in improvement?



Source: Adapted from The Improvement Guide (2009)

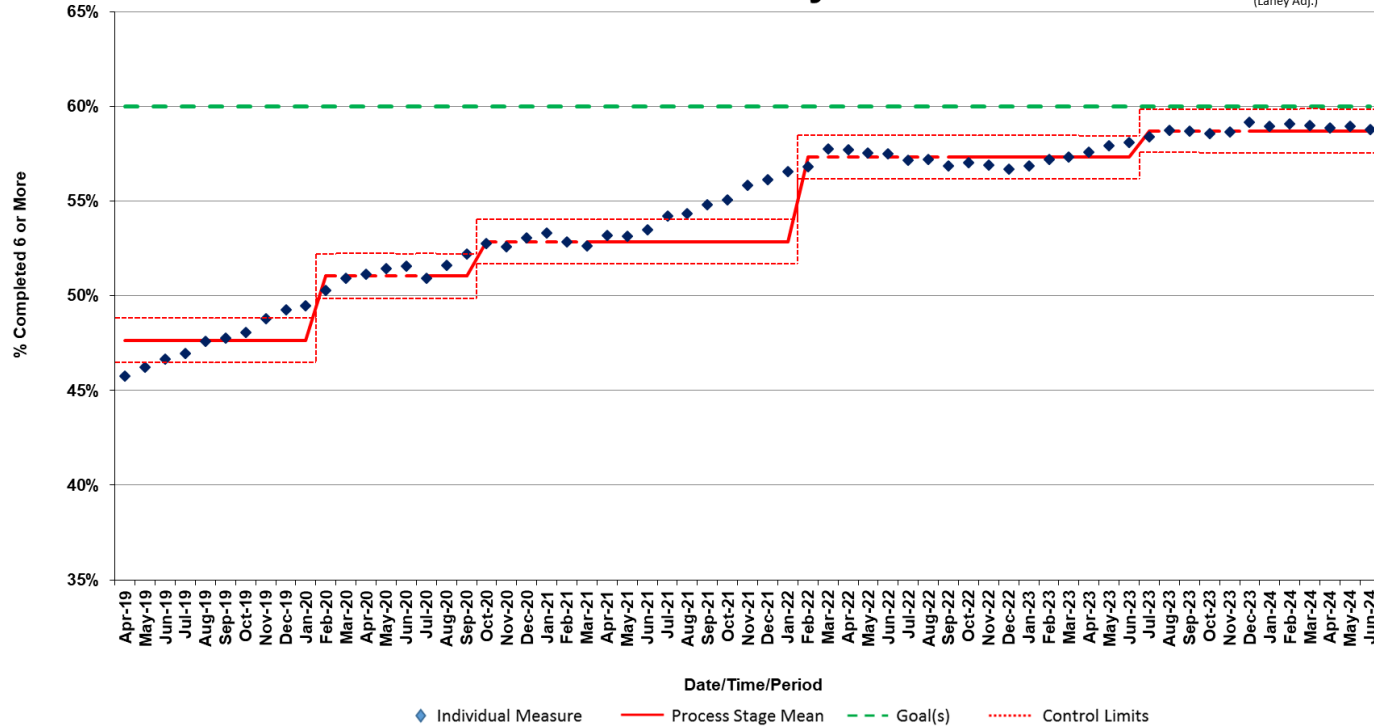
<https://www.ihl.org/resources/how-improve-model-improvement>

Nationwide Children's Hospital Primary Care Network



PCN Patients with 6 or More Well Visits by 15 months

Desired Direction
Chart Type: p'-Chart (Laney Adj.)



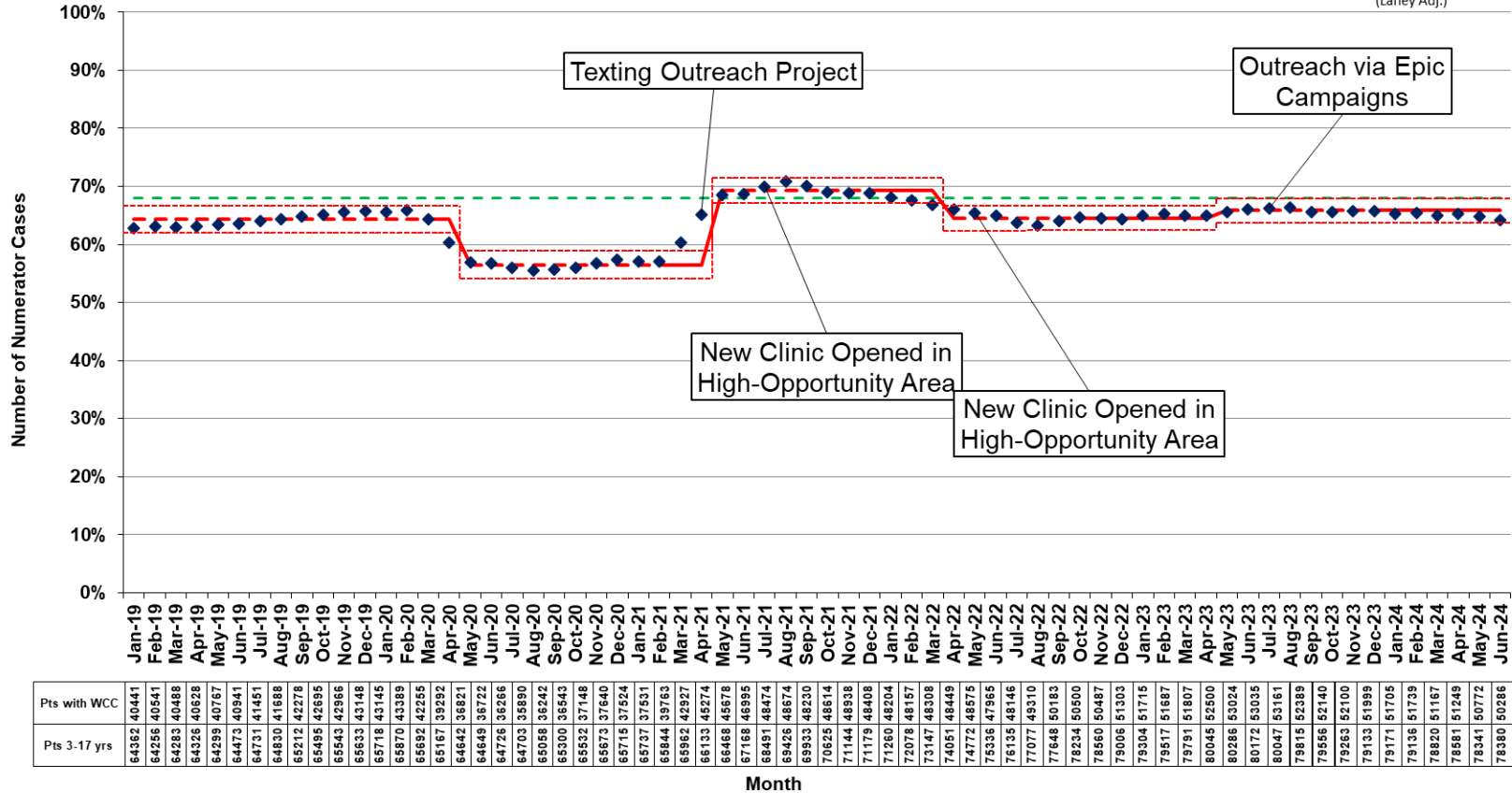
Pts with 6+ WCCs	Pts Turning 15 Mo
6459	2955
6442	2979
6392	2983
6417	3014
6412	3051
6429	3072
6384	3068
6352	3100
6319	3113
6314	3124
6290	3162
6243	3180
6250	3195
6237	3207
6273	3234
6270	3194
6280	3240
6280	3278
6274	3309
6280	3302
6295	3340
6313	3366
6287	3321
6320	3327
6304	3354
6284	3360
6299	3414
6314	3431
6280	3442
6491	3731
6474	3699
6479	3705
6479	3685
6472	3690
6468	3674
6487	3676
6512	3703
6581	3764
6591	3779
6649	3830
6605	3826
6620	3847
6651	3885
6592	3872
6597	3873
6540	3830
6544	3838
6460	3815
6377	3760
6317	3732
6308	3720
6386	3756
6440	3795
6433	3782



NATIONWIDE CHILDREN'S
When your child needs a hospital, everything matters.

PCN Patients 3-17 yrs with Well Visit in Past Year

Desired Direction
Chart Type: p-Chart (Laney Adj.)



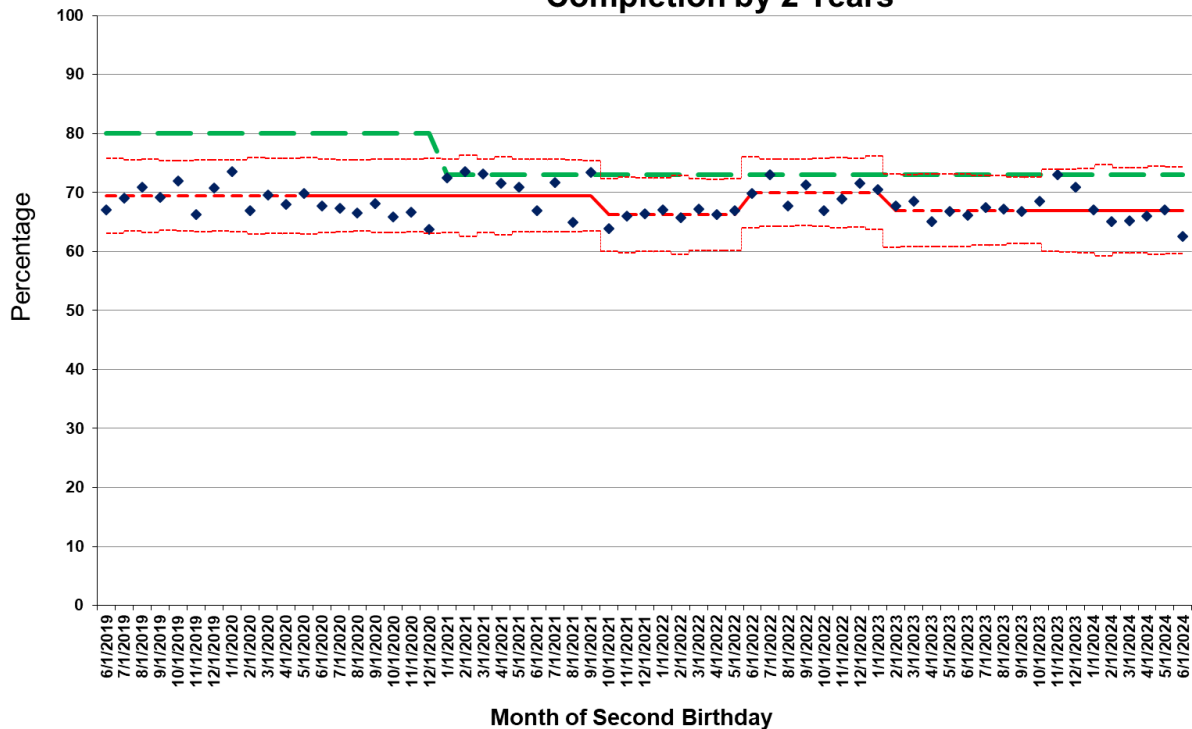
◆ Individual Measure — Process Stage Mean - - - Goal(s) Control Limits

NCH Primary Care Network Childhood Immunizations Primary Series Completion by 2 Years

Desired Direction



Chart Type: p-Chart



Primary series includes DTaP, HepB, Hib, IPV, MMR, PCV, VAR

◆ Individual Measure — Process Stage Mean - - - Goal(s) ····· Control Limits

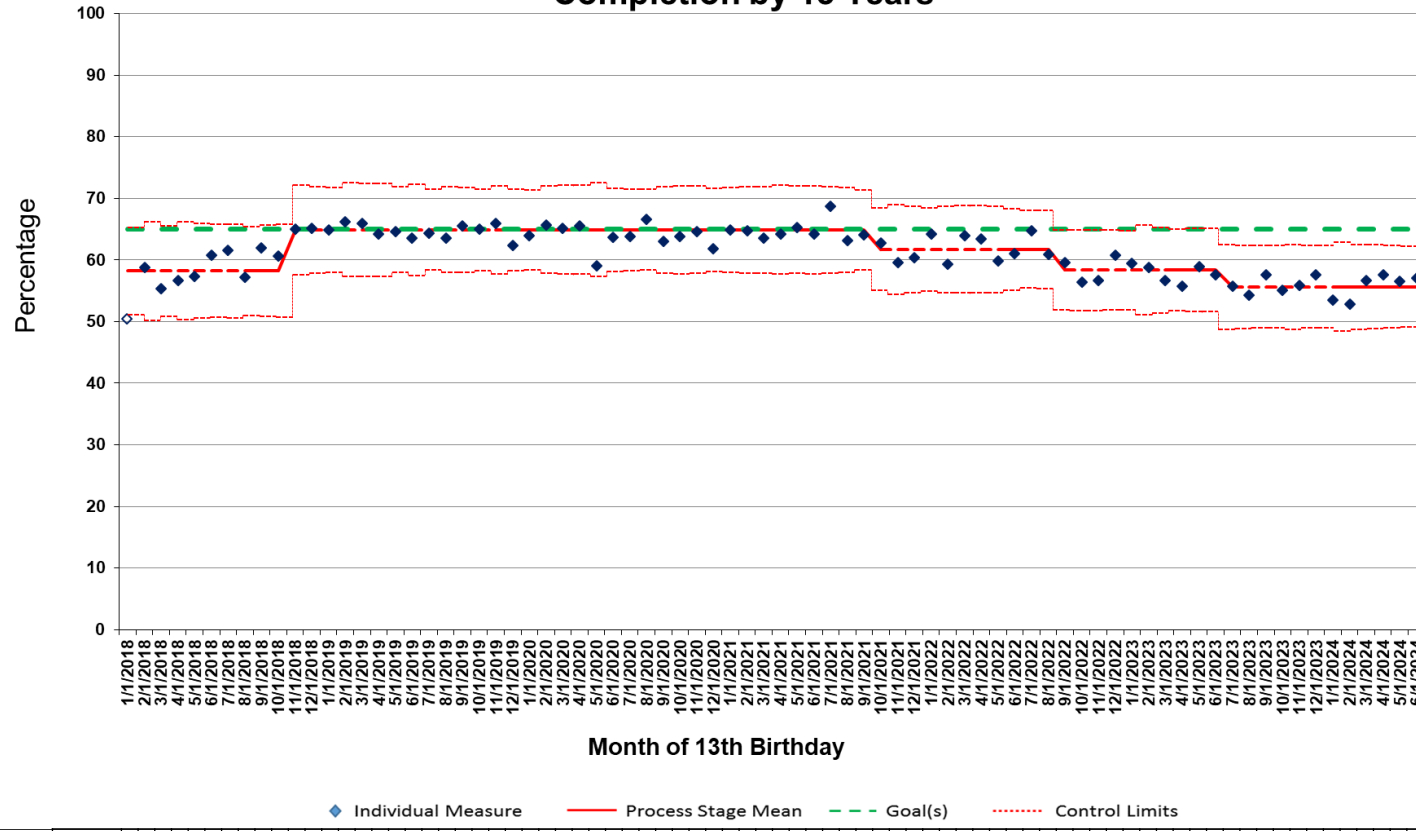
Pts with Series Completed	Pts Turning 2 Yrs
480	322
527	364
501	355
562	382
535	385
516	342
529	374
509	374
464	304
466	324
468	318
460	321
487	330
514	346
525	349
485	337
488	328
506	337
475	303
484	358
404	297
498	364
440	315
506	359
504	337
506	363
521	338
539	396
537	343
492	325
520	345
519	348
453	288
545	366
565	368
542	363
517	361
589	430
577	391
596	424
566	379
528	364
565	397
485	342
539	369
519	338
530	354
532	352
571	385
576	387
626	418
631	432
411	300
406	288
391	262
335	218
380	248
363	253
352	236
371	232

NCH Primary Care Network Adolescent Immunization Series Completion by 13 Years

Desired Direction



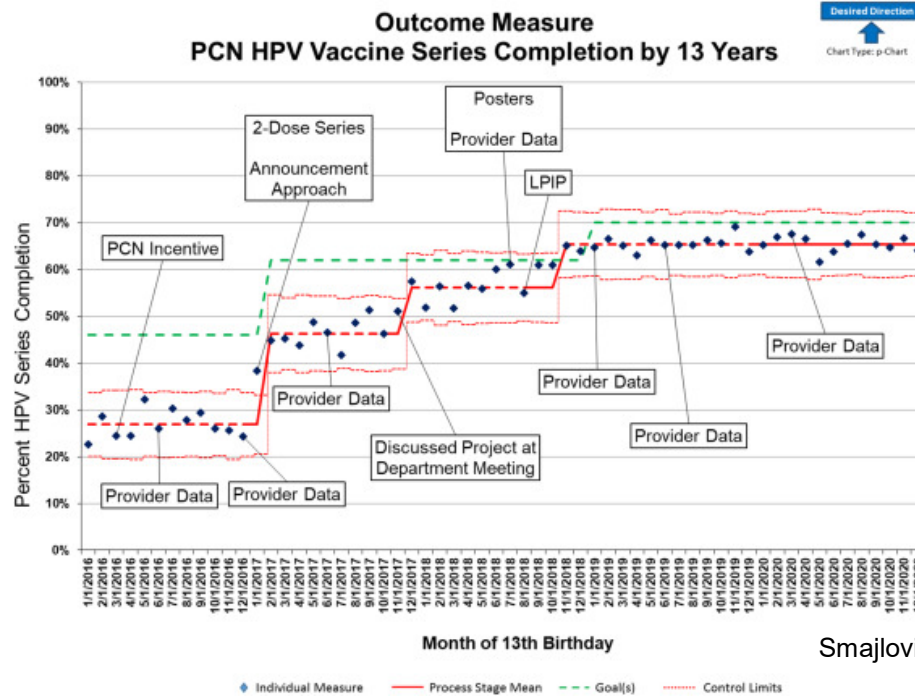
Chart Type: p-Chart



Series includes tdap,
HPV, meningococcal

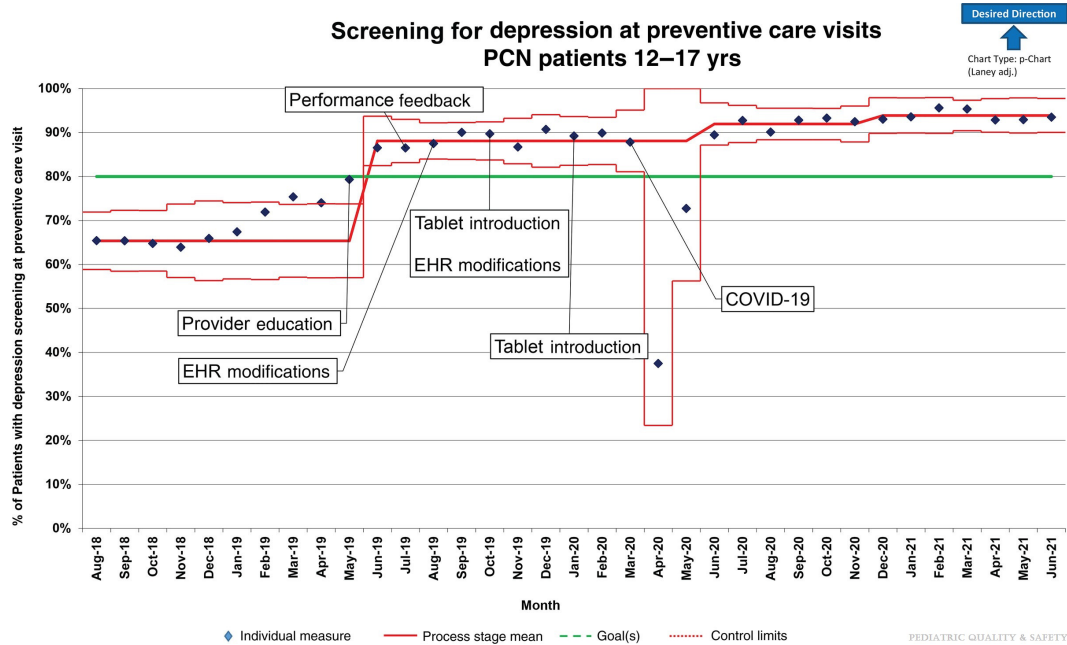
Pts with Series Completed	439	221	342	201	408	226	346	196	373	214	385	234	377	232	421	241	384	233	386	251	416	271	433	281	352	233	361	238	360	231	424	274	373	237	474	305	428	272	435	285	469	305	402	265	470	293	485	310	408	268	395	257	392	257	357	211	452	288	467	298	476	317	416	262	400	255	410	265	450	278	430	279	416	269	420	267	397	255	408	266	399	256	419	288	437	276	492	315	475	298	405	241	432	261	472	303	435	258	422	270	423	268	433	259	488	298	535	346	526	320	515	307	507	286	507	287	522	317	533	317	413	243	454	257	502	280	477	281	479	276	467	260	490	266	504	290	503	277	471	263	491	283	499	267	433	229	471	267	483	278	494	279	513	293
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HPV Vaccination



Smajlovic A, et al. J Adol Health. 2023; 72: 958-963.

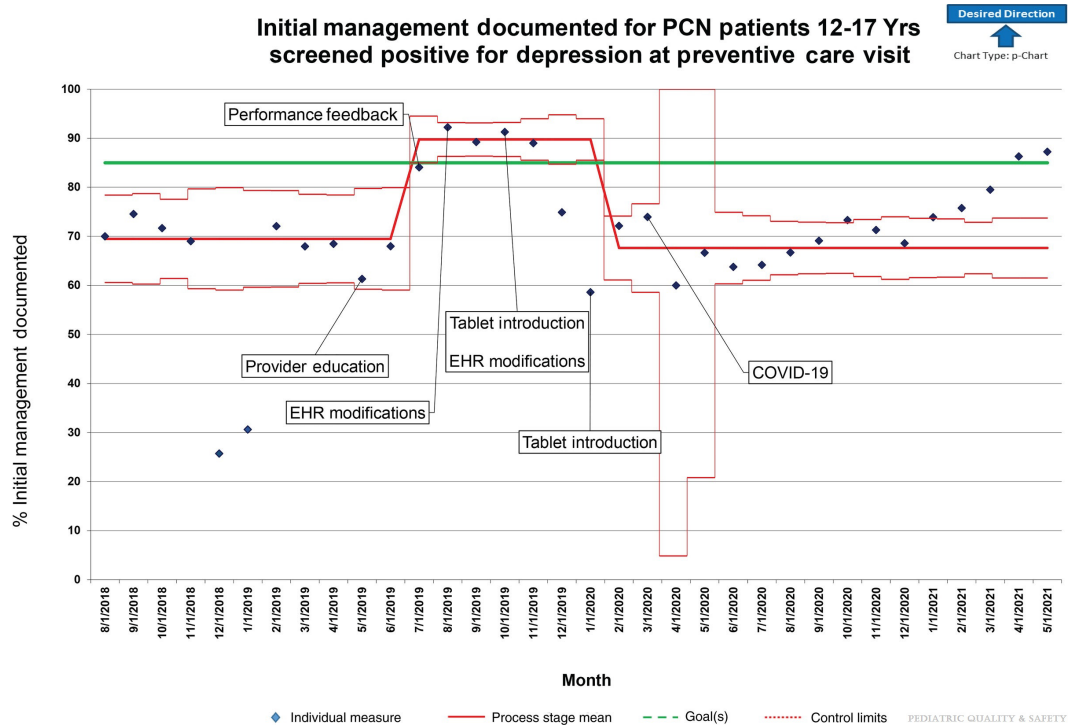
Adolescent Depression Screening



PEDIATRIC QUALITY & SAFETY

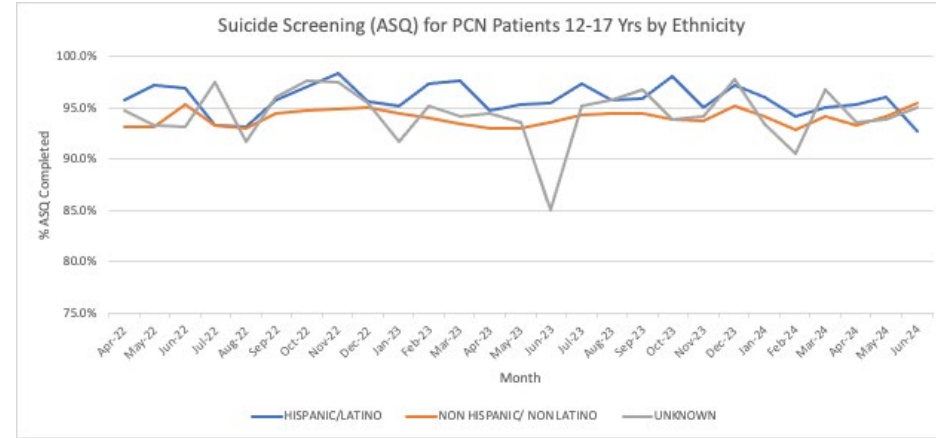
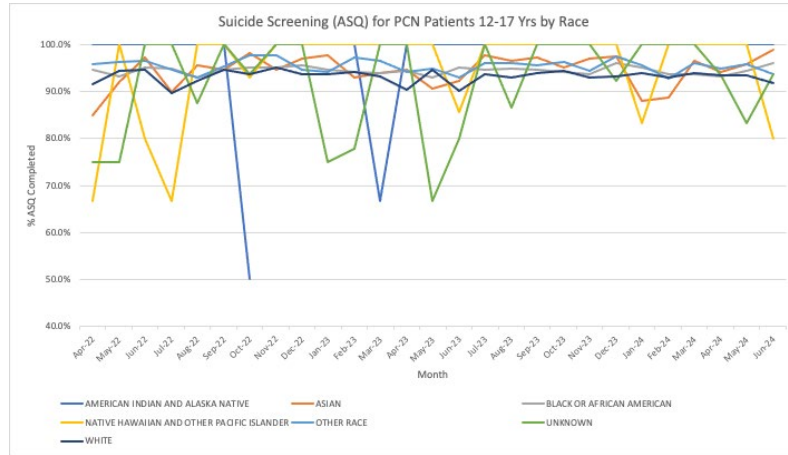
Beck K et al. *Pediatr Qual Saf.* 2022; 7:e549.

Adolescent Depression Screening

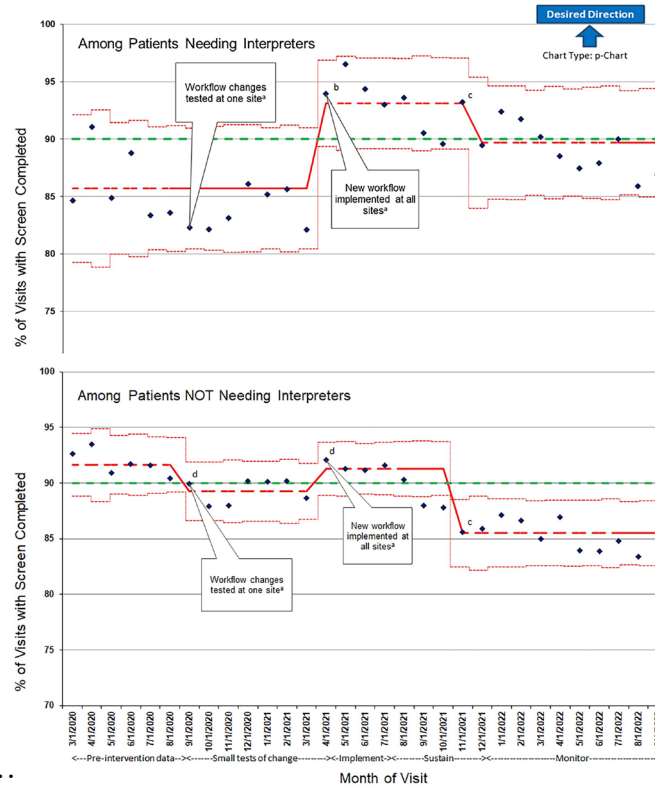


Beck K et al. *Pediatr Qual Saf.* 2022; 7:e549.

Adolescent Suicide Screening

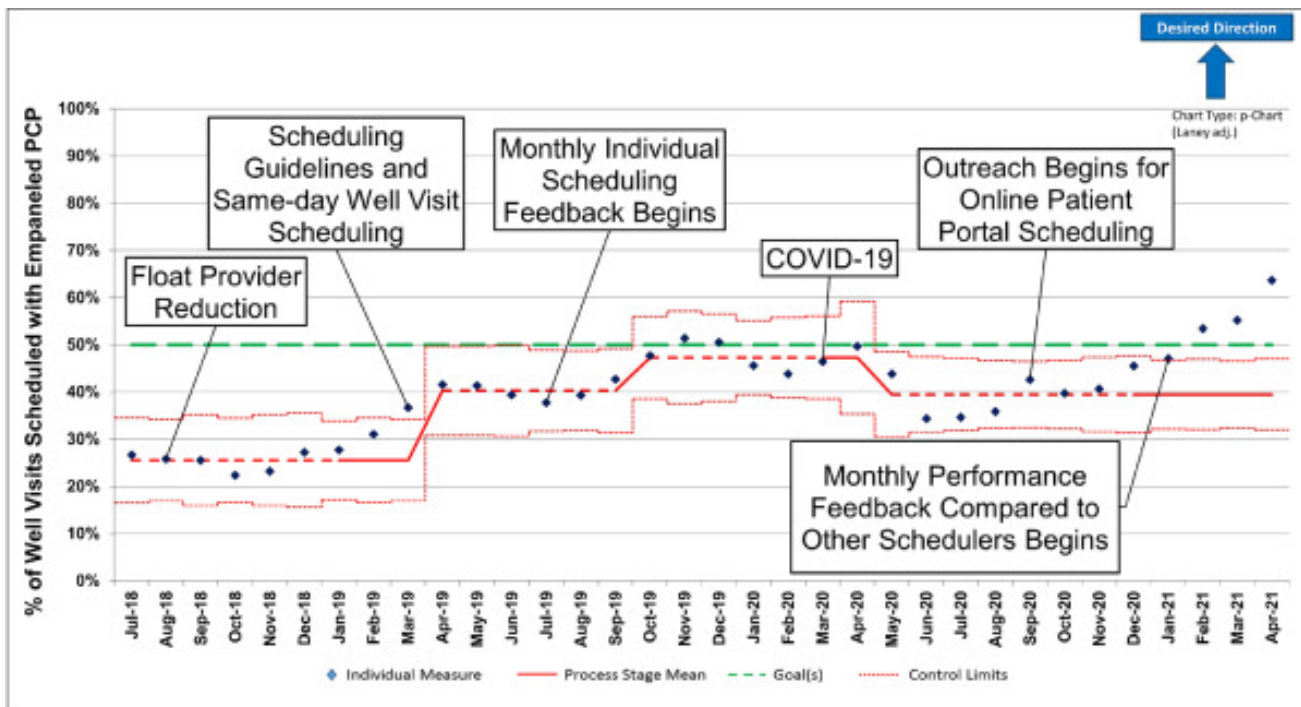


Developmental Screening By Interpreter Need



Brown CM et al. *Pediatr Qual Saf.* 2023;8:e670.

Improvement Requires Practice Redesign



Snyder DA et al. *Academ Pediatr.* 2022; 22:305-312.

Lessons Learned

- Recommendations should be clear and comprehensive
- Burning platform
- Easily measurable process outcomes
- Quality collaboratives with broad participation
- Near real-time data at the practice and clinician level
- Informatics tools and clinician informaticists
- Population focus
- Aligned incentives

Revisiting the Learning Objectives

- Summarize general prevention strategies
- Construct approaches for primary care prevention
- Relate approaches in primary care to newborn screening
- Evaluate approaches to primary care prevention
- Explain the importance of process and outcome measures
- Navigate the process from recommendation to implementation

Revisiting the Learning Objectives

- **S**ummarize general prevention strategies
- **C**onstruct approaches for primary care prevention
- **R**elate approaches in primary care to newborn screening
- **E**valuate approaches to primary care prevention
- **E**xplain the importance of process and outcome measures
- **N**avigate the process from recommendation to implementation