Women's and Children's Health Policy Center

Johns Hopkins University

Strengthen the Evidence for Maternal and Child Health Programs

National Performance Measure 10
Adolescent Well Visit Evidence Review

May 2018

Stephanie Garcia, MPH

Christina Yarborough

Danielle Pelaez

Donna Strobino, PhD

Cynthia Minkovitz, MD, MPP

May 2018

Table of Contents

EXECUTIVE SUMMARY

The adolescent well visit is one of fifteen Maternal and Child Health National Performance Measures (NPMs) for the State Title V Block Grant program. The goal of NPM 10 is to increase the percentage of adolescents, ages 12 through 17, who received a preventive medical visit in the past year. The purpose of this evidence review is to identify evidence-informed strategies that State Title V programs might consider implementing to address NPM 10 Adolescent Well Visit.

Thirteen peer-reviewed publications and two gray literature sources met study inclusion criteria and informed the review. These sources described interventions that targeted patients/consumers, health care providers, and payers. Examples of each intervention and its evidence rating criteria are shown below.

Target Audience	Intervention	Example	Evidence Rating
Patient/ Consumer	School-Based Health Centers	Partnership between a primary care clinic and local school-based health centers	-----
	Patient Reminders	Navigator program with telephone and mailed reminders, and transportation assistance	Emerging Evidence
Payer	Expanded Insurance Coverage	Enrollment in the Children's Health Insurance Program for at least one year	Moderate Evidence

----- indicates insufficient number of studies to assign evidence rating or outcome

Three key findings emerged regarding strategies to increase the percentage of adolescents with preventive medical visits:

1. Expanded insurance coverage appears to be effective.
2. Patient reminders appear to be somewhat effective.
3. There is insufficient evidence of the effectiveness for school-based health centers in increasing the percentage of adolescents with preventive medical visits.

This evidence review categorized interventions along an evidence continuum from *Evidence Against* (least favorable) to *Scientifically Rigorous* (most favorable). Assignment of evidence ratings was based on synthesis of study results. *Moderate Evidence* was identified for "Expanded Insurance Coverage" and "Patient Reminders" were found to have *Emerging Evidence.* An evidence rating was not assigned to "School-Based Health Centers" due to the limited number of studies assessing this strategy; however, the two studies identified yielded favorable results.

Findings from this review should be considered in the context of ongoing state and national initiatives focused on increasing the receipt and quality of preventive visits for adolescents. Title V efforts to support insurance outreach and enrollment (e.g., website information, hotlines, and enrollment-navigators) and patient reminders (e.g., educational resources and training for health care providers) may contribute to increased receipt of preventive visits by adolescents. While only two strategies were deemed to have sufficient evidence to be rated on the evidence continuum, it is likely that additional evidence-based strategies will emerge from ongoing evaluations of national initiatives, such as the Adolescent and Young Adult Health Collaborative Improvement and Innovation Network (AYAH CoIIN). Sustained investment in evaluations of patient, health care provider, and payer approaches is essential for expanding the evidence base of strategies to improve receipt of preventive medical visits by adolescents.

ACKNOWLEDGEMENTS

This evidence review is based on research conducted by the Strengthen the Evidence for Maternal and Child Health Programs team under grant number U02MC28257 from the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS).

We are thankful to our colleague Lori Rosman, MLS, AHIP at the Welch Medical Library who provided expertise in designing search strategies. We also express gratitude to Sylvia Sosa, MSc, Jessica Minnaert, MPH, Reem Ghandour, DrPH, MPA and Michael Kogan, PhD in the Office of Epidemiology and Research, Maternal and Child Health Bureau, HRSA. Additionally, we extend thanks to Anna Corona, MPH and Iliana White, MPH, CHES, CPH from AMCHP, and to selected state Title V programs, including Minnesota and Nebraska. Thank you as well to Claire Brindis, DrPH, and Charles Irwin, MD, Co-Directors, and Lauren Twietmeyer, MPH, Project Associate, at the Adolescent and Young Adult Health National Resource Center, University of California, San Francisco, for feedback provided on earlier drafts. Lastly, we would like to thank Mary Harrington, MPP and Joe Zickafoose, MD, MS from Mathematica Policy Research for providing additional data sources that informed this review. The findings and conclusions in this document are those of the authors, who are responsible for its contents; the findings and conclusions do not necessarily represent the view of HRSA or of individual reviewers.

Suggested Citation: Garcia S, Yarborough C, Pelaez D, Strobino D, Minkovitz C. National Performance Measure 10 Adolescent Well Visit Evidence Review. Strengthen the Evidence Base for Maternal and Child Health Programs. Women's and Children's Health Policy Center, Johns Hopkins University, Baltimore, MD. 2018.

INTRODUCTION

Strengthen the Evidence Base for Maternal and Child Health (MCH) Programs is a Health Resources and Services Administration (HRSA)-funded initiative that aims to support states in their development of evidence-based or evidence-informed strategies to promote the health and well-being of MCH populations in the United States. This initiative, carried out through a partnership among Johns Hopkins Women's and Children's Health Policy Center, the Association of Maternal and Child Health Programs, and Welch Library at Johns Hopkins, was undertaken to facilitate implementation of the transformed MCH Title V Block Grant Program.

One goal of the Strengthen the Evidence project is to conduct evidence reviews that summarize the effectiveness of possible strategies to address the National Performance Measures (NPMs) selected for the 5-year cycle of the Title V MCH Services Block Grant, beginning in fiscal year 2016. States are charged to select eight of the fifteen NPMs and incorporate evidence-based or evidence-informed strategies to achieve improvement for each selected NPM.

BACKGROUND

The adolescent well visit is one of the fifteen MCH National Performance Measures (NPMs). Thirty-nine states and jurisdictions selected NPM 10 Adolescent Well Visit, including: Alabama, American Samoa, Arizona, California, Connecticut, Federated States of Micronesia, Guam, Hawaii, Idaho, Illinois, Iowa, Kansas, Louisiana, Marshall Islands, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Palau, Pennsylvania, Puerto Rico, Rhode Island, South Dakota, Vermont, Virgin Islands, Washington, and Wyoming.[1] The goal for NPM 10 is to increase the percentage of adolescents, ages 12–17, with a preventive medical visit in the past year.[2]

Data from the National Survey of Children's Health (NSCH) are used to monitor progress toward this goal. On a national level, parents reported that 79% of adolescents in 2016 had received a preventive medical visit in the past year.[3] This percentage ranged from 66.7% in Alaska to 89.5% in Massachusetts.[4] The NSCH yields higher estimates of adolescent preventive visits than other national surveys; findings from the 2014 Medical Expenditure Panel Survey indicated that less than 50% of adolescents ages 12-17 received an annual preventive visit with a primary care physician.[5]

Health promotion during adolescence is critical, as various risk behaviors (e.g., smoking, substance use, unprotected sex) that are associated with poor health outcomes and premature mortality often begin during adolescence.[6,7] Moreover, this period presents unique opportunities to foster healthy habits, as adolescence is a key developmental period in which individuals may be particularly susceptible to their environment[8] and when many lifelong health behaviors are established.[9] Health promotion includes a focus on the social determinants of health, such as the quality of peer and family relationships, and access to education, all of which have been shown to strongly impact adolescent health.[10]

Adolescence is a key time to address the social determinants of health and assure that youth are on trajectories that optimize health and well-being. The annual adolescent well visit is one approach to promote healthy behaviors and prevent the onset of disease. *Bright Futures Guidelines for Health Supervision*,[11] led by the American Academy of Pediatrics and supported, in part by HRSA/MCHB, recommends that adolescents ages 11-21 receive an annual preventive visit. The visit should address physical, emotional, and social development and encompass preventive services such as a physical examination, routine screenings, vaccinations, and a discussion of age-appropriate health-related behaviors.[12] Annual adolescent preventive visits

have been recommended since 1994[13] and are endorsed by professional organizations including the American Medical Association,[13] the American Academy of Family Physicians[14] and the American College of Obstetricians and Gynecologists.[15]

The recommendations for preventive services for adolescents informed selected provisions of the Patient Protection and Affordable Care Act (ACA) of 2010. The ACA requires that most private insurance health plans cover a variety of preventive services, including the adolescent-well visit, without cost-sharing.[16] In addition, the ACA extends access to public insurance by expanding Medicaid up to 133% Federal Poverty Level for individuals under age 65, including adolescents.

A 2017 commentary by Brindis and colleagues highlighted promising strategies related to increasing insurance enrollment and the quality of preventive care among adolescents and young adults.[17] Cited strategies, such as youth engagement in outreach and enrollment, enhancing consumer awareness of well visits, expanding provider capacity, adopting medical home policies, and implementing state-wide quality improvement projects, may increase receipt of preventive visits. However, to our knowledge, the current review is the first to assess the evidence regarding interventions intending to increase receipt of preventive visits by adolescents

METHODS

Studies were identified for review by searching the PubMed, Cochrane Library, and CINAHL Plus online databases. Search strategies depend on the database due to differences in controlled vocabulary, indexing, and syntax. Table 1 provides detailed search strategies used for each database. A library specialist (informationist) at Welch Medical Library provided consultation regarding database selection and adequacy of the search strategies. The following inclusion criteria were used:

1. The study evaluated the effectiveness of an intervention aimed at increasing the percentage of adolescents with a preventive medical visit in the past year. The components of the intervention and the results were clearly described.
2. The study described interventions and/or strategies that fall within the scope of Title V as deemed by the authors and reviewers.
3. The study sample included adolescents between the ages of 12 and 17.
4. The receipt of an adolescent preventive medical visit in the past year was one of the outcome measures. Studies focused on increasing access to components of the adolescent well visit (e.g., immunizations, sexual health education) or assessing quality of the visit were excluded. Studies measuring appointment-keeping behavior or intention to seek preventive care also were excluded.
5. At a minimum, the study included a control and intervention group, an appropriate comparison group, or a pretest-posttest design to assess intervention effectiveness.
6. The study was conducted in the United States or in another high-resource country that is a member of the Organization for Economic Cooperation and Development.
7. The study was published in English.
8. The study was published in a peer-reviewed journal.

The results of each database were evaluated systematically for relevant studies. Duplicates were removed before beginning title screening. Each title was reviewed and if the title appeared related to the NPM, the abstract was then screened. If the abstract did not indicate whether the study met the inclusion criteria or the abstract was not available, a full-text review was undertaken. All articles remaining after title and abstract screening were retrieved for

detailed full-text review to assess their eligibility for inclusion. In addition, reference lists of relevant previously published review articles were reviewed to identify potential articles to be included in the current review.[17-21] In addition to peer-reviewed literature, two gray literature sources informed the review: *Florida Pediatric Medical Home Demonstration Project Evaluation* report,[22] published in 2014 by the Institute for Child Health Policy at the University of Florida, and *CHIPRA Mandated Evaluation of the Children's Health Insurance Program: Final Findings*,[23] released in 2014 by Mathematica Policy Research (Mathematica) and the Urban Institute. For this latter report, data for sample size and study results were obtained with permission from a 2013 memo sent by Mathematica to the Office of the Assistant Secretary for Planning and Evaluation in the US Department of Health and Human Services.[24]

The authors (SG & CY) extracted data pertaining to the study characteristics (setting, sample, and design), intervention (components and study period), data sources and outcome measures for assessing adolescent medical visits, and results. The study team met regularly to review interim extractions and resolve questions about the studies. Interventions were characterized by target audience: patients/consumers, health care providers, and payers. Studies were categorized into three groups based on their primary intervention: "School-Based Health Centers," "Patient Reminders," and "Expanded Insurance Coverage."

An evidence continuum was created to assess evidence-informed strategies, along with criteria for each category along the continuum. The Robert Wood Johnson Foundation *What Works for Health* evidence ratings were adapted to create our evidence continuum tailored for the Strengthen the Evidence project.[25] Evidence rating categories included: *Evidence Against, Mixed Evidence, Emerging Evidence, Expert Opinion, Moderate Evidence,* and *Scientifically Rigorous*. Strategies that are characterized by *Emerging Evidence* or more favorable ratings are

considered evidence-informed. Table 2 shows the detailed evidence rating criteria for both study type and study results for each rating.

Interventions identified through assessment of both peer-reviewed and gray literature were placed along the evidence continuum. Assignment to the continuum required that interventions or intervention categories be evaluated in four or more peer-reviewed studies selected for the evidence review. In addition, interventions or intervention categories that were evaluated in three peer-reviewed studies with expert opinion from gray literature also were assigned an evidence rating and placed on the evidence continuum. Interventions that were evaluated in three peer-reviewed studies without expert opinion from gray literature were neither assigned an evidence rating nor placed on the evidence continuum. A team of three project members independently assigned ratings to the interventions or intervention categories. The members then compared their assessments and discrepancies, and the full project team discussed the interventions until a consensus was reached.

RESULTS

Search Results

Searches in the PubMed, Cochrane Library, and CINAHL Plus databases were performed on July 26, 2017. In total, the systematic search identified 22,153 records. The search in PubMed, Cochrane Library, and CINAHL Plus yielded 12,564; 4,419; and 5,170 records respectively. Six additional articles were identified through expert consultation.[26-31]

Title and abstract screening was conducted for 17,578 records after 4,581 duplicates were removed from the total records. During title and abstract review, 17,365 records were excluded due to their failure to meet certain inclusion criteria. The most common reason for not meeting the criteria was that studies were not relevant to the purpose of this review; namely, they were

not evaluations of interventions aimed to increase the percentage of adolescents with a preventive medical visit. Full-text articles were assessed for eligibility for 213 records, and 200 were excluded due to failure to meet all inclusion criteria. Main reasons for excluding studies were: did not evaluate an intervention; did not measure the outcome of interest; and did not include an appropriate comparison group or pretest-posttest design. A total of 15 sources were included in this review after combining 13 peer-reviewed studies with two sources of gray literature. Figure 1 displays the flow chart for the study selection process.

Characteristics of Studies Reviewed

The 15 sources (13 peer-reviewed and 2 gray literature sources) included in this review varied in study setting and design, intervention type, and data source. The detailed characteristics of the studies are reported in Table 3. Of the 15 sources, 8 were quasi-experimental studies (4 pretest-posttest design[26,27,32,33]; 3 nonequivalent control group design[23,34,35]; and 1 pretest-posttest nonequivalent control group design[36]); 3 were randomized controlled trials[30,31,37]; 2 were retrospective cohort studies[28,38]; 1 was a time 1/time 2 (T1/T2) cohort design[39]; and 1 had a quality improvement time series design.[22]

In terms of setting, 14 studies were conducted in the United States,[22,23,26,27,30-33,35-40] and one in Israel[34]. Although all studies reported data about the receipt of an adolescent preventive visit, the data sources used to measure the outcome varied. They included self-report by parent or adolescent,[23,26,27,35,39] claims data,[32,33,37] and medical record or other administrative data.[22,28,30,31,34,36,38] Table 4 provides details on data sources and outcome measures.

Intervention Components

Table 5 includes a description of the intervention and comparison groups in each study, along with the timing of the intervention and data collection periods. Table 6 summarizes the

intervention components in each study and is organized by implementation level. Studies were grouped by strategy or intervention. "School-Based Health Centers," "Patient Reminders," "Expanded Insurance Coverage," and "Other" included 2, 4, 5, and 4 studies respectively.

Of the two studies evaluating "School-Based Health Centers," one study compared utilization of health care services for adolescents using school-based health centers (SBHCs) with adolescents using other community clinics,[38] while the other evaluated the effectiveness of a partnership between local SBHCs and a primary care practice.[36]

The studies in the "Patient Reminders" category varied in terms of type of reminder, intensity of intervention, and whether the reminder targeted the parent, adolescent, or both. Examples included one study by Szilagyi et al. (2011)[30] which evaluated a navigator program with telephone and mailed reminders, transportation assistance, and home visits by community health workers, and a second (Szilagyi et al., 2013)[37] which implemented mailed and automated telephone reminders.

"Expanded Insurance Coverage" included four studies assessing the impact of enrollment in the Children's Health Insurance Program (CHIP)[23,27,35,39] and one that assessed adolescent preventive visit rates before and after the ACA.[26]

Of the four studies categorized as "Other," one was a statewide pediatric medical home quality improvement project implemented as part of a CHIPRA Quality Demonstration Grant.[22] Another study assessed whether enrollment in a patient-centered medical home increased receipt of adolescent preventive services.[28] The third study evaluated a CHIP policy change that increased provider reimbursement for well-child visits[33] and the fourth assessed the impact of an incentive program that gave parents $30 to use toward their CHIP premium.

Summary of Study Results

Study results are presented in detail in Table 7 and summarized in Table 8. Both tables display studies organized by primary intervention. The results presented in Table 8 demonstrate a mix of favorable and non-significant findings.

"Expanding Health Insurance" appears to be effective in increasing receipt of adolescent preventive visits. Three of the four peer-reviewed studies showed favorable outcomes,[26,35,39] and the fourth study showed favorable results in one of two intervention states.[27] The gray literature source, *CHIPRA Mandated Evaluation of the Children's Health Insurance Program: Final Findings* also reported favorable findings across 10 states for adolescent well visits among established CHIP enrollees compared to children who were uninsured for 5-12 months prior to enrollment.[23]

"Patient Reminders" appear to be somewhat effective, as they demonstrate an evenly distributed mix of favorable and nonsignificant results. Two studies reported favorable results[30,37] and two reported nonsignificant results.[31,34] "School-Based Health Centers" included two studies, both with favorable outcomes.[36,38] However, conclusions cannot be drawn for this intervention due to the limited body of evidence.

Of the four sources in the "Other" category, two peer-reviewed studies and one gray literature source reported favorable findings. Strategies described in these sources included patient financial incentives,[32] provider reimbursement,[33] and the Florida Pediatric Medical Home Demonstration project, a quality improvement initiative implemented as part of a CHIPRA Quality Demonstration Grant.[22]

Evidence Rating & Evidence Continuum

Assignment of evidence ratings was based on the synthesis of study results for the 13 peer-reviewed studies and two gray literature sources (Tables 7 and 8). Only 2 peer-reviewed studies addressed "School-Based Health Centers" and were not assigned an evidence rating or placed on the continuum. Based on the evidence rating criteria (Table 2), "Expanded Insurance Coverage" was rated as *Moderate Evidence* and "Patient Reminders" was found to have *Emerging Evidence.* Figure 2 displays the evidence-informed interventions along the evidence continuum for NPM 10.

IMPLICATIONS

A majority of states and jurisdictions selected NPM 10 as a programmatic focus for the current 5-year cycle of the Title V MCH Services Block Grant Program beginning in fiscal year 2016. The purpose of this review was to identify evidence-based and evidence-informed strategies that state Title V programs might consider implementing to increase the percentage of adolescents ages 12-17 with a preventive medical visit in the past year.

The findings from this review suggest that expanding insurance coverage is effective in increasing the percentage of adolescents who receive an annual preventive visit in the varied settings where it has been implemented. Patient reminders may also be effective. These strategies were included in this review as Title V programs play a key coordination role across state agencies and the health care system to ensure families have access to resources for preventive health care services. State Title V programs can promote insurance outreach and enrollment by assuring that information on their state MCH website is up-to-date (e.g., links to state marketplace, Medicaid referral information, hotline numbers) and by coordinating with state partners to provide in-person enrollment assistance via Navigators.[41] With regard to patient

reminders, Title V programs can offer educational resources and provider training regarding evidence-based reminder systems.

It was not possible to draw conclusions about school-based health centers (SBHCs) due to a small number of studies. However, SBHC use has been associated with increased receipt of selected preventive services, including vaccinations[42] and reproductive health counseling by a health care provider.[43] In addition to reproductive health counseling, students using SBHCs may be more likely to talk with a health care professional about family, future plans, diet, and exercise.[44]

The major strength of this review was that it focused exclusively on strategies to increase receipt of the adolescent well visit, specifically interventions and settings within the scope of Title V. There are also several limitations. First, only 13 peer-reviewed studies and 2 gray literature sources met inclusion criteria. The small number of sources limits the conclusions that may be drawn regarding a range of potentially effective interventions. Second, search results were screened and interpreted by one reviewer; however, a consistent protocol (as described in the methods) was followed and questions that arose were discussed with the research team. The ability to compare and synthesize studies also was limited due to variation in setting, sample, and study design.

Though the evidence for increasing receipt of adolescent preventive visits is limited, there are a number of strategies that have been linked to increased receipt of selected components of the adolescent well visit, such as immunizations and reproductive health care services. In their 2017 scoping review, Harris et al. identified the following strategies to improve delivery of clinical preventive services to adolescents and young adults: expansion of health insurance, community-clinic linkages, clinician-targeted strategies (e.g., clinician decision

support system), parent engagement, and technology (e.g., social media, reminders through mobile device application).[20] Our review identified similar but not all interventions; expanding insurance coverage and patient reminders were plotted as evidence-informed strategies. Furthermore, one article in our review evaluated a community-clinic linkage[36] and one gray literature source, the *Florida Pediatric Medical Home Demonstration Project Evaluation* report, included parent engagement as a core component.[22]

The NPM 1 Well Woman Evidence Review also identified expanded insurance and patient reminders/invitations as evidence-based/-informed strategies to promote receipt of the annual well-woman visit.[45] This review yielded multiple other strategies targeting patients, providers/practices, communities, and payers, that State Title V programs may choose to tailor to adolescents and their families.

The Centers for Medicare and Medicaid Services (CMS) released a publication in 2014 designed to assist state Medicaid agencies and partners in promoting adolescent well-care visits.[46] Examples of strategies include incentivizing providers, adolescents and parents, and leveraging missed opportunities by modifying billing codes to allow preventive services on the same day as acute care visits. Additionally, a Center for Health Care Strategies toolkit of strategies for health plans serving Medicaid members, funded by the Robert Wood Johnson Foundation, emphasized the importance of using quality improvement to increase preventive care services for children and adolescents.[47]

An ongoing national initiative, the HRSA/MCHB-funded Adolescent and Young Adult Health Collaborative Improvement and Innovation Network (AYAH CoIIN) uses collaborative learning and quality improvement to support cohorts of states in promoting the adolescent well visit NPM.[48] National strategies from the first cohort of states included outreach and enrollment

for insurance, education/marketing about the importance of the preventive visit, collaboration with Federally Qualified Health Centers, and leveraging missed opportunities (e.g., link acute care visits and sports physicals with comprehensive preventive visits).[49] Additional strategies from the second cohort of states include engaging with a network of primary care adolescent clinics and leveraging school policies to increase well visits.[50]

Multiple strategies are intended to support receipt of preventive medical visits by adolescents. This review finds sufficient literature to identify expanded insurance coverage as effective and patient reminders as having emerging evidence. Ongoing evaluations of national initiatives and state efforts may expand the evidence base of strategies to support continued improvements of this NPM.

FIGURES AND TABLES

Figure 1. Flow Chart of the Review Process and Results

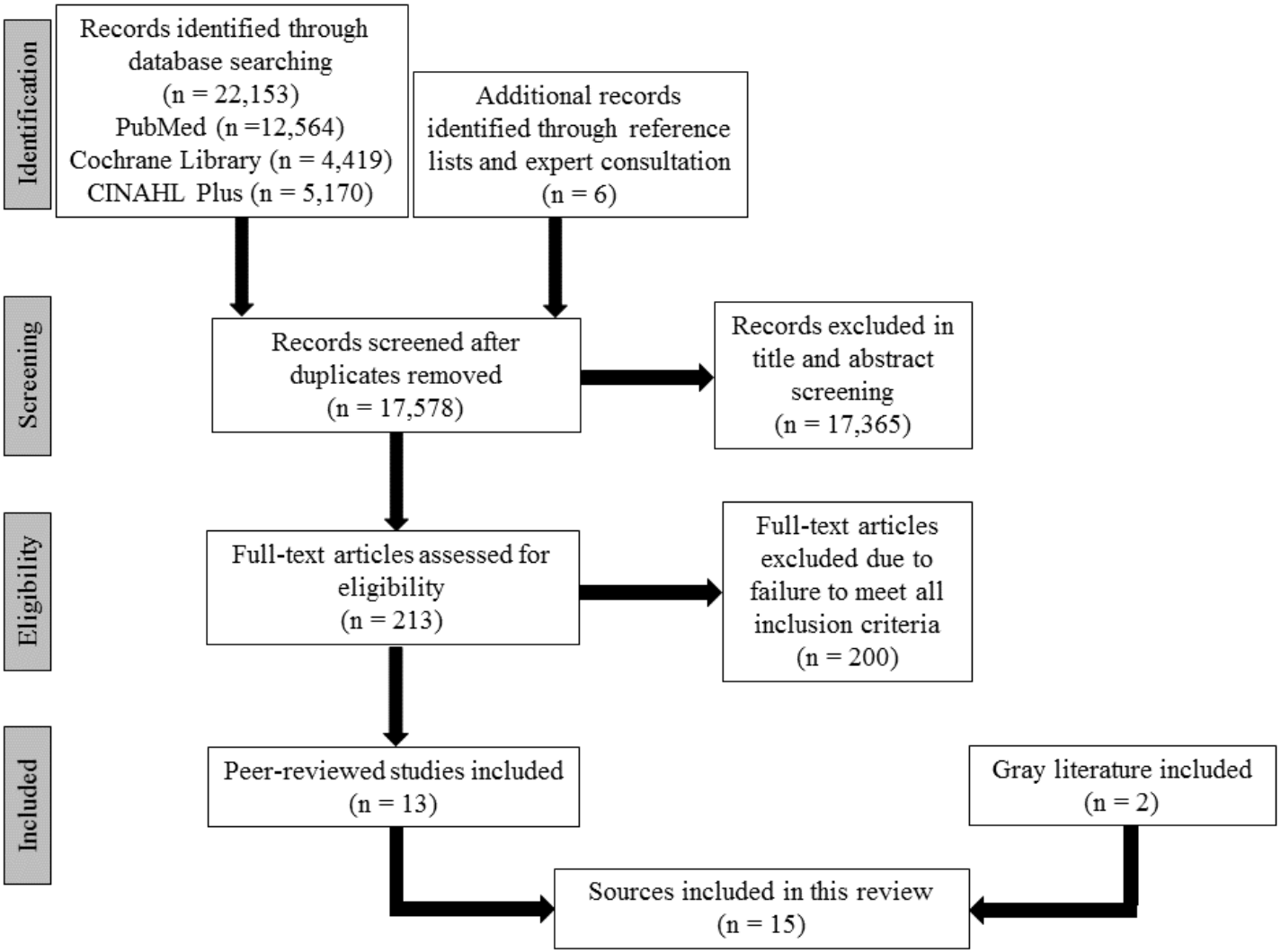

Figure 2. Evidence Continuum.

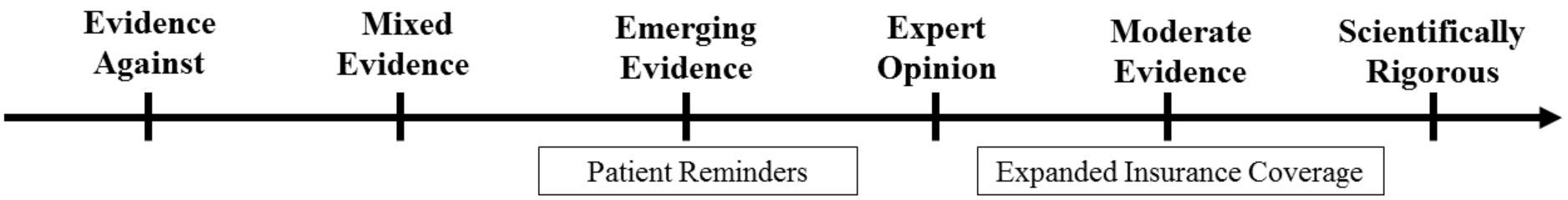

Table 1. Detailed Search Strategies

Database	Search Strategies	
PubMed	**#1**	**"**Child"[Mesh] OR "Adolescent"[Mesh] OR "Young Adult"[Mesh]
	#2	child*[tiab] OR adolescen*[tiab] OR teen*[tiab] OR youth*[tiab] OR young adult*[tiab] OR young people*[tiab]
	#3	#1 OR #2
	#4	"Adolescent Health Services"[Mesh] OR "Primary Health Care/standards"[Mesh:NoExp] OR "Primary Health Care/utilization"[Mesh:NoExp] OR "Preventive Health Services/standards"[Mesh:NoExp] OR "Preventive Health Services/utilization"[Mesh:NoExp]
	#5	preventive visit*[tiab] OR preventive services*[tiab] OR routine visit*[tiab] OR annual exam*[tiab] OR annual visit*[tiab] OR annual check-up*[tiab] OR annual checkup*[tiab] OR routine check up*[tiab] OR routine checkup*[tiab] OR well visit*[tiab] OR well child visit*[tiab] OR well child care visit*[tiab]
	#6	((Primary care[tiab] OR primary health care[tiab] OR preventive care[tiab] OR preventive health care[tiab]) AND (visit*[tiab] OR exam*[tiab] OR checkup*[tiab] OR check up*[tiab] OR delivery[tiab] OR standards[tiab]))
	#7	(("Adolescent Health"[Mesh] OR "Primary Health Care"[Mesh:NoExp] OR "Preventive Health Services"[Mesh:NoExp]) AND (visit*[tiab] OR exam*[tiab] OR checkup*[tiab] OR check up*[tiab] OR delivery[tiab] OR standards[tiab]))
	#8	#4 OR #5 OR #6 OR #7
	#9	"Health promotion"[Mesh] OR "Program evaluation"[Mesh] OR "Evidence-Based Practice"[Mesh:NoExp]
	#10	Strateg*[tiab] OR improv*[tiab] OR outreach*[tiab] OR health promotion*[tiab] OR effectiveness[tiab] OR evaluation*[tiab] OR intervention*[tiab]
	#11	#9 OR #10
	#12	#3 AND #8 AND #11
CINAHL Plus	S1	(MH "Child+") OR (MH "Adolescence+") OR (MH "Young Adult")
	S2	TI(child* OR adolescen* OR teen* OR youth* OR "young adult*" OR "young people*") OR AB(child* OR adolescen* OR teen* OR youth* OR "young adult*" OR "young people*")
	S3	S1 OR S2
	S4	(MH "Adolescent Health Services") OR (MH "Primary Health Care/ST/UT") OR (MH "Preventive Health Care/UT/ST")
	S5	TI("preventive visit*" OR "preventive services*" OR "routine visit*" OR "annual exam*" OR "annual visit*" OR "annual check-up*" OR "annual checkup*" OR "routine check up*" OR "routine checkup*" OR "well visit*" OR "well child visit*" OR "well child care visit*") OR AB("preventive visit*" OR "preventive services*" OR "routine visit*" OR "annual exam*" OR "annual visit*" OR "annual check-up*" OR "annual checkup*" OR "routine check up*" OR "routine checkup*" OR "well visit*" OR "well child visit*" OR "well child care visit*")
	S6	TI (("Primary care" OR "primary health care" OR "preventive care" OR "preventive health care") AND (visit* OR exam* OR checkup* OR "check up*" OR delivery OR standards)) OR AB (("Primary care" OR "primary health care" OR "preventive care" OR "preventive health care") AND (visit* OR exam* OR checkup* OR "check up*" OR delivery OR standards))
	S7	(((MH "Adolescent Health") OR (MH "Primary Health Care") OR (MH "Preventive Health Care")) AND (visit* OR exam* OR checkup* OR check up* OR delivery OR standards))
	S8	S4 OR S5 OR S6 OR S7
	S9	(MH "Health Promotion+") OR (MH "Program Evaluation") OR (MH "Professional Practice, Evidence-Based+")
	S10	TI (Strateg* OR improv* OR outreach* OR "health promotion*" OR effectiveness OR evaluation* OR intervention*) OR AB (Strateg* OR improv* OR outreach* OR "health promotion*" OR effectiveness OR evaluation* OR intervention*)
	S11	S9 OR S10
	S12	S3 AND S8 AND S11
Cochrane Library	**#1**	MeSH descriptor: [Child] explode all trees

	#2	MeSH descriptor: [Adolescent] explode all trees
	#3	MeSH descriptor: [Young Adult] explode all trees
	#4	(child* or adolescen* or teen* or youth* or young adult* or young people*):ti,ab,kw
	#5	or #1-#4
	#6	MeSH descriptor: [Adolescent Health Services] explode all trees
	#7	MeSH descriptor: [Primary Health Care] this term only and with qualifier(s): [Standards - ST]
	#8	MeSH descriptor: [Primary Health Care] this term only and with qualifier(s): [Utilization - UT]
	#9	MeSH descriptor: [Preventive Health Services] this term only and with qualifier(s): [Standards - ST
	#10	MeSH descriptor: [Preventive Health Services] this term only and with qualifier(s): [Utilization - UT]
	#11	(preventive visit* or preventive services* or routine visit* or annual exam* or annual visit* or annual check-up* or annual checkup* or routine check up* or routine checkup* or well visit* or well child visit* or well child care visit*):ti,ab,kw
	#12	((Primary care or primary health care or preventive care or preventive health care) and (visit* or exam* or checkup* or check up* or delivery or standards)):ti,ab,kw
	#13	or #6-#12
	#14	MeSH descriptor: [Adolescent Health] explode all trees
	#15	MeSH descriptor: [Primary Health Care] this term only
	#16	MeSH descriptor: [Preventive Health Services] this term only
	#17	or #14-#16
	#18	(visit* or exam* or checkup* or check up* or delivery or standards):ti,ab,kw
	#19	#17 and #18
	#20	#13 or #19
	#21	MeSH descriptor: [Health Promotion] explode all trees
	#22	MeSH descriptor: [Program Evaluation] explode all trees
	#23	MeSH descriptor: [Evidence-Based Practice] explode all trees
	#24	(Strateg* or improv* or outreach* or health promotion* or effectiveness or evaluation* or intervention*):ti,ab,kw
	#25	or #21-#24
	#26	#5 and #20 and #25

Table 2. Evidence Rating Criteria

Evidence Rating	Evidence Criteria: Type	Evidence Criteria: Study Results
Scientifically Rigorous	• Peer-reviewed study results are drawn only from: ○ Randomized controlled trials, and/ or ○ Quasi-experimental studies with pre-post measures and control groups	• Preponderance of studies have statistically significant favorable findings
Moderate Evidence	• Peer-reviewed study results are drawn from a mix of: ○ Randomized controlled trials ○ Quasi-experimental studies with pre-post measures and control groups ○ Quasi-experimental studies with pre-post measures without control groups ○ Time trend analyses	• Preponderance of studies have statistically significant favorable findings
Expert Opinion	• Gray literature	• Experts deem the intervention as favorable based on scientific review
Emerging Evidence	• Peer-reviewed study results are drawn from a mix of: ○ Randomized controlled trials ○ Quasi-experimental studies with pre-post measures and control groups ○ Quasi-experimental studies with pre-post measures without control groups ○ Time trend analyses ○ Cohort studies	• Studies with a close-to-evenly distributed mix of statistically significant favorable and non-significant findings • Only cohort studies with preponderance of statistically significant favorable findings
	• Gray literature	• Experts deem the intervention as favorable
Mixed Evidence	• Peer-reviewed study results are drawn from a mix of: ○ Randomized controlled trials ○ Quasi-experimental studies with pre-post measures and control groups ○ Quasi-experimental studies with pre-post measures without control groups ○ Time trend analyses ○ Cohort studies	• Studies with a close-to-evenly distributed mix of statistically significant favorable, unfavorable, and non-significant findings
	• Gray literature	• Experts deem the intervention as having mixed evidence
Evidence Against	• Peer-reviewed study results are drawn from a mix of: ○ Randomized controlled trials ○ Quasi-experimental studies with pre-post measures and control groups ○ Quasi-experimental studies with pre-post measures without control groups ○ Time trend analyses ○ Cohort studies	• Preponderance of studies have statistically significant unfavorable or non-significant findings
	• Gray literature	• Experts deem the intervention as being ineffective or unfavorable

Table 3. Study Characteristics.[1]

Study	Country	Setting	Study Sample[2]		Study Design
			Target Sample	Sample Size[3]	
Adams et al. (2018)	U.S.	U.S.	Adolescents ages 10-17	Total (N=25,695)	QE: pretest-posttest
Allison et al. (2007)	U.S.	Denver, Colorado Health safety-net system	Adolescents ages 14-17 within Denver Health safety-net system (study population was limited to uninsured or insured by Medicaid or SCHIP)	Total (N=3599)	Retrospective cohort design
Dick et al. (2004)	U.S.	Florida, New York, Kansas	Children and adolescents ages 1-18 who had enrolled in CHIP between July 2000 and March 2001	Florida (n=918)[4] N=adolescent ages 12-18 New York (n=2,290) N=all children ages 1-18 Kansas (n=434) N=all children ages 1-18	QE: pretest-posttest
Florida Pediatric Medical Home Demonstration Project 2014	U.S.	Florida	Pediatric practices accepting Medicaid and CHIP and serving at least 100 children with special health care needs	Round 1 Baseline (n=20) Final year (n=15) Round 2 (n=13) N=practices	Quality improvement time series design
Garcia-Huidobro et al. (2016)	U.S.	Clinics in the Hennepin County Medical Center network in Minneapolis, Minnesota	Young adults ages 10-24	Intervention (n=729) Control (n=20,975)	Retrospective cohort design
Greene (2011)	U.S.	Idaho	Children ages 1 to 18 years who received Medicaid or CHIP	Baseline (n=23,232) Year 1 (n= 24,313) Year 2 (n=23,392) N=adolescents ages 12-18	QE: pretest-posttest
Harrington & Kenney, et al.	U.S.	Ten states: Alabama, California, Florida, Louisiana,	Youth ages 13 and older enrolled in CHIP for at least 12 consecutive	Established enrollees (n≈2345)[5]	QE: non-equivalent control group

Study	Country	Setting	Study Sample[2]		Study Design
			Target Sample	Sample Size[3]	
(2014)/Smith & Dye (2013)		Michigan, New York, Ohio, Texas, Utah, and Virginia	months	Uninsured children (n≈381) N=children >13 years	
Kenney (2007)	U.S.	Ten states; California, Colorado, Florida, Illinois, Louisiana, Missouri, New Jersey, New York, North Carolina, and Texas	Children enrolled in SCHIP for at least 5 months	Established enrollees (n≈1747)[6] Uninsured children (n≈758) N= children >13 years	QE: non-equivalent control group
Kenney et al. (2011)	U.S.	Kentucky & Idaho	Non-institutionalized children ages 0-18	Kentucky (n=413,225) Idaho (n=194,593) N=children ages 6-18	QE: pretest-posttest
Klein et al. (2007)	U.S.	New York City, the urban environs of New York City, upstate urban areas, and upstate rural regions	Adolescents ages 12-18 in New York State	N=1118 at baseline N=970 at follow-up	Time 1/time 2 (T_1/T_2) cohort design
Knishkowy et al. (2000)	Israel	Family practice clinic in an urban, mainly lower-middle class, Jewish neighborhood in West Jerusalem	Teenagers ages 12 to 18 (7^{th} graders and 10^{th} graders) years who live with their parents in the neighborhood (all patients have national health insurance and visits are free of charge)	Total (N=106) Protocol 1: (n=47) Protocol 2: (n=59)	QE: non-equivalent control group
Riley et al. (2016)	U.S.	Regional Alliance for Healthy Schools (SBHCs) in middle and high schools and UMHS Ypsilanti Health Center	Middle and high school youth ages 10–21 years and a part of Michigan "safety net" network	Total (N=1471 at baseline)	QE: pretest-posttest non-equivalent control group
Szilagyi et al. (2006)	U.S.	4 urban primary care clinics in Rochester, New York	Adolescents ages 11-14 with one or more visits at each site	Total (N=3006) Intervention (n=1496) Control (n=1510)	RCT
Szilagyi et al. (2011)	U.S.	8 urban primary care practices in Rochester, New York	Adolescents ages 11-15 enrolled in one of the practices	Total (N=7546) Intervention (n=3707) Control (n=3,839)	RCT
Szilagyi et al. (2013)	U.S.	Monroe Plan for Medical Care, a not-for-profit managed care organization in upstate New York	Adolescents ages 10.5 through 17 years enrolled in Monroe Plan on December 31, 2009, with a primary care provider in a participating practice	Total (N=4115) Mailed reminder (n=1396) Telephone reminder	RCT

Study	Country	Setting	Study Sample[2]		Study Design
			Target Sample	Sample Size[3]	
				(n=1423) Control (n=1296)	

[1] Abbreviations used in this table: RCT (randomized controlled trial); QE (quasi-experimental study); SCHIP (State Children's Health Insurance Program); CHIP (Children's Health Insurance Program); SBHC (school-based health center)
[2] Target Sample describes sample for entire study; Sample Size refers to data analyzed for this review
[3] N denotes number of adolescents unless stated otherwise
[4] Sample obtained from Shenkman E, Youngblade L, Nackashi J. Adolescents' preventive care experiences before entry into the State Children's Health Insurance Program (SCHIP). *Pediatrics.* 2003;112(6 Pt 2):e533.
[5] Sample calculated by authors (SG & CM)
[6] Sample calculated by author (SG)

Table 4. Data Sources and Outcome Measures.

Study	Data Source	Outcome Measure
Adams et al. (2018)	Medical Expenditure Panel Survey	Percentage of adolescents receiving annual well-child visits

	data	
Allison et al. (2007)	Administrative databases maintained by Denver Health and Denver Public Schools	Percentage of adolescents receiving a health maintenance visit during a 1-year period
Dick et al. (2004)	Interviews	Percentage of adolescents receiving preventive care in the past 12 months
Florida Pediatric Medical Home Demonstration Project 2014	Administrative data, registry data, and medical records	Percentage of adolescents with at least one comprehensive well-care visit with a primary care provider or an OB/GYN during the measurement year
Garcia-Huidobro et al. (2016)	Medical record review	Percentage of adolescents receiving yearly preventive visits
Greene (2011)	Claims data	Percentage of children with CHIP up-to-date with well-child visits
Harrington & Kenney, et al. (2014)/Smith & Dye (2013)	2012 Congressionally Mandated Survey of CHIP and Medicaid Enrollees and Disenrollees	Percentage of children with a preventive care or check-up visit in the past 12 months
Kenney (2007)	Surveys of 16,700 SCHIP enrollees	Percentage of children with annual preventive/well-child visits
Kenney et al. (2011)	The 2004–2008 Medicaid/CHIP claims and enrollment data from Idaho and Kentucky	Percentage of children with annual well-child visits
Klein et al. (2007)	Telephone interviews	Percentage of adolescents receiving annual preventive visits
Knishkowy et al. (2000)	Clinic attendance records	Percentage of teenagers receiving annual preventive health visits
Riley et al. (2016)	The University of Michigan Hospital and Health Systems electronic health records	Percentage of adolescents receiving annual well-child visits
Szilagyi et al. (2006)	Medical record review	Percentage of well child visits within the prior year
Szilagyi et al. (2011)	Medical record review	Percentage of adolescents receiving preventive care visits
Szilagyi et al. (2013)	Managed care organization’s claims files	Percentage of adolescents receiving preventive visits during a 12-month period

Table 5. Intervention Description.[1]

Study	Comparison Group[2]	Description of Intervention	Intervention Implementation	Data Collection
Adams et al (2018)	N/A	ACA implementation	Enacted in 2010	Pre-intervention: 2007-2009 Post-intervention: 2012-2014
Allison et al. (2007)	Other community care	SBHC use	Aug 1, 2002, to Jul 31, 2003	1 year after enrollment
Dick et al. (2004)	N/A (Pre-SCHIP enrollment)	SCHIP enrollment	Beginning in Jul 2000	T1: shortly after enrollment (Jul 2000- Mar 2001) T2: 13 months after enrollment
Florida Pediatric Medical Home Demonstration Project	N/A	Florida Pediatric Medical Home Demonstration Project • CHIPRA Quality Demonstration Grant • Plan-Do-Study Act rapid cycle change QI framework (Breakthrough series and Model for Improvement) • Data collection via practice surveys, progress reports, and patient record reviews • Conference calls with practice teams and QI advisor • In-person learning sessions with presentations from experts on medical home concepts • Education for care coordinators • Maintenance of Certification credits • Parent involvement through in-person learning sessions, monthly check-in calls with parent partners, coaching and provision of resources through a parent partner email list	Round 1: Aug 2011-Oct 2012 Round 2: Aug 2013-Oct 2014	Monthly throughout action periods
Garcia-Huidobro et al. (2016)	Standard care	Enrollment in a patient-centered medical home	Jan 1, 2010-Dec 31, 2014	Yearly between 2010 and 2015

Study	Comparison Group[2]	Description of Intervention	Intervention Implementation	Data Collection
Greene (2011)	Medicaid-insured children	$30 in credits towards Children's Health Insurance Program (CHIP) premium	Beginning in Jan 2007	Baseline: Jul 2005-Jun 2006 Year 1: Jan 2007-Dec 2007 Year 2: Feb 2008-Jan 2009
Harrington & Kenney, et al. (2014)/Smith & Dye (2013)	Children who were uninsured for 5-12 months prior to enrollment	Enrollment in CHIP for one year or more	2012	2012
Kenney (2007)	Children who were uninsured at least 2 months prior to enrollment	Enrollment in SCHIP for 5 months or more	2002	2002
Kenney et al. (2011)	N/A (Children not affected by policy change)	Increased reimbursement for preventive care services	Idaho: Jul 2006 Kentucky: Jul 2007	Pre-reform: Jan 2004-Dec 2006 Post-reform: Jan 2007-Dec 2008
Klein et al (2007)	No intervention	SCHIP enrollment	Beginning in 2001	T1 interviews: Mar 15, 2001, and Sep 15, 2001 (~4-6 months after enrollment) T2 interviews: Dec 1, 2001, and May 4, 2002 (~13 months after enrollment)
Knishkowy et al. (2000)	Protocol 1 (1994-1995)	• *Protocol 1*: letter of explanation, consent form, and questionnaire sent to parents from family physician and nurse; teens contacted by nurse to set up appointment after forms received ○ Telephone follow up after 3 weeks to parents who hadn't returned forms	Protocol 1: school year 1994-5 Protocol 2: school year 1995-6	Protocol 1: school year 1994-5 Protocol 2: school year 1995-6

Study	Comparison Group[2]	Description of Intervention	Intervention Implementation	Data Collection
		• *Protocol 2:* letter of explanation (without consent form) and shorter questionnaire sent to parents; invitation letter sent to teen along with consent form to be signed by parents o Appointment scheduled upon receipt of teen or parent response o Telephone follow up after 3 weeks to teens who hadn't responded		
Riley et al. (2016)	Primary care clinic only	Partnership (shared patients) between a large primary care clinic with local SBHCs	Sep 2014- Jun 30, 2015	Baseline: Sep 1, 2013, through Aug 31, 2014 Intervention period (school-year): Sep 1, 2014-Jun 30, 2015
Szilagyi et al. (2006)	Standard care	Automated telephone message reminder system	Aug 8, 1998-Feb 29, 2000	Following intervention implementation
Szilagyi et al. (2011)	Standard care	Navigator program • 2 telephone calls (>1 week apart) • 2 letters (sent 2 weeks apart) • Offer of transportation assistance • Home visits if adolescents still hadn't received care	Oct 1, 2007-Dec 31, 2008	Following intervention implementation
Szilagyi et al. (2013)	Standard care	Mailed Reminders • Reminder letters sent at 10-week intervals by the managed care organization, advising parents to call their adolescent's primary care practice to schedule an appointment. Telephone Reminders • Telephone reminders sent at 10-week intervals by an autodialer service using a	Dec 11, 2009-Dec 12, 2010	Follow up: end of the 1-year study period

Study	Comparison Group[2]	Description of Intervention	Intervention Implementation	Data Collection
		recorded human voice in English or Spanish		

[1] ACA (Affordable Care Act); SCHIP (State Children's Health Insurance Program); CHIP (Children's Health Insurance Program); SBHC (school-based health center); CHIPRA (Children's Health Insurance Program Reauthorization Act); QI (Quality Improvement)
[2] "No intervention" refers to the comparison group not having received an intervention. "N/A" (not applicable) refers to quasi-experimental studies with pretest-posttest designs.

Table 6: Intervention Components

Study	Patients/Consumers						Health Care Providers					Payers
	School-Based Health Centers	Incentives	Patient Reminders	Home Visits	Transportation assistance	Parent Engagement	Increased Reimbursement	Maintenance of Certification Credits	Provider Education	Patient-Centered Medical Home	Quality Improvement	Expanded Insurance Coverage
School-Based Health Centers (n=2)												
Allison et al. (2007)	X											
Riley et al. (2016)	X											
Patient Reminders (n=4)												
Knishkowy et al. (2000)			X									
Szilagyi et al. (2006)			X									
Szilagyi et al. (2011)			X	X	X							
Szilagyi et al. (2013)			X									
Expanded Insurance Coverage (n=5)												
Adams et al (2018)												X
Dick et al. (2004)												X
Harrington & Kenney, et al. (2014)/Smith & Dye (2013)												X
Kenney (2007)												X
Klein et al (2007)												X
Other (n=4)												
Florida Pediatric Medical Home Demonstration Project 2014						X		X	X	X	X	
Garcia-Huidobro et al. (2016)										X		
Greene (2011)		X										
Kenney et al. (2011)							X					

Table 7. Study Results[1]

Study	Results
School-Based Health Centers (n=2)	
Allison et al. (2007)	• Significantly higher odds of health maintenance visit in the intervention group (aOR=1.9; 95% CI=1.5-2.3) • Significantly higher odds of health maintenance visit in the intervention group in repeat analysis (aOR=1.43; 95% CI=1.16-1.78)
Riley et al. (2016)	• Significantly higher rates of well-child visits for the SBHC/primary care partnership vs. primary care practice only group during intervention period (77.1% vs 69.9%; p=0.03)
Patient Reminders (n=4))	
Knishkowy et al. (2000)	• No significant increase in well-child attendance rate for seventh graders • No significant increase in well-child attendance rate for tenth graders
Szilagyi et al. (2006)	• No significant increase in adolescent well visit rates
Szilagyi et al. (2011)	• Significant increase in preventive care visit rates in the intervention group vs control group (p<.01)
Szilagyi et al. (2013)	• Significantly higher rates of annual preventive care visits in the mailed reminder group vs control group (Hazard ratio=1.2; CI=1.1- 1.3; p<.01) • Significantly higher rates of annual preventive care visits in the telephone reminder group vs control group (Hazard ratio=1.1; CI=1.0-1.2; p<.05)
Expanded Insurance Coverage (n=5)	
Adams et al. (2018)	• Significantly higher rates of well visits (7% difference; 95% CI=1.2%-1.5%; p<.001)
Dick et al. (2004)	• Significantly higher rates of preventive care for adolescents in Florida (0.71 vs 0.79; p<.01) • No significant increase in preventive care for adolescents in New York (p<.10)
Harrington & Kenney, et al. (2014)/Smith & Dye (2013	• Significantly higher percentage of adolescent well visits for CHIP enrollees vs children uninsured for 5-12 months in the prior year (p<.05)
Kenney (2007)	• Significantly higher percentage of adolescent well visits for CHIP enrollees vs children uninsured for at least 2 months in the prior year (p<.01)[2]
Klein et al. (2007)	• Significantly higher number of preventive-care visits in the insured group (8.3% difference; p=.003)
Other (n=4)	
Florida Pediatric Medical Home Demonstration Project 2014	• Percentage of adolescent well-care visits increased for both Round 1 practices (69.9% in Year 1 to 76.4% in Year 4) and Round 2 practices (64.2% in Year 3 to 72.3% in Year 4)
Garcia-Huidobro et al. (2016)	• No significant difference in odds of receiving a preventive visit for the total sample (ages 10-24), comparing patients enrolled in patient-centered medical homes with patients not enrolled (aOR=1.10; CI=0.93-1.29) • Decreased odds of having a visit for adolescents ages 10-18 comparing patients rolled in patient-centered medical homes with patients not enrolled (aOR=0.63; 99% CI=0.51-0.79)
Greene (2011)	• Significant increase in adolescent well-care visits in Year 1 for children with both CHIP $10 premium and CHIP $15 premium vs Medicaid comparison group (p<.001) • Significant increase in adolescent well-care visits in Year 2 for children with both CHIP $10 premium and CHIP $15

	premium vs Medicaid comparison group (p<.001)
Kenney et al. (2011)	• No significant increase in receipt of well-child care visits in Kentucky (0% difference; p<.01) • Significant increase in receipt of well-child care visits in Idaho (2.9% difference; p<.01)

[1] Abbreviations used in this table: SCHIP (State Children's Health Insurance Program); CHIP (Children's Health Insurance Program); SBHC (school-based health center)

[2] Results for adolescent subgroup obtained from Kenney, G., C. Trenholm, L. Dubay, M. Kim, L. Moreno, J. Rubenstein, A. Sommers, S. Zuckerman, W. Black, F. Blavin, and G. Ko. "The Experiences of SCHIP Enrollees and Disenrollees in 10 States: Findings from the Congressionally Mandated SCHIP Evaluation." Final report submitted to the U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. Princeton NJ: Mathematica Policy Research and Washington, DC: the Urban Institute, 2005.

Table 8. Summary of Study Results.[1]

Study	Adolescent Preventive Visit
School-Based Health Centers (n=2)	
Allison et al. (2007)	+
Riley et al. (2016)	+
Patient Reminders (n=4)	
Knishkowy et al. (2000)	ns
Szilagyi et al. (2006)	ns
Szilagyi et al. (2011)	+
Szilagyi et al. (2013)	+
Expanded Insurance Coverage (n=5)	
Adams et al. (2018)	+
Dick et al. (2004)	+, ns
Harrington & Kenney, et al. (2014)/Smith & Dye (2013)	+
Kenney (2007)	+
Klein et al. (2007)	+
Other (n=4)	
Florida Pediatric Medical Home Demonstration Project 2014	+
Garcia-Huidobro et al. (2016)	-, ns
Greene (2011)	+
Kenney et al. (2011)	+, ns

[1] "+" refers to statistically significant favorable outcomes ($p<.05$); "-" refers to statistically significant unfavorable outcomes; "ns" refers to non-significant outcomes ($p \geq .05$)

REFERENCES

1. National Performance Measure distribution. U.S. Department of Health and Human Services website. https://mchb.tvisdata.hrsa.gov/PrioritiesAndMeasures/NPMDistribution Accessed May 29, 2018.
2. Kogan MD, Dykton C, Hirai AH, et al. A new performance measurement system for maternal and child health in the United States. *Matern Child Health J.* 2015;19(5):945-957.
3. National Survey of Children's Health. NSCH 2016. Data query from the Child and Adolescent Health Measurement Initiative website. http://childhealthdata.org/browse/survey/results?q=4554&r=1 Accessed May 29, 2018.
4. Title V National Performance Measures (NPMs) across state hot-spotting table, 2016 NSCH. Data Resource Center for Child and Adolescent Health Website. http://www.childhealthdata.org/browse/compare-data-across-states/multiple-indicators/title-v-national-performance-measures-nsch-2016 Accessed May 29, 2018.
5. Rand CM, Goldstein NPN. Patterns of primary care physician visits for US adolescents in 2014: implications for vaccination. *Acad Pediatr.* 2018;18(2s):S72-s78.
6. National Research Council and Institute of Medicine. *Adolescent Health Services: Missing Opportunities*. Washington, DC: The National Academies Press; 2009.
7. Park MJ, Scott JT, Adams SH, Brindis CD, Irwin CE, Jr. Adolescent and young adult health in the United States in the past decade: little improvement and young adults remain worse off than adolescents. *J Adolesc Health.* 2014;55(1):3-16.
8. Halfon N, Hochstein M. Life course health development: an integrated framework for developing health, policy, and research. *Milbank Q.* 2002;80(3):433-479, iii.
9. Population Reference Bureau. Adolescence and the social determinants of health. Lancet Series on Adolescent Health. https://assets.prb.org/pdf14/lancet-youth-factsheet-2.pdf Published June 2014. Accessed May 29, 2014.
10. Viner RM, Ozer EM, Denny S, et al. Adolescence and the social determinants of health. *Lancet.* 2012;379(9826):1641-1652.
11. Hagan JF, Shaw J, Duncan PM, eds. *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents.* 4th ed. Elk Grove Village, IL: Americal Academy of Pediatrics; 2017.
12. Adolescent clinical preventive services guidelines. National Adolescent and Young Adult Health Information Center website. http://nahic.ucsf.edu/resource_center/adolescent-guidelines/ Updated November 2017. Accessed May 29, 2018.
13. Elster AB Kuznets NJ. *AMA Guidelines for Adolescent Preventive Services (GAPS): Recommendations and Rationale.* Baltimore, MD: Williams & Wilkins; 1994.
14. American Academy of Family Physicians. Recommendations for Periodic Health Examinations. American Academy of Family Physicians; Leawood, KS; 1994.
15. Well-woman recommendations. The American College of Obstetricians and Gynecologists website. https://www.acog.org/About-ACOG/ACOG-Departments/Annual-Womens-Health-Care/Well-Woman-Recommendations Accessed May 29, 2018.
16. Pilkey D, Skopec L, Gee E, Finegold K, Amaya K, Robinson W. The Affordable Care Act and Adolescents. Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. https://aspe.hhs.gov/system/files/pdf/180281/rb_adolescent.pdf Published August 2013. Accessed May 29, 2018.
17. Brindis CD, Twietmeyer L, Park MJ, Adams S, Irwin CE, Jr. Improving receipt and preventive care delivery for adolescents and young adults: initial lessons from top-performing states. *Matern Child Health J.* 2017;21(6):1221-1226.

18. Brindis C, Park MJ, Ozer EM, Irwin CE, Jr. Adolescents' access to health services and clinical preventive health care: crossing the great divide. *Pediatric Ann.* 2002;31(9):575-581.
19. Ozer EM, Scott JT, Brindis CD. Seizing the opportunity: improving young adult preventive health care. *Adolesc Med State Art Rev.* 2013;24(3).
20. Harris SK, Aalsma MC, Weitzman ER, et al. Research on clinical preventive services for adolescents and young adults: where are we and where do we need to go? *J Adolesc Health.* 2017;60(3):249-260.
21. Igra V, Millstein SG. Current status and approaches to improving preventive services for adolescents. *JAMA.* 1993;269(11):1408-1412.
22. Institute for Child Health Policy at the University of Florida. Florida Pediatric Medical Home Demonstration Project Evaluation. https://www.healthmanagement.com/wp-content/uploads/florida-pediatric-medical-home-demonstration-report-year-4.pdf Updated 2014. Accessed May 29, 2018.
23. Harrington M, Kenney GM, et al. *CHIPRA Mandated Evaluation of the Children's Health Insurance Program: Final Findings.* Report submitted to the Office of the Assistant Secretary for Planning and Evaluation. Ann Arbor, MI: Mathematica Policy Research; August 2014.
24. Smith K, Dye C. 2012 2012 Congressionally Mandated CHIP and Medicaid Survey: Findings on Access and Use for Primary and Preventative Care Under CHIP and Medicaid. Memo to the Office of the Assistant Secretary of Planning and Evaluation. Mathematica Policy Research. December 20, 2013.
25. The Robert Wood Johnson What Works for Health Project. County Health Rankings website. http://www.countyhealthrankings.org/take-action-improve-health/what-works-health/our-ratings Accessed May 29, 2018.
26. Adams SH, Park MJ, Twietmeyer L, Brindis CD, Irwin CE, Jr. Association between adolescent preventive care and the role of the Affordable Care Act. *JAMA Pediatr.* 2018;172(1):43-48.
27. Dick AW, Brach C, Allison RA, et al. SCHIP's impact in three states: how do the most vulnerable children fare? *Health Aff.* 2004;23(5):63-75.
28. Garcia-Huidobro D, Shippee N, Joseph-DiCaprio J, O'Brien JM, Svetaz MV. Effect of patient-centered medical home on preventive services for adolescents and young adults. *Pediatrics.* 2016;137(6).
29. Szilagyi PG, Dick AW, Klein JD, Shone LP, Zwanziger J, McInerny T. Improved access and quality of care after enrollment in the New York State Children's Health Insurance Program (SCHIP). *Pediatrics.* 2004;113(5):e395-404.
30. Szilagyi PG, Humiston SG, Gallivan S, Albertin C, Sandler M, Blumkin A. Effectiveness of a citywide patient immunization navigator program on improving adolescent immunizations and preventive care visit rates. *Arch Pediatr Adolesc Med.* 2011;165(6):547-553.
31. Szilagyi PG, Schaffer S, Barth R, et al. Effect of telephone reminder/recall on adolescent immunization and preventive visits: results from a randomized clinical trial. *Arch Pediatr Adolesc Med.* 2006;160(2):157-163.
32. Greene J. Using consumer incentives to increase well-child visits among low-income children. *Med Care Res Review.* 2011;68(5):579-593.
33. Kenney GM, Marton J, Klein AE, Pelletier JE, Talbert J. The effects of Medicaid and CHIP policy changes on receipt of preventive care among children. *Health Serv Res.* 2011;46(1 Pt 2):298-318.
34. Knishkowy B, Palti H, Schein M, Yaphe J, Edman R, Baras M. Adolescent preventive health visits: a comparison of two invitation protocols. *J Am Board Fam Pract.* 2000;13(1):11-16.
35. Kenney G. The impacts of the State Children's Health Insurance Program on children who enroll: findings from ten states. *Health Serv Res.* 2007;42(4):1520-1543.
36. Riley M, Laurie AR, Plegue MA, Richarson CR. The adolescent "expanded medical home": school-based health centers partner with a primary care clinic to improve population health and mitigate social determinants of health. *J Am Board Fam Med.* 2016;29(3):339-347.
37. Szilagyi PG, Albertin C, Humiston SG, et al. A randomized trial of the effect of centralized reminder/recall on immunizations and preventive care visits for adolescents. *Acad Pediatr.* 2013;13(3):204-213.

38. Allison MA, Crane LA, Beaty BL, Davidson AJ, Melinkovich P, Kempe A. School-based health centers: improving access and quality of care for low-income adolescents. *Pediatrics.* 2007;120(4):e887-894.
39. Klein JD, Shone LP, Szilagyi PG, Bajorska A, Wilson K, Dick AW. Impact of the State Children's Health Insurance Program on adolescents in New York. *Pediatrics.* 2007;119(4):e885-892.
40. Nyman JA, Abraham JM, Riley W. The effect of consumer incentives on Medicaid beneficiaries' compliance with well-child visit guidelines. *Inquiry.* 2013;50(1):47-56.
41. Outreach & enrollment: information for State Title V MCH Programs. Association of Maternal & Child Health Programs website. http://www.amchp.org/Policy-Advocacy/health-reform/resources/Documents/OutreachandEnrollmentFinal 2018.pdf Published October 2017. Accessed May 29, 2018.
42. Kempe A, Barrow J, Stokley S, et al. Effectiveness and cost of immunization recall at school-based health centers. *Pediatrics.* 2012;129(6):e1446-1452.
43. Minguez M, Santelli JS, Gibson E, Orr M, Samant S. Reproductive health impact of a school health center. *J Adolesc Health.* 2015;56(3):338-344.
44. Gibson EJ, Santelli JS, Minguez M, Lord A, Schuyler AC. Measuring school health center impact on access to and quality of primary care. *J Adolesc Health.* 2013;53(6):699-705.
45. Garcia S, Martino K, Lai Y, Minkovitz C, Strobino D. National Performance Measure 1 Well-Woman Visit Evidence Review. Strengthen the Evidence Base for Maternal and Child Health Programs. Women's and Children's Health Policy Center, Johns Hopkins University, Baltimore, MD. 2017. http://semch.org/evidence-reviews.html Accessed May 29, 2018.
46. Centers for Medicare and Medicaid Services. Paving the road to good health: strategies for increasing Medicaid adolescent well-visits. https://www.medicaid.gov/medicaid/benefits/downloads/paving-the-road-to-good-health.pdf Published February 2014. Accessed May 29, 2018.
47. Oehlmann ML & Martin CL. Improving Preventive Care Services for Children: A Best Clinical and Administrative Practices Toolkit for Medicaid Health Plans. 2002. Center for Health Care Strategies, Inc.
48. AYAH CoIIN resources and products. National Adolescent and Young Adult Health Information Center website. http://nahic.ucsf.edu/resource_center/ayah-coiin-resources-and-products/ Accessed May 29, 2018.
49. AYAH CoIIN national strategies. National Adolescent and Young Adult Health Information Center website. http://nahic.ucsf.edu/resource_center/ayah-coiin-nst/ Accessed May 29, 2018.
50. Adolescent and young adult health. Association of Maternal & Child Health Programs website. http://www.amchp.org/programsandtopics/AdolescentHealth/Pages/default.aspx Accessed May 29, 2018.