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ACCORDING TO ALAN GUTTMACHER, "Illegal or criminal abortion is the only great pandemic disease which remains unrecognized and untreated by modern medicine."[1] Criminal abortion continues to be a major cause of maternal death. In fact, a 1965 study reported that criminal abortion over the previous twenty years in New York City accounted for an increasing percentage of puerperal deaths.[2] They also noted that the increased number of puerperal deaths seemed inversely proportional to the decreasing number of therapeutic abortions performed in New York at that time. One third of the maternal deaths in California between 1957 and 1962 occurred following illegal abortions.[3] Happily, the number of legal abortions performed in New York and in California has increased significantly. Recent experience in New York where abortion on demand is now available by statute[4] suggests that the number of maternal deaths related to abortion has decreased precipitously.[5] A similar decrease in abortion related maternal deaths has been noted in California where abortion on demand is virtually available de facto.[6] Presumably a similar decrease in the number of abortion related maternal deaths could be expected if all states followed the lead of New York and California in making abortion more readily available.

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The widespread prevalence of abortion has never been seriously questioned. A conservative estimate of the number of illegal abor-

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[1] Guttmacher, *Induced Abortion*, 63 N.Y.J. MEDICINE 2334 (1963) (editorial).

[2] Gold, Erhardt, Jacobziner & Nelson, *Therapeutic Abortions in New York City: A 20 Year Review*, 55 AM. J. PUB. HEALTH 964, 965 (1965).

[3] Montgomery & Hammersly, *Maternal Deaths in California, 1957-1962*, 100 CAL. MEDICINE 412, 415 (1964).

[4] N.Y. PEN. LAW § 125.05(3) (McKinney Supp. 1971).

[5] Pakter & Nelson, *Abortion in New York City: The First Nine Months*, 3 FAMILY PLANNING PERSPECTIVES 5, 10-11 (No. 3, 1971).

[6] Personal communication from Walter Ballard, M.D., to the author, March, 1972.

tions in the United States is 300,000 out of a total of one million annually.[7] Kinsey found that 22 percent of the married women he interviewed had had one or more abortions *in marriage* by the age of 45.[8] Nearly 95 percent of the premarital pregnancies in his sample were resolved by abortion.[9] Obviously, modern society like earlier ones finds a frequent need for pregnancy interruption. Existing laws in many states prevent legal pregnancy interruption and criminal abortion results. Since abortion that can be performed legally under the guise of existing medical and social sanctions is known to be safer than illegally procured interruption of pregnancy, it is important to study the historical background of abortions, the contemporary indications of therapeutic abortions, and the current legal abortion procedures in order to understand the contemporary medical abortion practices in the United States.

I. HISTORY

Abortion is an ancient practice. The records of almost every civilization indicate knowledge of abortifacient agents and abortive techniques. Among primitive people, these were gruesome when practiced in the extreme, and remain so among certain primitive tribes today. One tribe, for example, encouraged large ants to bite the woman's body, and on occasion the insects were taken internally.[10] Gross traumatization of the pregnant abdomen was a popular method of attempting to induce abortion and is still used by some primitive groups. The early Hebrews knew abortive techniques although they strongly disapproved of the practice.[11] The Greeks, on the other hand, advocated abortion in order to control population size and ensure good social and economic conditions among the people. Hippocrates advised abortion in certain situations but, as a general rule, condemned the practice because it so often resulted in the mother's injury or death.

Christian belief in the immortality of the viable fetus' soul has been largely responsible for the Church's condemnation of

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[7] Fisher, *Criminal Abortion*, in THERAPEUTIC ABORTION: MEDICAL, PSYCHIATRIC, LEGAL, ANTHROPOLOGICAL AND RELIGIOUS CONSIDERATIONS 3, 6 (H. Rosen ed. 1954) [hereinafter cited as THERAPEUTIC ABORTION].

[8] ABORTION IN THE UNITED STATES 55 (M. Calderone ed. 1958).

[9] *Id.*

[10] *See generally* Devereux, *A Typological Study of Abortion in 350 Primitive, Ancient and Pre-Industrial Societies*, in THERAPEUTIC ABORTION 97, 121-34.

[11] *See generally* F. TAUSSIG, ABORTION, SPONTANEOUS AND INDUCED: MEDICAL AND SOCIAL ASPECTS 31-45 (1936).

abortion. Doctrine has placed abortion in the same category as infanticide, and the unbaptized soul of the fetus, like that of the infant, was considered in danger of hellfire. Many early canonists, however, did not feel that the soul entered the fetus at the time of conception; rather, the belief was prevalent that while the soul entered the body of a female fetus at eighty days gestation, the soul of the male fetus was present after the fortieth day of gestation. Because of this belief, interruption of the pregnancy before the fortieth day was punished only by a fine, whereas abortion when the soul was present was regarded as murder and was punished accordingly. In 1869 this distinction became unimportant since abortion before the soul entered the fetus became "anticipated homicide."[12] In spite of the Church's opposition, abortion *was* practiced and not infrequently resulted in the mother's death.

The punishment for the poor Renaissance woman who induced abortion was death by crucifixion, whereas her rich sister might buy her way out of such punishment. Even today, the indigent patient may have a more difficult time in obtaining legal sanction for a medically indicated abortion, and as a result, criminal abortion still accounts for a disproportionately higher number of deaths among the underprivileged. A report on abortions in New York City covering a twenty-year period indicated that 90 percent of the therapeutic abortions were performed on white women,[13] and a review of the abortions in two Buffalo, New York hospitals attests to the paucity of therapeutic abortions among nonwhite patients.[14] Thus, although indications for abortion may have changed over the centuries, discrimination against the lower socioeconomic classes and the very real dangers of criminal abortion remain.

Taussig, in his classic book on abortion, gives a good historical account of the medical indications for abortion and discusses some of the early authorities who refer to abortion.[15] Plato and Aristotle clearly encouraged abortion on social or economic grounds. Hippocrates practiced abortion but wanted only physicians to abort patients. In Rome, especially in the Empire period, abortion was approved for social indications. The influence of Christianity, although not

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[12] G. WILLIAMS, THE SANCTITY OF LIFE AND THE CRIMINAL LAW *passim* (1957).

[13] Gold, *supra* note 2, at 966.

[14] Niswander, Klein & Randall, *Changing Attitudes Toward Therapeutic Abortion*, 196 J.A.M.A. 1141, 1143 (1966).

[15] *See generally* F. TAUSSIG, *supra* note 11, at 31-45.

actually diminishing the practice of abortion, did make it socially unacceptable. Early in the Christian era, Priscianus, a physician, recommended abortion to save the life of the mother, but writings about therapeutic abortion were scarce and the ramifications of the abortion issue do not seem to have been reconsidered until 1772.[16] At that time William Cooper suggested therapeutic abortion for cases of contracted pelvis in order to prevent the horrors of attempted delivery through a malformed bony structure. Dewees, Velpeau, Hodge, and other prominent physicians continued to encourage abortion in cases of contracted pelvis. This suggestion was accepted by many obstetricians in Europe, and during the latter half of the nineteenth century "the indications, especially in Germany, were extended to include tuberculosis, heart disease, nephritis, and certain forms of psychosis".[17] These indications became more prevalent, and in recent years there has been a growing tendency to abort for fetal reasons. Psychogenic and socioeconomic factors have also undoubtedly exerted increasing influence in the decision to abort.[18]

II. CONTEMPORARY INDICATIONS FOR THERAPEUTIC ABORTION

Present day indications for therapeutic abortion can be conveniently divided into four categories: (a) medical, (b) fetal, (c) psychiatric, and (d) socioeconomic. Invariably, these categories overlap, for the gravida[19] with rubella[20] in the first trimester of pregnancy is likely to be psychiatrically, or at least emotionally disturbed. Extreme poverty may be an important adjuvant reason to terminate pregnancy when organic disease decreases the mother's ability to care for a larger family.

A. *Medical Indications*

The medical indications for therapeutic abortion are so numerous that it is impossible to consider them all or to even mention those which were considered to indicate abortion in the past. A majority

[16] *Id.* at 277.

[17] *Id.* at 278.

[18] *Id.*

[19] A woman in her first pregnancy is referred to as *Gravida I*; in the second pregnancy *Gravida II*; etc. Medical definitions are from J. SCHMIDT, ATTORNEYS' DICTIONARY OF MEDICINE AND WORD FINDER 376 (1969) [hereinafter cited as J. SCHMIDT, DICTIONARY].

[20] Commonly known as German measles. J. SCHMIDT, DICTIONARY at 712.

of them, however, can be included in one of the following types of disease: cardiovascular, gastrointestinal, renal, neurologic, pulmonary, diabetic, and malignant. Each will be briefly considered. The paucity of recent papers in the medical literature recommending abortion for medical disease or even describing the effect of medical diseases on pregnancy, however, undoubtedly reflects the infrequency with which medical disease now is thought to indicate abortion.

(1) Cardiovascular Disease[21]

Cardiovascular disease has long been thought to increase the risk of maternal death during pregnancy, and indeed, it has accounted for a significant percentage of maternal deaths.[22] Patients with rheumatic heart disease, congenital heart disorders, or chronic hypertensive disease must be watched closely by their physicians for signs of impending heart failure. In instances where the cardiac disease is severe, digitalis or other cardiac supporting drugs are often used. Labor is frequently terminated earlier than in the normal pregnant patient. With improved prenatal care (including the significant advances recently provided by cardiac surgery), the number of women with cardiovascular disease whose life is actually in danger during pregnancy has decreased substantially. Some physicians feel that with adequate medical attention practically every pregnancy of a cardiac patient can be completed successfully with little risk of maternal death.[23] Others are less sanguine.[24] As with some of the other medical indications, a consultation suggesting interruption of pregnancy in a cardiac patient is not infrequently influenced by appreciation of the difficult situation that will eventually face the disabled cardiac patient who must try to take care of her new baby.

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[21] Disease involving the heart and the blood vessels, *i.e.*, the arteries and the veins. J. SCHMIDT, DICTIONARY at 155.

[22] Gorenberg & Chesley, *Rheumatic Heart Disease in Pregnancy: The Remote Prognosis in Patients with "Functionally Severe" Disease*, 68 AM. J. OBSTETRICS & GYNECOLOGY 1151 (1954).

[23] *Id.* at 1159.

[24] Dack, Bader, Bader & Gelb, *Heart Disease*, in MEDICAL, SURGICAL, AND GYNECOLOGIC COMPLICATIONS OF PREGNANCY 37 (2d ed. J. Rovinsky & A. Guttmacher 1965). *See generally* Metcalfe, *Rheumatic Heart Disease in Pregnancy*, 11 CLINICAL OBSTETRICS & GYNECOLOGY 1010 (1968).

(2) Gastrointestinal Diseases

Ulcerative colitis,[25] either active or quiescent, is perhaps the most common gastrointestinal disease which has been thought to indicate therapeutic abortion. There is general agreement that emotional factors affect the medical course of the patient with ulcerative colitis. Since pregnancy regularly and sometimes severely affects the emotional stability of women, it has been felt that pregnancy may adversely affect the outcome of this hazardous disease.[26] Fortunately, the disease is not a common one.

(3) Renal Disease[27]

Patients in this category are likely to be the victims of chronic glomerulonephritis,[28] hypertension of renal origin,[29] or less commonly, they may have only one functioning kidney, or a history of nephrolithiasis.[30] Since the therapy of chronic nephritis[31] is still neither definitive nor effective, there are patients with nephritis whose lives will actually be shortened by the effects of pregnancy. Heroic measures, such as the use of the dialyzer, may see these women through severe life-threatening episodes; but all therapy will, in certain instances, eventually prove ineffective.[32] There are now a number of case reports in the medical literature of patients who have successfully completed a pregnancy following kidney trans-

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[25] An inflammation of the colon (the large bowel) characterized by ulceration of its lining membrane. J. SCHMIDT, DICTIONARY at 900. 34.

[26] Jacobs & Janowitz, *The Digestive Tract*, in MEDICAL, SURGICAL, AND GYNECOLOGIC COMPLICATIONS OF PREGNANCY 194 (2d ed. J. Rovinsky & A. Guttmacher 1965).

[27] A disease pertaining to, or involving the kidneys. J. SCHMIDT, DICTIONARY at 691.

[28] A variety of kidney disease in mild form in which the tufts formed by the tiny blood vessels are inflamed. It leads to hypertension (high blood pressure) and eventually to uremia, a poisoning of the body due to failure of the kidneys to eliminate the toxic substances. J. SCHMIDT, DICTIONARY at 365.

[29] *See* note 28 *supra.*

[30] An abnormal condition marked by the presence of concretions or calculi (i.e., "stones") in the kidney or kidneys. Also, the various disorders resulting from the presence of the concretions. J. SCHMIDT, DICTIONARY at 545.

[31] The prolonged and progressive form of nephritis (inflammation of the kidney or a deterioration of the tissue forming its delicate structure) which may follow an acute attack or may result from other diseases of the body, poisons, alcohol, germs, etc. The fine and delicate structure of the kidney becomes distorted; the fine blood vessels become thicker; the supporting tissue (the nonfunctional part) begins to overgrow the functional parts; and even the heart is affected. J. SCHMIDT, DICTIONARY at 544.

[32] Herwig, Merrill, Jackson & Oken, *Chronic Renal Disease and Pregnancy*, 92 AM. J. OBSTETRICS & GYNECOLOGY 1117, 1120 (1965).

plantation because of kidney failure.[33] This author knows of no instance, however, in which the kidney transplantation has been performed *during* a pregnancy in which the pregnancy successfully went to term.

Some of the renal conditions which might seem to indicate therapeutic abortion, however, do not significantly affect the risk of maternal death. Often, if one kidney has been removed there will be little increased risk for the pregnant patient, as long as the remaining kidney functions well. The risk of nephrolithiasis cannot be minimized, but the instances when it might actually increase the risk of death in a pregnant patient seem remote.

(4) Neurologic Disease

Diseases such as multiple sclerosis,[34] post poliomyelitis, paralysis, epilepsy, and various congenital neurologic diseases form the bulk of the neurologic diseases indicating therapeutic abortion. It is unusual for a patient with multiple sclerosis to be made worse by pregnancy, but the effect of pregnancy on the disease is unpredictable.[35] Riva, Carpenter, and O'Grady have found no justifiable indication for pregnancy interruption in patients with multiple sclerosis.[36] There appears to be little evidence that the disease actually increases the risk of death during pregnancy. Much the same can be said about epilepsy in a pregnant patient. About one-third of the pregnant epileptics seem worse during pregnancy, but the effect of the pregnancy is unpredictable, and epilepsy does not seem to increase the risk of death for the pregnant woman.[37] As with cardiovascular disease, however, it is evident that a woman with a severe paralysis or a disabling sensory disorder will find it difficult, if not impossible, to care for a newly born child once she leaves the hospital.

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[33] Caplan, Dossetor & Maughan, *Pregnancy Following Cadaver Kidney Homotransplantation*, 106 AM. J. OBSTETRICS & GYNECOLOGY 644 (1970).

[34] A disease of the brain and spinal cord. In this condition, various parts of the brain and spinal cord are subjected to a type of deterioration called sclerosis. Sclerosis in this instance is a hardening of the nerve tissue and its displacement by overgrowing connective (supporting) tissue. Basically functional nerve tissue gives way to supporting, nonfunctional tissue. The disease progresses slowly but is incurable. J. SCHMIDT, DICTIONARY at 534.101.

[35] Cohen & Kreuger, *Multiple Sclerosis and Pregnancy: Report of a Case*, 6 OBSTETRICS & GYNECOLOGY 144, 145 (1955).

[36] Riva, Carpenter & O'Grady, *Pregnancy Associated with Multiple Sclerosis*, 66 AM. J. OBSTETRICS & GYNECOLOGY 403, 407 (1953.)

[37] Sabin & Oxorn, *Epilepsy and Pregnancy*, 7 OBSTETRICS & GYNECOLOGY 175, 179 (1956).

(5) Pulmonary Disease

Tuberculosis accounts for nearly all of the pulmonary conditions thought to indicate therapeutic abortion. In former years, pregnancy was believed to affect adversely the tubercular patient and, in some instances, actually to increase the risk of death from tuberculosis. With the advent of drug therapy, tuberculosis has practically disappeared as an indication for therapeutic abortion. In addition to a possibly increased risk of maternal death, consultants often believed, as with some of the other diseases indicating abortion, that the tubercular patient could not properly care for her newborn child; and this consideration undoubtedly contributed to the decision to abort. With the current, relatively short period of hospitalization for tuberculosis and the relatively quick recovery, however, this consideration is no longer as important.

(6) Diabetes Mellitus[38]

Diabetes, of varying degrees of severity, has often been an indication for therapeutic abortion. On occasion poor medical control of the disease has indicated the abortion; at other times one of the complications of the disease, such as arteriosclerosis affecting the retina, heart, or brain, has been determined severe enough to interrupt the pregnancy. The maternal mortality rate, however, is currently considered to be essentially the same among diabetic patients as with the overall pregnant population. Fetal risk is distinctly increased in the diabetic patient, but this would seem to have little to do with the "health" or "life" of the mother. Loth and Hesseltine have stated that "it should be a rare instance in which the diabetic pregnant patient could not be carried to the time of fetal viability, if not to term, by adequate medical management."[39] As with other medical indications, the legal demand customary in most states that the "life" of the mother be endangered as a result of the disease necessitating an abortion is not always fulfilled.

(7) Malignancy

Some physicians feel that pregnancy will adversely affect the

[38] A disease in which the metabolism (body utilization) of sugars is greatly impaired due to the faulty secretion of insulin by the pancreas. J. SCHMIDT, DICTIONARY at 248.21.

[39] Loth & Hesseltine, *Therapeutic Abortion at the Chicago Lying-in Hospital,* 72 AM. J. OBSTETRICS & GYNECOLOGY 304, 309 (1956).

patient's medical course when a prior malignancy has been treated.[40] The medical course of the patient with carcinoma[41] of the breast, for example, may be changed by the use of the female hormones, either estrogen or progesterone, which are present in high concentration in the bloodstream of a pregnant patient. The effect of hormones on the patient with carcinoma of the breast, however, is unpredictable since these substances sometimes improve the clinical situation and at other times seem to contribute to the progression of the disease. There is little convincing evidence that they either prolong or shorten the patient's life. Majury says that "no convincing evidence has been produced which shows that subsequent pregnancy affects adversely the prognosis in extra-uterine malignancy."[42] A history of carcinoma of the bowel (or, on occasion, carcinoma in other locations) has also been an accepted indication for therapeutic abortion; however, there is no convincing evidence that pregnancy in any way adversely affects the outcome of these neoplastic[43] diseases.

(8) Other Medical Diseases

Rheumatoid arthritis,[44] hyperthyroidism,[45] lacerated cervix, multiple fibroids,[46] mumps in the first trimester, and other miscellaneous diseases too numerous to mention have also indicated therapeutic abortion. It is difficult to prove that many of these diseases actually threaten the life of the pregnant patient, and social factors often seem to be a prominent consideration in the decision to abort.

B. *Fetal Indications*

Only those states with recently liberalized laws permit abortion

[40] *See, e.g., Id.*

[41] A malignant tumor or new growth (*i.e.*, a cancer) arising from cells that make up epithelium. Epithelium is the outer covering of the skin and the lining of the body cavities, such as the mouth, the rectum, the interior of the chest, etc. J. SCHMIDT, DICTIONARY at 149.

[42] Majury, *Therapeutic Abortion in the Winnipeg General Hospital*, 82 AM. J. OBSTETRICS & GYNECOLOGY 10, 13 (1961). Other authors have agreed. *See, e.g.*, Holleb, *Breast Cancer and Pregnancy*, 15 CA. A. CANCER J. FOR CLINICIANS 182, 183 (1965).

[43] Pertaining to a new growth or a tumor. J. SCHMIDT, DICTIONARY at 544.

[44] A form of chronic arthritis usually affecting several joints. J. SCHMIDT, DICTIONARY at 702.

[45] The condition resulting from an abnormal and/or excessive activity of the thyroid gland. J. SCHMIDT, DICTIONARY at 434.

[46] Pertaining to, or composed of fibrous tissue. Fibroid is frequently used to refer to a tumor of the womb composed of muscle and fibrous tissue.

because of an expected abnormality or death of the fetus. This is not surprising when one considers that most of the abortion laws were written many years before anything was known about the etiology of fetal defects. Some hospitals, however, will abort a pregnant woman, notwithstanding the patent illegality of the procedure, when there is a strong possibility that the baby will be abnormal.[47] The consultant who recommends an abortion may simply state that the danger of fetal malformation due to maternal rubella in the first trimester of pregnancy makes an abortion advisable. On other occasions, however, a psychiatric opinion will be sought, and this specialist may suggest that the patient's mental condition, influenced by the fear of fetal malformation from the rubella, may deteriorate with suicidal ideation if the pregnancy is not interruped. Whether to abort to prevent the birth of an abnormal baby or to protect the life of the mother, both approaches achieve the same result: interruption of the pregnancy.

Abortion for fetal indications may be recommended in five situations: (1) where there has been an ingestion of certain harmful drugs during pregnancy; (2) where certain viral infections have been contracted by the mother, especially rubella; (3) where the mother's abdomen has been exposed to radiation during pregnancy; (4) where there is a substantial risk of fetal malformation due to genetic factors; and (5) where there is a sensitization to the Rh factor.

(1) Drugs

The tragedy that occurred following the ingestion of thalidomide by pregnant women both in Europe and in the United States is well-known to everyone. Thalidomide, however, is not the first drug known to cause severe fetal abnormalities. The folic-acid antagonists, employed in the treatment of leukemia, had previously been found to produce severe anomalies because of their metabolic action. Certain other drugs are suspected of teratogenicity,[48] although none are as well established in this regard as thalidomide or the folic-acid antagonists. As the field of developmental pharmacology progresses, however, there seems little doubt that other

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[47] *Cf.* George, *The Evolving Law of Abortion*, 23 CASE W. RES. L. REV. 708 at 741 n.177 (1972); Guttmacher, *The Genesis of Liberalized Abortion in New York: A Personal Insight*, 23 CASE W. RES. L. REV. 756, 759-61 (1972).

[48] Tending to produce deformities of the body. J. SCHMIDT, DICTIONARY at 860.

drugs will be implicated and will further aggravate the legal problem so vividly dramatized by thalidomide.

(2) Rubella

An epidemic of rubella occurred in the eastern part of the United States in 1964, and this spread to the West Coast and to Hawaii in 1965. Although many pregnant women who contracted rubella were aborted during this epidemic, estimates indicate that about 30,000 defective children conceived during the epidemic were born.[49] When one considers the severity of the fetal abnormalities among these children, it would certainly seem more desirable from an economic, as well as a humanitarian viewpoint, to have terminated pregnancy when the odds were so relatively high that the child would be abnormal. Many parents desperately sought, but failed to find a physician who would abort the pregnancy. The risk of rubella causation of an abnormal child is about 50 percent if the rubella occurs during the first month of pregnancy, 22 percent in the second month and 6 to 8 percent in the third month.[50] Even after the twelfth week, Hardy has shown that a substantial risk of fetal abnormality exists.[51] The administration of gamma globulin has not been a satisfactory preventative of the disease in the pregnant woman, partially because the commercial lots available vary so markedly in their effectiveness.[52]

The availability of an effective vaccine against rubella, however, has markedly decreased the risk that rubella infection will occur in a pregnant woman, but until the vaccine is universally used, instances of rubella in pregnancy will still sporadically appear. Certain other maternal infections may be associated with congenital fetal disease, but since diagnosis of the disease in the mother

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[49] Personal communication from John Sever to the author, October 1965.

[50] Michaels & Mellin, *Prospective Experience with Maternal Rubella and the Associated Congenital Malformations*, 26 PEDIATRICS 200, 204 (1960). *See also* Lundstrom, *Rubella During Pregnancy: A Follow-Up Study of Children Born After an Epidemic of Rubella in Sweden, 1951 with Additional Investigations on Prophylaxis in Treatment of Maternal Rubella*, 81 ACTA PAEDIATRICA Supp. 133 at 1 (1962).

[51] Hardy, McCracken, Gilkeson & Sever, *Adverse Fetal Outcome Following Maternal Rubella* AFTER *The First Trimester of Pregnancy*, 207 J.A.M.A. 2414, 2414-20 (1969).

[52] Sever, Schiff & Huebner, *Frequency of Rubella Antibody Among Pregnant Women and Other Human and Animal Populations*, 23 OBSTETRICS & GYNECOLOGY 153, 158 (1964). *See also* Lundstrom, *supra* note 50, at 10.

is virtually impossible, usually no consideration of abortion is possible.[53]

(3) Radiation

It is generally agreed that when radiation is given in therapeutic doses to the mother in the first few months of pregnancy, malformation or death of the fetus may result.[54] According to Parlee, "it appears that ionizing radiation in therapeutic doses in the early months of pregnancy are grounds for the termination of the pregnancy."[55] Doses of radiation in therapeutic amounts are usually prescribed only for the treatment of a malignant neoplastic disease, such as carcinoma of the cervix. Fetal death and extrusion of the products of conception are the usual, but not inevitable result of such quantities of irradiation. A lesser dose of radiation, such as may be involved in an extensive diagnostic investigation, usually does not produce fetal death, but the risk of fetal malformation is uncertain.[56] When extensive diagnostic x-ray is used during the earliest weeks of an undiagnosed pregnancy, some physicians recommend therapeutic abortion. The possibility of having a malformed child under these circumstances does exist, but the actual risk has not been demonstrated. In such cases abortion seems justified on both psychiatric and humanitarian grounds, despite the fact that only uncertain evidence indicates how many of these children might be deformed.

(4) Genetic

A large number of congenital malformations have a heredity basis.[57] Nadler and Gerbie feel that "firm diagnosis of all chromosome disorders can be established prenatally."[58] Since amniocentesis[59] is necessary to define the risk, however, and since amniocen-

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[53] D. Reid, K. Ryan & K. Benirschke, PRINCIPLES AND MANAGEMENT OF HUMAN REPRODUCTION 393 (1972).

[54] Parlee, *Radiation Hazards in Obstetrics and Gynecology*, 75 AM. J. OBSTETRICS & GYNECOLOGY 327, 328 (1958).

[55] *Id.* at 332.

[56] THE EVALUATION OF RISKS FROM RADIATION 12 (1st ed. R. Russell Oxford 1966).

[57] Reid, *supra* note 53, at 395.

[58] Nadler, Nadler & Gerbie, *Present Status of Amniocentesis in Intrauterine Diagnosis of Genetic Defects*, 38 OBSTETRICS & GYNECOLOGY 796 (1971).

[59] Perforating or tapping the *amnion* (*i.e.*, the inner of the two bags containing the fetus) with the use of a needle, the procedure is used to remove and study part of the amniotic fluid. J. SCHMIDT, DICTIONARY at 83.

tesis is not totally innocuous, the decision of when to perform the procedure must rest on expert genetic counselling. Nadler and Gerbie caution that "the physician who detects a genetic disorder prenatally is committed to providing therapy," *i.e.* legal abortion if the prospective parents desire it.

(5) Erythroblastosis Fetalis[60]

The hazard to the *fetus in utero*, affected by Rh antibodies produced by the maternal organism, is primarily anemia or lack of red blood cells. If this lack can be corrected by transfusing the *fetus in utero* at periodic intervals, there is a distinct possibility that the baby will be born alive and maintain good health through modern methods of exchange transfusion. Thus, abortion for fetal hemolytic disease is rarely indicated in contemporary medical practice. Of great medical importance is the discovery that the administration of the Rh antibody (Rhogam) to the nonsensitized gravida immediately following the delivery of an unaffected Rh positive infant usually prevents the formation of maternal antibodies thereby minimizing the risk of fetal sensitization during a subsequent pregnancy. Properly administered Rhogam should eliminate erythroblastosis fetalis almost totally.

C. Psychiatric Indications

Almost all reports on therapeutic abortion practice in the United States indicate an increasing frequency of abortion for psychogenic reasons. Since most state laws require that the "life" of the mother be endangered by pregnancy before abortion may be legally considered, the patient must have exhibited a genuine suicidal tendency to qualify for termination of her pregnancy. Despite the increase in this type of abortion, some psychiatrists believe that psychiatric indications are invalid. A paper in the British Medical Journal in 1963 by Dr. Myre Sim, and the correspondence in the same journal, which this article engendered, illustrate the disagreement over psychogenic indications for abortion.[61] Dr. Sim stated in the original article that "there are no psychiatric grounds for termination of pregnancy."[62] Hoenig, commenting on Dr. Sim's paper,

[60] A hemolytic anemia of the fetus or new born infant, caused by the transplacental transmission of maternally formed antibodies, usually secondary to an incompatability between the blood group of the mother and that of her offspring (usually an incompatability of the Rh factor). See J SCHMIDT, DICTIONARY at 294.701.

[61] Sim, *Abortion and the Psychiatrist*, 1963 Vol. II BRITISH MEDICAL J. 145.

[62] *Id.* at 148.

said that "termination of the pregnancy could well be indicated . . . in [specific] cases on psychiatric grounds within the meaning of the law."[63] Dr. Sim's reply to Dr. Hoenig stated that it was really the patient's socioeconomic condition which influenced the psychiatrist to recommend abortion. "If society wants abortion to be easier, it should have the courage to campaign for it honestly and not exploit the psychiatrist, who, I contend, has no factual basis for being associated with the problem."[64]

Psychiatrists were in the forefront of the fight to expand the grounds for legal abortion. They were frequently willing (and of necessity are frequently *still* willing in the states with restrictive laws) to find that patients desiring abortion suffer from psychiatric disease severe enough to threaten the "life" of the mother. Rosenberg and Silver, in a paper on the attitudes and practices of psychiatrists in this regard, suggest that when a psychiatrist recommends therapeutic abortion, he is likely to be considering the socioeconomic factors at least as much as the psychiatric indications.[65]

D. Socioeconomic Indications

Throughout history, socioeconomic indications have been the predominate reason for interruption of pregnancy. Women have been aborted because they were afraid of childbirth because they would not bear children before or after a certain age, in order to safeguard their beauty, and because of "improper" paternity. Nomadism, which made pregnancy inconvenient, and poverty have also played important roles in the motivation for abortion. With the advent of Christianity, all abortions were considered undesirable, if not criminal, and this was especially true of those performed for socioeconomic reasons. Legal abortion for social reasons in civilized societies, therefore, virtually disappeared; there is little evidence, however, to suggest that illegal abortion for the same reasons decreased significantly.

Socioeconomic factors have undoubtedly influenced many doctors to recommend abortion for legitimate medical reasons. In days past when tuberculosis responded slowly, or not at all, to treatment, Taussig believed that factors such as the willingness of the patient to cooperate with rigid therapy, the number of children

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[63] Hoenig, *Correspondence*, 1963 Vol. II BRITISH MEDICAL J. 1125-26.

[64] Sim, *Correspondence*, 1963 Vol. II BRITISH MEDICAL J. 1062.

[65] Rosenberg & Silver, *Suicide, Psychiatrists and Therapeutic Abortion*, 102 CAL. MEDICINE 407, 410 (1965).

she had, the amount of help she could get with her children, if any, and other related factors were important in the decision of whether or not to abort her.[66] Cardiac disease, while it may not actually increase the risk of death in the pregnant patient, may make it difficult or impossible for the mother to care adequately for her child. This problem has usually been an important consideration when the patient has cardiovascular disease, and the same problem exists with many other "medical" indications. Obviously, the fetal indications for abortion are primarily socioeconomic, since few, if any, actually threaten the life of the pregnant patient; however, the social as well as economic ramifications of a severely deformed infant are incalculable. It would seem too that socioeconomic factors play a predominant role in the decision to abort the psychiatric patient. Supporting this opinion is the fact that in 1969 before the liberal New York State law went into effect, 72 percent of the legal abortions done in New York City were done for psychiatric disease while during the first six months of 1970, after the law allowed abortion on demand, 64 percent of the abortions were for sociologic indication and only 0.4 percent were for psychiatric disease.[67]

III. Current Legal Abortion Practices in the United States

A. Changes in the Indications

In the last twenty to thirty years, nearly all hospital surveys report a decrease in the percentage of therapeutic abortions performed for medical reasons.[68] Taussig, in his volume published in 1936, lists a myriad of medical indications for abortion.[69] Since the publication of Taussig's book, there has been a gradual transition in medical thinking, and some of the diseases formerly used as indications for abortion no longer pertain. Taussig called tuberculosis, "the most significant indication for therapeutic abortion in point of frequency,"[70] but this disease rarely gives reason to abort

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[66] F. TAUSSIG, *supra* note 11, at 293.

[67] Pakter, Unpublished manuscript read at a meeting of the Population Association of America in Washington, D.C., April 23, 1971.

[68] *E.g.*, Colpitts, *Trends in Therapeutic Abortion*, 68 AM. J. OBSTETRICS & GYNECOLOGY 988, 996 (1954); Routledge, Sparling & MacFarlane, *The Present Status of Therapeutic Abortion*, 17 OBSTETRICS & GYNECOLOGY 168, 171 (1961); Russell, *Changing Indications for Therapeutic Abortion*, 151 J.A.M.A. 108, 111 (1953).

[69] F. TAUSSIG, *supra* note 11, at 282.

[70] *Id.* at 292.

today. In a Buffalo abortion study, tuberculosis accounted for 33 to 50 percent of the abortions in the 1940's, about 10 percent in the 1950's, and none during the years 1958 to 1964.[71] In 1936 Taussig stated that "recently a tendency toward greater conservation has . . . been manifested with regard to the indications for therapeutic abortion in women with heart disease,"[72] although he felt that it was frequently a legitimate indication. In the same Buffalo study, cardiovascular indications were present in about 15 percent of the pregnancy interruptions in the 1940's, about 5 percent in the 1950's, and became practically nonexistent in the 1960's.[73]

In 1936 Taussig pointed out that psychiatric indications accounted for only a small percentage of therapeutic abortions, but that such abortions were occurring more often. He quoted Maier as saying that from 1929 to 1931 in Zurich, Switzerland, psychiatrically indicated therapeutic abortions were definitely on the increase.[74] Since Taussig's book was written, most of the reports on hospital experience document a gradually increasing percentage of abortions done for what has been recorded as psychiatric indications. In one study, for example, the psychogenic indications increased in linear fashion from about 10 percent in 1943 to about 80 percent in 1963.[75] Of the legal abortions performed in the state of California during 1970, 98.2 percent were indicated for reasons of mental health.[76] As socioeconomic reasons for abortion become legal, we can expect to see the number of abortions for this reason increase and the number of abortions for psychiatric indication decrease.

An equally dramatic change occurred in the fetal indications that before the 1940's were practically unknown. For example, the first therapeutic abortion for rubella was performed in 1949 and although the incidence varied from year to year, dependent apparently upon the prevalence of the disease, rubella accounted for an increasingly significant proportion of the abortions particularly in an epidemic year such as 1964. With the gradual disappearance of rubella, however, a reverse trend is undoubtedly underway.

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[71] Niswander, *supra* note 14, at 1141.

[72] F. TAUSSIG, *supra* note 11, at 297.

[73] Niswander, *supra* note 14, at 1141.

[74] F. TAUSSIG, *supra* note 11, at 313.

[75] Niswander, *supra* note 14, at 1142.

[76] BUREAU OF MATERNAL AND CHILD HEALTH, 4TH ANNUAL REPORT ON THE IMPLEMENTATION OF THE CALIFORNIA THERAPEUTIC ABORTION ACT, Table I (Berkeley, Cal. 1971) [hereinafter cited as CALIFORNIA ACT].

Some psychiatrists feel that rarely, or indeed never, is psychiatric disease an absolute indication for therapeutic abortion.[77] Yet the number of such abortions gradually increases. A real suicidal risk must be present in the psychiatric patient to legally permit abortion in states with rigid laws, yet there is good evidence that the suicide rate among pregnant women is considerably lower than among the general population of nonpregnant women.[78] Further, although abortion for rubella is illegal in many states,[79] hospitals often choose to ignore the law for humanitarian reasons. Physicians performing these abortions believe that the patient has a right to make her own decision concerning a pregnancy which may result in the birth of an abnormal child. Social factors have thus become the prime consideration in the decision to terminate pregnancy for psychiatric indication or for fetal reason.

Evidence also indicates that, except for New York state and perhaps a few other localities, the private patient has been much more likely to secure a legal interruption of pregnancy than has been the ward patient. Hall reported that at the Sloane Hospital for Women, the incidence of therapeutic abortion was four times greater on the private service than on the ward.[80] By sending a questionnaire to sixty-five randomly selected major hospitals, Dr. Hall discovered that this same discrepancy was widespread. In one study in the 1940's when the majority of abortions were done for medical reasons, the incidences on the ward and private services were about the same. In the 1950's when medical reasons accounted for fewer abortions, the incidence on the private service rose to twice that of the ward service. From 1960 to 1964 when the number of abortions for psychiatric or fetal reasons rose dramatically, the incidence on the private service soared to better than twenty times the number in the clinic service.[81] Recent experience in New York City has reversed this trend. During the first nine months of the experience under the liberal abortion law in New York City, 42 percent of the abortions on New York City residents were performed on nonwhite patients, although only 32 percent

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[77] *See* Cheney, *Indications for Therapeutic Abortion From the Standpoint of the Neurologist and the Psychiatrist*, 103 J.A.M.A. 1914, 1918 (1934); Sim, *supra* note 61, at 148.

[78] ABORTION IN THE UNITED STATES *supra* note 8, at 140; Rosenberg, *supra* note 65, at 409.

[79] *Cf.* George, *supra* note 47 at 741 n.177.

[80] Hall, *Therapeutic Abortion, Sterilization and Contraception*, 91 AM. J. OBSTETRICS & GYNECOLOGY 518 (1965).

[81] Niswander, *supra* note 14, at 1142.

of the New York City births occurred in this group.[82] The precipitous decrease in the cost of an abortion, as well as the availability of Medicare coverage for abortion, undoubtedly accounts for this increase in the number of nonwhite women securing abortion.

Other interesting trends with regard to the maternal age, the parity, and the marital status of women securing legal abortion can be noted. In one series in the 1940's no girl under twenty years of age was aborted. In the 1950's about 7 percent of the patients were under twenty years of age, and from 1960 to 1964 almost 15 percent of the patients were in this younger age group.[83] Paralleling the decreasing age has been a change in parity. The proportion of nullipara[84] increased from about 20 percent during the 1940's to 36 percent in the early 1960's. The percentage of married patients dropped from 93.3 percent in the 1940's, to 85.1 percent in the 1950's, and to 58.9 percent in the 1960's. In the latter years, about two out of five of the patients aborted were either single, separated, or divorced.[85]

In a recent report of 42,598 legal abortions from 64 participating institutions in twelve states, Tietze and Lewit found that 25 percent of the patients were under 20 years of age, nearly 50 percent had had no prior pregnancies, and only about 25 percent of the patients were married at the time of the abortion.[86]

It is widely known that states, localities within the same state, and hospitals within the same locality vary greatly in their abortion policies. In the 1965 survey by Hall, hospital practices varied from no abortions in 24,417 deliveries to one in thirty-six deliveries.[87] It seems inconceivable that medical opinion at that time could have varied so widely. As recently as 1969, however, only 19 percent of the legal abortions in California were performed in the Los Angeles metropolitan area, whereas 44 percent of the state's live births occurred in the same area. San Francisco accounted for 59 percent of the abortions, but only 22 percent of the live births. An enormous change in 1970 increased Los Angeles' share of the legal

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82 Pakter, *supra* note 5.

83 Niswander, *supra* note 14, at 1141.

84 A woman who has never given birth to a child. J. SCHMIDT, DICTIONARY at 567.

85 Niswander, *supra* note 14, at 1141.

86 Tietze & Lewit, *Legal Abortions: Early Medical Complications, an Interim Report of the Joint Program for the Study of Abortions*, 3 FAMILY PLANNING PERSPECTIVES 6, 7 (No. 4, 1971).

87 Hall, *supra* note 80, at 525.

abortions to 59 percent.[88] Certainly, the need for abortion did not change so markedly form 1969 to 1970. One can only presume that social factors encouraged the change.

B. Medical Procedures Used to Produce Legal Abortion

A variety of techniques are currently used to produce legal abortion. A number of variables influence the particular technique chosen. Length of gestation, combining sterilization with abortion, and the presence of pelvic pathology all influence the physician's choice. A list of the techniques used in the past two or three decades would include intracervical insertion of a foreign body such as a hard, rubber catheter or a bougie; simple dilation and curettage (D & C); hysterectomy; hysterotomy (either vaginal or abdominal); the use of concentrated oxytocin solution;[89] the injection of hypertonic solutions into the uterus; and more recently, suction curettage and the use in a variety of ways of a new group of substances called prostaglandins. Until recently the simple D & C accounted for the majority of abortions performed. Hysterectomy was used often in the 1940's, but then lost favor. In recent years it has been used somewhat more commonly when a sterilizing procedure was to be performed along with the abortion, or if the uterus itself was the site of some pathology. The use of bougies or intrauterine catheters has become obsolete since the 1940's. Concentrated oxytocin was first used in 1964, but never gained many followers. Intra-amniotic injection of hypertonic solutions, usually saline or glucose, but more recently urea, have enjoyed increasing popularity since the mid-1960's. Prostaglandins must still be considered experimental pharmacologic agents, but they have been reported to successfully induce abortion if they are given by an intravenous or an intrauterine route.

C. Hazards of Therapeutic Abortion

Since the experience reported by various investigators concerning frequency of complications with abortion is so varied, it is difficult, if not impossible, to make any generalizations regarding the safety of legal abortion. Nevertheless, one can generalize that the

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[88] *See* CALIFORNIA ACT, *supra* note 76, at Table II.

[89] Oxytocin is a hormone which has the power to increase the contractions of the uterus in the late stages of pregnancy and during childbirth. J. SCHMIDT, DICTIONARY at 612.

safety of the particular procedure varies directly with its technical ease and the experience of the physician rendering the service.

Dilatation and curettage (D & C) seems to be a safe operation. A paper documenting experience with 320 D & C's performed from 1946 to 1964 included only two patients who became significantly ill.[90] One developed an abscess in the tissue adjacent to the uterus, an infection which responded rapidly to antibiotic therapy. The second patient developed pelvic peritonitis and a fistula between the bowel and the vagina. She required major abdominal surgery before she recovered. A more recent study was made of 812 patients aborted at Oxford University Hospital either by vacuum curettage (768 patients) or by D & C (44 patients).[91] Seventeen percent of the patients experienced hemorrhage of at least 500 cc of blood, 8.5 percent suffered a cervical laceration, 15 percent experienced a significant pyrexia,[92] and 1.7 percent suffered a perforated uterus. The recorded perforation rate was considered a minimum one, since in 3 of the 14 perforations reported the complication was not recognized until a planned laparotomy for tubal ligation. The investigators speculated that others might have been missed. Two patients required hysterectomy because of perforation.

In another study of 1000 vacuum curettages, only 6.1 percent of the patients suffered blood loss greater than 500 cc and only 0.5 percent of the patients suffered a perforated uterus.[93] Tietze and Lewit reported on 42,598 abortions from 64 United States institutions of which 75 percent were either suction curettage or the conventional D & C. They found a major complication rate of only 1.3 percent, except where a preexisting medical complication intervened.[94] Among 84,000 abortions performed in New York City during the first nine months (July 1970-April 1971) following enactment of the liberal New York State abortion law, Pakter and Nelson recorded hemorrhage in only 0.15 percent of the patients and perforation in 0.17 percent of the patients. They also recorded a striking reduction in abortion-related deaths in 1971. There were eight abortion-related maternal deaths during the first four months

[90] Niswander, Klein & Randall, *Therapeutic Abortion: Indications and Techniques*, 28 OBSTETRICS & GYNECOLOGY 127 (1966).

[91] Stallworthy, Moolgaoker & Walsh, *Legal Abortion: A Critical Assessment of its Risks*, II THE LANCET 1246 (1971).

[92] An abnormal rise in the temperature of the body. J. SCHMIDT, DICTIONARY at 668.86.

[93] Loung, Buckle & Anderson, *Results in 1,000 Cases of Therapeutic Abortion Managed by Vacuum Aspiration*, 4 BRITISH MEDICAL J. 478 (1971).

[94] Tietze, *supra* note 86, at 12.

of 1969, six during the first four months of 1970, and three during the first four months of 1971. An interpolation of these figures indicates that there were approximately 4.6 maternal deaths per 100,000 abortions in New York City during the first half of 1971: a figure which compares favorably with the rate of abortion-related deaths in other countries.[95]

The intra-amniotic injection of formalin to produce abortion was first used many years ago, although the use of this drug is now known to be hazardous. After World War II hypertonic saline solution was substituted for formalin; the technique was used widely in Japan and later in other countries.[96] In 1958 hypertonic glucose was tried and the first successful termination of a mid-trimester pregnancy using this solution was accomplished. No ill effects from either modality were reported in the English language literature the first few years, although several maternal deaths related to the use of intra-amniotic hypertonic saline solution in Japan were recorded.[97] A handful of deaths due to clostridium welchii infection were reported with dextrose.[98] In recent years an occasional death has occurred with the use of hypertonic saline, although the experience with this solution in general has been good. The deaths have been due primarily to brain damage related to inadvertent intravascular injection and hypernatremia. A number of cases of water intoxication due to the anti-diuretic effect of oxytocin, usually coupled with the administration of large amounts of intravenous fluids, have also been recorded. The experience reported by MacKenzie, Roufa, and Tovell on 400 consecutive mid-trimester abortions induced by hypertonic saline is probably typical.[99] A small experience with the procedure from 1965 to June of 1970, was accompanied by several complications. The more extensive experience after the New York law liberalization in July, 1970, was associated with a marked decrease in the number of complications, and no deaths were reported in this series of patients. Kar-

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[95] Pakter, *supra* note 5, at 9-11.

[96] Wagatsuma, *Intra-Amniotic Injections of Saline for Therapeutic Abortion*, 93 AM. J. OBSTETRICS & GYNECOLOGY 743 (1965).

[97] *Id.* at 743-44.

[98] MacDonald, O'Driscoll & Geoghegan, *Intra-Amniotic Dextrose — A Maternal Death*, 20 OBSTETRICS & GYNECOLOGY SURVEY 776, 777 (1965).

[99] MacKenzie, Roufa & Tovell, *Midtrimester Abortion: Clinical Experience with Amniocentesis and Hypertonic Instillation in 400 Patients*, 14 CLINICAL OBSTETRICS & GYNECOLOGY 107 (1971).

enyi[100] and Schulman[101] both reported experience with outpatients following intra-amniotic injection of hypertonic saline to procure abortion. In both series complications were rare and there were no deaths reported.

Experience with prostaglandins is too recent to appraise the hazards. Information to date has indicated a high percentage of complications (phlebitis[102] with PGE_2, and nausea and vomiting and fever with $PGF_{2\alpha}$) but these complications have apparently not been serious.[103]

IV. CONCLUSION

Criminal abortion remains a major public health problem which cannot be ignored. It is doubtful that human nature or human society will ever permit the avoidance of all unsafe or unwanted pregnancies, and the need for abortion is likely to continue. Legalized abortion provides at least a partial answer.

An analysis of the reasons why physicians in the United States recommend legal abortion shows a changing philosophy over the past two decades. As medical disease has demanded less pregnancy interruption, psychiatric disease and risk of fetal malformation have required abortion more frequently. Social factors are apparently an important consideration with these indications. Groups of influential citizens — physicians, lawyers, psychologists, and social workers — are currently encouraging liberalization of abortion statutes in order to take into account factors other than the "life" of the pregnant patient.

Legal abortion in a well equipped hospital is not hazardous, but criminal abortion in the United States annually accounts for hundreds of deaths and untold damage short of death. If liberalization of abortion statutes will decrease this toll of human potential, then society must offer this protection to women.

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[100] Kerenyi, *Outpatient Intra-Amniotic Injection of Hypertonic Saline*, 14 CLINICAL OBSTETRICS & GYNECOLOGY 124 (1971).

[101] Schulman, Kaiser & Randolph, *Outpatient Saline Abortion*, 37 OBSTETRICS & GYNECOLOGY 521 (1971).

[102] Inflammation of a vein. J. SCHMIDT, DICTIONARY at 668.3.

[103] Hendricks, Brenner, Ekbladh, Brotanek & Fishburne, *Efficacy and Tolerance of Intravenous Prostaglandins, $F_{2\alpha}$ and E_2*, 111 AM. J. OBSTETRICS & GYNEOLOGY 564 (1971).

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