

PELVIC
INFLAMMATORY
DISEASE
PID

The Canadian PID Society

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ACKNOWLEDGEMENTS

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FOREWORD

A million women suffer from PID each year in North America. If present trends continue, it is estimated that by the year 2000, one in every four women in North America will have or have had PID.

Most women who contract PID are young and have never had children: seventy-five percent of women with PID are under 25 years of age. PID is the leading cause of infertility and hysterectomy in young women: after one episode of PID a woman's chances of becoming infertile are 15%; after 3 episodes her risk of infertility is over 50%. After one episode of PID a woman has a tenfold increased risk of ectopic pregnancy (which is life threatening) and a 15% chance of developing chronic PID. One out of every four women who have PID will suffer a serious consequence such as ectopic pregnancy, infertility, or chronic abdominal pain.

The cost of this epidemic is 361 million dollars per year in Canada and over 3.6 billion dollars per year in the United States.

Despite the fact that PID is a serious health problem for women, surprisingly little research has been undertaken on this illness in North America.

This booklet was written to provide information for women who have PID and their families, for health care professionals, and for interested individuals. Women who have never had PID can use the information in this booklet to recognize and avoid some of the causes of PID or to identify the disease should they ever contract it.

PID is a preventable disease. We hope this booklet will be a step towards improved recovery and prevention of PID.

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CHAPTER ONE: DEFINITION, SYMPTOMS, AND CAUSES OF PID

DEFINITION

Pelvic inflammatory disease (PID) is the name for infection and inflammation of the pelvic organs (the uterus, tubes, and ovaries). The term PID does not indicate whether the infection is located primarily in the uterus (endometritis), tubes (salpingitis), ovaries (oophoritis), and/or the peritoneum (peritonitis). However, it is most common for the infection to localize in the tubes.

PID can be divided into four categories according to the severity and duration of the infection:

Acute

This refers to PID in which there seems to be a high or moderate amount of infection. Abscesses (pockets of pus) may form, and although this happens infrequently, there is a danger that these might burst and spread the infection to the lining of the pelvic cavity.

Subacute

This refers to PID in which the level of infection seems low. A low level of infection means that a woman has less chance

of developing an abscess. However, subacute PID can become acute or chronic without proper treatment.

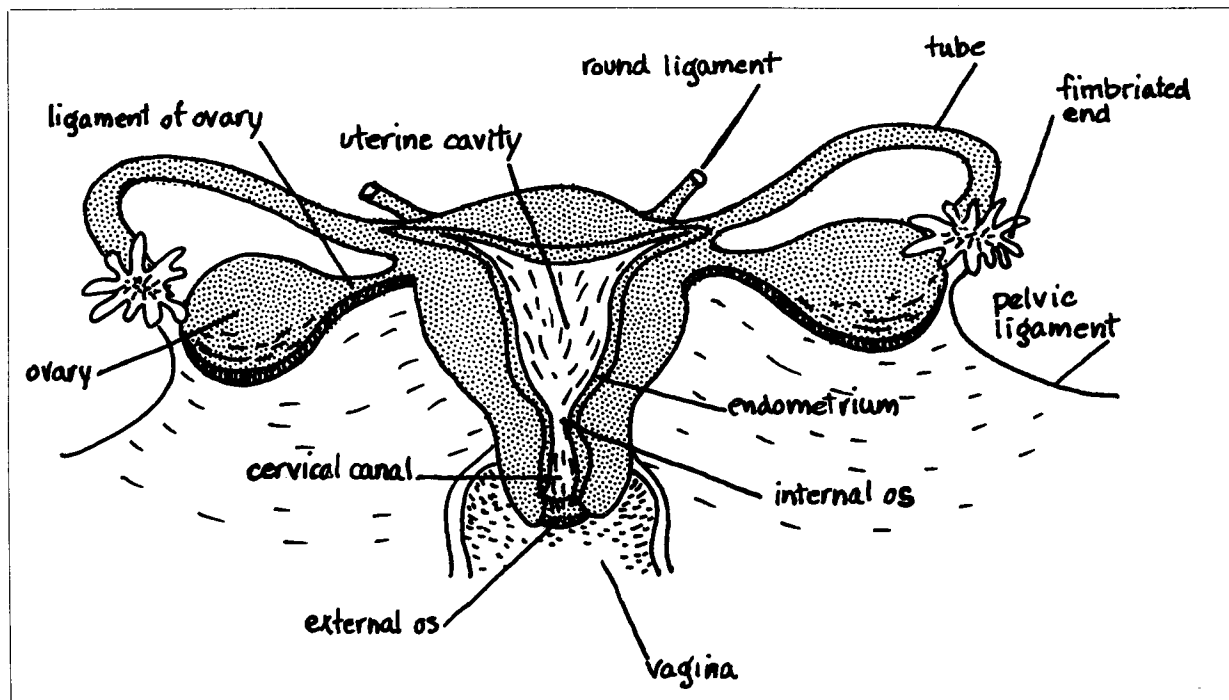
Recurrent

With recurrent PID, episodes of infection are followed by periods of health. Practitioners sometimes refer to recurrent PID as "chronic PID," but recurrent PID responds differently to treatment than does chronic. Recurrent PID should be treated as separate episodes of acute or subacute infection.

Chronic

This refers to PID which just doesn't seem to clear up. Sometimes the term "chronic PID" is used incorrectly to refer to chronic pelvic pain caused by scar tissue and/or muscle spasm.

The four categories above are subjective in the sense that what one doctor might call acute, another might call subacute. Although acute PID is sometimes taken more seriously than subacute PID, women should be aware that any level of infection in the pelvic organs is serious.



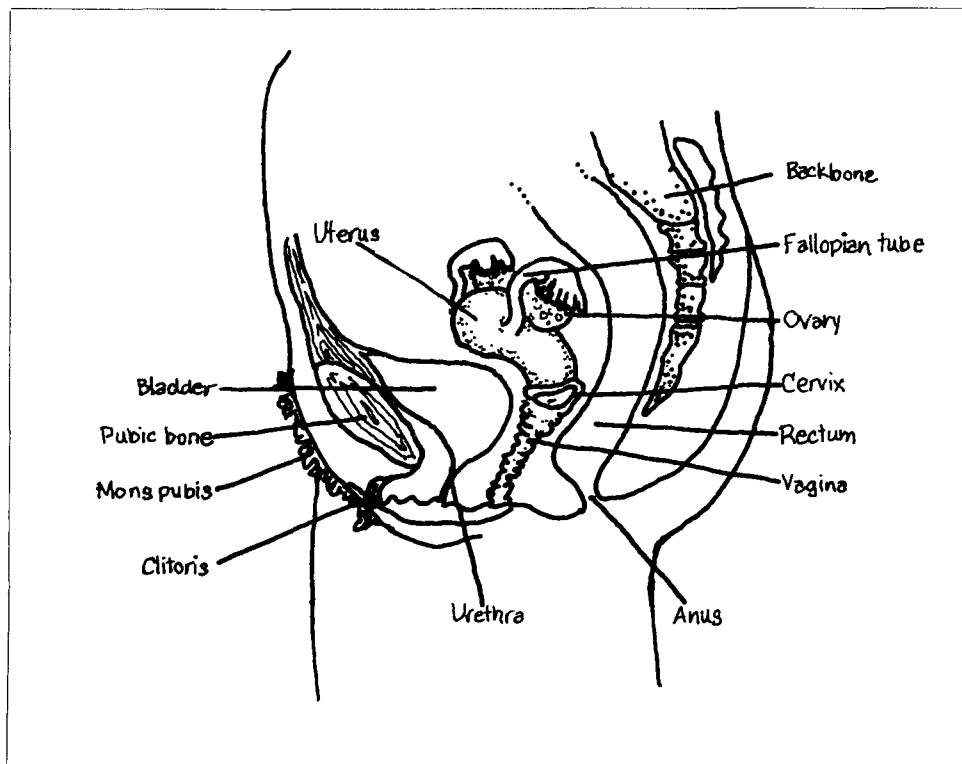
SYMPTOMS

It is sometimes difficult to diagnose PID and you will improve your chances of an accurate diagnosis if you know which symptoms to watch for. The symptoms of PID include lower abdominal pain, lower back pain, fatigue, fever, vaginal discharge, vaginal bleeding, abdominal swelling, a feeling of being full, and an elevated sedimentation rate (see Glossary). Some women experience pain during intercourse or increased pain during menstruation.^{1,27} Oc-

asionally women may experience nausea or vomiting.¹⁵³ However, it's important to know that very few women experience all the symptoms listed here. In fact, only 16% of women with PID fit the classic textbook picture.¹⁵³ It is more common to experience only one or two symptoms and often these are mild. Some women have no symptoms.¹⁵³

The first symptom that women usually notice is low, mild, dull bilateral pelvic pain.¹⁵³ This may be the only symptom.

PID SYMPTOMS	
Symptoms	Comments
Lower abdominal pain	This may be intermittent or constant. It may occur during intercourse, menstruation, or ovulation. Often the pain is only on one side of the abdomen. Usually it increases with movement such as walking, climbing stairs, etc. It is almost always present during a bimanual (done with two hands) pelvic examination. Sometimes women have pain associated with urination and defecation (peeing and moving the bowels).
Lower back pain	
Nausea and dizziness	
Fatigue	
Fever	If present, fever is often low.
Bleeding	Increased menstrual flow, bleeding between periods, or after intercourse.
Vaginal discharge	Unusual odour, quantity, consistency.
Feeling of fullness	As if bowels need to be moved.
General feeling of illness	
Abdominal bloating	



PID is a complex disease which has many causes.^{15,27,31,60,83,98,131,149,152,154} Researchers now believe that the symptoms of PID vary greatly depending on the cause. Thus the symptoms of PID vary in different women. Some of these differences are discussed in the section below.

CAUSES

PID is an infection caused by bacteria which get into the reproductive organs. How does this happen?

The body is actually designed to prevent such a thing from happening. The cervix, the lower end of the uterus which protrudes into the upper part of the vagina, has an opening that is normally closed and blocked by a mucous barrier, except during menstruation, ovulation, and childbirth. So the body has provided a barrier between the vagina, which is normally inhabited by many kinds of bacteria, and the uterus, which is normally sterile (free from bacteria). The following sections explain how bacteria may be introduced into the uterus and tubes through the cervix.

Sexually Transmitted Diseases

Sexually transmitted diseases (STD) are caused by organisms, such as bacteria and viruses, which are passed from one person to another during sex. Some of these organisms can travel through the cervix and the mucous barrier into the uterus and tubes and cause PID. Sometimes only one of these organisms acting alone can cause PID, but often several STDs are found together.^{12,13,27,149} STD is the most common cause of PID.

Chlamydia (*Chlamydia Trachomatis*)

Chlamydia is a bacteria which is passed between people during sex, and if these bacteria spread they can cause PID. Patterns of STDs are changing and many researchers now believe that chlamydia causes more PID than any other factor.^{13,59,83,98,106,131,152,154} Swedish researchers report that chlamydial infections cause about half of the cases of PID.^{83,152,154}

The chlamydia bacteria is very small and lives part of its life inside cells. If it is left untreated, it can remain undetected. Thus many people are unaware that they have chlamydia and may unwittingly pass it on to their sexual partner(s).

Most women with chlamydial infections do not have any symptoms unless the bacteria cause PID. A recent study indicates that approximately three quarters of women with chlamydial infections may have no symptoms.¹¹⁵ For this reason, testing for chlamydia is very important. However, many cities do not have facilities to test for chlamydia and only three provinces in Canada require reporting of chlamydial infections.

Accurate testing and diagnosis of chlamydia are also important because chlamydial infections are treated with a type of antibiotic called tetracyclines. This treatment differs from the treatment for other more well known STDs, such as gonorrhea (see Chapter Three: Treatment, for more details).

In Canada, there has been a five-fold increase in reported chlamydial infections since 1980.⁵⁴ In the U.S., over three million chlamydial infections are diagnosed each year.³ The increase in chlamydial infections is even greater for young women, especially for teenagers.^{13,148} The consequences of chlamydial infections are also more severe in younger women.¹³

Surprisingly, even individuals who do not think they are infected can have a high rate of chlamydial infections: for example, one survey reports that 27% of women at a prenatal clinic in Denver had chlamydial infections.³⁷

Chlamydial infections are often combined with other infections: 30 to 60 percent of women with gonorrhea infections or with contact to gonorrhea also have chlamydia infections.¹³

If your male sex partner has been diagnosed as having NGU (non-gonococcal urethritis) you may have chlamydia. There has been a three to six fold increase in NGU in the last decade.¹⁵² Studies indicate that from 30 to 50 percent of men diagnosed as having NGU have chlamydia; 30 to 60 percent of women who have contact with men who have NGU have chlamydial infections.¹³ Many researchers think that any woman who has sex with a man who has NGU should be treated with a tetracycline antibiotic, such as doxycycline, to eliminate possible chlamydia infection.

When chlamydia causes PID the symptoms appear mild even though the damage to the fallopian tubes is often severe.^{13,83,106,134} Thus women with chlamydially caused PID rarely have fever,^{60,153} and have milder, less acute symptoms, often at sub-clinical levels.^{13,83} The only symptoms may be a vague feeling of illness and/or vaginal discharge or very mild abdominal pain.

Unfortunately, possibly because of the apparent mildness of symptoms, women with chlamydial PID usually go to the doctor later: about one week to nine days after symptoms are noticed.¹⁵³ Since delayed treatment is less effective than prompt treatment, this delay may have serious consequences.

Gonorrhea

Gonorrhea is caused by sexually transmitted bacteria that can spread from the vagina to the uterus, tubes, and ovaries. About 10 to 19 percent of women who get gonorrhea develop PID.¹⁵² Many women who have gonorrhea also have chlamydia¹³ so it is especially important to be tested for all possible disease causing bacteria.

Most women who have gonorrhea have no symptoms until the disease spreads and causes PID. This is why it is

important to be tested for gonorrhea if there is a chance that you may have contracted this disease. A surprising number of men do not experience any symptoms either, so if your male partner has no symptoms this does not mean he does not have gonorrhea. Gonorrhea can be transmitted during anal intercourse and oral sex, so it can be passed during sex between men or between women.

Women who do have gonorrhea symptoms may notice some pain when they urinate and/or may have increased vaginal discharge. If the gonorrhea has spread and is causing PID, the symptoms may be different than for chlamydial PID.¹⁵³ In addition to the symptoms listed in this booklet, women with gonorrheal PID are more likely to have fever,¹³⁴ vaginal bleeding, spotty bleeding, and/or swelling of the abdomen.¹⁵³

Mycoplasmas

Mycoplasmas are organisms sometimes found in a woman's vagina or cervix. Mycoplasmas are also found in the urethras of men with NGU. One form of mycoplasma, *M. hominis*, is believed to cause 10 to 20 percent of the cases of PID.^{31,83,132,152,154} Mycoplasmas are virus-like bacteria which can be passed from one person to another during sex.

Unfortunately, despite their role in causing PID, many areas do not have testing facilities for mycoplasmas.

Other Bacteria

In the last few years researchers have found new bacteria which may cause PID.^{95,105} Some of the bacteria believed to possibly cause PID are *bacteroides*; Gram negative rods including *E. coli*, *Haemophilus* species, and *enterococci*; hemolytic and non hemolytic aerobic *streptococci*; anaerobic Gram positive cocci; anaerobic *streptococci*; *peptostreptococcus*; *actinomyces* species; *peptococcus*; *U. urealyticum*; *M. genitalia* and *H. influenzae*.^{13,95,105,126,148,153} The list of bacteria thought to cause PID is increasing rapidly and it is very likely that not all possible causes have been identified.

Some of these bacteria may be present in a woman's vagina; this is discussed below.

Endogenous Bacteria

Sometimes bacteria which are "normally" present in a woman's vagina (called endogenous bacteria) may cause PID.¹⁵⁴ In Sweden, where very detailed records of PID are kept, researchers report that about 5% of PID is caused by "normal flora".⁸³ These bacteria are usually a mix of anaerobic (bacteria which live without oxygen and often die in the presence of air) and aerobic (bacteria which need air to live) bacteria.⁵⁶ PID which is caused by these bacteria often has a more acute onset and the symptoms appear more clinically severe.^{153,154} Thus women with anaerobic PID often appear sicker, have fever, and may have abscesses.^{56,83,153,154} In addition, women with PID caused by

anaerobic bacteria are more likely to be older, to have long standing or chronic PID, or to have had two or more episodes of PID.^{56,153,154}

It is not known exactly how these bacteria move from the vagina to the uterus, tubes, or ovaries, but researchers believe they may be carried by sperm,^{71,143,144,154} with yeast, or by themselves (passive transport).⁷¹ It is also believed that this type of PID may follow an initial episode of PID which has "compromised" the fallopian tubes (ie. made the tubes more subject to infection).^{56,152,154}

Because of this possibility, any sign of an infection in a woman or in her partner should be taken very seriously.

IUD (Intra-uterine Device)

Insertion and Use

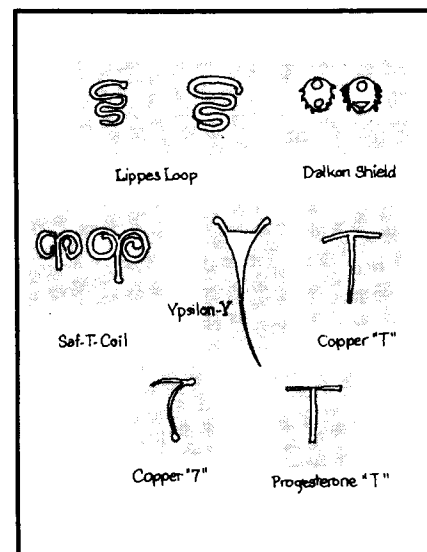
About three to nine percent of women who use IUDs get PID.³⁹ When the IUD is inserted, the uterus may be contaminated by bacteria from the vagina; it is therefore possible to get PID from the bacteria introduced during IUD insertion.

However, it's even more common for a woman to get an infection after using an IUD for months or years. This is because IUD use causes inflammation of the uterus, and sometimes the tubes; this inflammation is thought to prevent a fertilized egg from implanting in the uterus. Infection also occurs because the tail of the IUD acts as a wick connecting the vagina and the uterus.

The higher rate of PID among IUD users is not necessarily due to sexually transmitted diseases. In fact, one kind of PID called Actinomycosis is caused by bacteria called Actinomyces which are rarely found in the genital tracts of women who do not use IUDs.

Other Gynecological Procedures

Several other gynecological procedures involve dilatation of the cervix and/or insertion of instruments into the uterus, which may result in bacterial contamination and PID. Examples of such procedures include: therapeutic abortion;



D and C (dilatation and curettage); menstrual extraction; fetal monitoring; salpingography; endometrial biopsy; and amniocentesis. Researchers estimate that about 12% of PID is caused by iatrogenic factors (IUD insertion, surgery, abortion, etc.),^{27,152} and that .5% of abortions will result in PID.¹⁵² These procedures are defined in the glossary and, while some cannot be avoided (endometrial biopsy, for example, is a check for the presence of cancer), others may be less essential. If you are considering these procedures, remember that you have the option of a second opinion, and also that you can get additional information from women's health centres, medical libraries, health care practitioners, etc.

Before having any of the above procedures performed, women should insist that samples of mucus are taken from the cervix to test for the presence of disease-causing organisms such as chlamydia, gonorrhea, *M. hominis*, etc.

After any procedures which dilate the cervix or introduce instruments into the uterus, women should take even vague feelings of illness very seriously due to the possibility of PID.

Childbirth and Miscarriage

After childbirth and miscarriage, the cervix is dilated and this increases the possibility of getting PID. See Chapter Four: Prevention, on how to reduce your chances of getting PID.

Vigorous Douching

It may be possible for liquid in a douche solution to be forced into the opening of the cervix and for bacteria to be pushed up into the uterus during vigorous douching; this could progress to PID. Douching should be performed extremely gently due to this possibility and douching should not be done routinely in a mistaken attempt to "clean" the vagina. The vagina is not dirty and routine douching can disturb the normal balance and cause problems. Bulb-type douches should never be used since it is easy for the bulb to be pressed firmly enough to push water into the uterus. Pregnant women should not douche; neither should women who have recently (within six weeks) undergone cervical dilation.

Other Causes

PID can also be caused by tuberculosis, but this is a rare occurrence in North America and Europe.

Actinomycosis (see Glossary) may progress to PID in IUD users.

All the causes of PID are probably not identified. After careful examination of over 900 women whose PID was verified by visual inspection of the tubes, the cause of PID was considered unknown in 20-25%.^{83,154} Women who

tend to get recurrent PID should see the sections in this booklet on PID Prevention and Long Term Problems.

CONTRIBUTING FACTORS

Age

Young women are much more likely to get PID: 75% of PID cases occur in women less than 25 years old.¹⁵⁴ This risk is even greater for teenage women: a sexually active fifteen year old has ten times more risk of developing PID than a sexually active 25 year old.^{148,152}

The reason for this is not known, but may be due to a higher rate of chlamydial infections among teenagers, a higher number of sexual partners, less frequent use of barrier methods of birth control, hormonal changes, an immature and thus more vulnerable immune system, or physical changes: certain cells called columnar epithelia are more apparent on the cervixes of adolescents, and both chlamydia and gonorrhea bacteria have a preference for these cells.^{13,143,148,154}

Menstruation

Many women first notice symptoms of PID at menstruation or immediately following it.^{15,152} No one knows for sure why this occurs but it may be due to the opening of the cervix and loss of the cervical "plug" during menstruation, the sloughing of the endometrium which may have a protective function, or the fact that blood is an excellent culture medium.¹⁴⁸

Previous Infections

Women who have had one episode of PID are much more likely to have additional episodes than are women who have never had PID. It is estimated that 19% of women who have had PID will have one or more repeated episodes.^{15,154} Over half of the second episodes of PID occur within one year of the first episode.¹⁵⁴ Thus the importance of proper care with the first episode of PID cannot be overemphasized.

It is not completely understood why this is the case but researchers suspect that it may be caused by improper treatment of the original episode of PID, either by neglecting to treat all the possible causes or by inadequate diagnosis and/or treatment of sexual partners.^{34,154} Another explanation is that the fallopian tubes may be "compromised" by the first infection and may thus be more susceptible to infections after one episode of PID.¹⁵⁴

Bacteria Attached to Sperm

Many researchers now believe that bacteria may attach to sperm and thus be transported past the cervix and into the tubes or uterus.^{71,143,144,154} For this reason it is particular-

ly important that both sexual partners are free of any infection.

Some researchers believe that reinfection from sexual partners may account for the high rate of recurrence of PID.³⁴

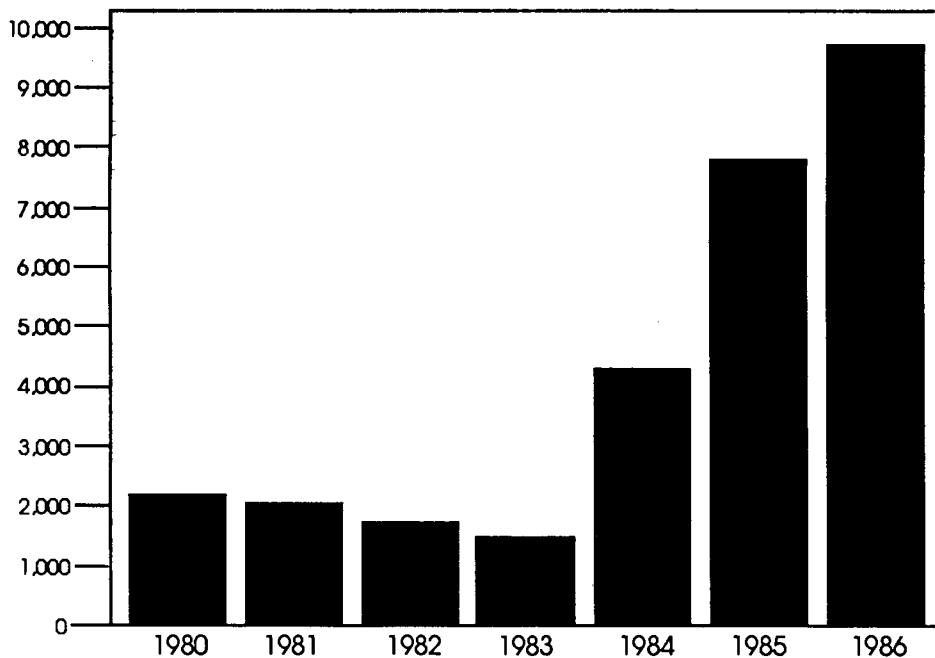
Number of Sexual Partners

Many researchers suggest a relationship between the number of sexual partners a woman has and her chances of developing PID, but the specific risk is difficult to determine. A recent survey concludes that the number of sexual partners a woman has is a factor in the development of PID

but that it is "impossible to separate and assess the relative impact of...sexual behavior" (p.86).¹⁰⁰

Other Vaginal Infections

Some researchers have suggested that vaginal yeast infections may be a contributing factor in the development of PID.⁷¹ For example, Keith suggests that some bacteria (Gram negative cocci and anaerobic bacteria) may attach to trichomonads (yeast) and thus travel from a woman's vagina into the fallopian tubes.⁷¹ While this possibility has not been fully documented it would seem wise for women to take any signs of vaginal infection seriously.



REPORTED CHLAMYDIA INFECTIONS IN CANADA FROM 1980 - 1986

- These figures are from the Laboratory Centre for Disease Control, Health and Welfare Canada.
- ** These figures only include reports from World Health Organization laboratories. Non-WHO labs report similar trends, which would more than double these figures. Also, chlamydia is only reportable in three provinces, so these figures are conservative.

CHAPTER TWO: DIAGNOSIS

A woman who suspects she has PID should endeavour to get diagnosis and treatment immediately.^{126,50} Delayed treatment is less effective than early treatment. Even a short delay can be serious: one researcher found that most women treated within two days recovered completely; women in whom treatment was delayed for one week had many more serious consequences such as infertility and ectopic pregnancy.¹⁴⁶ In addition, any delay allows more time for damage to occur.

PELVIC EXAM

This is the main way that a health practitioner can diagnose PID. She or he should do a gentle bimanual examination in which two fingers are inserted into the woman's vagina while her abdomen is felt with the other hand. Pain or swelling are a strong indication that a woman has PID. These may be the only indications.¹⁵⁴

Also, a speculum can be inserted so that the practitioner can see the cervix. He or she will check to see if motion of the cervix causes pain and will look for pus that might be seen coming out of the cervix. At this time, a sample of pus or mucus from the cervix should be taken with a swab for culture in the lab. This might indicate which bacteria are causing PID. This culture should not be delayed until a later date; the bacteria on the cervix can travel up through the uterus into the tubes, and then later cultures will not show what these bacteria are. A vaginal swab should also be taken and cultured for mycoplasmas.

If a diagnosis of PID is made, antibiotics should be given immediately. Any delay in treatment allows the infection to get worse; the doctor should not wait for the results from the culture. However, the culture must be taken before the antibiotic treatment starts, since antibiotic treatment will change the culture results.

CHECK OF SEX PARTNER

If PID is suspected, a woman's sex partner should be checked to see if he or she is harbouring any bacteria which could possibly be causing the PID. If the bacteria responsible for the PID can be discovered in this way, doctors have information which can help them to choose the most effective antibiotic. Also this information may prevent a possible recurrence of PID, since it decreases the chance that infection may be passed back and forth.

It is important to remember that a woman's sex partner may have disease causing bacteria without having any symptoms. For example, one New York woman had pelvic infection and pain for a year before doctors tested her partner, who had two kinds of disease-causing bacteria living in his urethra. When this woman and man were treated with antibiotics known to kill the bacteria found in the man's urethra, the woman finally recovered. The man had no symptoms of infection. Doctors had never managed to culture any disease-causing bacteria by taking samples from this woman's cervix and she might not have recovered if her sex partner had not been tested.

BLOOD TESTS

Blood tests can be done to find out whether the body is fighting an infection, although these tests will not show what kind of an infection is present. The tests indicate whether or not the white blood cell (lymphocyte) count is raised, or whether the sedimentation rate has shifted (see Glossary). Abnormal measurements indicate that infection may be present.

It is important to remember that a woman can have PID even though blood tests are normal. Many women whose PID is confirmed by laparoscopy (visual inspection of the tubes) have normal blood tests.¹⁵⁴ For example, one Vancouver woman with PID had a 5 cm pelvic abscess while her blood test indicated no infection.

ULTRASOUND

In this test, sound waves are used to get a picture of the pelvic organs. This might show whether abscesses are present; however, it is not always accurate. The test involves no radiation and is at present considered harmless.

LAPAROSCOPY

This is an operation performed in hospital under a general anesthetic. A one-stitch incision is made below the navel, carbon dioxide gas is used to inflate the abdomen, and a laparoscope (an instrument through which the pelvic organs can be seen) is inserted into the abdomen. Another tiny incision is made at the pubic hair line and a probe is inserted to move organs around so that the doctor can see more areas.

If an emergency is suspected a laparoscopy is needed to check the state of a woman's pelvic organs. Laparoscopy is also used to confirm an uncertain diagnosis. The doctor can see whether the organs are inflamed; she or he can also look for other pelvic problems which can cause PID-like symptoms. If laparoscopy confirms a diagnosis of PID, samples of fluid or tissue should be obtained at this time for culture.

Although routine laparoscopy is rarely practiced in North America, Swedish researchers believe laparoscopy is essential for proper diagnosis and treatment of PID.¹⁵⁴ In their clinic they have performed laparoscopy on all women suspected of having PID over the last ten years. In their examination of over 700 women they have found a surprisingly low correlation between a woman's symptoms and the extent of damage which is confirmed at laparoscopy. For example, only 16% of women whose PID was confirmed at laparoscopy had the classical symptoms of PID. On the other hand, 12% of women who were thought to have PID on the basis of a physical exam turned out to have other syndromes, usually appendicitis. In 6.6% of the women with PID, laparoscopy indicated a life-threatening condition such as appendicitis or ectopic pregnancy (see Glossary).¹⁵⁴

Doctors call laparoscopy "bandaid surgery" because the incisions are so tiny. However, the anesthetic used during laparoscopy is a general anesthetic and, thus, the risks of this operation are similar to those of any minor surgery carried out under general anesthetic (see Glossary).

SAMPLING AND IDENTIFYING BACTERIA

The best treatment for any infection results from (1) finding out which bacteria are causing the infection and (2) discovering which antibiotic is most likely to destroy these specific bacteria. There are many kinds of bacteria and no one antibiotic will kill all of them.

The first step in the process of identifying the bacteria causing the problem is to get a sample from the site of the infection. If you have a throat infection a swab should be taken from your throat; if you have a bladder infection, a urine sample should be taken; and so on. If you have PID, the infected site is usually your tubes. There are several ways samples can be taken to discover which bacteria are causing the PID. The sampling procedures are listed in order below, beginning with the least invasive. More details about these procedures are given in Appendix B of this booklet.

Cervical culture

This is an office procedure in which mucus is taken from the cervix. This must always be done because it may indi-

cate which bacteria are causing the PID. However, it is important to note that the bacteria causing the PID may have disappeared from the cervix after infection has moved to the tubes. Thus a positive cervical culture can give useful information about possible causative bacteria, but a negative cervical culture does *not* mean there is no infection in the tubes, uterus, or ovaries.¹⁵³

Culdocentesis

This is a hospital outpatient procedure in which fluid is withdrawn from inside the pelvic cavity. Some researchers report that there is little correlation between samples taken from the pelvic cavity with samples from the cervix or tubes.^{126,153,154} Please see Appendix C for more details.

Tubal samples

Samples from the tubes can be obtained during laparoscopy. This is a surgical procedure requiring general anesthetic. Doctors take fluid and sometimes tissue for culture and examination. If you are having a laparoscopy to check on a possible infection, you should ask your doctor to take samples if an infection is present.

Many researchers believe that tubal samples are essential for proper diagnosis of PID.^{34,50,131,154} The reason for this is that the tubes are the most frequent site of infection and cultures taken here are the most reliable indication of disease causing bacteria. Please see Appendix C for more details.

POSSIBLE PROBLEMS

The polymicrobial nature of PID

Most researchers now believe that PID is caused by a multitude of factors and bacteria.^{15,27,31,83,84,98,148,154} Indeed, one researcher recently found over 48 different microorganisms in the cul-de-sac of women with PID but no microorganisms in the cul-de-sac of women who did not have PID (see Glossary).¹⁹ Thus, it is very important that treatment of PID is aimed at all potential causes.^{13,126,154}

The complex, multiple causes of PID mean that diagnosis can be difficult. Diagnosis based on clinical signs is frequently in error.⁵⁰ Jacobson and Westrom⁶⁴ note that the clinical criteria for diagnosis of PID are unsatisfactory and are only 65% accurate: they detect less cases of PID than actually occur. Similarly, Westrom notes that only 16% of women whose PID is verified at laparoscopy fit the classical picture of PID.¹⁵³ He concludes that "the classical concept of PID is woefully inadequate," (p. 708).¹⁵³ Given the serious long-term problems which can result from PID, these researchers strongly suggest that any sign of genital infection be taken very seriously.

Mildness of symptoms

Many women experience mild symptoms or even no symptoms with an episode of PID. This is especially true when the PID is caused by a chlamydial infection.^{13,59,83,152,154} Indeed, in a very large scale study in Sweden only 3% of PID patients were seriously ill when admitted to the clinic.¹⁵³ Some women with PID may have no symptoms at all.

One researcher notes that "the LGTI (lower genital tract infection) preceding PID often passes unnoticed or causes only slight and transient symptoms from the lower genital and/or urinary tract" (p. 704).¹⁵³

This mildness of symptoms and the difficulty it causes for proper diagnosis of PID leads a world authority on PID to recommend that "in view of the infertility threatening patients with tubal infections, it is better to overtreat an LGTI (lower genital tract infection) than to not treat a case of acute salpingitis (PID)," (p. 708).¹⁵³ Again, this means that any sign, however mild, of vaginal or pelvic infection should be taken very seriously.

Credibility: being believed

In order to get an accurate diagnosis a woman's description of her symptoms must be taken seriously. Unfortunately, women sometimes have difficulty convincing people that

their pelvic pain is the symptom of a physical problem. For example, one researcher found that almost half of women who were told they did not have PID actually did have PID.¹⁸

Some women have even been advised to "see a psychiatrist" when they were actually suffering from PID.

If this happens, it is wise to get a second opinion immediately from a health practitioner who is experienced in diagnosing PID. Until you can get help, it is best to rest, abstain from intercourse, and eat light, nutritious meals.

The confusion of PID with other conditions

Acute PID is sometimes difficult to distinguish from appendicitis or tubal pregnancy. Both acute and chronic PID can also be confused with endometriosis, a condition in which cells identical to those inside the uterus grow in the pelvic cavity. These cells bleed during the menstrual cycle, causing inflammation, scarring and pain. PID can also be confused with some bowel problems, urinary tract infections, and ovarian cysts. If your PID does not respond to treatment there is the possibility that you may have some other pelvic problem and this should be investigated. On the other hand, it is common for PID to take a long time to clear up, so this fact alone certainly does not mean the diagnosis was incorrect.

CHAPTER THREE: TREATMENT

CONVENTIONAL MEDICAL TREATMENT

This section describes some of the treatments which are used for PID, beginning with antibiotic therapy, the most common treatment for acute and subacute PID.

Antibiotic Treatment

PID is a serious disease which does more damage and becomes more difficult to cure the longer it goes on. Therefore, it is important to take action quickly to treat the infection.^{50,131} A 1964 study of women with PID showed that women who had treatment for PID within two days of the onset of symptoms recovered without complications. Of the women in the study who did not have treatment until a week or more after they developed symptoms, 30 percent developed complications leading to reduced fertility.¹⁴⁶

Antibiotics, given orally or intravenously, are the most common treatment for PID because if the antibiotic given is one which kills the specific bacteria involved, and if it is given in correct doses, it will work very rapidly to kill the bacteria causing the PID. Antibiotics are appropriate treatment for women with acute, subacute, or recurrent PID; even chronic PID sometimes responds to antibiotics if a lingering infection is still present.

When a woman has PID, several different types of bacteria may be present in the tubes. This is called "polymicrobial" infection. Therefore, any antibiotic prescribed should be effective against a wide range of bacteria. For example, Dr. Bowie cautions that treatment "must be active against *C. trachomatis* (chlamydia), *N. gonorrhoeae*, *Mycoplasma hominis*, *Enterobacteriaceae*, and *anaerobes*. No single antimicrobial (antibiotic) provides adequate coverage against all of these," (p. 465).¹³ Other bacteria may be present as well (see Chapter One: Causes).

There are two approaches to treating this wide range of bacteria. The most effective one is treatment with more than one antibiotic at the same time. This approach covers a greater range of bacteria than treatment with a single antibiotic and is therefore more likely to eliminate the PID. However, combining antibiotics increases the risk of side effects. A second but usually less effective approach is treatment with a single broad-spectrum antibiotic.

The best way to administer antibiotics so that they act rapidly and effectively against PID is intravenously (into a

vein) by means of an IV (intravenous) apparatus. These IV antibiotics are given in hospital.

Antibiotics taken orally (by mouth) must be digested and absorbed by the body and are, therefore, often less effective in reaching an adequate concentration in a woman's pelvis than IV antibiotics.

There is really no one "best" antibiotic to treat all women with PID since different cases of PID involve different bacteria; however, some antibiotics are better choices than others. The table shows the most recent recommendations of antibiotics used in the treatment of PID. It was published in 1985 by the Center for Disease Control (CDC), a national body which monitors infections in the U.S.A. These recommendations are based both on laboratory tests indicating the antibiotics which wipe out the bacteria most often associated with various kinds of PID, and on the experiences of leading experts on PID treatment. The CDC may alter these recommendations in the future when more extensive research on PID treatment is done.

All antibiotic treatments in the table on page 12 must be given in two stages; *to be effective the total combined treatment must be continued for at least 10-14 days*. All the IV antibiotics mentioned must be given for at least four days; if a woman has a fever the IV administration must be continued for *at least 48 hours* after her temperature returns to normal.

Depending on the cause of the PID, antibiotic treatment may need to be continued for even longer periods of time. For example, chlamydial infections may require multidose regimens¹³ and antibiotics should be continued for at least two weeks if the PID is caused by *M. hominis*.⁸⁴

It is common to require antibiotics for more than the minimum 10-14 days and to require several weeks of bed rest. *Antibiotic treatment works best in combination with strict bed rest; the correct antibiotic may not cure PID without this rest.*

Most experts also recommend that a woman and her sex partner should not have intercourse during treatment, and should not resume sexual relations until after follow-up has indicated healing is complete and that the woman *and* her sex partner are free from infection.^{27,13,154} Please see discussion of follow-up later in this booklet.

Oral antibiotics should be taken exactly as directed until *all the pills or capsules in your prescription are gone*. The reason for this is that even when a woman feels better some tough bacteria may be alive; if she stops taking the

antibiotics she may experience a flare-up of an infection caused by these antibiotic-resistant bacteria. Any woman taking antibiotics should check with her doctor or pharmacist about any medications, vitamins, or tonics she is taking in case these interfere with the action of the antibiotics or cause side effects. *The People's Pharmacy* by Joe Graedon is another useful source of information.

See table in this chapter for specific antibiotic treatment regimes.

Location of treatment

Many leading experts on PID think all women with acute PID should be treated in hospital. There are good arguments to support this view: the woman can have IV antibiotics and her health can be monitored. The argument against hospital treatment is that it is expensive and inconvenient. However, if you are not in hospital it is important that your doctor see how you are within 48-72 hours after you begin antibiotic treatment so she or he can check for improvement.

The CDC recommends treatment in hospital for the following women:

- (1) Women whose diagnosis is uncertain.
- (2) Women who cannot be rechecked by a doctor within 48-72 hours after the start of antibiotic treatment.
- (3) Women who have been taking oral antibiotics which have not resulted in improvement after 48-72 hours of treatment.
- (4) Women who might have an ectopic pregnancy or appendicitis.
- (5) Women who might have a pelvic abscess.
- (6) Women who are severely ill.
- (7) Women who may be unable to follow the treatment procedure.
- (8) Women who are pregnant. PID during pregnancy is extremely dangerous for both the woman and the fetus; this is why pregnant women with PID must be immediately treated with antibiotics. Some antibiotics are less risky than others for the fetus (see Appendix D on antibiotic side effects).
- (9) Pre-pubertal children who have PID (this is a rare occurrence).

Antibiotic side effects

Antibiotics do more than just act against disease-causing bacteria; they also wipe out bacteria that the body needs. You can lessen your chances of developing digestive upsets by eating yogurt or taking acidophilus if these do not interact with the antibiotic you are taking. You may avoid vaginal yeast infections if you insert acidophilus capsules or plain unsweetened yogurt into your vagina during the period of antibiotic treatment.

Many antibiotics have the possibility of serious side effects associated with their use; check Appendix D for a par-

tial list of the possible side effects associated with antibiotics used in PID treatment.

After antibiotic treatment

When antibiotic treatment is completed a woman should be re-examined to see if the infection has cleared up. This is extremely important. For example, recurrences of chlamydia infections are common.¹³ In one study, one-third of men treated for chlamydial infections had recurrences of the infection despite appropriate treatment. Most importantly, fully one-half of these recurrences occurred *more than two weeks after treatment was completed*.¹³ Thus Dr. Bowie cautions that "an apparent clinical response...does not guarantee that *C. trachomatis* (chlamydia) has been eradicated," (p. 460).¹³ He recommends that follow-up for chlamydial infections should take place *at least four to six weeks after completion of treatment*.¹³ Because of the high risk of recurrence of PID, some practitioners recommend careful follow-up for a year.²⁷

Thus, appropriate antibiotic treatment and careful follow-up are essential.

For these reasons, a woman's opinion about the state of her health should be taken very seriously. We have heard from many women who were described as cured even though they felt very sick; some of these women went on to develop chronic health problems.

If any disease-causing bacteria were identified in an earlier cervical culture, this test should be repeated after antibiotic treatment is completed. This may indicate whether or not the bacteria have been wiped out. Sex partner(s) should also be rechecked.

Bedrest

This is extremely important. Drs. Westrom and Mardh, world authorities on PID, recommend bedrest and antibiotics as the most effective treatment.¹⁵⁴ Bedrest helps to keep the infection from spreading. Complete rest also means that the uterus and tubes will not be jolted or jarred and inflamed further, and it allows your body time to heal. A woman who has PID should stay in bed until at least two days after her temperature is normal and *there is no pain*.

The importance of complete bedrest cannot be emphasized enough. Until a woman feels entirely well, she should not get up except to go to the bathroom. Even getting up to answer the phone or to make a cup of tea may hinder the healing process. Complete rest is at least as important as the antibiotic prescription. Bedrest will help women with acute, subacute, and recurrent PID; it often helps women with chronic PID as well.

Healing might take two weeks if the antibiotics are dramatically effective; more often it takes more than the length of one menstrual cycle—six weeks is likely. One woman with PID spent six weeks in bed on the advice of her doctor—and she recovered completely. During another

RECOMMENDED ANTIBIOTICS

For PID caused by Gonorrhea* and/or Chlamydia

Stage one: DOXYCYCLINE 100 mg, twice a day by IV
plus
CEFOXITIN 2 g, four times a day by IV

Stage two: DOXYCYCLINE 100 mg, twice a day by mouth

Comments: *The above combination of antibiotics is probably not the best treatment choice for PID caused by anaerobic bacteria; PID associated with IUD use; or for a woman with pelvic abscesses. Cefoxitin should not be given to a woman who does not have healthy kidneys.*

**The above drug combination is effective against penicillin-resistant gonorrhea.*

For PID caused by Anaerobic Bacteria or Facultative Gram-Negative Rods

Stage one: CLINDAMYCIN 600 mg, four times a day by IV
plus
GENTAMICIN or TOBRAMYCIN, 2 mg for each kg of body weight to begin treatment. Then 1.5 mg per kg, three times a day. *Note that only women with healthy kidneys can take these two antibiotics.*

Stage two: CLINDAMYCIN 450 mg, four times a day by mouth

Comments: *The above combination of antibiotics is not the best treatment for PID caused by gonorrhea or chlamydia.*

For PID treated at home

Stage One: CEFOXITIN 2 g, injected into a muscle
or
AMOXICILLIN 3 g, by mouth
or
AMPICILLIN 3.5 g, by mouth
or
AQUEOUS PROCAINE PENICILLIN G. 4.8 million units, injected in two sites
in muscle tissue
or
CEFTRIAZONE 250 mg, injected into a muscle.

Each of these regimens *except ceftriazone* must be given along with PROBENECID 1 g. by mouth-this helps the body to retain the penicillin.

Stage two: DOXYCYCLINE 100 mg, twice a day by mouth
or
TETRACYCLINE HCl 500 mg, four times a day by mouth. This antibiotic is less effective against some anaerobes than doxycycline.

Comments: *The combination of cefoxitin plus doxycycline is active against gonorrhea, including the penicillin-resistant form, and is also active against chlamydia. Penicillin-resistant gonorrhea will **not** be cured by any of the three "cillin" drugs listed here. Not recommended by the CDC, but suggested by other PID researchers, is a stage two combination of doxycycline with metronidazole.*

episode of PID several years later, she "pushed herself," resuming her normal activities before she felt really well. The PID worsened, became chronic, and continues after three years.

You may hear that "bedrest doesn't work." While it is true that bedrest doesn't always work on its own, it certainly will help your body to heal. Before antibiotics existed, bedrest was the standard treatment which cured many women of PID. Women sometimes feel guilty about staying in bed and think they should be up doing things; it is important to give yourself complete permission to rest when you have PID. Staying in bed is one way a woman can help the healing process; it is not "doing nothing" or "just lying around." You may need to enlist a friend who can look after you. See the appendix on bedrest at the end of this booklet.

Bedrest means pelvic rest. It is unwise to have vaginal or anal intercourse while you have acute or subacute PID. The pelvic thrusts move the reproductive organs, and this can spread pus through the tubes and even into the pelvic cavity.

Treatment of sex partners

This is extremely important. Most experts recommend that a woman and her sexual partner must both be treated if treatment is to be effective.^{13,27,34,154} This is essential in order to prevent recurrences of infection.^{13,34,154} Many researchers suspect that the high recurrence rate of PID may be due in part to the lack of appropriate treatment of sexual partners.³⁴ In Sweden, where they have implemented careful follow-up of sex partners since 1977, there has been a

significant decrease in the number of second episodes of PID.¹⁵⁴

Heat

The application of heat to any area of the body helps to increase the blood flow through that area. Heat applied to the pelvic area may therefore increase the flow of infection-fighting white blood cells, proteins, and antibiotics. Many women find that heat eases their pelvic pain. However, it is not safe to apply heat before a diagnosis has been made, because of the risk of a ruptured appendix if you have appendicitis rather than PID.

There are several ways to apply heat to the pelvic area:

- (a) Hot water bottles or heating pads.
- (b) Sitz baths.

These are hot shallow baths in which you sit almost up to to your waist in water with your legs out of the water. The water surrounds only the pelvic area, so blood flows to that area. A baby's bathtub is ideal for sitz baths. Do not add soap to the water, since this will increase your risk of developing a yeast infection.

- (c) Pelvic diathermy.

A diathermy unit is a machine which uses waves of electrical energy. These waves penetrate deep into the tissue, and are thought to provide heat within the body rather than only on the surface. Hospitals, as well as some doctors, physiotherapists, and naturopaths, sometimes use diathermy to treat PID. These treatments can be helpful for some women; however, for others, the strain of going out to the doctor's office for a series of diathermy treatments



These treatments can be helpful for some women; however, for others, the strain of going out to the doctor's office for a series of diathermy treatments may counteract the possible benefits of the treatments. For these women a hot water bottle may be a better idea.

Ultrasound

An ultrasound machine uses very high-frequency sound waves. In PID treatment these are directed over the pelvic region, where they create vibrations at the cellular level. Many health practitioners believe that the use of ultrasound treatments can break up scar tissue in the pelvic area. Usually the treatment is painless, and at present health practitioners consider it harmless. The long term effects, if any, of the procedure are not known. Physiotherapists, hospitals, and many other health practitioners use ultrasound treatments.

Diet

A high-protein diet with high levels of vitamins and minerals will help women with PID to recover more quickly and completely. Adequate B vitamins, vitamin E, vitamin A, vitamin C, and zinc may be especially helpful to combat the stress of the infection, to promote tissue healing, and to lessen inflammation. Please note that excessive amounts of some supplements may be harmful rather than helpful.

ADDITIONAL TREATMENT APPROACHES

The following approaches to treatment are unfamiliar to many women since they are not part of conventional Western medicine (allopathy). We are including brief descriptions of these treatment approaches since some women with PID have been helped by them; some of these women had tried antibiotics and other medical treatments which had not worked for them.

Often these kinds of treatments are called "alternative", but we use the term "additional" since they usually can be combined with conventional antibiotic treatment. For example, a woman with active infection in her reproductive organs can take antibiotics and supplement these with vitamin therapy and acupuncture. However, the treatment approaches we describe here are especially appropriate for women whose PID is not cured by antibiotics; women who have chronic pelvic pain; and women who would like to explore all possibilities before considering elective surgery. Some approaches are also preventative so there is the chance that future infections might be avoided.

As is the case with medical doctors, a woman should know the qualifications of the practitioners she consults.

All people who practice a particular healing approach are not equally knowledgeable or skilled.

N.B. It is not appropriate to explore these treatment approaches as an alternative to emergency treatment. The following approaches tend to work gently and slowly and are not suited to emergency situations.

Acupuncture

This is an ancient healing technique which can relieve pain and reduce inflammation and infection in the pelvis. During an acupuncture treatment needles are temporarily inserted into specific points in the body. The acupuncturist decides on the location of the needles after noting the medical diagnosis of a woman's condition and reading her pulses in the Chinese fashion. Practitioners of Chinese medicine are trained to detect pulses at the ankles and the wrists which are thought to indicate energy imbalances in the body.

Traditional Chinese theory states that the body contains energies which are balanced during an acupuncture treatment. There is no evidence for or against this theory. In other words, we do not have a scientific explanation of how or why acupuncture works. Most Western scientific examination of acupuncture has concentrated on the pain-relieving effects of the technique.

The reason we are including acupuncture as a possible approach is because some women with PID have been helped by acupuncture treatments. This help has ranged from minor (some pain relief) to major (dramatic relief from disabling pelvic pain and chronic PID).

For best results acupuncture treatments should be started as soon as possible after the onset of disease; however, they can still be effective if begun at a later date. Generally more treatments are required in the case of an illness which has gone on for a long time.

It is best to seek an acupuncturist who has had lengthy training. Some practitioners who use the technique have only very limited knowledge about its use. For more information about acupuncture you could read "Acupuncture: A Contemporary Look at an Ancient System," by Steven Chang in the *The Holistic Health Handbook*, or other books that your local library or bookstore might have.

Naturopathy

Naturopathy is an approach to healing which draws on many treatment approaches. Some of these are ancient, e.g. acupuncture and herbal remedies, and others are modern, e.g. ultrasound and diathermy treatments. The fashionable belief that herbs are completely safe is misleading so it is important to take herbs prescribed by a competent herbalist or naturopath. After a consultation with a naturopath a woman with PID might have several treatment

graduate study in a specific healing technique, thereby developing an area of specialization. They are trained to understand the techniques used by medical doctors and to cooperate with them. For more information about naturopathy you could have a look at a few sections of *The Holistic Health Handbook* compiled by the Berkeley Holistic Health Center.

Visualization

Visualization is a kind of meditation during which a woman imagines her body healing. Meditation has been practiced in many different cultures since ancient times. Visualization, a kind of applied meditation, has been used in the treatment of cancer by the Simontons, a wife and husband team in the United States. They describe their program and its successes in their book, *Getting Well Again*.

Visualization can be learned from other people or from books. During visualization a woman enters a deeply relaxed state and imaginatively "sees" her reproductive system healing. She uses any images which seem powerful and positive for her. She might see her pain as a piece of jagged ice and then see it melting in the warm sun. If a woman is taking antibiotics she might imagine them killing the weak and sickly bacteria in her pelvis. She could imagine herself well and happy, walking along in a favorite place.

It is thought that when visualization improves a person's health, it does so because the mind and body are connected in a way that allows the mind to influence the body. Therefore, the mind can stimulate the healing powers of the body. However, a woman who tries this approach without success should not be made to feel guilty by people who have the simple-minded view that if a woman just "thinks positively" she'll be instantly well.

To learn more you can read the Simonton book or, for a simpler account of how to do visualization, try *Healing with Mind Power* by Richard Shames and Chuck Sterin.

SURGERY

Categories

Any surgery recommended to a woman with PID falls into one of two possible categories: emergency or non-emergency (elective).

Emergency surgery

A woman must have surgery without delay if her doctor thinks that abscesses have ruptured. Doctors will also advise surgery if they think that abscesses may rupture at any time.

This situation is a serious medical emergency which requires the immediate surgical removal of infection from the abdomen. However, during emergency surgery there is

sometimes the possibility of removing organs, so a woman should let the surgeon know her wishes in terms of saving her reproductive organs.

Elective surgery

Elective surgery is a non-emergency surgery and therefore a woman has the time to find out more about any operation which has been suggested to her. Information can be obtained from women's health groups, public and medical libraries, health care workers, and other women. Good information on gynecological surgery can be found in *Our Bodies, Ourselves* by the Boston Women's Health Book Collective, and *My Body, My Health, A Woman's Guide to Gynecology* by Felicia Hance Stewart and others.

A woman considering elective surgery also has time to try other treatment options (see previous discussion of additional treatments). She might also seek a second medical opinion. At the present time, there is no medical research which presents a clear picture of exactly what kind of elective surgery is needed to treat PID. *While surgery can remove infection, there is no guarantee that pain will be eliminated.* Most women have strong feelings about their reproductive organs and need time, information, and emotional support when making a decision about surgery. Women should not be pressured into making a decision.

Surgical options

Adhesion removal

During this operation scar tissue is removed to allow the woman's organs to move freely again; this procedure may reduce pain. The surgery can only be performed if no active infection is present. The adhesions can be removed either during laparoscopy or laparotomy.

During *laparoscopy* a skilled gynecological surgeon can separate adhesions through the laparoscope. The advantage of this procedure is that it is minor surgery which leaves only a one-inch scar and rarely causes the formation of more adhesions. The disadvantage is that only a limited amount of adhesion removal can be done through a laparoscope.

During *laparotomy*, a larger incision, about four inches, is made in the woman's abdomen. The incision can be either vertical or horizontal. Some women prefer the horizontal scar because it is later hidden in the pubic hairline.

The advantage of this procedure is that the doctor is able to do more extensive adhesion removal than is possible during laparoscopy. She or he can separate organs which have become stuck together. The disadvantage is that this is major surgery and the operation itself can often create adhesions. Many women who undergo adhesion removal find that they still have chronic pelvic pain unrelieved by this surgery. The use of delicate microsurgical techniques and

a high level of surgical skill improve the chances for successful surgery.

Salpingectomy

Salpingectomy is the removal of the fallopian tubes. This is done during laparotomy and can be combined with adhesion removal. The advantage of this operation is that the PID will be eliminated if infection and damage are confined to the tubes. The disadvantages are that the woman is no longer able to conceive and, as with other major abdominal surgery, this operation may cause adhesions to form.

Hysterectomy

Hysterectomy is the removal of the uterus and usually the cervix. If hysterectomy is done to treat PID doctors advise women to allow the fallopian tubes to be removed at the same time. This is because the tubes are almost certain to be damaged by infection.

The operation can be performed abdominally during laparotomy or through the vagina. Abdominal hysterectomy is considered the best approach for women with PID in case there is any scarring or infection in the pelvic cavity. The abdominal incision makes it easier for the doctor to see the condition of the organs in the abdomen.

There are several terms used to describe hysterectomy and it is important to find out what your doctor means by them. Some doctors use the term "complete hysterectomy" to refer to the removal of the uterus, cervix, tubes, and ovaries. If your doctor uses the terms "partial," "complete," or "total" when referring to hysterectomy, ask her or him for a precise definition of what will be removed. Have the doctor draw a diagram if you still don't understand.

The advantage of hysterectomy is that it is likely to eliminate the PID unless infection lingers in the ovaries. There is also the chance that hysterectomy will reduce chronic pelvic pain, although this result is not predictable. Doctors do not know why many women with pelvic pain continue to suffer despite hysterectomy; however, if pain is caused solely by infection in the uterus and tubes, then it is likely that hysterectomy will eliminate this pain.

One disadvantage of hysterectomy is that it is major surgery with a high rate of post-operative complications ranging from minor to serious. There is a 30 to 45 percent risk of serious complications such as infection, damage to ureters, or hemorrhage. One in every 500-1600 women who undergo hysterectomy die from the effects of the surgery.^{10,99} Some women say that it took them six months to a year to recover from hysterectomy. Some women feel fatigue for a long time after this operation and may experience depression. After hysterectomy a woman will no longer be able to bear children and there is the chance that adhesions will develop and cause pain.

There are differing reports on the effect hysterectomy may have on a woman's feelings of sexual pleasure. Some women find that after hysterectomy they feel decreased sexual pleasure, especially during orgasm. Other women report that their sexuality has not been adversely affected by this surgery. Evidence suggests that some women's experience of sexual pleasure depends on congestion and spasm of the pelvic organs. When these are gone, the sensations during arousal and orgasm are reduced. Also, some women miss the sensation of pressure on the cervix during intercourse. However, a woman who has explored other options without success may find relief from hysterectomy.

Oophorectomy

Oophorectomy, or ovariectomy, is the removal of a woman's ovaries. This causes more long term side effects than hysterectomy. If the ovaries are removed for PID this is usually done along with hysterectomy. Most doctors think that obviously infected ovaries should be removed; however, there is disagreement about whether or not ovaries should be removed if they appear normal. Some doctors think their removal will improve a woman's chances of getting well; other doctors think ovaries should be left if at all possible.

The ovaries produce fluctuating levels of hormones which cannot be replaced by taking estrogen (and there are serious risks associated with estrogen use). It is important to leave your ovaries if this is possible. One ovary, or even part of one ovary, can produce normal levels of hormones if both ovaries cannot be retained.

The advantage of oophorectomy is that unless peritonitis has occurred, the ovaries are thought to be the last possible site of infection and, therefore, if ovaries are removed during hysterectomy it is generally believed that no infection can remain.

The disadvantage of removing both ovaries is that sudden menopause occurs. This means that a woman may experience a number of menopausal symptoms and physical changes. Another disadvantage reported by many women after the removal of both ovaries is a lack of sexual desire. For very helpful information about menopause, you could have a look at *Menopause: A Positive Approach* by Rosetta Reitz.

Presacral neurectomy

The purpose of this operation is to eliminate pelvic pain. In this operation the sensory messages from the organs of the pelvis, carried along the presacral nerve, are eliminated by removing the nerve itself. This is major surgery which requires special experience and skill since the presacral nerve is very close to large blood vessels. Presacral neurectomy is considered by doctors to be a much more difficult operation than hysterectomy.

The surgery is estimated to be about 75 percent effective in eliminating pelvic pain.¹⁰⁸ It is not thought to affect a woman's chances of becoming pregnant.

Since the surgery removes the nerve registering sensation in the organs of the lower pelvis, it may have some effect on bladder and bowel function. This usually corrects itself over time as the woman recovers from the operation. The surgeons we consulted thought that permanent loss of the ability to control bladder and bowel function was a very infrequent complication of this surgery. One common side effect is the partial or complete absence of pain during labour. The medical literature generally assumes that the surgery has no effect on a woman's sexuality although, ac-

tually, there seems to be no evidence one way or the other. We wonder if it is really possible for sensation in the pelvic organs and cervix to be eliminated without affecting sexual sensation as well.

This surgery is a last resort for women suffering disabling pelvic pain, especially for those who wish to retain their organs in order to have children. Presacral neurectomy is usually combined with surgery designed to restore fertility. The operation is out of the question for a woman who has active infection or inflammation, or who suffers from recurring infections, since the surgery would only remove one symptom of serious pelvic disease.

CHAPTER FOUR: PREVENTION

A woman who has had PID once is more likely to develop PID than a woman who has never had PID. If you have had PID, the precautions below may help you to avoid it in the future. If you have never had PID they may help you to stay healthy.

CARE AFTER CERVICAL DILATION

Abortions, D & Cs, IUD insertion, miscarriages, and giving birth all involve the dilation of the cervix. This makes it easier to contract PID (see Chapter One: Causes of PID). Therefore, for six weeks after any of the above, or for two weeks after bleeding stops, a woman should not allow anything into her vagina. This means no baths (showers are O.K.), swimming, douches, vaginal intercourse or use of tampons until an examination with a speculum shows that the cervix is closed. Any feelings of illness should prompt a visit to a doctor to check on the possibility of PID.

In addition, a wet smear culture should be taken before having any of these procedures to ensure that no infection is present.¹⁵⁴

BIRTH CONTROL CHOICE

Women who use IUDs are three to nine times as likely to develop PID as women who do not use IUDs. Every kind of IUDs has resulted in PID; there is no "safe" brand of IUD.

Barrier methods of birth control and spermicides provide some protection against PID and sexually transmitted diseases.¹³ These methods, which include diaphragms used with spermicidal jelly, cervical caps, and condoms and foam used together, can be very effective if they are properly used (see Glossary). To use these methods effectively, it is important to find a health worker who is supportive of the methods and who is prepared to explain their proper use.

CARE DURING MENSTRUATION

If you have had PID, you should be especially careful during your menstrual period. Menstruation plays an important role in the onset of PID with the majority of diagnosed PID occurring in the first five to ten days of a woman's cycle (or within the week following a woman's period).¹⁵ Many women who have had PID first noticed the symptoms

during, or just after, a menstrual period. One likely reason for this is that blood is an ideal growth medium for bacteria. Also, during menstruation and again during ovulation, the cervix is slightly open, which makes it easier for any bacteria to enter the uterus. For these reasons it seems a good idea to avoid introducing any new bacteria into the vagina during menstruation or ovulation. Intercourse should be very gentle in order to prevent pushing bacteria up into the uterus. Condoms will also help prevent the introduction of bacteria.

TESTING FOR STD

Any woman who suspects she has been exposed to a sexually transmitted disease (STD) should have a test done for the presence of infection; her sex partner should also be tested. Men or women who have several sex partners should have regular tests for sexually transmitted diseases (see Chapter One: Causes). Remember that you are sharing bacteria not only with your sex partner, but also with all of his sex partners also.

It is important to remember that many women and men with STD are not aware that they are infected because they may have no symptoms. Thus, the importance of regular testing and the use of "safe sex" practices, such as barrier methods of birth control to prevent the transmission of disease causing micro-organisms, cannot be over emphasized.

AVOIDING BOWEL BACTERIA

To prevent these bacteria from getting into the vagina from the rectum, always wipe from front to back after a bowel movement. Never follow anal intercourse with vaginal intercourse.

TREATING VAGINAL INFECTIONS

Untreated vaginal infections may increase your chances of getting PID. Therefore, any vaginal infection should be treated promptly, whether it appears minor or not.

Vaginitis is more likely to occur when the normal slightly acidic state of the vagina is made more alkaline (less acid). This occurs during the menstrual period, and when taking antibiotics or birth control pills. Contraceptive foams may help to prevent vaginitis, because they increase the acidity of the vagina.

Some women who have recurrent yeast infections find that gentle douching with water containing white vinegar, two or three tablespoons per quart, increases vaginal acidity and lessens their chances of developing a yeast infection after menstruation (see the comments on douching under *Chapter One: Causes of PID* in this booklet). Women can also add a cup of white vinegar to the bathwater.

Women can also help prevent vaginitis by wearing 100 percent cotton underwear, and by avoiding tight trousers, bubble baths, and vaginal deodorants. It is best not to wash the vagina with soap, because soap makes the vagina more alkaline. Always change underwear each day.

A woman may be able to halt the development of a yeast infection by inserting acidophilus capsules vaginally at the first sign of infection.

MAINTAINING GENERAL HEALTH

The body has many defenses to help it resist infections. If your general health is good, your body will be more able to resist illness. When you are run down or under physical or mental stress, the body's defense systems are less effective. It is especially important for a woman who has had PID to eat a consistently good diet, have regular gentle exercise, and always get plenty of rest.

Stress can be dealt with by determining the cause of the stress and trying to reduce it. For example, a woman could

try working less overtime or getting help with child care, etc.; doing relaxation exercises such as yoga and visualization; and learning to release strong feelings, either by strenuous exercise, or through emotional release techniques.

PREVENTING RECURRENCES

Many researchers believe the high recurrence rate of PID may be due to improper treatment or follow up of the initial episode of PID.³⁴ Thus, prompt, appropriate treatment of the first episode of PID is very important. The following points are important to remember:

- (1) Antibiotics should be aimed at all possible causes.
- (2) Sex partner(s) must be treated even if they have no symptoms.
- (3) Treatment must start as quickly as possible; all symptoms, no matter how mild, should be taken very seriously.
- (4) Bedrest should be combined with antibiotic treatment.
- (5) No intercourse until treatment and follow up are completed.
- (6) Follow up should occur at least 6-8 weeks after treatment is completed.

CHAPTER FIVE: POSSIBLE LONG TERM PROBLEMS

While most women recover completely from PID, some women experience long term problems caused by their bout(s) of the disease. The list below briefly outlines the long term effects which are known to occur. It is important to realize that of those women who do suffer from chronic problems, few women actually experience all the possible long term effects.

It is also hopeful and important to know that some women have experienced improvement or recovery after being told that nothing could be done for them. It's helpful to keep in mind that when someone says this, it means that *they* don't know of anything that might help.

RECURRENT INFECTION

If you develop recurrent pelvic infections, it is useful to keep a record of when, and possibly why, each infection occurs. Did you get PID when you had a vaginal infection? When you travelled? When you went without sleep? Has your sex partner been checked for disease causing bacteria even if he has no symptoms? By doing this and by following the advice in the earlier section on PID prevention, you may be able to reduce the frequency of, or even eliminate recurrences. You may also be helped by approaches to healing which can be used to prevent disease.

CHRONIC PAIN

This is believed to result from any of the following conditions: scar tissue (adhesions), inflammation, infection, and chronic spasm of the muscles of the pelvic diaphragm. There may well be other causes. Despite the fact that researchers estimate that about fifteen percent of women with PID develop chronic pain,¹⁵⁴ there is very little discussion or research on this topic.

The first step in treating persistent pelvic pain is diagnosis. This may be hard to get since many women have had PID dismissed as chronic pelvic pain and their pelvic infections were left untreated.

If the pain is caused by scar tissue, it is possible to have some adhesions separated through the laparoscope. This may give some relief and is not likely to cause further scarring, unlike scar tissue removal during laparotomy—major surgery which is often unsuccessful (see Chapter Three: Treatment). Ultrasound treatment also helps break up scar tissue.

Pain caused by inflammation might be relieved by bedrest, acupuncture, naturopathy, visualization, etc. Some women find that the cycle of pain is linked to their hormonal cycles and that if they cut down on activity during a certain part of their cycle they can also reduce the pain.

Chronic pelvic muscle spasm, also called pelvic floor myalgia and levator syndrome, is not very well described in the medical literature. Basically, it is something like having a "charley horse" in your pelvis. The pelvic diaphragm, which is the muscle between your legs, goes into spasm and becomes immobile. The resulting pain is often felt in the lower abdomen. This muscle spasm can be treated with biofeedback techniques and/or very specialized and skilled physiotherapy, or cranial osteopathy supplemented by breathing techniques and heat. A sure-fire treatment is not known and a woman might have to try more than one approach to find one that helps her. Few doctors are acquainted with this problem; pelvic pain clinics are the places most likely to provide a diagnosis of chronic pelvic muscle spasm. This condition is most likely to occur in women who have had PID for a long time, especially those who have undergone abdominal surgery.

Some women with persistent pelvic pain and pelvic muscle spasm develop back problems which can also be treated with physiotherapy, acupuncture or massage.

Women who suffer from chronic pelvic pain often find that it increases during and after sexual intercourse. Experimenting with different positions might help a couple to find a way to have intercourse that does not increase the woman's pain. Oral sex might be explored as an alternative to intercourse. If you are a man reading this and your sex partner is a woman with pelvic pain, remember that this problem is not in her mind. Try to find out how little penetration and movement she can tolerate without her feeling pain—not how much. If you provide an accepting atmosphere she will tend to feel more comfortable about letting you know what feels okay and what doesn't.

INFERTILITY

Scarring can reduce or eliminate a woman's fertility by sealing off the fallopian tubes. Nevertheless, some women have conceived after being told that PID had made them infertile, so women who think they may be infertile should continue to use birth control if pregnancy is unwanted.

The main medical option for women who are infertile due to sealed fallopian tubes is surgery called tuboplasty, a

major operation during which the tubes are surgically opened. In the hands of the most skilled specialists the operation is from 0-46 percent effective, depending on the number and thickness of the adhesions,⁶² so women should ensure that they find the very best specialist. A few medical teams perform the surgery by using lasers which reduce the surgery time and the chance of subsequent scarring.

The other medical option, still experimental, is test tube fertilization in which eggs are taken from the woman's ovaries during laparoscopy and fertilized with her husband's sperm. At this time doctors are only using the technique with married couples. The fertilized egg is later implanted in her uterus. This procedure tends to be less successful than surgical repair of the fallopian tubes, and is available to few couples. Women should be aware that not all sperm donations are tested for bacteria and that this may be a source of infection.

If a woman has to deal with infertility which cannot be corrected, she might receive the comfort and support she needs by talking to other women with a similar problem, by working on her grief and anger with a sensitive counsellor or therapist or a woman's self-help therapy group, and by

giving herself time to mourn. Working to help other women avoid similar health problems is another way to deal with anger, but this does not replace the grieving process that must occur.

ECTOPIC PREGNANCY

If the fallopian tubes are damaged, a fertilized egg could grow outside the uterus, usually in one of the tubes. Such pregnancies must be ended surgically because they will cause the tube to rupture. If you have had PID and there is any chance that you may have conceived, you should have your doctor check this possibility. It is important to know that pregnancy tests are not always a reliable indicator of ectopic pregnancy. Some women with ectopic pregnancies do not have positive pregnancy tests.¹⁵³

This is a life threatening situation so it is imperative that this possibility is thoroughly explored. If there is reason to suspect an ectopic pregnancy an ultrasound examination can be done to discover the location of the developing embryo (see Glossary).

CONCLUSION

The information in this booklet was obtained from medical literature, health practitioners, and women with PID. The medical literature was disappointing in many ways. Perhaps the most glaring omission was the lack of research on chronic PID or on chronic abdominal pain, despite the fact that 10-18% of women who have PID develop this condition.

PID is a serious health problem which only recently has become the subject of growing research interest. Perhaps the next few years will provide us with better information about diagnosis and treatment. Health practitioners, we found, were either extremely knowledgeable (by far the smaller group) or hopelessly out of date in terms of their information. Women with PID, especially those suffering from recurrent or chronic pelvic infections, provided us with valuable information about the procedures which they found helpful and gave us a clear picture of the effect PID can have on women's lives. It is important for women with PID to get support from friends and family to help deal with the fear, depression, anger, and even guilt that people often feel during a time of serious illness. Other women who have had PID can be helpful because it is likely that they felt these things too. Most women we talked to had gone to at least one doctor who thought they were complainers; it's good to have friends who will help a woman reject such destructive opinions.

If you are reading this because you know someone with PID remember that your friend would benefit from your practical support as well as your good wishes. If you are reading this because you have PID remember that even though this is a discouraging illness, it is very likely that you will recover completely.

APPENDIX A BEDREST

Bedrest is most healing if it is strict bedrest. This means not getting up for anything other than to use the toilet. It is difficult for most women to arrange their lives to make bedrest possible; it is also difficult for many women to feel "right" about resting and depending on other people for a while. This list of ideas and resources may help you get the rest you need.

Organizing Differently

It's important to be able to have nutritious food without having to get up to reach it. Here are some ways to do this that other women have tried:

1. Put a small fridge, such as a bar fridge, beside the bed, filled with things like hard-boiled eggs, individual casseroles, etc. Have a tray of dishes within easy reach (disposable dishes are excellent). This cuts down on the help you need from other people.
2. Have a basket of fruit, vegetables, fruit leather, crackers, small cans of juice, pate, etc., beside the bed along with a cutting board, knife, can opener, and garbage container.
3. If someone is willing to provide them, thermoses of hot soups, stews, and drinks can be placed at your bedside.
4. One woman with PID arranged for a neighbour to bring her a serving of whatever her family was eating. Later the neighbour returned to wash the dishes. This required minimal organization and worked well.
5. Have a friend pick up soup, or other food, from a health food store or deli; this means that friends or relatives are needed only to heat things up and wash dishes.
6. Assign one friend the job of calling all your friends and relatives to schedule their help (this is much less stressful than doing it yourself).
7. Simplify your meals. For example, you could have a friend mix you a quart or so of some health drink such as tiger's milk or pep-up (see an Adelle Davis cookbook for the recipe) which you could drink as a meal substitute for some meals.

Obtaining Help from Agencies

Some provinces and states have programs which provide in-home care, including childcare, for people who have health problems. Information about programs available in your area may be obtained from women's health organizations, disabled people's groups, social workers, and doctors. Most programs require that your doctor recommend bedrest.

APPENDIX B

HOW TO DOUCHE

Equipment

You should use douching equipment which uses a gravity feed method of getting liquid into the vagina. This consists of a rubber bag and tubing attached to a plastic nozzle. A bulb syringe should not be used because it is easy to squeeze it too hard and risk forcing liquid up into the cervix (see section on douching under Chapter I: Causes of PID). Never use another woman's douche tip or nozzle, since vaginal infections can be transmitted this way. Routine douching is not necessary and may even be harmful.

Method

1. Fill the douche bag either with a quart of warm water to which one or two tablespoons of white vinegar have been added, or with a quart of a prescribed warm herbal tea.
2. Lie down on your back in the bathtub or shower with the bag about one foot above the level of your hips. The higher the bag is, the higher the pressure of water rushing into the vagina, so it's important to keep the bag low.
3. Spread the vaginal lips and insert the nozzle about 1 1/2" into the vagina, directing it upward and back.
4. Release the clamp gently, letting a stream of water flow in and out of the vagina.
5. After douching, wash the nozzle with soap and hot water. Make sure your equipment is thoroughly dry before storing it.

APPENDIX C

BACTERIAL SAMPLING PROCEDURES

Cervical Culture

In this test, mucus is taken from the cervix with a swab and then cultured in a lab. The test has the advantage of being easy to perform and harmless. The disadvantage is that many bacteria occur normally on the healthy cervix, making it difficult to tell which kind might be causing the PID.

Still, if the infection is due to bacteria which do not normally inhabit the vagina, such as sexually transmitted diseases, then a sample taken from the cervix might identify the bacteria which are also living in the tubes. This test may need to be repeated. It is important to remember that the bacteria which caused the PID may no longer be present on the cervix. Thus, while a positive cervical culture may give helpful information, a negative culture does *not* mean that there is no infection in the tubes or that the woman does not have PID.¹⁵⁴ The people most knowledgeable about culturing sexually transmitted organisms are often found at Sexually Transmitted Disease clinics, Departments of Infectious Diseases in university medical faculties, and women's clinics.

If your PID was caused by an IUD or a gynecological procedure, it is less likely that cervical cultures will identify the bacteria causing the problem than if your PID was caused by a sexually transmitted disease. However, it is extremely important to eliminate the latter possibility by having cervical cultures taken promptly. For example, if it turns out the PID was caused by gonorrhea, the treatment for gonorrhea-caused PID is well known.

Culdocentesis

In this procedure a needle is passed through the vaginal wall into the cul-de-sac, a place inside the pelvic cavity where fluid tends to collect. A sample of this fluid is withdrawn for culture.

The advantage of using culdocentesis is that fluid from the pelvic cavity may reveal the disease-causing bacteria. Unfortunately, even when the vagina has been specially prepared, bacteria from the vagina often contaminate the sample. When this happens the results of the test are confusing - it is not clear whether the bacteria are from the inside of the pelvic cavity or whether they are from the vagina. Several recent researchers have noted that samples from the cul-de sac are not an accurate reflection of the infection in the tubes.^{131,154}

One danger associated with this procedure is the possibility of the needle perforating the bowel, especially if the organs are distorted by scar tissue. However, when this happens, the bowel usually seals itself off. Another potential complication, which is a very serious one, is that the needle may rupture an abscess. Doctors should be careful to check for pelvic masses which could be abscesses.

Culdocentesis is a technique which should be attempted *only* by an experienced practitioner. Two pioneers of this technique in North America are Dr. A. W. Chow, of the U.B.C. Faculty of Medicine in Vancouver, and Dr. David Eschenbach, of the University of Washington Medical School, in Seattle, Washington.

Samples from the Tubes

During laparoscopy, two kinds of material can be sampled for culture: fluid and tissue.

Doctors can obtain fluid from the tubes during laparoscopy. They can insert a swab into the ends of the tubes or withdraw fluid from the tubes with a syringe. Most gynecologists are familiar with this technique. Special techniques should be used to ensure that bacteria are not killed by oxygen before they can be cultured.

The advantage of this procedure is that fluid is collected from the actual site of infection and therefore any bacteria discovered are certainly those causing the PID. The disadvantage is that surgery must be performed under a general anaesthetic to obtain the samples (see Glossary for anaesthetic risks). Most experts indicate that samples from the tubes are the most reliable indicators of infection.^{34,131,154}

Cultures from tissue are more likely to reveal the PID-related bacteria than cultures grown from fluid. Tissue samples may be obtained during laparoscopy by removing a piece of adhesion or even a very tiny piece of the tube.

It is a more difficult procedure to obtain tissue than fluid during laparoscopy due to the risk of causing abdominal bleeding. Many gynecologists do not have the experience or skill required to obtain tissue samples safely and successfully. Others believe that it is not possible to culture bacteria from an adhesion since the blood supply to adhesions is poor; however, bacteria have been successfully cultured from adhesions.

The disadvantage of tissue sampling includes the risks of (a) bleeding, and (b) scarring, which could result from removing tubal tissue and thus possibly reduce future fertility.

Problems Growing Bacterial Samples

Many pelvic infections involve a type of bacteria called anaerobes. These bacteria live where there is no oxygen and usually die when oxygen is present. This makes it difficult to get a sample of live bacteria for culture. If they are not killed by oxygen during the sample-taking procedure, they can die during transport to the lab, or in the lab itself. This is why it is essential that the very best techniques and equipment be used.

Certain other bacteria which cause PID are also difficult to culture. Therefore, active infection may be present even when a culture shows no evidence of bacteria. If bacteria are grown from the sample of fluid or tissue, the bacteria should then be tested to see which antibiotic is most effective in wiping out the infection. This is extremely important, but it is not always done.

APPENDIX D

SIDE EFFECTS OF ANTIBIOTICS USED TO TREAT PID

The information below lists some of the side effects associated with the use of the antibiotics mentioned in this booklet for the treatment of PID.

DOXYCYCLINE (a form of tetracycline, brand name: Vibramycin)

- intestinal side effects are common: nausea, etc.
- vaginal infections are common.
- allergic reactions (rash, etc.) occur, but are uncommon.
- liver damage can occur, particularly in pregnant women.
- can cause brown discoloration of teeth in children and in fetuses. **SHOULD BE AVOIDED BY PREGNANT WOMEN.**

CEFOXITIN (part of a group of drugs called cephalosporins)

- allergic reactions are fairly common – up to five percent.
- can cause kidney damage, especially if the woman has previous kidney damage.
- cephalosporins, of which cefoxitin is one type, have been recommended for women who are pregnant and allergic to penicillin.

METRONIDAZOLE (brand name: Flagyl)

- common side effects: nausea, headache, loss of appetite, metallic taste, dark urine.
- can cause abdominal pain, constipation, inflammation of the tongue or the mouth.
- can cause yeast infections; these are less common.
- may be cancer-causing: experiments have produced cancer in rodents.
- shows up in breast milk. **SHOULD BE AVOIDED BY PREGNANT WOMEN.**
- alcohol should not be consumed while taking metronidazole.

CLINDAMYCIN

- gastrointestinal problems are common – ranging from diarrhea (4-20 percent in people receiving clindamycin) to colitis (inflammation of the colon). Colitis usually disappears when clindamycin administration is stopped.
- allergic reactions may happen: rash, etc.
- may cause temporary abnormalities in liver function; this usually returns to normal when clindamycin administration is stopped.

GENTAMICIN AND TOBRAMYCIN

- allergic reactions can occur in one to three percent of patients.
- can cause hearing problems (giddiness and loss of balance or deafness) in up to two percent of patients; these may be permanent.
- can cause kidney function abnormalities in up to ten percent of patients; most of these are mild and can be reversed by discontinuing the drug at the first sign.
- safety for use by pregnant women is not established.

AMOXICILLIN, AMPICILLIN, PENICILLIN G

- main side effect: allergic reactions ranging from mild rashes to shock. Rashes are most common with ampicillin.
- can cause diarrhea, especially amoxicillin and ampicillin.
- can cause central nervous system problems: these are less common.
- penicillin is considered relatively safe for pregnant women.

PROBENECID

- this drug is used to inhibit the excretion of penicillin and therefore maintain a higher concentration of penicillin in the body.
- relatively nontoxic; can cause rashes, or stomach upsets. These are not frequent or severe.

Source: Miller, R.R., and Greenblatt, D.J., eds. *Handbook of Drug Therapy*. Elsevier North Holland, New York, 1979. If you would like a complete list of possible antibiotic side effects, see this source or have a look at *The Physician's Desk Reference*.

GLOSSARY

- abscess:** a collection of pus, the result of infection by bacteria. If an abscess is formed, it means that the body's defence against infection has been partially successful; tissue like that of a healing wound has grown around the site of infection, isolating it from the rest of the body. However, bacteria in the pus-filled centre of the abscess continue to be active, damaging the tissue in the abscess walls as new healing tissue grows. If the healing tissue outpaces the damage, a solid mass of scar tissue forms; if the pus and bacteria outgrow the healing tissue, the abscess usually bursts.
- actinomycosis:** a disease caused by tiny microscopic organisms called *Actinomyces*. *Actinomyces* have some characteristics of bacteria and some characteristics of fungi. They are therefore thought to be an intermediate form between two types of organisms. *Actinomyces* must enter the body through a mucous membrane. They may infect the genitals or mouth, causing abscesses which continually discharge pus. Women who use IUDs are at risk for this kind of infection, which can progress to PID.
- adhesions:** scar tissue growing on or between the internal organs, which can attach organs or membranes to one another. Adhesions are formed by the body in response to injury; when damaged tissue heals, scar tissue is formed. Adhesions are also a protective response, in that they can "wall off" and isolate an infected area, limiting the spread of infection.
- aerobes (or aerobic bacteria):** microscopic organisms which require oxygen to survive.
- allopathy:** an approach to healing which treats illness by trying to produce a condition which acts against the disease, e.g., treating PID with antibiotics. Western medicine is allopathic.
- amniocentesis:** a procedure in which a fine needle is inserted through the abdominal wall into the amniotic sac (the sac of fluid which surrounds a fetus). Some of the amniotic fluid is withdrawn and analyzed for genetic defects in the fetus. The risk of miscarriage increases by one percent if a woman undergoes amniocentesis.⁸⁸ An infection may occur due to an incomplete miscarriage or an imperfectly sterile needle, causing PID.
- anaerobes (or anaerobic bacteria):** microscopic organisms which do not need free oxygen to survive. The oxygen in air is considered "free" because it is not bound to other substances within a chemical compound. Some
- obes can live with or without oxygen. Others, called *obligate anaerobes*, die in the presence of free oxygen. This is why it is important that samples of diseased body fluid or tissue being tested for the presence of anaerobic bacteria don't come into contact with air.
- anaesthetic:** a drug which causes loss of sensation. *Local anaesthetics* cause loss of sensation in a part of the body by blocking the action of nerves in that area, while the person remains conscious. *General anaesthetics* cause loss of consciousness by depressing the central nervous system. A person's breathing, heart beat, blood pressure and bowels are also slowed down under general anaesthetic. The mortality (death) rate for general anaesthetics is one per 3000 operations and is usually caused by massive liver failure, convulsions, choking on vomit, or heart failure.⁸⁹ The risks of general anaesthetics increase the longer period of time a person is 'under.' Also, a person in poor health is at higher risk.
- antibiotic:** a substance which is used to treat disease by stopping or slowing the growth of bacteria or other microorganisms and/or eventually killing them. Each antibiotic is not effective against all microorganisms; some kill bacteria, others kill fungi; some are effective against many types of bacteria, others against only a few. The number and type of bacteria or fungi against which a particular antibiotic is effective is called its *spectrum*. If an antibiotic is effective against many types of bacteria, it is called a *broad spectrum antibiotic*.
- antibiotic sensitivity:** a measure of how well a particular antibiotic works against a particular microorganism. For instance, if a particular microorganism has high sensitivity to penicillin, it will be easily and quickly killed by penicillin. If it has low sensitivity to tetracycline, its population may grow a little more slowly in the presence of tetracycline and a few weaker individuals may be killed, but it won't be eliminated or seriously affected. It is important for samples containing bacteria to be tested for sensitivity to antibiotics to make sure that an antibiotic is prescribed which will effectively wipe out the bacteria.
- antibodies:** proteins which are produced by the body as part of its natural defence against foreign substances such as viruses, bacteria, tissue transplants, etc., which have entered the body. Each type of antibody is formed in response to a specific type of foreign substance, so that the antibody can chemically bind to the foreign substance. When a substance is bound to an antibody it be-

comes harmless because it loses its ability to interact chemically with other substances in the body.

appendicitis: acute or serious inflammation of the appendix, a pouch which comes off the large intestine. Appendicitis is dangerous because the appendix may fill with pus and burst, causing the infection to spread into the pelvic cavity.

bacteria: types of single-celled microorganisms. Bacteria are simple cells which reproduce by cell division and are able to rapidly enlarge their population size. This can sometimes cause bacterial infections of the human body to quickly worsen and spread in spite of the body's ability to fight off infection. Some bacteria occur naturally within the human body, and help to maintain health, such as the bacteria of the digestive tract.

Bacteroides fragilis: an anaerobic rod-shaped bacterium which is commonly found in the digestive tract and is often also found in the vagina. *B. fragilis* is one of the types of bacteria which can cause PID if it invades the uterus and/or fallopian tubes.

bimanual pelvic examination: a medical examination in which two fingers of one hand are inserted into the vagina to touch the cervix and the abdomen is pressed just above the pubic hairline with the other hand. The purpose of the exam is to feel the size and position of the uterus, tubes and ovaries.

broad spectrum antibiotic: see *antibiotic*.

cervix: the lower part of the uterus which extends into the vagina. The cervix is roughly cone-shaped, with a firmness similar to a person's nose. The cervix has a central opening called the *os* which connects the inside of the uterus to the vagina.

cervical cap: a cup-shaped birth control device that fits over the cervix and is held in place, at least partially, by suction between its firm, flexible rim and the surface of the cervix. Research data on cervical cap effectiveness is limited: the highest observed success rate is 98% and the success rate in typical users is 87%.¹⁵⁵

chlamydia: a sexually transmitted infection caused by a viral-bacterial organism called *Chlamydia trachomatis*. Symptoms are vaginal discharge, inflammation, and/or painful urination. However, many women show no symptoms until the infection has progressed to PID. Women whose sexual partners have been diagnosed with non-gonococcal urethritis (see section in this glossary) should be tested for chlamydia.

condoms: a sheath or covering that fits over the erect penis and acts as a barrier to the transmission of semen into the vagina. When used with spermicidal foam the suc-

cess rate of condoms is more than 99%. When used alone, the success rate decreases to 90%.¹⁵⁵ Condoms are important in the prevention of STDs because the sheath prevents the transmission of many microorganisms during sexual contact.

cul-de-sac: the lower part of the pelvic cavity, which surrounds and lies directly behind the vagina.

culdacentesis: a procedure in which a needle is inserted through the vagina to withdraw fluid from the pelvic cavity.

culture: cultivation of living material in an environment which will encourage the growth of bacteria and other microorganisms. The sample is placed in a nutrient medium, generally at a warm temperature, so that populations of microorganisms can quickly grow and be easily identified. Cultures for different types of microorganisms require different types of treatment; for instance, samples being tested for bacteria which die in the presence of oxygen can't come into contact with air, while other samples must have air present to test for bacteria which need oxygen to survive.

diaphragm: a barrier method of birth control which consists of a rubber dome on a flexible rim. It covers the cervix, with the rim fitting behind the pubic bone. About a tablespoon of spermicide must be used with a properly fitted diaphragm in order for it to be effective as a contraceptive. A wide range of success rates has been reported for the diaphragm. The highest observed success rate is 98%; the success rate for typical users is 81%.¹⁵⁵ The success rate depends upon many factors including proper fitting, adequate instruction regarding diaphragm use, frequency of intercourse and user motivation.

D and C (dilatation and curettage): an operation in which the endometrial lining of the uterus is surgically removed. A tapered rod is introduced into the cervical opening to widen (dilate) it, and a metal instrument, the curette, is inserted to scrape the uterine wall and remove tissue. D and Cs are used to collect tissue samples as specimens, to remove infected endometrial tissue, and for diagnosis of abnormal uterine bleeding. The infection rate associated with D and Cs is from 0.3 to 0.5 percent.⁴⁴

ectopic pregnancy: a condition in which a fertilized egg implants somewhere other than in the uterus. The most common types of ectopic pregnancy are *tubal pregnancies*, which occur when the fertilized egg implants in the fallopian tube. Most tubal pregnancies abort or rupture within 6-14 weeks, because the tube does not have the rich lining of the uterus, or the uterus's ability to expand. Rupture and bleeding from an ectopic pregnancy are

dangerous, and can be fatal, so if an ectopic pregnancy is diagnosed, it is removed surgically as soon as possible. Women who become pregnant with IUDs in place have seven to ten times the rates of ectopic pregnancy of women without IUDs.⁴⁴ If a woman has had PID, her chances of having an ectopic pregnancy increase because damaged fallopian tubes may not be able to transport the fertilized egg into the uterus.

endometrial biopsy: a tissue sample from the *endometrium*, the lining of the uterus. An endometrial biopsy is taken by scraping off a bit of the uterine lining with a thin instrument which is inserted through the cervix. It can be done in a doctor's office, and requires only a local anaesthetic.

erythrocyte: red blood cell.

erythrocyte sedimentation rate (ESR): a laboratory blood test which measures how fast red blood cells settle out of the blood. If the cells settle rapidly, it suggests that a disease or infection is still active. The reason red blood cells settle quickly during some diseases is that the body makes extra amounts of certain proteins in response to infection. These proteins can bind red blood cells together into clumps. Clumps of red blood cells are heavier than individual cells, and will settle faster. Or, if there are fewer cells than usual in the blood, cells will settle faster because they meet less resistance (they bump into fewer other cells) on their way down. Pregnant women have a higher erythrocyte sedimentation rate after their third month than non-pregnant women, and women have a higher rate during menstruation than during the rest of their cycle. So if you are pregnant or menstruating, you may be healthy but still have a relatively high settling rate.

facultative Gram negative rods: types of bacteria which can live either without oxygen or in the presence of a small amount of oxygen. This includes members of the *Bacteroides* species of bacteria (see *Bacteroides fragilis*) and many bowel bacteria. They are called facultative because they can live in more than one kind of environment (in terms of oxygen supply). They are called Gram negative, in contrast to Gram positive, because they share a property which shows up in a test called Gram's stain. Gram negative bacteria are usually more difficult to treat than gram positive bacteria. They are called rods due to their shape.

fetal monitor: a machine which electronically records the heart rate of the fetus during labour. There are two kinds of fetal monitors, internal and external monitors. The internal monitor uses electrodes which are attached directly to the fetus's head by metal clips or screws while the fetus is still inside the uterus. There is a risk of con-

tracting PID with the internal monitor because the apparatus may introduce harmful bacteria through the dilated cervix into the uterus and tubes. One study indicated that women's chances of getting PID after childbirth were doubled if an internal fetal monitor was used during labour.⁴⁶

gonorrhoea: a sexually transmitted disease which is caused by the bacterium *Neisseria gonorrhoeae*. Many men show early symptoms of the disease, but many women and some men do not show any symptoms until the disease has progressed quite far. If your sexual partner is diagnosed as having gonorrhoea, you should also be treated for the disease. Gonorrhoea is a known cause of PID.

herpes: a widespread viral disease which causes the skin to erupt in recurring blisters. The herpes simplex virus causes genital herpes and is also responsible for cold sores and fever blisters in the mouth area. The disease can be spread by contact between a herpes blister and any mucous membrane or open sore or cut. Genital herpes is usually sexually transmitted.

infection: infection occurs when microbes such as bacteria, viruses, or fungi enter the body, establish themselves, and multiply. Inflammation is one of the body's responses to infection.

inflammation: the body's defence reaction to injury or infection. The signs of inflammation are redness, heat, swelling, and pain. When cells are damaged they release a substance which causes the blood vessels in the area to widen and leak. It dilutes any poisons which may be present, and is somewhat harmful to microbes. White blood cells also collect in the area, destroying bacteria and other foreign substances.

infertility: the inability to conceive and produce a child.

IUD, Intra-uterine device: small plastic rods bent into various shapes which are inserted into a woman's uterus as a method of birth control. Some IUDs have progestin embedded in the plastic in order to change the character of the cervical mucus, making it difficult for sperm to pass through the cervix into the uterus. Other IUDs are coated with copper wire in order to kill sperm as the copper is released into the uterus from the wire. IUDs are thought to act by preventing fertilized eggs from implanting on the uterine wall. There are various theories as to why this occurs: the irritation caused by the IUD may change the character of the uterine lining; the IUD may mechanically discharge the implanted egg; or the IUD may set up a low level infection and trigger the body's defence mechanisms causing the sperm and fertilized egg to be destroyed. IUDs cause increased menstrual flow, longer menstrual periods, and increased

cramps. They also make a woman more susceptible to vaginal infections. The IUD may perforate the uterine wall and move out into the pelvic cavity, causing serious damage. The further major complication of the IUDs is the increased risk of PID, which is discussed in this booklet.

invasive: invasive medical procedures are those which require the penetration of the body by instruments and/or materials.

laparoscopy: a type of surgery in which a half to one inch cut is made in the abdomen just below the navel, and the abdomen is inflated with carbon dioxide. A tubelike lighted instrument, the *laparoscope* is inserted into the pelvic cavity to see into it. The laparoscope is used to look at the ovaries, uterus and tubes.

laparotomy: major pelvic surgery, any surgery done through an abdominal cut.

lymphocyte: a small cell derived from the lymphatic gland which becomes a white blood cell (white corpuscle) when it passes into the blood. White blood cells are an important part of the body's defence against infection.

menstrual extraction: the removal of the contents of the uterus by suction on or around the first day of the menstrual period. A flexible suction tube is inserted through the cervix to remove the contents of the uterus. Menstrual extraction may be used as an early form of abortion; it has the advantage of not requiring an anaesthetic or dilation of the cervix. However, as with other medical procedures used for abortion, there are risks of perforation of the uterus, incomplete removal of the fetal tissue, and infection which may result in PID associated with it.

mucous membrane: a moist, delicate, skin-like layer of body tissue which has mucus-secreting glands on its surface. The linings of the mouth, throat, nostrils, vagina, urethra, and anus are all mucous membranes. Mucous membranes are not as impenetrable as the skin. There are many bacteria, viruses and chemicals which can enter the body through a mucous membrane but can't pass through the skin.

non-gonococcal or non-specific urethritis (NGU): a condition which may cause men to have pain when they urinate. It has been shown that many men with NGU are infected with *Chlamydia trachomatis*. Women whose sexual partners have been diagnosed as having NGU should be tested immediately to see if any organisms have been transferred which could cause PID. If testing is not available, it is important for women to take antibiotics, preferably *tetracycline*, because of the risk of chlamydia infection.

ovarian cysts: non-cancerous growths on the ovary which may be filled with fluid or tissue. If an ovarian cyst becomes infected, it will cause symptoms similar to PID.

ovaries: the organs in a woman's reproductive system where the eggs are formed, and from which a ripe egg is released once a month during a woman's reproductive years. They also release hormones throughout a woman's life. Therefore, if a woman must have a hysterectomy, it is extremely important that the ovaries are not removed during surgery unless there is no other choice.

pelvic cavity: the lower part of the abdominal cavity which lies within the pelvis. The pelvis is the bone structure containing the hip bones and lower backbone. A woman's pelvic cavity contains the rectum, the bladder, the uterus, the tubes, the ovaries, and the vagina.

peritonitis: infection of the peritoneum, the layer of tissue lining the inside of the pelvic cavity. Women are more prone to peritonitis than men because the fallopian tubes open directly into the pelvic cavity, allowing infection to spread from the tubes to the pelvic cavity. Because the surface area of the peritoneum is very large, a spreading infection is very dangerous and can be fatal. The body can limit the spread of infection in the peritoneum by forming adhesions (see section in Glossary).

salpingectomy: surgical removal of the fallopian tubes.

salpingography: a procedure which tests whether or not a woman's tubes are open. A liquid which can be seen during X-ray is injected through the cervix into the uterus and tubes. An X-ray image shows the movement of this liquid through the tubes. If liquid does not flow out into the pelvic cavity it is assumed that the tubes are blocked; however a minority of women's tubes go into spasm and prevent the passage of this liquid even though the tubes are open. This test should never be done if there is the slightest chance that the woman has infection in tubes because the infection might be spread into the pelvis.

therapeutic abortion: the removal of an embryo or fetus from the uterus. Most early abortions (less than 12 weeks of pregnancy) are performed by dilating the cervix and inserting a tube to suction out the contents of the uterus. If the pregnancy is a bit more advanced, D & E (dilatation and evacuation) may be used, in which the uterus is scraped with a curette after the contents are suctioned out. If a woman is over 16 weeks pregnant, either a prostaglandin or saline solution is injected in the amniotic sac to kill the fetus and stimulate the woman to go into labour. There is a 1.1 percent rate of infection from early abortions and a 3.2 percent rate of infection

from prostaglandin or saline abortions.¹⁴ This compares to a 3.8 percent rate of infection following childbirth.¹²⁸

ultrasound (sonography): a method of getting an image of the interior of the body by means of high frequency sound waves. Sound waves are directed towards the body using a microphone-type instrument. The sound waves bounce back to the microphone receiver and these echo patterns are translated into a picture of the internal organs. Ultrasound is also used in physiotherapy and naturopathy to aid healing by directing sound waves at an injured area. Ultrasound does not involve radiation.

urethra: a short channel which drains the urine from the bladder.

uterus: the womb, a hollow muscular organ which is lined

with endometrial tissue, the tissue which thickens and is shed each month during the menstrual period. When conception occurs, the fertilized egg implants in the endometrial tissue, and the fetus grows and develops in the uterus, causing the size of the uterus to increase greatly during pregnancy.

vaginitis: inflammation of the vagina which can cause itching, pain, burning, and/or an unusual discharge. Vaginitis is caused by infection by yeast, parasites, or bacteria. Some of the organisms causing vaginitis are also present in healthy vaginas in smaller numbers. An infection often occurs when the vagina becomes less acidic than it normally is. This provides a favourable environment for certain microbes, such as yeast, to rapidly enlarge their population size.

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