Objective: To describe the experience and practices of emergency department pediatricians in the United States related to the diagnosis and management of pelvic inflammatory disease (PID) in adolescent girls and to compare this experience with Centers for Disease Control and Prevention recommended management guidelines.

Design: National telephone survey.

Subjects: One hundred four pediatricians randomly selected from the 659 members of the Section on Emergency Medicine of the American Academy of Pediatrics. Response rate was 56%.

Measures: A 42-item structured interview questionnaire assessed physician demographics, practice characteristics, PID diagnosis and management, and attitudes about sexually transmitted diseases in adolescents.

Results: Fifty-one (94%) of 54 emergency department pediatricians had diagnosed PID in adolescents at least once within the past 2 years, and 35 (69%) had diagnosed PID, on average, once per month or more. Less than half the pediatricians (23/51 [45%]) routinely recommended hospital admission for adolescents with PID as suggested by the Centers for Disease Control and Prevention, and among those treating adolescents with PID as outpatients, just over half (20/37 [54%]) arranged close follow-up within 72 hours of initiating antibiotic treatment. Although most emergency department pediatricians routinely suggested condom use (47/54 [87%]) and human immunodeficiency virus testing (34/54 [63%]) after diagnosing a sexually transmitted disease, a minority routinely provided contraceptive counseling (23/54 [43%]) or partner notification (17/54 [31%]). Approximately two thirds of pediatricians surveyed indicated that they thought that the care of an adolescent with a sexually transmitted disease should be different from that of an adult (35/54 [65%]) and that this age group was more prone to medical complications (38/54 [70%]).

Conclusions: The results of this survey suggest that emergency department pediatricians frequently diagnose PID in adolescent girls and understand the high risk of medical complications in this age group, but their management is often less aggressive than that recommended by Centers for Disease Control and Prevention guidelines and sexually transmitted disease experts.

SUBJECTS AND METHODS

SUBJECTS

Pediatricians were randomly selected from the membership list of the Section on Pediatric Emergency Medicine of the American Academy of Pediatrics. This organization includes the majority of American board-certified pediatricians with special interest in pediatric emergency medicine and most of those certified in the subspecialty of pediatric emergency medicine. With the use of standard tables of randomization, 104 names were selected from the total section membership of 659 members. The study was conducted during the summer and fall of 1995. Pediatricians were first contacted by letter to introduce a survey concerned with adolescent health care in the emergency department and to state that they would be contacted by telephone within 3 weeks. Up to 5 attempts were made to contact each subject by telephone. Once contacted, pediatricians were interviewed by 1 of 3 interviewers who were trained in techniques of conducting structured interviews for research purposes. If attempts at telephone contact were not successful, the survey questionnaire was mailed to the subjects. Of the initial sample, 34 physicians could not be contacted by telephone after 5 attempts and also did not respond to the follow-up mailed questionnaire. Of the remaining 70 subjects, 8 refused to participate and 8 were excluded from analysis on the basis of 1 of the following exclusion criteria: did not spend at least 15% of their clinical time in an emergency department; did not provide gynecological examinations; or did not routinely see patients older than 12 years. The final number of surveys available for analysis was 54, or 36% of the randomly selected eligible pediatricians in the initial sample. Forty-two physicians completed the survey by telephone and 12 by mail.

The characteristics of subjects are presented in Table 1. The mean age of the respondents was 40 years, and 32 (59%) were male. The geographic distribution represented all regions of the United States, with more physicians from the Northeast (18 [33%]) than the West (8 [15%]). Most pediatricians described their practice location as urban (38 [70%]), and the majority had teaching responsibilities (51 [94%]). Thirty-three (61%) were fellowship trained, almost all in pediatric emergency medicine. The respondents were not significantly different from nonrespondents or from the total membership of the Section on Emergency Medicine when compared by analyzing the available demographic variables of sex and geographic distribution. In addition, a recent survey of the same group of pediatricians by different investigators for a different purpose noted a similar demographic profile, lending external validity to our sampling technique.18

The pediatricians surveyed reported on characteristics of the patients served in their pediatric emergency departments. All saw adolescents up to age 18 years, and 17 (31%) saw patients up to age 21 years. The majority of physicians respondents (45 [83%]) reported that more than 50% of their patients were from minority groups. A large percentage (39 [72%]) estimated that more than 50% of their patients were from poor families. These patient characteristics likely reflect the predominantly urban location of the physicians surveyed.

MEASURE

We developed a 42-item structured interview questionnaire for this study. The questionnaire examined the following 5 domains: physician demographics; characteristics of the physician’s practice; diagnosis and management of PID in adolescents; counseling provided after the diagnosis of an STD; and attitudes about STDs in female adolescents as compared with adult women. The interview was field-tested on 10 pediatricians and revised for clarity before it was used in the study. The mail survey questionnaire was identical to the structured telephone interview except for instructions that were changed to reflect the different methods of administration.

for asymptomatic infection, and fear of disclosure of sexual activity, contribute to the high PID rate in this age group.4 Sequelae of PID are a major cause of reproductive morbidity in women, accounting for the majority of cases of acquired infertility and substantially increasing the risk of subsequent ectopic pregnancy.5-7 Other serious health sequelae of PID include tubo-ovarian abscess and pelvic adhesions, often leading to dyspareunia and chronic pelvic pain.8

In 1991, the Centers for Disease Control and Prevention (CDC) issued guidelines for the prevention and management of PID in which they specifically singled out the adolescent age group for special consideration.9 The CDC guidelines note that many women with PID have subtle, vague symptoms that are quite mild and, as a result, the condition is underdiagnosed and/or the seriousness of the infection is not appreciated. They recommend a “low threshold” for the diagnosis of PID. In addition, the guidelines indicate that the efficacy of outpatient management for preventing late sequelae is uncertain and could reduce the likelihood of successful eradication of upper genital tract pathogens because of both low serum levels of antibiotics given by the oral route and compliance issues. Adolescents are at the beginning of their reproductive lives, with a longer time frame in which to develop complications than adult women; they also have a greater likelihood of poor treatment adherence related to their living circumstances, psychosocial immaturity, and confidentiality issues. These concerns about the efficacy of outpatient management led the CDC experts to specifically recommend inpatient treatment with parenteral antibiotics for all adolescents diagnosed as having PID.9 These recommendations were reiterated in the CDC’s 1993 Sexually Transmitted Diseases Treatment Guidelines and in publications from other influential organizations.10-12 For adult women, the CDC guidelines suggest consideration of inpatient treatment, but if outpatient treatment is undertaken, they recommend close follow-up within 72 hours of beginning antibiotic therapy. In addition, the guidelines recommend notification of sex partners and risk reduction counseling for all women diagnosed as having PID. Leading authorities in adolescent medicine and in pediatric emergency medicine echo these
recommendations in major textbooks, as does the Institute of Medicine in its 1997 publication *The Hidden Epidemic: Confronting Sexually Transmitted Diseases.*¹³⁻¹⁵

However, there are forces within the health care system, most notably the growth of managed care, that work against inpatient management of PID for economic rather than health-related reasons, and, indeed, overall hospitalization rates for PID declined during the 1980s by about 36% with no evidence of a decline in office visits for this diagnosis.⁹ Although the decline in hospitalization rates occurred for all age groups, there was a relatively smaller decrease (10%) for 15- to 19-year-olds, suggesting that physicians still are more likely to treat this age group as inpatients. It is too soon to tell if the trend toward increased outpatient treatment will lead to higher rates of morbidity from sequelae of inadequately treated PID.

Many adolescents with PID will come to care for the emergency department with symptoms of abdominal pain, fever, dysuria, and/or vaginal discharge. One study examining emergency department use by rural adolescents aged 12 to 18 years found that females and older teens were more likely than males and younger teens to come to the emergency department for care and that, of the nearly 5000 adolescent emergency department visits examined, 9% of the females were given a discharge diagnosis of an obstetrics/gynecology problem (PID was included in this category).¹⁶ The authors of the study noted that the highest hospital admission rates were among adolescents diagnosed with obstetrics/gynecology problems, but they also remarked that STDs were underrepresented as a diagnosis in their cohort and speculated that adolescent-specific risk factors may be difficult to address in the emergency department setting.

In many centers, the pediatric department cares for adolescents up to the age of 18 or even 21 years. Thus, pediatricians working in emergency departments are likely to see many adolescent girls with PID, and they are the ones who must make the decision regarding hospital admission vs outpatient management. Pediatric emergency medicine is a newly board-certifiable subspecialty whose curriculum for fellowship training includes emergency medicine pediatricians work in teaching hospitals, and many are in leadership positions.¹⁸ Such pediatric emergency medicine specialists are a critical component in the education of medical students and pediatric residents and thus have an impact on the practice of future pediatricians. In addition, when they make a diagnosis of PID in the emergency department, pediatric emergency medicine specialists often advise the referring primary care physician and health insurance carrier about appropriate treatment and follow-up for the patient. Thus, pediatric emergency medicine specialists’ understanding of the diagnosis and management of PID in adolescents may be important in the control of this disease that extends far beyond their small numbers.

The purpose of this study was to describe the experience and practices of emergency department pediatricians in the United States related to the diagnosis and management of PID in adolescent girls. In addition, we wished to assess the physicians’ attitudes toward STDs in adolescents and their perception of the adequacy of their training in adolescent STD management. Specifically, we were interested in the degree to which pediatric emergency medicine physicians complied with CDC guidelines related to hospital admission for PID, postdiagnosis counseling, and timing of follow-up care.

**EXPERIENCE AND PRACTICES RELATED TO PID**

The large majority of pediatricians (51 [94%]) had made the diagnosis of PID in adolescent patients within the past 2 years (*Table 2*). The diagnosis was made frequently (once a week or more often) by nearly half (24 [47%]) of the 51 pediatricians who had diagnosed PID. However, only 23 (45%) of the pediatricians diagnosing PID reported recommending routine hospital admission for adolescent girls with this diagnosis. There was no significant difference in patient admission recommendations between pediatricians who cared for adolescents only up to age 18 years and those who also cared for young adults up to age 21 years. Of the 37 pediatricians who ever treated adolescents with PID as outpatients, just over half (20 [54%]) reported recommending a follow-up visit within 72 hours as suggested in the CDC guidelines. The follow-up site most commonly recommended to patients with no primary care physician was an adolescent clinic (23 [62%]), with a minority of pediatricians recommending a gynecology clinic (9 [24%]). The majority of respondents (22/37 [59%]) reported that they arrange follow-up by giving the adolescent the telephone number of the referral site, whereas 9 (24%) reported providing date, time, and directions to the site.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (%)</th>
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</thead>
<tbody>
<tr>
<td>Sex</td>
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</tr>
<tr>
<td>M</td>
<td>32 (59)</td>
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<tr>
<td>F</td>
<td>22 (41)</td>
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<td>Geographic distribution</td>
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<tr>
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<tr>
<td>Midwest</td>
<td>15 (28)</td>
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<tr>
<td>South</td>
<td>13 (24)</td>
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<tr>
<td>West</td>
<td>8 (15)</td>
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<tr>
<td>Practice location</td>
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<tr>
<td>Urban (population &gt;1 million)</td>
<td>38 (70)</td>
</tr>
<tr>
<td>Small metropolitan (population &lt;1 million)</td>
<td>10 (19)</td>
</tr>
<tr>
<td>Other (suburban/rural)</td>
<td>6 (11)</td>
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<tr>
<td>Have teaching responsibilities</td>
<td>51 (94)</td>
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<tr>
<td>Clinical time spent in ED, %</td>
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<tr>
<td>&gt;95</td>
<td>36 (67)</td>
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<tr>
<td>95-50</td>
<td>15 (28)</td>
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<td>&lt;50</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Fellowship training</td>
<td>33 (61)</td>
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</tbody>
</table>

*Mean age, 40 years; range, 30 to 55 years. ED indicates emergency department.
Informing him of the need for STD treatment.

Familiarization for the patient to give to her sexual partner(s)

Of the 54 pediatricians surveyed provided written notification. In addition, only 17 (31%) of respondents being unsure of the answer to this question when compared with adult women, with 14 (26%) of the respondents being unsure of the answer to this question and the others equally divided between yes and no answers.

PEDIATRICIANS’ PERCEPTION OF THEIR TRAINING IN ADOLESCENT HEALTH CARE

Subjects were asked, “On a scale of 1 to 5, how do you feel your post–medical school training prepared you to care for adolescents with STDs?” where 1 indicated “didn’t prepare me at all” and 5 indicated “prepared me extremely well.” The mean (± SD) response on this Likert-type scale for the total sample of pediatricians was 3.14 ± 1.27, indicating a moderate level of perceived adequacy of training in the area. When asked similarly about preparation for dealing with psychosocial problems of adolescent patients, the mean score was 2.6 ± 1.09, indicating that the pediatricians felt somewhat less well prepared in this area than in the area of STD care.

This survey of emergency department pediatricians confirms the important role of this group of physicians in the management of PID in adolescent girls. We found that PID is frequently diagnosed in pediatric emergency departments, with nearly one half of the pediatricians surveyed making this diagnosis once per week or more often. In addition, almost all the pediatricians surveyed reported that they have teaching responsibilities, confirming our hypothesis that they are in a position to influence trainees. The impact of these emergency department pediatricians on the management of PID in adolescent girls is therefore magnified by their importance to the training of future physicians in general and pediatricians in particular.

We found, however, that many emergency department pediatricians are not as aggressive in their management of PID in adolescents as the CDC guidelines and STD experts recommend. Our findings indicate that about half of the pediatric emergency physicians treated some adolescent girls with PID as outpatients. Although many pediatricians we surveyed indicated that they attempted to arrange close follow-up within 72 hours of beginning antibiotic therapy, many did not; 45% scheduled follow-up at longer intervals. This delay in follow-up is of some concern given the necessity to promptly evaluate response to therapy to minimize complications. Close follow-up of oral antibiotic therapy may be of particular importance in adolescents whose families may not help to reinforce medication compliance because they either do not appreciate the severity of the infection, or are unaware of the diagnosis, because of confidentiality issues related to the sexually transmitted nature of the disease.

We can only speculate about the reasons why many emergency department pediatricians are less aggressive in their management of PID in adolescents than STD experts recommend, since this issue was not directly assessed in the survey. On the basis of postinterview comments made by some physicians, several potential barriers can be considered. One such barrier may simply be that emergency department pediatricians are unaware of current recommendations for treatment of adolescents and how they differ from those of adults. Most of the pediatricians we surveyed believed that the care of adolescents with STDs ought to be different from the care of adult women and that adolescent girls are at higher risk of medical complications of STDs. These beliefs indicate that emergency department pediatricians were well aware of the potential complications from STDs.

In contrast, there was no agreement among the physicians who asked whether adolescent girls have increased biological susceptibility to acquiring an STD when compared with adult women, with 14 (26%) of respondents being unsure of the answer to this question and the others equally divided between yes and no answers.

ATTITUDES ABOUT STDs IN ADOLESCENT GIRLS

Almost two thirds of the respondents believed that the care of a female adolescent with an STD should be different from the care of a female adult with a similar condition (Table 3). The majority (38 [70%]) of the pediatricians thought that adolescent girls were more prone than adult women to complications from STDs. In contrast, there was no agreement among the physicians who asked whether adolescent girls have increased biological susceptibility to acquiring an STD when compared with adult women, with 14 (26%) of respondents being unsure of the answer to this question and the others equally divided between yes and no answers.

COUNSELING AFTER DIAGNOSIS OF AN STD IN ADOLESCENT GIRLS

The large majority of the pediatricians surveyed (47 [87%]) reported routinely suggesting condom use after the diagnosis of an STD in a female adolescent. Similarly, 34 (63%) of respondents routinely suggested testing for human immunodeficiency virus on such occasions. Contraceptive counseling (other than condoms) was reported by less than half (23 [43%]) of the respondents. In addition, only 17 (31%) of the 54 pediatricians surveyed provided written notification for the patient to give to her sexual partner(s) informing him of the need for STD treatment.

Recommended timing of follow-up visit by pediatricians who ever treat PID on an outpatient basis (n = 37)

- Within 72 h: 20 (54)
- 72 h to 1 wk: 11 (30)
- >1 wk: 6 (16)

Recommended follow-up site

- Adolescent clinic: 23 (62)
- Gynecology clinic: 9 (24)
- Emergency department/other: 5 (14)

* PID indicates pelvic inflammatory disease.

**Table 2. Emergency Department Pediatricians’ Experience and Practice Related to PID in Adolescents**

**Table 3. Emergency Department Pediatricians’ Experience and Practice Related to PID in Adolescents**

**Characteristics (No. Responding) No. (%)**

- Ever diagnosed PID within the past 2 y (n = 54): 51 (94)
- Frequency of PID diagnosis by pediatricians who ever diagnosed PID (n = 51): Several times/wk: 12 (24)
- Once/wk: 12 (24)
- Once/mo: 11 (22)
- Few times/y: 16 (31)
- Routinely recommend hospital admission: 23 (45)

**Recommended follow-up visit by pediatricians who treated PID on an outpatient basis (n = 37):**

- Within 72 h: 20 (54)
- 72 h to 1 wk: 11 (30)
- >1 wk: 6 (16)

**Recommended follow-up site:**

- Adolescent clinic: 23 (62)
- Gynecology clinic: 9 (24)
- Emergency department/other: 5 (14)

**Comment**

This survey of emergency department pediatricians confirms the important role of this group of physicians in the management of PID in adolescent girls. We found that PID is frequently diagnosed in pediatric emergency departments, with nearly one half of the pediatricians surveyed making this diagnosis once per week or more often. In addition, almost all the pediatricians surveyed reported that they have teaching responsibilities, confirming our hypothesis that they are in a position to influence trainees. The impact of these emergency department pediatricians on the management of PID in adolescent girls is therefore magnified by their importance to the training of future physicians in general and pediatricians in particular.
pediatricians understand the uniqueness of the adolescent developmental stage in relation to medical complications of sexual behavior. Despite these beliefs, however, many did not admit all adolescents with PID to the hospital for parenteral therapy or even arrange close outpatient follow-up. This may represent difficulty in handling the sensitive psychosocial issues related to adolescents and STDs. Many adolescents with PID are seen in community hospital emergency departments by physicians trained to treat adults. These clinicians may be less likely than the pediatric-trained physicians studied herein to acknowledge the uniqueness of the adolescent age group in relation to treatment of STDs and to follow guidelines for hospitalization. Thus, the problem of undertreatment may be much greater than suggested by this study alone.

We found in this survey that CDC recommendations pertaining to counseling after the diagnosis of STDs in adolescents were inconsistently followed. Most pediatricians surveyed would suggest HIV testing and condom use, but many do not provide optimal contraceptive counseling or partner notification. Effective partner notification procedures are especially important from a public health standpoint to prevent further spread of STDs. Despite increasing educational effort in adolescent medicine during pediatric training in recent years, some emergency department pediatricians may be uncomfortable with the care of adolescents, and this may influence their decision making related to PID management. This discomfort may have been reflected in our finding in this study that the respondents had a relatively poor perception of the adequacy of their own training in dealing with psychosocial problems of adolescents. In addition, addressing such sociomedical issues as partner notification and pregnancy prevention may be perceived as too time consuming for the emergency department setting. However, with the use of effective medical communication skills, these patient education tasks can be accomplished efficiently in a short time, and it may be the only opportunity to reach some high-risk adolescents.

Many pediatricians we surveyed commented anecdotally that they would admit a girl with PID if she had a fever and looked sick but would suggest outpatient treatment if she had no systemic signs of illness other than pelvic pain and cervical motion tenderness. However, the most common organism causing PID in adolescents, Chlamydia trachomatis, often follows a sub-acute course without fever or elevation of the white blood cell count, despite serious underlying disease. The severity of the symptoms at initial examination should not be used as the main criterion for hospital admission in adolescents, and this is clearly addressed in the CDC guidelines. In addition, several interviewees commented that they had difficulty with reimbursement for inpatient treatment of PID, and this could represent an additional barrier to optimal treatment of adolescent girls with this illness. Managed care organizations and other insurers may require education to understand the medical necessity for parenteral treatment early in the course of this infection in adolescents even when clinical signs and symptoms are subacute. These are important issues to explore in further research, since they have potential solutions, such as using the CDC recommendations to support claims for reimbursement from third-party insurers. Similarly, increasing educational efforts in adolescent medicine during pediatric training could help to remove other potential barriers, such as discomfort in managing psychosocial issues.

This study has some limitations that are important to consider. Although the pediatricians surveyed were a random sample of the entire group, the response rate was only moderate, adding a potential source of bias. However, we found that respondents were demographically similar to nonrespondents in terms of sex and geographic location, suggesting that any systematic respondent bias is unlikely. This allows us to be confident that the descriptive data can be generalized to all members of the Section on Pediatric Emergency Medicine. The small sample size did not allow us to compare PID management practices by physicians' training, age, sex, and practice characteristics. Although such analysis may support or contradict some of our hypotheses on the reasons for physicians' management decisions, it could not have pointed to causality because of the cross-sectional design of the survey.

The findings of this study confirm the importance of pediatric emergency medicine physicians in the diagnosis of PID in adolescent girls and highlight some of the barriers to providing optimal management of this serious infection in this age group. Important avenues to explore in attempting to improve the treatment of PID in adolescents are the relative importance of barriers related to health care economics and third-party payers vs those related to physicians' skills in psychoso-
cial management of STD in adolescent girls and their awareness of current management guidelines.

Accepted for publication December 12, 1997.

Presented in part at the annual meeting of the North American Society for Pediatric and Adolescent Gynecology, La Jolla, Calif, May 20, 1996.

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