

ICSI Institute for Clinical Systems Improvement

Health Care Guideline

Preventive Services Children and Adolescents

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Annotation Table

Level I Services: Preventive services that clinicians and care systems <i>must</i> assess the need for and recommend to each patient. These have the highest priority value.	Annotation #
Childhood Immunization Series	1
Chlamydia Screening (Sexually Active Ages 25 and Younger)	2
Neonatal Screening	3
Level II Services: Preventive services that clinicians and care systems <i>should</i> assess the need for and recommend to each patient. These have value but less than those in Level 1.	Annotation #
Breastfeeding Counseling	4
Depression Screening	5
Folic Acid Chemoprophylaxis Counseling	6
Hearing Screening	7
Infant Sleep Positioning and SIDS Counseling	8
Motor Vehicle Safety Screening and Counseling	9
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Oral Health Counseling and Treatments	11
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Vision Impairment Screening	13
Level III Services: Preventive Services for which the evidence is currently incomplete and/or high burden of disease and low cost of delivering care. Providing these services is left to the judgment of individual medical groups, clinicians and their patients.	Annotation #
Alcohol Use Screening and Counseling	14
Blood Lead Screening	15
Circumcision Counseling	16
Developmental/Behavioral Assessment Screening	17
Domestic Violence and Abuse Screening and Counseling	18
Dyslipidemia Screening	19
Dysplasia of the Hip Screening	20
Household and Recreational Injury Prevention Screening	21
Hyperbilirubinemia Screening	22
Infectious Disease Prevention Counseling	23
Iron Deficiency Screening	24
Nutritional Counseling	25
Preconception Counseling	26
Pregnancy Prevention Counseling	27
Scoliosis Screening	28
Secondhand Smoke Exposure Counseling	29
Sexually Transmitted Infection Counseling	30
Sexually Transmitted Infection Screening (Other than Chlamydia)	31
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Level IV Services: Preventive Services that are not supported by evidence and not recommended.	Annotation #
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Child Maltreatment Screening	36
Hemoglobin (for Anemia Screening Ages Five Years and Older)	37
Tuberculin Screening (for Average Risk)	38
Urinalysis	39

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Preventive Services Addressed in Alphabetical Order

Service	Annotation #
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Blood Chemistry Screening (Level IV)	34
Blood Lead Screening (Level III)	15
Breastfeeding Counseling (Level II)	4
Cervical Cancer Screening (Level IV)	35
Child Maltreatment Screening (Level IV)	36
Childhood Immunization Series (Level I)	1
Chlamydia Screening (Sexually Active Ages 25 and Younger) (Level I)	2
Circumcision Counseling (Level III)	16
Domestic Violence and Abuse Screening and Counseling (Level III)	18
Depression Screening (Level II)	5
Developmental/Behavioral Assessment Screening (Level III)	17
Dyslipidemia Screening (Level III)	19
Dysplasia of the Hip Screening (Level III)	20
Folic Acid Chemoprophylaxis Counseling (Level II)	6
Hearing Screening (Level II)	7
Hemoglobin (for anemia screening ages five years and older) (Level IV)	37
Household and Recreational Injury Prevention Screening (Level III)	21
Hyperbilirubinemia Screening (Level III)	22
Infant Sleep Positioning and SIDS Counseling (Level II)	8
Infectious Disease Prevention Counseling (Level III)	23
Iron Deficiency Screening (Level III)	24
Motor Vehicle Safety Screening and Counseling (Level II)	9
Neonatal Screening (Level I)	3
Nutritional Counseling (Level III)	25
Obesity Screening (Level II)	10
Oral Health Counseling and Treatments (Level II)	11
Preconception Counseling (Level III)	26
Pregnancy Prevention Counseling (Level III)	27
Scoliosis Screening (Level III)	28
Secondhand Smoke Exposure Counseling (Level III)	29
Sexually Transmitted Infection Counseling (Level III)	30
Sexually Transmitted Infection Screening (Other than Chlamydia) (Level III)	31
Skin Cancer Screening and Counseling (Level III)	32
Tobacco Use Screening, Prevention and Intervention in Adolescents (Level II)	12
Tuberculin Screening (for Average Risk) (Level IV)	38
Undescended Testicle Screening (Level III)	33
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Evidence Grading

Literature Search

A consistent and defined process is used for literature search and review for the development and revision of ICSI guidelines. The PubMed database was utilized and the literature search was divided into two stages to identify systematic reviews (stage I), and randomized controlled trials, meta-analysis and other literature (stage II). Literature search terms used for this revision are below and include literature from October 2010 through April 2012. Search terms included vitamin D, circumcision, dyslipidemia and prevention.

GRADE Methodology

Following a review of several evidence rating and recommendation writing systems, ICSI has made a decision to transition to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system.

GRADE has advantages over other systems including the current system used by ICSI. Advantages include:

- developed by a widely representative group of international guideline developers;
- explicit and comprehensive criteria for downgrading and upgrading quality of evidence ratings;
- clear separation between quality of evidence and strength of recommendations that includes a transparent process of moving from evidence evaluation to recommendations;
- clear, pragmatic interpretations of strong versus weak recommendations for clinicians, patients and policy-makers;
- explicit acknowledgement of values and preferences; and
- explicit evaluation of the importance of outcomes of alternative management strategies.

This document is in transition to the GRADE methodology

Transition steps incorporating GRADE methodology for this document include the following:

- All new literature considered by the work group for this revision has been assessed using GRADE methodology.
- Work is being done on placing strengths on recommendations.

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Evidence Grading

Category	Quality Definitions	Strong Recommendation	Weak Recommendation
High Quality Evidence	Further research is very unlikely to change our confidence in the estimate of effect.	The work group is confident that the desirable effects of adhering to this recommendation outweigh the undesirable effects. This is a strong recommendation for or against. This applies to most patients.	The work group recognizes that the evidence, though of high quality, shows a balance between estimates of harms and benefits. The best action will depend on local circumstances, patient values or preferences.
Moderate Quality Evidence	Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.	The work group is confident that the benefits outweigh the risks but recognizes that the evidence has limitations. Further evidence may impact this recommendation. This is a recommendation that likely applies to most patients.	The work group recognizes that there is a balance between harms and benefits, based on moderate quality evidence, or that there is uncertainty about the estimates of the harms and benefits of the proposed intervention that may be affected by new evidence. Alternative approaches will likely be better for some patients under some circumstances.
Low Quality Evidence	Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change. The estimate or any estimate of effect is very uncertain.	The work group feels that the evidence consistently indicates the benefit of this action outweighs the harms. This recommendation might change when higher quality evidence becomes available.	The work group recognizes that there is significant uncertainty about the best estimates of benefits and harms.

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Foreword

Introduction

This guideline, *Preventive Services for Children and Adolescents*, outlines recommended preventive services, including screening maneuvers, counseling messages and specific interventions for children and adolescents of average health risk.

This guideline is intended to be used primarily by health care organizations to design systems of care for the reliable delivery of preventative services to populations of patients. The various tests included in this guideline are discussed only in the context of screening asymptomatic individuals and the early detection of certain clinical conditions; we do not address the use of these tests in patients with symptoms, or for the ongoing management of these conditions.

As far as possible, the work group has reviewed the relevant literature and reached a consensus in making our recommendations. We have also incorporated recommendations from other ICSI guidelines, as well as those of other groups, especially the United States Preventive Services Task Force (U.S. Preventive Services Task Force).

Throughout the guideline, we recommend a preference-based approach, strongly encouraging patients/parents and clinicians to utilize the principles of shared decision-making, particularly when the evidence about specific interventions is incomplete or equivocal.

For pediatric care, the majority of preventive services are often centered around well-child visits. While these visits can serve as a framework for recommended interventions, it is important to recognize that any encounter can be used as an opportunity for initiating preventive services. Because there is limited evidence for many interventions in pediatrics, those services that have direct evidence should be given highest priority. Other interventions and counseling should be done on a discretionary basis, determined by the risks and needs identified for that individual.

Organizing a Practice for Delivery of Preventive Services

In order to provide preventive services, it is first necessary to know which services are needed for individual patients. Decision support tools, preferably integrated into the medical record, should generate alerts and reminders when services are due, both for individuals seen in the office, as well as for individuals for whom the care system has assumed responsibility but who may not be seen regularly.

For pediatric care, well-child visits have traditionally served as the framework for the delivery of preventive services and anticipatory guidance and counseling. Well-child visits are also an opportunity to build and strengthen relationships with children and their families.

However, there are other options besides well-child visits for the delivery of these services, and health care organizations must also incorporate new systems of care. Preventive services cannot be reliably delivered to a population of children and adolescents solely by individual clinicians at one-on-one office visits, relying only on memory and good intentions. Instead, every patient contact, for any reason, should be considered as an opportunity for prevention.

These new systems incorporate such features as treatment protocols, task delegation, automated patient reminders, and other decision support tools. Pre-visit planning, post-visit or between-visit outreach, system alerts, and decision support have also been shown to be useful as have shared decision-making, patient activation, and care management (*Bodenheimer, 2003 [Low Quality Evidence]*). Continuity of care has been shown to improve the consistency with which services are delivered (*Flores, 2008 [Moderate Quality Evidence]*).

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Team-Based Approach

Team-based care, with all health professionals sharing responsibility and working together to serve a population of patients, is essential for the reliable and efficient delivery of preventive services. Even if the traditional one-on-one office visit was effective, clinicians do not have enough time to deliver care in this manner; one study estimated that a primary care clinician, working alone, would spend over seven hours each day just providing all USPSTF-recommended services to a typical panel of patients (*Yarnall, 2003 [Low Quality Evidence]*). Rather, it is only through the cooperative efforts of appropriately trained and empowered team members, working at the fullest level of their licensure and skills, that this can be accomplished.

Prioritization of Preventive Services

Health care systems may need to initially focus on the reliable delivery of selected high-value preventive services. The work group has prioritized the services included in this guideline; they are ranked by evidence of effectiveness, based upon the sum of their clinically preventable burden and cost effectiveness. Although most preventive services target high-burden conditions, not all are equally effective in reducing disease, and each service has its own cost. By focusing on services with relatively high health impact and favorable cost effectiveness, limited resources can be directed to those preventive services that produce the largest health improvements.

Level I preventive services: Clinicians and care systems *must* assess the need for and recommend these services to every patient. These have the highest value and are worthy of attention at every opportunity.

Level II preventive services: Clinicians and care systems *should* assess the need for and recommend these services to every patient. These have demonstrated value, although less than Level I services, and should be provided whenever possible.

Level III preventive services: Clinicians and care systems *could* recommend these services to patients, but only after careful consideration of costs and benefits. These are services for which the evidence of effectiveness is currently incomplete or equivocal, or which may have the potential for significant harm. Providing these services is left to the judgment of individual medical groups, clinicians and their patients. Decisions about preventive services in particular should be made based on the principles of shared decision-making.

Level IV preventive services: These services are *not* supported by evidence and should not be recommended. They may have insufficient evidence of effectiveness, clear evidence of lack of effectiveness, or the potential for significant harm without any benefit.

Counseling Services

While there is good evidence that modifying certain behaviors has positive health benefits (unsafe sex, accidents and safety, nutrition, physical activity), there is minimal evidence at present that screening for these conditions or asking about them in the context of a risk assessment, even if followed by advice from a physician or other clinician, will result in a change in behavior or positive outcomes. Therefore, this guideline makes:

- minimal recommendations for risk assessment to drive counseling for what are largely lifestyle issues,
- specific recommendation that risk assessment and counseling about lifestyle not be considered suitable parameters for systematic implementation measures, and
- counseling messages for those clinicians who want to provide such counseling or whose patients express an interest in receiving this information.

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Nevertheless, there is no question that the elimination of the unhealthy behaviors addressed in this document would significantly reduce morbidity and mortality in the general population. Modifiable health behaviors account for up to 50% of premature deaths in this country (*Flegal, 2005 [Low Quality Evidence]*). Furthermore, the main problem is the lack of good controlled trials of such counseling, not that there are trials showing mixed or no effects. Therefore, clinicians may choose to provide such counseling even though we do not yet have a solid evidentiary basis for it.

See also [Appendix A, "Counseling Messages."](#)

Physical Exam

Most of the elements of the traditional physical examination are notably absent from these recommendations. The physical examination was originally developed and taught as a way to thoroughly evaluate the patient with a significant health problem or complaint, particularly in the hospital setting. It was not designed as a screening test for an asymptomatic person; in fact, it fails nearly all of the criteria for an effective screening test identified by most authorities. As a diagnostic test, in response to specific complaints or symptoms, the physical exam remains of inestimable, if underutilized value.

The only elements of the physical exam that have been sufficiently studied and that are recommended by this guideline are height, weight and body mass index as part of obesity screening (Level II), vision screening (Level II) and hearing screening (Level II).

There is incomplete evidence and/or high burden of disease and low cost of delivery care for Level III services, and these are left to the judgment of individual medical groups, clinicians and their patients.

There is no evidence that cardiopulmonary, abdominal or neurologic exams, done as routine screening maneuvers in asymptomatic patients, will reliably detect occult disease of any type. We recognize the real and intangible benefits, as well as parental expectations, inherent in examining a child or adolescent, but caution against assuming that all patients expect or want a physical exam as a part of routine preventive services.

Prevention Visit Schedules

The work group acknowledges that there are many visit schedules offered by both national (e.g., American Academy of Pediatrics) and local advisory bodies, such as the Minnesota Cover All Kids Coalition. It is important to note that there is a paucity of data to support any particular visit schedule. The federal government requires individual states to provide preventive services as part of their participation in federally funded health care programs. Each state is responsible for setting up its own recommended schedule. Most states use the American Academy of Pediatrics recommendations for preventive pediatric health care as the basis for their requirements. Clinicians should take into consideration the frequency of required visits by their own individual state for this population as they design their system of care.

There is insufficient evidence to recommend one schedule over another in terms of lowering mortality and morbidity; recognizing disability; promoting optimal growth and development; or helping patients achieve longer, more productive lives. Many services can be provided during routine visits. Similarly, an assessment of preventive services needs can be incorporated into any visit. The visit schedules recommended in these guidelines may augment a clinic's ability to assure provision of preventive services, but this may be unnecessary over time as effective clinic systems allow the services to be incorporated into other clinic visits.

There have been no studies comparing the efficacy of various scheduled frequencies of preventive services visits. All existing schedules are attempts to combine various medical opinions with the frequency required for certain preventive services, especially immunizations.

Please see [Appendix B, "Visit Schedule,"](#) for a sample of well-child visits.

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Patient-Centered Care: Shared Decision-Making and Patient Activation

Children and families should have the opportunity to understand the risks and benefits of preventive services and to consider their personal values and preferences in their decisions. They should be encouraged to actively participate in this process to the extent to which they desire.

Shared decision-making is a key part of patient-centered care. Patient-centered care is one of the six aims of the Institute of Medicine in *Crossing the Quality Chasm* and is defined as "care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions" (*Institute of Medicine, 2001 [Reference]*).

The decisions that people face in health care systems are complex and important. There is a need to balance potential benefits and risks. In many situations, there is not one best alternative based on medical evidence. Personal values and preferences play a large part in what an individual's best choice might be.

Shared decision-making uses a structured process and specific tools to provide information to people and to encourage them to actively participate in decision-making.

Shared decision-making has been shown to improve patient knowledge and clarity about preferences. It also may increase patient trust, compliance, and satisfaction with the decision process and the ultimate decision. Shared decision-making may increase appropriate utilization of preventive services.

There is good evidence that well designed decision aids can improve patient knowledge. They help clarify the decision, identify decision-making needs, explore needs and how values relate to the decision, and plan next steps (*O'Connor, 2007 [Systematic Review]*).

Shared decision-making has intrinsic value. Patient preferences matter, especially when making preference-sensitive decisions, where the best choice for the patient depends on his or her values and preferences. The medical evidence is clear: clinicians generally do not know their patient's preferences unless they specifically ask about them. Therefore, in many situations, a "shared" rather than a "delegated" model for decision-making is desirable. The ultimate goal is to ensure that medical decisions are well informed by the best available evidence and consistent with patient preferences and values.

See [Appendix C, "ICSI Shared Decision-Making Model,"](#) for more information.

Care Coordination

Although some individuals, following health risk assessments and screening tests, will initiate and sustain lifestyle changes on their own, most will require some degree of structured feedback and follow-up to achieve even modest improvements. Patient-centered health care systems should implement evidence-based changes to ensure consistent follow-up of conditions and risk factors, and support for healthier lifestyles.

Timely feedback

- Clear, strong personal message
- Include documentation of "lifestyle vital signs"

Appropriate interventions

- Integrate into clinical decision support to assist the care team with knowledge of evidence-based preventive services to recommend at a given time
- Decision aids can help patients increase knowledge and collaborate with choices and options
- If screening and/or counseling results warrant treatment, see treatment guidelines

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Optimal follow-up

- Plan for and anticipate upcoming preventive service needs. Electronic systems may be particularly beneficial for advanced ordering of services
- Providing preventive screening and counseling services
- If screening and/or counseling results warrant additional follow-up, proceed as indicated. See also treatment guidelines, as noted in the specific topic sections

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Scope and Target Population

The scope of this guideline is to provide a comprehensive approach to the provision of evidence-based preventive services including screening maneuvers, immunizations and counseling, and to assist in the prioritization of these preventive services.

This guideline is not intended to diagnose or treat any condition; if a health issue or condition is found or suspected, or a screening maneuver is abnormal, other guidelines (such as the ICSI [Prevention and Management of Obesity \[Mature Adolescent and Adults\]](#) guideline) address the details of subsequent evaluation, testing, and management.

The target population of this guideline is average-risk, asymptomatic children and adolescents under age 18. In general, this guideline does not apply to pregnant women, individuals with chronic disorders, or high-risk populations; certain exceptions are noted.

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Aim

1. Increase the rate of pediatric patients up-to-date with Level I preventive services. (*Annotation Table, Level I Services*)

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Clinical Highlights

- All clinic contacts – whether acute, chronic or for preventive service – are opportunities for prevention. Incorporate appropriate preventive services at every opportunity.
- Address or initiate child preventive services that clinicians and care systems *must* assess the need for and recommend to each patient. These have the highest priority value. (Level I) (*Annotation Table, Level I Services; Aim #1*)
 - Childhood immunization series
 - Chlamydia screening (sexually active ages 25 years and younger)
 - Neonatal screening
- Provide timely feedback, appropriate interventions and optimal follow-up.

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Implementation Recommendation Highlights

The following system changes were identified by the guideline work group as key strategies for health care systems to incorporate in support of the implementation of this guideline.

- Prioritization and implementation of preventive services should be part of the overall system and should include the following:
 - Practice preventive services at every clinic opportunity while addressing high-priority services.
 - Individualize preventive services; regularly assess patient risk factors.
 - Provide education to patients/parents/guardians.
- Develop a plan for staff and clinician education around preventive services and organizational goals for implementation of preventive services (should also include education around "level" of service and the rationale behind each level).
- Develop decision support processes in electronic medical record or for paper medical records to support physicians and staff in delivery of specific components of Level 1 services.
- For those organizations with a paper medical record, create a "tickler" system that will generate reminders for preventive services in order to support completion of recommended Level I services.
- Develop a "catch-up" plan for those patients who are not on time with services by creating a tracking system that allows for periodic medical record audits to identify patient gaps in preventive services.
- Develop a collaborative relationship with patients/parents/guardians in order to activate/motivate them to practice preventive health while staying on time.
- Place throughout the facility patient education materials that focus on preventive services and the importance of each. Materials may include, but are not limited to, posters, pamphlets, videos and available Web sites, as well as services available in the community.

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Related ICSI Scientific Documents

Guidelines

- [Diagnosis and Treatment of Respiratory Illness in Children and Adults](#)
- [Immunizations](#)
- [Initial Management of Abnormal Cervical Cytology \(Pap Smear\) and HPV Testing](#)
- [Preventive Services for Adults](#)
- [Routine Prenatal Care](#)

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Definition

Clinician – All health care professionals whose practice is based on interaction with and/or treatment of a patient.

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Algorithm Annotations

Preventive Services That Clinicians and Care Systems *Must* Assess the Need for and Recommend to Each Patient. These Have the Highest Priority Value (Level I)

Level I preventive services are worthy of attention at every opportunity. Busy clinicians cannot deliver this many services in any single encounter. However, with systems in place to track whether or not patients are up-to-date with the high-priority preventive services for their age group, clinicians can recommend the high-priority services as opportunities present.

Table 1: Level I Services by Age:

Service	0-2 years	2-6 years	7-12 years	13-18 years
Childhood Immunization series See Annotation #1				
Chlamydia Screening (sexually active ages 25 years and younger)				Screen all sexually active women age 25 years and younger.
Neonatal Screening	Screen for hemoglobinopathies, phenylketonuria, hypothyroidism in the first week of life.			

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1. Childhood Immunization Series (Level I)

Recommendation:

Clinicians must screen and recommend immunizations for infants, children and adolescents for age-appropriate vaccines (*Strong Recommendation*).

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Algorithm Annotations

Recommended immunization schedule for persons aged 0 through 6 years

FIGURE 1: Recommended immunization schedule for persons aged 0 through 6 years—United States, 2012 (for those who fall behind or start late, see the catch-up schedule [Figure 3])

Vaccine ▼	Age ►	Birth	1 month	2 months	4 months	6 months	9 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years	
Hepatitis B ¹		Hep B	HepB			HepB		HepB						Range of recommended ages for all children
Rotavirus ²				RV	RV	RV ²								
Diphtheria, tetanus, pertussis ³				DTaP	DTaP	DTaP	see footnote ⁶		DTaP				DTaP	
<i>Haemophilus influenzae</i> type b ⁴				Hib	Hib	Hib ⁴		Hib						Range of recommended ages for all children and certain high-risk groups
Pneumococcal ⁵				PCV	PCV	PCV		PCV				PPSV		
Inactivated poliovirus ⁹				IPV	IPV			IPV					IPV	
Influenza ⁷								Influenza (Yearly)						
Measles, mumps, rubella ⁸								MMR	see footnote ⁶				MMR	Range of recommended ages for all children and certain high-risk groups
Varicella ⁹								Varicella	see footnote ⁶				Varicella	
Hepatitis A ¹⁰								Dose 1 ¹⁰					HepA Series	
Meningococcal ¹¹													MCV4 — see footnote ¹¹	

This schedule includes recommendations in effect as of December 23, 2011. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967).

- Hepatitis B (HepB) vaccine.** (Minimum age: birth)
 - At birth:**
 - Administer monovalent HepB vaccine to all newborns before hospital discharge.
 - For infants born to hepatitis B surface antigen (HBsAg)-positive mothers, administer HepB vaccine and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth. These infants should be tested for HBsAg and antibody to HBsAg (anti-HBs) 1 to 2 months after receiving the last dose of the series.
 - If mother's HBsAg status is unknown, within 12 hours of birth administer HepB vaccine for infants weighing $\geq 2,000$ grams, and HepB vaccine plus HBIG for infants weighing $< 2,000$ grams. Determine mother's HBsAg status as soon as possible and, if she is HBsAg-positive, administer HBIG for infants weighing $\geq 2,000$ grams (no later than age 1 week).
 - Doses after the birth dose:**
 - The second dose should be administered at age 1 to 2 months. Monovalent HepB vaccine should be used for doses administered before age 6 weeks.
 - Administration of a total of 4 doses of HepB vaccine is permissible when a combination vaccine containing HepB is administered after the birth dose.
 - Infants who did not receive a birth dose should receive 3 doses of a HepB-containing vaccine starting as soon as feasible (Figure 3).
 - The minimum interval between dose 1 and dose 2 is 4 weeks, and between dose 2 and 3 is 8 weeks. The final (third or fourth) dose in the HepB vaccine series should be administered no earlier than age 24 weeks and at least 16 weeks after the first dose.
- Rotavirus (RV) vaccines.** (Minimum age: 6 weeks for both RV-1 [Rotarix] and RV-5 [Rota Teq])
 - The maximum age for the first dose in the series is 14 weeks, 6 days; and 8 months, 0 days for the final dose in the series. Vaccination should not be initiated for infants aged 15 weeks, 0 days or older.
 - If RV-1 (Rotarix) is administered at ages 2 and 4 months, a dose at 6 months is not indicated.
- Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine.** (Minimum age: 6 weeks)
 - The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.
- Haemophilus influenzae* type b (Hib) conjugate vaccine.** (Minimum age: 6 weeks)
 - If PRP-OMP (PedvaxHIB or Comvax [HepB-Hib]) is administered at ages 2 and 4 months, a dose at age 6 months is not indicated.
 - Hiberix should only be used for the booster (final) dose in children aged 12 months through 4 years.
- Pneumococcal vaccines.** (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPSV])
 - Administer 1 dose of PCV to all healthy children aged 24 through 59 months who are not completely vaccinated for their age.
 - For children who have received an age-appropriate series of 7-valent PCV (PCV7), a single supplemental dose of 13-valent PCV (PCV13) is recommended for:
 - All children aged 14 through 59 months
 - Children aged 60 through 71 months with underlying medical conditions.
 - Administer PPSV at least 8 weeks after last dose of PCV to children aged 2 years or older with certain underlying medical conditions, including a cochlear implant. See *MMWR* 2010;59(No. RR-11), available at <http://www.cdc.gov/mmwr/pdf/rr/r5911.pdf>.
- Inactivated poliovirus vaccine (IPV).** (Minimum age: 6 weeks)
 - If 4 or more doses are administered before age 4 years, an additional dose should be administered at age 4 through 6 years.
 - The final dose in the series should be administered on or after the fourth birthday and at least 6 months after the previous dose.
- Influenza vaccines.** (Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 2 years for live, attenuated influenza vaccine [LAIV])
 - For most healthy children aged 2 years and older, either LAIV or TIV may be used. However, LAIV should not be administered to some children, including 1) children with asthma, 2) children 2 through 4 years who had wheezing in the past 12 months, or 3) children who have any other underlying medical conditions that predispose them to influenza complications. For all other contraindications to use of LAIV, see *MMWR* 2010;59(No. RR-8), available at <http://www.cdc.gov/mmwr/pdf/rr/r5908.pdf>.
 - For children aged 6 months through 8 years:
 - For the 2011–12 season, administer 2 doses (separated by at least 4 weeks) to those who did not receive at least 1 dose of the 2010–11 vaccine. Those who received at least 1 dose of the 2010–11 vaccine require 1 dose for the 2011–12 season.
 - For the 2012–13 season, follow dosing guidelines in the 2012 ACIP influenza vaccine recommendations.
- Measles, mumps, and rubella (MMR) vaccine.** (Minimum age: 12 months)
 - The second dose may be administered before age 4 years, provided at least 4 weeks have elapsed since the first dose.
 - Administer MMR vaccine to infants aged 6 through 11 months who are traveling internationally. These children should be revaccinated with 2 doses of MMR vaccine, the first at ages 12 through 15 months and at least 4 weeks after the previous dose, and the second at ages 4 through 6 years.
- Varicella (VAR) vaccine.** (Minimum age: 12 months)
 - The second dose may be administered before age 4 years, provided at least 3 months have elapsed since the first dose.
 - For children aged 12 months through 12 years, the recommended minimum interval between doses is 3 months. However, if the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.
- Hepatitis A (HepA) vaccine.** (Minimum age: 12 months)
 - Administer the second (final) dose 6 to 18 months after the first.
 - Unvaccinated children 24 months and older at high risk should be vaccinated. See *MMWR* 2006;55(No. RR-7), available at <http://www.cdc.gov/mmwr/pdf/rr/r5507.pdf>.
 - A 2-dose HepA vaccine series is recommended for anyone aged 24 months and older, previously unvaccinated, for whom immunity against hepatitis A virus infection is desired.
- Meningococcal conjugate vaccines, quadrivalent (MCV4).** (Minimum age: 9 months for Menactra [MCV4-D], 2 years for Menveo [MCV4-CRM])
 - For children aged 9 through 23 months 1) with persistent complement component deficiency; 2) who are residents of or travelers to countries with hyperendemic or epidemic disease; or 3) who are present during outbreaks caused by a vaccine serogroup, administer 2 primary doses of MCV4-D, ideally at ages 9 months and 12 months or at least 8 weeks apart.
 - For children aged 24 months and older with 1) persistent complement component deficiency who have not been previously vaccinated; or 2) anatomic/functional asplenia, administer 2 primary doses of either MCV4 at least 8 weeks apart.
 - For children with anatomic/functional asplenia, if MCV4-D (Menactra) is used, administer at a minimum age of 2 years and at least 4 weeks after completion of all PCV doses.
 - See *MMWR* 2011;60:72–6, available at <http://www.cdc.gov/mmwr/pdf/wk/mm6003.pdf>, and Vaccines for Children Program resolution No. 6/11-1, available at <http://www.cdc.gov/vaccines/programs/vfc/downloads/resolutions/06-11mening-mcv.pdf>, and *MMWR* 2011;60:1391–2, available at <http://www.cdc.gov/mmwr/pdf/wk/mm6040.pdf>, for further guidance, including revaccination guidelines.

This schedule is approved by the Advisory Committee on Immunization Practices (<http://www.cdc.gov/vaccines/recs/acip>), the American Academy of Pediatrics (<http://www.aap.org>), and the American Academy of Family Physicians (<http://www.aafp.org>).
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Algorithm Annotations

Recommended immunization schedule for persons aged 7 through 14 years

FIGURE 2: Recommended immunization schedule for persons aged 7 through 18 years—United States, 2012 (for those who fall behind or start late, see the schedule below and the catch-up schedule [Figure 3])

Vaccine ▼	Age ►	7–10 years	11–12 years	13–18 years	
Tetanus, diphtheria, pertussis ¹		1 dose (if indicated)	1 dose	1 dose (if indicated)	Range of recommended ages for all children
Human papillomavirus ²		see footnote ²	3 doses	Complete 3-dose series	
Meningococcal ³		See footnote ³	Dose 1	Booster at 16 years old	
Influenza ⁴		Influenza (yearly)			
Pneumococcal ⁵		See footnote ⁵			Range of recommended ages for catch-up immunization
Hepatitis A ⁶		Complete 2-dose series			
Hepatitis B ⁷		Complete 3-dose series			
Inactivated poliovirus ⁸		Complete 3-dose series			Range of recommended ages for certain high-risk groups
Measles, mumps, rubella ⁹		Complete 2-dose series			
Varicella ¹⁰		Complete 2-dose series			

This schedule includes recommendations in effect as of December 23, 2011. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967).

- Tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine.** (Minimum age: 10 years for Boostrix and 11 years for Adacel)
 - Persons aged 11 through 18 years who have not received Tdap vaccine should receive a dose followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter.
 - Tdap vaccine should be substituted for a single dose of Td in the catch-up series for children aged 7 through 10 years. Refer to the catch-up schedule if additional doses of tetanus and diphtheria toxoid-containing vaccine are needed.
 - Tdap vaccine can be administered regardless of the interval since the last tetanus and diphtheria toxoid-containing vaccine.
- Human papillomavirus (HPV) vaccines (HPV4 [Gardasil] and HPV2 [Cervarix]).** (Minimum age: 9 years)
 - Either HPV4 or HPV2 is recommended in a 3-dose series for females aged 11 or 12 years. HPV4 is recommended in a 3-dose series for males aged 11 or 12 years.
 - The vaccine series can be started beginning at age 9 years.
 - Administer the second dose 1 to 2 months after the first dose and the third dose 6 months after the first dose (at least 24 weeks after the first dose).
 - See *MMWR* 2010;59:626–32, available at <http://www.cdc.gov/mmwr/pdf/wk/mm5920.pdf>.
- Meningococcal conjugate vaccines, quadrivalent (MCV4).**
 - Administer MCV4 at age 11 through 12 years with a booster dose at age 16 years.
 - Administer MCV4 at age 13 through 18 years if patient is not previously vaccinated.
 - If the first dose is administered at age 13 through 15 years, a booster dose should be administered at age 16 through 18 years with a minimum interval of at least 8 weeks after the preceding dose.
 - If the first dose is administered at age 16 years or older, a booster dose is not needed.
 - Administer 2 primary doses at least 8 weeks apart to previously unvaccinated persons with persistent complement component deficiency or anatomic/functional asplenia, and 1 dose every 5 years thereafter.
 - Adolescents aged 11 through 18 years with human immunodeficiency virus (HIV) infection should receive a 2-dose primary series of MCV4, at least 8 weeks apart.
 - See *MMWR* 2011;60:72–76, available at <http://www.cdc.gov/mmwr/pdf/wk/mm6003.pdf>, and Vaccines for Children Program resolution No. 6/11-1, available at <http://www.cdc.gov/vaccines/programs/vfc/downloads/resolutions/06-11mening-mcv.pdf>, for further guidelines.
- Influenza vaccines (trivalent inactivated influenza vaccine [TIV] and live, attenuated influenza vaccine [LAIV]).**
 - For most healthy, nonpregnant persons, either LAIV or TIV may be used, except LAIV should not be used for some persons, including those with asthma or any other underlying medical conditions that predispose them to influenza complications. For all other contraindications to use of LAIV, see *MMWR* 2010;59(No. RR-8), available at <http://www.cdc.gov/mmwr/pdf/rr/r5908.pdf>.
 - Administer 1 dose to persons aged 9 years and older.
 - For children aged 6 months through 8 years:
 - For the 2011–12 season, administer 2 doses (separated by at least 4 weeks) to those who did not receive at least 1 dose of the 2010–11 vaccine. Those who received at least 1 dose of the 2010–11 vaccine require 1 dose for the 2011–12 season.
 - For the 2012–13 season, follow dosing guidelines in the 2012 ACIP influenza vaccine recommendations.
- Pneumococcal vaccines (pneumococcal conjugate vaccine [PCV] and pneumococcal polysaccharide vaccine [PPSV]).**
 - A single dose of PCV may be administered to children aged 6 through 18 years who have anatomic/functional asplenia, HIV infection or other immunocompromising condition, cochlear implant, or cerebral spinal fluid leak. See *MMWR* 2010;59(No. RR-11), available at <http://www.cdc.gov/mmwr/pdf/rr/r5911.pdf>.
 - Administer PPSV at least 8 weeks after the last dose of PCV to children aged 2 years or older with certain underlying medical conditions, including a cochlear implant. A single revaccination should be administered after 5 years to children with anatomic/functional asplenia or an immunocompromising condition.
- Hepatitis A (HepA) vaccine.**
 - HepA vaccine is recommended for children older than 23 months who live in areas where vaccination programs target older children, who are at increased risk for infection, or for whom immunity against hepatitis A virus infection is desired. See *MMWR* 2006;55(No. RR-7), available at <http://www.cdc.gov/mmwr/pdf/rr/r5507.pdf>.
 - Administer 2 doses at least 6 months apart to unvaccinated persons.
- Hepatitis B (HepB) vaccine.**
 - Administer the 3-dose series to those not previously vaccinated.
 - For those with incomplete vaccination, follow the catch-up recommendations (Figure 3).
 - A 2-dose series (doses separated by at least 4 months) of adult formulation Recombivax HB is licensed for use in children aged 11 through 15 years.
- Inactivated poliovirus vaccine (IPV).**
 - The final dose in the series should be administered at least 6 months after the previous dose.
 - If both OPV and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of the child's current age.
 - IPV is not routinely recommended for U.S. residents aged 18 years or older.
- Measles, mumps, and rubella (MMR) vaccine.**
 - The minimum interval between the 2 doses of MMR vaccine is 4 weeks.
- Varicella (VAR) vaccine.**
 - For persons without evidence of immunity (see *MMWR* 2007;56(No. RR-4), available at <http://www.cdc.gov/mmwr/pdf/rr/r5604.pdf>), administer 2 doses if not previously vaccinated or the second dose if only 1 dose has been administered.
 - For persons aged 7 through 12 years, the recommended minimum interval between doses is 3 months. However, if the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.
 - For persons aged 13 years and older, the minimum interval between doses is 4 weeks.

This schedule is approved by the Advisory Committee on Immunization Practices (<http://www.cdc.gov/vaccines/recs/acip>), the American Academy of Pediatrics (<http://www.aap.org>), and the American Academy of Family Physicians (<http://www.aafp.org>).
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Catch-up immunization schedule for persons aged 4 months through 18 years

FIGURE 3. Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind —United States • 2012
The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. **Always use this table in conjunction with the accompanying childhood and adolescent immunization schedules (Figures 1 and 2) and their respective footnotes.**

Persons aged 4 months through 6 years					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to dose 2	Dose 2 to dose 3	Dose 3 to dose 4	Dose 4 to dose 5
Hepatitis B	Birth	4 weeks	8 weeks and at least 16 weeks after first dose; minimum age for the final dose is 24 weeks		
Rotavirus ¹	6 weeks	4 weeks	4 weeks ¹		
Diphtheria, tetanus, pertussis ²	6 weeks	4 weeks	4 weeks	6 months	6 months ²
<i>Haemophilus influenzae</i> type b ³	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose) if first dose administered at age 12–14 months No further doses needed if first dose administered at age 15 months or older	4 weeks ³ if current age is younger than 12 months 8 weeks (as final dose) ³ if current age is 12 months or older and first dose administered at younger than age 12 months and second dose administered at younger than 15 months No further doses needed if previous dose administered at age 15 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months	
Pneumococcal ⁴	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older or current age 24 through 59 months No further doses needed for healthy children if first dose administered at age 24 months or older	4 weeks if current age is younger than 12 months 8 weeks (as final dose for healthy children) if current age is 12 months or older No further doses needed for healthy children if previous dose administered at age 24 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age	
Inactivated poliovirus ⁵	6 weeks	4 weeks	4 weeks	6 months ⁵ minimum age 4 years for final dose	
Meningococcal ⁶	9 months	8 weeks ⁶			
Measles, mumps, rubella ⁷	12 months	4 weeks			
Varicella ⁸	12 months	3 months			
Hepatitis A	12 months	6 months			
Persons aged 7 through 18 years					
Tetanus, diphtheria/ tetanus, diphtheria, pertussis ⁹	7 years ⁹	4 weeks	4 weeks if first dose administered at younger than age 12 months 6 months if first dose administered at 12 months or older	6 months if first dose administered at younger than age 12 months	
Human papillomavirus ¹⁰	9 years	Routine dosing intervals are recommended ¹⁰			
Hepatitis A	12 months	6 months			
Hepatitis B	Birth	4 weeks	8 weeks (and at least 16 weeks after first dose)		
Inactivated poliovirus ⁵	6 weeks	4 weeks	4 weeks ⁵	6 months ⁵	
Meningococcal ⁶	9 months	8 weeks ⁶			
Measles, mumps, rubella ⁷	12 months	4 weeks			
Varicella ⁸	12 months	3 months if person is younger than age 13 years 4 weeks if person is aged 13 years or older			

- Rotavirus (RV) vaccines (RV-1 [Rotarix] and RV-5 [Rota Teq]).**
 - The maximum age for the first dose in the series is 14 weeks, 6 days; and 8 months, 0 days for the final dose in the series. Vaccination should not be initiated for infants aged 15 weeks, 0 days or older.
 - If RV-1 was administered for the first and second doses, a third dose is not indicated.
- Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine.**
 - The fifth dose is not necessary if the fourth dose was administered at age 4 years or older.
- Haemophilus influenzae* type b (Hib) conjugate vaccine.**
 - Hib vaccine should be considered for unvaccinated persons aged 5 years or older who have sickle cell disease, leukemia, human immunodeficiency virus (HIV) infection, or anatomic/functional asplenia.
 - If the first 2 doses were PRP-OMP (PedvaxHIB or Comvax) and were administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 months and at least 8 weeks after the second dose.
 - If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a final dose at age 12 through 15 months.
- Pneumococcal vaccines.** (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPSV])
 - For children aged 24 through 71 months with underlying medical conditions, administer 1 dose of PCV if 3 doses of PCV were received previously, or administer 2 doses of PCV at least 8 weeks apart if fewer than 3 doses of PCV were received previously.
 - A single dose of PCV may be administered to certain children aged 6 through 18 years with underlying medical conditions. See age-specific schedules for details.
 - Administer PPSV to children aged 2 years or older with certain underlying medical conditions. See *MMWR* 2010;59(No. RR-11), available at <http://www.cdc.gov/mmwr/pdf/rr/r5911.pdf>.
- Inactivated poliovirus vaccine (IPV).**
 - A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.
 - In the first 6 months of life, minimum age and minimum intervals are only recommended if the person is at risk for imminent exposure to circulating poliovirus (i.e., travel to a polio-endemic region or during an outbreak).
 - IPV is not routinely recommended for U.S. residents aged 18 years or older.
- Meningococcal conjugate vaccines, quadrivalent (MCV4).** (Minimum age: 9 months for Menactra [MCV4-D]; 2 years for Menveo [MCV4-CRM])
 - See Figure 1 ("Recommended immunization schedule for persons aged 0 through 6 years") and Figure 2 ("Recommended immunization schedule for persons aged 7 through 18 years") for further guidance.
- Measles, mumps, and rubella (MMR) vaccine.**
 - Administer the second dose routinely at age 4 through 6 years.
- Varicella (VAR) vaccine.**
 - Administer the second dose routinely at age 4 through 6 years. If the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.
- Tetanus and diphtheria toxoids (Td) and tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccines.**
 - For children aged 7 through 10 years who are not fully immunized with the childhood DTaP vaccine series, Tdap vaccine should be substituted for a single dose of Td vaccine in the catch-up series; if additional doses are needed, use Td vaccine. For these children, an adolescent Tdap vaccine dose should not be given.
 - An inadvertent dose of DTaP vaccine administered to children aged 7 through 10 years can count as part of the catch-up series. This dose can count as the adolescent Tdap dose, or the child can later receive a Tdap booster dose at age 11–12 years.
- Human papillomavirus (HPV) vaccines (HPV4 [Gardasil] and HPV2 [Cervarix]).**
 - Administer the vaccine series to females (either HPV2 or HPV4) and males (HPV4) at age 13 through 18 years if patient is not previously vaccinated.
 - Use recommended routine dosing intervals for vaccine series catch-up; see Figure 2 ("Recommended immunization schedule for persons aged 7 through 18 years").

Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (<http://www.cdc.gov/vaccines>) or by telephone (800-CDC-INFO [800-232-4636]).

Counseling Messages

Educate parents to immunize children according to age-appropriate schedule.

Related guidelines

See the ICSI [Immunizations](#) guideline.

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2. Chlamydia Screening (Sexually Active Age 25 Years and Younger) (Level I)

Recommendation:

Routine screening for chlamydia must be recommended for all sexually active women aged 25 years and younger (*Meyers, 2007 [Systematic Review]; Centers for Disease Control and Prevention, 2002 [Low Quality Evidence]; Strong Recommendation*).

Burden of suffering

Chlamydia is the most common bacterial sexually transmitted infection in the United States. An estimated three million new cases occur annually, with the majority being asymptomatic when initially infected. If left untreated, chlamydia infections can lead to serious complications, including pelvic inflammatory disease, infertility and increased risk of human immunodeficiency virus (HIV) infection. It has been shown that having a process to identify, test and treat women at risk for cervical chlamydia infections is associated with a decreased incidence of pelvic inflammatory disease (*Scholes, 1996 [High Quality Evidence]*).

Efficacy

The sensitivity of available screening tests for chlamydia infection is 80% and higher (*Cook, 2005 [Systematic Review]*). The U.S. Preventive Service Task Force does not recommend a specific screening test as studies have generally been performed in ideal circumstances in small populations with high prevalence rates. However, they concluded that nucleic acid amplification tests had higher sensitivities and specificities than older antigen detection tests and better sensitivities than culture (*Meyers, 2007 [Systematic Review]*). Following detection, treatment with antibiotics approaches 100% efficacy. Two randomized studies have observed a decrease in pelvic inflammatory disease following chlamydia screening (*Østergaard, 2000 [Low Quality Evidence]; Scholes, 1996 [High Quality Evidence]*).

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3. Neonatal Screening (Level I)

Recommendation:

Screening in the first week of life for conditions that are initially asymptomatic but that result in serious health issues in the first month of life must be recommended for hemoglobinopathies (*Lin, 2007 [Low Quality Evidence]*), phenylketonuria (*Mabry-Hernandez, 2008 [Low Quality Evidence]*) and hypothyroidism (*Meyers, 2007 [Systematic Review]*) and other conditions according to state law (*Strong Recommendation*).

Efficacy

Newborn screening for metabolic and other disorders is designed to detect infants with serious health conditions that are initially asymptomatic like inborn errors of metabolism and hypothyroidism. Early identification in many cases can avert a poor outcome for a child with various interventions, depending on the condition. There is strong evidence to support screening for hemoglobinopathies (*Lin, 2007 [Low Quality Evidence]*), phenylketonuria (*Mabry-Hernandez, 2008 [Low Quality Evidence]*) and hypothyroidism (*Meyers, 2007 [Systematic Review]*). Approximately 4,000 infants per year are identified with a condition

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through the newborn metabolic screening program. Each state varies on the test required to be done by law, but a uniform approach with all states using mass spectrometry is being promoted by various national groups (<http://www.mchb.hrsa.gov/screening>). There is fair evidence that false-positive results are not a burden for parents (Prosser, 2008 [Low Quality Evidence]). There is fair evidence that screening appears to be cost effective (Norman, 2009 [Cost-Effective Analysis]; Insinga, 2002 [Cost-Effective Analysis]).

Counseling message

All infants should receive a newborn metabolic screening test prior to hospital discharge, ideally when greater than 24 hours of age. Infants who receive screening before 24 hours of age should receive a repeat test before the second week of life.

System alerts should provide notice of positive results. Appropriate follow-up services must be provided for any child with a positive test.

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Preventive Services That Clinicians and Care Systems *Should* Assess the Need for and Recommend to Each Patient. These Have Value but Less than Those in Level I (Level II)

Level II services have been shown to be effective and should be recommended whenever possible. If systems/care management teams are successful in keeping patients on time with high-priority services during illness and disease management visits, preventive services in the second group can be delivered.

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4. Breastfeeding Counseling (Level II)

Recommendation:

Promotion and support of breastfeeding should be recommended (U.S. Preventive Services Task Force, 2008 [Low Quality Evidence]).

Efficacy

Breastfeeding promotion interventions have resulted in significantly increased rates of short-term (one to three months) and long-term (six to eight months) exclusive breastfeeding. Additionally, combined pre- and postnatal breastfeeding interventions have a larger effect on breastfeeding durations than either alone. Lay support (peer support or peer counseling) has shown to increase short-term breastfeeding rates (Chung, 2008 [Low Quality Evidence]).

Breastfeeding has been shown to decrease the number of ear and gastrointestinal infections. The incidence of asthma, type 2 diabetes and obesity has also been shown to decrease with breastfeeding (U.S. Preventive Services Task Force, 2008 [Low Quality Evidence]). In the first study to look at the duration of breastfeeding and child maltreatment, the results found the odds ratio for maternal maltreatment decreases as breastfeeding duration increases (Strathearn, 2009 [Moderate Quality Evidence]).

Counseling messages

Birth-2 years

Encourage:

- Breastfeeding exclusively for the first six months, and up to one year
- Supplementing breastfed infants with iron no later than age six months with iron-fortified cereals
- Supplementing for breastfeeding with 400 IU/day vitamin D within two months for infants (Wagner, 2008 [Low Quality Evidence])

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- Pacifier use has not shown to affect breastfeeding duration or exclusivity (*O'Connor, 2009 [Systematic Review]*)

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5. Depression Screening (Level II)

Recommendation:

Screen adolescents (ages 12-18) for major depressive disorder, but only when systems are in place in their organization to ensure accurate diagnosis, careful selection of treatment and close follow-up. There is insufficient evidence to recommend such screening for children ages 7-11 and no evidence about the optimal frequency of screening for any age group (*U.S. Preventive Services Task Force, 2009c [Low Quality Evidence]*).

If systems are in place, only two instruments have been specifically validated for use in screening adolescents in primary care settings – the PHQ-A and the BDI, with sensitivities of 73% and 94%, respectively, and specificities of 91% and 91% (*Johnson, 2002 [Low Quality Evidence]*; *Winter, 1999 [Low Quality Evidence]*). However, the PHQ-A is modified from the PHQ-9 by only asking for a Yes/No response to whether each symptom is present nearly every day. Therefore, it seems unlikely to be useful for monitoring severity over time and hasn't been tested for that purpose. Since close monitoring is an essential part of the system required for care, each care system will be faced with the practical issue of either using a validated instrument for screening and assuming it will also work for monitoring severity over time, or using an instrument for one or both purposes that has been very well validated for them in adults (the PHQ-9) but lacks any published tests of either screening or monitoring in adolescents (*Kroenke, 2010 [Systematic Review]*). Another consideration in this choice is that the PHQ-9 is rapidly becoming the instrument of choice for both practice use and performance measurement for public reporting.

Efficacy

The systems needed to provide evidence-based, more effective depression care include evaluation, registry, close follow-up with regular severity score assessment, tracking, treatment intensification, care manager, pre-arranged routine psychiatry consultation, and relapse prevention counseling. Unless these systems are functioning well, benefits from screening are unlikely to be realized.

Potential harms to screening

There is adequate evidence that treating adolescents with selective serotonin reuptake inhibitors (SSRIs) (especially fluoxetine and citalopram), psychotherapy (cognitive-behavioral or interpersonal) and combined therapy decreases major depressive disorder symptoms more than in control subjects. There are at least 18 fair- or good-quality randomized controlled trials demonstrating efficacy (*Williams, 2009 [Systematic Review]*). However, nearly all of these trials have taken place outside a primary care setting, so an assumption is that the very good evidence for efficacy in primary care in adults should apply to adolescents (*Williams, 2007a [Systematic Review]*; *Gilbody, 2003 [Systematic Review]*). There is inadequate evidence about harms from screening or psychotherapy, but there is convincing evidence for a small risk of increased suicidality from antidepressant treatments and an increased risk of conversion from a unipolar depressive disorder to a bipolar disorder. The U.S. Preventive Services Task Force meta-analysis of evidence from nine good-quality randomized controlled trials found an absolute risk of suicide-related adverse events (suicidal ideation, suicide attempts or preparatory actions for imminent suicide) of about 1% greater than in controls. However, no suicidal deaths occurred among the 2,000 adolescents involved in these trials (*Williams, 2009 [Systematic Review]*). The U.S. Preventive Services Task Force concluded that because of this risk, SSRIs in adolescents "should only be considered if judicious clinical monitoring is possible" (*U.S. Preventive Services Task Force, 2009c [Low Quality Evidence]*).

Counseling messages

There is no evidence that simple, brief messages have any effect.

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Related guidelines

ICSI Preventive Services for Adults guideline.

ICSI Major Depression in Adults in Primary Care guideline.

See the "Implementation Tools and Resources Table" section of the guideline for example of screening instruments.

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6. Folic Acid Chemoprophylaxis Counseling (Level II)

Recommendation:

Clinicians should offer to counsel women of reproductive age to consume 400-800 micrograms of folic acid per day from food sources and/or supplements (*Wolff, 2009b [Low Quality Evidence]*).

Efficacy

Neural tube defects are common birth defects that affect approximately 3,000 pregnancies each year (*Centers for Disease Control and Prevention, 2004 [Low Quality Evidence]*). The occurrence of neural tube defects is reduced by 50-70% with the daily periconceptional consumption of 400-800 micrograms of folic acid (*U.S. Preventive Services Task Force, 2009b [Guideline]*). Not all women receive adequate levels of folic acid in their diets, and the 2005 March of Dimes Gallup survey indicated the number taking daily supplements is declining. When asked what would motivate them to take a supplement, the most common reported needs were being sick or a clinician's recommendation (*Centers for Disease Control and Prevention, 2005 [Low Quality Evidence]*).

Counseling messages

- Eat folic acid-rich foods and fortified foods such as dark green leafy vegetables; dried beans and peas; whole grain, fortified enriched grain products and breakfast cereals; and citrus fruits and berries.
- Take a vitamin supplement containing folic acid.

Related guideline

See the ICSI [Routine Prenatal Care](#) guideline.

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7. Hearing Screening (Level II)

Recommendation:

Universal screening of infants for congenital hearing loss should be recommended before one month of age (*Nelson, 2008 [Systematic Review]*).

Efficacy

There is good evidence to recommend newborn hearing screening by otoacoustic emissions and/or auditory brainstem response prior to one month of age (*Nelson, 2008 [Systematic Review]*). Screening for asymptomatic hearing impairment beyond age three is not recommended, although thorough follow-up should be provided for potential cases identified by symptoms or through school-based screening programs (*Nelson, 2008 [Systematic Review]*).

The U.S. Preventive Services Task Force found good evidence to recommend universal newborn hearing screening. The testing methodology of a one- or two-step validated protocol showed high sensitivity (0.92) and specificity (0.98) for the two-step protocol (otoacoustic emissions followed by auditory brainstem

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response for those who failed otoacoustic emissions) (Kennedy, 2005 [Low Quality Evidence]). Screening also improves outcomes (Wessex Universal Neonatal Hearing Screening Trial Group, 1998 [Low Quality Evidence]). Harms of screening in this age group were felt to be minimal.

After age three, undetected hearing problems are rare, and the majority of cases can be identified by thorough examination of children with otitis media with effusion. There is insufficient evidence on the effectiveness of early detection in asymptomatic children (Nelson, 2008 [Systematic Review]).

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8. Infant Sleep Positioning and Sudden Infant Death Syndrome (SIDS) Counseling (Level II)

Recommendation:

Clinicians should ask about the child's sleep environment. Inform parents of importance of back sleeping position. Demonstrate the appropriate sleeping position when the patient is under medical care.

Efficacy

Stomach and side sleeping have been identified as a major risk factor for sudden infant death syndrome in various studies (Taylor, 1996 [Low Quality Evidence]). Since 1992, the frequency of stomach sleeping has decreased from over 70% to 20% in United States infants, and in that time, the sudden infant death syndrome rate has decreased by over 50% (American Academy of Pediatrics, 2005b [Guideline]). Sudden infant death syndrome does continue to occur, and there is evidence that some populations of patients (Schlaud, 1999 [Low Quality Evidence]) and some health care clinicians (Bullock, 2004 [Low Quality Evidence]) have not received adequate information about proper sleeping position. There is good evidence that counseling about sleeping position and demonstration of appropriate sleeping position by health care clinicians increase the percentage of parents who choose to place their child in a back sleeping position (Moon, 2008 [Low Quality Evidence]; Colson, 2002 [Low Quality Evidence]; Schlaud, 1999 [Low Quality Evidence]). There is fair evidence that exclusive breastfeeding decreases the rate of sudden infant death syndrome (Vennemann, 2009a [Low Quality Evidence]). Other modifiable environmental risk factors have been identified. This has led to further recommendations, including sleeping in the same room with parents but not in the same bed, avoiding head covering and loose soft objects around the infant, and the offering of pacifiers during sleep (Vennemann, 2009b [Low Quality Evidence]; Mitchell, 2008 [Low Quality Evidence]; American Academy of Pediatrics, 2005b [Guideline]).

Burden of suffering

According to the annual summary of Vital Statistics: 2004, sudden infant death syndrome is one of five causes attributing to more than half of all infant deaths in 2002 (Hoyert, 2006 [Low Quality Evidence]). In 1993 an estimated 58% of infants in the United States were placed to sleep on their stomachs (Taylor, 1996 [Low Quality Evidence]). Infants who sleep on their stomachs or side are at increased risk for sudden infant death syndrome. There has been a noted rise in the number of children who experience accidental suffocation and strangulation in bed. This mechanism continues to be a major contributor to death in infancy (Shapiro-Mendoza, 2009 [Low Quality Evidence]).

Counseling message

Infants should be placed on their back for sleep. Side sleeping is no longer recognized as an alternative position.

Sleep position education should start in the newborn nursery. Health care workers should be careful to place babies on their back to demonstrate to parents the appropriate sleeping position. Continued work to educate all potential caregivers of infants should be supported.

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Infant sleep surfaces should be firm, and there should be no loose bedding or soft objects around the infant.

Improved room ventilation by use of a fan may be an effective intervention for decreasing sudden infant death syndrome (*Coleman-Phox, 2008 [Low Quality Evidence]*).

Parents should be encouraged not to smoke, as a no-smoking environment has many important health benefits. Smoking during pregnancy has been shown to be associated with increased risk of sudden infant death syndrome (*American Academy of Pediatrics, 2005b [Guideline]*).

Approximate but separate sleeping environment and the use of pacifiers have been recommended (*American Academy of Pediatrics, 2005b [Guideline]*).

Exclusive breastfeeding may decrease the risk of sudden infant death syndrome, and given all of its other health benefits, should be strongly encouraged (*O'Connor, 2009 [Systematic Review]*).

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9. Motor Vehicle Safety Screening and Counseling (Level II)

Recommendation:

Clinicians should assess use of the following:

- Car seats, booster seats and seat belts in the family
- Helmet use in recreational activities.

Efficacy

An updated review of the effectiveness of counseling for the U.S. Preventive Services Task Force found a small number of poor to fair studies of counseling to promote child safety seats that were conducted in years prior to the current environment of legislative and community interventions that have improved child seat use. Therefore, the U.S. Preventive Services Task Force found insufficient evidence to issue a recommendation for or against counseling to promote proper safety and booster seat use (*Williams, 2007b [Systematic Review]*). In the absence of better evidence, a choice to provide counseling can be supported by indirect evidence of counseling effectiveness (short-term effects reported in earlier studies), the high relative burden of motor vehicle injuries in young children, and the low cost of counseling.

Although the effectiveness of counseling is unclear, studies have found child seats to be effective. A recent study found that child safety seats are more effective than lap-shoulder safety belts for children ages two to three years, when seated in the rear. The study also concluded that laws requiring child safety seats for children younger than four years have a sound basis and recommends they remain in force (*Zaloshnja, 2007 [Moderate Quality Evidence]*). Another study on children ages two through six years was conducted for effectiveness on child restraint systems over seat belt use alone. The study's data indicated a 21% reduction in mortality risk for children ages two years through six years when a child restraint system was used over seat belts. The study recommends continued promotion of child restraint systems through laws and with education and disbursement programs. Newer studies indicate that children placed in child safety seats reduce their risk of injury by 71-82% compared to children similar ages using seat belts alone. The study's data indicated a 28% reduction in mortality as well (*Elliott, 2006 [Low Quality Evidence]*).

Unrestrained children are over 10 times as likely to die in a motor vehicle crash than are restrained children, although these data come from studies with important design limitations. Other studies suggest that child safety seats can reduce serious injury by 67% and mortality by 71%. Child restraints may also reduce non-crash injuries to child passengers by preventing falls both within and out of the vehicle (*Williams, 2007b [Systematic Review]*). Belt-positioning booster seats have been shown to decrease the risk of injury by 59% in children ages 4-7 years (*Durbin, 2003 [Low Quality Evidence]*).

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Persons who wear safety helmets while operating or riding on motorcycles can reduce their risk of injury or death from head trauma in the event of a crash. Head injury rates are reduced by about 75% in motorcyclists who wear safety helmets.

Counseling messages

Age Group Counseling Messages

- Birth-9 years**
- Install and use federally approved child safety seats.
 - Provide resources on using car seats appropriately, such as advising the patient to have a demonstration or check of proper seat installation.
 - All infants and toddlers should ride in a rear-facing car safety seat until they are age two or until they have met the maximum height or weight allowed by the car seat manufacturer. (*American Academy of Pediatrics, 2012 [Guideline]*).
 - All children two years of age and older or those younger who have met the maximum height and weight requirements by their car seat manufacturer, should use a forward-facing car seat with a harness until the highest weight and height allowed by the manufacturer have been met. (*American Academy of Pediatrics, 2012 [Guideline]*).
 - Children ages 12 years and younger should not be placed in any seat with an air bag. (Best: middle rear seat).
 - Children who have outgrown their forward-facing car safety seat should use a belt positioning booster until the vehicle lap and shoulder belt fit properly.
 - It is recommended that children should be in a belt positioning booster until they have reached a height of four feet nine inches, approximately 8-12 years of age (*American Academy of Pediatrics, 2012 [Guideline]*). Refer to local state laws.

All individuals, including older children and drivers of motor vehicles with child passengers

- Discuss always wearing a safety belt when driving or riding in a car (Minnesota Statute 169.686). Discuss the fact that 50% of death and disability from motor vehicle accidents can be prevented when passengers wear seat belts.
- Discuss the importance of properly installing child safety seats.
- Do not drive or ride in a motor vehicle when the driver is under the influence of alcohol or drugs.
- Discuss the fact that passengers should not ride in cargo areas of any vehicle.
- Discuss that car seat restraints were not designed to be fastened over heavy winter clothing, but over indoor clothing.
- The safest way to travel is to ensure that EVERYONE in the vehicle is correctly buckled up and that all children under age 13 ride in the back seat.
- Front passenger seats should be moved as far back as possible (Minnesota Department of Public Safety).
- Motorcycle riders should always wear helmets to reduce the risk of head injury.
- Discuss avoiding distractions while driving including use of cell phones and other handheld devices and conversations with passengers.

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10. Obesity Screening (Level II)

Recommendation:

Height, weight and body mass index should be recorded annually beginning at age two as part of a normal visit schedule.

Efficacy

The U.S. Preventive Services Task Force concluded there was "insufficient evidence to recommend for or against routine screening for overweight in children and adolescents." However, in a separate summary article they noted, "Because existing trials report modest short- to medium-term improvements (~10-20% decrease in percentage of overweight), overweight improvements among children and adolescents seem possible." They found "fair" evidence that body mass index is a reasonable measure for identifying those who are overweight (*Whitlock, 2005 [Low Quality Evidence]*). See [Appendix D, "Body Mass Index-for-Age Percentiles."](#)

The ICSI [Prevention and Management of Obesity \(Mature Adolescents and Adults\)](#) guideline recommends measuring height, weight and body mass index annually. This guideline also recommends addressing weight maintenance for those with body mass index in the normal range (18.5-24.9) because a substantial proportion may become overweight in the future. Children with body mass indexes in the overweight range were about five times more likely to become overweight as adults. Those in the obese range were up to 20 times more likely to be overweight. Among boys, an elevated body mass index was also a predictor of hypertension in young adulthood (*Field, 2005 [Moderate Quality Evidence]*). Overweight and obesity during childhood were found to be strong predictors of obesity and coronary heart disease risks in young adults who were part of the Bogalusa Heart Study (*Janssen, 2005 [Moderate Quality Evidence]*).

Plotting body mass index to note trends in weight change above or below the growth chart is recommended by the U.S. Department of Health and Human Services (2005) and could be started at two years. For children below the 85th percentile, encourage wholesome eating and activity and reevaluate annually. Those between the 85th and 95th percentiles are considered overweight (rather than obese; however, obesity is a billable code, overweight is not). Further medical screening and behavioral management should be considered (*Himes, 1994 [Low Quality Evidence]*); body mass index is not a precise indicator of the proportion of fat and lean tissue (*Demerath, 2006 [Low Quality Evidence]*).

There is general consensus that energy expended in physical activity has the potential to affect energy balance and weight regulation. There is some evidence that physical activity can minimize weight gain (*Jakicic, 2002 [Low Quality Evidence]*) and it reduces obesity-associated comorbidities, especially glucose intolerance and hyperlipidemia (*Roberts, 2003 [Low Quality Evidence]*; *Kang, 2002 [High Quality Evidence]*). However, physical activity alone cannot be expected to overcome unwholesome eating habits. Both must be balanced to prevent excessive weight gain.

Pediatric obesity prevention programs have been shown to cause small changes in target behaviors but no significant effect on body mass index compared to control (*Kamath, 2008 [Systematic Review]*). However, combination nutrition and physical activity interventions are effective at achieving weight reduction in school settings (*Katz, 2008 [Systematic Review]*). Obesity interventions with three or more components might be more efficacious than those using fewer components (*Seo, 2010 [Meta-analysis]*).

Additional topics receiving notice include soft drinks, portion sizes and television viewing or other sedentary activities. Decreasing caloric soft drink consumption can have a beneficial effect on body weight (*Ebbeling, 2006 [High Quality Evidence]*), and adolescents still obtain about half of their beverages at home (*French, 2003 [Low Quality Evidence]*), where there could be parental oversight. Television viewing not only affects lack of activity, but it also communicates behaviors related to food and diet that may not be wholesome (*Eisenmann, 2002 [Low Quality Evidence]*).

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Counseling messages

Encourage wholesome eating and physical activity.

2-18 years

Encourage

- Consumption of fruits, vegetables, whole grains and low-fat dairy products
- Limiting total fat, especially saturated, trans fats and cholesterol
- Daily participation of 30-60 minutes of moderate to vigorous physical activity appropriate for age
- Regular meals

Discourage

- Foods with added sugars
- Sweetened beverages
- Television and video games; limit to one hour per day

(U.S. Department of Health and Human Services, 2005 [Reference])

Related guideline

ICSI's [Prevention and Management of Obesity \(Mature Adolescents and Adults\)](#)

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11. Oral Health Counseling and Treatments (Level II)

Recommendation:

Fluoride should be recommended to prevent caries and cavities.

Risk assessment including oral screening and referral for dental care should be recommended for those at high risk.

Counseling on oral health preventive measures should be recommended.

Efficacy

The use of fluoride to prevent tooth decay can take multiple forms. In medical offices, recommendations to caregivers regarding the use of fluoride toothpaste and application of fluoride varnishes are effective approaches. The main potential complication of fluoride use is fluorosis.

There is good-quality evidence that the topical daily application of 1,000-1,500 parts per million (ppm) of fluoride using toothpaste is effective in preventing cavities (Walsh, 2010 [Systematic Review]). This has been evaluated in a recent meta-analysis that showed that the use of 1,000 ppm in toothpaste is safe, but that higher doses could result in fluorosis (Wong, 2010 [Systematic Review]; Ismail, 2008 [Systematic Review]). The use of a pea-sized amount of toothpaste has been shown not to increase the rate of fluorosis (Pendry, 2010 [Low Quality Evidence]). Brushing should be supervised in young children. The use of fluoride toothpaste was supervised in all studies up to the age of six. There is evidence that the use of fluoride toothpaste is safe after two years of age. The data about its use from age one to two is unclear. There is good-quality evidence to discourage its use prior to age one (Walsh, 2010 [Systematic Review]; Wong, 2010 [Systematic Review]).

The second method of fluoride delivery is the topical application of fluoride (fluoride varnish) in the office setting. This practice was recently evaluated in a meta-analysis, which showed that it was an effective intervention when targeted at those patients who were at higher risk for cavities (Marinho, 2009 [Systematic Review]; Weintraub, 2006 [High Quality Evidence]).

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The delivery of this service is dependent on the risk assessment. Methods of risk assessment have been proposed, but studies to demonstrate effective risk assessment using validated tools have been lacking (*Bader, 2004 [Low Quality Evidence]*). One good-quality prospective study of different risk-assessment strategies showed effectiveness of screening by questionnaire or the combination of a questionnaire and examination (*Gao, 2010 [Low Quality Evidence]*). Access to dental care also can be difficult for those patients who are identified because there continues to be difficulty finding dentists who accept Medicaid (*Lewis, 2009 [Low Quality Evidence]*; *Cruz, 2004 [Low Quality Evidence]*).

The final method of use of fluoride is supplementation. Most fluoride supplementation occurs through the delivery of fluoride in municipal water supplies. Patients should be encouraged to drink fluoridated tap water. When optimally fluoridated tap water is not available, oral supplementation has been recommended, but outcome evidence is limited (*Moyer, 2004 [Low Quality Evidence]*). In a recent meta-analysis, the use of oral supplementation was shown to be most effective in patients over six years of age, and the evidence of effectiveness in patients under six years of age was unclear (*Ismail, 2008 [Systematic Review]*).

The effectiveness of clinician counseling in affecting dental outcomes has been questioned in previous analyses (*Bader, 2004 [Low Quality Evidence]*; *Moyer, 2004 [Low Quality Evidence]*). Barriers to implementing caries prevention services in primary medical practices include reported lack of training and confidence (*Cruz, 2004 [Low Quality Evidence]*). There have been recent limited studies that show that clinician education to improve the delivery of oral health services in clinic settings can be successful (*Talib, 2010 [Low Quality Evidence]*; *Slade, 2007 [Low Quality Evidence]*; *Rozier, 2003 [Low Quality Evidence]*).

Counseling and education messages

Birth-2 years

- Do not use fluoridated toothpaste under one year of age.
- Use fluoride varnish for patients at high risk of cavities if mechanisms to successfully and consistently deliver this in the clinic setting are available. Access Web-based or in-person training to acquire knowledge and skills.
- Discourage the practice of putting infants and children to bed with a bottle.
- Encourage women to breastfeed.
- Encourage healthy eating habits to reduce the risk of dental caries. In particular, avoidance of frequent sugar intake.
- Encourage regular dental visits. Children at high risk for dental caries should be referred to the appropriate dental clinician.

2-18 years

- Parents should be advised to have children brush teeth daily with toothpaste containing 1,000 to 1,500 ppm of fluoride. Use a pea-sized amount of fluoride toothpaste for children over two years of age.
- Consider fluoride varnish for patients at high risk of cavities if mechanisms to successfully and consistently deliver this in the clinic setting are available.
- Provide daily fluoride supplements of 1 mg of fluoride for those patients over six years of age who do not have fluoride in their water supply already.
- Encourage regular dental visits.
- Consider daily flossing.
- Children at high risk for dental caries should be referred to the appropriate health care source.
- Encourage healthy eating habits to reduce the risk of dental caries. In particular, avoidance of frequent sugar intake.

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Professional medical associations (American Academy of Pediatrics and American Academy of Family Physicians) and professional dental associations (American Academy of Pediatric Dentistry, American Academy of Public Health Dentistry and American Dental Association) provide educational programs for clinicians or other support through tools to assess risk of caries. Two related Web site resources include:

<http://www.aap.org>

and

<http://www.smilesforlifeororalhealth.org>.

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12. Tobacco Use Screening, Prevention and Intervention in Adolescents (Level II)

Recommendation:

Clinicians should establish tobacco use status for all patients and reassess at every opportunity. (See [Annotation #29, "Secondhand Smoke Exposure Counseling \[Level III\]."](#)) All forms of tobacco should be included in this assessment. Clinicians should recommend ongoing cessation services to all tobacco users at every opportunity and reinforce non-users to continue avoiding tobacco products (*U.S. Preventive Services Task Force, 2009a [Systematic Review]; Fiore, 2008 [Low Quality Evidence]*).

Efficacy

Tobacco use is the single most preventable cause of death and disease in our society. There is some evidence that school-based programs and family intervention programs may help prevent smoking in children and adolescents (*Thomas, 2007 [Systematic Review]; Thomas, 2006 [Systematic Review]*). There is good evidence that tobacco cessation interventions are best carried out when the entire clinical staff is organized to provide these services (*U.S. Preventive Services Task Force, 2009a [Systematic Review]; Fiore, 2008 [Low Quality Evidence]*).

Two treatment elements are effective for tobacco cessation intervention in adults: social support for cessation and skills training/problem-solving. The more intense the treatment, the more effective it is in achieving long-term abstinence from tobacco. Structured physician clinical-based smoking cessation counseling is more effective than usual care in reducing smoking rates in adults (*Katz, 2004 [High Quality Evidence]*). The addition of telephone-based counseling may result in further improvements in cessation (*Zhu, 2002 [High Quality Evidence]*). The success of this approach in the adult population has led to the adoption of the same approach in the pediatric population. The effectiveness of psycho-social intervention for this age group is not well established (*Grimshaw, 2006 [Systematic Review]*). While readiness-stage intervention is commonly used, evidence does not strongly support it (*Riemsma, 2003 [Systematic Review]*).

Numerous pharmacotherapies for smoking cessation now exist. Except in the presence of contraindications, use may be recommended with patients attempting to quit smoking. There are no studies at this time demonstrating effectiveness of nicotine replacement or bupropion for adolescent smokers (*Glass, 2006 [Systematic Review]*).

The U.S. Public Health Service guideline cites a review of adolescent cessation programs in a variety of settings and concluded that such programs produce quit rates that exceed naturally occurring quit rates. In contrast, the U.S. Preventive Services Task Force found "little evidence addressing the effectiveness of screening and counseling children and adolescents to prevent the initiation of tobacco use and to promote its cessation in a primary care setting, but clinicians may use their discretion in conducting tobacco-related discussions with this population, since the majority of adult smokers begin tobacco use as a child."

(*Fiore, 2008 [Low Quality Evidence]; Prochaska, 1992 [Low Quality Evidence]*)

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Counseling messages

For children and adolescents using tobacco:

- Emphasize short-term negative effects of tobacco use.
- Advise tobacco users to quit.
- Assess user's willingness to make a quit attempt.
- Provide a motivational intervention if the user is not ready to make a quit effort (*Fiore, 2008 [Low Quality Evidence]*).
- Assist in quitting if ready to make a quit effort. Negotiate a quit date. Counsel to support cessation and build abstinence skills. Offer phone line for more assistance.
- Arrange follow-up to occur soon after the quit date.
- Provide educational and self-help materials for all patients and families.
- Support school and family based programs to help prevent smoking.

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13. Vision Impairment Screening (Level II)

Recommendation:

Vision screening should be recommended for all children three to five years of age. Screening should be used to detect amblyopia, strabismus and defects in visual acuity (*Chou, 2011 [Systematic Review]*; *Kemper, 2004 [Systematic Review]*).

Vision screening could be recommended for children under the age of three.

Efficacy

The U.S. Preventive Services Task Force concluded that there is adequate evidence that early treatment for amblyopia, including the use of cycloplegic agents, patching, and eye glasses for children three to five years of age leads to improved visual outcomes. The effectiveness of screening in preschool children is supported by indirect evidence that screening is effective in identifying strabismus and amblyopia, treatment of strabismus and amblyopia is effective, and more intensive screening leads to improved visual acuity compared to usual screening (*Kemper, 2004 [Systematic Review]*).

The U.S. Preventive Services Task Force found inadequate evidence that early treatment of amblyopia for children under the age of three years leads to improved visual outcomes.

A single randomized control trial demonstrated that children randomized to more intensive screening between 8 and 37 months of age had a lower prevalence of severe amblyopia, and at 7.5 years of age, lower prevalence of amblyopia after treatment (*Williams, 2001 [Moderate Quality Evidence]*).

Three fair- or good-quality trials for children three to five years of age with mild/moderate amblyopia or unilateral refractive errors (with or without amblyopia) reported that treatment resulted in a statistically significant but average improvement in visual acuity in the affected eye, compared with no treatment, after follow-up periods of five weeks to one year. Benefits were greater for children with more severe visual impairment at baseline. One trial found that, in a subgroup of children with more severe visual impairment at baseline, patching was associated with visual acuity improvement, compared with no treatment. Five fair- or good-quality trials found no differences in visual acuity improvement in the affected eye between shorter and longer daily patching regimens, among different atropine treatment regimens, or between patching and atropine treatment (*Chou, 2011 [Systematic Review]*).

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Counseling message

Normal objective vision screening performed at schools need not be repeated by clinics for average-risk, asymptomatic children (*Williams, 2001 [Moderate Quality Evidence]*).

Service	0-2 years	2-6 years	7-12 years	13-18 years
Breastfeeding Counseling	Promote and support breastfeeding.			
Depression Screening			Screen adolescents ages 12-18 for major depressive disorder when systems are in place for accurate diagnosis, treatment and follow-up.	
Folic Acid Chemoprophylaxis Counseling				Counsel women to consume 400-800 micrograms of folic acid per day from food sources or supplements.
Hearing Screening	Screen for congenital hearing loss before age one month.			
Infant Sleep Positioning and SIDS Counseling	Ask about the child's sleep environment. Inform parents to place infants on their back to sleep.			
Motor Vehicle Safety Screening and Counseling	Ask about the use of car seats, booster seats and seat belts in the family. Ask about helmet use in recreational activities.			
Obesity Screening		Record height, weight and calculate body mass index annually.		
Oral Health Counseling and Treatment	Fluoride should be provided to prevent caries and cavities. Risk assessment including oral screening and referral for dental care should be provided for those at high risk. Counseling on oral health preventive measures should be provided.			
Tobacco Use Screening, Prevention and Intervention in Adolescents	Establish tobacco use and secondhand exposure; offer tobacco cessation on a regular basis. Provide brief intervention.			
Vision Impairment Screening (age five years and younger)		Recommended for all children 3-5 years of age. Vision screening should be recommended for children under the age of three.		

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Preventive Services for Which the Evidence Is Currently Incomplete and/or High Burden of Disease and Low Cost of Delivering Care. Providing These Services Is Left to the Judgment of Individual Medical Groups, Clinicians and Their Patients (Level III)

Level III services either have insufficient evidence to prove their effectiveness and/or have important harms. For these preventive services in particular, decisions about recommending the service should be made based on shared decision-making. It is important to remember that insufficient evidence does not mean the service is not effective, but rather that the current literature is not sufficient to say whether or not the service is effective.

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14. Alcohol Use Screening and Counseling (Level III)

Recommendation:

Screening for risky or hazardous drinking could be performed.

Efficacy

The goal is to identify those with risky or hazardous drinking, as well as those who have carried that behavior to the point of meeting criteria for dependence, and then to provide a brief intervention. In the United States, risk/hazardous drinking is defined as the number of standard drinks (12 oz. beer, 1 glass of wine or mixed drink) in a given time period:

- Healthy women (and healthy men over 65): no more than 7 drinks per week and no more than 3 drinks per occasion
- Healthy men (less than 65 years): No more than 14 drinks per week and no more than 4 drinks per occasion

(U.S. Department of Health and Human Services, 2007 [Low Quality Evidence])

A brief intervention can be done by having the clinician, or preferably the rooming nurse, simply ask about the quantity drunk, using a simple questionnaire with the same questions on it, or using a formal validated screening questionnaire, of which the AUDIT is best (10 questions, created by the WHO, extensively validated). Other questionnaires, especially the four-question CAGE, are primarily designed to identify those with dependence, so they don't include questions about the quantity/frequency. These tools have not been validated in the children/adolescent population.

The U.S. Preventive Services Task Force in 2004 "found good evidence that screening in primary care settings can accurately identify patients whose levels or patterns of alcohol consumption do not meet criteria for alcohol dependence, but place them at risk for increased morbidity and mortality." It also "found good evidence that brief behavioral counseling interventions with follow-up produce small to moderate reductions in alcohol consumption that are sustained over 6- to 12-month periods or longer" (*Whitlock, 2004 [Systematic Review]*). In a standardized review of the clinically preventable burden and cost effectiveness of 25 preventive services recommended by the U.S. Preventive Services Task Force, Solberg et al. found this service to have the fourth-highest priority score and one of only six services that were actually cost-saving from a societal perspective. Additionally, the authors demonstrated that problem drinking screening and brief interventions in primary care are two of the most health effective and cost-effective clinical preventive services. They rank very close to tobacco cessation counseling, yet are two of the least commonly delivered (*Solberg, 2008 [Systematic Review]*).

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Counseling messages

Reinforce do not drink and drive.

Age Group Counseling and Education Messages

- 7-12 Years**
- Reinforce alcohol abuse prevention and education.
- 13+ Years**
- Don't ride with someone who is under the influence of alcohol.
 - Prevent others from driving in this condition: "Friends don't let friends drive drunk."
 - Reinforce not drinking and driving, and the dangers of it.
 - Abstinence if driving
 - Have a designated driver
 - Discuss characteristics of dependency.
 - Assess current use of alcohol (by history and/or use of standardized screening questionnaire).
 - Advise all females of the harm of alcohol on a fetus, and advise them to limit or cease alcohol intake.

Counseling method

Brief counseling should follow the 5A model (a variation on tobacco intervention guideline):

- Assess current and historical use of alcohol.
- Advise patients to stop drinking.
- Agree on individual goals for reduction or abstinence.
- Assist with motivation, skills and supports.
- Arrange follow-up support and repeated counseling, including referral if needed.

Other messages that may be of value include:

- Advise all females of childbearing age of the harmful effects of alcohol on a fetus and the need for cessation during pregnancy.
- Reinforce not drinking and driving.
- Advise patients to not ride with someone under the influence of alcohol and to prevent him or her from driving.

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15. Blood Lead Screening (Level III)

Recommendation:

Clinicians could screen for elevated blood lead levels between the ages of one and five.

Efficacy

The work group does not recommend blood lead screening for average-risk children. It does recognize federal requirements made on clinicians to screen patients who are covered by federally funded health programs (<http://www.cms.hhs.gov/medicaid/epsdt/default.asp>). The rate of screening has increased to 33.3% as measured in an analysis from data from 1988 to 2004 (Jones, 2009 [Low Quality Evidence]).

The U.S. Preventive Services Task Force recommends against routine screening for elevated blood lead levels in asymptomatic children ages one to five who are at average risk. The U.S. Preventive Services Task

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Force found insufficient evidence to recommend for or against screening in asymptomatic children ages one to five who are at increased risk (*Rischitelli, 2006 [Low Quality Evidence]*).

The guideline from the Centers for Disease Control and Prevention (1997) endorses screening at ages one and two years and children 36-72 months of age who have not been previously screened, if they meet one of the following criteria:

- Child resides in areas with greater than 27% of the housing built before 1950
- In populations where the percentage of one and two year olds with elevated blood lead levels is greater than 12%
- Child receives services from public assistance for the poor, such as Medicaid or the Supplemental Food Program for Women, Infants and Children
- For children in other areas, the Centers for Disease Control and Prevention recommends targeted screening based on risk assessment. See counseling message below.

The Centers for Disease Control and Prevention recommends that each state develop a statewide plan that would supersede the Centers for Disease Control and Prevention's general recommendation. Contact the state department of health or local public health agency for more information on screening recommendations for your area and follow-up on positive results.

Two cost-effectiveness analyses have been published that support the switch from targeted to universal blood lead testing at a community prevalence of 12-14% (children with elevated blood lead level greater than 12%) (*Kemper, 1998 [Cost-Effectiveness Analysis]*; *Briss, 1997 [Cost-Effectiveness Analysis]*). Target lead screening approaches have not decreased the effectiveness of screening high-risk populations (*Jones, 2009 [Low Quality Evidence]*).

Burden of suffering

Childhood lead poisoning is a serious preventable environmental health problem in the United States. It is currently estimated that some 310,000 children are at risk for lead exposure. The prevalence of elevated lead levels (greater than 10 mcg/dL) was 1.4% when the period 1999-2004 was studied. This prevalence has been steadily declining over the past 20 years due primarily to measures taken to reduce the level of lead in the environment (*Centers for Disease Control and Prevention, 2007 [Low Quality Evidence]*). There is higher prevalence of elevated blood lead levels in non-Hispanic African American children and in children of lower socioeconomic status (*Jones, 2009 [Low Quality Evidence]*).

Blood levels below 10 ug/dL have been associated with harmful effects on a child's ability to learn (*Binns, 2007 [Low Quality Evidence]*). The Centers for Disease Control and Prevention continues to support a threshold of 10 ug/dl for consideration of intervention at this time, while research continues in this area. Very high levels greater than 70 ug/dL can lead to seizures, coma and death.

Because the risk for childhood lead exposure varies widely, the recommendation for screening efforts should be targeted to children at elevated risk for exposure.

Counseling message

Blood lead screening is specific to each state. This section contains information specific to the state plan for Minnesota. Screening can consist of a capillary blood lead test, but if this is elevated, a venous test is recommended. Federal law requires screening to be done at around one and two years of age and for children up to six years of age who have not previously been screened or if parent or guardian has concern about lead poisoning or answers "yes" or "don't know" to any of the following questions:

- During the past six months, has the child lived in or regularly visited a home, child care or other building built before 1950? This question could apply to a facility such as a home day care center or the home of a babysitter or relative.

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- During the past six months has the child lived in or regularly visited a home, child care or other building built before 1978 with recent or ongoing repair, remodeling or damage (such as water damage or chipped paint)?
- Has the child or his/her sibling, playmate or housemate had an elevated blood lead levels?
- Does your child currently receive services from Minnesota Care; the Supplemental Food Program for Women, Infants, and Children; or Medical Assistance, which includes the Prepaid Medical Assistance Program?
- Does your child live within the city limits of Minneapolis or St. Paul?

Reference (<http://www.cdc.gov/nceh/lead/>)

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16. Circumcision Counseling (Level III)

Recommendation:

Clinicians could present unbiased information to patients/parents/families regarding the potential risks and benefits of circumcision, in a process of shared decision-making. While not uniformly recommended, there is evidence that circumcision in infants may be a medically valid decision.

Also, separate and beyond the medical issues, the decision to have an infant circumcised or not may reflect parental beliefs, values and preferences.

Efficacy

Male circumcision may offer protection from infections throughout the life course including urinary tract infections in infants and sexually transmitted infections in adults. In infants, the procedure has a low rate of mild to moderate complications. Potential benefits are greater in populations with greater exposure levels (e.g., HIV exposure).

According to the American Academy of Pediatrics Consensus Statement on circumcision (1999), the existing medical evidence demonstrates potential medical benefits of newborn male circumcision; however, the data are not sufficient to recommend routine neonatal circumcision. They conclude that parents should be given unbiased and accurate information in order to make an informed choice. The potential benefits of circumcision include 1) decreased risk of urinary tract infections in infants (*Wiswell, 1989 [Low Quality Evidence]*); 2) decreased risk of sexually transmitted diseases including HIV, HPV and HSV-2 in adults (*Gray, 2010 [High Quality Evidence]*; *Tobian, 2009 [High Quality Evidence]*; *Mills, 2008 [Meta-analysis]*) and 3) potential lower risk of penile cancer in adults. The potential risks include 1) bleeding, 2) infection, 3) trauma/injury to the penis, and 4) Suboptimal cosmetic result. Severe complications following circumcision are rare (*Weiss, 2010 [Systematic Review]*). A new statement was released in September 2012 after this work group concluded its review of evidence. This will be evaluated during the next revision cycle.

The majority of studies that focused on the risk of decreased STDs in adults were carried out on African men where the baseline rate of HIV is much higher than the average population. Therefore, the risk of STDs in circumcised versus uncircumcised men in the United States has not been as well analyzed and may potentially lead to population-biased results.

Counseling Messages

Clinicians should present unbiased information to parents regarding the potential risks and benefits of circumcision.

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17. Developmental/Behavioral Assessment Screening (Level III)

Recommendation:

Clinicians could recommend developmental and behavioral assessment of infants and children. The periodic evaluation of children who are at great risk for developmental delay is mandated by federal statute (Individuals with Disabilities Education Act [IDEA] [Pub L No. 101-476]).

Efficacy

Individual states are required to develop processes to provide screening for delayed development as part of providing federally funded health care services. Health care clinicians are considered to be part of a coordinated system to provide this evaluation. The payment for services can be contingent on completion of this screening in selected populations. There have been recommendations by national societies on the provision of these services (*Council on Children with Disabilities, 2007 [Low Quality Evidence]*). State-specific recommendations for Minnesota are provided in the Resources Table.

Developmental assessment can be broken into several major categories including motor skills, language development and social development. Analysis of these different areas has been limited in the past.

Language development

The U.S. Preventive Services Task Force has recently completed an analysis of the data surrounding screening for speech and language disorders for children under five years of age (*Nelson, 2006 [Systematic Review]*). The evidence analysis showed that there were many screening instruments available, but that there was insufficient evidence to show which instrument was the best to use. There was not evidence to support the strategy of identifying any specific risk factors to target intervention. There was fair to good evidence that intervention can be helpful in the short term in both the two- to three-year and the three- to five-year age groups (*Nelson, 2006 [Systematic Review]*). A recent large cluster randomized study from the Netherlands showed that screening at 15 months and two years of age showed significant decreases in the need for specialized schooling and in difficulties in spelling among the screened population at eight years of age. Other areas of educational progress were not affected. Those within the screened population who were identified with delay were given a structured intervention. This is the first study to show a long-term impact on educational outcomes of screening under two years of age (*van Agt, 2007 [Moderate Quality Evidence]*). There were not any studies to look at the potential harms of screening (*Nelson, 2006 [Systematic Review]*).

Reading aloud to children has been shown to be important to prepare children for reading success. Reach Out and Read (ROR) is an intervention program that integrates the promotion of parent-child reading activity in pediatric practice by modeling reading activities, delivering counseling messages about the importance of reading and distributing age appropriate books. There is fair evidence that ROR promotes parental support for reading and enhances language development (*Needlman, 2005 [Low Quality Evidence]*; *Theriot, 2003 [Low Quality Evidence]*; *Mendelsohn, 2001 [Moderate Quality Evidence]*).

Social development

Among health care clinicians and the public, there is increasing concern with disorders of social development (autistic spectrum disorders) (*Barbarese, 2006 [Low Quality Evidence]*). There has been recent research into screening for these disorders because of the general consensus and fair evidence that early intervention, particularly with behavioral therapy, leads to improved outcomes (*Myers, 2007 [Low Quality Evidence]*; *Barbarese, 2006 [Low Quality Evidence]*; *Eikeseth, 2002 [Low Quality Evidence]*). There is still a lack of higher-quality research studies to support this conclusion (*Rogers, 1998 [Low Quality Evidence]*). The result of the research done on screening has shown a variability of specificity and sensitivity of screening instruments and questions. There have not been enough high-quality studies to support the use of a particular methodology (*Mawle, 2006 [Systematic Review]*; *Rydz, 2006 [Low Quality Evidence]*; *Rydz, 2005 [Low Quality Evidence]*). There is expert opinion that longitudinal surveillance with some structured methodology

of assessment is the best tool available at this time to detect this problem based on current evidence (Rydz, 2006 [Low Quality Evidence]; Rydz, 2005 [Low Quality Evidence]). This approach, however, has not been well studied. Studies have shown that specific screening for disorders of social development may not occur as often as other forms of screening. Many experts have raised concerns that there may need to be more encounters with patients between 9 and 36 months of age to provide assessment for these issues than are currently included in various preventive services schedules. The nature and type of encounter are subject to much debate. Some studies have pointed to evaluation by individuals of different levels of training other than physicians may be able to be part of the developmental screening process (Johnson, 2006 [Low Quality Evidence]). But these studies are not adequate to make a particular recommendation. Research into these areas continues and hopefully will lead to the clearer definition of a more precise and effective screening or surveillance strategy. Research into intervention should continue, as well, to better define the optimal treatment strategy. The work group suggests considering that longitudinal surveillance by a health care clinician with some structured screening methodology is the best available approach at this time, though the available research does not support the use of any specific screening tool or question at this point. The American Academy of Pediatrics published a recommended screening strategy and management strategy (Johnson, 2007 [Low Quality Evidence]; Myers, 2007 [Low Quality Evidence]).

Motor development

Pediatric health care clinicians play a critical role in early detection of infants who may be at risk of developing motor dysfunction due to a neurological disorder. Infants with low birth weights and or who are preterm are at increased risk of behavioral, cognitive and motor impairments (Spittle, 2007 [Systematic Review]). There are screening tools that can be administered at an early age to detect possible major and minor motor dysfunction (Heineman, 2008 [Systematic Review]). Once identified, these children may qualify for early intervention programs. There is inconclusive evidence to support specific parameters of such early intervention programs. Current evidence encourages parent education as an important component to the early intervention program to enrich the parent-infant relationship in order for parents to confidently respond to their infants needs at home. Early intervention programs for preterm or low birth weight infants have a positive impact on cognitive outcomes until 3-5 years of age. Effects on motor outcomes are inconsistent, and typically are not present after 24 months of age (Koldewijn, 2009 [Low Quality Evidence]; Vanderveen, 2009 [Meta-analysis]). Further research is indicated to determine which early intervention programs are most effective for improving long-term motor and cognitive outcomes.

Burden of suffering

Speech and language delay has been shown to affect 5-8% of preschool age children (Nelson, 2006 [Systematic Review]). Developmental delay or behavioral disorders have estimated to affect 12-16% of children (American Academy of Pediatrics, 2001a [Guideline]). The frequency of autistic spectrum disorders is 6 per 1,000 (Hirtz, 2007 [Low Quality Evidence]).

Counseling message

Routine screening for problems with development can allow for early identification of developmental issues. Early intervention has been proposed by multiple authors as important to supporting children with developmental delay. The components of developmental surveillance include eliciting and addressing parental concerns, obtaining a relevant developmental history, observation of the child in the office and proper referrals when necessary. Specific developmental and behavioral screening tools should be administered at the discretion of the clinician to identify children who need more comprehensive evaluation. There have been no specific studies as to the frequency of evaluation for developmental concerns, although several groups support frequent screening on various schedules (American Academy of Pediatrics, 2007 [R]; American Academy of Pediatrics, 2006 [Guideline]).

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18. Domestic Violence and Abuse Screening and Counseling (Level III)

Recommendation:

Screening and counseling for domestic violence and abuse could be recommended. No single tool has been identified as the gold standard for screening of domestic violence or abuse (*Basile, 2007 [Low Quality Evidence]*). It may be necessary to tailor domestic violence messages when providing care to various ethnic and racial groups in the area.

An example of two questions that are commonly used in assessment are:

- Does your partner put you down or try to control what you can do?
- In the past year have you ever been hit, pushed, restrained or choked during an argument?

Efficacy

Studies show that patients favor inquiries about abuse. Methods used to screen for domestic violence can include self-administered questionnaire, medical staff interview and physician interview. There is some evidence that self-administered questionnaires are as effective as medical or physician interviews (*Chen, 2007 [High Quality Evidence]*; *MacMillan, 2006 [High Quality Evidence]*).

Counseling messages

Clinicians should also be alert for symptoms and signs of drug abuse and dependence, various presentations of family violence, and suicidal ideation in persons with established risk factors. It may be necessary to tailor domestic violence messages when providing care to various ethnic and racial groups in the area.

- Discuss awareness of potential violence in dating and relationships, emphasizing the need to set boundaries and clearly communicate them to others.
- Discuss ways to stop potentially violent arguments.
- Discuss sexual orientation and associated potential risk of violence exposure.
- Discuss the fact that experiencing anger and conflict is normal.
- Discuss the fact that dealing with conflict violently is a learned behavior that has dire consequences. Violent behavior can also be unlearned. Reinforce non-violent discipline and conflict resolution. Reinforce the fact that no person should fear violence or abuse in any relationship.
- Discuss safe storage of firearms when appropriate.
- Ask about weapons in the home and how they are stored.

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19. Dyslipidemia Screening (Level III)

Recommendation:

Dyslipidemia screening could be recommended for children over the age of two years at increased risk for the genetic forms of hypercholesterolemia (familial hyperlipidemia and others) and for overweight and obese children (*McCrindle, 2007 [Low Quality Evidence]*). Routine cholesterol screening in low-risk children and adolescents has not been shown to be an effective way of identifying individuals at risk for cardiovascular disease.

Efficacy

There is insufficient evidence to recommend for or against routine dyslipidemia screening in children and adolescents. Screening has not been shown to be effective in delaying the onset or reducing the incidence

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of cardiovascular disease (Haney, 2007 [Systematic Review]). However, several professional organizations including the American Academy of Pediatrics and the American Heart Association have recommended selective screening based on current evidence. These expert panels have recommended cholesterol testing for children over the age of two years at increased risk for the genetic forms of hypercholesterolemia (familial hyperlipidemia and others). Additionally, both organizations recommend screening children with other cardiovascular risk factors including overweight, hypertension or diabetes mellitus (Daniels, 2008 [Low Quality Evidence]; McCrindle, 2007 [Low Quality Evidence]). Measurement of a fasting lipid profile has been recommended for children and young adults who have a parent or grandparent with a history of cardiovascular disease, peripheral vascular disease, or cerebrovascular disease prior to the age of 55 in men and prior to age 65 in women, or a parent with a cholesterol level greater than 240 mg/dL. For children whose parental history is unobtainable, particularly for those with other risk factors (including high-fat diet, obesity or diabetes), physicians may recommend measurement of cholesterol levels (Daniels, 2008 [Low Quality Evidence]; National Cholesterol Education Program, 1991 [Low Quality Evidence]).

A total fasting cholesterol of 200 mg/dL or greater or an LDL greater than 130 mg/dL is the general cutoff to signify individuals with dyslipidemia. Individuals with a fasting low-density lipoprotein greater than or equal to 164 may have familial hyperlipidemia and require further evaluation (Gillman, 1992 [Low Quality Evidence]; Kwiterovich, 1989 [Low Quality Evidence]). Monitoring and possible intervention of children and young adults with cardiovascular risk factors with borderline high total cholesterol levels (170 to 199 mg/dL) or borderline LDL levels (110-129 mg/dL) are also recommended (Daniels, 2008 [Low Quality Evidence]; National Cholesterol Education Program, 1991 [Low Quality Evidence]). Cutoffs for elevated cholesterol may vary based on age, gender and ethnicity (Friedman, 2006 [Low Quality Evidence]; Hickman, 1998 [Low Quality Evidence]).

The appropriate screening test, age at which to perform screening, frequency of testing and long-term beneficial or adverse effects of screening are unclear as adequate studies have not been performed (Haney, 2007 [Systematic Review]). Familial hyperlipidemia is amenable to screening. Nearly all children with familial hyperlipidemia have a first-degree relative with either a history of a cardiovascular disease event at an early age or a history of a serum total cholesterol greater than or equal to 240 mg/dL (Starc, 1991 [Low Quality Evidence]). Children with familial hyperlipidemia have been shown to have blood vessel changes consistent with early atherosclerosis at a young age, and treatment with statins causes regression in affected children. Other studies have also demonstrated that statin therapy is safe and effective in children with familial hyperlipidemia (Wiegman, 2004 [High Quality Evidence]).

Children and young adults with elevated cholesterol who do not meet the criteria for familial hyperlipidemia do require further testing and possible intervention (Daniels, 2008 [Low Quality Evidence]). However, beneficial and adverse effects on health outcomes from treatment with medications, diet, exercise and combination therapies have been inadequately evaluated in children with other forms of hyperlipidemia (Haney, 2007 [Systematic Review]). A healthy diet and regular exercise could be recommended for all children with risk factors for cardiovascular disease regardless of their screening results. There is good evidence that more than half of all children with elevated lipid levels will continue to have elevated lipids as adults (Haney, 2007 [Systematic Review]; Lauer, 1988 [Moderate Quality Evidence]; Freedman, 1985 [Moderate Quality Evidence]).

Several studies that have determined that parent history screening criteria are ineffective in identifying all children at risk for hypercholesterolemia because of variability in definitions and unreliable information (Haney, 2007 [Systematic Review]; O'Loughlin, 2004 [Low Quality Evidence]; Resnicow, 1993 [Low Quality Evidence]; Starc, 1991 [Low Quality Evidence]). However, newer studies support that adding overweight as an indicator for screening may increase the identification of individuals who are at risk for dyslipidemia (Eissa, 2009 [Low Quality Evidence]).

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Burden of suffering

Hypercholesterolemia is one of the most frequently identified cardiovascular disease risk factors in childhood, with 14-25% of children in the United States reported to have borderline or high levels (*National Cholesterol Education Program, 1991 [Low Quality Evidence]*; *Dennison, 1990 [Low Quality Evidence]*). Most cases of elevated cholesterol in childhood are the result of environmental factors (dietary excess of saturated fat and cholesterol, inactivity, obesity, cigarette smoking, medication), expressed within a framework of genetic susceptibility (*Williams, 1995 [Low Quality Evidence]*). A smaller number of these children have secondary hypercholesterolemia (liver, kidney or thyroid disorders) or a genetic hypercholesterolemia condition, such as familial hyperlipidemia. Familial hyperlipidemia has an autosomal dominant pattern of inheritance and can be diagnosed at any age. Patients with this condition have total cholesterol levels greater than 240 mg/dL (average 300 mg/dL) and low-density lipoprotein levels greater than 160 mg/dL (average 240 mg/dL). Familial hyperlipidemia occurs in about 0.2% of the population, and people with this condition have a 50% risk for a major coronary event by age 50 (*Kwiterovich, 1989 [Low Quality Evidence]*).

There is growing evidence that the atherosclerotic process begins in childhood. Increased atherosclerotic lesions have been noted in autopsies of younger individuals with dyslipidemia and obesity (*Berenson, 1998 [Low Quality Evidence]*). Non-invasive studies measuring the intimal medial thickness have seemed to correlate with the atherosclerotic process in adults (*Davis, 2001 [Moderate Quality Evidence]*). Studies have shown that increases in intimal medial thickness have been associated with childhood dyslipidemia and other cardiovascular risk factors (*Dawson, 2009 [Low Quality Evidence]*).

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20. Dysplasia of the Hip Screening (Level III)

Recommendation:

Screening for disorders of the hip could be recommended by physical examination or radiologic tests.

The previous American Academy of Pediatrics recommendation was for universal screening of all infants using serial physical examination, with further evaluation by an orthopedic surgeon if abnormalities were discovered. The U.S. Preventive Services Task Force made a specific alteration to their rating, stating "that evidence is insufficient to recommend routine screening for developmental dysplasia of the hip in infants as a means to prevent adverse outcomes." It is the feeling of our committee that the evidence of potential harm is less conclusive than was expressed in the U.S. Preventive Services Task Force report. We also feel that the evidence for screening is not of high enough quality to recommend for universal screening. Therefore, we would leave this recommendation in the Level III category and allow individual clinicians to determine the value of screening on the basis of personal skill and risk factors. We would encourage better quality studies to more clearly establish the efficacy of treatment and the value of universal screening.

Efficacy of screening

Developmental dysplasia of the hip describes an abnormal relationship between the head of the femur and the acetabulum of variable degrees of severity. The proper relationship between these two structures allows normal hip development. Screening for disorders of the hip can be performed by physical examination or radiologic tests. The recommendations for screening vary among different sources. In 2000, a clinical practice guideline was produced by the American Academy of Pediatrics supporting universal physical exam screening of the hip by "a properly trained health care clinician," with follow-up by an orthopedic surgeon if there was clinical suspicion of developmental dysplasia of the hip. They specifically recommended against the use of ultrasound as a screening tool in otherwise normal infants. High-risk patient populations were defined (*American Academy of Pediatrics, 2000a [Guideline]*). In 2006, the U.S. Preventive Services Task Force stated the "evidence is insufficient to recommend routine screening for developmental dysplasia of the hip as a means to prevent adverse outcomes" (*Shipman, 2006 [Systematic Review]*).

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Screening of the hip for dysplasia consists of two physical examination techniques: the Ortolani and Barlow tests. These tests attempt to determine instability of the hip by provocative maneuvers. Details of these tests are outlined in the American Academy of Pediatrics guideline. They are more sensitive at a young age. Later in infancy, other physical exam findings can show evidence of abnormal hip position, including limited abduction of the hip and asymmetry of thigh folds and leg length discrepancy. The presence of these later signs is variable. A child may not present with abnormality until he or she begins to walk. There is concern expressed on the part of the U.S. Preventive Services Task Force that there is a lack of data on the sensitivity and specificity of these tests (*Shipman, 2006 [Systematic Review]*). Ultrasound has been shown to be very sensitive in detecting abnormalities of the hip. Both parties agree that routine screening with ultrasound is not supported by the evidence because it may identify patients who do not need treatment. The U.S. Preventive Services Task Force raised specific concerns about the lack of evidence surrounding the natural course of the disease process. They felt that it may be likely that hip abnormalities will resolve on their own over time. They cited some evidence supporting this; however, the studies in question were somewhat flawed as they excluded patients who subsequently developed frank dislocation, which is the most severe manifestation of the disease process, and the age at which they were assessed was variable (*Shipman, 2006 [Systematic Review]*).

The difficulty in the analysis of the natural course of the disease is that though there is no direct evidence that screening improves outcomes, there is fair quality evidence that late-presenting disease has been shown to have worse outcomes (*Shipman, 2006 [Systematic Review]*). Thus, leaving the population unscreened could leave those patients with disease who are not detected based on clinical presentation at risk for more complications.

Efficacy of intervention

There are two main interventions for the hip with developmental dysplasia. A non-operative intervention is the Pavlik Harness, which holds the hip in a position of stable abduction and flexion. More severe disease and disease that does not resolve with non-operative intervention may require surgery. In the era of routine screening, there have been studies to show decreased incidence of operative intervention. The U.S. Preventive Services Task Force states that the evidence is unclear as to whether this decrease is due to early detection or other factors. The evidence review states that the evidence of effectiveness of non-surgical interventions is limited because of a lack of comparison to no intervention (*Shipman, 2006 [Systematic Review]*). They also raised concerns about the occurrence of avascular necrosis of the femoral head as a consequence of both surgical and non-surgical interventions. There was a high variability of the occurrence of this complication in the studies cited. There was limited and weak evidence showing that avascular necrosis of the femoral head would not occur in the natural course of the disease if left untreated. There were several other possible adverse outcomes of screening listed, but evidence supporting these as actual problems was weak or not found at all (*Shipman, 2006 [Systematic Review]*).

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21. Household and Recreational Injury Prevention Screening (Level III)

Recommendation:

Clinicians could ask about the following:

- Helmet use when riding a bicycle, motorcycle, scooter, snowmobile, or all terrain vehicle (ATV)
- Smoke detector use, cigarette smoking and fire prevention in the home
- Temperature of water heater set no higher than 120°F
- Possible choking hazards in the home
- Training for choking treatment and cardiopulmonary resuscitation

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- Safety measures to prevent falls in the home
- Firearms in the home and how they are stored
- Water safety in the home and around swimming pools
- Encourage swimming lessons for children to decrease the risk of accidental drowning (*Brenner, 2009 [Low Quality Evidence]*)
- The availability of the poison control number in the home and safety measures to prevent accidental poisonings
- Proper education and training on operating small motorized vehicles (including boats, snowmobiles, ATVs, farm vehicles) and hunting (gun safety, tree-stand safety)

Efficacy

Bicycle safety

Data on effectiveness of bicycle helmet safety from two case-controlled studies provide evidence that the risk of head injury among bicyclists is reduced as much as 69-80% (*Thompson, 1989 [Low Quality Evidence]*). Counseling bicyclists to avoid riding near motor vehicle traffic is based on evidence that nearly 95% of bicycle fatalities occur as a result of a collision with a motor vehicle.

Families that recalled being counseled about wearing helmets while biking reported 44% compliance, compared to 19% helmet use by families that did not receive counseling (*Quinlan, 1998 [Low Quality Evidence]*). Other studies have also shown a positive effect from counseling (*Moyer, 2004 [Low Quality Evidence]*).

Burns

Several studies have shown that counseling patients to install smoke detectors has been successful (*Moyer, 2004 [Low Quality Evidence]*; *Bass, 1993 [Low Quality Evidence]*). However, smoke detectors often fail to operate due to incorrect installation or inadequate testing, and some occupants may be unable to hear or respond to the alarm signal. For these reasons, it is important that smoke alarm counseling emphasize the importance of correct installation and biannual testing to ensure proper operation. Evidence is lacking regarding frequency of smoke detector testing, but the work group feels biannual testing is prudent. Several studies have documented compliance when parents are instructed to turn down their hot water heater (*Bass, 1993 [Low Quality Evidence]*). It has also been shown to be beneficial to discuss avoiding scald injuries from microwaves.

Falls

Parents report that walker-related injuries occur in 12-40% of infants who use walkers. Studies have shown that a walker-related injury does not prevent parents from using the walker again for the injured child or siblings (*American Academy of Pediatrics, 2001b [Guideline]*).

Falls in children are often from stairs or furniture; collapsible gates have been advocated as a means of protecting children from stairways. Although the efficacy of stairway gates has not been studied, there is evidence that window guards can reduce child falls from apartment windows. Counseling parents to prevent falls has been somewhat effective (*American Academy of Pediatrics, 2001b [Guideline]*).

Firearm safety

Most unintentional injuries from firearms involve adolescent and young adult males, and about 65-78% of these injuries occur in or around the home. Over 90% of firearm accidents involving children occur at home; a study in children ages 0-14 found that 40% involved a firearm stored in the room where the shooting occurred.

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Poisoning

Childhood poisoning can be reduced by placing medications in child-resistant containers (*American Academy of Pediatrics, 2003 [Low Quality Evidence]*). Carbon monoxide detector use could prevent many of the 2,100 United States deaths from CO poisoning each year (*Yoon, 1998 [Low Quality Evidence]*).

Education has been shown to motivate parents to display poison control center telephone numbers (*Quinlan, 1998 [Low Quality Evidence]*). Other studies have found counseling to be ineffective in promoting safety (*Moyer, 2004 [Low Quality Evidence]*).

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22. Hyperbilirubinemia Screening (Level III)

Recommendation:

Clinicians could screen for hyperbilirubinemia in newborn infants to prevent severe complications (kernicterus).

Efficacy

Hyperbilirubinemia is a common condition in newborn infants. Kernicterus is a rare complication of hyperbilirubinemia with serious adverse health outcomes. There has not been sufficient analysis of the value of screening for hyperbilirubinemia. There is good data to show that methods to screen for hyperbilirubinemia are effective in detecting the condition (*Mah, 2010 [Moderate Quality Evidence]*; *Kuzniewicz, 2009 [Moderate Quality Evidence]*; *Trikalinos, 2009 [Systematic Review]*). The rare incidence of kernicterus and the uncertainty that treatment could effectively improve outcomes raise questions about cost-benefit ratio of this intervention. According to the U.S. Preventive Services Task Force, evidence is not conclusive enough to recommend for or against screening (*Trikalinos, 2009 [Systematic Review]*).

Benefit and Risk

One analysis of hospital discharge data showed that 15.6% of infants hospitalized in the first 30 days of life had a diagnosis of hyperbilirubinemia (*Burke, 2009 [Low Quality Evidence]*). Kernicterus occurs in 1.5/100,000 full-term infants and 4/100,000 pre-term infants. The use of screening protocols and treatment guidelines for hyperbilirubinemia has been proposed to decrease the incidence of kernicterus (*Maisels, 2009 [Low Quality Evidence]*; *American Academy of Pediatrics, 2004 [Guideline]*). This is proposed because of the assumption that reducing the incidence of episodes of severe hyperbilirubinemia will decrease the frequency of kernicterus. Screening can be done by risk factor assessment, transcutaneous bilirubin measurement, early serum bilirubin measurement or a combination of these methods. This has been shown to be effective in detecting hyperbilirubinemia (*Trikalinos, 2009 [Systematic Review]*). There are two main treatment options for hyperbilirubinemia: phototherapy and exchange transfusion. Phototherapy is the more commonly used intervention. There have not been studies to analyze the impact of the use of phototherapy in the incidence of kernicterus (*Trikalinos, 2009 [Systematic Review]*). Exchange transfusion is associated with significant risk, and its use has steeply declined from 1988 to 2005 without a change in the incidence of kernicterus.

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23. Infectious Disease Prevention Counseling (Level III)

Recommendation:

Clinicians could educate on good hand-washing technique.

Efficacy

Jefferson et al. conducted a systematic review on the effectiveness of physical interventions to reduce the spread of respiratory viruses. The paper concluded that hand-washing is effective (*Jefferson, 2008 [Systematic Review]*).

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Two randomized control trials showed that education is effective and can reduce medical visits (*Roberts, 1983 [Low Quality Evidence]; Vickery, 1983 [Low Quality Evidence]*).

Counseling messages

Hand-washing is the most effective way to prevent the spread of the common cold. Viral upper respiratory infection is most contagious at the onset of symptoms and while febrile. Educate good hand-washing at a well-child visit, preferably just before or sometime during the cold and flu season (November through April).

For infants and toddlers:

- Discourage visitors who have an acute illness, a fever or contagious disease.
- Prevent child with viral upper respiratory infection from sharing toys and pacifiers with other children.
- Clean these items with soap and hot water, as feasible, to reduce opportunities for viral transmission.
- Use and teach good hand-washing.
- Ask visitors to wash their hands before handling baby.
- Check day care hand-washing and infection control measures.
- Consider day care options that reduce exposure to other children.
- Encourage and support mothers to continue breastfeeding.

Related guideline

See the [ICSI Diagnosis and Treatment of Respiratory Illness in Adults and Children](#) guideline.

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24. Iron Deficiency Screening (Level III)

Recommendation:

Screening for iron deficiency and/or anemia for asymptomatic children could be recommended.

Efficacy

Evidence is insufficient to recommend for or against routine screening for iron deficiency anemia in asymptomatic children (*Oregon Evidence-Based Practice Center, 2006 [Systematic Review]*).

Routine iron supplementation for asymptomatic children ages 6 to 12 months who are at increased risk for iron deficiency anemia is recommended. High-risk groups would include recent immigrants, children with a history of prematurity or low birth weight, and adolescent females who are fad dieters or who are obese. Evidence is insufficient to recommend for or against routine iron supplementation for asymptomatic children ages 6 to 12 months who are at average risk for iron deficiency anemia (*Oregon Evidence-Based Practice Center, 2006 [Systematic Review]*).

Inadequate intake of dietary iron in infants and young children is the most common nutritional deficiency for this age group in the United States. It continues to raise concern because it has been linked to health problems and developmental issues. Iron deficiency anemia is one more severe manifestation of iron deficiency. There has been considerable ongoing debate as to the best approach to this problem. Screening for iron deficiency, and in particular iron deficiency anemia, has been recommended in the past utilizing measurement of hemoglobin or hematocrit at 6-12 months of age. Further study has raised a number of concerns about this screening methodology. The method of screening hemoglobin or hematocrit alone is not sensitive to discovering iron deficiency because a significant percentage of patients are iron deficient but

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not anemic (*White, 2005 [Low Quality Evidence]*). It also suffers from a lack of specificity because there are other causes of anemia that are not related to iron deficiency. Other testing methods for iron deficiency have been studied. These have not been shown to adequately meet the criteria of an ideal screening test (*Biondich, 2006 [Low Quality Evidence]*; *Crowell, 2006 [Low Quality Evidence]*). These issues are also complicated by the possibility that iron deficiency at a level that does not cause anemia may still have an adverse effect on developmental outcomes (*Chaparro, 2008 [Low Quality Evidence]*; *Shafir, 2007 [Low Quality Evidence]*). Consideration should be given to several factors when deciding what to do for screening, including risk assessment for iron deficiency, evaluation for other types of anemia and testing at later ages.

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25. Nutritional Counseling (Level III)

Recommendation:

Clinicians could ask what children typically eat and drink and about daily activity.

Efficacy

Despite the lack of demonstrated effectiveness, intervention is encouraged, due to the numerous benefits associated with consumption of a healthy diet and prevention of obesity. Parents play a direct role in children's eating patterns through their behaviors, attitudes and feeding styles (*Patrick, 2005 [Low Quality Evidence]*).

Counseling messages

Birth-2 years

Encourage:

- Breastfeeding exclusively for the first six months
- Supplementing breastfed infants with iron no later than age six months with iron-fortified cereals
- Breastfeeding or formula up to one year
- Use of iron-fortified formula. Use iron-fortified cereals through two years and older.
- Supplementing for breastfeeding with 400 IU/day vitamin D within two months (*Wagner, 2008 [Low Quality Evidence]*)
- Introduction of solid foods when developmentally ready, about 4-6 months; juices after 6 months. Use 100% juices and limit to 4-6 ounces daily.
- Wean from the bottle by end of first year.
(*Reaffirmed 2007 [R]*; *American Academy of Pediatrics, 2005a [Guideline]*; *American Academy of Pediatrics, 2001c [Low Quality Evidence]*)

Discourage:

- Cow's milk during first 12 months (*American Academy of Pediatrics, 1992 [Low Quality Evidence]*; *Ziegler, 1999 [Low Quality Evidence]*)
- Reduced-fat milk before two years; use whole milk (*American Academy of Pediatrics, 2005a [Guideline]*)
- Foods with added sugars and sweetened beverages (*U.S. Department of Health and Human Services, 2005 [Reference]*)
- Excessive intake of any beverage (*Skinner, 2004 [Low Quality Evidence]*)

2-18 years

- Encourage consumption of fruits, vegetables, whole grains and low-fat dairy products
- Limit total fat, especially saturated fat, trans fats and cholesterol
- Discourage foods with added sugars and caloric carbonated beverages
- Encourage regular meals

(*U.S. Department of Health and Human Services, 2005 [Reference]*)

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Related guideline

Also see ICSI's [Prevention and Management of Obesity \(Mature Adolescents and Adults\)](#) guideline.

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26. Preconception Counseling (Level III)

Recommendation:

Preconception counseling could be recommended during a visit. (Due to time constraints during a routine health maintenance visit, however, it may be more practical to provide comprehensive preconception counseling during a separate preconception counseling visit.)

Counseling messages

- 13-18 years**
- Inform all women of childbearing age of the deleterious effects of teratogens in early pregnancy, often before the pregnancy is diagnosed.
 - Encourage women who are seeking to become pregnant to schedule a preconception counseling visit.

Related guideline

See the ICSI [Routine Prenatal Care](#) guideline for more information.

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27. Pregnancy Prevention Counseling (Level III)

Recommendation:

Preventive counseling could be recommended at preventive care visits beginning at puberty, preferably before onset of sexual activity. These visits could include education and counseling regarding contraception and unintended pregnancy. Other messages could also be given as indicated (e.g., prevention and symptoms of sexual transmitted infections, association between sexual activity and use of drugs, preconception counseling).

Efficacy

Though the exact efficacy of contraceptive counseling is unknown, making sure teens know what is available to prevent pregnancy is important.

Counseling messages

When to counsel and educate

There is some evidence that adolescents with a stronger relationship with their parents have a lower risk of pregnancy. Supporting parents in talking with their adolescents with these issues has been shown in some small, poor-quality studies to have an impact (*Lederman, 2008 [Moderate Quality Evidence]*). However, larger literature reviews have not shown any well-designed studies to describe an effective counseling approach on these issues (*Bennett, 2005 [Systematic Review]*; *DiCenso, 2002 [Systematic Review]*).

- Obtain a sexual history from all adolescents.
- Inform adolescents that abstinence is the most effective way to prevent pregnancy and sexually transmitted infections.
- Provide detailed information regarding all contraceptive methods, including barrier contraceptives, birth control pills, injectibles, implantables, intrauterine devices, tubal sterilization and vasectomy.
- Studies have suggested that multimedia education sources and programs offering repetitive, scheduled education sessions may be more effective in assisting patients with their contraceptive choice

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and promote adherence to a contraceptive method. Referral to any available community resource for contraceptive education outside the traditional clinical setting should be considered.

- Longer-duration contraceptive methods may improve compliance and efficacy.
- To enhance acceptance of contraceptive methods, accompanying health and quality of life benefits should be discussed:
 - Use of oral contraceptives reduces lifetime risks of ovarian and uterine cancer, while improving bone mineral density.
 - Use of barrier contraceptives and spermicides reduces the risk of developing cervical cancer and sexually transmitted infections.
 - Use of hormonal contraceptives can reduce menstrual flow and discomfort.
 - Use of oral contraceptives can reduce acne.

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28. Scoliosis Screening (Level III)

Recommendation:

Physical examination of the back for signs of scoliosis has been a long-standing practice. The screening test involves the patient bending forward with arms placed together and observing for asymmetry of the back with or without a measurement tool. This screening is often done outside the medical practice setting. Patients with abnormal physical exams are evaluated with plain films of the spine. This allows a determination of the degree of curvature of the spine. Patients with more advanced curvature may then be referred on for intervention, including bracing and possible surgery. This screening recommendation specifically excludes patients with other medical conditions that can lead to scoliosis, including neuromuscular problems and congenital deformities. It also excludes those patients who develop scoliosis before adolescence.

Efficacy

There was no evidence discovered to show that screening programs have a significant impact to reduce burden of disease, compared to detection of disease without screening. In particular, school screening programs were found to be ineffective and may cause an increase in unnecessary testing. There are some mixed-quality studies to show that extensive bracing (23 hours per day) can be more effective than short-term bracing or no intervention. The patients who benefited from this intervention were those with more severe disease who likely would have been detected without screening.

Burden of suffering

The U.S. Preventive Services Task Force found that there was fair evidence that detection of patients by screening may result in moderate harms related to unnecessary brace wear and referral to specialists.

Recommendation

The U.S. Preventive Services Task Force recommends against routine screening for scoliosis. The American Academy of Orthopedic Surgeons recently responded to the U.S. Preventive Services Task Force recommendation with their own position statement, which supports continued screening. This statement has been endorsed by the American Academy of Pediatrics, as well (*Richards, 2008 [Low Quality Evidence]*).

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29. Secondhand Smoke Exposure Counseling (Level III)

Recommendation:

Clinicians could establish tobacco use and secondhand smoke exposure and reassess at every opportunity. (See the "Tobacco Use Screening, Prevention and Intervention in Adolescents [Level II]," Annotation #12, for a patient who is using tobacco.) Advise all patients/parents that secondhand smoke exposure is harmful for the patient. Encourage a smoke-free living and working environment for patients, and assist the exposed patient/parent to communicate to other household members about decreasing smoke in their house. Encourage the patient/parent to support smoking cessation efforts among other household members who use tobacco.

Recommend tobacco cessation services on a regular basis to all household members who use tobacco.

Efficacy

Tobacco use is the single most preventable cause of death and disease in our society. In this guideline, all of the attention devoted to encouraging cessation by smokers in the child's environment is because:

- it is important for the person's health to quit smoking,
- children whose parents smoke are much more likely to begin smoking as they grow older, and
- intensive efforts to reduce environmental smoke by encouraging avoidance of smoking in the infants' vicinity have been unsuccessful.

The U.S. Public Health Service guideline concluded that advising parents to stop smoking reduces childhood secondhand smoke exposure and may reduce parental smoking rates. In contrast, the U.S. Preventive Services Task Force found limited studies with mixed results that address the effect of parental counseling on reducing secondhand exposure of children and reducing parental smoking rates.

(Fiore, 2008 [Low Quality Evidence]; U.S. Preventive Services Task Force, 2003 [Guideline]; Prochaska, 1992 [Low Quality Evidence])

Counseling message

For infants and children from birth to 10 years old:

- If child is exposed to smoke, counsel adult accompanying the child about harmful effect of secondhand smoke, and promote a smoke-free household.

For children and adolescents ages 10 years and above and the child or adolescent is not using tobacco, but a parent, sibling or friend is using tobacco:

- Counsel child or adolescent and the accompanying adult about the harmful effect of secondhand smoke, and promote a smoke-free household.
- Assist patient in developing refusal skills.

For all ages:

- If accompanying household member uses tobacco, encourage member to quit. If the member user is interested in quitting, encourage a visit at his or her clinic for more cessation assistance.
- Provide educational and self-help materials.

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30. Sexually Transmitted Infection Counseling (Level III)

Please note that this guideline discusses primary prevention of sexually transmitted infections through the adoption of safer sexual practices. It does not address patient education messages after a sexually transmitted infection is diagnosed.

Recommendation:

Counseling regarding sexual behaviors to prevent sexually transmitted infection could be recommended beginning at age 12.

Efficacy

There is good evidence that behavioral counseling involving multiple visit interventions is effective in reducing the incidence of sexually transmitted infection for sexually active adolescents. There is insufficient evidence to show efficacy for less-intense interventions and low-risk patients (*Lin, 2008 [Systematic Review]*).

Burden of suffering

Sexually transmitted infection continue to increase in incidence resulting in significant morbidity and health care costs in the United States. According to the 2007 Sexually Transmitted Diseases Surveillance by the Centers for Disease Control and Prevention, there are an estimated 19 million new sexually transmitted infections each year, with almost half of those in individuals between the ages of 15 and 24.

Counseling message

Empathy, confidentiality and a nonjudgmental, supportive attitude are important when discussing issues of sexuality. Messages should be delivered both verbally and in the form of educational materials. Clinicians can play an important role by reinforcing and clarifying educational messages, providing literature and community resource references and dispelling misconceptions about unproven modes of transmission.

Some messages might include:

- Abstinence is the most effective means to decrease sexually transmitted infections risk, and there is increased risk of contracting sexually transmitted infections associated with multiple partners.
- A mutually monogamous relationship with a partner known not to be infected is effective in decreasing sexually transmitted infections risk.
- Avoid sexual contact with high-risk partners (e.g., intravenous drug users, commercial sex workers, and persons with numerous sexual partners).
- Emphasize that alcohol/drug use is associated with high-risk sexual behavior.
- Inform women at risk that female barrier contraceptive methods (e.g., diaphragm or cervical cap) can reduce the risk of sexually transmitted infection.
- Encourage safer sexual practices, including regular use of latex condoms. Even under optimal conditions, however, condoms are not always efficacious in preventing transmission.

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31. Sexually Transmitted Infection Screening (Other than Chlamydia) (Level III)

Recommendation:

Screening for sexually transmitted infections other than chlamydia could be recommended.

The Centers for Disease Control and Prevention revised their recommendation for human immunodeficiency virus screening, recommending patients ages 13 to 64 years in all health care settings be screened after informing the patient that testing will be performed unless the patient declines (*Branson, 2006 [Low Quality Evidence]*).

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The work group reviewed the evidence, and because of a continuing lack of trials of the benefits of screening average-risk patients, consensus is to retain human immunodeficiency virus screening as a Level III service at this time.

Efficacy

There is insufficient evidence to recommend universal screening of average-risk persons for human immunodeficiency virus (*Chou, 2005 [Low Quality Evidence]*), and gonorrhea (*Glass, 2005 [Systematic Review]*; *Potterat, 1987 [Low Quality Evidence]*).

Benefits versus harms are unknown for genital herpes simplex and syphilis, but with the increasing prevalence of these infections, the work group consensus is also to place these as Level III services.

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32. Skin Cancer Screening and Counseling (Level III)

Recommendation:

Screening and counseling to prevent skin cancer could be recommended.

Efficacy of counseling

There is insufficient evidence to recommend for or against routine screening for skin cancer in the primary care setting. Evidence is lacking on reduction of morbidity and mortality for whole body examination by a primary care clinician, and accuracy of screening is limited and inconsistent (*Wolff, 2009a [Low Quality Evidence]*).

Evidence-based reviews do not show sufficient evidence that physician counseling prevents skin cancer. (*Lin, 2011 [Systematic Review]*). Fair-quality randomized, controlled trials suggest that counseling interventions may modestly increase self-reported sun-protective behaviors and decrease indoor tanning (*Lin, 2011 [Systematic Review]*). However, it remains uncertain whether these effects translate into meaningful behavior change that results in the prevention of skin cancer or sunburns. There is no evidence that such counseling results in harm, although data on potential harm is sparse and of limited quality.

The use of sunscreen may show modest benefit in preventing squamous cell carcinoma. One recent trial found that daily application of sunscreen over a five-year period appeared to reduce the incidence of new primary melanomas for up to 10 years after the end of the trial (*Green, 2011 [Moderate Quality Evidence]*), the first study to provide clear evidence for reduction in the incidence of melanoma after regular application of sunscreen in adults. No trial to date has demonstrated a benefit of sunscreen use in the prevention of basal cell carcinoma.

Burden of suffering

Skin cancer is the most common type of cancer in the United States, and sun exposure is a known strong risk factor for skin cancer. Intermittent sun exposure, particularly in childhood, is associated with an increased risk for all types of skin cancer. Excess sun exposure, including intermittent sunburn in childhood, should be a preventable risk factor.

Counseling message

Although there is not sufficient evidence to recommend routine total body exams, it is prudent for clinicians to examine the skin when the opportunity arises during a physical examination.

While the effectiveness of counseling has not been established, counseling does appear to modestly increase sun-protective behaviors. Given the association between intermittent sun exposure, particularly in childhood, and risk of skin cancer, counseling patients to avoid excess sun exposure is reasonable.

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The recommended counseling messages include:

- Avoidance of sun between the hours of 10 a.m. and 4 p.m.
- Use of protective clothing when outdoors
- Use of sunscreen that blocks both ultraviolet A (UVA) and ultraviolet B (UVB)
- Avoidance of sunlamps and tanning equipment
- Practice of skin self-examination

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33. Undescended Testicle Screening (Level III)

Recommendation:

Clinicians could recommend an assessment by physical exam of the descent of testicles in males.

Burden of suffering

Undescended testicle occurs in 2 to 5% of boys born at term. It can spontaneously resolve, but 1% to 2% can have a persistent undescended testicle (*Toppari, 1999 [Low Quality Evidence]*). Descended testes can be pulled back into the inguinal canal at a later age if the spermatic cord does not lengthen adequately as a boy grows (*Hutson, 2005 [Low Quality Evidence]*).

Efficacy

The efficacy of screening for undescended testes has not been studied. There is good-quality evidence that early treatment of undescended testicle by surgical intervention results in a significant decrease in the frequency of testicular cancer in adults (*Pettersson, 2007 [Moderate Quality Evidence]*). There is also some evidence that early intervention with surgery reduces the risk of fertility problems in adult males (*Hutson, 2005 [Low Quality Evidence]*). The straightforward nature of the exam for this problem and the efficacy of treatment warrant periodic screening for undescended testicles at routine preventive services checkups. The age of intervention has been a point of discussion. It is clear that intervention before puberty is very important. Generally, most recommendations are for intervention before one year of age (*Hutson, 2005 [Low Quality Evidence]*).

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Preventive Services That Are Not Supported by Evidence and Not Recommended (Level IV)

Level IV services are those with low predictive value and/or uncertain beneficial action for true positives. They may also be a combination of insufficient evidence, potential for harm in treatment, no defined benefit and/or overuse.

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34. Blood Chemistry Screening (Level IV)

Recommendation:

The guideline recommends against multiple chemistry tests (*Weak Recommendation*).

This recommendation refers to multiple chemistry tests, often grouped in a 6-18 test group or panel, collected without indication, in hopes of identifying diseases unsuspected on clinical grounds. Most evaluations of benefits have concluded that in a well population, multiple chemical screens find few unsuspected conditions and create considerable worry, as well as subsequent diagnosis testing with its own costs and hazards.

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These screens may be useful for patients suspected of having serious illness, but even for those patients, the selection of specific tests is usually more efficacious (*Romm, 1986 [Low Quality Evidence]*).

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35. Cervical Cancer Screening (Level IV)

Recommendation:

The guideline recommends against screening for cervical cancer in children and adolescents before age 21 (*Strong Recommendation*).

Efficacy

Cervical cancer screening is not recommended due to the high incidence of abnormalities, which resolve spontaneously and therefore are not clinically significant. This may start a cascade of care, which leads to significant harms to patients (*American College of Obstetricians and Gynecologists, 2009 [Low Quality Evidence]*).

Related guideline

See the [ICSI Initial Management of Abnormal Cervical Cytology \(Pap Test\) and HPV Test in Adult and Adolescent Females](#) guideline.

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36. Child Maltreatment Screening (Level IV)

Recommendation:

The guideline recommends against screening for the physical abuse and neglect of children (*Weak Recommendation*).

Efficacy

Insufficient evidence exists to recommend for or against screening of parents or guardians for the physical abuse or neglect of children (*Nygren, 2004 [Systematic Review]*).

Effectiveness of screening

There has been intensive investigation over the past 20 years toward identifying people at risk of committing physical child abuse or neglect. Methods of screening include self-administered checklists or questionnaires and standardized interviews (e.g., Family Stress Checklist, Dunedin Family Services Indicator, Child Abuse Potential Inventory, Michigan Screening Profile of Parenting). The major problems with these instruments are the high false-positive rate and the potential harm of mislabeling people as child abusers. For this reason most advocate that efforts at predicting high-risk individuals be abandoned in favor of identifying high-risk communities (*MacMillan, 1993 [Low Quality Evidence]*; *Dubowitz, 1990 [Low Quality Evidence]*).

Research into risk indicators has been conducted primarily in the area of physical abuse and sexual abuse. Limited information is available about neglect (*MacMillan, 1993 [Low Quality Evidence]*).

Research has shown that home visitation during infancy has led to decreased reports of abuse and neglect, fewer emergency room visits, fewer accidents and fewer hospital admissions. This decrease was particularly noted to be of benefit among teenage, unmarried and poor parents. For this reason, the Canadian Task Force included home visitation referrals for selected populations in their 1993 recommendations for primary prevention of child maltreatment (*Olds, 1986 [High Quality Evidence]*).

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37. Hemoglobin (for Anemia Screening Ages Five Years and Older) Level IV

Service

The guideline recommends against routine testing for anemia (*Weak Recommendation*).

Routine testing for anemia is not recommended for asymptomatic children or adolescents in the absence of clinical indications. The burden of suffering and the low benefits of detection of anemia do not warrant the cost of routine testing. Hemoglobin screenings requested by schools, camps or other organizations for asymptomatic older children are unnecessary and should not be performed (*Oregon Evidence-based Practice Center, 2006 [Systematic Review]*).

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38. Tuberculin Screening (for Average Risk) (Level IV)

Recommendation:

The guideline recommends against screening for tuberculosis for average risk patients (*Strong Recommendation*).

Efficacy

The work group consensus is that tuberculin testing is not recommended for populations at average risk for infection with *M. tuberculosis* (TB).

High-risk groups for developing tuberculosis should be tested using five tuberculin units (TU) of purified protein derivative (PPD) injected intradermally by standard "mantoux" technique. Repeat screening should be determined by the likelihood of continued exposure to infectious tuberculosis. There is not good evidence to recommend screening persons in average-risk groups, which are in the primary scope of this guideline; however, there is good evidence to support screening of high-risk groups (*U.S. Department of Health and Human Services, 1995 [Guideline]*).

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39. Urinalysis (Level IV)

Recommendation:

The guideline recommends against urinalysis screening as part of the routine well-child care (*Strong Recommendation*).

The efficacy of screening children for asymptomatic bacteriuria to prevent pyelonephritis and renal scarring has not been established. This screening strategy is costly, fails to prevent subsequent complications and should not be included as a part of well-child care. Other findings (proteinuria, hematuria) are rarely significant in asymptomatic children but often lead to anxiety and unnecessary testing (*Kemper, 1992 [Low Quality Evidence]*).

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The Aims and Measures section is intended to provide guideline users with a menu of measures for multiple purposes, which may include the following:

- Population health improvement measures
- Quality improvement measures for delivery systems
- Measures from regulatory organizations such as The Joint Commission
- Measures that are currently required for public reporting
- Measures that are part of Center for Medicare Services Physician Quality Reporting initiative
- Other measures from local and national organizations aimed at measuring population health and improvement of care delivery

This section provides resources, strategies and measurement for use in closing the gap between current clinical practice and the recommendations set forth in the guideline.

The subdivisions of this section are:

- Aims and Measures
- Implementation Recommendations
- Implementation Tools and Resources
- Implementation Tools and Resources Table

Aims and Measures

1. Increase the rate of pediatric patients up-to-date with Level I preventive services.

Measures for accomplishing this aim:

- a. Percentage of patients who by their second birthday have the following immunization status:

- Four DTaP/DT
- Three IPV
- One MMR
- Three Hib
- Three hepatitis B
- One VAR, or documented chicken pox disease
- Four pneumococcal
- Two hepatitis A
- Rotavirus:
 - Two doses of the two-dose vaccine, or
 - One dose of the two-dose and two doses of the three-dose vaccine, or
 - Three doses of the three-dose vaccine
- Two influenza

(HEDIS 2012 by National Committee for Quality Assurance Measure)

- b. Percentage of patients who by age 13 years were up-to-date with recommended adolescent immunizations:
 - One HPV - Human papillomavirus vaccine by age 13
 - One MCV4 - Meningococcal
 - One Tdap - Tetanus, diphtheria toxoids and acellular pertussis vaccine
 - One influenza vaccine within the last year
- c. Percentage of sexually active women, ages 25 years and younger, who have had screening for chlamydia.
- d. Percentage of newborns who have had neonatal screening for hemoglobinopathies, phenylketonuria and hypothyroidism in the first week of life. Composite measure.
- e. Percentage of patients, age five years and younger, who have had vision impairment screening.

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Measurement Specifications

Measurement #1a

Percentage of patients who by their second birthday have the following immunization status:

- Four DTaP/DT
- Three IPV
- One MMR
- Three Hib
- Three hepatitis B
- One VAR, or documented chicken pox disease
- Four pneumococcal
- Two hepatitis A
- Rotavirus:
 - Two doses of the two-dose vaccine, or
 - One dose of the two-dose and two doses of the three-dose vaccine, or
 - Three doses of the three-dose vaccine
- Two influenza

(HEDIS 2012 by National Committee for Quality Assurance Measure)

Notes

This is a HEDIS 2012 outcome measure for Childhood Immunization Status by National Committee for Quality Assurance (NCQA).

Full specifications for this measure can be obtained from NCQA at <http://www.ncqa.org>.

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Aims and Measures

Measurement #1b

Percentage of patients who by age 13 years were up-to-date with recommended adolescent immunizations:

- One HPV – Human papillomavirus vaccine by age 13
- One MCV4 – Meningococcal
- One Tdap – Tetanus, diphtheria toxoids and acellular pertussis vaccine
- One influenza vaccine within the last year

Population Definition

Patients who reach their 13th birthday during the specified measurement period.

Data of Interest

$$\frac{\text{\# of patients who are up-to-date with immunizations}}{\text{\# of patients 13 years of age}}$$

Numerator/Denominator Definitions

Numerator: Number of patients who are up-to-date with following immunizations:

- One HPV – Human papillomavirus vaccine (for females)
- One MCV4 – Meningococcal
- One Tdap – Tetanus, diphtheria toxoids and acellular pertussis vaccine

Denominator: Number of patients who reach their 13th birthday during the specified measurement period.

Measurement period can be monthly, quarterly or annual.

Method/Source of Data Collection

Select patients who reached their 13th birthday within the specified measurement period. Measurement period can be monthly, quarterly or annual.

Review medical records to determine whether patients were up-to-date with immunizations.

Time Frame Pertaining to Data Collection

The suggested time period is annual.

Notes

This is an outcome measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #1c

Percentage of sexually active women, age 16-24 years, who have had screening for chlamydia.

Population Definition

Female patients age 24 years and younger who are sexually active.

Data of Interest

$$\frac{\text{\# of female patients who were screened for chlamydia}}{\text{\# of female patients age 24 and younger and sexually active}}$$

Numerator/Denominator Definitions

Numerator: Number of female patients who have screening for chlamydia

Denominator: Number of female patients age 24 years and younger and sexually active

Method/Source of Data Collection

Review medical records for female patients age 24 years and younger and sexually active. Determine whether they had chlamydia screening done.

Time Frame Pertaining to Data Collection

Annually.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #1d

Percentage of newborns who have had neonatal screening for hemoglobinopathies, phenylketonuria and hypothyroidism in the first week of life.

Population Definition

Newborn patients.

Data of Interest

of newborns screened for hemoglobinopathies, phenylketonuria and hypothyroidism in the first week of life

of newborns

Numerator/Denominator Definitions

Numerator Number of newborns screened for hemoglobinopathies, phenylketonuria and hypothyroidism in the first week of life.

Denominator: Number of newborns.

Method/Source of Data Collection

Review medical records for all newborns and whether they were screened for hemoglobinopathies, phenylketonuria and hypothyroidism in the first week of life.

Time Frame Pertaining to Data Collection

Annually.

Notes

This measure is mandated by Minnesota State Law. Out-of-state organizations should be aware of their state's mandates. This is a process composite measure, and improvement is noted as an increase in the rate.

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Aims and Measures

Measurement #1e

Percentage of patients age five years and younger who have had vision impairment screening.

Population Definition

Patients five years old and younger.

Data of Interest

$$\frac{\text{\# of patients who have had vision impairment screening}}{\text{\# of patients five years old and younger}}$$

Numerator/Denominator Definitions

Numerator: Number of patients five years old and younger who have vision impairment screening

Denominator: Number of patients five years old and younger.

Method/Source of Data Collection

Review medical records for all patients five years old and younger and whether they were screened for vision impairment.

Time Frame Pertaining to Data Collection

Annually.

Notes

This is a process measure, and improvement is noted as an increase in the rate.

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Implementation Recommendations

Prior to implementation, it is important to consider current organizational infrastructure that address the following:

- System and process design
- Training and education
- Culture and the need to shift values, beliefs and behaviors of the organization

The following system changes were identified by the guideline work group as key strategies for health care systems to incorporate in support of the implementation of this guideline.

- Prioritization and implementation of preventive services should be part of the overall system and should include the following:
 - Practice preventive services at every clinic opportunity while addressing high-priority services.
 - Individualize preventive services; regularly assess patient risk factors.
 - Provide education to patients/parents/guardians.
- Develop a plan for staff and clinician education around preventive services and organizational goals for implementation of preventive services (should also include education around "level" of service and the rationale behind each level).
- Develop decision support processes in electronic medical record or for paper medical records to support physicians and staff in delivery of specific components of Level 1 services.
- For those organizations with a paper medical record, create a "tickler" system that will generate reminders for preventive services in order to support completion of recommended Level I services.
- Develop a "catch-up" plan for those patients who are not on time with services by creating a tracking system that allows for periodic medical record audits to identify patient gaps in preventive services.
- Develop a collaborative relationship with patients/parents/guardians in order to activate/motivate them to practice preventive health while staying on time.
- Place throughout the facility patient education materials that focus on preventive services and the importance of each. Materials may include, but are not limited to, posters, pamphlets, videos, available Web sites, as well as services available in the community.

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Implementation Tools and Resources

Criteria for Selecting Resources

The following tools and resources specific to the topic of the guideline were selected by the work group. Each item was reviewed thoroughly by at least one work group member. It is expected that users of these tools will establish the proper copyright prior to their use. The types of criteria the work group used are:

- The content supports the clinical and the implementation recommendations.
- Where possible, the content is supported by evidence-based research.
- The author, source and revision dates for the content is included where possible.
- The content is clear about potential biases and when appropriate conflicts of interests and/or disclaimers are noted where appropriate.

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Implementation Tools and Resources Table

Author/Organization	Title/Description	Audience	Web Sites/Order Information
Agency for Health Research and Quality	The Guide to Clinical Preventive Services provides the latest available recommendations on preventive interventions – screening tests, counseling and immunizations for more than 80 conditions. The 3rd Edition, 2000-2002, updates recommendations from the 2nd Edition and evaluates new topics. Reviews and recommendations will be released as they are completed. These recommendations are made by the U.S. Preventive Services Task Force.	Patients and Families; Health Care Professionals	http://www.ahrq.gov/clinic/prevenix.htm
American Academy of Family Physicians	Professional information on clinical care research, practice management and policy.	Health Care Professionals	http://www.aafp.org
American Academy of Pediatrics	This site provides both professional literature and patient-based information.	Patients and Families; Health Care Professionals	http://www.aap.org
American Academy Pediatrics	Provides information on safety issues, advocacy and research.	Patients and Families; Health Care Professionals	http://www.healthychildren.org
American Dental Association	Provides fact sheets and frequently asked questions on the topic of oral health.	Patients and Families; Health Care Professionals	http://www.ada.org
American Dietetic Association	This site sponsored by the American Dietetic Association provides food and nutrition information that is reliable and useful. Registered Dietitians prepare the site.	Patients and Families; Health Care Professionals	http://www.eatright.org
American Medical Association	The Guidelines for Adolescent Preventive Services (GAPS) approach is a model that uses a systematic strategy for screening and health guidance by primary care clinicians.	Health Care Professionals	http://www.ama-assn.org/ama/pub/physician-resources/public-health/promoting-healthy-lifestyles/adolescent-health/guidelines-adolescent-preventive-services/screening-health-guidance-suicide-depression.shtml
Centers for Disease Control and Prevention	Healthy Youth	Health Care Professionals	http://www.cdc.gov/healthyyouth

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Implementation Tools and Resources Table

Author/Organization	Title/Description	Audience	Web Sites/Order Information
Centers for Disease Control and Prevention	Comprehensive site provides information on immunizations and CDC prevention guidelines.	Patients and Families; Health Care Professionals	http://www.cdc.gov
Centers for Disease Control and Prevention	Immunization Contraindications: A guide designed to help immunization clinicians determine what common symptoms and conditions should contraindicate vaccination and which ones should not. It supersedes the 2000 Guide to Contraindications to Childhood Vaccination and, unlike that and previous guides, contains information on all licensed U.S. vaccines, not just pediatric vaccines.	Health Care Professionals	http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm
Department of Health and Human Services	The 2010 Dietary Guidelines for Americans provides advice for people > 2 years on dietary habits that promote health and reduce risk of major chronic disease.	Patients and Families	http://www.healthierus.gov/dietaryguidelines
HealthFinder	A-Z health information organizations and health care topics.	Patients and Families	http://www.healthfinder.gov
Institute for Clinical Systems Improvement	Tool kits Preventive Risk Assessment Forms	Health Care Professionals	Go to http://www.icsi.org for order information, or call 952-814-7060
March of Dimes	Provides fact sheets for preconception counseling to prevent birth defects.	Patients and Families; Health Care Professionals	http://www.marchofdimes.com
Mayo Clinic	Provides information on current hot topics and provides the opportunity to ask a Mayo specialist your questions.	Patients and Families; Health Care Professionals	http://www.mayoclinic.com
Minnesota Safety Council	The Minnesota Safety Council, a private, not-for-profit organization, has been dedicated to keeping Minnesotans safe from unintentional injuries ("accidents"). This site provides information resources on safety.	Patients and Families; Health Care Professionals	http://www.minnesotasafetycouncil.org/family/DontSkipASStep.pdf
National Institute on Alcohol Abuse and Alcoholism	A pocket guide for alcohol screening and brief intervention.	Health Care Professionals	http://www.niaaa.nih.gov
National Institutes of Health	This user-friendly site helps you start a search for health information by directing you to some credible databases.	Patients and Families; Health Care Professionals	http://www.nih.gov

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Implementation Tools and Resources Table

Author/Organization	Title/Description	Audience	Web Sites/Order Information
National SAFEKIDS Campaign	Provides safety information regarding bikes, car seats, product recalls and other injury prevention information.	Patients and Families	http://www.safekids.org
Patient Health Questionnaire (PHQ) Screeners	A diagnostic tool for mental health disorders used by health care professionals that is quick and easy for patients to complete. Created by Robert L. Spitzer, MD, Kurt Kroenke, MD, and colleagues at Columbia University.	Health Care Professionals	http://www.phqscreeners.com
Quitnet	Provides fact sheets on all aspects of tobacco cessation, including motivational e-mails, chat rooms and links to local organizations that provide support to individuals.	Patients and Families	http://www.quitnet.com
Quitplan	Provides free tobacco cessation services.	Patients and Families	http://www.quitplan.com/services/phone-services/html
Shape-Up America	Provides self-assessment tools, information about the benefits of becoming more active, suggestions about different ways to approach adding physical activity, and assistance with overcoming barriers.	Patients and Families/ Health Care Professionals	http://www.shapeup.org
Substance Abuse and Mental Health Services Administration	Information on programs and publications for improving the quality and availability of substance abuse prevention, alcohol and drug addiction treatment, and mental health services. Includes information on the CAGE-AID screening tool.	Health Care Professionals	http://www.samhsa.gov
The Food and Nutrition Information Center	This site is sponsored by the United States Department of Agriculture (USDA). It is very user friendly and filled with current information on almost any nutrition topic.	Patients and Families/ Health Care Professionals	http://fnic.nal.usda.gov
U.S. Department of Agriculture	Food Pyramid: Games and posters about good nutrition and activities for kids. My Pyramid Plan and Inside the Pyramid provide development of individual personal nutrition and activity plans.	Patients and Families/ Health Care Professionals	http://www.choosemyplate.gov
U.S. Department of Health and Human Services	Comprehensive site provides information on Healthy People 2010. Leading health indicators, guidelines, data and health information are given.	Patients and Families/ Health Care Professionals	http://www.healthypeople.gov

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The subdivisions of this section are:

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- Appendices

References

Links are provided for those new references added to this edition (author name is highlighted in blue).

- American Academy of Pediatrics. Breastfeeding and the use of human milk. *Pediatrics* 2005a;100:1035-39. (Guideline)
- [American Academy of Pediatrics](#). Child passenger safety. *Pediatrics* 2011;127:788-93. (Guideline)
- American Academy of Pediatrics. Clinical practice guideline: early detection of developmental dysplasia of the hip. *Pediatrics* 2000a;105:896-905. (Guideline)
- American Academy of Pediatrics. Developmental surveillance and screening of infants and young children. *Pediatrics* 2001a;108:192-96. (Guideline)
- American Academy of Pediatrics. Falls from heights: windows, roofs, and balconies. *Pediatrics* 2001b;107:1188-91. (Reaffirmed 2005) (Guideline)
- American Academy of Pediatrics. Identifying infants and young children with developmental disorders in the medical home: an algorithm for developmental surveillance and screening. *Pediatrics* 2006;118:405-20. (Guideline)
- American Academy of Pediatrics. Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. *Pediatrics* 2004;114:297-316. (Guideline)
- American Academy of Pediatrics. Poison treatment in the home. *Pediatrics* 2003;112:1182-85. (Reaffirmed 2007) (Low Quality Evidence)
- American Academy of Pediatrics. Selecting and using the most appropriate car safety seats for growing children: guidelines for counseling parents. *Pediatrics* 2002;109:550-53. (Guideline)
- American Academy of Pediatrics. The changing concept of sudden infant death syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics* 2005b;116:1245-55. (Guideline)
- American Academy of Pediatrics. The use and misuse of fruit juice in pediatrics. *Pediatrics* 2001c;107:1210-13. (Reaffirmed 2007) (Low Quality Evidence)
- American Academy of Pediatrics. The use of whole cow's milk in infancy. *Pediatrics* 1992;89:1105-09. (Low Quality Evidence)
- American College of Obstetricians and Gynecologists. Cervical cytology screening. *Obstet & Gynecol* 2009;114:1409-20. (Low Quality Evidence)
- Bader JD, Rozier RG, Lohr KN, Frame PS. Physicians' roles in preventing dental caries in preschool children: a summary of the evidence for the U.S. preventive services task force. *Am J Prev Med* 2004;26:315-25. (Low Quality Evidence)
- Barbaresi WJ, Katusic SK, Voigt RG. Autism: a review of the state of the science for pediatric primary health care clinicians. *Arch Pediatr Adolesc Med* 2006;160:1167-75. (Low Quality Evidence)
- Basile KC, Hertz MJ, Black SE. Intimate partner violence and sexual violence victimization assessment instruments for use in health care settings: version 1. Atlanta GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. 2007. (Low Quality Evidence)
- Bass JL, Christoffel KK, Widome M, et al. Childhood injury prevention counseling in primary care settings: a critical review of the literature. *Pediatrics* 1993;92:544-50. (Low Quality Evidence)
- Bennett SE, Assefi NP. School-based teenage pregnancy prevention programs: a systematic review of randomized controlled trials. *J Adolesc Health* 2005;36:72-81. (Systematic Review)

[Return to Table of Contents](#)

References

- Berenson GS, Srinivasan SR, Bao W, et al. Association between multiple cardiovascular risk factors and atherosclerosis in children and young adults. *N Engl J Med* 1998;338:1650-56. (Low Quality Evidence)
- Binns HJ, Campbell C, Brown MJ. Interpreting and managing blood lead levels of less than 10 ug/dL in children and reducing childhood exposure to lead: recommendations of the centers for disease control and prevention advisory committee on childhood lead poisoning prevention. *Pediatrics* 2007;120:e1285-98. (Low Quality Evidence)
- Biondich PG, Downs SM, Carroll AE, et al. Shortcomings in infant iron deficiency screening methods. *Pediatrics* 2006;117:290-94. (Low Quality Evidence)
- Bodenheimer T. Innovations in primary care in the United States. *BMJ* 2003;326:796-98. (Low Quality Evidence)
- Branson BM, Handsfield HH, Lampe MA, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health care settings. *MMWR* 2006;55(RR14):1-17. (Low Quality Evidence)
- Brenner RA, Taneja GS, Haynie DL, et al. Association between swimming lessons and drowning in childhood: a case-control study. *Arch Pediatr Adolesc Med* 2009;163:203-10. (Low Quality Evidence)
- Bright Futures. National Guidelines for Health Supervision of Infants, Children and Adolescents. Aug 1993. (Guideline)
- Briss PA, Matte TD, Schwartz J, et al. Costs and benefits of a universal screening program for elevated blood lead levels in 1-year-old children. *Centers for Disease Control* 1997:1-19. (Cost-Effectiveness Analysis)
- Bull MJ, Durbin DR. Rear-facing car safety seats: getting the message right. *Pediatrics* 2008;121:619-20. (Low Quality Evidence)
- Bullock LFC, Mickey K, Green J, Heine A. Are nurses acting as role models for the prevention of SIDS. *MCN* 2004;29:172-77. (Low Quality Evidence)
- Burke BL, Robbins JM, Mac Bird T, et al. Trends in hospitalizations for neonatal jaundice and kernicterus in the United States, 1988-2005. *Pediatrics* 2009;123:524-32. (Low Quality Evidence)
- Caird JK, Willness CR, Steel P, Scialfa C. A meta-analysis of the effects of cell phones on driver performance. *Accid Anal Prev* 2008;40:1282-93. (Meta-analysis)
- Centers for Disease Control and Prevention. Interpreting and managing blood lead levels <10 ug/dL in children and reducing childhood exposures to lead. *MMWR* 2007;56(RR08):1-14. (Low Quality Evidence)
- Centers for Disease Control and Prevention. Screening tests to detect *chlamydia trachomatis* and *neisseria gonorrhoeae* infections – 2002. *MMWR* 2002;51 (No. RR-15). (Low Quality Evidence)
- Centers for Disease Control and Prevention. Spina bifida and anencephaly before and after folic acid mandate – United States, 1995-1996 and 1999-2000. *MMWR* 2004;53:362-65. (Low Quality Evidence)
- Centers for Disease Control and Prevention. Use of dietary supplements containing folic acid among women of childbearing age – United States, 2005. *MMWR* 2005;54:955-58. (Low Quality Evidence)
- Chaparro CM. Setting the stage for child health and development: prevention of iron deficiency in early infancy. *J Nutr* 2008;138:2529-33. (Low Quality Evidence)
- Chen PH, Rovi S, Washington J, et al. Randomized comparison in 3 methods to screen for domestic violence in family practice. *Ann Fam Med* 2007;5:430-35. (High Quality Evidence)

[Return to Table of Contents](#)

References

- Chou R, Huffman LH, Fu R, et al. Screening for HIV: a review of the evidence for the U.S. preventive services task force. *Ann Intern Med* 2005;143:55-73. (Low Quality Evidence)
- Chou R, Dana T, Bougatsos C. Screening for visual impairment in children ages 1-5 years: update for the U.S. Preventive Services Task Force. *Pediatrics* 2011;127:e442-79. (Systematic Review)
- Chung M, Raman G, Trikalinos T, et al. Interventions in primary care to promote breastfeeding: an evidence review for the U.S. preventive services task force. *Ann Intern Med* 2008;149:565-82. (Low Quality Evidence)
- Coleman-Phox K, Odouli R, Li D. Use of a fan during sleep and the risk of sudden infant death syndrome. *Arch Pediatr Adolesc Med* 2008;162:963-68. (Low Quality Evidence)
- Colson ER, Joslin SC. Changing nursing practice gets inner-city infants in the supine position for sleep. *Arch Pediatr Adolesc Med* 2002;156:717-20. (Low Quality Evidence)
- Cook RL, Hutchison SL, Østergaard L, et al. Systematic review: noninvasive testing for *chlamydia trachomatis* and *Neisseria gonorrhoeae*. *Ann Intern Med* 2005;142:914-25. (Systematic Review)
- Council on Children with Disabilities. Role of the medical home in family-centered early intervention services. *Pediatrics* 2007;120:1153-58. (Low Quality Evidence)
- Crowell R, Ferris AM, Wood RJ, et al. Comparative effectiveness of zinc protoporphyrin and hemoglobin concentrations in identifying iron deficiency in a group of low-income, preschool-aged children: practical implications of recent illness. *Pediatrics* 2006;118:224-32. (Low Quality Evidence)
- Cruz GD, Shore R, Le Geros RZ, Tavares M. Effect of acculturation on objective measures of oral health in Haitian immigrants in New York City. *J Dent Res* 2004;83:180-84. (Low Quality Evidence)
- Daniels SR, Greer FR, the Committee on Nutrition. Lipid screening and cardiovascular health in childhood. *Pediatrics* 2008;122:198-208. (Low Quality Evidence)
- Davis PH, Dawson JD, Riley WA, Lauer RM. Carotid intimal-medial thickness is related to cardiovascular risk factors measured from childhood through middle age: the Muscatine study. *Circulation* 2001;104:2815-19. (Moderate Quality Evidence)
- Dawson JD, Sonka M, Blecha MB, et al. Risk factors associated with aortic and carotid intima-media thickness in adolescents and young adults: the Muscatine Offspring study. *J Am Coll Cardiol* 2009;53:2273-79. (Low Quality Evidence)
- Demerath EW, Schubert CM, Maynard LM, et al. Do changes in body mass index percentile reflect changes in body composition in children? Data from the Fels longitudinal study. *Pediatrics* 2006;117:487-95. (Low Quality Evidence)
- Dennison BA, Kukuchi DA, Srinivasan SR, et al. Serum total cholesterol screening for the detection of elevated low-density lipoprotein in children and adolescents: the bogalusa heart study. *Pediatrics* 1990;85:472-79. (Low Quality Evidence)
- DiCenso A, Guyatt G, Willan A, Griffith L. Interventions to reduce unintended pregnancies among adolescents: systematic review of randomised controlled trials. *BMJ* 2002;324:1426. (Systematic Review)
- Dubowitz H. Pediatrician's role in preventing child maltreatment. *Pediatr Clin North Am* 1990;37:989-1002. (Low Quality Evidence)
- Durbin DR, Elliott MR, Winston FK. Belt-positioning booster seats and reduction in risk of injury among children in vehicle crashes. *JAMA* 2003;289:2835-40. (Low Quality Evidence)
- Ebbeling CB, Feldman HA, Osganian SK, et al. Effects of decreasing sugar-sweetened beverage consumption on body weight in adolescents: a randomized, controlled pilot study. *Pediatrics* 2006;117:673-80. (High Quality Evidence)

References

- Eikeseth S, Smith T, Jahr E, Eldevik S. Intensive behavioral treatment at school for 4- to 7-year-old children with autism: a 1-year comparison controlled study. *Behav Modif* 2002;26:49-68. (Low Quality Evidence)
- Eisenmann JC, Bartee RT, Wang MQ. Physical activity, TV viewing, and weight in U.S. youth: 1999 youth risk behavior survey. *Obesity Research* 2002;10:379-85. (Low Quality Evidence)
- Eissa MA, Wen E, Mihalopoulos NL, et al. Evaluation of AAP guidelines for cholesterol screening in youth: project HeartBeat! *Am J Prev Med* 2009;37:S71-S77. (Low Quality Evidence)
- Elliott MR, Kallan MJ, Durbin DR, Winston FK. Effectiveness of child safety seats vs seat belts in reducing risk for death in children in passenger vehicle crashes. *Arch Pediatr Adolesc Med* 2006;160:617-21. (Low Quality Evidence)
- Field AE, Cook NR, Gillman MW. Weight status in childhood as a predictor of becoming overweight or hypertensive in early adulthood. *Obes Res* 2005;13:163-69. (Moderate Quality Evidence)
- Fiore MC, Jaén CR. A clinical blueprint to accelerate the elimination of tobacco use. *JAMA* 2008;299:2083-85. (Low Quality Evidence)
- Flegal KM, Graubard BI, Williamson DF, Gail MH. Excess deaths associated with underweight, overweight, and obesity. *JAMA* 2005;293:1861-67. (Low Quality Evidence)
- Flores AI, Bilker WB, Alessandrini EA. Effects of continuity of care in infancy on receipt of lead, anemia, and tuberculosis screening. *Pediatrics* 2008;121:e399-e406. (Moderate Quality Evidence)
- Freedman DS, Shear CL, Srinivasan SR, et al. Tracking of serum lipids and lipoproteins in children over an 8-year period: the bogalusa heart study. *Prev Med* 1985;14:203-16. (Moderate Quality Evidence)
- French SA, Lin BH, Guthrie JF. National trends in soft drink consumption among children and adolescents age 6 to 17 years: prevalence, amounts, and sources, 1977/1978 to 1994/1998. *J Am Diet Assoc* 2003;103:1326-31. (Low Quality Evidence)
- Friedman LA, Morrison JA, Daniels SR, et al. Sensitivity and specificity of pediatric lipid determinations for adult lipid status: findings from the Princeton lipid research clinics prevalence program follow-up study. *Pediatrics* 2006;118:165-72. (Low Quality Evidence)
- Gao XL, Hsu YS, Xu Y, et al. Building caries risk assessment models for children. *J Dent Res* 2010;89:637-43. (Low Quality Evidence)
- Gilbody S, Whitty P, Grimshaw J, et al. Educational and organizational interventions to improve the management of depression in primary care: a systematic review. *JAMA* 2003;289:3145-151. (Systematic Review)
- Gillman MW, Cupples LA, Moore LL, Ellison RC. Impact of within-person variability on identifying children with hypercholesterolemia: Framingham Children's Study. *J Pediatr* 1992;121:342-47. (Low Quality Evidence)
- Glass N, Nelson HD, Villemyer K. Screening for Gonorrhea: update of the evidence. AHRQ Publication No. 05-0579-B. May 2005. (Systematic Review)
- Gray RH, Serwadda D, Kong X, et al. Male circumcision decreases acquisition and increases clearance of high-risk human papillomavirus in HIV-negative men: a randomized trial in Rakai, Uganda. *J Infect Dis* 2010;201:1455-62. (High Quality Evidence)
- Green AC, Williams GM, Logan V, Strutton GM. Reduced melanoma after regular sunscreen use: randomized trial follow-up. *J Clin Oncol* 2011;29:257-63. (Moderate Quality Evidence)
- Grimshaw G, Stanton A. Tobacco cessation interventions for young people. *Cochrane Database Syst Rev* 2006;(4):CD003289. (Systematic Review)

[Return to Table of Contents](#)

References

- Haney EM, Huffman LH, Bougatsos C, et al. Screening and treatment for lipid disorders in children and adolescents: systematic evidence review for the U.S. preventive services task force. *Pediatrics* 2007;120:e189-e214. (Systematic Review)
- Heineman KR, Hadders-Algra M. Evaluation of neuromotor function in infancy-A systematic review of available methods. *J Dev Behav Pediatr* 2008;29:315-23. (Systematic Review)
- Henary B, Sherwood CP, Crandall JR, et al. Car safety seats for children: rear facing for best protection. *Injury Prevention* 2007;13:398-402. (Low Quality Evidence)
- Hickman TB, Briefel RR, Carroll MD, et al. Distributions and trends of serum lipid levels among United States children and adolescents ages 4-19 years: data from the third national health and nutrition examination survey. *Prev Med* 1998;27:879-90. (Low Quality Evidence)
- Himes JH, Dietz WH. Guidelines for overweight in adolescent preventive services: recommendations from an expert committee. *Am J Clin Nutr* 1994;59:307-16. (Low Quality Evidence)
- Hirtz D, Thurman DJ, Gwinn-Hardy K, et al. How common are the "common" neurologic disorders? *Neurology* 2007;68:326-37. (Low Quality Evidence)
- Horrey WJ, Wickens CD. Examining the impact of cell phone conversations on driving using meta-analysis techniques. *Hum Factors* 2006;48:196-205. (Meta-analysis)
- Hoyert DL, Mathews TJ, Menacker F, et al. Annual summary of vital statistics: 2004. *Pediatrics* 2006;117:168-83. (Low Quality Evidence)
- Humphrey LL, Helfand M, Chan BKS, Woolf SH. Breast cancer screening: a summary of the evidence for the U.S. preventive services task force. *Ann Intern Med* 2002;137:347-60. (Meta-analysis)
- Hutson JM, Hasthorpe S. Testicular descent and cryptorchidism: the state of the art in 2004. *J Pediatr Surg* 2005;40:297-302. (Low Quality Evidence)
- Insinga RP, Laessig RH, Hoffman GL. Newborn screening with tandem mass spectrometry: examining its cost-effectiveness in the Wisconsin newborn screening panel. *J Pediatr* 2002;141:524-31. (Cost-Effectiveness Analysis)
- Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. National Academy Press. Washington, D.C. February 2001. (Reference)
- Ismail AI, Hasson H. Fluoride supplements, dental caries and fluorosis: a systematic review. *J Am Dent Assoc* 2008;139:1457-68. (Systematic Review)
- Jakicic JM. The role of physical activity in prevention and treatment of body weight gain in adults. *J Nutr* 2002;132:3826S-29S. (Low Quality Evidence)
- Janssen I, Katzmarzyk PT, Srinivasan SR, et al. Utility of childhood BMI in the prediction of adulthood disease: comparison of national and international references. *Obes Res* 2005;13:1106-15. (Moderate Quality Evidence)
- Jefferson T, Foxlee R, Del Mar C, et al. Physical interventions to interrupt or reduce the spread of respiratory viruses: systematic review. *BMJ* 2008;336:77-80. (Systematic Review)
- Johnson CP, Myers SM, the Council on Children with Disabilities. Identification and evaluation of children with Autism spectrum disorders. *Pediatrics* 2007;120:1183-1215. (Low Quality Evidence)
- Johnson JG, Harris ES, Spitzer RL, Williams JBW. The patient health questionnaire for adolescents: validation of an instrument for the assessment of mental disorders among adolescent primary care patients. *J Adol Health* 2002;30:196-204. (Low Quality Evidence)

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References

- Johnson S, Marlow N. Developmental screen or developmental testing? *Early Human Develop* 2006;82:173-83. (Low Quality Evidence)
- Jones RL, Homa DM, Meyer PA, et al. Trends in blood lead levels and blood lead testing among U.S. children aged 1 to 5 years, 1998-2004. *Pediatrics* 2009;123:e376-e385. (Low Quality Evidence)
- Kamath CC, Vickers KS, Ehrlich A, et al. Clinical review: behavioral interventions to prevent childhood obesity: a systematic review and meta-analyses of randomized trials. *J Clin Endocrinol Metab* 2008;93:4606-15. (Systematic Review)
- Kang H-S, Gutin B, Barbeau P, et al. Physical training improves insulin resistance syndrome markers in obese adolescents. *Med Sci Sports Exerc* 2002;34:1920-27. (High Quality Evidence)
- Katz DL, O'Connell M, Njike VY, et al. Strategies for the prevention and control of obesity in the school setting: systematic review and meta-analysis. *Int J Obes (Lond)* 2008;32:1780-89. (Systematic Review)
- Katz DA, Muehlenbruch DR, Brown RL, et al. Effectiveness of implementing the agency for health care research and quality smoking cessation clinical practice guideline: a randomized, controlled trial. *J Natl Cancer Inst* 2004;96:594-603. (High Quality Evidence)
- Kemper A, Harris R, Lieu TA, et al. Screening for visual impairment in children younger than age 5 years: a systematic evidence review for the U.S. preventive services task force. Number 27. May 2004. (Systematic Review)
- Kemper AR, Bordley WC, Downs SM. Cost-effectiveness analysis of lead poisoning screening strategies following the 1997 guidelines of the Centers of Disease Control and Prevention. *Arch Pediatr Adolesc Med* 1998;152:1202-08. (Cost-Effectiveness Analysis)
- Kemper KJ, Avner ED. The case against screening urinalyses for asymptomatic bacteriuria in children. *Am J Dis Child* 1992;146:343-46. (Low Quality Evidence)
- Kennedy C, McCann D, Campbell MJ, et al. Universal newborn screening for permanent childhood hearing impairment: an 8-year follow-up of a controlled trial. *Lancet* 2005;366:660-62. (Low Quality Evidence)
- Koldewijn K, Wolf MJ, van Wassenaer A, et al. The infant behavioral assessment and intervention program for very low birth weight infants at 6 months corrected age. *J Pediatr* 2009;154:33-38. (Low Quality Evidence)
- Kroenke K, Spitzer RL, Williams JB, Löwe B. The patient health questionnaire somatic, anxiety, and depressive symptom scales: a systematic review. *Gen Hosp Psych* 2010;32:345-59. (Systematic Review)
- Kuzniewicz MW, Escobar GJ, Newman TB. Impact of universal bilirubin screening on severe hyperbilirubinemia and phototherapy use. *Pediatrics* 2009;124:1031-39. (Moderate Quality Evidence)
- Kwiterovich PO Jr. Pediatric implications of heterozygous familial hypercholesterolemia: screening and dietary treatment. *Arteriosclerosis Suppl* 1989;9:I-111-I-120. (Low Quality Evidence)
- Lauer RM, Lee J, Clarke WR. Factors affecting the relationship between childhood and adult cholesterol levels: the muscatine study. *Pediatrics* 1988;82:309-18. (Moderate Quality Evidence)
- Lederman RP, Chan W, Roberts-Gray C. Parent-adolescent relationship education (PARE): program delivery to reduce risks for adolescent pregnancy and STDs. *Behav Med* 2008;33:137-43. (Moderate Quality Evidence)
- Lewis C, Teeple E, Robertson A, Williams A. Preventive dental care for young, medicaid-insured children in Washington state. *Pediatrics* 2009;124:e120-27. (Low Quality Evidence)
- Lin JS, Eder M, Weinmann S. Behavioral counseling to prevent skin cancer: a systematic review for the U.S. preventive services task force. *Ann Intern Med* 2011;154:190-201. (Systematic Review)

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www.icsi.org

References

- Lin K, Barton M. Screening for hemoglobinopathies in newborns: reaffirmation update for the U.S. preventive services task force. Evidence Synthesis No. 52. Rockville, MD: Agency for Health care Research and Quality, August 2007. AHRQ Publication No. 07-05104-EF-1. Available at: <http://www.ahrq.gov/clinic/serfiles.htm#sicklecell>. (Low Quality Evidence)
- Lin JS, Whitlock E, O'Connor E, Bauer V. Behavioral counseling to prevent sexually transmitted infections: a systematic review for the U.S. preventive services task force. *Ann Intern Med* 2008;149:497-508. (Systematic Review)
- Mabry-Hernandez I, Wolff T, Green K. Screening for phenylketonuria: a literature update for the U.S. preventive services task force. AHRQ Publication No. 08-05110-EF-1. Rockville, MD: Agency for Health care Research and Quality, 2008. (Low Quality Evidence)
- MacMillan HL, MacMillan JH, Offord DR, et al. Periodic health examination, 1993 update: 1. primary prevention of child maltreatment. *Can Med Assoc J* 1993;148:151-63. (Low Quality Evidence)
- MacMillan HL, Wathen CN, Jamieson E, et al. Approaches to screening for intimate partner violence in health care settings: a randomized trial. *JAMA* 2006;296:530-36. (High Quality Evidence)
- Mah MP, Clark SL, Akhigbe E, et al. Reduction of severe hyperbilirubinemia after institution of pre-discharge bilirubin screening. *Pediatrics* 2010;125:e1143-e48. (Moderate Quality Evidence)
- Maisels MJ, Bhutani VK, Bogen D, et al. Hyperbilirubinemia in the newborn infant > 35 weeks' gestation: an update with clarifications. *Pediatrics* 2009;124:1193-98. (Low Quality Evidence)
- Marinho VCC, Higgins JPT, Logan S, Sheiham A. Fluoride varnishes for preventing dental caries in children and adolescents (review). *The Cochrane Library* 2009, Issue 1. (Systematic Review)
- Mawle E, Griffiths P. Screening for autism in pre-school children in primary care: systematic review of English language tools. *Int J Nurs Stud* 2006;43:623-36. (Systematic Review)
- McCrinkle B, Urbina EM, Dennison BA, et al. Drug therapy of high-risk lipid abnormalities in children and adolescents: a scientific statement from the American heart association atherosclerosis, hypertension, and obesity in youth committee, council of cardiovascular disease in the young, with the council on cardiovascular nursing. *Circulation* 2007;115:1948-67. (Low Quality Evidence)
- Mendelsohn AL, Mogilner LN, Dreyer BP, et al. The impact of a clinic-based literacy intervention on language development in inner-city preschool children. *Pediatrics* 2001;107:130. (Moderate Quality Evidence)
- Meyers DS, Halvorson H, Luckhaupt S. Screening for chlamydial infection: an evidence update for the U.S. preventive services task force. *Ann Intern Med* 2007;147:135-42. (Systematic Review)
- Mills E, Cooper C, Anema A, Guyatt G. Male circumcision for the prevention of heterosexually acquired HIV infection: a meta-analysis of randomized trials involving 11,050 men. *HIV Med* 2008;9:332-35. (Meta-analysis)
- Mitchell EA, Thompson J, Becroft DMO, et al. Head covering and the risk for SIDS: findings from the New Zealand and German SIDS case-control studies. *Pediatrics* 2008;121:e1478-e1483. (Low Quality Evidence)
- Moon RY, Calabrese T, Aird L. Reducing the risk of sudden infant death syndrome in child care and changing clinician practices: lessons learned from a demonstration project. *Pediatrics* 2008;122:788-98. (Low Quality Evidence)
- Moyer VA, Butler M. Gaps in the evidence for well-child care: a challenge to our profession. *Pediatrics* 2004;114:1511-21. (Low Quality Evidence)

[Return to Table of Contents](#)

References

- Myers SM, Johnson CP, the Council on Children with Disabilities. Management of children with Autism spectrum disorders. *Pediatrics* 2007;120:1162-82. (Low Quality Evidence)
- National Cholesterol Education Program, 1991; U.S. Preventive Services Task Force, 2001. Highlights of the report of the expert panel on blood cholesterol levels in children and adolescents. Bethesda, MD. April 7, 1991. (Low Quality Evidence)
- Needman R, Toker KH, Dreyer BP, et al. Effectiveness of a primary care intervention to support reading aloud: a multicenter evaluation. *Ambul Pediatr* 2005;5:209-15. (Low Quality Evidence)
- Nelson HD, Bougatsos C, Nygren P. Universal newborn hearing screening: systematic review to update the 2001 U.S. preventive services task force recommendation. Evidence Synthesis No. 62. AHRQ Publication No. 08-05117-EF-1. Rockville, MD: Agency for Health care Research and Quality, July 2008. (Systematic Review)
- Nelson HD, Nygren P, Walker M, Panoscha R. Screening for speech and language delay in preschool children: systematic evidence review for the U.S. Preventive Services Task Force. *Pediatrics* 2006;117:e298-e319. (Systematic Review)
- Norman R, Haas M, Chaplin M, et al. Economic evaluation of tandem mass spectrometry newborn screening in Australia. *Pediatrics* 2009;123:451-57. (Cost-Effective Analysis)
- Nygren P, Nelson HD, Klein J. Screening children for family violence: a review of the evidence for the U.S. preventive services task force. *Ann Fam Med* 2004;2:161-69. (Systematic Review)
- O'Connor AM, Bennett C, Stacey D, et al. Do patient decision aids meet effectiveness criteria of the international patient decision aid standards collaboration? A systematic review and meta-analysis. *Med Decis Making* 2007;27:554-74. (Systematic Review)
- O'Connor NR, Tanabe KO, Siadat MS, Hauck FR. Pacifiers and breastfeeding: a systematic review. *Arch Pediatr Adolesc Med* 2009;163:378-82. (Systematic Review)
- O'Loughlin J, Lauzon B, Paradis G, et al. Usefulness of the American Academy of Pediatrics recommendations for identifying youths with hypercholesterolemia. *Pediatrics* 2004;113:1723-27. (Low Quality Evidence)
- Olds DL, Henderson CR Jr, Chamberlin R, Tatelbaum R. Preventing child abuse and neglect: a randomized trial of nurse home visitation. *Pediatrics* 1986;78:65-78. (High Quality Evidence)
- Oregon Evidence-based Practice Center. Screening for iron deficiency anemia in childhood and pregnancy: update of the 1996 U.S. preventive services task force review. AHRQ Publication No. 06-0590-EF-1. April 2006. (Systematic Review)
- Østergaard L, Andersen B, Møller JK, Olesen F. Home sampling versus conventional swab sampling for screening of *chlamydia trachomatis* in women: a cluster-randomized 1-year follow-up study. *Clin Infect Dis* 2000;31:951-57. (Low Quality Evidence)
- Patrick H, Nicklas TA. A review of the family and social determinants of children's eating patterns and diet quality. *J Am Coll Nutr* 2005;24:83-92. (Low Quality Evidence)
- Pendrys DG, Haugejorden O, Bardsen A, et al. The risk of enamel fluorosis and caries among Norwegian children: implications for Norway and the United States. *J Am Dent Assoc* 2010;141:401-14. (Low Quality Evidence)
- Pettersson A, Richiardi L, Nordenskjold A, et al. Age at surgery for undescended testis and risk of testicular cancer. *N Engl J Med* 2007;356:1835-41. (Moderate Quality Evidence)
- Potterat JJ, Dukes RL, Rothenberg RB. Disease transmission by heterosexual men with gonorrhea: an empiric estimate. *Sex Transm Dis* 1987;14:107-10. (Low Quality Evidence)

[Return to Table of Contents](#)

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References

- Prochaska JO, DiClemente CC, Norcross JC. In search of how people change: applications to addictive behaviors. *Amer Psych* 1992;47:1102-14. (Low Quality Evidence)
- Prosser LA, Ladapo JA, Rusinak D, Waisbren SE. Parental tolerance of false-positive newborn screening results. *Arch Pediatr Adolesc Med* 2008;162:870-76. (Low Quality Evidence)
- Quinlan KP, Sacks JJ, Kresnow M. Exposure to and compliance with pediatric injury prevention counseling – United States, 1994. *Pediatrics* 1998;102:E55. (Low Quality Evidence)
- Resnicow K, Cross D. Are parents' self-reported total cholesterol levels useful in identifying children with hyperlipidemia? an examination of current guidelines. *Pediatrics* 1993;92:347-54. (Low Quality Evidence)
- Rhee KE, De Lago CW, Arscott-Mills T, et al. Factors associated with parental readiness to make changes for overweight children. *Pediatrics* 2005;116:94-101. (Low Quality Evidence)
- Richards BS, Vitale MG. Screening for idiopathic scoliosis in adolescents: an information statement. *J Bone Joint Surg Am* 2008;90:195-98. (Low Quality Evidence)
- Riemsma RP, Patlenden J, Bridle C, et al. Systematic review of the effectiveness of stage based interventions to promote smoking cessation. *BMJ* 2003;326:1175-77. (Systematic Review)
- Rischitelli G, Nygren P, Bougatsos C, et al. Screening for elevated lead levels in childhood and pregnancy: an updated summary of evidence for the U.S. Preventive Services Task Force. *Pediatrics* 2006;118:e1867-95. (Low Quality Evidence)
- Roberts CR, Imrey PB, Turner JD, et al. Reducing physician visits for colds through consumer education. *JAMA* 1983;250:1986-89. (Low Quality Evidence)
- Roberts EA. Nonalcoholic steatohepatitis in children. *Current Gastroenterology Reports* 2003;5:253-59. (Low Quality Evidence)
- Rogers SJ. Empirically supported comprehensive treatments for young children with autism. *J Clin Child Psychol* 1998;27:168-79. (Low Quality Evidence)
- Romm FJ. "Routine" chemistry testing. *Fam Med* 1986;18:230-32. (Low Quality Evidence)
- Rozier RG, Sutton BK, Bawden JW, et al. Prevention of early childhood caries in North Carolina medical practices: implications for research and practice. *J Dent Educ* 2003;67:876-85. (Low Quality Evidence)
- Rydz D, Shevell MI, Majnemer A, Oskoui M. Developmental screening. *J Child Neurol* 2005;20:4-21. (Low Quality Evidence)
- Rydz D, Srouf M, Oskoui M, et al. Screening for developmental delay in the setting of a community pediatric clinic: a prospective assessment of parent-report questionnaires. *Pediatrics* 2006;118:e1178-86. (Low Quality Evidence)
- Schlaud M, Eberhard C, Trumann B, et al. Prevalence and determinants of prone sleeping position in infants: results from two cross-sectional studies on risk factors for SIDS in Germany. *Am J Epidemiol* 1999;150:51-57. (Low Quality Evidence)
- Scholes D, Stergachis A, Heidrich FE, et al. Prevention of pelvic inflammatory disease by screening for cervical chlamydial infection. *N Engl J Med* 1996;334:1362-66. (High Quality Evidence)
- Seo DC, Sa J. A meta-analysis of obesity interventions among U.S. minority children. *J Adolesc Health* 2010;46:309-23. (Meta-analysis)
- Shafir T, Angulo-Barroso R, Jing Y, et al. Iron deficiency and infant motor development. *Early Human Develop* 2008;84:479-85. (Low Quality Evidence)

[Return to Table of Contents](#)

References

- Shapiro-Mendoza CK, Kimball M, Tomashek KM, et al. U.S. infant mortality trends attributable to accidental suffocation and strangulation in bed from 1984 through 2004: are rates increasing? *Pediatrics* 2009;123:533-39. (Low Quality Evidence)
- Shipman SA, Helfand M, Moyer VA, Yawn BP. Screening for developmental dysplasia of the hip: a systematic literature review for the U.S. Preventive Services Task Force. *Pediatrics* 2006;117:557-76. (Systematic Review)
- Skinner JD, Ziegler P, Ponza M. Transitions in infants' and toddlers' beverage patterns. *J Am Diet Assoc* 2004;104:S45-S50. (Low Quality Evidence)
- Slade GD, Rozier RG, Zeldin LP, Margolis PA. Training pediatric health care clinicians in prevention of dental decay: results from a randomized controlled trial. *BMC Health Serv Res* 2007;7:176. (Low Quality Evidence)
- Solberg LI, Maciosek MV, Edwards NM. Primary care intervention to reduce alcohol misuse ranking its health impact and cost effectiveness. *Am J Prev Med* 2008;34:143-52. (Systematic Review)
- Spittle A, Orton J, Doyle LW, Boyd R. Early developmental intervention programs post hospital discharge to prevent motor and cognitive impairments in preterm infants (review). *Cochrane Database Syst Rev* 2007;18:CD005495. (Systematic Review)
- Starc TJ, Belamarich PF, Shea S, et al. Family history fails to identify many children with severe hypercholesterolemia. *AJDC* 1991;145:61-64. (Low Quality Evidence)
- Strathearn L, Mamun AA, Najman JM, O'Callaghan MJ. Does breastfeeding protect against substantiated child abuse and neglect? A 15-year cohort study. *Pediatrics* 2009;123:483-93. (Moderate Quality Evidence)
- Talib N, Onikul R, Filardi D, et al. Effective educational instruction in preventive oral health: hands-on training versus web-based training. *Pediatrics* 2010;125:547-53. (Low Quality Evidence)
- Taylor JA, Krieger JW, Reay DT, et al. Prone sleep position and the sudden infant death syndrome in King County, Washington: a case-control study. *J Pediatr* 1996;128:626-30. (Low Quality Evidence)
- Theriot JA, Franco SM, Sisson BA, et al. The impact of early literacy guidance on language skills of 3-year-olds. *Clin Pediatr (Phila)* 2003;42:165-72. (Low Quality Evidence)
- Thomas RE, Baker PRA, Lorenzetti D. Family-based programmes for preventing smoking by children and adolescents. *Cochrane Database Syst Rev* 2007;4:CD004493. (Systematic Review)
- Thomas RE, Perera R. School-based programmes for preventing smoking. *Cochrane Database Syst Rev* 2006;3:CD001293. (Systematic Review)
- Thompson RS, Rivara FP, Thompson DC. A case-control study of the effectiveness of bicycle safety helmets. *N Engl J Med* 1989;320:1361-67. (Low Quality Evidence)
- Tobian AAR, Serwadda D, Quinn TC, et al. Male circumcision for the prevention of HSV-2 and HPV infections and syphilis. *N Engl J Med* 2009;360:1298-309. (High Quality Evidence)
- Toppari J, Kaleva M. Maldescensus testis. *Horm Res* 1999;51:261-69. (Low Quality Evidence)
- Trikalinos TA, Chung M, Lau J, Ip S. Systematic review of screening for bilirubin encephalopathy in neonates. *Pediatrics* 2009;124:1162-71. (Systematic Review)
- U.S. Department of Health and Human Services. Dietary guidelines for Americans 2005. Available at: <http://www.healthierus.gov/dietaryguidelines>. 2005. (Reference)

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References

- U.S. Department of Health and Human Services. Essential components of a tuberculosis prevention and control program: screening for tuberculosis and tuberculosis infection in high-risk populations. September 8, 1995/Vol. 44/No. RR-11. (Guideline)
- U.S. Department of Health and Human Services. Helping patients who drink too much. 2007. (Low Quality Evidence)
- U.S. Preventive Services Task Force. Counseling and interventions to prevent tobacco use and tobacco-caused disease in adults and pregnant women: U.S. preventive services task force reaffirmation recommendation statement. *Ann Intern Med* 2009a;150:551-55. (Systematic Review)
- U.S. Preventive Services Task Force. Counseling to prevent tobacco use and tobacco-caused disease. Available at: [http://www.uspreventiveservicestaskforce.org/U.S. Preventive Services Task Force/uspstbac2.htm](http://www.uspreventiveservicestaskforce.org/U.S.Preventive.Services.Task.Force/uspstbac2.htm). 2003. (Guideline)
- U.S. Preventive Services Task Force. Folic acid for the prevention of neural tube defects. *Ann Intern Med* 2009b;150:626-31. (Guideline)
- U.S. Preventive Services Task Force. Screening and treatment for major depressive disorder in children and adolescents: U.S. preventive services task force recommendation statement. *Pediatrics* 2009c;123:1223-28. (Low Quality Evidence)
- U.S. Preventive Services Task Force. Primary care interventions to promote breastfeeding: U.S. preventive services task force recommendation statement. *Ann Intern Med* 2008;149:560-64. (Low Quality Evidence)
- U.S. Preventive Services Task Force. The periodic health examination: age specific charts. In United States Preventive Services Task Force Report, 2nd ed. Baltimore: Williams & Wilkins, 1996: IVii. (Low Quality Evidence)
- van Agt HME, van der Stege HA, de Ridder-Sluiters H, et al. A cluster-randomized trial of screening for language delay in toddlers: effects on school performance and language development at age 8. *Pediatrics* 2007;120:1317-25. (Moderate Quality Evidence)
- Vanderveen JA, Bassler D, Robertson CM, Kirpalani H. Early interventions involving parents to improve neurodevelopmental outcomes of premature infants: a meta-analysis. *J Perinatol* 2009;29:343-51. (Meta-analysis)
- Vennemann MM, Bajanowski T, Brinkmann B, et al. Does breastfeeding reduce the risk of sudden infant death syndrome? *Pediatrics* 2009a;123:e406-e410. (Low Quality Evidence)
- Vennemann MM, Bajanowski T, Brinkmann B, et al. Sleep environment risk factors for sudden infant death syndrome: the German sudden infant death syndrome study. *Pediatrics* 2009b;123:1162-70. (Low Quality Evidence)
- Vickery DM, Kalmer H, Lowry D, et al. Effect of a self-care education program on medical visits. *JAMA* 1983;250:2952-56. (Low Quality Evidence)
- Wagner CL, Greer FR, and the Section on Breastfeeding and Committee on Nutrition. Prevention of rickets and vitamin D deficiency in infants, children, and adolescents. *Pediatrics* 2008;122:1142-52. (Low Quality Evidence)
- Walsh T, Worthington HV, Glenny AM, et al. Fluoride toothpastes of different concentrations for preventing dental caries in children and adolescents (review). *The Cochrane Library* 2010, Issue 2. (Systematic Review)
- Weintraub JA, Ramos-Gomez F, Jue B, et al. Flouride varnish efficacy in preventing early childhood caries. *J Dent Res* 2006;85:172-76. (High Quality Review)

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References

- Weiss HA, Larke N, Halperin D, Schenker I. Complications of circumcision in male neonates, infants and children: a systematic review. *BMC Urol* 2010;10:2. (Systematic Review)
- Wessex Universal Neonatal Hearing Screening Trial Group. Controlled trial of universal neonatal screening for early identification of permanent childhood hearing impairment. *Lancet* 1998;352:1957-64. (Low Quality Evidence)
- White KC. Anemia is a poor predictor of iron deficiency among toddlers in the United States: for heme the bell tolls. *Pediatrics* 2005;115:315-20. (Low Quality Evidence)
- Whitlock EP, Orleans CT, Pender N, Allan J. Evaluating primary care behavioral counseling interventions: an evidence-based approach. *J Prev Med* 2002;22:267-84. (Low Quality Evidence)
- Whitlock EP, Polen MR, Green CA, et al. Behavioral counseling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med* 2004;140:557-68. (Systematic Review)
- Whitlock EP, Williams SB, Gold R, et al. Screening and interventions for childhood overweight: a summary of evidence for the U.S. Preventive Services Task Force. *Pediatrics* 2005;116:125-44. (Low Quality Evidence)
- Wiegman A, Hutten BA, de Groot E. Effects of statin therapy in children with familial hypercholesterolemia. *JAMA* 2004;292:331-37. (High Quality Evidence)
- Williams CL, Bollella M. Guidelines for screening, evaluating, and treating children with hypercholesterolemia. *Pediatr Health Care* 1995;9:153-61. (Low Quality Evidence)
- Williams C, Harrad RA, Harvey I, et al. Screening for amblyopia in preschool children: results of a population-based, randomised controlled trial. *Ophthalmic Epidemiol* 2001;8:279-95. (Moderate Quality Evidence)
- Williams Jr JW, Gerrity M, Holsinger T, et al. Systematic review of multifaceted interventions to improve depression care. *Gen Hosp Psychiatry* 2007a;29:91-116. (Systematic Review)
- Williams SB, O'Conner EA, Eder M, Whitlock EP. Screening for child and adolescent depression in primary care settings: a systematic evidence review for the U.S. preventive services task force. *Pediatrics* 2009;123:e716-e35. (Systematic Review)
- Williams SB, Whitlock EP, Edgerton EA, et al. Counseling about proper use of motor vehicle occupant restraints and avoidance of alcohol use while driving: a systematic evidence review for the U.S. preventive services task force. *Ann Intern Med* 2007b;147:194-206. (Systematic Review))
- Winter LB, Steer RA, Jones-Hicks L, Beck AT. Screening for major depression disorders in adolescent medical outpatients with the Beck depression inventory for primary care. *J Adoles Health* 1999;24:389-94. (Low Quality Evidence)
- Wiswell TE, Geschke DW. Risks from circumcision during the first month of life compared with those for uncircumcised boys. *Pediatrics* 1989;83:1011-15. (Low Quality Evidence)
- Wolff T, Tai E, Miller T. Screening for skin cancer: an update of the evidence for the U.S. preventive services task force. *Ann Intern Med* 2009a;150:194-98. (Low Quality Evidence)
- Wolff T, Witkop CT, Miller T, Syed SB. Folic acid supplementation for the prevention of neural tube defects: an update of the evidence for the U.S. preventive services task force. *Ann Intern Med* 2009b;150:6323-39. (Low Quality Evidence)
- Wong MCM, Glenny AM, Tsang BWK, et al. Topical fluoride as a cause of dental fluorosis in children (review). *The Cochrane Library* 2010, Issue 6. (Systematic Review)

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References

Yarnall KSH, Pollak KI, Ostbye T, et al. Primary care: is there enough time for prevention? *Am J Public Health* 2003;93:635-41. (Low Quality Evidence)

Yoon SS, Macdonald SC, Parrish RG. Deaths from unintentional carbon monoxide poisoning and potential for prevention with carbon monoxide detectors. *JAMA* 1998;279:685-87. (Low Quality Evidence)

Zaloshnja E, Miller TR, Hendrie D. Effectiveness of child safety seats vs safety belts for children aged 2 to 3 years. *Arch Pediatr Adolesc Med* 2007;161:65-68. (Moderate Quality Evidence)

Zhu SH, Anderson CM, Tedeschi GJ, et al. Evidence of real-world effectiveness of a telephone quitline for smokers. *N Engl J Med* 2002;347:1087-93. (High Quality Evidence)

Ziegler EE, Jiang T, Romero E, et al. Cow's milk and intestinal blood loss in late infancy. *J Pediatr* 1999;135:720-26. (Low Quality Evidence)

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Appendix A – Counseling Messages

Behavioral counseling interventions in clinical settings are a potential important means of addressing prevalent health-related behaviors – such as lack of physical activity, poor diet, substance (tobacco, alcohol and illicit drugs) use and dependence and risky sexual behavior – that underlie a substantial proportion of preventable morbidity and mortality in the United States (*Whitlock, 2002 [Low Quality Evidence]*).

Appropriate Counseling Approaches

The work group recommends that implementation of the preventive services guideline be tied to a system to perform risk assessment of patients, so that counseling can be individualized to a patient's risks and needs.

WHO Is to Counsel and Educate

Counseling and educational messages are to be provided by the primary care clinician, clinician nurse or other health professional or educator. About 80% of the population identifies a health care clinician as a source of care. Thus, physicians have a special opportunity to take advantage of teachable moments to provide health advice. Given physicians' time constraints, they may be limited to stressing the need to meet with another health care professional for more detailed information.

HOW to Effectively Deliver Messages

Parents and older children

A wide variety of counseling and education messages is recommended for various services. Delivering them all in one visit or setting may be overwhelming; therefore, it is desirable to spread out the messages across several visits whenever possible. Once compliance has been attained, intermittent reinforcement messages may be desirable for some behaviors.

Especially for younger children, the parent is the one who needs to understand the risk and be ready to make changes. Multiple factors and perceptions may be associated with a parent's readiness to help his or her child lose weight (*Rhee, 2005 [Low Quality Evidence]*), and the same may be true for other risks. Whether working with a parent or older child, communicating in a direct manner and making clear recommendations are encouraged. Recognition of health risks and physician's concerns may heighten the parent/older child's awareness.

- For the parent/older child considering change, assess perception of importance and build on this in a nonjudgmental way. "How important is it for you to..." or "How confident are you that you can..." may help assess motivation and determine strategies for further counseling.
- For the parent/older child who doesn't perceive there is a problem or isn't ready to change, provide new information or indicate a willingness to help when he or she is ready.

Another goal is to communicate that the parent/older child can contact the clinician and other health care professionals for resources whenever he or she is interested in more information.

The Five A's

The U.S. Preventive Services Task Force Counseling and Behavioral Interventions Work Group has recommended a construct known as the "Five A's" as a way to structure health behavior interventions in the health care setting.

- **Assess:** Ask about/assess behavioral health risk(s) and factors affecting choice of behavior change goals/methods.

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Appendix A – Counseling Messages

- **Advise:** Give clear, specific and personalized behavior change advice, including information about personal health harms/benefits.
- **Agree:** Collaboratively select appropriate treatment goals and methods based on the patient's interest in and willingness to change the behavior.
- **Assist:** Using behavior change techniques (self-help and/or counseling), aid the patient in achieving agreed-upon goals by acquiring the skills, confidence, and social/environmental supports for behavior change, supplemented with adjunctive medical treatments when appropriate (e.g., pharmacotherapy for tobacco dependence, contraceptive drugs/devices).
- **Arrange:** Schedule follow-up contacts (in person or by telephone) to provide ongoing assistance/support and to adjust the treatment plan as needed, including referral to more intensive or specialized treatment.

(Whitlock, 2002 [Low Quality Evidence])

Interviewing younger children using the five-stage model.

In communicating with younger children, you may find the following helpful:

- Establish a rapport.
- Gather data emphasizing strengths. Paraphrase, reflect the child's feelings, summarize frequently. Keep questions and concepts concrete, and avoid abstract talk. Identify positive aspects.
- Determine goals. Ask what the child wants to happen. Accept a child's goals but focus on concrete, short-term goals.
- Generate alternative solutions and actions.
- Allow time to try new behaviors and ideas.

Adapted from Handbook of Pediatric Nutrition, 3rd ed., Samour PQ, King K., who adapted from Ivey AE, Ivey MB and Simek-Morgan L. Counseling and Psychotherapy: A Multicultural Perspective, 4th ed. 1997.

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Appendix B – Visit Schedule

The schedule of visits will largely be determined by completion of necessary preventive services and screening maneuvers listed for each age group. The schedule recommended within this guideline is a synthesis of the recommendations of various groups, including the U.S. Preventive Services Task Force, Bright Futures, American Academy of Pediatrics and AAFP (*Bright Futures, 1993 [Guideline]; U.S. Preventive Services Task Force, 1996 [Low Quality Evidence]*). There is insufficient evidence to recommend one visit schedule over another in terms of lowering child mortality and morbidity, recognizing disability, promoting optimal growth and development or helping children achieve longer, more productive lives. Some visit schedules, such as the child and teen checkup schedules, are designed to serve a possibly higher-risk population of children. For the purposes of this guideline, a reasonable schedule to allow for the needed preventive services and screening maneuvers is as follows.

Birth to 24 months

Preventive service visits are recommended within the first two weeks after birth and at 2, 4, 6-9, 12 and 15 months of age.

2 to 6 years

Preventive service visits are recommended at age 2 and between ages 4 and 6.

The visit at two years of age is primarily a counseling visit. The discretion of both the clinician and the parent or guardian should be used in determining whether to schedule this visit.

7 to 12 years

Preventive service visits are recommended between the ages of 7 and 9 and at age 12.

Patients in the preteen years who are seen in the clinic for an acute or preventive visit should be informed of the health risks for the upcoming teen years and encouraged to visit in the future to discuss these risks.

13 to 18 years

One to two preventive care visits are recommended between the ages of 13 and 18 years. (The second visit is at the preference of clinician and parent/guardian.) Adolescent preventive visits are primarily for counseling. Visits are dependent upon the child's developmental stage and behaviors and other factors. The discretion of both the clinician and the parent or guardian should be used in determining whether to schedule a second adolescent visit.

Additional visits may be useful if there has been a significant change in an adolescent's behavior or environment.

Related guideline

[ICSI Immunization guideline](#)

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Appendix C – ICSI Shared Decision-Making Model

ICSI Institute for Clinical Systems Improvement

The technical aspects of Shared Decision-Making are widely discussed and understood.

- **Decisional conflict** occurs when a patient is presented with options where no single option satisfies all the patient's objectives, where there is an inherent difficulty in making a decision, or where external influencers act to make the choice more difficult.
- **Decision support** clarifies the decision that needs to be made, clarifies the patient's values and preferences, provides facts and probabilities, guides the deliberation and communication and monitors the progress.
- **Decision aids** are evidence-based tools that outline the benefits, harms, probabilities and scientific uncertainties of specific health care options available to the patient.

However, before decision support and decision aids can be most advantageously utilized, a Collaborative Conversation™ should be undertaken between the clinician and the patient to provide a supportive framework for Shared Decision-Making.

Collaborative Conversation™

A collaborative approach toward decision-making is a fundamental tenet of Shared Decision-Making (SDM). The Collaborative Conversation™ is an inter-professional approach that nurtures relationships, enhances patients' knowledge, skills and confidence as vital participants in their health, and encourages them to manage their health care.

Within a Collaborative Conversation™, the perspective is that both the patient and the clinician play key roles in the decision-making process. The patient knows which course of action is most consistent with his/her values and preferences, and the clinician contributes knowledge of medical evidence and best practices. Use of Collaborative Conversation™ elements and tools is even more necessary to support patient, care clinician and team relationships when patients and families are dealing with high stakes or highly charged issues, such as diagnosis of a life-limiting illness.

The overall framework for the Collaborative Conversation™ approach is to create an environment in which the patient, family and care team work collaboratively to reach and carry out a decision that is consistent with the patient's values and preferences. A rote script or a completed form or checklist does not constitute this approach. Rather it is a set of skills employed appropriately for the specific situation. These skills need to be used artfully to address all aspects involved in making a decision: cognitive, affective, social and spiritual.

Key communication skills help build the Collaborative Conversation™ approach. These skills include many elements, but in this appendix only the questioning skills will be described. (For complete instruction, see O'Connor, Jacobsen “Decisional Conflict: Supporting People Experiencing Uncertainty about Options Affecting Their Health” [2007], and Bunn H, O'Connor AM, Jacobsen MJ “Analyzing decision support and related communication” [1998, 2003].)

1. Listening skills:

Encourage patient to talk by providing prompts to continue such as “*go on, and then?, uh huh,*” or by repeating the last thing a person said, “*It's confusing.*”

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Appendix C – ICSI Shared Decision-Making Model

Paraphrase content of messages shared by patient to promote exploration, clarify content and to communicate that the person's unique perspective has been heard. The clinician should use his/her own words rather than just parroting what he/she heard.

Reflection of feelings usually can be done effectively once trust has been established. Until the clinician feels that trust has been established, short reflections at the same level of intensity expressed by the patient without omitting any of the message's meaning are appropriate. Reflection in this manner communicates that the clinician understands the patient's feelings and may work as a catalyst for further problem solving. For example, the clinician identifies what the person is feeling and responds back in his/her own words like this: *“So, you're unsure which choice is the best for you.”*

Summarize the person's key comments and reflect them back to the patient. The clinician should condense several key comments made by the patient and provide a summary of the situation. This assists the patient in gaining a broader understanding of the situations rather than getting mired down in the details. The most effective times to do this are midway through and at the end of the conversation. An example of this is, *“You and your family have read the information together, discussed the pros and cons, but are having a hard time making a decision because of the risks.”*

Perception checks ensure that the clinician accurately understands a patient or family member, and may be used as a summary or reflection. They are used to verify that the clinician is interpreting the message correctly. The clinician can say *“So you are saying that you're not ready to make a decision at this time. Am I understanding you correctly?”*

2. Questioning Skills

Open and closed questions are both used, with the emphasis on open questions. Open questions ask for clarification or elaboration and cannot have a yes or no answer. An example would be *“What else would influence you to choose this?”* Closed questions are appropriate if specific information is required such as *“Does your daughter support your decision?”*

Other skills such as summarizing, paraphrasing and reflection of feeling can be used in the questioning process so that the patient doesn't feel pressured by questions.

Verbal tracking, referring back to a topic the patient mentioned earlier, is an important foundational skill (Ivey & Bradford-Ivey). An example of this is the clinician saying, *“You mentioned earlier...”*

3. Information-Giving Skills

Providing information and **providing feedback** are two methods of information giving. The distinction between providing information and giving advice is important. Information giving allows a clinician to supplement the patient's knowledge and helps to keep the conversation patient centered. Giving advice, on the other hand, takes the attention away from the patient's unique goals and values, and places it on those of the clinician.

Providing information can be sharing facts or responding to questions. An example is *“If we look at the evidence, the risk is...”* Providing feedback gives the patient the clinician's view of the patient's reaction. For instance, the clinician can say, *“You seem to understand the facts and value your daughter's advice.”*

Additional Communication Components

Other elements that can impact the effectiveness of a Collaborative Conversation™ include:

- Eye contact
- Body language consistent with message
- Respect

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Appendix C – ICSI Shared Decision-Making Model

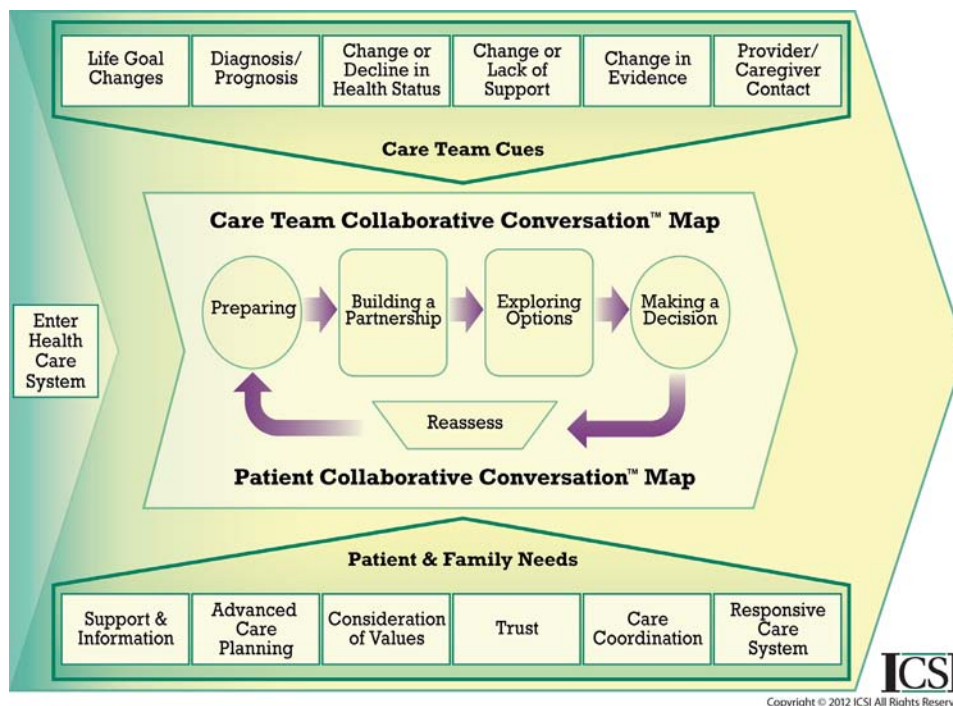
- Empathy
- Partnerships

Self-examination by the clinician involved in the Collaborative Conversation™ can be instructive. Some questions to ask oneself include:

- Do I have a clear understanding of the likely outcomes?
- Do I fully understand the patient's values?
- Have I framed the options in comprehensible ways?
- Have I helped the decision-makers recognize that preferences may change over time?
- Am I willing and able to assist the patient in reaching a decision based on his/her values, even when his/her values and ultimate decision may differ from my values and decisions in similar circumstances?

When to Initiate a Collaborative Conversation™

A Collaborative Conversation™ can support decisions that vary widely in complexity. It can range from a straightforward discussion concerning routine immunizations to the morass of navigating care for a life-limiting illness. Table 1 represents one health care event. This event can be simple like a 12 year-old coming to the clinic for routine immunizations, or something much more complex like an individual receiving a diagnosis of congestive heart failure. In either case, the event is the catalyst that starts the process represented in this table. There are cues for clinicians and patient needs that exert influence on this process. They are described below. The heart of the process is the Collaborative Conversation™. The time the patient spends within this health care event will vary according to the decision complexity and the patient's readiness to make a decision.



Regardless of the decision complexity there are cues applicable to all situations that indicate an opportune time for a Collaborative Conversation™. These cues can occur singularly or in conjunction with other cues.

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Cues for the Care Team to Initiate a Collaborative Conversation™

- **Life goal changes:** Patient's priorities change related to things the patient values such as activities, relationships, possessions, goals and hopes, or things that contribute to the patient's emotional and spiritual well-being.
- **Diagnosis/prognosis changes:** Additional diagnoses, improved or worsening prognosis.
- **Change or decline in health status:** Improving or worsening symptoms, change in performance status or psychological distress.
- **Change or lack of support:** Increase or decrease in caregiver support, change in caregiver, or caregiver status, change in financial standing, difference between patient and family wishes.
- **Change in medical evidence or interpretation of medical evidence:** Clinicians can clarify the change and help the patient understand its impact.
- **Clinician/caregiver contact:** Each contact between the clinician/caregiver and the patient presents an opportunity to reaffirm with the patient that his/her care plan and the care the patient is receiving are consistent with his/her values.

Patients and families have a role to play as decision-making partners, as well. The needs and influencers brought to the process by patients and families impact the decision-making process. These are described below.

Patient and Family Needs within a Collaborative Conversation™

- **Request for support and information:** Decisional conflict is indicated by, among other things, the patient verbalizing uncertainty or concern about undesired outcomes, expressing concern about choice consistency with personal values and/or exhibiting behavior such as wavering, delay, preoccupation, distress or tension. Generational and cultural influencers may act to inhibit the patient from actively participating in care discussions, often patients need to be given “permission” to participate as partners in making decisions about his/her care.

Support resources may include health care professionals, family, friends, support groups, clergy and social workers. When the patient expresses a need for information regarding options and his/her potential outcomes, the patient should understand the key facts about options, risks and benefits, and have realistic expectations. The method and pace with which this information is provided to the patient should be appropriate for the patient's capacity at that moment.

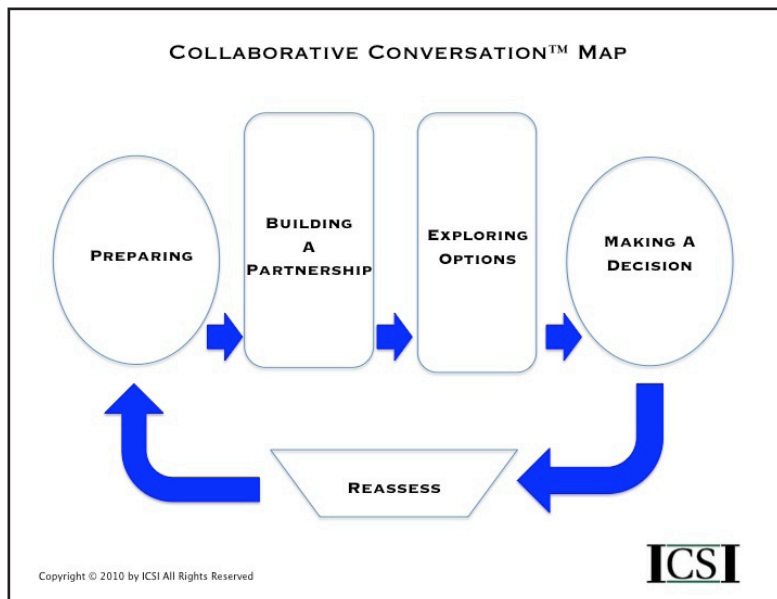
- **Advance Care Planning:** With the diagnosis of a life-limiting illness, conversations around advance care planning open up. This is an opportune time to expand the scope of the conversation to other types of decisions that will need to be made as a consequence of the diagnosis.
- **Consideration of Values:** The personal importance a patient assigns potential outcomes must be respected. If the patient is unclear how to prioritize the preferences, value clarification can be achieved through a Collaborative Conversation™ and by the use of decision aids that detail the benefits and harms of potential outcomes in terms the patient can understand.
- **Trust:** The patient must feel confident that his/her preferences will be communicated and respected by all caregivers.
- **Care Coordination:** Should the patient require care coordination, this is an opportune time to discuss the other types of care-related decisions that need to be made. These decisions will most likely need to be revisited often. Furthermore, the care delivery system must be able to provide coordinated care throughout the continuum of care.

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Appendix C – ICSI Shared Decision-Making Model

- **Responsive Care System:** The care system needs to support the components of patient- and family-centered care so the patient's values and preferences are incorporated into the care he/she receives throughout the care continuum.

The Collaborative Conversation™ Map is the heart of this process. The Collaborative Conversation™ Map can be used as a stand-alone tool that is equally applicable to clinicians and patients as shown in Table 2. Clinicians use the map as a clinical workflow. It helps get the Shared Decision-Making process initiated and provides navigation for the process. Care teams can use the Collaborative Conversation™ Map to document team best practices and to formalize a common lexicon. Organizations can build fields from the Collaborative Conversation™ Map in electronic medical records to encourage process normalization. Patients use the map to prepare for decision-making, to help guide them through the process and to share critical information with their loved ones.



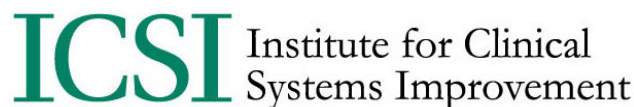
Evaluating the Decision Quality

Adapted from O'Connor, Jacobsen “Decisional Conflict: Supporting People Experiencing Uncertainty about Options Affecting Their Health” [2007].

When the patient and family understand the key facts about the condition and his/her options, a good decision can be made. Additionally, the patient should have realistic expectations about the probable benefits and harms. A good indicator of the decision quality is whether or not the patient follows through with his/her chosen option. There may be implications of the decision on patient's emotional state such as regret or blame, and there may be utilization consequences.

Decision quality can be determined by the extent to which the patient's chosen option best matches his/her values and preferences as revealed through the Collaborative Conversation™ process.

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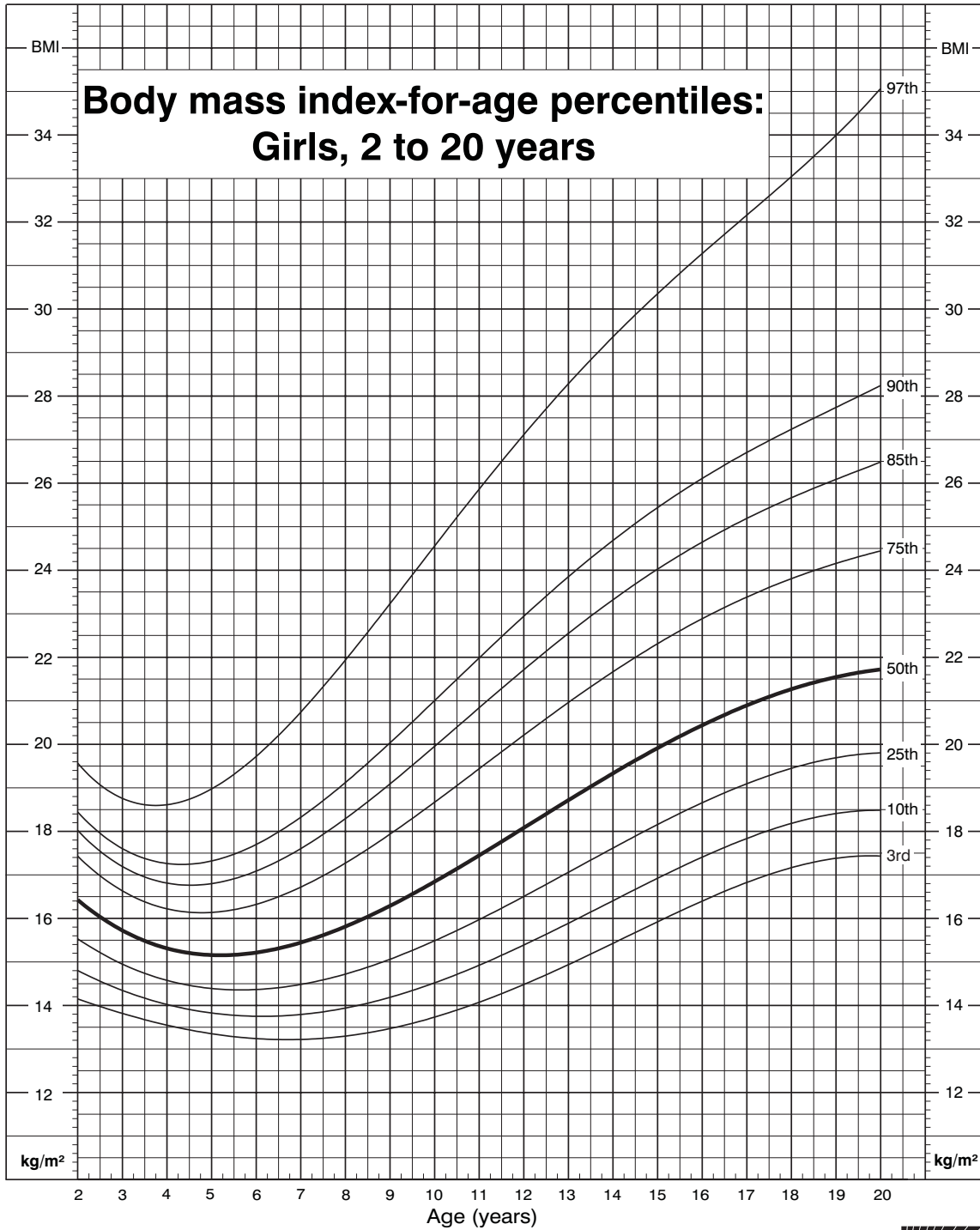
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Appendix D – Body Mass Index-for-Age Percentiles

CDC Growth Charts: United States



Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).



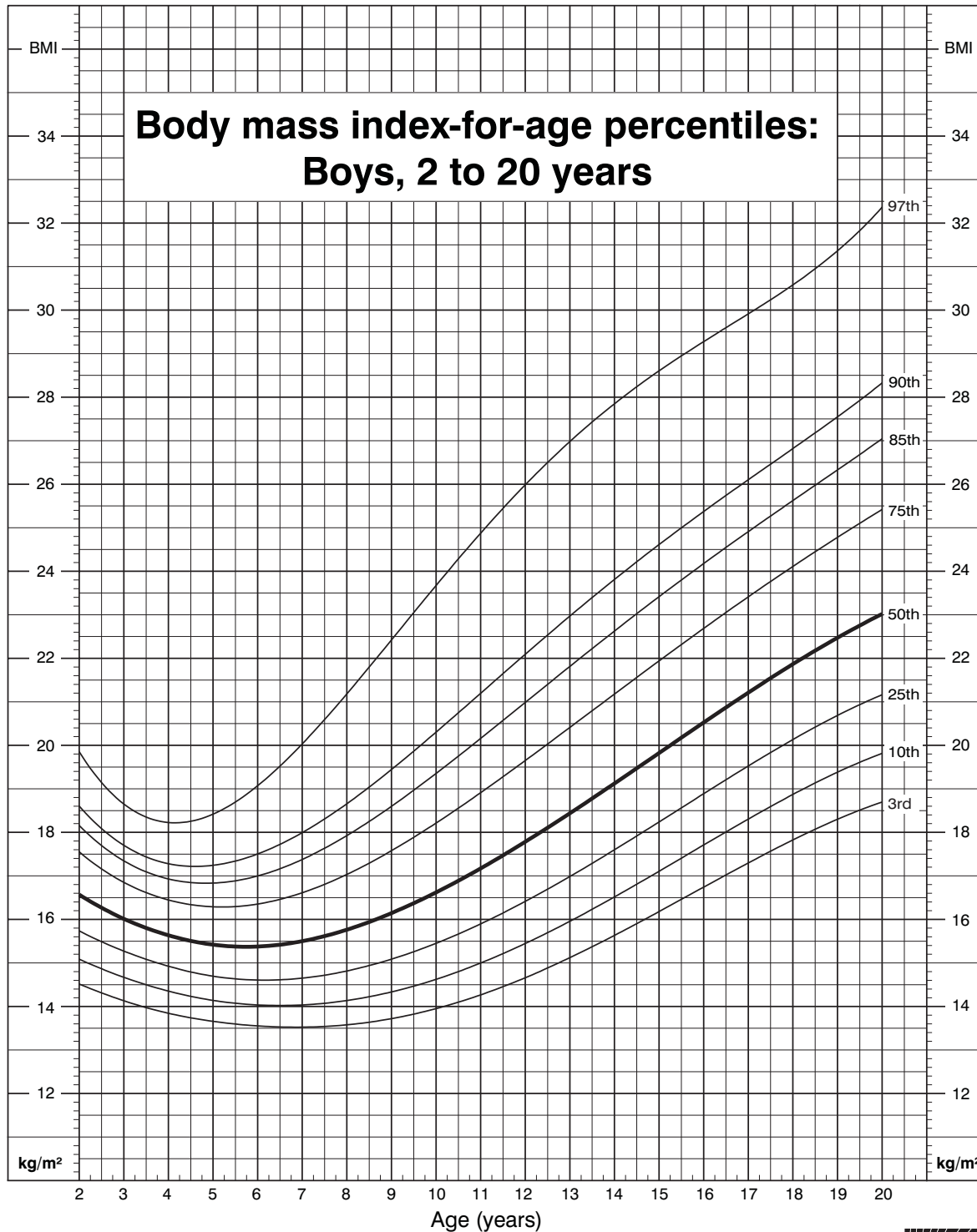
SAFER • HEALTHIER • PEOPLE™

The body mass index for age percentiles for girls 2 -20 can be found at: <http://www.cdc.gov/growthcharts/data/set3/chart%2016.pdf>

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CDC Growth Charts: United States



Published May 30, 2000.
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).



The body mass index for age percentiles for boys 2-20 can be found at: <http://www.cdc.gov/growthcharts/data/set3/chart%2015.pdf>

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Appendix E – Injury Prevention Counseling Messages

Counseling Message: Bicycle Safety

- Reinforce always wearing an approved safety helmet when riding a bicycle. Please check on your state law for helmet recommendations.
- Enhance safety, follow safety rules (look carefully for traffic, signal turns, etc.), avoid riding in heavy motor vehicle traffic, wear light-colored and reflective clothing, and install a light on your bicycle.

Counseling Message: Poisoning

Birth-12 years

- Reinforce having the national poison control phone number readily accessible (1-800-222-1222).
- Use child-resistant containers for medications, toxic substances and matches.
- Dispose of expired or unused portions of medications.
- Syrup of ipecac is no longer recommended in households.

Counseling Message: Burns

Birth-12 years

- Encourage the use of flame-resistant sleepwear.
- Reinforce setting the household hot water heater at or below 120° F.

All individuals

- Install smoke detectors and test them biannually.
- Install carbon monoxide detectors.
- Discuss the use of "911" for fire emergencies.
- Cigarettes used by adults are the leading cause of ignition in fatal house fires; avoid smoking near bedding or upholstery.
- Discuss the fact that residential fires occur more frequently in the winter due to the use of portable heaters, fireplaces and Christmas trees.
- Matches, lighters and smoking materials should be handled safely and shouldn't be available to children.
- Discuss the importance of a family fire escape plan with a predesignated meeting location outside of home.

Counseling Message: Choking

Teach back blows and chest thrusts to parents of infants; teach Heimlich maneuver to parents of children greater than one year of age. Encourage CPR training.

Birth-3 years

- Discuss avoiding foods that children commonly choke on (hot dogs, peanuts, popcorn, hard candy, raw carrots, whole grapes).
- Discuss avoiding other non-food items that children commonly choke on (balloons, age-inappropriate items such as small toys).
- Discuss avoiding eating while walking or running.

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Appendix E – Injury Prevention Counseling Messages

Counseling Message: Falls

Birth-2 years

- Use window and stairway guards/gates to prevent falls from stairways, balconies and windows.
- Discourage walker use.
- Prevent falls from changing tables by never leaving child unattended.

2-6 years

- Assess and control environment to reduce likelihood of falls from stairs, balconies, windows, etc.

Counseling Message: Firearm Safety

13-18 years

- Teach firearm safety (proper handling, hunting practices including wearing orange fluorescent clothing).

All individuals

- Ask about firearms in the home.
- Discuss storing unloaded firearms in a locked place.
- Keep ammunition in a safe/locked place separate from the firearm.

Counseling Message: Water Safety

Never leave children alone near water.

Birth-6 years

- Reinforce never leaving infants or young children alone in a bath or near standing water.
- Install isolation fences around swimming pools.
- Encourage cardiopulmonary resuscitation training.

7-12 years

- Discuss the fact that swimming lessons are not a substitute for adult supervision.
- Encourage cardiopulmonary resuscitation training.

Please see "[Preventive Services That Clinicians and Care Systems *Should* Assess the Need for and Recommend to Each Patient. These Have Value but Less than Those in Level I \(Level II\)](#)," for information on motor vehicle safety counseling.

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ICSI has long had a policy of transparency in declaring potential conflicting and competing interests of all individuals who participate in the development, revision and approval of ICSI guidelines and protocols.

In 2010, the ICSI Conflict of Interest Review Committee was established by the Board of Directors to review all disclosures and make recommendations to the board when steps should be taken to mitigate potential conflicts of interest, including recommendations regarding removal of work group members. This committee has adopted the Institute of Medicine Conflict of Interest standards as outlined in the report, *Clinical Practice Guidelines We Can Trust* (2011).

Where there are work group members with identified potential conflicts, these are disclosed and discussed at the initial work group meeting. These members are expected to recuse themselves from related discussions or authorship of related recommendations, as directed by the Conflict of Interest committee or requested by the work group.

The complete ICSI policy regarding Conflicts of Interest is available at <http://bit.ly/ICSICOI>.

Funding Source

The Institute for Clinical Systems Improvement provided the funding for this guideline revision. ICSI is a not-for-profit, quality improvement organization based in Bloomington, Minnesota. ICSI's work is funded by the annual dues of the member medical groups and five sponsoring health plans in Minnesota and Wisconsin. Individuals on the work group are not paid by ICSI but are supported by their medical group for this work.

ICSI facilitates and coordinates the guideline development and revision process. ICSI, member medical groups and sponsoring health plans review and provide feedback but do not have editorial control over the work group. All recommendations are based on the work group's independent evaluation of the evidence.

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All ICSI documents are available for review during the revision process by member medical groups and sponsors. In addition, all members commit to reviewing specific documents each year. This comprehensive review provides information to the work group for such issues as content update, improving clarity of recommendations, implementation suggestions and more. The specific reviewer comments and the work group responses are available to ICSI members at <http://bit.ly/PrevSvcsKids0912>.

The ICSI Patient Advisory Council meets regularly to respond to any scientific document review requests put forth by ICSI facilitators and work groups. Patient advisors who serve on the council consistently share their experiences and perspectives in either a comprehensive or partial review of a document, and engaging in discussion and answering questions. In alignment with the Institute of Medicine's triple aims, ICSI and its member groups are committed to improving the patient experience when developing health care recommendations.

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Acknowledgements

ICSI Patient Advisory Council

The work group would like to acknowledge the work done by the ICSI Patient Advisory Council in reviewing the Preventive Services for Children and Adolescents and thank them for their feedback on routine preventive services.

Invited Reviewers

During this revision, the following groups reviewed this document. The work group would like to thank them for their comments and feedback.

CentraCare, St. Cloud, MN
Marshfield Clinic, Marshfield, WI
Mayo Clinic, Rochester, MN
South Lake Pediatrics, Minnetonka, MN

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Released in September 2012 for Eighteenth Edition.
The next scheduled revision will occur within 12 months.

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Document History

Preventive Services for Children and Adolescents has had two guidelines merged into its content.

Preventive Counseling and Education

The Preventive Counseling and Education guideline was drafted between January and July 1994, with the first release for implementation in 1995. The last release of the guideline was in June 2004, prior to being merged with the Preventive Services guidelines.

The original scope of this guideline was targeted to all low-risk, asymptomatic children and adults with an emphasis on identifying counseling opportunities. The guideline generally did not address the needs of pregnant women or individuals with chronic disorders. It was intended to be a tool to assist in the prioritization of counseling needs and opportunities.

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Tobacco Use Prevention and Cessation for Infants, Children and Adolescents

The Tobacco Use Prevention and Cessation for Infants, Children and Adolescents guideline was drafted between July and September 1993. The last revision occurred in 2004 during its tenth revision cycle; after this point the content was incorporated into the Preventive Services guideline.

The original scope of the guideline was to define the appropriate interventions in the clinic setting for identification of tobacco use status in infants, children and adolescents, and for provision of counseling and assistance in tobacco use cessation.

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ICSI Document Development and Revision Process

Overview

Since 1993, the Institute for Clinical Systems Improvement (ICSI) has developed more than 60 evidence-based health care documents that support best practices for the prevention, diagnosis, treatment or management of a given symptom, disease or condition for patients.

Audience and Intended Use

The information contained in this ICSI Health Care Guideline is intended primarily for health professionals and other expert audiences.

This ICSI Health Care Guideline should not be construed as medical advice or medical opinion related to any specific facts or circumstances. Patients and families are urged to consult a health care professional regarding their own situation and any specific medical questions they may have. In addition, they should seek assistance from a health care professional in interpreting this ICSI Health Care Guideline and applying it in their individual case.

This ICSI Health Care Guideline is designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition.

Document Development and Revision Process

The development process is based on a number of long-proven approaches and is continually being revised based on changing community standards. The ICSI staff, in consultation with the work group and a medical librarian, conduct a literature search to identify systematic reviews, randomized clinical trials, meta-analysis, other guidelines, regulatory statements and other pertinent literature. This literature is evaluated based on the GRADE methodology by work group members. When needed, an outside methodologist is consulted.

The work group uses this information to develop or revise clinical flows and algorithms, write recommendations, and identify gaps in the literature. The work group gives consideration to the importance of many issues as they develop the guideline. These considerations include the systems of care in our community and how resources vary, the balance between benefits and harms of interventions, patient and community values, the autonomy of clinicians and patients and more. All decisions made by the work group are done using a consensus process.

ICSI's medical group members and sponsors review each guideline as part of the revision process. They provide comment on the scientific content, recommendations, implementation strategies and barriers to implementation. This feedback is used by and responded to by the work group as part of their revision work. Final review and approval of the guideline is done by ICSI's Committee on Evidence-Based Practice. This committee is made up of practicing clinicians and nurses, drawn from ICSI member medical groups.

Implementation Recommendations and Measures

These are provided to assist medical groups and others to implement the recommendations in the guidelines. Where possible, implementation strategies are included that have been formally evaluated and tested. Measures are included that may be used for quality improvement as well as for outcome reporting. When available, regulatory or publicly reported measures are included.

Document Revision Cycle

Scientific documents are revised every 12-24 months as indicated by changes in clinical practice and literature. ICSI staff monitors major peer-reviewed journals every month for the guidelines for which they are responsible. Work group members are also asked to provide any pertinent literature through check-ins with the work group midcycle and annually to determine if there have been changes in the evidence significant enough to warrant document revision earlier than scheduled. This process complements the exhaustive literature search that is done on the subject prior to development of the first version of a guideline.

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