Internet Appendix 3

Medical Risks of Infertility

Infertility, next to pregnancy and childbirth, affects more women of reproductive age than any other condition. Literally millions of women are affected by this condition every year but are not able to receive adequate medical care because the health insurance industry excludes coverage for "fertility-related services" (to be read: "infertility").

Infertility is associated with a group of diseases that affect not only the reproductive status of women but also their very health. An enormous amount of insight has been gained into the causes of infertility over the last 20 to 30 years. Infertility is now known to be associated with diseases that have a substantial health impact on women and, if these women are left untreated, such diseases lead to a decrease in quality of life and the potential that life may be either impaired or shortened.

Infertility is usually associated with some degree of *either organic disease, or hormonal or ovulatory dysfunction*. In women, these include such conditions as endometriosis, ovulation-related disorders, various hormonal dysfunctions, pelvic adhesive disease, polycystic ovarian disease, various forms of tubal occlusion and anovulation. Male causes of infertility are associated with low sperm counts, and these are associated with such conditions as chronic prostatitis, hormonal dysfunction, varicocele (varicose vein of the testicle), and some causes that are not yet known.

In women, one of the main difficulties with infertility and the

organic diseases and hormonal dysfunctions that are associated with it is that these same diseases can also cause both *short- and long-term disability*, *impairment of one's quality of life* and even potentially the *shortening of one's life*. In other words, fertility-related problems in women have a "two-pronged" effect. They not only affect a woman's fertility but they also affect her general health. Because infertility evaluation and treatment has been excluded by the insurance industry for so many years, literally thousands, if not millions, of women throughout the United States have been denied access to the type of medical care that they deserve for these medical conditions.

Such problems as pelvic pain; dysmenorrhea; dyspareunia; irritable bowel syndrome; various metabolic effects including increased risk for heart attack, and diabetes; the potential onset of various cancers including ovarian cancer, endometrial cancer and breast cancer; osteoporosis; and the risks of subsequent pathologic pregnancies and low birth weight infants are all associated with that "two-pronged" effect. It has become irresponsible for a society not to recognize these medical effects and risks exist while denying appropriate third-party reimbursement for their medical care.

Endometriosis

Endometriosis is notorious for causing such problems as *severe pelvic pain*, *menstrual cramps*, and *pain with intercourse*. But it is also associated with *irritable bowel syndrome*, *hormonal dysfunctions*, and a *variety of cancers*.

Endometriosis is treated either surgically or medically, but the surgical approach is generally better for the relief of pain and for future fertility purposes. However, surgical procedures must be done expertly in such a fashion so as to prevent adhesions (or scar tissue) from forming as a result of the surgical procedure itself. Even with these treatments, there is some rate of recurrence with the disease. However, long-lasting relief can be anticipated especially with surgical treatment.

It is well known that certain aspects of endometriosis are similar to those of malignant disease.[1] Endometriosis may proliferate and invade other tissues due to a loss of control of growth and proliferation, and the mechanisms underlying this loss may be similar to those seen in cancers. It has been observed in association with small bowel obstruction,[2] the

involvement of the ureter leading to kidney obstruction and uremia (kidney failure),[3] and other areas of the urinary tract.[4-7] The sigmoid colon has been perforated during pregnancy as a result of endometriosis[8], and massive ascites can also be associated with endometriosis.[9-10] Endometriosis has been observed in the lung,[11-12] the sciatic nerve,[13] the diaphragm,[14] and in the rectal/vaginal area[15] along with many other areas.

Hormonal Dysfunctions associated with Infertiltiy

Hormonal dysfunctions are very common in women with infertility problems. These problems are often associated with the abnormalities that occur in association with infertility relative to the occurrence of ovulation. Abnormal events of ovulation are common in women with infertility and because of this, the hormonal dysfunctions associated with abnormal ovulations are also common.

In Figure 1, the luteal phase progesterone levels are shown for women who have infertility from all causes. In patients with endome-

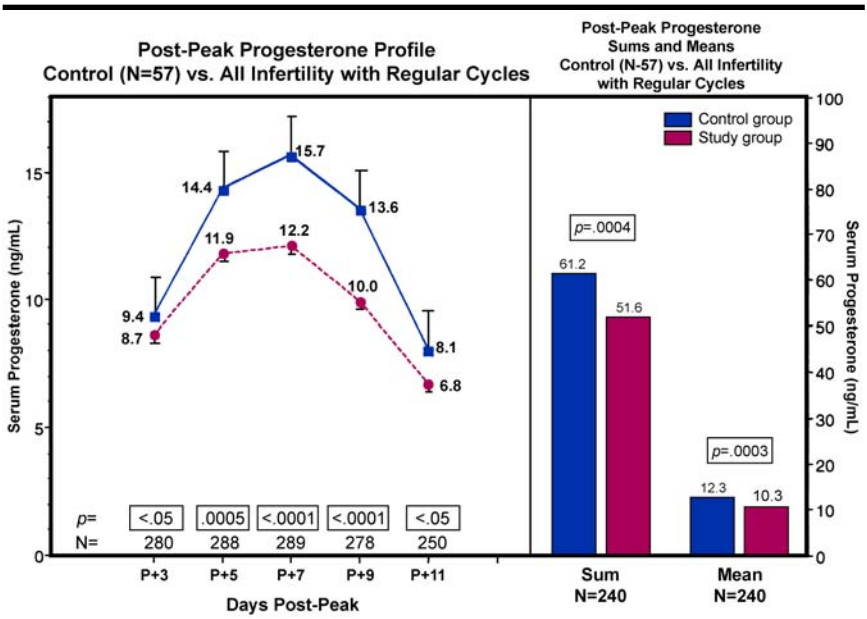

Figure 1: Postovulatory (post-Peak) progesterone profile in patients with infertility and regular cycles (N=240, dotted line) compared to a control group of women with normal ovulatory function. All levels in the infertility group are significantly lower than in the control group (From: Pope Paul VI Institute research, 2004).

triosis, polycystic ovarian disease, pelvic adhesive disease, and distal and proximal tubal occlusion, the production of progesterone during the postovulatory phase of the cycle has been shown to be significantly decreased.

Progesterone is very important to the *support of pregnancy* and it also *modulates or modifies the immune system*. It supports the immune system and, when the progesterone levels are low, the immune system becomes less effective. It is thought that these decreased progesterone levels are one reason why women with infertility have an increased risk of various types of cancers (see later).

In Figure 2, the androgen levels in women with polycystic ovarian disease are shown. *Testosterone* and *androstenedione*, are specifically elevated. In women with polycystic ovaries (PCOD), hirsutism, acne, obesity and hypertension are all associated with these elevated androgen levels. Furthermore, some of the cancers that are associated with long-term, untreated PCOD are associated, at least in part, to the elevated androgen levels (see below).

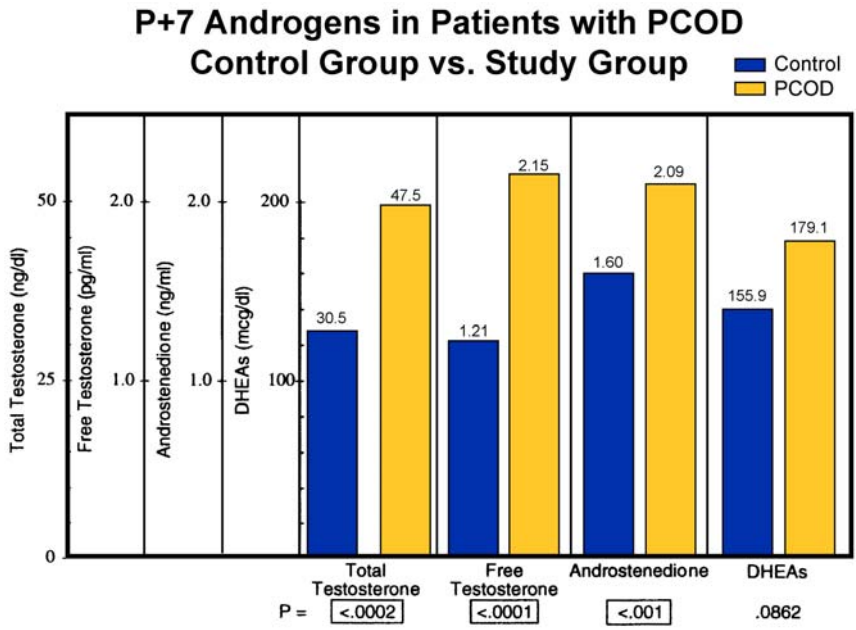

Figure 2: Androgen levels in patients with PCOD compared to a control population without PCOD. Total testosterone, free testosterone and androstenedione levels are all statistically significantly higher and DHEAs levels are higher and approach statistical significance (From: Pope Paul VI Institute research, 2004).

Pelvic Adhesive Disease

Pelvic adhesions are formed in a variety of different conditions. Endometriosis, for example, is notorious for causing very thick and dense pelvic scar tissue. However, pelvic infections such as Chlamydia and gonorrhea also cause such problems.

When a women has pelvic adhesions, it is often associated with pelvic pain and increases her risk of tubal pregnancy. Pelvic adhesions cause infertility or other reproductive problems by scarring the fallopian tubes and causing tubal blockage.

Polycystic Ovarian Disease

In women who have polycystic ovaries, the condition is associated with *long and irregular menstrual cycles*. These ovaries do not respond normally and so these women are chronically anovulatory or oligo-ovulatory. Much of their infertility is due to the fact that they are not ovulating regularly and, of course, treatment is aimed at trying to assist them with this.

Polycystic ovarian disease is often associated with a variety of different metabolic abnormalities (see later) and the increased risk of endometrial cancer is significant. These cancers are preventable with adequate evaluation and treatment and, more and more, the metabolic abnormalities are also treatable as well.

Pelvic Pain, Dysmenorrhea, and Dyspareunia

The long-established associations between endometriosis and pelvic pain and between endometriosis in general and infertility have been confirmed.[16] The frequency of symptoms in association with women with endometriosis are identified in Table 1. In a survey conducted by the Endometriosis Association, 72% of patients had symptoms for *six or more years* before they eventually obtained adequate evaluation and treatment. Furthermore, 60% of women saw more than three physicians and 32% saw five or more physicians. This data suggests that women with endometriosis continue to *experience significant delays in the diagnosis and treatment* of this condition and they suffer considerable disruption in their life.[17]

Table 1: Frequency of Symptoms Associated with Endometriosis[1]

Symptom	Frequency
Dysmenorrhea	68%
Bowel changes	52%
Dyspareunia	32%
Back/thigh pain	20%

1. Halstead L, Pepping P, Dmowski WP: *The Woman with Endometriosis: Ignored, Dismissed and Devalued*. The Second International Symposium on Endometriosis. The Endometriosis Association, 1989.

Furthermore, pelvic adhesive disease and chronic pelvic infections, while associated with infertility, can also be an associated finding in chronic pelvic pain.[18]

Chronic pelvic pain is associated with endometriosis in 71 to 87% of cases.[19-23] Such pelvic pain and its associated dysmenorrhea can be extremely debilitating but also can be treated quite adequately if the woman is given access to medical care.[24-29]

Interestingly enough, women with endometriosis and pelvic pain who conceive are less likely to experience persistent pelvic pain throughout their reproductive life.[30]

Gastrointestinal Problems, Irritable Bowel Syndrome

Endometriosis can frequentlyinvolve the intestinal tract (approximately 25% of cases[31]). This may involve the sigmoid colon, the rectum, the terminal ileum, cecum or appendix. When such involvement occurs, it can create symptoms of *irritable bowel syndrome*, *partial bowel obstruction*,[2] and even *mimic primary gastrointestinal cancers* on x-ray imaging.[32] Furthermore, the *ovarian steroid hormones* (especially progesterone) have long been thought to have important effects on the motor activity of the gastrointestinal tract and to determine the expression of that activity. Dysfunction of these hormones has been observed in patients with *idiopathic functional bowel disease*[33] and, with the decreased production of progesterone observed in a variety of infertility states, it is easy to

understand how this could be made worse. In these conditions, the ability of progesterone to quiet the bowel is less intense, and functional bowel disease may be exacerbated. These symptoms can be debilitating for women and lead to a significant decrease in their quality of life.

Metabolic Effects of PCOD

It has been clearly recognized now that polycystic ovarian syndrome is associated with *major metabolic disturbances* which are related to *insulin resistance* and that same insulin resistance plays a role in the development of the reproductive abnormalities that occur with this disorder. Insulin resistance and elevated low density lipoprotein (LDL cholesterol) levels are observed in women with PCOD. Furthermore, brothers of women with PCOD have insulin resistance and elevated DHEAs levels which suggests that these are genetically related conditions.[34-35]

Polycystic ovarian disease is a metabolic disorder which affects multiple organs. Studies have suggested that women who have this condition are at risk for developing Type II diabetes mellitus, hypertension, dyslipidemia (increased triglycerides, increased cholesterol), and even an increased risk of myocardial infarction.[36-38] In addition, women with pre-existing polycystic ovarian disease have an increased risk for developing diabetes when they are pregnant.[39] The impairment of glucose tolerance in normal women and women with polycystic ovarian disease is identified in Table 2. Chronic fatigue syndrome is also observed more frequently in women who have polycystic ovaries.[40]

Table 2: Incidence of Glucose Tolerance in Normal Women and Women with PCOD[1]

Glucose	Normal Control Women	Polycystic Ovaries
Normal	89.7	61.4
Impaired	7.8	31.1
Diabetes mellitus	1.0	7.5

1. Dunaif A and Thomas A: *Current Concepts in Polycystic Ovary Syndrome*. Annu Rev Med 52: 401-419, 2001.

PCOD, Dysfunctional Bleeding, and Hirsutism

Additional symptoms associated with PCOD include dysfunctional uterine bleeding. This dysfunctional bleeding is associated with the prolonged *absence of ovulation and the chronic stimulation of the endometrium with estrogen which is unopposed by progesterone*. Because of the unopposed estrogen stimulation of the endometrium, the endometrium breaks down and the woman experiences chronic bleeding, which is not a true menstrual period. This is truly an endocrine disorder, but it does need to be properly evaluated and treated.[41]

Excessive hair growth on the chin, upper lip, sideburns, chest, abdomen and upper thighs is also a common condition associated with PCOD. This is usually thought to be associated with the increased androgens (male hormones) that are associated with this condition (Figure 2). Such *hirsutism* can be disfiguring and very problematic decreasing the quality of life for these women. Without proper medical evaluation and treatment this condition can go on unabated. However, it does respond fairly well to medical treatment.[42-45]

Infertility and Cancer

It is clear that some forms of infertility are associated with the development of certain types of cancers. In some cases, this connection is well established while in other cases it is more speculative. Nonetheless, there are certain types of cancers that are clearly associated with problems related to infertility. This is particularly true for ovarian cancer, endometrial cancer and breast cancer.

With regard to endometriosis, the Endometriosis Association recently conducted a survey that showed an elevated risk for breast cancer, ovarian cancer, non-Hodgkin's lymphoma and melanoma in women with endometriosis. In addition to this, the study indicated elevated risks for these cancers in the families of women with endometriosis.[46] Furthermore, the risk of ovarian cancer, breast cancer, and non-Hodgkin's Lymphoma have been shown to be increased by others[47] in patients with endometriosis.

A. Ovarian Cancer

Because ovarian endometriosis may play a role in the pathogenesis

of some ovarian cancers, it has been recently suggested that ovarian endometriosis should be recognized as a precancerous condition and strictly followed up.[48] Nulliparity and infertility are both associated with an increased risk of developing ovarian cancer with these women nearly three times more likely to develop ovarian tumors compared to women who have been pregnant.[49] Malignant transformation of endometriosis is a well documented process especially with regard to ovarian endometriosis.[50-52]

It has been suggested that genetic factors contribute both to the development of endometriosis and also to ovarian cancer and that there may be some common linkages[53] to that genetic inheritance. It has also been suggested that infertility and endometriosis may be independent risk factors for ovarian cancer and that both, therefore, should be taken into consideration as risk factors.[54] In any regard, the linkage between infertility, endometriosis and ovarian cancer is strong and has been well documented in the medical literature.[55-65]

B. Endometrial Cancer

An increased risk for endometrial cancer has been found among a variety of subgroups of infertile women. It is suggested that chronic anovulation is primarily responsible for this linkage.[66] In anovulation, the endometrium is exposed to *chronic estrogen stimulation unopposed by progesterone*. Progesterone is normally produced following ovulation. In the absence of ovulation, of course, progesterone is no longer produced. Thus, this presents a situation where there are relatively high estrogen and low or absent progesterone and this is clearly associated with an increased risk of endometrial cancer.[67-68]

The most commonly cited pre-existing linkage with endometrial cancer is polycystic ovarian disease because it is often associated with long and irregular menstrual cycles and prolonged periods of anovulation. This situation sets itself up for prolonged exposure of the endometrium with estrogen and a situation that is progesterone deficient.[69-71] With *proper evaluation and treatment—with the use of exogenous progesterone therapy—the incidence of endometrial cancer can be significantly reduced*. However, women must have exposure to medical care in order for this to be accomplished.

C. Breast Cancer

Over the past 20 years, the overall incidence of breast cancer has increased (see Figure 39-3). Furthermore, one of the clear risk factors for the development of breast cancer is delayed onset of the first pregnancy.[72] It has been long recognized that *progesterone deficiency states* have been associated with an increased risk of breast cancer particularly of the premenopausal type.[70, 73, 74]

Furthermore, it has been shown that women who have elevated androgen levels and decreased progesterone levels also have increased risks of breast cancer.[75-79] While the relationship of the factors remains controversial, the risk factor of delayed onset of pregnancy (which is common in infertility patients) is incontrovertible. Considering also that these are patients who often have significantly decreased luteal phase progesterone production and in some cases elevated androgen levels (Figure 2), this is something that needs to be further discussed and studied.[80]

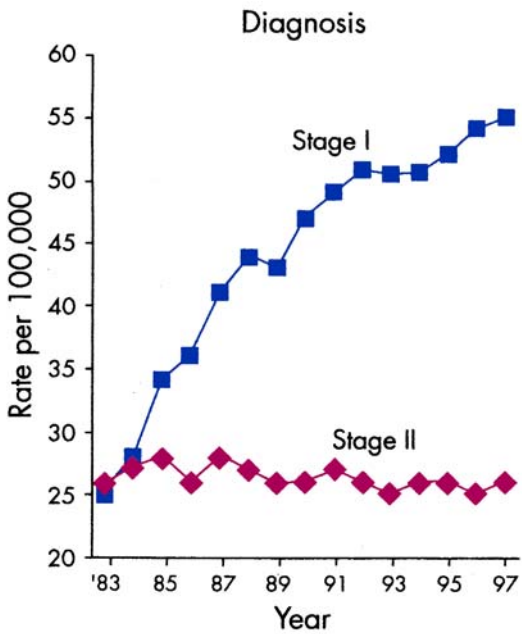

Figure 3: This shows the increasing rates of stage I breast cancer. The diagnosis of stage I breast cancer has increased 113% between 1983 and 1997 (data is from the Surveillance, Epidemiology and End Results—SEER—Program of the National Cancer Institute[72]).

Osteoporosis

In patients with *hypothalamic amenorrhea*, the infertility is due to the lack of ovulation. The reason the woman does not ovulate is because the hypothalamusoperates dysfunctionally and the pituitary does not respond with the needed cyclic gonadotropin production. In such conditions, without ovulation occurring, the woman is exposed to *chronic low levels of estrogen and the complete absence of progesterone*. In such circumstances, the woman is significantly at increased risk for osteoporosis.[81]

In addition, because women with regular menstrual cycles who have infertility also have decreased progesterone production by their ovaries, there is the likelihood that they may be at increased risk for osteoporosis in the long term as well. In fact, there is evidence to suggest that progesterone is a bone-building hormone and that postmenopausal osteoporosis may be, at least in part, a progesterone deficiency disease which is exacerbated in women who have a prolonged chronic deficiency of progesterone during their reproductive years.[82]

Immune Deficiency and Infertility

It has been thought for a number of years that endometriosis may be associated with some type of alteration in cell-mediated immunity.[83] In fact, ***e****ndometriosis fulfills all the classic characteristics of an autoimmune disease*—polyclonal B cell activation, tissue damage, multi-organ involvement, female preponderance, familial occurrence, and increased concurrence with other autoimmune diseases.[84]

In women with endometriosis, there is a defect in natural killer cell activity, and the natural killer cell activity of the peritoneal fluid mononuclear cells is decreased in endometriosis. This correlates significantly with the severity of the disease in both the peripheral blood and the peritoneal fluid of women with endometriosis.[85,86]

Substantial evidence indicates that endometriosis shares many similarities with autoimmune diseases. The theory of an altered immune system and endometriosis suggests that changes in cell-mediated immunity and/or humoral immunity may contribute to the development of the disease. Many investigators now are looking at immunomodulaters and inflammatory modulators as possible innovative treatments for endometriosis.[87-89]

Salpingitis Isthmica Nodosa and Ectopic Pregnancy

Salpingitis isthmica nodosa (SIN) is a condition which usually affects the portion of the fallopian tube that immediately enters the uterus. The proximal fallopian tube that is involved with this condition results in either *complete or partial blockage of that fallopian tube*. Most commonly, the blockage of the fallopian tube is partial. Because the blockage is only partial, it disturbs the normal transmission of the fertilized ovum down the fallopian tube and into the uterus. Because of this abnormality, the blastocyst or early embryo may get caught in the fallopian tube resulting in an ectopic pregnancy. Such a pregnancy is dangerous for the woman because the fallopian tube can rupture unexpectedly and cause uncontrollable hemorrhage. It may require emergency surgical intervention.[90-93]

Infertility and Subsequent Pregnancy Complications

Women suffering from infertility who then achieve a pregnancy are also at increased risk for subsequent pregnancy-related complications. For example, it has been known for a long time that the incidence of spontaneous abortion, ectopic pregnancy, intrauterine growth retardation, and stillbirth are all increased in a subsequent pregnancy following infertility.[94-105] The above risks occur in women who have pre-existing endometriosis but also occur in women with hyperprolactinemia.[100]

In women who have polycystic ovarian disease, the incidence of gestational diabetes and pregnancy-induced hypertension is increased significantly.[106-107] In fact, even the pre-existing diagnosis of infertility will increase the risk of pregnancy-induced hypertension in a subsequent pregnancy.

It has also been known that a pre-existing history of infertility is a risk factor when it comes to preterm delivery. Babies born to mothers who have previous infertility have a significantly increased risk of having a low birth weight infant due either to premature delivery or to intrauterine growth restriction.[108-110]

As a result of these medical findings, pregnancies that occur in women who have pre-existing infertility are more commonly high risk and demand to be followed more carefully and with more focused medical intervention. With pre-existing knowledge of the cause of the

underlying infertility factor, a more specific form of intervention can be made.

General Medical Problems

There are also a number of other general medical problems that occur more commonly in women who have infertility. For example, women with endometriosis have been shown to have heavier menstrual flow and significantly higher abnormal menstrual scores than those who do not have the disease.[111] Thyroid disease is often associated with fertility problems of one type or another. Various types of subfertility is associated with both hyper- and hypothyroidism.[112-113] Thus, these patients require a complete evaluation of thyroid function as a part of their evaluation for infertility.

In women who have hypothalamic amenorrhea, it has been shown that certain psychosocial stressors may be associated with this condition.[114] These women often report more depressive symptoms and dysfunctional attitudes than other women and also an increased risk of disordered eating patterns. With these types of problems, psychological intervention and support may be necessary.[114]

Socioeconomic and Health Costs of Infertility Care

It has been shown that most women with impaired fertility do not obtain infertility services.[115] This means that the underlying medical risks of their infertility problem are not being evaluated or subsequently treated. It also means that a large number of women are not being evaluated or subsequently treated. It also means that many women are being significantly underserved when it comes to their basic health needs.

Standard insurance plans generally have language that excludes coverage for "an expense or charge for the diagnosis or treatment of fertility or infertility or promotion of fertility including (but not limited to): (1) fertility tests and procedures; (2) reversal of surgical sterilization and (3) any attempts to cause pregnancy …". This language has led to significant problems in this area of medicine for physicians, hospitals and patients. These problems include but are not limited to the following:

1. The language is extremely vague and leads to an inability on the part of the physician or the patient to reasonably interpret the provision. This leads to a very uneven and unfair administration of the provision.

2. An example of this would be that many "fertility-related" procedures are, in fact, often paid for by insurance coverage and are not excluded by these provisions. These include such things as surgical sterilization, various methods of contraception, and abortion procedures. If, in fact, an insurance program excludes contraceptive coverage, the plan will often subsidize the use of birth control pills for the treatment of various women's health problems even though those pills are technically "fertility related."

3. Patients complain that the administration of this provision is often irrational. For example, insurance may cover a particular surgical procedure for the treatment of a particular disease, but it will not pay for the diagnostic laparoscopy which is necessary for the physician to adequately and accurately diagnose it and thus prescribe the proper surgical procedure.

4. This exclusion is often dependent upon the review of the claims person in charge of reviewing the particular claim at the insurance company. It is often open to their interpretation even though they are not medically qualified to assess the medical aspects of the situation, and experience has shown that the actual application of the provision is extremely uneven. The claims review person is usually not medically trained and not prepared to deal with all of the variations of evaluation and treatment that might exist for the condition. The same is often also true for those physicians employed by the insurance industry for review of these claims. They are often not up-to-date with current capabilities of diagnosis and treatment.

5. Medical problems associated with male infertility are often covered without any questions asked. For example, antibiotics for the treatment of prostatitis which will improve fertility; a surgical procedure for the repair of a varicocele which also may improve

male fertility; testicular biopsies which will assist in the diagnosis of various male diseases that may be associated with infertility and, of course, the use of Viagra for male impotence which may improve a male's fertility by correcting impotence are often, without question, reimbursed by the insurance industry. This clearly opens up the problem of ***gender-specific discrimination*** where the exclusionary causes, which most often affect women, have been targeted.

6. It has been known, in addition, that nuns, who may have hormone problems associated with their menstrual cycles, are at times denied coverage because of it being "fertility related" when it is quite obvious that the medical evaluation and treatment has nothing to do with fertility.

7. In addition, patients who have premenstrual syndrome, which is also often observed in women who have infertility, are often denied coverage for both the evaluation and treatment of their condition because it is tagged as "fertility related" when, in fact, it is not at all fertility related in these cases. The same is true for various hormone-related causes of abnormal bleeding.

8. As a result, this has led to a very contentious and confrontational relationship between women and their insurance companies when it comes to issues related to the reproductive system. It is not uncommon for these couples to hire attorneys to represent them in their negotiations with their insurance companies, to constantly be on the telephone with their insurance plan trying to straighten out the claim's process and to often enter into very contentious appeals hearings which are stressful and quite unbecoming the premium paid to the insurance company for health coverage.

9. Finally, some physicians have been targeted by the insurance industry in retaliation for some of the contentiousness.

The current use of "exclusion of coverage" clauses by the insurance industry for "fertility-related services" is very problematic and needs to be remedied. Furthermore, it is out of date with our modern knowledge

of the underlying diseases that actually cause fertility-related problems.

It has been argued that managed care organizations should take the lead in providing infertile couples with an organized, humanistic approach that is mindful of the attending social and health issues.[116] In this way, care for infertility and its attendant health risks can be made more accessible and comprehensive.

In a recent study of the costs of an infertility evaluation and treatment, infertility costs accounted for only a small fraction of the total health care costs of the plan. Furthermore, the addition of infertility specific evaluation and treatment programs could be obtained for a nominal monthly fee. ***This was estimated to be an additional member per month health care cost of $0.67.***[117]

Summary and General Conclusions

Infertility is the *inability of a woman to achieve a pregnancy over a period of one year of unrestricted intercourse*. In reality, it is only a *symptom of underlying disease*. While many years ago infertility was thought to be "all in your head," work that has been done over the past 30 years has shown that the inability to achieve pregnancy is the result of a multi-factorial combination of organic, hormonal and immunological diseases.

The current approach of insurance plans to exclude coverage for "fertility-related services" does not recognize this change in the understanding of the underlying problems of infertility. It still appears to observe infertility as more of a psychological problem than a medical one. In fact, **next to pregnancy and childbirth, it is the most common medical problem affecting reproductive age women.** And yet, because of excluded coverage, the insurance industry has specifically targeted this group of women with poor medical care.

There are many issues that are involved in this current problem. The primary issue, however, should be the question of whether or not women should be given the right to have reproductive health care specific to their gender. While a U.S. District Court in Chicago ruled that infertility fit the definition of a disability and was therefore subject to the antidiscrimination enforcement under the Americans with Disability Act,[116] this approach ultimately denies the fundamental issue that this is a health care issue encountered by women. It is not only a health

care issue specific to their immediate health but also, and perhaps most importantly, their long-term health.

It is quite possible that the current procedures followed by the insurance industry of excluding infertility coverage from the standard health care plans of women discriminate against women mostly on a gender basis. In fact, from actual practice, it is clear that this exclusion specifically targets women because similar conditions which have a two-pronged effect of affecting one's fertility and also one's health that involve men are not subject to similar discrimination.

It should also be pointed out that many of the very same tests, procedures and treatments that are used to diagnose and treat these conditions from an infertility perspective are also used to diagnose and treat these diseases from a purely women's health perspective. Diagnostic tools include laparoscopy, ultrasound assessment, testing of various hormones, testing for blockages in the fallopian tubes, various types of biopsies, and seminal fluid analysis in men. Treatment procedures that treat the underlying diseases include various surgical procedures, hormonal therapies, programs that treat ovulatory dysfunction, and antibiotics.

Therefore, it seems that legislatures must understand the reality of the underlying diseases and medical risks that infertility poses. These women often suffer from severe pelvic pain, dysmenorrhea and dyspareunia. They may have gastrointestinal abnormalities and irritable bowel syndrome. They may have severe hormonal deficiencies, which result in formation of cancers such as ovarian cancer and endometrial cancer in women who have pre-existing infertility. Furthermore, the risk of breast cancer is definitely increased in those women who have had prolonged episodes of infertility.

Other health risks include the growing knowledge that there are similarities between certain types of infertility and some of the autoimmune disorders such as thyroiditis, systemic lupus, and rheumatoid arthritis. Furthermore, women who have prolonged anovulation are at increased risk for osteoporosis which can be a debilitating disease not only in younger women but most importantly as those women age.

Perhaps one of the most hidden of all of the factors relative to the infertility medical crisis is the issue of what happens to these women when they become pregnant. The evidence that shows that the pregnancies are at increased risk once the woman becomes pregnant after a

pre-existing infertility problem is overwhelming. With better medical knowledge and understanding of the basic underlying problem of the infertility that exists—whether that be organic or hormonal or immune stimulated—the physician is in a better position to adequately treat that pregnancy and reduce the types of problems associated with those pregnancies. Taking simply one example, the example of prematurity, with medical intervention, the prematurity rate can be expected to be decreased if the physician has a better understanding of the underlying causes. The cost for the delivery of a premature infant to that infant as well as to the insurance industry and to society in general, is exorbitant. Any headway that can be made in the reduction of those premature births and the improvement of the outcomes of those infants can only benefit the health insurance industry and society in general not to speak at all of the individual baby and their families (which ultimately are the most important).

Finally, this can all be done at a relatively low cost. It has been shown that if the standard exclusion is removed and infertility is covered by the standard health insurance plan, the actual per member cost is extremely low. Currently, it is estimated at being less than $1.00 per month.

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Excerpted from Hilgers, TW, ***The Medical & Surgical Practice of NaProTECHNOLOGY***, Pope Paul VI Institute Press, Omaha, Nebraska, 2004.
Chapter 39: Medical Risks of Infertility