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Management of Pelvic Inflammatory Disease: A Survey of Primary Care Physicians in California

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by

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Chapter I

Introduction

The purpose of this study is to describe the current practices of primary care physicians in the management of pelvic inflammatory disease in California. In 1990 an estimated one in nine women of reproductive age in the U.S. experienced an episode of pelvic inflammatory disease (PID) [1] . PID refers to ascending infection of the female genital tract, usually associated with gonococcal or chlamydial infection. A sexually transmitted disease affecting only women, PID can lead to irreversible sequelae, including chronic pelvic pain, ectopic pregnancy, tubal infertility and recurrent infection. With each reinfection, the risk of infertility doubles, reaching as high as 75 percent in some women [2].

Women from lower socioeconomic groups, African-American and younger women, and those with multiple sexual partners are all at increased risk of contracting PID, a disease which can be successfully treated with antimicrobial agents [2]. However an estimated 75 to 85 percent of PID cases are asymptomatic and remain undiagnosed and untreated [3]. Because PID is a disease with several known and modifiable risk factors and with irreversible sequelae, clinical management, including counseling, screening, diagnosis and treatment, can be a crucial mode of prevention. Thus, physicians' management of PID and related sexually transmitted diseases such as chlamydia and gonorrhea can play a key role in reducing the risk for PID and its sequelae. Understanding how providers assess risk and detect, diagnose, and treat PID is essential in determining how prevention and

management practices can be improved, especially as our understanding of the pathology and clinical presentation of PID changes.

A national goal is for 90% of health care providers to correctly manage sexually transmitted diseases by the year 2000 [4]. However, little is known about how providers actually manage PID. The Centers for Disease Control publish recommendations for clinicians on the management of PID, but it is unknown if providers are aware of the guidelines or follow them.

Few studies have examined the management of PID in primary care settings, especially outpatient care. Some studies have examined health care providers' knowledge, attitudes, risk assessment, diagnosis and treatment of sexually transmitted diseases in general [5,6]. However, PID is rarely included in these studies. The little existing information specifically on PID management indicates that practice patterns for PID vary significantly from published recommendations, at least in the areas of screening, diagnosis, antimicrobial treatment and hospitalization [7,8,9]. This study examines the screening, reporting, partner referral, diagnosis and treatment practices for PID of primary care physicians in California.

Specific aims

This study addresses the following specific aims regarding PID management by primary care physicians in California:

1. To describe the medical demographic characteristics of respondents who treat PID

2. To examine correlates of high levels of adherence to published CDC guidelines for screening, reporting, partner referral, diagnosis and treatment of PID

3. To identify physicians who need training in PID management

We hypothesize that the following major study variables will predict respondents need for training in PID managment:

1. Specialty group: family practice, general practice, internal medicine, infectious disease, obstetrics/gynecology, pediatrics/adolescent medicine, and emergency medicine

2. Practice setting: private/group practice, HMO, private hospital or clinic, public hospital or clinic, university/college health service, and Armed Forces/Veteran's Administration or other government practice

3. Geographic location: San Francisco, all other California counties

4. Years in clinical practice

5. Patient demographics

Chapter two provides background on the clinical presentation, pathophysiology, and prevalence of PID, as well as a review of the literature describing what is known about risk factors and sequelae of PID. Chapter three describes the current standards of care and recommendations for diagnosis, antimicrobial treatment, hospitalization and prevention of PID. In addition, this chapter examines what *is* known about physician management of PID and related sexually transmitted diseases. Chapter four details the research design and methods used in this study. The final two chapters present the results of this research and discuss their implications.

Chapter II

Review of the literature on pelvic inflammatory disease

Clinical presentation of PID

PID is a clinical syndrome caused by ascending spread of infection from the vagina or the cervix to the endometrium and fallopian tubes. The term PID describes the clinical symptoms and signs associated with acute salpingitis and endometritis -- an inflammation of the epithelial surfaces of the fallopian tubes and uterus caused by active infection with one or more of a number of organisms, most of which are sexually transmitted diseases. PID can cause both acute and chronic illness. Classically, acute PID presents clinically with the triad of lower abdominal pain, cervical motion tenderness and adnexal tenderness. Some physicians call this last finding the "chandelier sign", indicating how high the patient jumps in pain when the cervix is touched on exam. Other symptoms and signs include fever, irregular bleeding, dysuria, dysparunia, increased or changed vaginal discharge, palpable abdominal swelling, nausea, and vomiting. The term chronic PID is used loosely to describe recurring infections and/or infections which persist for months to years causing chronic, mild symptoms. Severe infection can cause tubal abscesses and scarring, and spread to the abdominal cavity can cause life-threatening peritonitis, inflammation of the abdominal cavity, and peri-appendicitis, peri-splenitis and peri-hepatitis (inflammation of the capsules surrounding the appendix, spleen and liver, respectively) [2].

Despite the broad spectrum of associated symptoms, the large majority of PID infections are believed to be asymptomatic and inapparent.

The term inapparent PID describes subclinical or atypical pelvic inflammatory disease not associated with the classic triad of clinical signs and possibly with few or none of the other possible symptoms. These infections can still cause the irreversible and severe sequelae of classic acute PID, perhaps even to a greater degree because they generally go undiagnosed and untreated. The number of women with inapparent disease is unknown, but is estimated to be three to five times the number with symptomatic disease [2].

The magnitude of the problem caused by inapparent PID is estimated from several types of studies [2]. First, laparoscopic biopsies to diagnose the cause of infertility show evidence of endometritis, salpingitis, tubal occlusions or adhesions, all components of PID, in many women with no history of PID. In retrospective studies of women with two common sequelae of PID, tubal infertility or ectopic pregnancy, but with no history of PID, laparoscopic exams show tubal adhesions and occlusions characteristic of the disease in 30 to 92 percent of patients [2]. Even among infertile women with serum antibodies to *Chlamydia trachomatis*, an indicator of both previous chlamydial infection and increased risk of PID, as many as 84 percent had no known history of PID [2]. These findings suggest that the women experienced inapparent PID which in turn led to their sequelae. Second, a prospective study of women with lower genital tract infections but no symptoms of PID found high rates of endometritis on further investigation. In this study, 47 percent of women with mucopurulent cervicitis but without adnexal tenderness or temperature > 38.0°C had histopathologic evidence of PID on biopsy [10]. Thus, inapparent PID may occur in the absence of abdominal pain, adnexal tenderness and other classic signs and symptoms of PID. Although our understanding of inapparent PID

is incomplete, these findings suggest that "silent" PID cases are numerous and go largely undiagnosed, while causing the same irreversible sequelae as classic PID.

Pathophysiology of PID

The organisms causing PID are often grouped as STD-associated, exogenous pathogens or non-STD, endogenous pathogens. The majority of PID cases in developed countries are associated with two sexually transmitted pathogens, *Chlamydia trachomatis* (40-80 percent) and *Neisseria gonorrhea* (5-18 percent) [11]. Chlamydia accounts for more cases of PID, possibly because chlamydial infections are less symptomatic than gonococcal infections or are asymptomatic and may go unnoticed by the woman, allowing spread to the upper genital tract before being detected and treated [12]. In addition, late treatment or lack of treatment for sexually transmitted diseases increases the risk of transmission to partners, a possible explanation for the rising incidence of chlamydial infections. *C. trachomatis* is now the most common bacterial STD in the U.S., causing an estimated 2.6 million infections in women and 1.8 million in men in 1986 [13]. Reported chlamydial infections have been increasing since 1984, and in 1991, more cases of chlamydia than gonorrhea were reported in women [4]. The increasing frequency of *C. trachomatis* as an STD in the U.S. is troubling considering the large role it plays in PID. As the number of *C. trachomatis* and *N. gonorrhea* infections increase, so will the risk of contracting PID. An estimated 30 to 40 percent of women with untreated gonococcal and chlamydial cervicitis will develop PID [14,15]. Other less common STD-associated PID pathogens include some mycoplasma and ureaplasma species [2].

A smaller proportion of PID cases are attributed to non-STD, endogenous pathogens including anaerobic bacteria such as *Clostridium perfringens*, *Peptococcus* species and *Bacteroides fragilis*; and facultative anaerobes such as *Gardnerella vaginalis*, *streptococcus*, *Escherichia coli* and *Haemophilus influenzae*. These microbes are normally found in the endogenous flora of the vagina, but have been found in the upper genital tract of women with PID [2]. Non-STD PID is more likely to be clinically severe and/or suppurative, and associated with chronic cases, repeat episodes of PID, older women, and women using intrauterine devices (IUDs) [2].

The mechanism by which PID develops is still not completely understood, but one current hypothesis implicates both STDs and the endogenous flora of the vagina [2,16,17]. PID may begin as a cervical infection by a sexually transmitted pathogen, usually chlamydia or gonorrhea, which changes the vaginal environment and allows overgrowth of endogenous vaginal flora and anaerobic organisms. Then, both the STD pathogens and the overgrown vaginal flora ascend from the cervix to the fallopian tubes. The STD pathogens may invade the tubal mucosa, causing an initial inflammatory reaction which is clinically mild or asymptomatic, thus priming the tissue for secondary invasion by other organisms from the lower genital tract, leading to a clinically severe polymicrobial infection.

The electron micrographs in Figures 1 and 2 illustrate the damage done to fallopian tube epithelium causing infertility in a case of salpingitis [18].

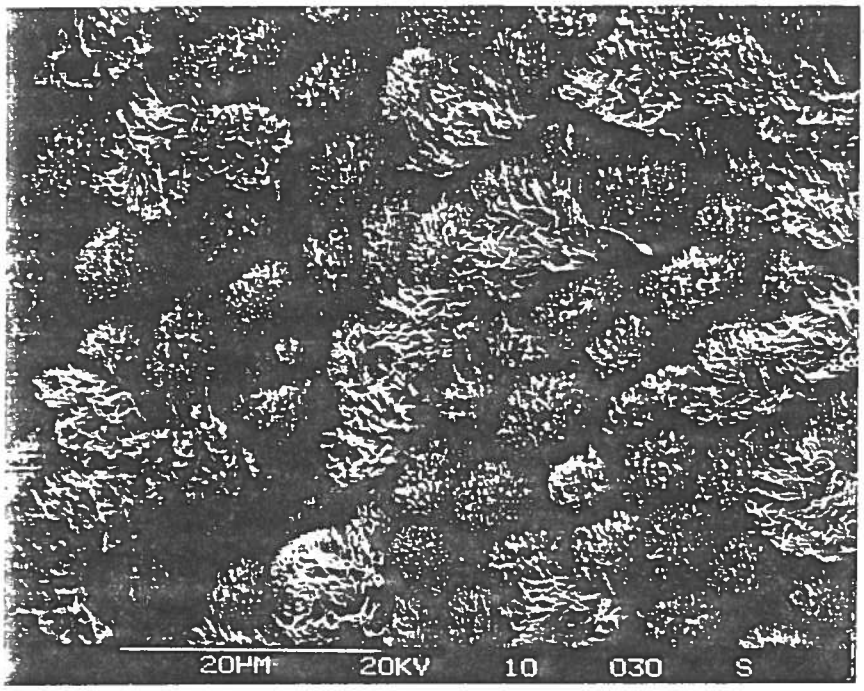

Figure 1: Scanning electron micrograph of normal human fallopian tube epithelium. The epithelium is composed of a regular layer of nonciliated cells intersperesed with ciliated cells (magnification x 1,650) [11].

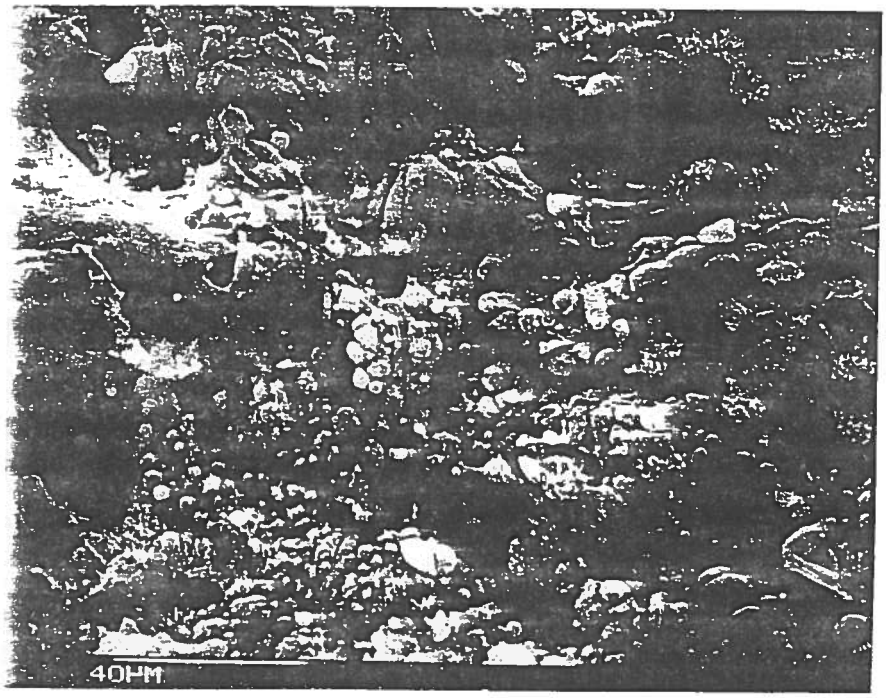

Figure 2: Scanning electron micrograph of human fallopian tube isthmus from a case of acute salpingitis. The epitheluim is irregular, hyperplastic, and disorganized (magnification x 625) [11].

Several factors may aid the spread of infection from the cervix to the endometrium and fallopian tubes. Cervical mucous normally acts as a mechanical and chemical barrier to protect the uterus. PID symptoms often begin about seven days after the onset of menses, indicating that the change in cervical mucous during menses allows the bacteria to enter the uterus. Similarly, the flow of sperm and uterine contractions during sexual intercourse, the use of oral contraceptives, douching and insertion of an intrauterine device may also play roles in spreading infection to the upper genital tract (see p. 18) [11] . Dilation of the cervix during childbirth, therapeutic abortion, and dilation and currettage can also lead to PID [11]. Although these causes are more commonly associated with unsanitary obstetrical and abortion practices seen in developing countries, a study in the U.S. found that women with cervical chlamydial infection are five times more likely to get PID after a first trimester abortion [19]. Gonococcal, chlamydial and non-STD associated PID differ in clinical presentation. As mentioned above, non-STD, polymicrobial infections usually occur in older women with a history of IUD use and previous PID. The onset is more likely to be acute, with pelvic swelling and fever, mimicking a ruptured appendix [2]. Women with gonococcal-associated PID are usually younger and from lower socioeconomic groups. They seek care after a short duration of abdominal pain and are more likely to have vaginal discharge, fever, and pelvic swelling [2]. Women with chlamydial PID are also likely to be young, but to seek treatment after a longer period of milder abdominal pain (seven to nine days) and usually do not have fever or vaginal discharge. However, laparoscopic exam shows more inflammation than expected from the mild clinical picture [2].

Incidence and prevalence of PID

Trends in the incidence of PID have been estimated from self-reports to national surveys, reported outpatient visits, hospital discharge data, and community surveys. In industrialized countries, the incidence of PID is estimated to be from 10 to 14 per 1000 women aged 15-44, and as high as 20 per 1000 in women aged 15-24 [2]. Sexually active teenagers have the highest incidence of PID, and 50 percent of all young women who were 15 in 1990 are expected to have at least one episode of PID by the year 2000 [1]. In the U.S., over one million women report an episode of PID each year, resulting in 2.5 million office visits and 300,000 hospitalizations [20]. In 1988, almost 11 percent of U.S. women reported treatment for PID, with one-third of those cases being hospitalized for treatment [1]. Of those hospitalized for acute PID, one-third will undergo surgery, while 90 percent of those hospitalized for chronic PID will have surgery, including 40,000 hysterectomies [21].

From 1982 to 1988, self-reported cases of PID in the U.S. declined from 14 to 10.8 percent of women aged 15-44 [1]. This decline was seen in all demographic subgroups and in both the outpatient and inpatient setting. Similarly, hospitalization rates for acute PID declined 36 percent from 1979 to 1988, although the number of office visits remains unchanged. However, a smaller decrease was seen in 15-19 year olds, only 10 percent, compared to a 40 percent in decline in the 20-24 year old group. And, 15-19 year olds had the highest hospitalization rate of all age groups in 1988 [21]. The overall decline in hospitalizations for PID may reflect a decreasing incidence of PID; however the decline may also represent the general decline in hospitalizations due to the growth of managed care. In contrast to these U.S. trends, the incidence of

PID hospitalizations in England increased by 28 percent from 1975 to 1985 [22]. However, in Sweden, it decreased by 40 percent during the same period [23]. Sweden's dramatic decrease reflects the success of STD control programs in preventing PID. Although the U.S. trend seems encouraging, the data do not reflect cases of inapparent PID, which is estimated to be three to five times more common than symptomatic disease [3]. Extrapolating from the percentage of women with self-reported PID, the total proportion of U.S. women of reproductive age who experienced at least one episode of PID in 1988 could range from 40 to 60 percent.

The cost of care for PID is significant. PID-associated care cost $4.2 billion in 1990, and, if current trends continue, these costs are projected to reach $10 billion by the year 2000 [24]. Indirect costs due to lost wages and decreased productivity amount to an additional $1.5 billion. Private insurance currently pays the largest share of these costs overall, 41 percent. But public funds pay for the largest share (36 percent) among the under 19 age group. The public share of PID costs is steadily increasing, reflecting demographic changes in the incidence of PID and the availability of private insurance [24].

Risk factors for PID

The literature describes many risk factors for PID. However, risk factors for the acquisition of STDs in general must be distinguished from those factors which specifically increase the risk for developing PID. While risk factors for acquisition of STDs are fairly well understood, less is known about which variables influence the development of PID and its sequelae. In a review of published data on PID risk variables, Washington and coworkers

categorized variables for PID risk as either risk markers of risk factors, with factors being defined as those variables which are causally related to the development of PID and markers being defined as those variables which are indirectly related [25]. In general, they found that while sociodemographic variables are more likely to be risk markers for PID, contraceptive practices are more likely to be true risk factors, related to the development of PID. And, although sexual behavior is associated with PID, its role as a causal risk factor, rather than simply as a marker for STD acquisition, is undefined in existing studies.

Cervical infection with *C. trachomatis* and *N. gonorrhea* is a risk factor for PID. An estimated 10 to 19 percent of all women with cervical gonorrhea develop symptoms of acute PID [26]. In addition, cultural and serological evidence of chlamydia infection has been found in as many as 38 percent of hospitalized PID cases and up to 52 percent of outpatient PID cases in the U.S. [2]. An estimated 30 to 40 percent of women with untreated chlamydial cervicitis will develop PID [14,15].

Bacterial vaginosis (BV) may be related to PID. Of 600 women attending an STD clinic, those with BV had a significantly higher rate of clinical diagnosis of PID than those without BV [27]. Formerly called non-specific vaginitis, bacterial vaginosis is a common vaginal syndrome, which may be sexually transmitted, involving the overgrowth of a variety of endogenous flora, including *Gardenerella vaginalis* and anaerobic organisms. As noted earlier, these organisms have been found in the upper genital tract of women with PID, suggesting that bacterial vaginosis may be a cause of PID. In a doubled-blind, randomized study of 174 women with BV undergoing first-trimester abortion, women treated post-operatively with metronidazole

(an antiprotozoal drug with activity against BV organisms) were three times less likely to get post-abortion PID than those treated with a placebo [28]. Estimates of the prevalence of BV range from 33 percent of women attending an STD clinic, to 27 percent attending a primary health clinic, to 15 to 20 percent of pregnant women [27-29]. Because BV is so common, its possible relationship to PID deserves further study.

Women with a history of PID are at risk for repeated episodes. As many as one-third of women experiencing one episode of PID have a second episode, 56 percent within a year of the first episode [2]. Prior PID may be a direct cause of repeated PID, as damaged fallopian tubes are more vulnerable to subsequent infection. And inadequate or inappropriate treatment may allow the initial infection to smolder and resurface later. Prior PID can also be a risk marker for repeat PID, reflecting high risk variables for STD acquisition such as multiple partners and early sexual encounters, failure to identify and treat sex partners, adolescence, or low socioeconomic status [25,30].

Sexual behavior is related to PID. Age at first intercourse, multiple sexual partners, and high rate of new partners are associated with increased risk of sexually transmitted lower genital tract infections and with a higher risk of PID [25]. A case-control study of 712 women hospitalized with PID and 2719 hospitalized control women with no history of PID found an association between high frequency of intercourse and PID [31]. Married women with one sexual partner who had intercourse six or more times per week were over three times more likely to have PID than similar women having intercourse less than once per week (RR=3.2; 1.4-7.2). Because frequency of intercourse alone has not been shown to increase the risk of acquiring an STD, these results implicate high frequency of intercourse as a

true risk factor for PID. However, it is unclear whether other sexual behaviors are direct risk factors for PID or just risk markers reflecting increased likelihood of STD acquisition.

Age is both a risk marker and a risk factor for PID. Sexually active teens are three times more likely to be diagnosed with PID than 25 to 29 year old women [32]. Young age may be a causal risk factor related to biological characteristics of adolescents that increase risk of infection, such as lower prevalence of protective antibodies, larger zone of cervical ectopy, and greater penetrability of cervical mucous. Adolescent age is a also a risk marker for PID because teens are more likely to exhibit sexual behavior which puts them at risk for STDs, such as high numbers of sexual partners, low use of barrier contraceptives, and a higher prevalence of STDs in the teenage partner pool [32].

African-American women are at increased risk for PID and all STDs. African-American women report a history of PID twice as often as white women, and are hospitalized three times more often for PID [1,20]. However, it is unclear how race is directly associated with the development of PID. The higher rate of PID in African-Americans may be solely a marker of other variables, such as low socioeconomic status, poor access to health care, higher prevalence of of STDs in the partner pool, and higher rates of IUD use (see p. 18).

Low educational status, unemployment and low income representing low socioeconomic status have been associated with increased risk of PID, probably because women with these characteristics are at increased risk for sexually transmitted lower genital tract infections [1,20]. Marital status is associated with increased risk of PID: single, separated and

divorced women have higher rates of hospitalization for acute PID when compared to married or widowed women. However, it is unclear whether marital status is an independent risk factor or a marker of increased STD transmission [25].

Choice of contraception can affect PID risk. Barrier methods such as condoms, spermicides and diaphragms are associated with decreased risk of STD transmission. Thus, barrier methods are markers for decreased PID risk. In addition, barrier methods may directly reduce the risk of developing PID following STD infections [25,33]. The relationship between oral contraceptive use and PID is unclear. Although oral contraceptive use is associated with increased prevalence of cervical chlamydial infection, some studies indicate that oral contraceptives protect against PID, at least against symptomatic PID caused by *C. trachomatis* [34]. This protective effect may be due to increased cervical mucous, inhibition of bacterial growth by decreased menstrual blood loss, or alterations of the immune system by oral contraceptives [25]. However, a study of infertile women showed no association between oral contraceptive use and tubal infertility, casting doubt on the findings of a protective effect against PID [25]. For now, few conclusions can be made about the risk of PID associated with oral contraceptive use.

The association between IUD use and PID remains controversial, despite extensive study. Early studies found an increased risk of PID and its sequelae in IUD users [25]. However, newer data indicate that the risk of PID is increased only in the first four months after IUD insertion [35]. In addition, women at low risk of acquiring an STD are not at increased risk of IUD-related PID [35]. According to these findings, IUD-related PID cases are most

likely caused by spread of pathogens into the endometrium at the time of IUD insertion [35-38].

Vaginal douching is probably a risk factor for PID. In a case-control study of 100 hospitalized patients with verified PID and 762 random controls, after adjusting for confounding variables, women with PID were 1.7 times as likely to have douched in the past two months compared with control women. In addition, women who douched three or more times monthly were 3.6 times more likely to have PID than those who douched less than once monthly [39]. Further research is needed to understand the relationship between douching and PID.

Use of cigarettes, alcohol and certain illegal drugs has been shown to be associated with increased risk of PID. However, the relationship between these variables and the acquisition of STDs and the subsequent development of PID is unclear [25].

Women's health care-seeking behavior and their access to appropriate health care can influence the risk of PID and its sequelae. In a case-control study of women presenting with clinically diagnosed PID, women who delayed seeking care for PID for just three or more days were three times more likely to suffer infertility or ectopic pregnancy than women who sought care earlier (95 % CI = 1.27,6.11). In addition, the risk of infertility increased the longer appropriate care was delayed [40]. These findings indicate that early detection and treatment of PID reduce the risk and severity of sequelae. Women who delay care are also more likely to transmit their infection to their sex partners, leading to increased prevalence of STDs and risk of reinfection. Compliance with PID treatment should also influence the risk for repeat PID and PID sequlae. Compliance behavior includes taking

medications as prescribed, returning for follow-up exams, and following other advice from the provider [25]. However, limited access to health care may increase women's risk of PID and its sequelae, regardless of their health care behavior. For example, women who cannot obtain or afford medical care or medications could be at increased risk. However, few studies have examined the relationship between health care-seeking behavior, access to care, and PID.

To further describe the risk factors for PID, an NIH-funded study in San Francisco is examining risk factors in the male partners of women with PID, and other possible relationships such as specific sexual practices and social, economic and cultural factors that influence sexual behavior and access to the health care system.

PID sequelae

Due in part to the advent of antibiotic therapy, death from PID is rare today. In 1979, the death rate from PID in the U.S. was 0.29 per 100,000 women aged 15-44 [2]. However, in the preantibiotic era, PID carried a case fatality rate of 1.3 percent [2]. The most common cause of death from PID is ruptured tubo-ovarian abcess with generalized peritonitis, carrying a 6-8 percent mortality rate [2]. The more common sequelae of PID include chronic pelvic pain, increased risk of repeated infections, ectopic pregnancy, and infertility.

Chronic pelvic pain, lasting longer than six months and causing the woman to seek medical advice was reported by 18.1 percent of women with PID in one study [2]. Pelvic pain can range from monthly cramping accompanying ovulation to constant, disabilitating pain. One-third of

women with PID will have a repeat episode of PID, usually within a year, increasing their risks of irreversible scarring and sequelae [2].

Women with only one episode of PID have seven to ten times greater risk of ectopic pregnancy, implantation of the fetus in the abdomen or fallopian tubes instead of the normal location in the uterus, as compared to women with no history of PID [2]. If not detected, these pregnancies will rupture, causing a surgical emergency. CDC surveillance data show that the number of ectopic pregnancies in the U.S. quadrupled in the last decade, with much of the increase attributed to PID [41,42]. Currently, an estimated fifty percent of ectopic pregnancies are related to PID [42]. Paralleling their increased risk of PID, African-American women have a four-fold greater risk of ectopic pregnancy than white women [42]. In addition, ectopic pregnancies are the leading cause of maternal mortality among African-American women [41].

Perhaps the least clinically dramatic, but most tragic sequelum of PID is infertility, defined as the lack of recognized conception after one year of regular, unprotected intercourse. The growing rate of infertility in the U.S. has received much attention in the past two decades. PID plays a major in infertility, accounting for 30 to 50 percent of the increase in infertility from 1975 to 1985 in the U.S. [43]. Both gonococcal and chlamydial associated PID have been causally related to subsequent tubal infertility [2]. Infection with these organisms causes tubular obstruction and peritubal adhesions due to scarring, leading to infertility. In the U.S., women with a history of PID are twice as likely to have fertility problems than women with no history of the disease [44]. After one episode of PID, the risk of infertility is 11 percent, and the risk doubles with each subsequent episode to 23 percent and 54 percent [2].

In some studies, the rate of infertility with repeated infections reaches 75 percent [2]. When PID is diagnosed and treated properly, infertility following symptomatic PID is a preventable disease. Despite this fact, an estimated two million women of reproductive age have tubal occlusion in the U.S., and 125,000 new cases of PID-related infertility occur yearly [44].

Chapter III

Clinical management of pelvic inflammatory disease

Little is known about what type of health care providers manage cases of PID. Existing data indicate that obstetrician-gynecologists and family practitioners are likely to manage PID. Data from the 1980-1981 National Ambulatory Medical Care Survey show that PID accounts for one to two of every 1000 patient encounters with family and general practitioners and 12 of every 1000 patient encounters with gynecologists [45,46]. Analyses of office visits to private physicians from the National Disease and Therapeutic Index for 1979 to 1989 found most visits for pelvic inflammatory disease were to obstetrician-gynecologists (45%) or general and family practitioners (27%) [47]. A nationwide survey of antibiotic treatment of PID found that from 1980 to 1983, obstetrician-gynecologists gave the largest percentage of all antibiotic prescriptions for PID (35%), more than general practitioners (26%) and internists (14%) [48]. Obstetrician-gynecologists also gave the largest percentage of antibiotic prescriptions for hospitalized PID patients, 36%, while general practitioners gave 20% and internists gave 13%. Although these data are not current, they suggest that obstetrician-gynecologists and general practitioners are more likely to manage PID patients, in both inpatient and outpatient settings, than internists.

Information about who manages STDs in general can also help identify PID providers. Clinicians who treat patients with STDs are likely to see women with PID as well and may detect PID during gynecologic exams. In addition, because most cases of PID are STD-related, proper management of STDs is crucial to reducing risk for PID. Management of STDs in private

practice and by family practitioners is significant. Recent data from Seattle show that more that half of all STD cases are diagnosed in the private practice setting, not in public STD or family planning clinics [49]. In addition, family practitioners treat a greater absolute number of STDs than other specialties, mainly because they comprise a larger proportion of physicians.

Diagnosis of PID

No widely-agreed-upon, uniform case definition exists for PID. Because PID can present with a broad spectrum of symptoms and severity of illness, clinical diagnosis is difficult. Criteria used in diagnosis include historical and physical findings; lab tests, such as cervical culture for *N. gonorrhea* and *C. trachomatis*, white blood cell count, erythrocyte sedimentation rate and c-reactive protein level; and diagnostic procedures, such as endometrial biopsy, laparoscopy and ultrasound. Endometrial biopsy is used mainly in research settings to confirm suspected cases of PID and has an estimated 70 - 89% sensitivity and 67 - 89% specificity when compared to laparoscopy [50]. Considered the gold standard in PID diagnosis, laparoscopy allows direct visualization and biopsy of the tubal mucosa. It is used extensively to diagnose infertility and in clinical research, but the high cost and associated surgical risks limit its use in routine diagnosis [2].

The differential diagnosis for PID is broad, including many conditions that can cause abdominal pain, pelvic mass, or fever. Laparoscopic exam revealed salpingitis in 91 women who were incorrectly diagnosed with other disorders based on clinical evidence [51]. These diagnoses included ovarian tumor (22%), acute appendicitis (19.8%), ectopic pregnancy (17.6%),

"chronic" PID (11%), acute peritonitis (6.6%), pelvic endometriosis (5.5%), and fibroids (5.5%). These findings illustrate not only the range of differential diagnoses for PID, but also the failure of clinical criteria to differentiate PID from other disorders. These cases presented clinically with severe illness. The differential diagnosis for PID with mild clinical presentations is not discussed in the literature but is likely to include other STDs such as chlamydia or trichomoniasis, urinary tract infections and mild endometriosis or fibroids.

In 1983, according to guidelines endorsed by the Infectious Disease Society for Obstetrics and Gynecology, diagnosis of PID required abdominal tenderness, cervical motion tenderness and adnexal tenderness on exam, in addition to signs of a genital tract infection such as temperature greater than 38°C, positive endocervical Gram's stain for gram-negative intracellular diplococci, elevated white blood cell count, or evidence of pelvic abscess on ultrasound [52]. However, in a longitudinal cohort study of 814 PID cases diagnosed with these criteria in Sweden, laparoscopic exam confirmed acute PID in only 65% of women, illustrating the low specificity of these criteria. Furthermore, only 16% of women with laparoscopically confirmed PID had the classic syndrome of PID with lower abdominal pain, motion tenderness, and signs of a lower genital tract infection, indicating the low sensitivity of these criteria [53]. Indeed, a review of 12 clinical studies covering the diagnosis of PID found that no single diagnostic criterion or combination of diagnostic criteria could reliably predict PID [50].

These results, together with the increasing awareness of inapparent PID, are leading researchers to formulate new diagnostic models for PID. The current Centers for Disease Control guidelines (1991) for

diagnosing PID are similar to the model suggested by Kahn et. al. [50,54]. Based on a review of the accuracy of existing diagnostic indicators, this model stresses the need for highly sensitive diagnostic criteria to ensure that cases with mild clinical presentations will be detected and treated. This focus on a low diagnostic threshold means that many women without PID will be misdiagnosed. However, the risks of overdiagnosis are considered to be less than the risk of infertility and other sequelae of untreated PID.

PID cases can be classified as "mild" or "severe." Severe cases are distinguished from mild cases by the presence of some combination of malaise, nausea, vomiting, pallor, sweating, depressed mental status or abnormal vital signs. According to the CDC guidelines, given a mild presentation, PID can be diagnosed in the presence of three minimum criteria: lower abdominal tenderness, bilateral adnexal tenderness and cervical motion tenderness. (In the model developed by Kahn, abdominal tenderness is not a necessary criterion for diagnosis, as its association with PID has never been evaluated in a clinical study.) Thus, mild cases require few diagnostic indicators; empiric therapy is encouraged when PID is suspected.

The CDC recommends using additional criteria among women with severe clinical signs to increase the specificity of diagnosis, ensuring that serious, non-PID disorders are diagnosed and treated in a timely manner. Simple additional criteria include: temperature greater than 38.3°C, abnormal cervical or vaginal discharge, elevated erythrocyte sedimentation rate and/or c-reactive protein level, and culture or non-culture evidence of cervical infection with *N. gonorrhea* or *C. trachomatis*. More elaborate additional criteria includes: histopathologic evidence on endometrial biopsy, laparoscopy, and tubo-ovarian abscess on sonogram. However, the

recommedations do not specify that these additional criteria are necessary for diagnosis.

In addition, the CDC guidelines recommend bacteriologic tests to confirm diagnoses and to guide treatment of sexual partners. These tests include cervical cultures for *N. gonorrhea* and cervical culture or non-culture test for *C. trachomatis*. However, these tests are not necessary for initial treatment decisions.

Treatment of PID

As the microbial etiology of PID has become better understood, treatment recommendations have changed accordingly. Prior to 1982, treatment guidelines recommended single drug therapy to combat *N. gonorrhea*, then believed to be the major cause of PID [55]. Improved research and diagnostic techniques revealed the polymicrobial nature of PID, and clinical studies found that no single antimicrobial was effective in eradicating the spectrum of organisms associated with the disease [56-58]. In a study of PID treated as outpatients for ten days with tetracycline only or with procaine G penicillin followed by ampicillin, 14% of gonoccocal PID cases and 21% of non-gonoccocal PID cases were unresolved within 30 days [59]. In addition, narrow spectrum antibiotic regimens are less likely to prevent future infertility after PID. In a prospective study, over 600 women with laparoscopically-confirmed first episodes of PID were treated as inpatients with an antibiotic regimen that did not cover a broad spectrum of pathogens. This group had a consistently high subsequent infertility rate of 10 to 13% [60].

In response to these studies, the CDC began recommending two drug antimicrobial therapy in 1982 [61].

However, given the variety of organisms and infectious processes associated with PID, no single therapeutic regimen can be expected to treat all patients with PID successfully. The current CDC treatment guidelines suggest a variety of drug regimens for both inpatient and outpatient treatment, designed to provide broad spectrum coverage for *C. trachomatis*, *N. gonorrhea*, anaerobes, gram-negative rods and streptococci (Table 1). Regimens which meet the CDC guidelines provide coverage for gram-negative organisms such as *N. gonorrhea*, enteric rods and anaerobic organisms with a parenteral ß-lactam antibiotic such as cefoxitin or ceftriaxone, and coverage for *C. trachomatis* with either doxycycline or tetracycline [54].

Usually, antimicrobial therapy will be started before the microbiologic etiology of PID is established, so a regimen should be selected based on the suspected organisms involved. Thus, these outpatient drug recommendations are geared towards eradicating chlamydial and gonoccocal infections commonly found in young women with mild to moderately severe PID [2,54]. The recommended inpatient drug regimens provide broad coverage for mixed anaerobic/facultative bacterial infections associated with clinically severe disease, often seen in older women, and in women using IUDs [2,54]. Choice of drug therapy should also reflect clinical severity, availability of medical care, cost-containment needs and patient acceptance [54]. In general, women treated with antimicrobials as outpatients are advised to rest at home, monitor body temperature, complete all medications, and

avoid intercourse until treatment is finished. Medical follow-up is recommended within 72 hours of beginning treatment.

Extensive studies of the two inpatient drug regimens, including four large randomized clinical trials, have shown both to be clinically effective against PID, regardless of the pathogen identified [62-65]. However, few studies have examined the clinical effectiveness of the recommended outpatient antimicrobial therapy for PID. In one study, of 24 women with probable PID who were treated as outpatients with cefoxitin and doxycycline, 22 (92%) were clinically cured or improved [66]. However, a randomized controlled trial in Nairobi found that neither cefoxitin/doxycycline nor ampicillin/sulbactam regimens were highly effective as outpatient therapy for acute PID. Only 70% of the 64 women treated with ampicillin-sulbactam and 72% of the 37 women treated with cefoxitin-doxycycline were clinically and microbiologically cured. In addition, both groups had high rates of post-PID tubal obstruction: 18% for ampicillin-sulbactam and 33% for cefoxitin-doxycycline [67]. However, the study did not control for medication compliance rates. Thus, while the recommended drug regimens for inpatient therapy of acute PID have been shown to be clinically effective, the efficacy of recommended outpatient drug regimens is uncertain. In addition, although recommended drug regimens may effect a clinical and microbiologic cure, no studies have examined the relationship between these short-term endpoints and prevention of long-term sequelae of PID, such as infertility and ectopic pregnancy.

Although the CDC provides recommendations for antimicrobial treatment for both inpatient and outpatient care, little information exists to help health care providers decide if a patient with PID requires

hospitalization. No studies have examined the efficacy of inpatient versus outpatient treatment for PID, and no widely agreed upon guidelines for hospitalization exist [2,54]. Because the efficacy of recommended outpatient drug regimens has not been extensively studied and because the ability of any of the drug regimens to prevent future infertility or ectopic pregnancy is unknown, some researchers advocate hospitalization with intravenous antimicrobial therapy for all women with PID [17,54]. Similarly, other sources suggest that because preservation of fertility is the major goal of therapy in PID, outpatient therapy should be limited to parous women with mild to moderately severe disease who are likely to comply with therapy [2]. However, no difference in future fertility has been shown between women with PID treated as outpatients and as inpatients [2]. The CDC does not advocate universal hospitalization for PID patients. Instead, it recommends hospitalization in several specific clinical situations (Table 2) [17,54].

Despite the existence of guidelines on both antimicrobial use and hospitalization for PID, little information is available on how health care providers actually treat PID. Existing studies indicate that treatment patterns for PID vary significantly from published recommendations and that treatment is often sub-optimal. One study examined nationwide patterns of antibiotic treatment of PID [48]. From 1966 to 1983, before the CDC recommended two drug therapy, the majority of patients with PID were treated with a single antibiotic. From 1980 to 1983, tetracycline and aminopenicillins were the most frequently prescribed antimicrobials in cases of PID treated with a single drug. In hospitalized PID patients treated with a single drug, cephalosporins and aminopenicillins were used most often. In the minority of women treated with two drugs, cephalosporins with

metronidazole, clindamycin or an aminoglycoside were the most common combinations. The dramatic decline in prescriptions for penicillins and the rise in the use of cephalosporins over the 18 years of the study illustrate changing patterns in the treatment of PID. However, this study does not evaluate changes in antimicrobial use since the 1982 and 1991 CDC recommendations on PID management.

Several pieces of information suggest physicians do not hospitalize PID patients as often as would be expected under the published recommendations for hospitalization. In a survey of office-based, primary care physician practices, of 516 patients with PID seen from 1982 to 1983, at least 43% of the women met one or more of the CDC current conservative criteria for hospitalization, yet only 9.4% were hospitalized when first seen [8]. In addition, nationwide antibiotic patterns from 1968 to 1983 show no significant change in the proportion of antibiotics given for inpatient PID treatment, despite increasing recommendations for hospital therapy during this period [48].

Prevention of PID

The prevention of PID and its sequelae can be addressed at several different levels: the individual, the provider, and the health care system. Individuals can practice safer sex to prevent the transmission of sexually transmitted diseases that commonly cause PID. Individuals can learn to recognize signs of genital infections and seek prompt medical attention, as well as to encourage sex partners to seek appropriate care. In addition, individuals can reduce the reservoir of STDs, prevent progression to PID or

recurrence of PID by completing prescribed antimicrobial treatment and following other treatment recommendations, including follow-up medical care. However, once a woman presents for care, providers can take several steps to help prevent PID or its sequelae, including: maintaining current knowledge on STD and PID management and prevention, identifying high risk patients by taking a sexual history, counseling patients to reduce high risk behavior, screening patients for existing genital infections, treating existing infections promptly and appropriately, and notifying and treating sexual partners of infected patients [68]. This section will focus on physicians' STD/PID knowledge, sexual history taking skills, screening practices, and partner referral practices.

Most physicians do not receive adequate clinical training in STD management and prevention during their medical education. In 1985, only 20% of U.S. medical schools made STD clinical training available to at least half their students [68]. This lack of training is evident in reports of primary care physicians' inadequate PID management practices as described earlier and poor sexual history-taking and counseling skills. In a survey of California primary care physicians' sexual history-taking and counseling practices, only 10% of physicians took an adequate sexual history with new patients, and only 52% recommended condom use to patients at risk for contracting human immunodeficiency virus (HIV) or other STDs [5]. A similar survey of primary care physicians found that 58% could not identify two routinely-used HIV screening tests, and 31% believed that physicians should take a sexual history from high-risk patients only [6]. Physicians who take a complete and accurate sexual history can identify women who are at high risk for STDs, including PID, and can then pursue appropriate counseling, screening and

treatment measures, thus helping to prevent the incidence of PID and its sequelae. Although supplementary STD education and training is available to health care providers through continuing medical education programs and STD training and prevention centers, little is known about what methods, if any, primary care physicians use to update their knowledge on STDs and PID in particular.

Because the majority of PID cases are related to lower genital tract infections with chlamydia and/or gonorrhea, early detection and treatment of these STDs can presumably lower the incidence of PID. Ideally, all sexually active women at risk of acquiring STDs should be routinely screened for STDs, but cost-effectiveness concerns limit screening to populations in which the prevalence of STDs is high enough to warrant routine screening. Chlamydia and gonorrhea infections can sometimes be detected by clinical symptoms and signs during pelvic exam, such as mucopurulent cervicitis, friable cervix, or abnormal cervical discharge. Previously, selective screening of women in high-risk populations using these and other clinical predictors was recommended. However, a study of the prevalence of chlamydial cervicitis in family planning clinics found that 70% of chlamydial infections were clinically inapparent. Using presumptive clinical indicators alone identified only 39 of 132 women with culture positive chlamydial infections (30% sensitivity) [69]. In a similar study of 1348 women attending family planning clinics, no single or combination of risk factors or presumptive clinical criteria was found to be both sensitive and specific for chlamydia infection [70]. Thus, clinical predictors alone cannot reliably identify women with lower genital tract infections. Several studies support the medical-effectiveness and cost-effectiveness of universal, not selective, screening for

chlamydia in moderate and high-risk populations where the prevalence of chlamydia is greater or equal to 7% [71-74].

Currently, the U.S. Preventive Services Task Force recommends routine screening for chlamydia and gonorrhea in asymptomatic women in certain groups. Chlamydia screening of asymptomatic women using laboratory diagnostic tests is indicated in the following high risk groups: women attending STD, adolescent, and family planning clinics; women with other risk factors such as age less than 25, multiple sexual partners or a partner with multiple sexual contacts, or purulent cervical exudate or cervical friability [75]. In addition, the CDC recommends routine chlamydia screening at the first prenatal visit for women who are under 20, unmarried, have multiple sexual partners or a history of an STD [76]. The two most commonly used screening tests for chlamydia are direct fluorescent antibody test (MicroTrak, Syva) and enzyme immunoassay (Chlamydiazyme, Abbott Labs).

Routine cultures for gonorrhea in asymptomatic women are indicated in high risk groups such as prostitutes, women with multiple sexual partners, women whose partners have gonorrhea or urethritis, as well as all pregnant women at their first prenatal visit [77].

As noted earlier, another lower genital tract infection, bacterial vaginosis, has been associated with PID; thus, screening and treating for BV might reduce risk for PID. However, no data currently exist to support this hypothesis, and no official recommendations address BV screening. Although simple and accurate clinical detection of BV is practiced by providers, little is known about what populations are commonly screened.

Similar to other areas of STD management, little information is available to assess whether health care providers follow these screening

recommendations. National data from self-reports of women who received STD testing show that a significantly smaller number of women are actually screened for STDs than is recommended [78]. In 1988, only only 43% of women with a positive STD history reported being screened for STDs in the past year; as did only 34% of sexually experienced teenage women; and only 32% of women with 10 or more partners. The data did not differentiate tests for specific STDs. Although screening recommendations do not differ for different racial groups, white women with a positive STD history were only two-thirds as likely to be tested as African-American women with a positive history. Similarly, although teenagers are known to be at higher risk for STDs than older women, white teenagers were no more likely to be tested than women over 20, while African-American teenagers were less likely to be tested than women over 20. These findings indicate that STD screening practices do not cover groups proportional to their risk and do not follow published guidelines.

Adequate treatment and prevention of PID requires evaluation and treatment of a patient's sexual partners. Up to 53% of these partners may be infected with chlamydia and up to 41% with gonorrhea [68]. Frequently, these infections are asymptomatic and will not be detected or treated. Thus, a woman with PID is at continued risk of reinfection until all of her partners have been evaluated and, when necessary, treated for infection. Partners can be referred for medical evaluation in several ways. The health care provider may ask the woman with PID to inform her partner(s) that they may have a genital infection and should obtain appropriate care immediately, or the provider may give the woman self-referral slips to distribute to her partner(s). Although not recommended, providers may sometimes provide the patient

with antimicrobial prescriptions for their partners. In other cases, the local health department may trace contacts either through the mail, by telephone or with case worker visits to encourage prompt evaluation and treatment. Each of these methods requires substantial time, cost and motivation. The frequency and degree of involvement of primary care physicians in contact tracing for partners of women with PID is not known.

Chapter IV

Research design and methods

A mailed questionnaire was used to collect information from primary care physicians in California on their management practices regarding PID. The study was approved by the Committee for Protection of Human Subjects at the University of California at Berkeley (Appendix A).

Purpose and significance

As the preceding review of clinical management of PID indicates, little information is available about the diagnostic, treatment and prevention practices of physicians regarding PID. Available evidence suggests that physician practices vary widely from published guidelines for PID management. The purpose of this study was to describe the medical demographic characteristics of respondents who treat PID; to examine correlates of high levels of adherence to published CDC guidelines for screening, reporting, partner referral, diagnosis and treatment of PID; and to identify physicians who need training in PID management. This study addressed the following specific questions:

- Characteristics of physicians who treat PID
  - Physicians in which primary care specialties and practice settings are most likely to manage PID?
  - Are physicians who see a high proportion of patients on Medi-Cal more likely to treat PID?

- Diagnosis and treatment
  - What proportion of physicians have received training on the management of PID since residency?
  - Do physicians follow the CDC guidelines for diagnosis of PID?
  - Do physicians prescribe antimicrobial regimens for PID that meet the CDC recommendations?
  - Do physicians follow the CDC recommendations for hospitalization of patients with PID?
  - What clinical and laboratory tests do physicians use to diagnose PID?
  - What combination of clinical findings prompt physicians to diagnose PID, and to hospitalize a patient with suspected PID?

- Prevention
  - What proportion of physicians have received training on the management of PID since residency?
  - Do physicians follow the CDC guidelines for chlamydial and gonorrheal screening in certain populations?
  - What percentage of suspected or diagnosed PID cases do physicians report to their local health department?
  - In what percentage of suspected or diagnosed PID cases do physicians initiate partner referral?
  - In what percentage of suspected or diagnosed PID cases do physicians have confirmation that partner(s) received treatment?

Because appropriate medical care can play an essential role in reducing the reservoir of PID-related sexually transmitted diseases and in reducing the prevalence and morbidity of PID, we need to understand primary care physician practices in the management and prevention of PID. This information is necessary to help focus further training and prevention measures for PID.

Sample

The target population for this survey was primary care physicians in California practicing in medical subgroups which serve women of reproductive age. These subgroups include general practice, family practice, internal medicine, obstetrics/gynecology, pediatrics/adolescent medicine, and emergency medicine. Because primary care physicians are frequently a patient's first contact with the medical system, they are in a unique position to influence women's reproductive health through appropriate prevention and management of PID and associated STDs. As described earlier, family and general practitioners and obstetrician/gynecologists are likely to manage PID and related STDs in their practice. Thus, these specialties were chosen as part of the target population for this study. In addition, obstetrician/gynecologists frequently serve as the sole health care provides for women of reproductive age. Internal medicine physicians and infectious disease specialists were included in the target population as they are likely to manage cases of infectious disease, especially those requiring hospitalization.

Although not usually considered primary care providers, emergency physicians were included in the target population for the study.

Emergency physicians provide a substantial amount of primary care, especially to uninsured patients without a regular provider, and are likely to see a high number of PID cases presenting to the emergency department with an acute clinical picture. Finally the target population included pediatricians and adolescent medicine physicians who may see a substantial number of PID and STD-related cases considering the high incidence of these diseases in teenage populations. Nurse practitioners, physician assistants, and certified nurse-midwives probably mange a substantial proportion of STD and PID cases as they are heavily used in family planning, STD, community, college/university, and county hospital outpatient clinics. Unfortunately, this study did not have the resources to survey these important populations of health care providers.

The California Medical Association list of licensed physicians was used as the sampling frame. The CMA list includes both members and non-members and specifies primary care providers whose major professional activity is direct patient care as opposed to administration or research. This list is compiled using the California Medical Licensing Board list of licensed physicians, and the membership files of the American Medical Association and the CMA. The list is updated biannually (personal communication, K. Caffrey, CMA). The sampling frame for the entire state of California is described in Table 3.

Sample size estimation

No known published studies have examined provider knowledge, attitude and practices regarding PID. Thus, it was difficult to determine what

variation in response will be found. Because this questionnaire was largely descriptive in nature, no formal sample size calculations were made. Initially, we estimated a sample size of 1000 with a 65 percent response rate would be necessary to ensure enough responses for analysis. San Francisco county physicians were over-sampled as county health department officials wished to make use of the data for planning purposes. Tables 4 and 5 describe the number of physicians needed in each specialty group in San Francisco and in all other counties in California, assuming a total sample size of 1000 and a 65 percent response rate.

To ensure sufficient responses for comparison between specialties, the number of obstetrician/gynecologist and emergency medicine physicians was increased to 100 in both the San Francisco and other California county groups. However, the CMA sampling frame for San Francisco contained only 80 emergency medicine physicians, so the entire population was included for this group. The CMA label department provided us with a computer-generated, simple random sample of the sampling frame. Table 6 describes the final sample population.

Pretest procedures

This section describes the procedures used to pretest a pilot version of the questionnaire for this study, the pretest findings, and the revisions made based on these findings. A pilot version of the questionnaire was designed in Spring 1992. Several revisions were made over the next six months based on comments from the following sources: the Women's Sexually Transmitted Disease (STD) Research Group at San Francisco General

Hospital (SFGH), the Survey Research Center at UC Berkeley, epidemiologists at UC San Francisco, UC Berkeley, and the San Francisco County Office of STD Control, biostatisticians at SFGH, and clinical faculty at UC Berkeley. A revised version of the pilot form was pretested in October 1992 (Appendix B). The pilot form consisted of brief instructions followed by 17, closed-ended questions on four pages. Six questions required the respondent to fill in numbers or percentages, but the majority involved only checking the appropriate response.

The questionnaire and a cover letter from the author were distributed to 44 primary health care providers in the Bay Area. Primary care physicians associated with the UC Berkeley Joint Medical Program distributed the questionnaire to their colleagues practicing at private and community hospitals in the East Bay. In addition, the questionnaire was distributed to health care providers at the San Francisco City Clinic, including registered nurses, nurse practitioners and physicians. Although nurses and nurse practitioners are not part of the target population for the study, their responses were included because their suggestions could still improve the questionnaire. The respondents were asked to note their start and end times on the cover and to fill out the questionnaire with particular attention to the clarity and coherence of the questions. The respondents were asked to make written comments wherever needed throughout the survey. All responses were confidential; respondents were instructed not to include any identifying information on the questionnaire. See Appendix C for pretest results and specific revisions.

Evaluation of the pretest

19 completed questionnaires were returned, a response rate of 43 percent. The results of the pretest were useful in improving the clarity and coherence of the questions. In addition, the results were used to assess the validity and reliability of the questions. In general, the results showed variability in response across items for most questions. However, the number of responses (19) made analysis of responses or comparison of specialty groups difficult.

The pilot sample population did not completely reflect the target population for the study. Only one obstetrician/gynecologist responded, and no general practitioners responded. Similarly, most respondents worked in one of two settings, private group practices or a city STD clinic. No physicians working in HMO, hospital or university clinic settings were included in the pilot sample. In addition, 42 percent of the respondents worked at the same facility and answered almost identically to most questions. Despite these limitations, the pretest was useful in guiding revision of the final questionnaire items.

Procedures for questionnaire administration

The questionnaire (Appendix D) was mailed to the home or work address of the sample population. The mailed packet contained a cover letter, questionnaire, and pre-addressed, business reply envelope. The cover letter was signed by the Deputy Director of Preventive Services for the California Department of Health Services. Respondents were asked to return the completed questionnaire in the enclosed envelope to the Department of

Health Services. An ID number on the back of the returned questionnaire and on the return envelope was matched with the ID number on the address list to delete respondents from the sampling list. To ensure confidentiality, the survey responses were not matched with any identifying information about the respondents. Six weeks after the first mailing, all non-respondents remaining on the sampling list were mailed another packet containing a follow-up cover letter encouraging their participation, a questionnaire and a pre-addressed, business-reply envelope.

Coding and data entry

Returned questionnaires were coded by the author and entered using the Epi-Info data analysis package (Epi-Info Version 5, USD, Inc., Stone Mountain, Georgia).

Chapter V

Results

Of 1165 mailed questionnaires, 38 were returned unopened by the post office due to change of address. Of the remaining 1127 questionnaires which reached their destination, 571 were returned, a response rate of 50.7%. 37.0% (417) were returned after the initial mailing, and 13.7 % (154) were returned after the second mailing. Of these 571 responses, 18 were returned unanswered because the respondent was recently retired, deceased, or not currently practicing. Thus, 553 respondents particiated in the study.

Comparison of response population and target population

Few statewide data are available to assess the representativeness of the remaining 553 respondents. However, a breakdown of California licensed physicians by specialty is available from the California Medical Association. This list was used as the target population to select the sample for the study. Comparison of the response population with the target population found no significant differences in the proportion of family practitioners, pediatricians and infectious disease physicians in the two populations (Table 7).

Obstetrician/gynecologists and emergency medicine physician are over-represented in the response population. Obstetrician/gynecologists comprise 19.3% of respondents, but only 14% of target physicians ($p<0.001$). Similarly, emergency medicine physicians account for 15.6% of respondents but only 7.2% of the target population ($p<0.001$). In contrast, general practitioners and internists are under-represented in the response population. The over-representation of obstetrician/gynecologists and emergency medicine physicians may be due to over-sampling of these specialties in the study

design to ensure for adequate responses for analysis. But it may also be related to higher response rates in these specialties (see below).

Comparison of San Francisco and non-San Francisco respondents

San Francisco physicians were over-sampled in the study design because the San Francisco Department of STD Control wished to collect more detailed information from this group. As expected, they are over-represented in the response population, accounting for 31.9% of responses, but only 6.4% of the target population. I reviewed the results to see if San Francisco respondents were systematically different from non-San Francisco respondents. When all 571 returned surveys were considered, the San Francisco sample had a lower response rate, 40.4% (199), than the non-San Francisco sample, 55.5% (372). When compared to respondents from other California counties, respondents from San Francisco were more likely to be obstetrician/gynecologists ($p<0.005$), less likely to be emergency physicians ($p<0.05$), more likely to care for 20% or more Medi-Cal patients ($p<0.005$), and more likely to practice in a public hospital or clinic ($p<0.05$).

No significant differences were found between San Francisco and non-San Francisco respondents in the proportion treating a case of PID in the past year, receiving any training in PID management, ordering the recommended tests for diagnosis of suspected PID, and following the CDC guidelines for PID diagnosis. However, San Francisco respondents were significantly more likely to follow at least four of five recommendations for hospitalization of patients with suspected PID (69.8%) than other respondents (56.3%) ($p<0.05$). In addition, they were significantly more likely to prescribe the recommended

antimicrobials for outpatient treatment of PID (59.6%) than non-San Francisco respondents (43.6%) ($p<0.05$).

Although San Francisco respondents do differ systematically from other respondents in some demographic and management categories, for the purposes of this study, the two groups will be analyzed together. However, this decision must be taken into account when attempting to apply the results drawn from this sample to the target population.

Response rates by specialty

Family practitioners and obstetrician/gynecologists had the highest response rates, over 50%. Just under 50% of physicians in emergency medicine and pediatrics responded, but only 32.4% of internists and 21.7% of general practitioners responded (Table 8).

Practice demographics of respondents

505 respondents indicated that they practiced in one of the seven specialty areas, provided more than one hour of direct patient care per week and saw at least one female patient per week. Only these responses were analyzed to describe the respondents' "practice demographics," such as primary site of practice, years in practice, hours per week providing direct patient care, and number of female patients seen per week. The respondents spent a median of 40 hours per week providing direct patient care (range = 2 - 100), saw a median of 25 female patients per week (range = 1 - 200), and had spent a median of 15 years in practice (range = 1 - 66). A slight majority of respondents, 53.8% (253), had been in practice more than 15 years. General

practitioners were significantly more likely than non-general practitioners to have been in practice longer than fifteen years ($p<0.001$).

Close to half of the respondents identified their primary site of practice as a private or group practice (49.4%), while the second largest cohort practiced in HMOs (17.7%) (Table 9). Physicians practicing in public hospitals/clinics and private hospital clinics accounted for 14.0% and 13.2% of respondents respectively. Only a small number of respondents practiced in university/college clinics or government facilities.

411 respondents estimated the percentage of their patients on Medi-Cal (Medicaid). Medi-Cal recipients comprised a median of 10% (range 0 - 98) of their patients, and 39.7% of respondents saw more than 20% Medi-Cal clients in their practice. Internists were significantly less likely to see Medi-Cal patients than non-internists ($p<0.001$).

Screening practices for chlamydia and gonorrhea

All respondents were asked if they would routinely test or screen for gonorrhea, chlamydia, both or neither in ten different hypothetical patients. Five of the cases were women with distinct, gynecologic diagnoses, and five cases were asymptomatic women with different risk factors. This question was analyzed for the 505 physicians who reported practicing in one of the seven designated specialties, provided at least one hour of patient care per week, and saw at least one female patient per week.

I analyzed whether respondents followed the standard of care in each clinical situation. Standard of care was taken from current CDC and U.S. Preventive Services Task Force Recommendations [74-76]. Current recommendations advise routine screening for both chlamydia and

gonorrhea in women with mucopurulent cervicitis and women with suspected PID. 94.5% of respondents reported screening for both chlamydia and gonorrhea in a patient with suspected PID; no respondents reported screening for neither disease (Table 10). Over 90% of respondents in all specialties and practice settings reported following these recommendations.

89.2% of respondents reported screening as recommended for both chlamydia and gonorrhea in a patient with mucopurulent cervicitis. At least 90% of pediatricians (96.9%), emergency physicians (91.6%), and obstetrician/gynecologists (91.1%) reported screening as recommended in a patient with mucopurulent cervicitis. At least 90% of respondents in all practice settings except private/group practices reported screening as recommended in a patient with mucopurulent cervicitis. Physicians in private /group practice were less likely to follow the recommended screening practices (84.9%) than physicians in other practice settings (93.4%) ($p<0.01$).

Women with a partner with urethritis are at risk of contracting chlamydia or gonorrhea and should be routinely screened for both diseases. 87.0% of respondents reported screening for both diseases in a female patient whose partner has urethritis, while 7.8% reported screening for neither. The recommendations do not address the need for routine screening in cases of other STDs, such as syphilis. However, women with one STD are likely to be infected with another STD, thus, women with syphilis should be routinely screened for both chlamydia and gonorrhea [75]. 88.7% of respondents reported screening for both diseases in cases of syphilis, while 5.8% reported screening for gonorrhea only, and 4.9% reported screening for neither. Similarly, recommendations do not address the need for routine screening in milder STDs such as trichomoniasis and vaginal syndromes such as bacterial

vaginosis. 58.6% of respondents would screen for both chlamydia and gonorrhea in cases of trichomoniasis, while 32.4% reported screening for neither. In cases of bacterial vaginosis, 55.3% of respondents would screen for both diseases, while 35.0% would screen for neither.

Routine chlamydia screening is recommended for women less than 25 years of age, independent of other risk factors. However, only 26.9% of respondents would screen for chlamydia in this age group, while 69.4% reported screening for neither chlamydia or gonorrhea. However, a larger share of respondents reported screening for chlamydia in sexually active adolescents, 48.5%, independent of other risk factors. 47.7% reported screening for neither chlamydia or gonorrhea in this age group.

Respondents were more likely to screen for both chlamydia and gonorrhea in women who had a new sexual partner in the past month (38.3%) than in women under age 25 (24.7%). Still, the majority of respondents (54.6%) would not screen for either disease in women with a new sex partner. Respondents were least likely to screen for both chlamydia and gonorrhea in monogamous women seen at annual exam (14.5%).

Characteristics of respondents who treat PID

Of the 505 physicians who provided greater than one hour of patient care, see at least one female patient per week and practice in one of the seven designated specialties, 59.8% (302) reported treating at least one case of PID in the past year. Only these respondents were selected for analysis of training, diagnosis, treatment and prevention practices for PID. Of the 182 physicians who reported *not* treating PID in the past year, 54.3% (94) claimed they did not see PID in their practice, 36.4% (63) reported referring PID cases to other

providers, and 9.2% (16) gave other reasons. Gynecologists were the most frequently identified providers to whom respondents would refer cases of PID (90.6%).

The proportion of physicians who reported treating a case of PID in the past year varied significantly among specialties ($p<0.001$) (Table 11). Emergency physicians, obstetricians, and family practitioners were more likely to have treated PID in the past year than respondents in other specialties. 92.9% of emergency physicians had treated a case of PID in the past year, as had 83.5% of obstetricians, and 65.6% of family practitioners. In contrast, a smaller proportion (<50%) of internists, general practitioners, and pediatricians reported treating a case of PID in the past year.

Similarly, the proportion of physicians who reported treating a case of PID in the past year was not evenly distributed among practice settings ($p<0.001$) (Table 12). Over two-thirds of physicians in private hospitals/clinics, HMOs, and public hospitals/clinics reported treating a case of PID in the past year. Physicians practicing in private hospitals or clinics were more likely to have treated a case of PID in the past year (88.7%) than physicians in any other setting ($p<0.05$). In contrast, only 53.9% of physicians in private or group practice reported treating a case of PID in the past year.

The likelihood of treating PID in the past year did not differ significantly for physicians practicing 15 years or less (66.0%) and those practicing for more than 15 years (61.8%) ($p=0.33$).

Physicians whose patient population included 20% or more Medi-Cal recipients were significantly more likely to have treated a case of PID in the past year (76.7%) than physicians seeing less than 20% Medi-Cal patients (56.5%) ($p<0.001$).

Volume of PID cases treated and hospitalized

Respondents were asked to estimate the number of female patients treated and proportion hospitalized for suspected or diagnosed PID in the past 12 months. Respondents (n=292) reported treating a median of 10 PID cases in the past 12 months (range=1 to 600). Emergency physicians (n=75) reported treating the highest number of suspected or diagnosed PID cases in the past year (median = 25, range = 3-600). Both obstetrician/gynecologists (n=83) and general practitioners (n=9) reported treating a median of 10 suspected or diagnosed PID cases in the past 12 months (range = 1 to 500; 1 to 20 respectively). Family practitioners (n=59) and pediatricians (n=23) reported treating a median of 6 cases in the past year (range = 1-120; 1-60 respectively). Internists (n=39) reported treating the fewest number of PID cases in the past 12 months (median = 5, range = 1-100).

As a group (n=278), respondents hospitalized 21.1% of all PID cases seen in the past year. Pediatricians hospitalized the highest proportion of suspected or diagnosed PID cases seen in the past year, 51.9%, while obstetrician/gynecologists hospitalized 35.1% of cases. In contrast, internists, emergency physicians, family practitioners, and general practitioners hospitalized smaller proportions of PID cases (16.8%, 12.6%, 8.1% and 1.1% respectively).

Reporting, partner referral, and partner treatment practices

Questionnaire respondents estimated reporting 35.7% of suspected or diagnosed PID cases treated in the past year to their local health departments. The specialties reporting the highest proportion of cases to their local health

departments were general practitioners (50.0%), pediatricians (43.2%), and emergency physicians (42.2%). Reporting a smaller proportion of PID cases were internists (32.2%), obstetricians (31.0%) and family practitioners (30.5%).

Respondents were asked to estimate the number of suspected or diagnosed PID cases in the last 12 months from whom they attempted to elicit sex partner information and encourage partner referral. Respondents reported following these referral practices in 81.3% of all PID cases seen in the past year. Pediatricians followed these practices for a larger proportion of cases than other providers, 89.0%. However, respondents had confirmation that a partner had been treated in only 27.1% of PID cases seen in the past 12 months.

PID training

Of the 302 respondents who reported treating a case of PID in the past year, 24.4% (73) reported receiving no specific training in PID management since medical school, residency and/or fellowship training (Table 13). Training was defined as continuing education courses, CDC STD training courses, or individual journal reading and conference attendance, etc. The groups reporting the lowest proportions of no subsequent training were pediatricians (17.4%), general practitioners (20.0%), family practitioners (21.7%), emergency physicians (22.1%), and obstetrician/gynecologists (24.7%). Internists were most likely not to have had subsequent training (40%), significantly more likely than non-internists (22.0%) ($p<0.05$). Physicians in practice 15 or fewer years were significantly more likely to have no subsequent training in PID management (32.9%) than those with more than 15 years practice experience (13.6%) ($p<0.001$).

PID diagnostic tests and procedures

Respondents were classified based on whether they ordered the recommended tests for at least 95% of patients with suspected PID: a gonococcal culture plus either a chlamydia antigen test or a chlamydia culture. 79.5% (237/298) of respondents reported ordering both of these recommended tests. Most specialties showed high rates of adhering to the recommendations for these diagnostic tests. Pediatricians had a significantly higher adherence rate (100.0%) (23/23) than non-pediatricians ($p<0.05$), while family practitioners were less likely to follow the recommendations (63.9%) than other providers ($p<0.001$). Of respondents who ordered chlamydia tests in at least 95% of patients with suspected PID, 45.8% chose a chlamydia antigen test, and 48.2% chose chlamydia culture (Table 14).

Of the respondents who do not follow the recommendations, 47.5% (29) reported ordering none of the three possible tests for chlamydia and gonorrhea, while 41.0% (25) reported ordering a gonococcal culture, but no test for chlamydia.

Table 14 describes the proportions of respondents who reported ordering or performing other diagnostic tests in cases of suspected PID. Close to half (48.5%) the respondents reported ordering a white blood cell count for at least 95% of patients with suspected PID. Cervical Gram's stain and erythrocyte sedimentation rate were less commonly ordered. 44.5% of respondents never ordered a Gram's stain in patients with suspected PID. 52.5% of respondents ordered an erythrocyte sedimentation rate in few (1-10%) or no patients (0%) with suspected PID. Respondents were most likely to order a pelvic sonogram for some patients (11-59%) with suspected PID.

The more invasive diagnostic tests, laparoscopy and endometrial biopsy, were least frequently ordered. 88.7% of respondents ordered laparoscopy in few (1-10%) or no patients (0%), and 96.1% of respondents ordered endometrial biopsy in few (1-10%) or no patients (0%).

Adherence to CDC guidelines for PID diagnosis

The majority of respondents (54.1%) said they do not follow the CDC guidelines for diagnosis of PID or are not sure if they follow the guidelines. A significantly higher proportion of obstetrician/gynecologists (61.0%) and pediatricians (60.9%) reported following the CDC guidelines when compared to physicians in each other speciality ($p<0.05$). In contrast, only 25.0% of internists reported following the guidelines.

Of the 148 respondents who do not follow the guidelines or are not sure, 59.2% (93) said they did not remember the guidelines, while 27.4% (43) said they had never seen the CDC guidelines, and 8.9% (14) gave other reasons.

PID diagnostic criteria

To evaluate physicians' index of suspicion for the presence of PID, the questionnaire presented respondents with nine different hypothetical medical histories and physical findings for a 21 year-old female patient with a negative pregnancy test. Respondents were asked to choose one of three management options for each case. Table 15 describes the cases and the proportion of respondents who chose each management option. The cases were grouped on the basis of clinical severity: no physical findings (A,B), mild illness (C,D,E), moderate illness (F,G), and severe illness (H,I). Only the

last two cases fulfill the CDC requirements for diagnosis of PID. In the cases of severe illness (H,I), almost all respondents (95.9%) would follow the CDC guidelines and diagnose PID in a patient with lower abdominal tenderness, bilateral adnexal tenderness, and cervical motion tenderness. Even more respondents (97.9%) would diagnose PID in a patient with these three signs and temperature >39.5°C.

In the seven cases which did not fulfill the CDC requirements for diagnosis, a majority of respondents diagnosed PID. Respondents' management of two cases of moderate illness (F,G) depended on the presence of an elevated temperature. 82.2% of physicians would diagnose PID in a patient with unilateral adnexal tenderness and cervical motion tenderness. However, an even higher proportion of physicians (95.2%) would hospitalize patient with the same presentation plus temperature > 39.5°C. Neither of these cases fulfill the CDC criteria for PID diagnosis.

In cases of moderate disease indicated by cervical motion tenderness (C,D,E), physicians were more likely to diagnose PID when abnormal cervical discharge and fever were present. 93.2% of physicians would diagnose PID in a patient with cervical motion tenderness and a history of treated gonorrhea, chlamydia or PID; 94.9% would diagnose PID in a patient with cervical motion tenderness and abnormal cervical discharge; and 97.6% would diagnose PID in a patient with the above presentation and a temperature >39.5°C. Again, none of these cases fulfill the CDC criteria for PID diagnosis.

Respondents were least likely to diagnose PID in a patient with symptoms of abdominal pain, fever and dyspareunia, and a normal physical exam. Still, 52.7% of respondents would diagnose PID in this case, which does not fulfill CDC diagnosis guidelines. Women with the same presentation

plus a history of gonorrhea, chlamydia or PID were much more likely to be diagnosed with PID. 81.1% of respondents would diagnose PID in this case, which also does not fulfill CDC diagnosis guidelines.

Interestingly, when asked what type of treatment, inpatient or outpatient, they would chose for each case, physicians recommended hospitalization most often in the three cases with an elevated temperature (D,G, I) even though elevated temperature is not a criteria for hospitalization according to the CDC guidelines.

Outpatient antimicrobial treatment for PID

Respondents who reported treating at least one case of PID in the past year were asked to indicate their preferred outpatient antimicrobial regimen for an uncomplicated case of PID. Of the 287 respondents who answered, 50.2% chose a regimen which does not meet the CDC recommendations for outpatient treatment of PID (Table 1). Regimens which meet the CDC guidelines provide coverage for gram-negative organisms such as *N. gonorrhea*, enteric rods and anaerobic organisms with a parenteral ß-lactam antibiotic such as cefoxitin or ceftriaxone, and coverage for *C. trachomatis* with either doxycycline or tetracycline. In addition, dose and duration of each antimicrobial must be sufficient to meet the CDC recommendations.

Responses were classified as either "standard" or "non-standard." Respondents who chose appropriate antimicrobials in sufficient dosages and durations were classified as "standard." Respondents who chose inappropriate antimicrobials or appropriate antimicrobials with inadequate dose and/or duration were classified as "non-standard." Four respondents chose a regimen that fulfilled the guidelines, but was excessive in number of

drugs, dose and/or duration. For purposes of analysis, these responses were classified as "standard." The proportion of physicians who prescribed standard antimicrobials for PID was unevenly distributed among specialties ($p<0.001$) (Table 16). Emergency physicians (68.4%) were most likely to prescribe standard antimicrobial regimens. Half of pediatricians (50.0%) and less than half of general practitioners (44.4%), internists (44.7%), and family practitioners (46.6%) prescribed standard medications for PID. Only 37.8% of obstetricians prescribed standard regimens for outpatient treatment of PID.

Similarly, the proportion of physicians prescribing standard medications for PID varied significantly by practice setting ($p<0.001$). Only 32.8% of physicians in private or group practices prescribed standard antimicrobial regimens. In contrast, over 60% of physicians in public hospitals/clinics (65.9%), university/college clinics (62.5%), HMOs (62.3%), and private hospitals/clinics (61.5%) prescribed standard regimens.

Physicians in practice for more than 15 years were significantly less likely to prescribe standard regimens for outpatient treatment of PID (37.9%) than physicians in practice 15 or fewer years (59.9%) ($p<0.001$). Similarly, a significantly smaller proportion of non-San Francisco respondents prescribed standard antimicrobials (45.1%) than did San Francisco respondents (60.7%) ($p<0.05$).

Hospitalization of PID cases

Respondents were asked if they would recommend hospitalization of a woman with suspected PID in nine different clinical scenarios. Five of these scenarios are indications for hospitalization according to the current CDC guidelines for PID management (Table 17: A-E). Almost all respondents said

they would recommend hospitalization for a patient with a suspected pelvic abscess (98.0%) or if a patient has failed to respond to outpatient therapy (98.7%). Most physicians (85.3%) would recommend hospitalization for a pregnant patient with suspected PID, but fewer would hospitalize a patient when clinical follow-up within 72 hours was not possible (65.6%).

Only 30.8% of respondents would hospitalize a teenager with suspected PID. The proportion of physicians who would recommend hospitalization of a teenager with PID varied significantly by specialty ($p<0.005$) (Table 18). Pediatricians (47.4%), obstetrician/gynecologists (41.5%) and internists (40.0%) were more likely to hospitalize a teenager with suspected PID than physicians in other specialties. Only 14.9% of emergency physicians said they would hospitalize a teenager with suspected PID.

We analyzed the proportion of respondents who would follow the CDC hospitalization recommendations 80% of the time (four of five scenarios) and 100% of the time (five of five scenarios). Only 24.8% of respondents reported recommending hospitalization in all five of the cases where the CDC advises hospitalization. 60.4% (180/298) of respondents would recommend hospitalization in four of five of these cases. Pediatricians were most likely to recommend hospitalization in at least four of five recommended cases (73.9%). In contrast, only 44.7% of emergency physicians advised hospitalization for four of five cases ($p<0.001$).

Elevated temperature is not included in the CDC guidelines as an indication for hospitalization of a patient with suspected PID, but 89.3% of respondents would recommend hospitalization in this situation. Similarly, prior history of IUD use in a patient with suspected PID is not an indication for hospitalization, but almost half of respondents (48.3%) would recommend

hospitalization for such patients. HIV status is not discussed as an indication for hospitalization in the current CDC guidelines on PID management, however, 66.4% of respondents would recommend hospitalization of an HIV-positive patient with suspected PID.

Some researchers advocate hospitalization of all patients with PID. Only 5.8% (17) of respondents would advise hospitalization of all patients with suspected PID. Interestingly, pediatricians and obstetricians accounted for 15 of the 17 recommendations. Pediatricians were significantly more likely to recommend universal hospitalization (33.3% (7/21)) than non-pediatricians (3.7%) ($p<0.001$). No emergency physicians (0/74), general practitioners (0/10) or family practitioners (0/60) would recommend hospitalization of all patients with suspected PID.

Chapter VI

Discussion

This survey of primary care physicians in California was used to describe physician practices in the management of PID and to evaluate how closely physicians follow the CDC recommendations for PID diagnosis, treatment and prevention. Almost 60% of respondents had treated a case of PID in the past year, indicating that PID is a commonly encountered disease in primary care practice. The findings of this survey show that primary care physicians' management of PID differs significantly from CDC recommendations in several areas, and the proportions of physicians following the recommendations in most categories are well below the rate called for by the Public Health Service's Year 2000 objectives.

Prevention practices

Screening

Over 90% of respondents followed the recommendations for routine chlamydia and gonorrhea screening in women with suspected PID, meeting the Year 2000 goal. Similarly, close to 90% of respondents reported performing both screening tests for women with mucopurulent cervicitis, women with syphilis, and women whose partner(s) had urethritis. However, rates of routine chlamydia and gonorrhea for young women and sexually active adolescents was substantially lower than current recommendations. Less than half of respondents would screen for chlamydia as recommended in

sexually active adolescent females, and only 26.9% would screen for chlamydia as recommended in women less than 25 years of age. These findings are particularly troubling considering the increasing chlamydia rate in young and teenage women and the major role of chlamydia as a PID pathogen.

Also troubling is the minority of physicians who routinely screened for chlamydia in women with new sexual partners in the past month (38.3%). Although current STD management guidelines do not recommend routine screening for this group specifically, some researchers believe that this group should be routinely screened for certain STDs, including chlamydia.

Current guidelines do not address routine screening in women with bacterial vaginosis. However, recent studies have shown an association between BV and PID. The current study found that while over 50% of respondents already routinely screen for both chlamydia and gonorrhea in women with BV, some 35% screen for neither infection. If further studies demonstrate BV to be a risk factor for PID, these recommendations could be changed, and a substantial proportion of physicians will need to update their clinical practices.

Over 30% of respondents would not routinely screen for chlamydia and gonorrhea in patients with trichomoniasis, a protozoal STD which is often considered to be troublesome to the patient, but clinically benign with no major sequelae in non-pregnant women. Although no data exist to support an association with PID, patients with one STD are at risk of having a second STD. The 60% of respondents who do screen for both chlamydia and gonorrhea in this population probably understand this concept. However,

these data indicate that many other physicians do not view a patient with trichomoniasis as being at risk for other STDs.

Reporting

Even though PID is a reportable disease in California, respondents estimated reporting only 35.7% of suspected or diagnosed PID cases to their local health departments. Under-reporting of PID decreases the ability of health researchers and planners to estimate the magnitude of PID in California and to provide preventive and medical services to groups at high risk. Methods to increase reporting rates for PID should be developed and actively promoted by state health agencies.

Partner referral and treatment

Surprisingly, respondents reported practicing partner referral in over 80% of PID cases treated. However, partner referral was defined only as "attempting to elicit sex partner information and encourage partner referral." Our study did not collect information on specific partner referral practices, such as advising the patient to tell her partner(s), giving the patient a written note to give to her partner(s), or contacting the partner(s) directly. However, respondents had confirmation that a partner had been treated in only one-quarter of PID cases, indicating that while they may practice some method of partner referral, the outcome was largely unknown. Future studies should focus on which methods of partner referral physicians use and which methods are most effective.

Diagnosis

Over half of the respondents said they do not follow the CDC guidelines for diagnosis of PID; of these, over one-fourth said they have never seen the CDC guidelines for diagnosis. The protocol for detecting and diagnosing PID has changed several times in the past decade and is still debated in the literature. Physicians who do not follow the CDC guidelines for PID diagnosis are likely to follow older, inadequate standards of care which do not take into account recent knowledge about the pathogenesis and presentation of PID, especially chlamydial and inapparent PID. In addition, these physicians are unlikely to follow or have seen the CDC recommendations on preventive measures and treatment for PID which are outlined in the same publication as the diagnostic guidelines.

Close to 80% of respondents reported ordering both chlamydia and gonorrhea tests as recommended for a patient with PID. While high, this proportion still does not meet the Year 2000 goal of 90%. Of those physicians who reported not ordering the recommended tests, close to half ordered a gonorrhea test only, while over 40% order neither a gonorrhea nor a chlamydia test, indicating that these physicians are not aware of chlamydia's major role in the pathogenesis of PID.

When asked if they would diagnose and treat for PID in a variety of hypothetical clinical cases, physicians acted conservatively, with the majority choosing to diagnose and treat for PID in every case, even though only two cases fulfilled the CDC criteria. In those two cases, well over 90% of physicians diagnosed PID, meeting the Year 2000 goal. However, under the guidelines, the majority of respondents would be over-treating the other seven cases. According to the CDC guidelines, criteria necessary for a

diagnosis of PID include lower abdominal tenderness, bilateral adnexal tenderness, and cervical motion tenderness. Our findings suggest that in practice, physicians require fewer, less specific, criteria to diagnose PID.

In general, respondents were highly likely to diagnose PID in cases with any of the physical criteria listed above. Over 90% of respondents diagnosed PID in three of four cases where cervical motion tenderness was present. The only exception was a case with cervical motion tenderness and unilateral adnexal tenderness, suggesting that unilateral adnexal tenderness is not considered specific to PID.

In addition, the results of this study suggest that physicians rely on clinical criteria not required by the CDC algorithm to determine whether PID is present. For example, the three cases where fever (temperature > 39.5°C) was present had the highest rates of diagnosis, even though fever is not required for diagnosis under the CDC guidelines. These cases were also the most likely to be hospitalized for treatment, indicating that physicians use fever as a marker of severe, systemic illness in PID.

The case of a symptomatic patient with a normal exam was least likely to be diagnosed as PID; still, over half of the respondents diagnosed PID in this case. By adding a history of gonorrhea, chlamydia or PID, diagnosis of PID rose to over 80%, suggesting that physicians believe that even in a patient with no physical findings, a history of these diseases increases the likelihood of PID. Like fever, a history of gonorrhea, chlamydia or PID is not a criterion for diagnosis under the CDC guidelines.

The CDC recommendations for diagnosis are a synthesis of the criteria which have been shown in clinical research to be associated with PID, although the sensitivity and specificity of many of the criteria are debated in

the literature. As this study shows, physicians' diagnostic decisions for PID take into account criteria which research has not shown to be highly sensitive or specific for PID (e.g. elevated temperature, past history of chlamydia, gonorrhea, or PID). However, physicians in this study were more likely to over-diagnose than under-diagnose PID. As discussed earlier, the consequences of over-diagnosis are deemed justifiable in order to avoid the more severe consequences of under-diagnosis, such as infertility and ectopic pregnancy. So, even though the majority of physicians do not follow the standard of care for PID diagnosis, their tendency to have a low threshold of diagnosis means that most cases of PID seen by physicians will be detected and treated. However, by following the more selective approach to diagnosing PID outlined in the CDC guidelines, physicians would avoid the hazards of over-diagnosis, including excessive and/or unnecessary use of antibiotics, unnecessary laboratory tests, invasive procedures, and emotional distress to the patient and her partner(s).

Treatment

Over half of respondents prescribe antimicrobial regimens for outpatient treatment of PID which do not meet the CDC recommendations. Of those physicians prescribing non-standard drug regimens, many chose appropriate drugs (Table 1), but did not prescribe them in adequate dosage or duration. The impact of inadequate antimicrobial treatment for PID has several implications. First, inadequate drug treatment is unlikely to effect a cure for PID and prevent sequelae. However, it may reduce the intensity of the infection and symptoms for a period of time, leading the patient to

believe she is cured. These patients can still suffer the irreversible sequelae of PID and may unknowingly spread STD organisms to their partner(s). Second, treatment with antimicrobials in insufficient dosage and duration or with drugs that are not effective against PID pathogens could favor the development of antimicrobial-resistant organisms in PID. Third, the finding that most physicians prescribed appropriate drugs but in inadequate dosage and duration indicates that physicians are following older standards of care for PID and have not changed their practices to meet the most recent drug therapy recommendations published in 1991 [54, 61].

Only one-fourth of respondents followed the CDC recommendations for hospitalization of PID cases in five of five cases where hospitalization was indicated. The most troubling finding was that less than one-third of physicians would hospitalize a teenager with suspected PID as recommended. Although the recommendations for hospitalization of PID cases is controversial, many researchers believe that teenagers with PID should be hospitalized because they are unlikely to fully comply with outpatient treatment and are at high risk for future infertility [79].

Characteristics of physicians who treat PID

As found in earlier studies, obstetricians and family practitioners were likely to treat PID in their practices [45-48]. However, not described earlier is the role of emergency physicians in PID management. In this study, a higher proportion of emergency physicians treated PID than physicians in other specialties, and they treated a 2.5 times as many cases of PID than any other group of physicians. Emergency physicians may see more PID cases because

many patients present acutely to the emergency department, or because women with PID may be uninsured and use the emergency department as their source of primary care. Although these findings do not reflect the proportion of all PID cases seen by emergency physicians, they show that emergency physicians are a significant source of care for PID, and therefore, their management practices may have a substantial impact on the overall quality of care for PID. Emergency physicians, along with obstetricians and family practitioners, should be a focus of education and training efforts.

Surprisingly, over one-third of pediatricians reported treating PID. Although fewer pediatricians treat PID than do physicians in the above specialties, pediatricians constitute the third largest primary care specialty group, accounting for close to 16% of the target population. And as pediatricians' role in adolescent medicine grows, they may become more significant providers of care for PID patients. Thus, their impact on PID care could be important, and training efforts should reach this group. Similarly, although less than half of internists reported treating PID and saw only a median of five cases in the past year, their impact on overall PID management may be significant as they account for close to 30% of primary care physicians in California. This large group of providers should also be included in prevention efforts.

Other groups which should be targeted for PID education and training messages include physicians in hospital or clinic settings, and those in HMOs. Over two-thirds of respondents in these settings had treated PID. These findings could reflect a higher incidence of PID in HMO, hospital and clinic populations than in private practice populations. In addition, physicians treating high proportions of Medi-Cal patients were more likely to treat PID

than other physicians. This finding supports previous knowledge that the incidence of PID is higher in teens, African-Americans and women of lower socioeconomic status, all populations that are more likely to be Medi-Cal recipients [2].

Interestingly, physicians at private hospitals or clinics were most likely to treat PID. In contrast, we expected physicians at public hospital or clinics to be most likely to treat PID. Physicians at private sites are not likely to serve high rates of Medi-Cal patients, so perhaps this unexpected finding is due to high rates of PID patients presenting to private hospital emergency departments or high rates of hospitalization for PID in private hospitals. In any case, these findings indicate that PID is more likely to be treated in a hospital, clinic or HMO setting than in a private/group practice setting and appropriate education and training should be targeted to these sites.

Differences in PID management by Specialty

We predicted that physician management of PID would differ by specialty group. We expected that specialties in which high proportions of physicians treated PID and/or treated high volumes of PID would be more likely to adhere to CDC guidelines for management of PID, specifically emergency physicians, obstetricians and family practitioners. However, our findings show that physicians in these specialties do not follow the standard of care for PID in many categories.

Emergency physicians are important providers of PID care. Emergency physicians were more likely to prescribe standard drug regimens for PID than other specialty groups, and over 85% ordered the recommended diagnostic

tests. However, emergency physicians were least likely to follow CDC recommendations for hospitalization, and only 14.9% of these physicians would hospitalize a teenager with PID as recommended. For some reason, while emergency physicians follow standard of care in PID diagnosis and antimicrobial treatment, they seem reluctant to hospitalize PID patients. These findings are troubling considering the high volume of PID cases seen by this specialty.

Obstetrician/gynecologists followed standard of care for PID in many categories. For example, this group was more likely to follow the CDC diagnostic recommendations for PID than other specialty groups, and they were likely to hospitalize teens with PID as recommended. However, obstetrician/gynecologists had low levels of reporting and training, and most significantly, only 31.6% of these physicians prescribed standard drug regimens for PID, lower than all other specialty groups.

Internists were notable for their low rates of adherence to most CDC recommended practices. Only one-fourth of internists followed the CDC guidelines for diagnosis; less than half prescribed standard drug treatment for PID; less than one-third reported PID cases. In addition, 40% of internists reported no training in PID management subsequent to their residency, more than any other specialty group.

In contrast, pediatrician practices consistently met the CDC guidelines for PID management in most categories. For example, 100% of pediatricians ordered the recommended diagnostic tests for a patient with suspected PID. High proportions of pediatricians reported PID cases, practiced partner referral, followed CDC diagnostic and hospitalization guidelines, and prescribed standard drug regimens for PID. As expected, pediatricians were

also most likely to hospitalize a teenager with PID as recommended. In addition, pediatricians were more likely to have had training in PID management since their residency than physicians in other specialties. This group appears to be well-informed about PID and follow published recommendations for PID management.

Limitations

The ability to generalize the findings of this study to all primary care physicians in California is somewhat limited by the study design and the response rate. Although San Francisco respondents do differ systematically from other respondents in some demographic and management categories, no significant differences were found between San Francisco and non-San Francisco respondents in the proportion treating a case of PID in the past year, receiving any training in PID management, ordering the recommended tests for diagnosis of suspected PID, and following the CDC guidelines for PID diagnosis. Even if the findings in this study cannot be considered completely generalizable to all primary care physicians in California, they are likely to represent physicians who practice in urban or semi-urban areas where high STD and PID rates make understanding physician management practices particularly important.

Close to 50% of those surveyed did not respond. We were not able to test whether non-respondents were systematically different from respondents. However, physicians who responded probably did so because they were more likely to see PID, more interested in PID, and more knowledgeable about the disease than non-respondents. Non-respondents

were probably less likely to meet the criteria for inclusion into the study, less likely to see patients with PID, and therefore, less likely to follow the CDC guidelines for PID management. So, a higher response rate might have found that an even higher proportion of physicians do not provide standard of care for PID.

This study examined physician self-reports of clinical practice patterns, so the accuracy of the data depends on physicians' ability to accurately report their clinical practices. However, other studies have found that on self-report, physicians overestimate the frequency of clinical practices provided [80, 81]. Therefore, in some cases, physicians in this survey may have overestimated their adherence to CDC guidelines, and true practice patterns for PID management may be even more divergent from the guidelines than these findings show.

Recommendations

1) Physicians need more information and training in PID management to increase their effectiveness in preventing PID and its sequelae. Training efforts should be focused on emergency physicians, obstetricians, family practitioners, pediatricians, and internists. Physicians in private hospitals/clinics, HMOs, and public hospitals/clinics should also be targeted for training, as these groups see higher rates of PID than physicians in private/group practice, college/university clinics or government health facilities. In addition, physicians who serve a high proportion of Medi-Cal

recipients also care for many PID patients and should be included in training efforts.

2) The current study indicates that the CDC guidelines for PID management do not influence many physicians. These physicians do not follow the guidelines either because they have never seen the guidelines or because they do not remember them. Note that few respondents said they do not agree with the guidelines. Divergence from the guidelines was most evident in diagnosis of PID and antimicrobial treatment. Further research is needed to understand what sources *do* influence physician practices in PID management. These sources might include residency training, professional society guidelines, professional conferences, hospital or HMO practice guidelines, medical journal updates, and local practice patterns. PID prevention and training efforts might reach more physicians through one of these routes.

3) We need to understand why emergency physicians care for such a high number of PID cases. Could these cases be detected earlier via routine gynecologic care and/or routine screening for chlamydia and gonorrhea? Are the women treated by emergency physicians demographically different than those treated by other physicians, and do these women suffer a higher proportion of sequelae from PID? Similarly, why are physicians in private hospitals/clinics more likely to treat PID patients than physicians in other practice types? Both of these findings could be due to the clinical course of PID or they may be explained by poor access to primary gynecologic health care. Further research should explore these questions.

4) Finally, further study of the management of PID by clinicians should include nurse practitioners, physician assistants, and certified nurse-midwives. These providers probably mange a substantial proportion of STD and PID cases in family planning, STD, community, college/university, and county hospital outpatient clinics.

Table 1: Centers for Disease Control Recommendations for Antimicrobial Treatment of Acute Pelvic Inflammatory Disease - 1991

Outpatient therapy

Cefoxitin 2 g IM plus probenecid, 1 g orally, concurrently,
or
Ceftriaxone 250 mg IM or equivalent cephalosporin
plus
Doxycycline 100 mg orally 2 times daily for 10-14 days, **or**
Tetracycline 500 mg orally 4 times daily for 10-14 days

Inpatient therapy

a) Cefoxitin 2 g IV every 6 hours, or Cefotetan IV 2 g every 6 hours
plus
Doxycycline 100 mg orally or IV every 12 hours and for 10-14 days after discharge

b) Clindamycin IV 900 mg every 8 hours
plus
Gentamicin loading dose IV or IM followed by a maintenance dose every 8 hours
plus
Doxycycline 100 mg orally 2 times daily for 10-14 days after discharge

Table 2: Centers for Disease Control Recommendations for Hospitalization of Women with Acute PID - 1991

1) The diagnosis is uncertain.
2) Surgical emergencies such as appendicitis and ectopic pregnancy cannot be excluded.
3) A pelvic abscess is suspected.
4) The patient is pregnant.
5) The patient is an adolescent.
6) Severe illness precludes outpatient management.
7) The patient is unable to tolerate an outpatient regimen.
8) The patient has failed to respond to outpatient therapy.
9) Clinical follow-up within 72 hours of staring antibiotic treatment cannot be arranged.

Table 3: Number and Proportion of California Physicians in Target Population and by Specialty

Physician speciality	*State total*	*% of target population*
Emergency medicine	2311	7.2
General practice	4439	13.9
Family practice	5863	18.4
Internal medicine	9351	29.3
Infectious disease	363	1.1
Obstetrics/gynecology	4081	12.8
Gynecology only	392	1.2
Pediatrics	5007	15.7
Adolescent medicine	81	0.3
Total	**31,888**	**100.0**

Table 4: Number of Physicians in Target Population by Specialty in San Francisco County

Specialty	*Total*	*# in sample of 400 physicians*	*# available for analysis assuming a 65% response rate*
Emergency medicine	147	29	19
General practice	282	55	36
Family practice	372	73	47
Internal medicine	617	121	78
Obstetrics/gynecology	286	58	38
Pediatrics/adolescent medicine	325	64	42
Total	**2029**	**400**	**260**

Table 5: Number of Physicians in Target Population by Specialty in All Other California Counties (Other Than San Francisco)

Specialty	*Total*	*# in sample of 600 physicians*	*# available for analysis assuming a 65% response rate*
Emergency medicine	2164	43	28
General practice	4157	83	54
Family practice	5491	110	72
Internal medicine	9097	183	119
Obstetrics/gynecology	4224	85	55
Pediatrics/adolescent medicine	4763	96	62
Total	**29,896**	**600**	**390**

Table 6: Sample Population by Specialty and Location

Specialty	*San Francisco County*	*Other California Counties*	*Total*
Emergency medicine	80	100	180
General practice	55	83	138
Family practice	73	110	183
Internal medicine	121	183	304
Obstetrics/gynecology	100	100	200
Pediatrics/adolescent medicine	64	96	160
TOTAL	**493**	**672**	**1165**

Table 7: Comparison of Response and Target Populations by Specialty (n=553)

Specialty	*Response population* # (%)	*Target population* # (%)	*p-value*
Obstetrics/gynecology	107 (19.3)	4081 (14.0)	<0.001
Internal medicine	104 (18.8)	9351 (29.3)	<0.001
Family practice	99 (17.9)	5863 (18.4)	0.91
Emergency medicine	86 (15.6)	2311 (7.2)	<0.001
Pediatrics/adolescent medicine	78 (14.1)	5088 (16.0)	0.40
General practice	30 (5.4)	4439 (13.9)	<0.001
Infectious disease	6 (1.1)	363 (1.1)	0.98
Multiple specialties		6 (1.1)	
Other specialties		34 (6.1)	
Unknown specialty		3 (0.5)	
TOTAL	553 (100.0)	31,888 (100.0)	

Table 8: Response Rate by Specialty (n=553)

Specialty	*Surveys mailed* *N*	*Surveys returned* *N*	*Response rate* *%*
Family practice	183	99	54.1%
Obstetrics/gynecology	200	107	53.5%
Emergency medicine	180	89	49.4%
Pediatrics/adolescent medicine	160	78	48.8%
General practice	138	30	21.7%
Internal medicine/ Infectious disease	304	104	32.4%

Table 9: Primary Practice Setting of Respondents (n=470)

Practice type	*Respondents* %	(N)
Private or group practice	49.4	(232)
HMO	17.7	(83)
Public hospital or clinic	14.0	(66)
Private hospital or clinic	13.2	(62)
University or college clinic	3.6	(17)
Government facility	1.9	(9)
Other	0.2	(1)

Table 10: Proportion of Respondents who Reported Screening for Chlamydia, Gonorrhea, Both or Neither in Ten Clinical Situations (n=398)*

Clinical situation	*Both* %	*Chlamydia only* %	*Gonorrhea only* %	*Neither* %
Females with . . .				
Mucopurulent cervicitis	89.2	2.3	4.3	4.3
Bacterial vaginosis	55.3	5.3	4.3	35.0
Suspected PID	94.5	3.5	2.0	0.0
Trichomoniasis	58.6	4.4	4.6	32.4
Syphilis	88.7	0.5	5.8	4.9
Females who are asymptomatic and . . .				
Monogamous, seen at annual exam	14.5	1.8	3.3	80.5
Have had new sex partner(s) in the past three months	38.3	3.4	3.7	54.6
Have male partner(s) with urethritis	87.0	2.1	3.1	7.8
Are under age 25 (independent of other risk factors)	24.7	2.2	3.6	69.4
Are sexually active adolescents (independent of other risk factors)	45.1	3.4	3.7	47.7

*Of 505 respondents who reported providing at least one hour of patient care per week, seeing at least one female patient per week, and practicing in one of the seven designated specialties.

Table 11: Proportion of Respondents who Reported Treating a Case of PID in Past Year , by Specialty (n=479)

	Treated a case of PID in past year		
Specialty	*Yes* *N (%)*	*No* *N (%)*	*Total*
Emergency medicine	78 (92.9)	6 (7.1)	84
Obstetrics/gynecology	86 (83.5)	17 (16.5)	103
Family practice	61 (65.6)	32 (34.4)	93
Internal medicine	41 (42.3)	56 (57.7)	97
Pediatrics	23 (34.8)	43 (65.2)	66
General practice	10 (33.3)	20 (66.7)	30
Infectious disease	1 (16.7)	5 (83.3)	6
Total	300 (62.6)	179 (37.4)	479

Overall chi-square p-value <0.001

Table 12: Proportion of Respondents who Reported Treating a Case of PID in Past Year, by Practice Type (n=469)

	Treated a case of PID in past year		
Practice type	*Yes* *N (%)*	*No* *N (%)*	*Total*
Private/group practice	125 (53.9)	107 (46.1)	232
HMO	61 (73.5)	22 (26.5)	83
Private hospital/clinic	55 (88.7)	7 (11.3)	62
Public hospital/clinic	45 (68.2)	21 (31.8)	66
University/college clinic	10 (58.8)	7 (41.2)	17
Government	4 (44.4)	5 (55.6)	9
Total	300 (64.0)	169 (36.0)	469

Overall chi-square p-value <0.001

Table 13: Proportion of Respondents Reporting No Training in PID Management Since Residency, by Specialty*

Specialty	*No PID training since residency* %	(#)
Internal medicine	40.0	(16)
Obstetrics/gynecology	24.7	(21)
Emergency medicine	22.1	(17)
Family practice	21.7	(13)
General practice	20.0	(2)
Pediatrics/adolescent medicine	17.4	(4)
Infectious disease	0.0	(0)
Total	24.4	(73)

*Of the 302 respondents who reported treating a case of PID in the past year.

Table 14: Proportion of Physicians Who Order or Perform a Clinical Test for a Patient with Suspected PID (n=297)*

		Proportion of patients for whom test is ordered/performed %				
Test/procedure		*Almost all (>95%)*	*Most (60-95%)*	*Some (11-59%)*	*Few (1-10%)*	*None (0%)*
A.	Chlamydia antigen test	45.8	5.2	3.3	9.6	36.2
B.	Chlamydia culture	48.2	9.1	6.5	10.5	25.7
C.	Gonoccocal culture	88.2	6.4	2.0	2.0	1.3
D.	Cervical Gram's stain	20.3	6.8	8.5	19.9	44.5
E.	Erythrocyte sed. rate	19.8	9.7	18.1	22.6	29.9
F.	White blood cell count	48.5	20.0	21.0	5.8	4.7
G.	Pelvic sonogram	8.3	11.1	42.2	28.4	10.0
H.	Endometrial biopsy	0.0	0.7	3.2	18.3	77.8
I.	Laparoscopy	0.0	1.1	10.2	39.6	49.1

*Of the 302 respondents who reported treating a case of PID in the past year.

Table 15: Management of Hypothetical Clinical Cases (n=292)*

Cases	*Proportion of respondents who would... Don't treat await lab results* %	*Diagnose and treat as probable PID* %
A. Two week history of intermittent abdominal pain, fever and dyspareunia with normal exam	47.3	52.7
B. Same history as (A) plus a history of gonorrhea, chlamydia or PID	18.9	81.1
C. Cervical motion tenderness and abnormal cervical discharge	5.1	94.9
D. Cervical motion tenderness, abnormal cervical discharge and fever	2.4	97.6
E. Cervical motion tenderness and a prior history of treated chlamydia, gonorrhea or PID	6.8	93.2
F. Unilateral adnexal tenderness and cervical motion tenderness	17.8	82.2
G. Unilateral adnexal tenderness, cervical motion tenderness and fever	4.8	95.2
H. Lower abdominal tenderness, bilateral adnexal tenderness, and cervical motion tenderness	4.1	95.9
I. All of the findings in (H) plus temperature > 39.5°C	2.1	97.9

*Of the 302 respondents who reported treating a case of PID in the past year.

Table 16: Proportion of Respondents who Prescribed Standard Drug Regimens for Outpatient PID Treatment, by Specialty (n=285)*

	Prescribed standard drug regimens		
Specialty	*Yes* *N (%)*	*No* *N (%)*	*Total*
Emergency medicine	52 (68.4)	24 (31.6)	76
Obstetrics/gynecology	31 (37.8)	51 (62.2)	82
Family practice	27 (46.6)	31 (53.4)	58
Internal medicine	17 (44.7)	21 (55.3)	38
Pediatrics	11 (50.0)	11 (50.0)	22
General practice	4 (44.4)	5 (55.6)	9
Total	142 (49.8)	143 (50.2)	285

Overall chi-square p-value <0.001

*Of the 302 respondents who reported treating a case of PID in the past year.

Table 17: Proportion of Respondents who Prescribed Standard Drug Regimens for Outpatient PID Treatment, by Practice Type (n=285)*

	Prescribed standard drug regimens		
Practice type	*Yes* *N (%)*	*No* *N (%)*	*Total*
Private/group practice	38 (32.8)	78 (67.2)	116
HMO	38 (62.3)	23 (37.3)	61
Private hospital/clinic	32 (61.5)	20 (38.5)	52
Public hospital/clinic	29 (65.9)	15 (34.1)	44
University/college clinic	5 (62.5)	3 (37.5)	8
Total	139 (49.5)	142 (50.5)	281

Overall chi-square p-value <0.001

*Of the 302 respondents who reported treating a case of PID in the past year.

Table 18: Proportion of Respondents Recommending Hospitalization in Nine Clinical Scenarios (n=297)*

Clinical scenario		*% (N)*
CDC recommends hospitalization		
A.	If the patient has failed to respond to outpatient therapy	98.7 (293)
B.	If pelvic abscess is suspected	98.0 (291)
C.	If the patient in pregnant	85.3 (249)
D.	If clinical follow-up within 72 hours of starting antibiotic is not possible	65.6 (191)
E.	If the patient is less than 20 years old	30.8 (88)
CDC does not address hospitalization		
F.	If the patient is HIV positive	66.4 (190)
G.	If the patient has a temperature > 39.5°C	89.3 (260)
H.	If the patient has a history of IUD use	48.3 (140)
I.	If the patient has a history of PID use	22.4 (66)
J.	Would hospitalize all patients with PID	5.8 (17)

*Of the 302 respondents who reported treating a case of PID in the past year.

Table 19: Proportion of Respondents Who Recommend Hospitalization of a Teenager with Suspected PID, by Specialty (n=283)*

	Recommend hospitalization for teens		
Specialty	*Yes* *N (%)*	*No* *N (%)*	*Total*
Emergency medicine	11 (14.9)	63 (85.1)	74
Obstetrics/gynecology	34 (41.5)	48 (58.5)	82
Family practice	16 (27.6)	42 (72.4)	58
Internal medicine	16 (40.0)	24 (60.0)	40
Pediatrics	9 (47.4)	10 (52.6)	19
General practice	2 (20.0)	8 (80.0)	10
Total	88 (31.1)	195 (68.9)	283

Overall chi-square p-value < 0.005

*Of the 302 respondents who reported treating a case of PID in the past year.

References

1. Aral SO, Mosher WD, Cates W. Self-reported pelvic inflammatory disease in the United States, 1988. *JAMA* 1991; 266:2570-2573.

2. Weström L, Märdh, P-A. Acute pelvic inflammatory disease (PID). In Holmes, KK, Märdh P-A, Spurling PF, et al, eds. *Sexually Transmitted Diseases*. 2nd ed. New York: McGraw Hill Company, 1990: 593-613.

3. Wølner-Hanssen P, Kiviat N, Holmes KK. 1990. Atypical pelvic inflammatory disease: subacute, chronic, or subclinical upper genital tract infection in women. In Holmes, KK, Märdh P-A, Spurling PF, et al, eds. *Sexually Transmitted Diseases*. 2nd ed. New York: McGraw Hill Company, 1990: 615-620.

4. Center for Prevention Services (U.S.). Division of Sexually Transmitted Diseases. *1991 STD treatment guidelines*. Atlanta, Ga: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Prevention Services, Division of Sexually Transmitted Diseases, 1992.

5. Lewis CE, Freeman HE. The sexual history-taking and counseling practices of primary care physicians. *West J Med* 1987; 147:165-167.

6. Fredman L, Rabin D, Bowman M, Bandemer C, Sardeson K, Taggart V, English D. Primary care physicians' assessment and prevention of HIV infection. *Am J Prev Med* 1989; 5:188-195.

7. Rolfs RT, Galaid EI, Zaidi AA. Pelvic inflammatory disease: Trends in hospitalizations and office visits, 1979 through 1988. *Am J Obstet Gynecol* 1992; 166:983-990.

8. Freeman WL, Green LA, Becker LA. Pelvic inflammatory disease in primary care. *Family Medicine* 1988; 20:192-196.

9. Grimes DA, Blount JH, Patrick J, Washington AE. Antibiotic treatment of pelvic inflammatory disease. *JAMA* 1986; 256:3223-3226.

10. Paavonen J, Kiviat N, Brunham RC, Stevens CE, Kuo C-C, Stamm WS, Miettiner A, Soules M, Eschenbach DA, Holmes KK. Prevalence and manifestations of endometritis among women with cervicitis. *Am J Obstet Gynecol* 1985; 152:280-286.

11. Cates W, Rolfs RT, Aral SO. Sexually transmitted diseases, pelvic inflammatory disease, and infertility: an epidemiologic update. *Epidemiologic Reviews* 1990; 12:199-220.

12. Cates W. Sexually transmitted organisms and infertility: the proof of the pudding. *Sexually Transmitted Diseases*, 1984; 11:113-116.

13. Centers for Disease Control. Summary of notifiable diseases, United States, week ending 30 December 1989. *MMWR* 1989; 36(54):1-59.

14. Platt R, Rice PA, McCormack WM. Risk of acquiring gonorrhea and prevalence of abnormal adnexal findings among women recently exposed to gonorrhea. *JAMA* 1983; 250:3205-3209.

15. World Health Organization. Infections, pregnancies, and infertility: perspectives on prevention. *Fertility and Sterility* 1987; 47:964-968.

16. Wasserheit JN. Pelvic inflammatory disease and infertility. *Maryland Medical Journal* 1987; 36:58-63.

17. Sweet RL. Pelvic inflammatory disease and infertility in women. *Infectious Disease Clinics of North Americ*a 1987; 1:199-215.

18. Draper DL, Donegan EA, James JF, Sweet RL, Brooks GF. *In vitro* modeling of acute salpingitis caused by *Neisseria gonorrhoeae. Am J Obstet Gynecol* 1980; 138:996.

19. Radberg T, Hamberger L. *Chlamydia trachomatis* in relation to infections following first trimester abortions (abstract). *Acta Obstetrica et Gynecologica* 1980; Supplement 93: 54.

20. Washington AE, Cates W, Zaidi AA. Hospitalizations for pelvic inflammatory disease: epidemiology and trends in the United States, 1975-1981. *JAMA* 1984; 2529-33.

21. Rolfs RT, Galaid EI, Zaidi A. Pelvic inflammatory disease: trends in hospitalizations and office visits 1979-1988. Op. cit. in Cates 1990.

22. Buchan H, Vessey M. Epidemiology and trends in hospital discharges for pelvic inflammatory disease in England, 1975 to 1985. *Br J Obstet Gynaecol* 1989; 96: 1219-23.

23. Weström L. Decrease in incidence of women treated in hospital for acute salpingitis in Sweden. *Genitourinary Medicine* 1988; 64: 59-63.

24. Washington AE, Katz P. Cost of payment source for pelvic inflammatory disease: trends and projection, 1983 through 2000. *JAMA* 1991; 266:2565-2569.

25. Washington AE, Aral SO, Wølner-Hanssen P, Grimes D, Holmes KK. Assessing risk for pelvic inflammatory disease and its sequelae. *JAMA* 1991; 266(18):2581-2586.

26. Weström L. Incidence, prevalence and trends of acute pelvic inflammatory disease and its consequences in industrialized countries. *JAMA* 1980; 138: 901.

27. Moi H. Prevalence of bacterial vaginosis and its association with genital infections, inflammation, and contraceptive methods in women attending STD and primary care health clinics. *International Journal of STD and AIDS* 1990; 1:86-94.

28. Larsson PG, Paltz-Christensen JJ, Thejls H, Forsum U, Pahlson, C. Incidence of pelvic inflammatory disease after first-trimester legal abortion in women with bacterial vaginosis after treatment with metronidazole: A double-blind, randomized study. *Am J Obstet Gynecol* 1992; 166:100-103.

29. Eschenbach DA, Hillier S, Critchlow C, Steven C, DeRouen T, Holmes KK. Diagnosis and clinical manifestations of bacterial vaginosis. *Am J Obstet Gynecol* 1988; 158:819-828.

30. Sweet RL, et. al. Etiology of acute salpingitis: Influence of episode number and duration of symptoms. *Obstet Gynecol* 1981; 58:62.

31. Lee NC, Rubin GL, Grimes DA. Measures of sexual behavior and the risk of pelvic inflammatory disease. *Obstet Gynecol* 1991; 77(3):425.

32. Bell TA, Holmes KK. Age-specific risks of syphilis, gonorrhea, and hospitalized pelvic inflammatory disease in sexually experienced US women. *Sexually Transmitted Diseases* 1984; 11:291-5.

33. Stone KM, Grimes DA, Magder L. Personal protection against sexually transmitted diseases. *Am J Obstet Gynecol* 1986; 155:180-8.

34. Wølner-Hanssen P, Eschenbach DA, Paavonen J, et al. Decreased risk of symptomatic chlamydial pelvic inflammatory disease associated with oral contraceptive use. *JAMA* 1990; 263:54-59.

35. Lee NC, Rubin GL, Ory HW, et al. Type of intrauterine device and the risk of pelvic inflammatory disease. *Obstet Gynecol* 1983; 62:1-6.

36. Vessey MP, Yeates D, Flavel R, et al. Pelvic inflammatory disease and the intrauterine device: findings in a large cohort study. *Br Med J* 1981; 282:855-857.

37. Lee NC, Rubin GL, Borucki R. The intrauterine device and pelvic inflammatory disease revisited: New results from the Women's Health Study. *Obstet Gynecol* 1983; 62:1-6.

38. Kessel E. Pelvic inflammatory disease with the intrauterine device use: a reassessment. *Fertility and Sterility* 1988; 72:1-6.

39. Wølner-Hanssen P, Eschenbach DA, Knapp JS. Association between vaginal douching and acute pelvic inflammatory disease. *JAMA* 1990; 263: 1936-41.

40. Hillis SD, Joesoef R, Marchbanks PA, Wasserheit JN, Cates W, Weström L. Delayed care of PID as a risk factor for impaired fertility (unpublished).

41. Atrash, HK et al. Ectopic pregnancy in the United States. *MMWR* 1986; 35:29-37.

42. Lawson HW et al. Ectopic pregnancy surveillance, United States, 1970-1985. *MMWR* 1988; 37:9-18.

43. Aral SO et. al. Contraceptive use, PID and fertility problems among American women, 1982. *Am J Obstet Gynecol* 1987; 157:59.

44. Moore DE, Cates W. Sexually transmitted diseases and infertility. In Holmes, KK, Märdh P-A, Spurling PF, et al, eds. *Sexually Transmitted Diseases*. 2nd ed. New York: McGraw Hill Company, 1990: 763-769.

45. Marsland OW, Wood M, Mayo F. Part two: Diagnoses by disease category and age/sex distribution. *Journal of Family Practice* 1976; 3:48-68.

46. NIH Center for Health Statistics. Patterns of ambulatory care in obstetrics and gynecology: the national ambulatory medical care survey, United States, 1980-1981. Vital and Health Statistics Series 13, no. 76. Washington, D.C.: Government Printing Office. 1984. DHHS Pub. No. (PHS) 84-1737.

47. Rolfs RT, Galaid EI, Zaidi AA. Pelvic inflammatory disease: Trends in hospitalizations and office visits, 1979 through 1988. *Am J Obstet Gynecol* 1992; 166:983-990.

48. Grimes DA, Blount JH, Patrick J, Washington AE. Antibiotic treatment of pelvic inflammatory disease. *JAMA* 1986; 256:3223-3226.

49. Berg AO. The primary care physician and STD control. In Holmes, KK, Märdh P-A, Spurling PF, et al, eds. *Sexually Transmitted Diseases.* 2nd ed. New York: McGraw Hill Company, 1990: 1095-1098.

50. Kahn JG, Walker CK, Washington AE, Landers DV, Sweet RL. Diagnosing pelvic inflammatory disease: a comprehensive analysis and considerations for developing a new model. *JAMA* 1991; 266:2594-2604.

51. Jacobsen L, Weström L. Objectivized diagnosis of acute pelvic inflammatory disease. *Am J Obstet Gynecol* 1969; 105:1088.

52. Hager WD, Eschenbach DA, Spence MR, Sweet RL. Criteria for diagnosis and grading of salpingitis. *Obstet Gynecol* 1983; 61:113-114.

53. Weström L, Märdh, P-A. Pelvic inflammatory disease: Epidemiology, diagnosis, clinical manifestations, and sequela. In *International Perspectives on Neglected Sexually Transmitted Diseases: Impact on Venerology, Infertility and Maternal and Child Health.* KK Holmes, P-A Märdh eds. New York: McGraw- Hill, 1983.

54. Centers for Disease Control. Pelvic inflammatory disease: guidelines for prevention and management. *MMWR* 1991; 40(no. RR-5):1-57.

55. Curran JW. Management of gonoccocal pelvic inflammatory disease. *Sexually Transmitted Disease* 1979; 6:174-180.

56. Goodrich JT. Pelvic inflammatory disease: Considerations related to therapy. *Review of Infectious Disease* 1982; 4:S778-S787.

57. Brunham RC. Therapy for acute pelvic inflammatory disease: A critique of recent treatment trials. *Am J Obstet Gynecol* 1984; 148:235-240.

58. Bell TA, James JF. Computer-assisted analysis of the therapy of acute salpingitis. *Am J Obstet Gynecol* 1980; 138:1048-1054.

59. Thompson SE, Brooks C, Eschenbach DA. High failure rates in outpatient treatment of salpingitis with either tetracycline alone or penicillin/ampicillin combination. *Am J Obstet Gynecol* 1985; 152:635-641.

60. Weström L, Iosif S, Svensson L et.al. Infertility after acute salpingitis: Results of treatment with different antibiotics. *Current Therapy* 1979; 26:752-759.

61. Peterson HB, Walker CK, Kahn JG, Washington AE, Eschenbach DA, Faro S. Pelvic inflammatory disease: Key treatment issues and options. *JAMA* 1991; 266:2605-2611.

62. Walters MD, Gibbs RS. A randomized comparison of gentamicin-clindamycin and cefoxitin-doxycycline in the treatment of acute pelvic inflammatory disease. *Obstet Gynecol* 1990; 75:867-872.

63. Landers DV, Wølner-Hanssen R, Paavonen J, Thorpe E, Kiviat N, Ohm-Smith M, Green JR, Schachter J, Holmes KK, Eschenbach DA. Combination antimicrobial therapy in the treatment of acute pelvic inflammatory disease. *Am J Obstet Gynecol* 1991; 164:849-858.

64. Soper DE, Despres B. A comparison of two antibiotic regimens for treatment of pelvic inflammatory disease. *Obstet Gynecol* 1988; 72:7-12.

65. The European Study Group. Comparative evaluation of clindamycin/gentamicin and cefoxitin/doxycycline for treatment of pelvic inflammatory disease: a multi-center trial. *Acta Obstetricia et Gynecologica Scandanavica* 1992; 71:129-134.

66. Wølner-Hanssen P, Paavonen J, Kiviat N, Young M, Eschenbach DA, Holmes KK. Outpatient treatment of pelvic inflammatory disease with cefoxitin and doxycycline. *Obstet Gynecol* 1988; 71:595-600.

67. Kosseim M, Ronald A, Plummer FA, D'Costa L, Brunham RC. Treatment of acute pelvic inflammatory disease in the ambulatory setting: Trial of cefoxitin and doxycycline versus ampicillin-sulbactam. *Antimicrobial Agents and Chemotherapy* 1991; 35:1651-1656.

68. Washington AE, Cates W, Wasserheit, JN. Preventing pelvic inflammatory disease. *JAMA* 1991; 266:2574-2580.

69. Schachter J, Stoner E, Moncada J. Screening for chlamydial infections in women attending family planning clinics. *West J Med* 1983; 183:375-379.

70. Weinstock HS, Bolan GA, Kohn R, Balladares C, Back A, Oliva G. *Chlamydia trachomatis* infection in women: A need for universal screening in high prevalence populations? *Am J Epidem* 1992; 135:41-47.

71. Nettleman MD, Jones RB. Cost-effectiveness of screening women at moderate risk for genital infections caused by *Chlamydia trachomatis*. *JAMA* 1988; 260:207-213.

72. Phillips RS, Aronson MD, Taylor WC, Safran C. Should tests for *Chlamydia trachomatis* cervical infection be done during routine gynecologic visits? *Annals of Internal Medicine* 1987; 107:188-194.

73. Nettleman MD, Jones RB, Roberts SD. Cost-effectiveness of culturing for *Chlamydia trachomatis*: A study in a clinic for sexually transmitted diseases. *Annals of Internal Medicine* 1986; 105:189-196.

74. Trachtenberg AL, Washington AE, Halldorsen S. A cost-based decision analysis for *Chlamydia* screening in California family planning clinics. *Obstet Gynecol* 1988; 71:101-108.

75. U.S. Preventive Services Task Force. Screening for sexually transmitted diseases. *Am J Fam Pract* 1990; 42:691-699.

76. *Chlamydia trachomatis* infections. Policy guidelines for prevention and control. *MMWR* 1985; 34(Suppl 3):53S-74S.

77. 1985 STD treatment guidelines. *MMWR* 1985; 34(Suppl 4):75S-108S.

78. Mosher WD, Aral SO. Testing for sexually transmitted diseases among women of reproductive age : United States, 1988. *Family Planning Perspectives* 1991; 23:216-221.

79. Shafer M. Sweet RL. Pelvic inflammatory disease in adolescent females. *Pediatric Clinics of North America* 1989; 36(3):513-533.

80. Gemson DH, Colombotos J, Elinson J, Fordyce J, Hynes M, Stoneburner R. Acquired immunodeficiency syndrome prevention knowledge, attitudes, and practices of primary care physicians. *Arch Intern Med* 1991; 151:1102-1108.

81. Norman GR, Neufelf VR, Walsh A, Woodward CA, McConvey GA. Measuring physicians' performance by using simulated patients. *J Med Educ* 1985; 60:925-934.

Other sources consulted

1. Expert Committee on Pelvic Inflammatory Disease, NIH. Pelvic inflammatory disease: research directions in the 1990. *Sexually Transmitted Diseases* 1991; January-March: 46-64.

2. Rice PA, Schachter J. Pathogenesis of pelvic inflammatory disease: What are the questions? *JAMA* 1991; 266:2587-2593.

Appendix A

Human subjects committee exemption request and approval

Committee on Protection of Human Subjects Exemption Request

As a graduate student in the Health and Medical Sciences department at University of California, Berkeley, I am proposing to conduct research on health care providers' knowledge and practices regarding management of pelvic inflammatory disease (PID) for my master of science thesis. I will work with the current NIH Center Study on sexual partners and risk of PID, conducted by Nancy Padian, PhD., UCSF Department of Epidemiology.

A confidential, mailed questionnaire will be used to collect data on health care providers' knowledge and practices regarding management of PID. The questionnaire and cover letter will be mailed to a random sample of liscensed primary care providers in California, including obstetrician/gynecologists, internists, family and general practitioners, emergency room physicians, pediatricians, nurse practitioners and physician assistants. The names and addresses will be purchased as mailing labels from the California Medical Association and Board of Registered Nurses.

A copy of the instrument is enclosed. The questionnaire will ask respondents to answer 25 questions regarding detection, diagnosis, reporting and treatment for women with PID and similar conditions, and demographic information about themsleves and their practice. Respondents will be asked to complete the questionnaire and return it to my office using an enclosed, pre-stamped envelope. Non-respondents will be mailed a reminder letter and second survey three weeks after the initial mailing.

This questionnaire will be confidential. The respondents will be requested not to put their name or any identifying information on the questionnaire form or envelope. To track the respondent rate, the cover page will be separated from returned surveys, matched to the address list and then destroyed to ensure confidentiality. The questions do not deal with sensitive aspects of the respondents' behavior, and the nature of the responses could not reasonably place the respondent at risk of liability or be damaging to their personal or public life, CPHS Guidelines, Section I.C.3a.i.and ii:

(i) "in the researcher's private data as well as in any published material, responses are recorded in such a manner that the human subjects cannot be identified, directly or through identifiers linked to the subjects"

(ii) "the responses, even if disclosed outside the research, could not reasonably place the subject at risk of criminal or civil liability or be damaging to the subject's financial standing, employability, or reputation."

Thus, I am requesting exemption from review by the CPHS for this study.

Thomasine Kushner, Ph.D.	Frances H. Priddy
Faculty sponsor	Graduate student
Health and Medical Sciences	Health and Medical Sciences

UNIVERSITY OF CALIFORNIA, BERKELEY

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SANTA BARBARA • SANTA CRUZ

COMMITTEE FOR PROTECTION
OF HUMAN SUBJECTS

THE A & E BUILDING
BERKELEY, CALIFORNIA 94720
(510) 642-7461 • FAX: (510) 643-6272

September 16, 1992

Frances Priddy
6461 Benvenue Avenue
Oakland, CA 94618

Re: "Pelvic Inflammatory Disease Health Care" - Graduate Research - Health and Medical Sciences

Dear Mr. Priddy:

Thank you for the statement of exemption that you submitted to the Committee for the project referred to above. The statement satisfies the Committee's requirements under Exemption # 3, page 3, of our Guidelines of August 1992. The project is exempt from further Committee review provided that there are no changes in the use of human subjects.

For our records, the number of the project is 92-10-7. Please refer to this number in any future correspondence about the project.

If you have any questions about this matter, please be in touch with the CPHS staff at 642-7461, FAX 643-6272.

Sincerely,

Austin Ranney

Austin Ranney
Professor of Political Science
Chair, CPHS

AR:nan

cc: Professor Thomasine Kushner
Graduate Assistant

Appendix B

Pretest questionnaire and cover letter

UNIVERSITY OF CALIFORNIA, BERKELEY

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SANTA BARBARA • SANTA CRUZ

HEALTH AND MEDICAL SCIENCES PROGRAM

570 UNIVERSITY HALL
BERKELEY, CALIFORNIA 94720

October 26, 1992

Dear Physician:

I am a third year medical student in the UC Berkeley Joint Medical Program. Together with the California Department of Health Services, I am conducting a study on diagnosis and treatment of pelvic inflammatory disease (PID) in California. To better understand how PID is currently diagnosed and treated in California, we need your assistance. The enclosed questionnaire asks you to respond to several questions concerning the diagnosis and treatment of PID in your practice. This questionnaire is a pilot version, and your feedback will be invaluable in helping us to design the final product.

Because this is a pre-test of the questionnaire, we would appreciate any comments you may have concerning both the content and format of the questionnaire. Please feel free to write your comments directly onto the survey. Please record your starting and finishing time below and return the survey to your receptionist. We will collect the surveys from your office.

Time started _____ Time finished _____

Thank you for your assistance. Using the final version of this questionnaire, we hope to increase our knowledge about PID and our ability to improve both prevention and treatment efforts in California. If you have any questions regarding the study or the questionnaire, please feel free to contact me at the address and telephone number above.

Sincerely yours,

Fran H. Priddy
MSIII

Pelvic Inflammatory Disease
Physician Questionnaire

- Please try to answer every question. If you can't remember or aren't sure, please estimate as best you can.

- Please do NOT write your name anywhere on the questionnaire. The ID number will tell us which people's questionnaires have arrived and who needs reminder letters or phone calls. At no time will the questionnaires be identified by respondent.

THANK YOU FOR YOUR PARTICIPATION.

---

1. Do you practice in one of the following clinical specialities?

[ ] Yes ----------> PLEASE CHECK ALL THAT APPLY

[ ] Family practice [ ] Obstetrics/gynecology

[ ] General practice [ ] Pediatrics or Adolescent medicine

[ ] Internal medicine [ ] Emergency medicine

[ ] No ----------> PLEASE STOP AND RETURN THE QUESTIONNAIRE

2. How many years have you been practicing (including residency and fellowship training)?

_____ years

3. In which of the following settings do you work? PLEASE CHECK ALL THAT APPLY.

[ ] Private or group practice

[ ] HMO

[ ] As an employee of a private hospital or clinic

[ ] As an employee of a publicly funded hospital or clinic (state, county or municipal)

[ ] As an employee of a college or university health clinic

[ ] Armed Forces, VA or other government practice

4. In an average week, do you see at least 10 female patients for gynecologic care?

[ ] Yes [ ] No

5. Do you ever manage cases of PID in your practice?

[ ] Yes [ ] No ---------> IF NO, PLEASE CHECK ONE AND CONTINUE:

[ ] I do not see PID in my patient population.

[ ] I routinely refer cases of suspected PID to another provider.

PLEASE CONTINUE

Please specify type of provider_____

[ ] Other, please explain_____

6. Of the patients you have seen in the past month, about how many females did you treat for suspected or diagnosed PID?

_____ patients

7. Of the above PID patients . . .

A. how many were hospitalized for treatment? _____ patients

B. how many did you report to your local health department? _____ patients

C. in how many cases did you contact the partner(s)? _____ patients

8. In the following groups, do you usually test for gonorrhea, chlamydia, both or neither?

	Both	Chlamydia	Gonorrhea	Neithe
A. Women with mucopurulent cervicitis	[ ]	[ ]	[ ]	[ ]
B. Women with bacterial vaginosis	[ ]	[ ]	[ ]	[ ]
C. Women with suspected PID	[ ]	[ ]	[ ]	[ ]
D. Women with other STDs (e.g. trich, herpes, genital warts)	[ ]	[ ]	[ ]	[ ]
E. Monogamous women seen at annual exam	[ ]	[ ]	[ ]	[ ]
F. Women with new sex partner(s) in the past three months	[ ]	[ ]	[ ]	[ ]
G. Women with male partner(s) who have GC or CT urethritis	[ ]	[ ]	[ ]	[ ]
H. Women under age 25	[ ]	[ ]	[ ]	[ ]
I. Sexually active adolescents	[ ]	[ ]	[ ]	[ ]
J. Other _____	[ ]	[ ]	[ ]	[ ]

9. Which of the following minimum criteria are necessary for a diagnosis of PID? PLEASE CHECK ALL THAT APPLY:

[ ] mucopurulent cervicitis

[ ] bilateral adnexal tenderness

[ ] temperature > 38.3°C

[ ] unilateral adnexal tenderness

[ ] cervical motion tenderness

[ ] history of chlamydia or gonorrhea

[ ] positive lab test for GC or CT

[ ] lower abdominal tenderness

10. When you suspect that a patient may have PID, how routinely do you perform or order each of the following tests or procedures?

	Always	Sometimes	Never
A. Chlamydia antigen detection test	[ ]	[ ]	[ ]
B. Chlamydia culture	[ ]	[ ]	[ ]
C. Gonococcal culture	[ ]	[ ]	[ ]
D. Cervical gram stain	[ ]	[ ]	[ ]
E. Erythrocyte sedimentation rate (ESR)	[ ]	[ ]	[ ]
F. White blood cell count	[ ]	[ ]	[ ]
G. Pelvic sonogram	[ ]	[ ]	[ ]
H. Endometrial biopsy	[ ]	[ ]	[ ]
I. Laparoscopy	[ ]	[ ]	[ ]
J. Other, please specify _____	[ ]	[ ]	[ ]

11. Below are several sets of hypothetical medical history and physical findings of a 24 year old female patient with a negative pregnancy test. For each case scenario, please indicate how you would most likely manage the patient.

The patient has	Await lab results and not treat	Diagnose and treat as probable PID	Hospitalize for treatment
A. Lower abdominal tenderness, bilateral adnexal tenderness and cervical motion tenderness	[ ]	[ ]	[ ]
B. All of the findings in (a) plus temperature > 38.3° C	[ ]	[ ]	[ ]
C. Unilateral adnexal tenderness and cervical motion tenderness	[ ]	[ ]	[ ]
D. Both of the findings in (c) plus abnormal cervical discharge	[ ]	[ ]	[ ]
E. Cervical motion tenderness, fever, and abnormal cervical discharge	[ ]	[ ]	[ ]
F. Cervical motion tenderness and a history of chlamydia, gonorrhea or PID	[ ]	[ ]	[ ]
G. Two week history of intermittent abdominal pain, fever and dyspareunia with normal exam	[ ]	[ ]	[ ]

12. Which antimicrobials do you use to initiate **outpatient** therapy for a single, uncomplicated case of PID, in a non-pregnant, non-allergic patient? PLEASE CHECK ALL THAT APPLY, SPECIFYING DOSE AND DURATION.

[ ] Doxycycline_____ [ ] Cefoxitin_____
[ ] Amoxicllin_____ [ ] Ceftriaxone_____
[ ] Ampicillin_____ [ ] Flagyl (metronidazole)_____
[ ] Erythromycin_____
[ ] Other, please specify_____

13. How often to do you report PID cases to your local health department? PLEASE CHECK ONLY ONE ANSWER.

[ ] Always report [ ] Sometimes report [ ] Never report

14. How often do you make an effort to notify partners of patients with PID? PLEASE CHECK ONLY ONE ANSWER.

[ ] Usually [ ] Sometimes [ ] Never

15. Since your residency, what, if any, training have you had on the management of PID? PLEASE CHECK ALL THAT APPLY.

[ ] CME Update course(s)
[ ] Centers for Disease Control STD training course(s)
[ ] None
[ ] Other, please explain _____

16. Approximately what percentage of your patients are on Medi-Cal? _____ %

17. Approximately what percentage of your **female** patients are:
PLEASE ENTER PERCENTAGES, ADDING TO 100%.

less than 15?	_____ %	Black?	_____ %
15-24?	_____ %	Hispanic/Latino?	_____ %
25-44?	_____ %	Asian/Pacific Islander?	_____ %
45 or older ?	_____ %	White?	_____ %
	100 %	Other, specify	_____
			100 %

THANK YOU FOR YOUR PARTICIPATION.

Appendix C

Pretest results

Nineteen surveys were returned, a response rate of 43 percent. The time needed to complete the questionnaire ranged from one to 15 minutes; the mean response time was 12.8 minutes, while the modal response time was 10 minutes. None of the respondents noted difficulty in following the format of the survey or understanding the directions.

Question 1: *Clinical specialty*

The respondents practiced in the following clinical specialties

Internal medicine	4
Internal medicine/ emergency medicine	1
Pediatrics	2
Family practice	2
Family practice/ emergency medicine	1
Obstetrics/gynecology	1
Registered nurse	1
Nurse practitioner	1
STD practice	6

The nurse, nurse practitioner and STD specialists all worked at the San Francisco City Clinic. The six STD specialists were instructed to write-in their specialty for question 1 and so did not identify themselves as practicing in any of the listed clinical specialties.

Question 2: *Years in practice since residency and fellowship training*

Respondents had been practicing an average of 12.8 years. All 19 respondents answered this question, without comment.

Question 3: *Practice type*

All but one respondent answered this question. The directions instruct respondents to check all applicable answers. Five respondents practiced exclusively in a private or group practice. Nine practiced exclusively as employees of a publicly funded hospital or clinic. Two respondents checked both private practice and HMO, noting that they cared for some patients through HMO-like independent provider associations. One respondent practiced in private, HMO and public settings. One respondent practice in Armed Forces, VA or other government practice.

As these results show, providers often practice in more than one type of clinical setting. To clarify this question and simplify data analysis, the question was changed, asking respondents to check only one answer describing which setting **best** describes their type of clinical practice. In addition, an "other' response category was added to allow write-in answers.

Question 4: *Number of female patients*

Of the 19 respondents, 14 saw at least ten female patients a week for gynecologic care. One respondent questioned whether gynecologic care included "routine care like pelvic and pap exams?" Another asked to which age group the question referred. To clarify these questions, the question was changed to specify female patients, age 15-44 and the term "gynecologic care"

was dropped all together. Thus, the question now asks respondents how many female patients, age 15-44, they see for any type of care each week.

Question 5: *Management of PID*

Sixteen respondents did manage cases of PID in their practice. Of the three who responded negatively, one pediatrician did not see PID in his/her patient population and one RN routinely referred such cases to a physician. In the revised questionnaire, this question was used to identify physicians who have treated a case of PID in the past year; those physicians who have not treated a case of PID in the past year were directed to stop return the questionnaire.

Questions 6 and 7: *Number of PID cases treated, hospitalized, reported, and for whom partner(s) were contacted*

Respondents had seen from zero to 20 females for suspected or diagnosed PID in the past month, with a mean of 4.9. None of the 11 respondents who answered Question 7A indicated that any of their PID patients had been hospitalized for treatment. These responses may reflect a low hospitalization rate for PID, the lack of public hospital-based gynecologists in the pilot sample, or it may indicate a lack of physician awareness that some of their PID patients are hospitalized. Of the 12 respondents who had seen any patients with suspected or diagnosed PID in the past month, four claimed to have reported all cases, while the remaining eight claimed to have reported none (Question 7B). Three respondents commented that their staff or clinic reported PID cases. Similarly, two commented for Question 7C that

staff or clinic, not the physician, contacted the partner(s). Seven respondents claimed to have contacted all partners of PID patients.

This question was expanded to ask for the number of PID patients seen in the past two and the past twelve months to include those physicians who may see only a few PID patients a year. In addition, 7C was changed to reflect current partner referral practices. Another sub-question, 7D, asks how many patients had partner(s) known to be treated.

Question 8: *Testing for chlamydia and gonorrhea*

For each category in this question, all responses fell in either the "both" or "neither" categories; no respondents indicated that they would test for only chlamydia or gonorrhea in any of the groups described. The majority of respondents usually test for both, in all groups. The results from this question are biased due to the homogeneity of the pretest sample population: the eight respondents from the STD clinic answered identically, checking "both" for all nine categories. The response categories "chlamydia" and "gonorrhea" were kept in the revised version, assuming that in the more diverse study sample these responses might be chosen by some respondents. Another response category was added, "does not apply," for those respondents who do not see patients in these categories. In addition, the categories were divided into two groups, females with one of five conditions, and asymptomatic females with one of five risk factors. Within the question wording, "usually test for" was changed to "routinely (at least 90 percent of the time) test or screen for."

Question 9: *Necessary criteria for PID diagnosis*

The purpose of this question was to identify respondents who recognized the three criteria considered necessary for a diagnosis of PID in the CDC guidelines: cervical motion tenderness, bilateral adnexal tenderness, and lower abdominal tenderness. However, eight respondents commented that the question was unclear, poorly worded or unanswerable. The majority of respondents checked-off over four of the criteria, indicating that the intent of the question was not clear. After several attempts at revision, this question was deleted from the revised questionnaire. Respondents who recognize the three criteria as signs of PID are now identified by question 17H.

Question 10: *Diagnostic tests and procedures for PID*

In contrast to question 8, the responses to this question were distributed over the three response options. For example, six respondents answered that they would routinely order a chlamydia culture for a patient with suspected PID, three answered sometimes, and one answered never. One respondent would always order a white blood count, eight would sometimes, and five would never. And for laparoscopy, one respondent would always order the procedure, two would sometimes and 11 would never. To improve the reliability of responses, the response options were changed from "always," "sometimes," and "never" to five percentage groups: "almost all patients (>95%)," "most patients (60-95%)," "some patients (11-59%)," "few patients (1-10%)," and "no patients (0%)".

Question 11: *Management of hypothetical case scenarios*

The responses to this question were distributed over the three response options; however, for all but two case scenarios, the majority of responses fell into the middle option," diagnose and treat as probable PID." For the case scenario with three classic PID signs plus fever, the majority of respondents chose hospitalization, while most chose to await lab results and not treat for the case scenario with a normal exam. Several respondents commented that more clinical history was needed in the case scenarios to respond. "How sick is she?" asked one respondent. Although detailed clinical histories would more realistically simulate actual clinical decision-making, the purpose of this question is to understand how physicians would *most likely* manage patients with different combinations of signs and symptoms often related to PID. The case scenarios were rearranged in the revised question into three categories of risk for PID: low (17A,B), mild (17C,D,E), moderate (17F,G) and high (17H,I).

Question 12: *Outpatient antimicrobial therapy for PID*

Of the seventeen respondents who answered this question, three failed to fill in dose and duration. For those that did write in dose and duration, many responses were illegible and did not fit in the small space allotted. Five respondents checked more than two drugs, listing alternatives or indicating all possible drugs that would be considered. The revised question provided specific columns labelled "dose," "route," "frequency," and "duration" for each drug. The five most common drugs were listed and three "other" categories were added. A capitalized instruction line was added to

clarify that the responses should reflect only the drugs or combination of drugs used in a single case.

Questions 13 and 14: *Reporting of PID cases and partner referral*

Some respondents and reviewers felt that the response categories, "always," "sometimes," "never," were too vague. Both of these questions were incorporated in questions 13B and 13C in the revised questionnaire, with more concrete response categories.

Question 15: *Sources of PID training since residency*

Nine respondents had used CME Update course(s) as further training on the management of PID, while five had used CDC STD training courses. No respondents marked the "none" category. The few "other" responses included reading and clinical research. In the revised question, "none" is listed first to ensure that respondents do not miss it, and a response category for those currently in residency training was added.

Question 16: *Percentage of patients on Medi-Cal*

Six of the 16 respondents who answered this question indicated that they did not know what percentage of their clients are on Medi-Cal. Responses ranged from 1.5 to 54 percent, with a mean of 23 percent. Because so many respondents were unsure of their Medi-Cal population, a "don't know" category was added to the revised question.

Question 17: *Age and race of female patients*

Fifteen of the respondents answered this question and filled in both age and racial percentages of their female clients adding to 100. In the revised question, a "don't know" category was added.

Several more general changes were made to the revised questionnaire (Appendix D). The opening instructions were removed to allow more room for questions. The demographic and training questions were moved to the beginning, to ensure that this information was collected for all respondents. In addition, a question on workplace zip code will differentiate between San Francisco County and other California respondents in the analysis (Question 4). Two default questions were constructed: those respondents who spend less than one hour providing care to patients or who have not treated a case of PID in the past year were asked to stop and return the questionnaire (Questions 2 and 11). Two questions were added asking whether the respondents follow the CDC guidelines for diagnosis of PID (Questions 15 and 16). A final question on hospitalization of patients with suspected PID was added on the last page (Question 19). The final version of the questionnaire is 19 questions and five pages in length.

Appendix D

Questionnaire and cover letter

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY PETE WILSON, Governor

DEPARTMENT OF HEALTH SERVICES
714/744 P STREET
P.O. BOX 942732
SACRAMENTO, CA 94234-7320
(510) 540-2566

November 27, 1992

Dear Colleague:

The California Department of Health Services is conducting a study on diagnosis and treatment of pelvic inflammatory disease (PID) in California. To better understand how PID is currently diagnosed and treated in California, we need your assistance. The enclosed questionnaire asks you to respond to several questions concerning the diagnosis and treatment of PID in your practice. The questionnaire takes about ten minutes to complete.

Because we are surveying only a small number of physicians in each specialty, your response is crucial. Kindly return the questionnaire in the enclosed self-addressed stamped envelope to my office by December 14. Your responses will be completely confidential; please do not put your name or any identifying information about you or your practice on the questionnaire.

Thank you for your cooperation. We hope this study will increase our knowledge about PID and our ability to improve both prevention and treatment efforts in California. If you have any questions regarding this study or the questionnaire, please feel free to contact my office at (510) 540-2566.

Sincerely Yours,

George W. Rutherford, M.D.
Deputy Director
Prevention Services

Enclosure

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY PETE WILSON, Governor

DEPARTMENT OF HEALTH SERVICES
714/744 P STREET
P.O. BOX 942732
SACRAMENTO, CA 94234-7320
(916) 657-1493

January 11, 1993

Dear Colleague:

The California Department of Health Services is conducting a study on the diagnosis and treatment of pelvic inflammatory disease (PID) in California. We recently sent a questionnaire to your home or office address, but we have not received a response to date.

Because you are one of a small number of physicians selected from each specialty, your response is critical to the success of the study. The enclosed questionnaire asks you to respond to several questions concerning the diagnosis and treatment of PID in your practice. The questionnaire takes about 15 minutes to complete.

Kindly complete and return the questionnaire in the enclosed, self-addressed prestamped envelope to my office by January 22. Your responses will be completely confidential. Please do not put your name or any identifying information on the questionnaire or return envelope.

Thank you for your assistance. This study will increase both our knowledge about PID and our ability to improve both prevention and treatment efforts in California. If you have any questions regarding the study or the questionnaire, please feel free to contact my office at the address and telephone number above.

If you have already returned the questionnaire, please disregard this reminder. Thank you for your participation.

Sincerely yours,

George W. Rutherford, M.D.
Deputy Director
Prevention Services

Enclosure

Pelvic Inflammatory Disease
Physician Questionnaire

1. In which of the following clinical specialities or subspecialities do you practice? PLEASE CHECK ALL THAT APPLY:

   [ ] Family practice
   [ ] General practice
   [ ] Internal medicine
   [ ] Infectious disease
   [ ] Obstetrics/gynecology
   [ ] Pediatrics or Adolescent medicine
   [ ] Emergency medicine
   [ ] Other_____

2. On the average, how many hours a week do you spend actively providing care to patients?
   _____ HOURS

   IF < 1 HOUR, PLEASE STOP AND RETURN THE QUESTIONNAIRE, OTHERWISE, PLEASE CONTINUE TO QUESTION 3

3. Which of the following settings **best** describes your type of clinical practice? PLEASE CHECK ONLY ONE ANSWER

   [ ] Private/group practice
   [ ] HMO
   [ ] Private hospital or clinic
   [ ] Publicly funded hospital or clinic (state, county or municipal)
   [ ] College or university health clinic
   [ ] Armed Forces, VA or other government practice
   [ ] Other, specify_____

4. What is the zip code of your primary clinical workplace? ___ ___ ___ ___ ___

5. How many years have you spent in clinical practice (including residency and clinical fellowship training)? _____ YEARS

6. Since your residency, what, if any, training have you had on the management of PID? PLEASE CHECK ALL THAT APPLY

   [ ] None
   [ ] Centers for Disease Control STD Prevention/Training Center course(s)
   [ ] CME Update course (other than Centers for Disease Control Course)
   [ ] I am currently in residency training
   [ ] Other, specify _____

7. Approximately what percentage of your patients are on Medi-Cal?
   _____ % [ ] Dont' know

8. In an average week, how many female patients, age 15-44, do you personally see?
   _____ PATIENTS

9. Approximately what percentage of your **female** patients are:
PLEASE ENTER PERCENTAGES, ADDING TO 100%

younger than 15 years? _____ %
15-24 years old? _____ %
25-44 years old? _____ %
45 years or older ? _____ %
100 %
[ ] Don't know

Black? _____ %
Hispanic/Latino? _____ %
Asian/Pacific Islander? _____ %
White? _____ %
Others? _____ %
100 %
[ ] Don't know

10. Do you routinely (at least 90 percent of the time) test or screen for gonorrhea, chlamydia, both or neither in each of the following situations?

PLEASE CHECK ONLY ONE ANSWER FOR EACH SITUATION

	Both	Chlamydia only	Gonorrhea only	Neither	Does not apply*
A. Females with					
1) mucopurulent cervicitis	[ ]	[ ]	[ ]	[ ]	[ ]
2) bacterial vaginosis	[ ]	[ ]	[ ]	[ ]	[ ]
3) suspected PID	[ ]	[ ]	[ ]	[ ]	[ ]
4) trichomoniasis	[ ]	[ ]	[ ]	[ ]	[ ]
5) syphilis	[ ]	[ ]	[ ]	[ ]	[ ]
B. Females who are asyptomatic and					
1) monogamous, seen at annual exam	[ ]	[ ]	[ ]	[ ]	[ ]
2) have had new sex partner(s) in the past three months	[ ]	[ ]	[ ]	[ ]	[ ]
3) have male partner(s) with urethritis	[ ]	[ ]	[ ]	[ ]	[ ]
4) are under age 25 (independent of other risk factors)	[ ]	[ ]	[ ]	[ ]	[ ]
5) are sexually active adolescents (independent of other risk factors)	[ ]	[ ]	[ ]	[ ]	[ ]

* Does not apply = Don't see patients in this category

11. Have you treated a case of PID in the past year?

[ ] Yes --------> IF YES, PLEASE CONTINUE TO QUESTION 12

[ ] No ---------> IF NO, PLEASE CHECK ONE ANSWER BELOW AND THEN STOP AND RETURN THE QUESTIONNAIRE

[ ] I do not see PID in my patient population.

[ ] I routinely refer cases of suspected PID to another provider.
Please specify type of provider_____

[ ] Other, explain_____

12. About how many female patients did you treat for suspected or diagnosed PID in the past two months, and in the past twelve months?

past 2 months _____ patients

past 12 months _____ patients

13. Of the above PID patients . . .

		past 2 months	past 12 months	
A.	how many patients were hospitalized for treatment?	_____	_____	patients
B.	how many patients did you report to your local health department?	_____	_____	patients
C.	with how many patients did you attempt to elicit sex partners and encourage partner referral?	_____	_____	patients
D.	how many patients had a partner known to have been treated?	_____	_____	patients

14. In what proportion of patients with suspected PID do you perform, order, or refer for each of the following tests or procedures?

	Almost all patients (>95%)	Most patients (60-95%)	Some patients (11-59%)	Few patients (1-10%)	No patients (0%)
A. Chlamydia antigen test	[ ]	[ ]	[ ]	[ ]	[ ]
B. Chlamydia culture	[ ]	[ ]	[ ]	[ ]	[ ]
C. Gonococcal culture	[ ]	[ ]	[ ]	[ ]	[ ]
D. Cervical Gram's stain	[ ]	[ ]	[ ]	[ ]	[ ]
E. Erythrocyte sedimentation rate (ESR)	[ ]	[ ]	[ ]	[ ]	[ ]
F. White blood cell count	[ ]	[ ]	[ ]	[ ]	[ ]
G. Pelvic sonogram	[ ]	[ ]	[ ]	[ ]	[ ]
H. Endometrial biopsy	[ ]	[ ]	[ ]	[ ]	[ ]
I. Laparoscopy	[ ]	[ ]	[ ]	[ ]	[ ]

15. Do you consistently follow the CDC recommended guidelines for diagnosis of PID?

[ ] Yes ------> IF YES, PLEASE SKIP TO QUESTION 17

[ ] No ------> IF NO, PLEASE CONTINUE TO QUESTION 16

[ ] Not sure -----> IF NOT SURE, PLEASE CONTINUE TO QUESTION 16

16. If you do not follow the CDC guidelines for diagnosis of PID or are not sure, please explain why by checking the ONE best answer below:

[ ] I have never seen the CDC guidelines for diagnosis of PID.

[ ] I do not remember the CDC guidelines for diagnosis of PID.

[ ] The CDC guidelines are too sensitive (include patients who probably *do not* have PID).

[ ] The CDC guidelines are not sensitive enough (miss patients who probably *do* have PID).

[ ] Other, explain_____

17. Below are several sets of hypothetical medical histories and physical findings for a 21 year-old female patient with a negative pregnancy test. For each scenario, please indicate how you would manage the case.

The patient has		Don't treat; await lab results	Diagnose and treat as probable PID as outpatient	Hospitalize or refer for PID treatment in hospital
A.	Two week history of intermittent abdominal pain, fever and dyspareunia with normal exam	[ ]	[ ]	[ ]
B.	Same history as (A) plus a history of gonorrhea, chlamydia or PID	[ ]	[ ]	[ ]
C.	Cervical motion tenderness and abnormal cervical discharge	[ ]	[ ]	[ ]
D.	Cervical motion tenderness, abnormal cervical discharge and fever	[ ]	[ ]	[ ]
E.	Cervical motion tenderness and a prior history of treated chlamydia, gonorrhea or PID	[ ]	[ ]	[ ]
F.	Unilateral adnexal tenderness and cervical motion tenderness	[ ]	[ ]	[ ]
G.	Unilateral adnexal tenderness, cervical motion tenderness and fever	[ ]	[ ]	[ ]
H.	Lower abdominal tenderness, bilateral adnexal tenderness and cervical motion tenderness	[ ]	[ ]	[ ]
I.	All of the findings in (H) plus temperature > 39.5° C	[ ]	[ ]	[ ]

18. What is your **preferred outpatient** antimicrobial regimen for an **uncomplicated case** of PID? (Assume the patient is not pregnant and has no allergies.)

PLEASE CHECK THE DRUG OR COMBINATION OF DRUGS THAT YOU WOULD USE FOR THIS TYPE OF CASE

		Dose (mg)	Route (IM, PO)	Frequency (times/day)	Duration (days)
[ ]	Tetracycline	_____	_____	_____	_____
[ ]	Doxycycline	_____	_____	_____	_____
[ ]	Metronidazole	_____	_____	_____	_____
[ ]	Ceftriaxone	_____	_____	_____	_____
[ ]	Cefoxitin	_____	_____	_____	_____
[ ]	Other, specify_____	_____	_____	_____	_____
[ ]	Other, specify_____	_____	_____	_____	_____
[ ]	Other, specify_____	_____	_____	_____	_____

[ ] Not applicable, explain_____

19. In each of the following situations, would you recommend hospitalization for treatment of a woman with suspected PID?

A.	If pelvic abscess is suspected	[ ] Yes	[ ] No
B.	If the patient is pregnant	[ ] Yes	[ ] No
C.	If the patient is less than 20 years old	[ ] Yes	[ ] No
D.	If the patient is HIV positive	[ ] Yes	[ ] No
E.	If the patient has a temperature > 39.5°C	[ ] Yes	[ ] No
F.	If the patient has a history of IUD use	[ ] Yes	[ ] No
G.	If the patient has a history of PID	[ ] Yes	[ ] No
H.	If the patient has failed to respond to outpatient therapy	[ ] Yes	[ ] No
I.	If clinical follow-up within 72 hours of starting antibiotic is not possible	[ ] Yes	[ ] No
J.	Would hospitalize all patients with PID	[ ] Yes	[ ] No

THANK YOU FOR YOUR PARTICIPATION

Please return the survey **by December 14** in the enclosed envelope to *STD Survey, Department of Health Services, 2151 Berkeley Way, Berkeley, CA 94740-1011.*

Appendix E

Questionnaire codebook

PID Questionnaire Codebook
March 1993

Q0 ID ID number

Q0 RETURN A = returned in second mailing
B = returned in third mailing
C = returned to sender unopened or returned blank
. = returned in first mailing

Q1 In which of the following clinical specialties or subspecialties do you practice?

FAMILY	1 = marked	2 = blank	. = all blank
GENERAL	"	"	"
INTERNAL	"	"	"
INFECTIOUS	"	"	"
OBGYN	"	"	"
PEDS	"	"	"
EMERGENCY	"	"	"
OSPEC (Other)	"	"	"

SPSPEC (Specify other)
1 = Administration
2 = Other specialties
examples:
maternal-fetal medicine, neonatology, pathology,gastroenterology, neurology, addiction medicine, endocrinology, occup. medicine, heme/oncology
3 = Retired, deceased or not currently active
. = missing

Q2 How many hours a week do you spend actively providing care to patients?

HOURS ranges from 0 - 100
. = missing

Q3 Which of the following settings best describes your type of clinical practice?

PRACTICE
1 = private/group practice
2 = HMO
3 = private hospital or clinic
4 = publicly funded hospital or clinic
5 = college or university health clinic
6 = Armed Forces, VA or other govt
7 = other (very few responses)
. = missing

Q4 ZIP zip code

(If unknown, check address list; if address is business, then enter zip from list;
if address is home or unclear, then enter zip as either 94100 or 90000.)

Q5 How many years have you spent in clinical practice?

YEARS enter number (ranges from 0 - 40s)
. = missing

Q6 Since your residency, what training have you had on the management of PID?

NONE	1 = marked	2 = blank	. = all blank
COURSE (CDC)	1 = marked	2 = blank	. = all blank
UPDATE (CME)	1 = marked	2 = blank	. =all blank
RESIDENCY	1 = marked	2 = blank	. = all blank
OTRAIN (other)	1 = marked	2 = blank	. = all blank

SPTRAIN (specify)

1 = Journal reading/self education
2 = Grand rounds
3 = Conferences
4 = Clinical faculty position
5 = Board review class
6 = Fellowship (e.g. STD, adolescent medicine)
7 = Experience
. = missing

Q7 Approximately what percentage of your patients are on Medi-Cal?

MEDICAL	1 = (not used)
	2 = marked "don't know"
	. = missing (left entire question blank)
PMEDCAL	enter percent (ranges from 0 - 100%)
	. = missing

Q8 In an average week, how many female patients, age 14-44, do you personally see?

FEMALE (ranges from 0 - 100s)
. = missing

Q9 Approximately what percentage of your female patients are:

AGE	1 = filled in percentages 2 = answered "Don't know" . = left percentages blank
UNDER15	enter number . = missing
AGE1524	"
AGE2544	"
OVER45	"
RACE	1 = filled in percentages 2 = answered "Don't know" . = left percentages blank
BLACK	enter number . = missing
HISPANIC	"
ASIAN	"
WHITE	"
OTHER	"

(If given numbers add to 100, then enter 0 for other categories, except OTHER.
If numbers don't add to 100, don't fill in empty category unless it's obvious.)

Q10A-B Do you routinely test or screen for gonorrhea, chlamydia, both or neither in each of the following situations?

MPC	(mucopurulent cervicitis)	1 = both
B V	(bacterial vaginosis)	2 = chlamydia only
PID	(suspected PID)	3 = gonorrhea only
TRICH	(trichimonas)	4 = neither
SYPHILIS	(syphilis)	5 = Does not apply
MONOG	(monogamous)	. = missing
NEW	(new sex partner)	
WURETHRITI	(partner with urethritis)	
UNDER25	(under 25 years)	

Q11 Have you treated a case of PID in the past year?

PID01
1 = marked YES
(skip NOPID, PIDREFER, PIDOTHER)
2 = marked NO
. = left both blank

NOPID
1 = I do not see PID in my patient population.
2 = I routinely refer
3 = Other
. = missing

PIDREFER (specify referral)
1 = gynecologist
2 = nurse practitioner
3 = teen clinic / adolescent medicine
4 = county hospital
5 = internist
. = missing

PIDOTHER

1 = patients seen early with vaginal symptoms
2 = don't see gyn patients
3 =
4 = part-time practice
5 =
6 =
7 = consultant only
. = missing

Q12A MOS (# female patients treated for PID in the past two months)

enter number (ranges 0 - 20s)
. = missing

Q12B MOS01 (# female patients treated for PID in past twelve months)

enter number (ranges 0 - 100)
. = missing

Q13A HOSP2 (# hospitalized in past two months)

enter number
. = missing, "don't know" or "?"

HOSP12 (# hospitalized in the past twelve months)

enter number
. = missing "don't know" or "?"

Q13B REPORT2 (# cases reported to health dept. in past two months)

enter number
. = missing "don't know" or "?"

REPORT12 (# cases reported to health dept. in past twelve months)

enter number
. = missing, "don't know" or "?"

Q13C REFER2 (# cases where partners referred in past two months)

enter number
. = missing, "don't know" or "?"

REFER12 (# cases where partners referred in past twelve months)

enter number
. = missing, "don't know" or "?"

Q13D TX2 (# cases with partner known to be treated in past two months)

enter number
. = missing, "don't know" or "?"

TX12 (# cases with partner known to be treated in past twelve months)

enter number
. = missing, "don't know" or "?"

LAB

1 = wrote in "reported by lab"
. = missing

POSCULT

1 = wrote in "report positive cultures only"
. = missing

Q14A-I In what proportion of patients with suspected PID do you perform, order or refer for each of the following tests or procedures?

CFAG	(chlamydial antigen test)	1 = almost all pts
CTCULT	(chlamydial culture)	2 = most patients
GCCULT	(gonococcal culture)	3 = some patients
GRAMS	(cervical Gram's stain)	4 = few patients
ESR	(erythrocyte sed. rate)	5 = no patients
WBC	(white blood cell count)	. = missing
SONO	(pelvic sonogram)	
BIOP	(endometrial biopsy)	
LAP	(laparoscopy)	

Q15 Do you consistently follow the CDC recommended guidelines for diagnosis of PID?

PIDDX
1 = Yes (skip CDCNO, OCDCNO)
2 = No
3 = Not sure
. = missing

Q16 If you do not follow the CDC guidelines for diagnosis of PID or are not sure, please explain why by checking the one best answer below:

CDCNO
1 = I have never seen the CDC guidelines . . .
2 = I do not remember . . .
3 = The CDC guidelines are too sensitive . . .
4 = The CDC guidelines are not sensitive enough . . .
5 = Other
. = missing

OCDCNO (specify other)

1 = wrote in something

. = missing

Q17A-I Case scenarios

WKHX	(two week history of abdominal pain, fever and dyspareunia with normal exam)
ASTD	(above, plus history of GC, CT or PID)
CMTD	(cervical motion tenderness, abnormal cervical discharge)
CMTDF	(cervical motion tenderness, abnormal cervical discharge, and fever)
CMTSTD	(cervical motion tenderness and history of CT, GC, PID)
UATCMT	(unilateral adnexal tenderness, cervical motion tenderness)
UATCMTF	(unilateral adnexal tenderness, cervical motion tenderness, and fever)
TRIO	(lower abdominal tenderness, bilateral adnexal tenderness and cervical motion tenderness)
TRIOF	(above, plus fever)

1 = Don't treat . . .

2 = Diagnose and treat . . .

3 = Hospitalize or refer . . .

4 = Marked 2 and 3

. = missing

Q18 What is your preferred outpatient antimicrobial regimen for an uncomplicated case of PID?

If combination is one of those listed below, code in SPMED1. Leave all other fields blank.

1 = doxy 100 mg po bidx 10 *and* ceftriaxone 250 mg IM x 1

2 = x 7 *and*

3 = " x 14 "

4 = " x 10-14 "

5 = " x 7-14 "

6 = doxy 100 mg po bid x 10-14 *or* tetra 500 mg po qid x 10-14
plus ceftriaxone 250 mg IM x 1

7 = doxy 100 mg po bid x 10
tetra 500 mg po qid x 10
metro 500 mg po tid x 10

8 = tetra 250 po qid x 10
ceftriaxone 500 mg IM X 1
metro 250 po tid x 7

9 = doxy 100 mg po bid x 14 *and* ceftriaxone 500 mg IM x 1

10 = checked => 4 drugs

11 = doxy 100 mg po bid x 10-14
ceftriaxone 500 mg IM x 1
metro 250 po tid x 7

Others

1.	doxy 100 mg po bid	x 10			
2.	"	x 10	*and*	cefoxitin 1 g	
3.	"	x 14	*and*	cefoxitin 2 g IV bid x 4-7	
4.	"	x 14	*and*	cefoxitin 2 g IV q 6°x 4	
5.	"	x 7	*and*	tetra 500 mg po qid x7	(1)
6.	"	x 10	*and*	metronidazole 500 mg po TID	x 10
7.	"	x 14	*and*	"	x 7

8. doxy 100 mg po bid x 10
   tetra 500 mg po qid x 10
   metro 500 mg po tid x 10

9. tetra 500 mg po qid x 10
10. " x 7

11.	tetra 250 mg po qid x 10	*and*	ceftriaxone	500 mg IM x 1
12.	tetra 250 mg po qid x 7	*and*	ceftriaxone	250 mg IM x 1

13. tetra 500 mg po qid x 10
    ceftriaxone 1-2 g IM x 1
    metro 500 po tid x 10

14.	ceftriaxone 2 g IM x 1	*and*	azithromycin 1 g po x 1
15.	ceftriaxone 250 mg IM x 1	*and*	azithromycin 1000 mg po x 1

If combination cannot be coded, then enter each drug marked with route, dose and duration. Enter 2 for unmarked drug names (TETRA, DOXY, CEFTRI, METRO).

Q19A-J In each of the following situations, would you recommend hospitalization for treatment of a woman with suspected PID?

ABSCESS	1 = Yes
PREG	2 = No
UNDER20	. = missing
HIV	
TEMP	
IUD	
PIDHX	
FAIL	
FU	
HOSPALL	