2. ADOLESCENT PREVENTIVE SERVICES

Mark Schuster, M.D., Ph.D.

Because the topic of adolescent preventive services has been considered by several expert panels, we relied on their findings in developing our recommendations. Specifically, we reviewed: (1) the AMA Guidelines for Adolescent Preventive Services (GAPS) (Elster and Kuznets, 1994), (2) the American Academy of Pediatrics (AAP) Guidelines for Health Supervision II (AAP, 1988), (3) Bright Futures (Green, 1994), and (4) the Guide to Clinical Preventive Services (USPSTF, 1989).

This review does not cover every aspect of adolescent preventive services that is recommended by these sources. Rather, we have covered topics that lend themselves to the development of quality indicators and are likely to have broad support from clinicians. Many recommended components of preventive services are the product of expert opinion and have not been evaluated using rigorous research designs. This is particularly true for the frequency and timing of certain aspects of the physical examination, topics for counseling, and tests.

Immunizations and tuberculosis screening are addressed in Chapters 14 and 18, respectively.

GENERAL TOPICS IN ADOLESCENT PREVENTIVE SERVICES

Routine Health Visit

GAPS recommends an annual routine health visit for all adolescents (defined by the AMA as ages 11 to 21). Each of these 11 visits should cover education and counseling; three should include physical examinations (though GAPS recommends certain aspects of the physical examination be done annually, e.g., blood pressure measurement) (Elster and Kuznets, 1994). Bright Futures recommends an annual visit between 11 and 21 years of age, with more frequent visits for adolescents considered at high risk for health and social problems (Green, 1994). In 1995, the American Academy of Pediatrics increased the recommendation of one visit every two years in its Guidelines for Health Supervision II (AAP, 1988) to one visit every year (AAP, 1995). The Guide to Clinical
Preventive Services recommends one visit between 13 and 18 years of age (USPSTF, 1989).

**Guarantee of Confidentiality**

The various guidelines recommend a discussion of the scope and limits of confidential care (AAP, 1989; AAP, 1990; American Academy of Family Physicians [AAFP], 1988; AAFP, 1994; ACOG Technical Bulletin, 1986; Elster and Kuznets, 1994; SAM, 1991; SAM, 1992; USPSTF, 1989). Adolescents want confidential care and say they will be inhibited if it is not offered (Cheng et al., 1993). While this finding is not surprising, we are not aware of any studies that show a negative effect on outcomes if confidentiality is ignored. Confidentiality laws vary by state, so it is difficult to create indicators that are specific to the content of such discussions. However, given the broad support for such discussions, it seems reasonable to expect that clinicians will address the topic, even if only to say that they do not provide confidential care. Discussions about confidentiality may be poorly documented, but they should be documented for the protection of the physician and adolescent.

**Anticipatory Guidance**

Essentially all guidelines for adolescents recommend education and counseling on a variety of topics (AAP, 1988; Elster and Kuznets, 1994; Green, 1994; USPSTF, 1989), though there is not much evidence about the effectiveness of clinician counseling. For sensitive topics (e.g., drug use, sex, contraception), documentation is likely to vary widely. Recommendations on such issues have two components: (a) counseling about risks and prevention and (b) an inquiry into the adolescent's experience with the pertinent topic. While both are typically recommended, many clinicians may not document the latter because of the risk of breaching the adolescent's confidentiality. Therefore, it may only be feasible to expect documentation that the topic was discussed (without expecting documentation that the adolescent had experience with it). Though some clinicians may not routinely document anticipatory guidance (whether the topic is sensitive or not), it seems particularly important to document anticipatory guidance for adolescent patients, who
may seek care erratically, and in managed care settings where patients may not see the same provider at each visit. An expectation that anticipatory guidance be documented may prompt more clinicians to provide it.

SPECIFIC TOPICS IN PREVENTION

Substance Use Screening and Cigarette Use Counseling
Steven Asch, M.D., M.P.H., and Mark Schuster, M.D., Ph.D.

We relied on Chapter 48 of the Guide to Clinical Preventive Services published by the U.S. Preventive Services Task Force (USPSTF, 1989) to construct quality indicators for prevention of smoking and screening for and treatment of cigarette use. When this core reference cited studies to support individual indicators, we have referenced the original source. We also performed narrow MEDLINE literature searches for articles from 1990 to 1995 to update the literature support for the proposed indicators.

Importance

Cigarette Use. Sixteen percent of adolescents smoke, and 22 percent of adolescent males use smokeless tobacco (Elster and Kuznets, 1994). The interval between use of tobacco and development of nicotine addiction is about two years, so there is a window of opportunity after the start of tobacco use for smoking cessation intervention. The long-term consequences of cigarettes and passive smoking include coronary artery disease, lung cancer, and chronic obstructive pulmonary disease. Smoking is responsible for 1 in 6 adult deaths in the United States and is the single most preventable cause of death. The use of smokeless tobacco causes oral cancer, gingivitis, periodontal disease, and other problems. There is evidence that office-based physician counseling can be effective in reducing tobacco use among adults. Community and school-based programs have been found to be effective for adolescents (Elster and Kuznets, 1994).

Alcohol Use. Thirty to 44 percent of high school seniors, 23 to 36 percent of 10th graders, and 10 percent of 8th graders report a recent episode of binge drinking (five or more drinks at one time). Among adolescents 12 to 17 years old, 15 percent have used marijuana, 8
percent have used an inhalant psychoactive substance, 3 to 6 percent have used cocaine, and 3 percent have used a hallucinogen. From 5 to 11 percent of high school students have used anabolic steroids (Elster and Kuznets, 1994).

The leading cause of death in adolescence is motor vehicle crashes, half of which are related to the use of alcohol by adolescent drivers. Alcohol is a factor in 50 percent of homicides, 30 percent of suicides, and 24 percent of fatal pedestrian or bicycle accidents among adolescents.

Inappropriate anabolic steroid use can affect hepatic, gonadal, and psychological function, as well as serum lipids and blood pressure (Elster and Kuznets, 1994).

**Efficacy and/or Effectiveness of Interventions**

**Screening**

There is some evidence that suggests that clinical intervention may be effective in preventing substance use, particularly when the intervention is reinforcing messages provided by teachers, parents, and other adults (Elster and Kuznets, 1994).

GAPS recommends asking adolescents annually about their use of tobacco products, including cigarettes and smokeless tobacco; alcohol; and other abusable substances. It also recommends annual counseling to promote avoidance of tobacco, alcohol, and abusable substances (Elster and Kuznets, 1994). The AAP suggests bringing tobacco, alcohol, and other abusable substances into the history and anticipatory guidance as early as 10 years old and throughout the rest of adolescence, with the level of detail and specificity changing with the age of the adolescent (AAP, 1988). The USPSTF recommends both screening and counseling on these topics during the 13 to 18 year old age period (USPSTF, 1989). Bright Futures recommends that physicians discuss these topics starting with the 11th-year visit (Green, 1994).

Most patients begin smoking as adolescents and tobacco usage has been rising in this age group. As a result, the Surgeon General and the USPSTF have recommended that clinicians counsel their adolescent patients to avoid starting smoking. We found no randomized clinical trials that specifically address clinician-based programs for
adolescents, though the preponderance of controlled trials support the effectiveness of similar school-based programs (Perry, 1987; Perry and Silvis, 1987; Elder et al., 1993; Elders et al., 1994; Sussman et al., 1993; Murray et al., 1992).

Treatment for Cigarette Use

Once a patient has been identified as a smoker, providers have modest but definite impact in helping them quit (Russell et al., 1979; Ewart et al., 1983; Wilson et al., 1982; Wilson et al., 1988). A meta-analysis of 39 controlled trials found that counseling yielded an 8.4 percent (95 percent CI +/- 2.8 percent) reduction in the number of smokers at six months and a 5.8 percent (95 percent CI +/- 2.6 percent) reduction at one year (Kottke et al., 1988). While most of the individual trials did not demonstrate an effect, the 95 percent confidence limits after pooling the subjects exclude zero for both time points (Kottke et al., 1988).

A broad-based program to stop smoking appears to be most effective. The most successful trials were more likely to employ both group and individual counseling, teams of physicians and nonphysicians, multiple reinforcement sessions, and face-to-face advice. Multivariate analysis of the attributes of successful trials showed that the number of interventions was strongly associated with the smoking cessation rate (Table 2.1) (Kottke et al., 1988).

Adding nicotine replacement therapy may increase the success rate of counseling alone by up to one-third, particularly in heavy smokers. A meta-analysis of 14 randomized trials of nicotine gum compared to placebo gum found that more patients who used nicotine gum had quit smoking at 6 months (27 percent vs. 18 percent, n=734) and 12 months (23 percent vs. 13 percent), although this study occurred in the setting of specialized smoking cessation clinics (Lam et al., 1987). The meta-analysis found lower rates of effectiveness when the treatment occurred in general medical clinics, however. Placebo controlled trials in general practice did not demonstrate an effect, though uncontrolled trials show that nicotine replacement had a modest effect at 6 months.

\[^{1}\text{From the Women's Quality of Care Review.}\]
(17 percent vs. 13 percent; n=2238) and 12 months (9 vs. 5 percent) in general practice. Given its questionable efficacy in the setting of general practice, we propose that nicotine replacement be prescribed as second line therapy after counseling alone has failed (Lam et al., 1987).

There are several contraindications for nicotine replacement therapy. Nicotine replacement is contraindicated in the settings of pregnancy and nursing because it crosses the placenta and is excreted in the breast milk. Patients with temporomandibular joint disease may experience symptomatic worsening. If the patient continues to smoke, the potential toxicities of nicotine replacement become much more likely. Nicotine gum may not be as effective in the absence of counseling; all the controlled studies combined gum with some form of advice (Lam et al., 1987; Oster et al., 1986; Russell et al., 1983; Benowitz, 1988; Wilson et al., 1988; Fagerström, 1984).

Follow-up

The above-mentioned meta-analysis of 39 clinical trials of smoking cessation counseling showed that one of the common attributes of successful programs is reinforcement through follow-up appointments. Both the number of subject contacts with the program and the number of months duration of the program were positively correlated with the cessation rate (Table 2.1). We propose that the medical record should indicate a plan for such reinforcement either by adding tobacco abuse to the patient’s problem list or through addressing the problem during at least one subsequent visit.
Table 2.1
Descriptors for Interventions (Continuous Variables) Reporting Results
12 Months After Initiation of Intervention

<table>
<thead>
<tr>
<th>Descriptors</th>
<th>Range</th>
<th>Mean ± SD</th>
<th>Correlation With Cessation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of intervention modalities</td>
<td>1-6</td>
<td>2.1 ± 0.9</td>
<td>.48*</td>
</tr>
<tr>
<td>Participant drop-out rate</td>
<td>0%-51%</td>
<td>13.8% ± 12.0%</td>
<td>.05</td>
</tr>
<tr>
<td>No. of subject contacts with program</td>
<td>1-15</td>
<td>3.8 ± 4.6</td>
<td>.38*</td>
</tr>
<tr>
<td>Months subject in contact with program</td>
<td>0-12</td>
<td>1.1 ± 2.1</td>
<td>.55*</td>
</tr>
<tr>
<td>No. of participants</td>
<td>32-8189</td>
<td>608.2 ± 948.6</td>
<td>.20</td>
</tr>
<tr>
<td>No. of times smoking status was assessed</td>
<td>1-18</td>
<td>4.0 ± 4.5</td>
<td>.13</td>
</tr>
<tr>
<td>Months from first contact to last verification</td>
<td>0-12</td>
<td>7.6 ± 11.8</td>
<td>.16</td>
</tr>
<tr>
<td>No. of times cessation claims were validated</td>
<td>0-6</td>
<td>0.9 ± 1.2</td>
<td>.09</td>
</tr>
<tr>
<td>Subjective rating of study quality</td>
<td>0-5</td>
<td>3.2 ± 1.0</td>
<td>-.23</td>
</tr>
</tbody>
</table>

*p<.01.
Source: Kottke et al., 1988.

Sexually Transmitted Diseases and HIV Prevention
Eve Kerr, M.D., M.P.H., and Mark Schuster, M.D., Ph.D.

The primary references for the review done for adults were the Guide to Clinical Preventive Services of the U.S. Preventive Services Task Force and the Healthy People 2000 National Health Promotion and Disease Prevention Objectives. For adolescents, we also reviewed GAPS (Elster and Kuznets, 1994) and guidelines from various specialty societies (AAP et al., 1989; AAP, 1990; AAFP, 1988; AAFP, 1994; ACOG Technical Bulletin, 1986; SAM, 1991; SAM, 1992).

Importance
An estimated 1-1.5 million people are infected with the human immunodeficiency (HIV) virus (USPSTF, 1989). Within 10 years of infection with HIV, approximately 50 percent of persons develop AIDS and another 40 percent or more develop other clinical illnesses associated with HIV infection (USDHHS, 1991). Persons with AIDS can develop severe opportunistic infections, malignancies, and multiple-system medical complications. In a study performed before the licensure of AZT, the
five-year survival rate was only 15 percent (USPSTF, 1989). The economic consequences of AIDS are enormous; it is estimated that the annual cost of treating AIDS is $2.2 billion (USPSTF, 1989).

Almost 12 million cases of sexually transmitted diseases occur annually (USDHHS, 1991). Each year there are about 3-4 million cases of chlamydia, 2 million cases of gonorrhea, over 35,000 cases of primary and secondary syphilis, and 270,000 primary episodes of genital herpes (USPSTF, 1989). These diseases are associated with considerable morbidity. Chlamydia and gonorrhea produce mucopurulent cervicitis and pelvic inflammatory disease (PID) in women. PID is an important risk factor for ectopic pregnancy and infertility; approximately 1 million cases of PID are reported annually in the United States (USPSTF, 1989). Syphilis produces ulcers of the genitalia, pharynx, and rectum and can progress to secondary and tertiary syphilis if left untreated (USPSTF, 1989). Genital herpes causes painful vesicular and ulcerative lesions and recurrent infections due to latent infection (USPSTF, 1989). The total societal costs of STDs is estimated to be $3.5 billion annually (USDHHS, 1991).

Over 50 percent of females and over 60 percent of males ages 15 to 19 years have had sexual intercourse. Over one million adolescents conceive each year, with 40 percent having elective abortions. Adolescents account for an estimated 3 to 6 million cases of sexually transmitted diseases each year. It is not known whether clinical counseling has an impact, though school-based interventions have been found to effect behavior change (Elster and Kuznets, 1994).

**Efficacy and/or Effectiveness of Interventions**

The most efficacious means of reducing the risk of acquiring AIDS and other STDs through sexual contact is either abstinence from sexual relations or maintenance of a mutually monogamous sexual relationship with an uninfected partner (USPSTF, 1989). In addition, the use of latex condoms and spermicides may reduce the risk of infection with HIV or other STDs (USPSTF, 1989). Intravenous drug use and unsterilized needles should be avoided to reduce the risk of HIV infection. The prevalence of HIV infection in heterosexual partners of persons in high-risk categories may be as high as 11 percent and as many as 60 percent
of heterosexual partners of HIV-infected individuals may be seropositive (USPSTF, 1989).

The primary purposes of HIV and STD counseling are to prevent further spread of infection (USDHHS, 1991). Physicians can play an important role in preventing infection in asymptomatic persons by reinforcing and clarifying educational messages, providing literature and community resource references for additional information, and dispelling misconceptions about unproved modes of transmission (USPSTF, 1989). Although it has not been proven that physicians can change the sexual behavior of patients, there is evidence that the frequency of high-risk behaviors can be reduced in response to information provided through public education (USPSTF, 1989). A survey of primary care physicians found that only 10 percent asked new patients questions specific enough to identify those at risk of exposure to HIV (USPSTF, 1989).

GAPS recommends annual counseling about sexual risk and prevention. It also recommends an annual inquiry about involvement in sexual behaviors that may result in unintended pregnancy and STDs, including HIV infection (Elster and Kuznets, 1994). Bright Futures recommends providing age-appropriate sexuality education starting in childhood and asking the child about his/her own sexual experiences starting with the 10 year old visit (though it includes vague questions that might prompt a response about sexual activity or sexual abuse at an earlier age) (Green, 1994). The USPSTF recommends screening of sexual practices and counseling about them between ages 13 and 18 (USPSTF, 1989). Other guidelines also generally recommend taking a sexual history and providing counseling about preventing sexually transmitted diseases and pregnancy, though the recommendations do not specify the frequency (AAP et al., 1989; AAP, 1990; AAFP, 1988; AAFP, 1993; ACOG Technical Bulletin, 1986; SAM, 1991; SAM, 1992).

The indicators require documentation of counseling about sexual activity. If a sexual history is recorded, it will serve as presumptive evidence that counseling was provided.

The need to protect confidentiality raises troubling issues both for policies for recording information in medical records and for the
development of quality of care indicators. For example, the USPSTF (1989) recommends a Pap smear every 1 to 3 years for sexually-active females between the ages of 13 and 18. However, if the adolescent's positive history of vaginal intercourse is not recorded in the chart, then the provider who sees her at the next visit may not know to obtain a Pap smear (unless a prior Pap smear result appears in the chart), making it difficult to assess whether the adolescent is receiving quality care (i.e., whether she needs and receives a Pap smear). The same applies to testing for STDs, for which GAPS recommends annual screening of sexually active adolescents.

Injury Prevention and Seat Belt Use Counseling
Lisa Schmidt, M.P.H.

The primary references for this review were the Guide to Clinical Preventive Services of the U.S. Preventive Services Task Force and the Healthy People 2000 National Health Promotion and Disease Prevention Objectives. The major focus of this section will be on injury prevention through seat belt use counseling.

Importance

Almost 70 percent of deaths among 10- to 19-year-olds are due to injuries, and 70 percent of these deaths are from unintentional injuries (Elster and Kuznets, 1994).

Injuries are the fourth leading cause of death in the United States and the leading cause of death in persons under age 45. Motor vehicle injuries account for about one-half of these deaths (USPSTF, 1989). In 1986, nearly 48,000 Americans died in motor vehicle crashes, and each year several million suffer nonfatal injuries (USPSTF, 1989). Although males and persons aged 15-24 account for one-third of all deaths from motor vehicle accidents (MVA), a significant number of women and children are killed or injured in MVAs each year. Many of these deaths and injuries are preventable with use of a safety restraint. However, only 46 percent of Americans used seat belts in 1988, up from 13 percent in 1978 (USPSTF, 1989).

Efficacy and/or Effectiveness of Interventions
The effectiveness of safety belts has been demonstrated in a variety of study designs that include laboratory experiments (using human volunteers, cadavers, and anthropomorphic crash dummies), post-crash comparisons of injuries sustained by restrained and unrestrained occupants, and post-crash judgments by crash analysts regarding the probable effects of restraints had they been used (USPSTF, 1989). It has been estimated on the basis of such evidence that the proper use of lap and shoulder belts can decrease the risk of moderate to serious injury to front seat occupants by 45 to 55 percent and can reduce crash mortality by 40 to 50 percent (USPSTF, 1989). When brought to the hospital, crash victims who are wearing safety belts at the time of the crash have less severe injuries, are less likely to require admission, and have lower hospital charges (USPSTF, 1989).

The USPSTF recommends that clinicians regularly urge their patients to use safety belts whenever driving or riding in an automobile. In addition, they should be counseled regarding the dangers of operating a motor vehicle while under the influence of alcohol or other drugs, as well as on the risks of riding in a vehicle operated by someone who is under the influence of these substances (USPSTF, 1989). A number of other organizations have issued recommendations on physician counseling of patients on seat belt use, including the American Medical Association, the American College of Physicians, the American Academy of Family Physicians and the National Highway Traffic Safety Administration (USPSTF, 1989). In addition, the American College of Obstetricians and Gynecologists has issued recommendations for the use of passenger restraints by pregnant women (USPSTF, 1989). Lastly, the Healthy People 2000 objectives include a risk-reduction objective to increase the use of occupant protection systems to at least 85 percent of motor vehicle occupants (Healthy People 2000, 1991).

It is not known, however, how effectively clinicians can alter behaviors regarding seat belt use. In one questionnaire survey, patients claimed to have increased their use of safety belts as a result of a brief statement by their physician during a routine office visit, but the study lacked controls and the patients were carefully selected (USPSTF, 1989). Other measures that have been proven successful in
motivating people to use safety belts, such as community educational programs and intensive psychological strategies, may not be generalizable to the clinical practice setting (USPSTF, 1989).

GAPS recommends annual health guidance to promote reduction of intentional and unintentional injuries (e.g., not using alcohol or other substances while driving; using seat belts, helmets, etc.) (Elster and Kuznets, 1994). The AAP recommends anticipatory guidance on bicycle and vehicle safety, wearing a seat belt, and not riding in a car with a driver who has been using alcohol or drugs (AAP, 1988). Bright Futures recommends anticipatory guidance for a long list of injury and violence prevention throughout adolescence (Green, 1994). The USPSTF recommends addressing injury prevention with 13- to 18-year-olds (USPSTF, 1988).

Hyperlipidemia and Hypertension Screening
Steven Asch, M.D., M.P.H., and Mark Schuster, M.D., Ph.D.

Importance
Identifying high blood pressure in asymptomatic patients allows modifications of an important risk factor for coronary artery disease, the leading cause of death in the United States (Reed, 1987). The MRFIT trial found that patients with a cholesterol in the highest quintile (>246 mg/dl) were 3.4 times as likely to die from coronary heart disease as those in the lowest quartile (<181) (Martin et al., 1986). Several other major observational cohorts including Framingham and Whitehall have demonstrated the same risk relationship between cholesterol (particularly low density lipoprotein subcomponent and cardiovascular mortality) and most have found a synergistic relationship between cholesterol and other cardiovascular risk factors like hypertension and smoking (Littenberg et al., in Eddy, 1991; Rose and Shipley, 1986; and Kannel et al., 1971). The relationship between serum cholesterol and total mortality appears to be J-shaped; those with very low cholesterol die more frequently from cancer. Most experts believe that the higher mortality rates in patients with very low cholesterol derive from occult malignancies or other serious illnesses rather than low cholesterol inducing those conditions (Littenberg et al., in Eddy, 1991). The relationship between hypertriglyceridemia and coronary artery disease is
less certain, but recent studies tend to confirm the suspected relationship (AHA, 1993). The American Heart Association estimates that cardiovascular disease costs the US about $80 billion each year (AHA, 1993).

**Efficacy and/or Effectiveness of Interventions**

The tests for total cholesterol, HDL cholesterol and LDL cholesterol, and triglycerides are inexpensive and safe. The accuracy of the test varies somewhat by laboratory. The American College of Pathology found a range of 197 to 379 mg/dl in 5000 samples with a known concentration of 262 mg/dl mailed to labs throughout the country (Laboratory Standardization Panel, 1988). The same study found similar problems with the measurement of triglycerides, HDL and LDL. Serum cholesterol varies somewhat with recent dietary fat intake. So do serum triglycerides, which also vary greatly with a number of other noncardiac conditions including liver disease, pancreatitis and hyperthyroidism. Despite this, there is no strong evidence that fasting lipids are any more predictive of coronary artery disease than nonfasting lipids. Perhaps more importantly for the current study, cholesterol measurements in younger patients are highly predictive of elevations later in life (Gillum et al., 1982). Like in hypertension, while the screening test itself poses little risk to the patient’s health, incorrectly labeling a patient as having hyperlipidemia may impose some risk of unnecessary side effects of pharmacologic therapy. The subgroup of patients with the highest mortality are those with familial hyperlipidemia (National Cholesterol Education Program, 1991).

About 1 percent of adolescents have sustained hypertension, defined as a consistent blood pressure (BP) over the 95th percentile for age and gender. Even mild hypertension has subtle cardiovascular effects during adolescence, and hypertension is one of the major preventable risk factors that contribute to the development of cardiovascular disease (Elster and Kuznets, 1994).

There is evidence that blood pressure can be reduced in adolescents with hypertension and there is some evidence that this reduction will decrease future cardiovascular disease. Effective nonpharmacologic treatment includes weight reduction for obese adolescents, physical
exercise, and dietary modification. Antihypertensive medications are effective in adolescents with hypertension unresponsive to other treatments. Some adolescents will have treatable underlying conditions causing their hypertension, such as renal or cardiac disease (Elster and Kuznets, 1994).

The National Heart, Lung, and Blood Institute (NHLBI) Second Task Force on Blood Pressure Control in Children recommends an annual screen for hypertension among adolescents, and GAPS incorporates this recommendation (Elster and Kuznets, 1994). Bright Futures also recommends annual blood pressure screening (Green, 1994). The AAP recommends the blood pressure be checked at each recommended biannual adolescent visit (AAP, 1988). Annual measurement of blood pressure would be difficult to implement given that an annual clinical visit has not become part of routine care for adolescents. However, given the inconsistency with which adolescents currently visit physicians, it is reasonable to expect documentation of blood pressure at each well visit or at least once a year if visits occur more than once a year.

GAPS recommends that adolescents with either systolic or diastolic BP at or above the 90th percentile for gender and age have BP readings repeated at three different times within one month under similar physical conditions to confirm baseline values. It also recommends that adolescents with baseline BP values greater than the 95th percentile have a complete evaluation. Adolescents with BP values between the 90th and 95th percentiles should be assessed for obesity and have their BP monitored every six months (Elster and Kuznets, 1994).

Cervical Cancer Screening
Deidre Gifford, M.D.

The following guidelines are based primarily on the US Preventive Services Task Force’s review of “Screening for Cervical Cancer” (USPSTF, 1989). This document addresses the questions of which populations should be screened and at what interval, but does not address follow-up of abnormal testing. In addition, we performed a review of the English language literature between 1990 and 1995. Articles were obtained using

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1Originally prepared for the Women’s Quality of Care Panel.
a MEDLINE search with the search terms cervix dysplasia, cervix neoplasms, and vaginal smears.

**Importance**

There are approximately 13,000 new cases of cervical cancer diagnosed each year in the United States, and about 7,000 deaths annually from the disease (CDC, 1992a). The annual incidence of invasive cervical cancer is estimated to be 20 per 100,000, and the lifetime probability of developing cervical cancer was estimated in 1985 to be 0.7 percent (Eddy, 1990). Five-year survival for women with advanced disease is about 40 percent, whereas it is about 90 percent for women with localized cancer (USPSTF, 1989). Cervical cancer is a good candidate for screening programs because it has a long preinvasive stage during which the disease can be detected and cured.

**Effectiveness of Intervention**

The Pap smear is the primary method of screening for cervical cancer. Pap smears can detect early cell changes which are precursors to invasive disease. Women in whom such abnormalities are detected can then have further diagnostic testing and treatment with interventions such as colposcopy and biopsy, cervical conization, and local excision, which can prevent further progression of the disease.

Evidence of the effectiveness of screening programs comes from observational studies showing decreases in cervical cancer mortality following the introduction of population screening programs. Such decreases have been observed in the United States and Canada, as well as in several European countries (USPSTF, 1989). For example, data from Iceland demonstrated a rising cervical cancer mortality during the 1960s. Screening was introduced in 1964, and by 1970 the annual mortality rate began to decline. By 1974 it had fallen significantly, decreasing from 23 per 100,000 in 1965-1969 to about 15 per 100,000 in 1970-74 (Johannesson et al., 1978). Further evidence comes from Canada, where the reduction in cervical cancer mortality has been noted to correlate with the proportion of the population screened with Pap tests (Eddy, 1990). In addition to this evidence, several case control studies have noted a marked decrease in risk of cervical cancer in women
screened with Pap smears when compared to unscreened women. Such studies indicate that screening for cervical cancer with Pap smears is highly effective, decreasing the occurrence of invasive cancer by 60-90 percent (Eddy, 1990).

The effectiveness of cervical cancer screening appears to increase with decreasing screening intervals. This evidence also comes from case control studies, which demonstrated decreased relative risks of invasive disease in women with shorter screening intervals (Eddy, 1990). However, there is also evidence that annual screening may produce only a minimally lower risk of invasive disease than screening every two to three years (USPSTF, 1989; Eddy, 1990). According to one study of eight cervical cancer screening programs in Europe and Canada, the incidence of cervical cancer can be reduced by 64.1 percent with a screening interval of ten years, by 83.6 percent with a five-year interval, and by 90.8 percent, 92.5 percent and 93.5 percent with intervals of three, two and one years, respectively (IARC Working Group, 1986).

Several important risk factors have been identified for cervical cancer (Eddy, 1990). These include:

1) race/ethnicity, with blacks and Hispanics having a two-fold increased risk;
2) early age at first sexual intercourse;
3) number of sexual partners;
4) smoking;
5) human immunodeficiency virus (HIV) infection; and
6) human papillomavirus (HPV) infection.

There is also some evidence that long-term use of oral contraceptives may predispose a woman to cervical neoplasia. There has been debate in the literature about whether or not women with such risk factors should be screened more frequently than the general population of women. Published recommendations leave room for physician discretion in screening such women. A consensus recommendation has been adopted by the American Cancer Society, the National Cancer Institute, the American College of Obstetricians and Gynecologists, the American Medical Association, the American Nurses Association, the American Academy of
Family Physicians and the American Medical Women’s Association (Fink, 1988). This guideline recommends annual Pap smears for all women who are or have been sexually active, or who are at least 18 years of age. After three normal annual smears, and if recommended by the physician, less frequent testing is permitted. The U.S. Preventive Services Task Force (1989) makes similar recommendations about the onset of testing and about annual testing until three normal tests have been obtained. They add that “...pap tests are appropriately performed at an interval of one to three years, to be recommended by the physician on the basis of risk factors (e.g., early onset of sexual intercourse, history of multiple sexual partners, low socioeconomic status). Women who have never been sexually active or who have had a total hysterectomy for benign indications with previously normal screening do not need regular Pap smears because they are not at risk for cervical cancer.

Treatment and Follow-up

Although there is generally less consensus about appropriate treatment and follow-up of abnormal pap smears than there is about their effectiveness as a screening technique, reductions in cervical cancer mortality are dependent on follow-up and treatment of women who have positive screening exams.

The classification of abnormal smears is variable, with different systems for reporting abnormalities (Table 2.2).
Table 2.2

Cytopathology Reporting Systems for Pap Smears

<table>
<thead>
<tr>
<th>Class</th>
<th>World Health Organization System</th>
<th>Intraepithelial Neoplasia System</th>
<th>Bethesda System</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Normal</td>
<td>Normal</td>
<td>Within normal limits</td>
</tr>
<tr>
<td>II</td>
<td>Inflammation</td>
<td>Other Infection</td>
<td>Reactive and reparative</td>
</tr>
<tr>
<td>III</td>
<td>Dysplasia</td>
<td>Squamous intraepithelial lesions</td>
<td>CIN-1: Low grade</td>
</tr>
<tr>
<td></td>
<td>Mild</td>
<td>CIN-2: Low grade</td>
<td>CIN-3: High grade</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>CIN-2: Low grade</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>CIN-3: High grade</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Carcinoma in situ</td>
<td>Invasive squamous cell carcinoma</td>
<td>Squamous cell carcinoma</td>
</tr>
<tr>
<td>V</td>
<td>Invasive squamous cell carcinoma</td>
<td>Adenocarcinoma</td>
<td>Adenocarcinoma</td>
</tr>
</tbody>
</table>

Source: Miller et al., 1992

The Bethesda system was introduced to replace the previous Pap classifications and to facilitate precise communication between cytopathologists and clinicians. There is not universal agreement that it is superior to the CIN designations (Kurman et al., 1991), nor any evidence that it has been widely adopted.

Recommendations for follow-up of abnormal smears have been summarized by the report of a Canadian National workshop on screening for cancer of the cervix (Miller et al., 1991). First, they stress that screening recommendations (as summarized above) apply only to women with normal screening exams, and that women with abnormal smears should be screened and treated differently. This group recommends that women with so-called “benign atypia,” mild dysplasia (CIN I, low grade SIL) or HPV infection without dysplasia should be rescreened at intervals of 6 to 12 months, and referred for colposcopy if the abnormality persists at 24 months past the original smear. This is based on the finding that many of these lesions will regress spontaneously without intervention (Montz et al., 1992); however, some have argued that the inconvenience, distress, and possibly the cost of this strategy are excessive, and that all women with abnormal smears should be referred immediately for...
colposcopic evaluation (Soutter, 1992; Wright et al., 1995). ACOG suggests that women with these low grade lesions may either be followed at six-month intervals or referred for colposcopy. They recommend colposcopic evaluation eventually for all women with “persistent” lesions.

There is not disagreement about management of women with more dysplastic lesions on pap smear. Women with Pap smears read as “moderate dysplasia,” “severe dysplasia,” “carcinoma in-situ,” CIN II or greater, high grade squamous intraepithelial lesions, squamous cell carcinoma or adenocarcinoma should be referred for colposcopic evaluation. Further, the presence of a visible cervical lesion, even with a normal Pap smear, requires colposcopy because of the possibility of a false negative screening test (Miller et al., 1991; ACOG, 1993).

**Eating Disorders**

*Mark Schuster, M.D., Ph.D.*

Anorexia is estimated to occur in 0.5 percent of adolescents and is most common among white females. Bulimia is estimated to occur in 2 to 20 percent of females and 1 to 5 percent of males. Among adolescents, obesity is estimated to occur in about 20 percent of white males, 13 percent of black males, 26 percent of white females, and 25 percent of black females; excessive obesity is estimated to occur in 8, 5, 11, and 12 percent of these groups (USDHHS, 1991). In addition to discussing dietary patterns and satisfaction with weight, following weight and body mass index (BMI) are the screening tools to use for early signs of eating disorders. The BMI is also useful in screening for obesity (Elster and Kuznets, 1994).

GAPS recommends annual measurement of weight and height (Elster and Kuznets, 1994). The USPSTF recommends weight and height be measured between ages 13 and 18 but does not state how often (USPSTF, 1989). The AAP recommends height and weight be checked at each recommended biannual adolescent visit (AAP, 1988). Based on these recommendations, it is reasonable to expect weight and height to be measured at every visit or once a year, whichever occurs less often. While it would be ideal for the BMI to be recorded for each adolescent, it is certainly unnecessary for the many adolescents who are visibly neither too thin nor obese or
who are visibly much too thin or obese. Therefore, the BMI will not be incorporated into an indicator.
RECOMMENDED QUALITY INDICATORS FOR PREVENTIVE SERVICES FOR ADOLESCENTS

The following criteria apply to adolescents ages 13 to 18.

Screening

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Quality of evidence</th>
<th>Literature</th>
<th>Benefits</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Between the ages of 13 and 18 years, all adolescents should have at least one clinician visit.</td>
<td>III</td>
<td>USPSTF, 1989</td>
<td>To detect treatable health problems (e.g., STDs, hypertension).</td>
<td>There is no consensus among experts regarding the frequency of well visits for adolescents. The least restrictive recommendation was selected.</td>
</tr>
<tr>
<td>2. Confidentiality should be discussed and documented by age 14 or at the first visit afterwards.</td>
<td>III</td>
<td>Elster and Kuznets, 1994; USPSTF, 1989</td>
<td>To prevent problems related to sensitive topics (e.g., STDs, illicit substance use).</td>
<td>An age cut-off is not described in the literature.</td>
</tr>
<tr>
<td>3. Documentation of discussion of substance use (tobacco, alcohol, marijuana, other illicit drugs, anabolic steroids) or of the adolescent’s history should occur by age 14 or the first well visit afterwards.</td>
<td>III</td>
<td>AAP, 1988; Elster and Kuznets, 1994; Green, 1994; USPSTF, 1989</td>
<td>To prevent and reduce substance use. To treat addiction.</td>
<td>There is limited evidence that clinical interventions reduce risk behaviors.</td>
</tr>
<tr>
<td>4. Documentation of discussion of sexual activity and risk reduction or the adolescent’s sexual history should occur by age 14 or the first well visit afterwards.</td>
<td>III</td>
<td>AAP, 1988; Elster and Kuznets, 1994; Green, 1994; USPSTF, 1989</td>
<td>To prevent and treat STDs, to prevent unwanted pregnancies, and to detect pregnancies.</td>
<td>There is limited evidence that clinical interventions reduce risk behaviors.</td>
</tr>
<tr>
<td>5. Patients for whom the medical records indicate that they have ever been sexually active should be asked the following questions: if they currently have a single sexual partner; if they have had more than 2 sexual partners in the past 6 months; and if they have had a history of any STDs.</td>
<td>III</td>
<td>USPSTF, 1989</td>
<td>Prevent HIV; Prevent STDs.**</td>
<td>Non-monogamous relationships, more than 2 sexual partners in the past 6 months and past history of STDs are risk factors for HIV and/or other STDs.</td>
</tr>
<tr>
<td>6. Patients for whom the medical records indicate that they are sexually active and not in a monogamous relationship, have had more than 2 sexual partners in the past six months, have a history of STDs, or have used intravenous drugs, should be counseled regarding the prevention and transmission of HIV and other STDs.</td>
<td>III</td>
<td>USPSTF, 1989</td>
<td>Prevent HIV; Prevent STDs.**</td>
<td>Persons with risk factors for HIV or other STDs should receive appropriate counseling</td>
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<tr>
<td><strong>Injury Prevention</strong></td>
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<tr>
<td>7. Documentation of discussion of injury prevention should occur by age 14 or the first well child visit afterwards.</td>
<td>III</td>
<td>AAP, 1988; Elster and Kuznets, 1994; Green, 1994; USPSTF, 1989</td>
<td>To prevent serious morbidity or death from unintentional injuries.</td>
<td>There is limited evidence that clinical interventions reduce risk behaviors.</td>
</tr>
<tr>
<td>8. Patients should receive counseling regarding the use of seat belts on at least one occasion.</td>
<td>III</td>
<td>USPSTF, 1989</td>
<td>Prevention of motor vehicle injuries and fatalities.</td>
<td>In practice, it is not known how effectively physicians can alter this behavior.</td>
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<tr>
<th><strong>Hyperlipidemia Screening</strong></th>
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<tr>
<td>9. Adolescents whose parents have a serum cholesterol level greater than 240 mg/dl should receive a total blood cholesterol screen.</td>
<td>III</td>
<td>Elster and Kuznets, 1994</td>
<td>Prevention of coronary heart disease.</td>
</tr>
<tr>
<td>10. Documentation of parental history of hypercholesteremia should occur by 14 years of age or the first well visit afterwards.</td>
<td>III</td>
<td>Elster and Kuznets, 1994</td>
<td>Prevention of coronary heart disease.</td>
</tr>
<tr>
<td>11. Documentation of parents’ or grandparents’ history of coronary artery disease (CAD), peripheral vascular disease (PVD), cerebrovascular disease, or sudden cardiac death at age 55 or younger should occur by 14 years of age or the first well visit afterwards.</td>
<td>III</td>
<td>Elster and Kuznets, 1994</td>
<td>Prevention of CAD, PVD, and cerebrovascular disease.</td>
</tr>
<tr>
<td>12. Adolescents whose parents or grandparents have a positive history of CAD, PVD, cerebrovascular disease or sudden cardiac death at age 55 or younger should have a fasting lipoprotein analysis.</td>
<td>III</td>
<td>Elster and Kuznets, 1994</td>
<td>Prevention of CAD, PVD, and cerebrovascular disease.</td>
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<tr>
<th><strong>Hypertension Screening</strong></th>
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<tr>
<td>13. Blood pressure should be measured at least once a year or at every visit, if visits occur less frequently than once a year.</td>
<td>III</td>
<td>Elster and Kuznets, 1994</td>
<td>To treat hypertension (and in some cases underlying causes of hypertension).</td>
</tr>
<tr>
<td>14. If a patient has 3 or more blood pressure readings above the 95th percentile for age, a full work-up for hypertension should be conducted.</td>
<td>III</td>
<td>Elster and Kuznets, 1994</td>
<td>To treat hypertension and prevent future cardiovascular disease.</td>
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<tr>
<th><strong>Cervical Cancer Screening</strong></th>
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<tr>
<td>15. The medical record should contain the date and result of the last Pap smear for all females under 18 years of age, for whom there is documentation of a history of vaginal intercourse, if it has been at least one year since they first had vaginal intercourse.</td>
<td>II-2</td>
<td>USPSTF, 1989</td>
<td>Prevent cervical cancer morbidity and mortality. Prevent cervical cancer.</td>
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<tr>
<td>16. All females under 18 years of age, for whom there is documentation of a history of vaginal intercourse, who have not had 3 consecutive normal smears and who have not had a Pap smear within the last year should have one performed.</td>
<td>III USPSTF, 1989</td>
<td>Prevent cervical cancer morbidity and mortality.* Prevent cervical cancer.</td>
<td>Prevent cervical cancer morbidity and mortality.* Prevent cervical cancer. A normal Pap smear is defined as one without atypia, dysplasia, CIS or invasive carcinoma. If there is no documentation of the actual pathology/cytology reports (i.e., because previous Pap smears were done at another facility) but there is documentation that all previous Paps were normal in the history, then the appropriate screening interval may be regarded as three years.</td>
</tr>
<tr>
<td>17. All females under 18 years of age, for whom there is documentation of a history of vaginal intercourse, who have had three consecutive normal smears and subsequently have not had a Pap smear within the last 3 years should have one performed.</td>
<td>II-2 USPSTF, 1989</td>
<td>Prevent cervical cancer morbidity and mortality.* Prevent cervical cancer.</td>
<td>The maximum interval for all women with intact uteri is every three years. The incidence of cervical cancer is increased when screening intervals exceed 3 years.</td>
</tr>
<tr>
<td>18. All females under 18 with a history of cervical dysplasia or carcinoma-in-situ who have not had a Pap smear within the last year should have one performed.</td>
<td>III Miller et al., 1991; ACOG, 1993</td>
<td>Prevent cervical cancer morbidity and mortality.* Prevent cervical cancer.</td>
<td>These women are at increased risk for cervical disease, and should not be returned to 3-year screening intervals.</td>
</tr>
<tr>
<td>19. Adolescent girls presenting for contraception who have not previously had a Pap test should have one.</td>
<td>III Wilson and Jaffe, 1988</td>
<td>Prevent cervical cancer morbidity and mortality.* Prevent cervical cancer morbidity and mortality.* Prevent cervical cancer.</td>
<td>Presentation for contraception may provide presumptive evidence of sexual activity.</td>
</tr>
<tr>
<td><strong>Eating Disorders</strong></td>
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<tr>
<td>20. Weight and height should be measured at least once a year or at every visit, if visits occur less frequently.</td>
<td>III AAP, 1988; Green, 1994; Elster and Kuznets, 1994; USPSTF, 1989; Elster and Kuznets, 1993</td>
<td>To identify and treat anorexia nervosa, bulimia, obesity, or other diseases affecting growth (e.g., hypothyroidism).</td>
<td>These measurements not only screen for abnormalities but also allow tracking growth trends over time.</td>
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## Treatment

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<tr>
<th>Indicator</th>
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<tbody>
<tr>
<td><strong>Cigarette Use Counseling—Treatment</strong></td>
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<tr>
<td>21. All current smokers should receive counseling to stop smoking.‡</td>
<td>I</td>
<td>Kottke et al., 1988</td>
<td>Decrease smoking-related morbidity and mortality. †</td>
<td>Meta-analysis of 39 trials of counseling showed 8% decrease in smoking rate at six months and 6% at one year.</td>
</tr>
<tr>
<td>22. If counseling alone fails to help the patient quit smoking, the patient should be offered nicotine replacement therapy (gum or patch).</td>
<td>I-II</td>
<td>Lam et al., 1987</td>
<td>Decrease smoking-related morbidity and mortality. †</td>
<td>Meta-analysis of RCTs of nicotine replacement therapy demonstrated efficacy in setting of specialized smoking clinics; adding nicotine replacement may increase cessation rate by one third. Weaker evidence in general practice. For adolescent girls, the provider may consider whether the risk of unprotected sex and attendant risk to fetus overrides this approach to smoking cessation.</td>
</tr>
<tr>
<td>23. Nicotine replacement should only be prescribed in conjunction with counseling.‡</td>
<td>I</td>
<td>Lam et al., 1987</td>
<td>Avert potential side effects of nicotine therapy in patients who will not benefit without concomitant counseling. Decrease smoking-related morbidity and mortality. †</td>
<td>All controlled trials of nicotine replacement combine it with some form of counseling.</td>
</tr>
<tr>
<td>24. Nicotine replacement should not be prescribed if the patient: 1) is pregnant or nursing 2) has temporomandibular joint disease 3) continues to smoke</td>
<td>I-II</td>
<td>Benowitz, 1988</td>
<td>Avert premature births, birth defects, potential harm to nursing newborns, ischemic events.</td>
<td>Nicotine crosses placenta and is excreted into breast milk. It can worsen symptoms of temporomandibular joint disease. Continuing to smoke makes side effects of nicotine replacement much more likely.</td>
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<tr>
<td><strong>Cervical Cancer Screening—Follow-up</strong></td>
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<tr>
<td>25. All adolescents with severely abnormal Pap smear should have colposcopy performed.***</td>
<td>III</td>
<td>Miller et al., 1991</td>
<td>Prevent cervical cancer morbidity and mortality.*</td>
<td>Appropriate follow-up for abnormal findings is key in preventing progression to cervical cancer or disease progression.</td>
</tr>
<tr>
<td>26. If an adolescent has a Pap smear that is not normal but is not severely abnormal,*** then one of the following should occur within 1 year of the initial Pap: 1) repeat Pap smear; or 2) colposcopy.</td>
<td>III</td>
<td>Miller et al., 1991</td>
<td>Prevent cervical cancer morbidity and mortality.*</td>
<td>Patients with intermediate findings should be monitored closely. In many cases, abnormal findings resolve spontaneously, so follow-up with Pap smears or immediate colposcopy are both appropriate.</td>
</tr>
<tr>
<td>27. All adolescents with a Pap smear that is not &quot;normal&quot; but is not severely abnormal*** and who have had the abnormality documented on at least 2 Pap smears in a 2-year period should have colposcopy performed.</td>
<td>III</td>
<td>Miller et al., 1991</td>
<td>Prevent cervical cancer morbidity and mortality.*</td>
<td>Patients with intermediate findings should be monitored closely since some portion of these may represent preinvasive disease, or progress to a high-grade SIL. If findings persist, colposcopy should be performed. This may be difficult to operationalize for women who have not been enrolled in the same plan for two years or more.</td>
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Cigarette Use Counseling—Follow-up

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<tr>
<td>28. Tobacco abuse should be added to the problem list of all current smokers or addressed during at least one subsequent visit.</td>
<td>I</td>
<td>Kottke et al., 1988; Wilson et al., 1988</td>
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</table>

*Morbidity of cervical cancer includes postsurgical and chemotherapeutic complications, infertility, incontinence, and pain from metastases.

**HIV causes fatigue, diarrhea, neuropathic symptoms, fevers, and opportunistic infections (OIs). OIs cause a wide variety of symptoms, including cough, shortness of breath, and vomiting. Average life expectancy after HIV infection is less than 10 years. Other STDs include gonorrhea, syphilis, and chlamydia. They cause a wide variety of symptoms, including dysuria, genital ulcers, infertility, rashes, neurologic and cardiac problems and rarely contribute to mortality. Preventing HIV and STDs has the added benefit of interrupting the spread of disease and preventing morbidity and mortality in those who thus avoid infection.


†Smoking has been associated with increased risk of cancer of the lung, trachea, bronchus, lip, oral cavity, pharynx, larynx, esophagus, kidney, bladder, stomach, and pancreas. Smoking also causes or exacerbates COPD, asthma, bronchitis, cerebrovascular accidents and coronary heart disease. Smoking while pregnant is a contributing factor in low birthweight, shortened gestation, and sudden infant death syndrome. Each of these conditions causes a wide range of morbid symptoms and most increase mortality.

‡We plan a broad operationalization of counseling to include everything from from pamphlets and brief advice in the primary care setting to specialized structured programs.

Quality of Evidence Codes:

I: RCT
II-1: Nonrandomized controlled trials
II-2: Cohort or case analysis
II-3: Multiple time series
III: Opinions or descriptive studies
REFERENCES – ADOLESCENT PREVENTIVE SERVICES


