Peer Review Medical Research from the US National Library of Medicine and USPHS Grants Compiled by Delegate Bob Marshall in Support of Legislation Requiring Informed Consent for Women

Abortion Safety -- Medical Myth or Medical Fact?

Abortion is safer for women than childbirth. This claim has been medical mainstay of abortion legalization from the years just prior to the Supreme Court's 1973 Roe v. Wade and Doe vs. Bolton cases to the present. For example, in 1971 the American College of Obstetricians and Gynecologists filed a friend of the court brief in the Doe v. Bolton case claiming that, "the medical procedure of induced abortion … is potentially 23.3 times as safe as the process of going through ordinary childbirth." 1 Justice Blackmun, in the Roe decision, gave constitutional and legal credence to the abortion safety numbers crunching dogma:

> When most criminal abortion laws were first enacted, the procedure was a hazardous one for the woman. (43) … Antiseptic techniques, of course, were based on discoveries by Lister, Pasteur, and others first announced in 1867, but were not generally accepted and employed until about the turn of the century. Abortion mortality was high. Even after 1900, and perhaps until as late as the development of antibiotics in the 1940's, standard modern techniques such as dilation and curettage were not nearly so safe as they are today. Thus, it has been argued that a State's real concern in enacting a criminal abortion law was to protect the pregnant woman, that is, to restrain her from submitting to a procedure that placed her life in serious jeopardy.
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> Modern medical techniques have altered this situation. Appellants and various amici refer to medical data indicating that abortion in early pregnancy, that is, prior to the end of the first trimester, although not without its risk, is now relatively safe. Mortality rates for women undergoing early abortions, where the procedure is legal, appear to be as low as or lower than the rates for normal childbirth. (44) 2

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[1] Amicus Curiae brief for ACOG, American Medical Women's Association American Psychiatric Association, the New York Academy of Medicine, cited by Hilgers, Horanand Mall, New Perspectives on Human Abortion, Aletheia Books, University Publications of America, Frederick, Maryland, c. 1981, p. 69.

2 Roe vs. Wade, 410 U.S. 113, (1973) citing [Footnote 43] See C. Haagensen & W. Lloyd, A Hundred Years of Medicine 19 (1943). [Footnote 44] Potts, Postconceptive Control of Fertility, 8 Int'l J. of G. & O. 957, 967 (1970) (England and Wales); Abortion Mortality, 20 Morbidity and Mortality 208, 209 (June 12, 1971) (U.S. Dept. of HEW, Public Health Service) (New York City); Tietze, United States: Therapeutic Abortions, 1963-1968, 59 Studies in Family Planning 5, 7 (1970); Tietze, Mortality with Contraception and

And, official public health figures from authorized US Government sources seemed to confirm Blackmun's conclusion. In 1971, when the Roe and Doe cases were being argued before the Court, the maternal mortality stood at 18.8 deaths, per 100,000 births. 3 This figure, according to the US Centers for Disease Control would drop in 1997 to roughly 12.9 maternal deaths per 100,000 births. 4 Maternal deaths increased slightly to 13.2/100,000 in 1999. 5

However, even the best years of official reported deaths to women associated with childbirth and pregnancy never came close to the worst years for deaths to women from legal abortion. The purported number of deaths from legal abortion, according to "Centers for Disease Control and Prevention abortion surveillance data. Mortality decreased by 90% from 4.1 deaths/100,000 legal induced abortions in 1972 to 0.4/100,000 in 1987. ... The case fatality rate for legal abortions during 1972-87 was 1.3 deaths/100,000 legal abortions." 6

Critics of abortion safety suggested bogus safety comparisons by noting that, "most women dying from abortion were young, white, and healthy, while those dying from childbirth had serious underlying conditions." 7 Ever ready to defand abortion safety claims the CDC circled the statistical wagons by calculating, "standardized abortion and childbirth mortality rates between 1972 and 1978. We also adjusted independently for preexisting medical conditions. These adjustments for demographic and health differences between the two populations actually widened the difference in the mortality risk between abortion and childbirth. Thus, between 1972 and 1978, women were about seven times

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Induced Abortion, 45 Studies in Family Planning 6 (1969) (Japan, Czechoslovakia, Hungary); Tietze & Lehfeldt, Legal Abortion in Eastern Europe, 175 J. A. M. A. 1149, 1152 (April 1961). Other sources are discussed in Lader 17-23.

[3] Hilgers, Horan and Mall, New Perspectives on Human Abortion, Aletheia Books, University Publications of America, Frederick, Maryland, c. 1981, p 70, citing Monthly Vital Statistics Report, Provisional Statistics, Annual Summary for the United States, 1978, Dept. of HEW, Office of Health Research, Statistics and Technology, National Center for Health Statistics, 27.9, 1979.

[4] Berg CJ, Chang J, Callaghan WM, Whitehead SJ, Pregnancy-related mortality in the United States, 1991-1997, Obstetrics and Gynecology, 2003 Feb;101(2):289-96; Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia.

[5] Chang J, Elam-Evans LD, Berg CJ, Herndon J, Flowers L, Seed KA, Syverson CJ, Pregnancy-related mortality surveillance--United States, 1991—1999, MMWR Surveillance Summary. 2003 Feb 21;52(2):1-8,

[6] Lawson HW, Frye A, Atrash HK, Smith JC, Shulman HB, Ramick M, "Abortion mortality, United States, 1972 through 1987," Am J Obstet Gynecol. 1994 Nov;171(5):1365-72. Pregnancy and Infant Health Branch, Centers for Disease Control and Prevention, Atlanta, GA. [PubMed Sumary]

[7] LeBolt SA, Grimes DA, Cates W Jr., "Mortality from abortion and childbirth. Are the populations comparable?" JAMA. 1982 Jul 9;248 (2):188-91.

more likely to die from childbirth than from legal abortion, with the gap increasing in the more recent years." 8

And at one point in 1982, CDC officials were so confident after a review of their own abortion and maternal mortality data they claimed that, "abortion deaths appear to be more completely ascertained than childbirth deaths … From this evidence, we conclude that the crude data are biased in a direction that overestimates the abortion risks for the women relative to the risks of childbearing." 9

If there were any "problems" with legal abortion, the public was assured the CDC statistical super sleuths would take care of them. The two leading lights on abortion for the CDC, Jack Smith, Chief of the Statistical Services Branch, and Willard Cates, MD, Chief, Abortion Surveillance Branch appeared to provide oversight assurances, noting that, "Because of the widespread use of abortion in the United States, there is a need for definitive data to assess the delayed and long-term effects of abortion." 10

CDC officials, Dr. Willard Cates and abortionist David Grimes, would look back at their work and congratulate themselves on their efforts to spread enlightened support for keeping abortion legal: "Today, more is known about the epidemiology of abortion than any other operation in the history of medicine. In the midst of strident debate over the abortion issue, CDC abortion surveillance data have helped to guide judicial rulings, legislative actions, and Surgeon General's reports, which have supported safer choices for women of reproductive age. When medical historians of the future look back on this century, the increasing availability of safe, legal abortion will stand out as a public health triumph." 11

So, if official figures are to be believed, legal abortion in the United States is at least at least ten times safer than childbirth. That is what the US Government and official medicine at all levels would have policymakers and other Americans believe--end of discussion—that is, if you publicly agree with the abortion safety orthodoxy.

If you disagree with abortion safety orthodoxy, well, it won't get you burned at the steak, but you will be subject first to raised eyebrows and paternalistic chiding, to be followed if that fails by social and professional isolation, and finally vilification and banishment from public respectability by defenders of abortion safety dogma at all levels.

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[8] LeBolt SA, Grimes DA, Cates W Jr., "Mortality from abortion and childbirth. Are the populations comparable?" JAMA. 1982 Jul 9;248 (2):188-91.

[9] Cates W Jr, Smith JC, Rochat RW, Grimes DA. "Mortality from abortion and childbirth. Are the statistics biased?" JAMA. 1982 Jul 9;248 (2):192-6. [PubMed Sumary]

[10] Jack Smith, MS, Willard Cates, MD, The Public Health Need for Abortion Statistics," Public Health Reports March-April, 1978, Vol. 93, No. 2 194-197.

[11] Cates W, Grimes DA, Schulz KF, Abortion surveillance at CDC: creating public health light out of political heat," American Journal of Preventive Medicine, 2000 Jul;19(1 Suppl):12-7. Family Health International, Research Triangle Park, North Carolina 27709, USA. [PubMed Summary]

For exaple, if you positively conclude that not only is abortion not safer than chiodbirth, but even more dangerous you are subject to vilification in official US Government publications as at best, anti abortion zealots who are woefully ignorant of medical facts, or dubbed as cunning Elmer Gantry type liars who use abstinence programs as a lure for federal money, but slyly seeking to bring unmarried pregnant teens to Jesus even if the methods involve skirting the moral law!

This, in fact, is the conclusion of a July, 2006 publication of the US House of Representatives Committee on Government Reform — Minority Staff report prepared for US Representative Henry Waxman. Specifically, Crisis Pregnancy Centers allegedly "provided false and misleading information about a link between abortion and breast cancer … the effect of abortion on future fertility … the mental health effects of abortion." 12

The Congressional Report singled out a 2005 presentation by CareNet, an umbrella resource organization for 975 evangelical pregnancy centers across North America, for its allegedly deceptive anti-abortion abstinence tactics: "Now obviously when you go into public schools you can't start talking about Jesus dying on the cross …But … you're building credibility for your pregnancy center … So people that come into your center that have already heard you, you get the chance to share the Gospel with them, which is the ultimate thing of what we're doing." 13

Thus aware of the "treats" that may be in store for us, we, as medical professionals, nevertheless will present readers to an examination of the question of abortion safety from sources that should at least be accepted for their professional responsibility and accuracy. If our conclusions are different from the reigning abortion safety orthodoxy, they will have been based them on sources that are widely accepted withing professional medicine and scientific investigation.

And we ask careful readers who may be surprised or perhaps even doubt our conclusions to examine the same sources we have, before they are dismissed. If the results make readers uncomfortable, we sincerely hope that this disquiet will provoke further investigations in the scientific literature as wel as among professional peers.

This project sponsored by the (American Life League or an ALL Institute?) does not claim that official figures from the United Sates Government or professional medical associations are incorrectly reported. But this project disputes whether the official figures are based on the right questions or are any where near correct and asks whether Members of Congress, State Lawmakers and other public policy officials are being adequately informed by public health authorities, or are they being manipulated, willingly or not, into keeping abortion legal by an almost 40 year effort to make abortion seem something that it is not.

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[12] US House of Representatives Committee on Government Reform, Minority Staff, Special Investigations Division, July, 2006, "False and Misleading Information Provided by Federally Funded Pregnancy Resource Centers, Prepared for Representative Henry Waxman, page 3

[13] Government Reform Report, page 7; http://www.care-net.org/aboutus/

Hear no Evil, See no Evil, Speak no Evil
Japanese Proverb

"Facts were never pleasing to him. He acquired them with reluctance and got rid of them with relief. He was never on terms with them until he had stood them on their heads."
Sir James Matthew Barrie

For the Public Health Establishment to arrive at the abortion is safer than childbirth dogma, health officials isolated any deaths or damage to women from abortion to a very narrow set of circumstances, mostly those which take place on the operating table. If a bad effect doesn't happen there or isn't documented as starting there, it is not recorded, and so it officially doesn't happen. This avoids the necessity for policy makers to make any effort to alter the status quo. And, in fact, it makes it necessary to maintain the legal abortion status quo.

Specifically, this whitewashing of abortion safety has been achieved by:

(1) Not collecting data. Thus, official public health event reporting forms were prepared and produced which ensure that no links can be made between an earlier legally induced abortion with a later maternal or child death or complication;
(2) Collecting primarily favorable data which presents an incomplete picture of abortion safety as if it were the entire story;
(3) Altering the conventional meaning of words, and/or discrediting studies which undermine the abortion safety claim.

Pregnancy Complications and Induced Abortion

Despite Justice Henry Blackmun stating in Roe that, "The pregnant woman cannot be isolated in her privacy," US Public Health Officials took precautions to ensure thereas no official public health paper trail that could link legal abortion to all but a very few medical misadventures. There are, however, other data sources, and we have relied upon reports in the world's medical literature implicating legal abortion with a host of women's medical problems for women that have have no possibility of showing up on official public health reporting documents.

For example, the current US Standard Certificate of Live Birth, which the US Public Health Service recommends to the states provides for the recording of pregnancy events in the reproductive life of the woman delivering her child, ether alive or dead. Among others, they include:

- maternal medical conditions affecting the pregnancy: Abruptio Placenta, Placenta Previa, Diabetes, Hypertension, Eclampsia, Incompetent Cervix, Premature Rupture of Membranes, Prolonged Labor, Uterine Bleeding, Chlamydia, Gonnorhea;
- present and past reproductive circumstances: Infertility Treatment Pregnancy, number of prior pregnancy outcomes (Ectopic Pregnancy, Induced Abortion, Spontaneous Abortion/Miscarriage), Previous Life Births, Previous Low

Birthweight Baby, birth weight of current pregnancy, gestation length (Pre-term delivery);

- personal maternal habits: Alcohol Use/Abuse, Drug Abuse, smoking.
- Apgar Scores, Malformation. 14

The official recommended USPHS birth certificate exhibits a marked curiosity for other information including, the exact level of the mother and father's schooling, their race, source of payment for this delivery, the precise number of cigarettes smoked three months before and during the pregnancy. However, when it comes to abortion, any information is too much information. The USPHS just wants to know the total number of pregnancies not resulting in a live birth. They do NOT want to know separately how many individual ectopic pregnancies, how many individual induced abortions or how many individual spontaneous abortions the women giving birth has experienced. A gross total figure is perfecty adequate. Thus, the birth certificate is precluded from becoming a "paper trail" for medical, labor or birth problems, deaths, complications or other bad outcomes that would point to induced abortion as its cause.

And consider that the US Standard Report of Fetal Death (i.e. miscarriage at 20 weeks or greater) also does not want to know how many separate induced and spontaneous abortions a woman has had. 15

Why is that important? Well, the effect of legal induced abortion on a woman's health later in life or the effect, if any, on future pregnancies cannot be answered by official government forms if there is no way to see if induced abortion only preceded a miscarriage of a "wanted" pregnancy.

Is this blurring of possible fact-finding intentional on the part of abortion supporters within the federal government? For officials who can track the source of an e coli infection to a particular farm in California, it leaves many unanswered questions.

The reader will perhaps be interested to know that the same US Public Health Agency which produced the live birth and fetal death forms, the CDC's National Center for Health Statistics, also produced the US Standard Report of Induced Termination of Pregnancy. On that form, there ARE separate boxes for "Other Terminations (14c.) Spontaneous Number____, None □ ; (14d.) Induced (Do not include this termination.) Number____, None □." 16

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[14] US Standard Certificate of Live Birth Rev. 11/2003, see http://www.cdc.gov/nchs/vital_certs_rev.htm.
[15] From Data to Action: CDC's Public Health Surveillance for Women, Infants, and Children, US Standard Report of Fetal Death, page 166.

[16] Handbook on the Reporting of Induced Termination of Pregnancy, Centers for Disease Control, National Centers for Health Statistics, Appendix A, page 15, DHHS Publication No (PHS) 98-1117. From Data to Action: CDC's Public Health Surveillance for Women, Infants, and Children, US Standard Report of Fetal Death, page 166.

No explanation is offered by officials for the double standard as to why there are differences in the requirements for separate or linked induced abortion, spontaneous abortion or ectopic pregnancy reporting. 17

However, there are studies, which are not encumbered by the hesitance of the USPHS Centers for Disease Control which an provide missing facts about allegedly safe legal abortion which the CDC is content to leave unreported.

Abortion complications will be presented in the next section of this inquiry from the scientific and medical literature available from the US Pubic Health Service's National Library of Medicine in Bethesda, Maryland. Abortion problems covered will be those which the CDC chooses to ignore, while at the same time asserting that abortion is safe for women.

(The reader shold note that medical journal citations cited below which are preceeded by "[PubMed Summary]" represent computer "copy and paste" summaries available via the Natioual Library of Medicine's PubMed Internet search engine. They do not inany way represent the authors interpretations of the journals cited, or any mistaken retyping or erroneous summary prepared by the authors. These summaries of the adverse outcomes of "safe, legal, abortion," are available to the public, the CDC and the staff of Representative Henry Waxman (D-CA) when his Government Operations whitewash report on the effects of induced abortion was published without any "screening" of such outcomes by persons who have a "pro-life" persuasion.-The Authors)

Complications From "Safe, Legal, Abortion"

Pregtnancy and Placenta Complications

The placenta is an external organ of the child in the womb. It begins to form on roughly the eighth day of development or gestation. It is the child's organ which works in exchange with the mother's circulatory system and secretes hormones that direct the mother's body to alter certain functions so as to maintain the pregnancy.

"Abruptio Placenta" is the separation of the placenta before delivery from its normal position in the uterine wall of the mother in a pregnancy of 20 weeks or more. It can be partial, or complete which causes immediate fetal death. Placental Previa happens when the placenta is implanted abnormally in the uterus and covers the cervix. It is a cause of third trimester bleeding. Retained Placenta is the failure of the placenta to be delivered within 30 minutes following birth. Placenta Accrete involves the invasion of the muscle of the uterus by the placenta making separation difficult.

CDC officials, without acknowledging that abortion can cause placental problems in later "wanted" pregnancies, have recognized dangers in this area: "Abruptio placentae and

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[17] Hospitals' and Physicians' Handbook on Birth Registration and Fetal Death Reporting, US Dept. of Health and Human Services, National Center for Health Statistics, Hyattsville, Maryland, 1987.

placenta previa are two leading causes of third-trimester bleeding. Both conditions can result in serious pregnancy morbidity and an increased risk of pregnancy-related and perinatal mortality. Data from the NHDS indicate that the rate of abruptio placentae increased significantly between 1979 and 1987 for women of all racial groups: the rate increased from 8.2 per 1,000 deliveries in 1979-80 to 11.5 cases per 1,000 deliveries in 1987." 18

The CDC further acknowledges, "Placenta previa can cause serious, occasionally fatal cmplications for fetuses and mothers; however, data on its national incidence and sociodemographic risk factors have not been available. … We analyzed data from the National Hospital Discharge Survey for the years 1979 through 1987 and from the Retrospective Maternal Mortality Study (1979 through 1986). … We found that placenta previa complicated 4.8 per 1000 deliveries annually and was fatal in 0.03% of cases. … Women with placenta previa were at an increased risk of abruptio placentae (rate ratio 13.8), cesarean delivery (rate ratio 3.9), fetal malpresentation (rate ratio 2.8), and postpartum hemorrhage (rate ratio 1.7)." 19

Placenta complications are associated with varied causes and conditions, including abortion. For example, in one US study women with a history of a previous cesarean birth and a total of 3 or more births or late miscarriages have been found to be 1.7 times more likely to experience placenta previa, and with 4 such pregnancies, the risk was increased 5.5 times. 20 And smoking, in a Washington State Study, doubled the chances for placenta previa. 21 But smoking has also been implicated with induced abortion (see below).

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[18] Audrey Saftlas, PhD, MPH, Hershel Lawson, MD, Hani Atradh, MD, From Data to Action: CDC's Public Health Surveillance for Women, Infants, and Children, Pregnancy Related Morbidity 134. [PubMed Summary]

[19] Iyasu S, Saftlas AK, Rowley DL, Koonin LM, Lawson HW, Atrash HK, "The epidemiology of placenta previa in the United States, 1979 through 1987," American Journal of Obstetrics and Gynecology, 1993 May;168 (5):1424-9, Division of Reproductive Health, Centers for Disease Control, Atlanta, Georgia. [PubMed Summary]

[20] McMahon MJ, Li R, Schenck AP, Olshan AF, Royce RA. "Previous cesarean birth. A risk factor for placenta previa?" Journal of Reproductive Medicine, 1997 Jul;42(7):409-12; Department of Obstetrics and Gynecology, University of North Carolina at Chapel Hill "The study population included 342 women with a pregnancy complicated by placenta previa and 1,082 randomly selected controls. Analysis was restricted to women who reported one or more previous live births and delivered a singleton, live neonate. Adjusted odds ratios (ORs) with 95% confidence intervals (95% CIs) were calculated using logistic regression, controlling for maternal age, race, prior spontaneous or induced abortions and cigarette use." [PubMed Summary]

[21] Kramer MD, Taylor V, Hickok DE, Daling JR, Vaughan TL, Hollenbach KA, "Maternal smoking and placenta previa," Epidemiology. 1991 May;2(3):221-3, Department of Epidemiology, University of Washington, Seattle. "using Washington State birth certificate data from 1984 through 1987. The study population was comprised of live, singleton births to women whose pregnancies were complicated by placenta previa (N = 598) and randomly selected controls (N = 2,422) from the same time period. We used logistic regression to estimate odds ratios (OR) and their 95% confidence intervals (CI). Maternal smoking approximately doubled the risk of placenta previa after adjustment for the confounding effect of maternal age (OR = 2.1, 95% CI: 1.7-2.5). [PubMed Summary]

Medical Studies: Legal Abortion and Placenta Previa

"A retrospective analysis of all single gestation deliveries at National University Hospital of Singapore from 1993-1997 was done. … Of the 16,169 singleton deliveries, 164 women (1.0%) had placenta previa. … Among the 164 women with placenta previa, women with 1, 2, and 3 previous cesarean sections had 2.2 (95% CI 1.4, 3.4), 4.1 (95% CI 1.9, 8.8) and 22.4 (95% CI 6.4, 78.3) times increased risk of developing placenta previa respectively. Similarly, **women with 2 or more previous abortions had a 2.1 (95% CI 1.2, 3.5) times increased risk of subsequently developing placenta previa**."

[PubMed Summary] Hendricks MS, Chow YH, Bhagavath B, Singh K, "Previous cesarean section and abortion as risk factors for developing placenta previa," Obstet Gynaecol Res. 1999 Apr;25 (2):137-42, Department of Obstetrics and Gynaecology, National University Hospital, Singapore.

"A population-based, case-control study was conducted using 1984-1987 Washington state birth certificate data. **The study population included 486 white women with a pregnancy complicated by placenta previa** and 1598 randomly selected controls without placenta previa. … After adjustment for confounding variables, the odds ratio in association with one or more induced abortions was 1.28 (95% CI 1.00-1.63). For one or more spontaneous abortions, the odds ratio was 1.30 (95% CI 1.01-1.66). … **Women who report one or more induced or spontaneous abortions are 30% more likely to have a subsequent pregnancy complicated by placenta previa than women without such a history.** The results should not be generalized to areas where suction curettage is not the preferred method of induced abortion."

[PubMed Summary] Taylor VM, Kramer MD, Vaughan TL, Peacock S, "Placental previa in relation to induced and spontaneous abortion: a population-based study," "Obstetrics and Gynecology, 1993 Jul;82 (1):88-91," Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, Washington.

"We performed a systematic literature review and identified 58 studies on placenta previa published between 1966 and 2000. … Each study was reviewed independently by the two authors and was scored (on the basis of established criteria) on method of diagnosis of placenta previa and on quality of study design. … Our results showed that the overall prevalence rate of placenta previa was 4.0 per 1000 births, with the rate being higher among cohort studies (4.6 per 1000 births), USA-based studies (4.5 per 1000 births) and hospital-based studies (4.4 per 1000 births) than among case-control studies (3.5 per 1000 births), foreign-based studies (3.7 per 1000 births) and population-based studies (3.7 per 1000 births), respectively. **Advancing maternal age, multiparity, previous Cesarean delivery and abortion, smoking and cocaine use during pregnancy, and male fetuses all conferred increased risk for placenta previa**. … **Future etiological studies on placenta previa must, at the very least, adjust for potentially confounding effects of maternal age, parity, prior Cesarean delivery and abortions."**

[PubMed Summary] Faiz AS, Ananth CV, "Etiology and risk factors for placenta previa: an overview and meta-analysis of observational studies." Journal of Maternal Fetal Neonatal Medecine, 13 (3): 175-90, 2003;

"A threefold increase in the incidence of placenta previa, from one in 318 deliveries (0.3%) in 1972-1974 to one in 109 deliveries (0.9%) in the twelve-month period ending June 30, 1980, was noted at Vanderbilt University Hospital. … patients not present in 1972-1974 were found to be responsible for this increased incidence of placenta previa: one-way

maternal transports and women who had had induced first trimester abortions. **The frequency of maternal transports having placenta previa was 3.3% (p less than 0.0001), and the frequency of placenta previa in women after an induced first trimester abortion was 3.8% (p less than 0.0001). When correction for maternal transports was made, the endogenous induced first trimester abortion population had a frequency of placenta previa of 2.1% (p less than 0.004)**, whereas the remainder of the endogenous population had an incidence of placenta previa similar to that found in the years 1972-1974. **Induced first trimester abortion is seen as a significant factor predisposing to placenta previa."**

[PubMed Summary] Barrett JM, Boehm FH, Killam AP, "Induced abortion: a risk factor for placenta previa," American Journal of Obstetrics and Gynecology, 1981 Dec 1;141 (7):769-72.

"We reviewed studies on placenta previa published between 1950 and 1996 on the basis of a comprehensive literature search with use of MEDLINE and by identifying studies cited in the references of published reports. … We also restricted the search to studies published in English. … The tabulation of 36 studies identified a total of 3.7 million pregnant women, of whom 13,992 patients were diagnosed with placenta previa. The reported incidence of placenta previa ranged between 0.28% and 2.0%, or approximately 1 in 200 deliveries. Women with at least one prior cesarean delivery were 2.6 (95% confidence interval 2.3 to 3.0) times at greater risk for development of placenta previa in a subsequent pregnancy. … **Women with a history of spontaneous or induced abortion had a relative risk of placenta previa of 1.6 (95% confidence interval 1.0 to 2.6) and 1.7 (95% confidence interval 1.0 to 2.9), respectively. … There is a strong association between having a previous cesarean delivery, spontaneous or induced abortion, and the subsequent development of placenta previa."**

[PubMed Summary] Ananth CV, Smulian JC, Vintzileos AM, "The association of placenta previa with history of cesarean delivery and abortion: a Meta-analysis," American Journal of Obstetrics and Gynecology, 1997 Nov;177 (5):1071-8. Department of Obstetrics, Gynecology, and Reproductive Sciences, University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, New Brunswick, USA.

"A retrospective analysis of all single gestation deliveries at National University Hospital of Singapore from 1993-1997 was done. … Of the 16,169 singleton deliveries, 164 women (1.0%) had placenta previa. Women with placenta previa had a significantly higher incidence of previous cesarean sections ($p < 0.001$). Among the 164 women with placenta previa, women with 1, 2, and 3 previous cesarean sections had 2.2 (95% CI 1.4, 3.4), 4.1 (95% CI 1.9, 8.8) and 22.4 (95% CI 6.4, 78.3) times increased risk of developing placenta previa respectively. **Similarly, women with 2 or more previous abortions had a 2.1 (95% CI 1.2, 3.5) times increased risk of subsequently developing placenta previa."**

[PubMed Summary] Hendricks MS, Chow YH, Bhagavath B, Singh K, "Previous cesarean section and abortion as risk factors for developing placenta previa." Journal of Obstetrics and Gynaecology Research, 1999 Apr;25 (2):137-42.

"We evaluated the risk of placenta previa being associated with a history of induced abortion by different surgical procedures. … Cases (n=192) were women who had a singleton delivery complicated by placenta previa at a major obstetric care hospital in western Washington state between April 1, 1990 and December 31, 1992. Controls (n=622) were women with singleton deliveries not complicated by placenta previa or abruption. Odds ratios, determined by logistic regression, approximate the relative risks. …

Vacuum aspiration abortion was not associated with an increased risk of placenta previa (OR 0.9, 95% CI 0.6-1.5). **However, the risk of placenta previa increased with the number of sharp curettage abortions (OR 2.9, 95% CI 1.0-8.5 for > or =3).”**

[PubMed Summary] Johnson LG, Mueller BA, Daling JR, “The relationship of placenta previa and history of induced abortion.” International Journal of Gynaecology and Obstetrics, 2003 May;81 (2):191-8. Fred Hutchinson Cancer Research Center, Division of Public Health Sciences, Seattle, WA, USA

“**Placenta previa, placenta accreta, and vasa previa are important causes of bleeding in the second half of pregnancy and in labor. Risk factors for placenta previa include prior cesarean delivery, pregnancy termination,** intrauterine surgery, smoking, multifetal gestation, increasing parity, and maternal age. … The incidence of placenta accreta is rising, primarily because of the rise in cesarean delivery rates. This condition can be associated with massive blood loss at delivery. Prenatal diagnosis by imaging, followed by planning of peripartum management by a multidisciplinary team, may help reduce morbidity and mortality. Women known to have placenta accreta should be delivered by cesarean, and no attempt should be made to separate the placenta at the time of delivery. The majority of women with significant degrees of placenta accreta will require a hysterectomy.”

[PubMed Summary] Oyelese Y, Smulian JC, “Placenta previa, placenta accreta, and vasa previa,” Obstetrics and Gynecology, 2006 Apr;107 (4):927-41 Division of Maternal Fetal Medicine, Department of Obstetrics, Gynecology, and Reproductive Sciences, UMDNJ-Robert Wood Johnson Medical School, Robert Wood Johnson University Hospital

The study consisted of 20,296 women living in upstate New York who aborted their first pregnancy between July 1, 1970 and June 30, 1971. These aborting women were matched to al like number of controls, which were matched for “age, race, number of previous pregnancies, and socioeconomic status.” Possible confounding factors like smoking, birth control use, drug and alcohol intake and some other variables were not available for either the cases or controls. Almost 92% of the abortions were done in hospitals. Over 5% were done at less than 12 weeks gestation with 90% done at less than 18 weeks. Subsequent pregnancy outcomes are presented below for women aborting their first pregnancy to women who delivered their first pregnancy. (For this complication, there were an insufficient number of non whites to track.)

Complications of Labor for married or single (premature separation of the placenta, placenta previa, prolapse of the cord and contracted pelvis.) sorted by # with complications, # with no complications, percent with complications Table 47

Race	Live Birth 1st pregnancy	Abortion 1st pregnancy	First Pregnancy
White	**169/3,900 4.3%**	**161/1,048 13.0%**	582/5,671 9.1%
Non-White	**17/251 6.3%**	**12/157 7.1%**	81/673 10.7%

Vito M. Logrillo, Principal Investigator, “Effect of Induced Abortion on Subsequent Reproductive Function,” contract number NO1-6-2802, National Institutes of Health funded New York State Department of Health, Office of Biostatistics, Published April 18, 1980,.

“In Hungary, with 10 million inhabitants, the number of induced abortions in the 1960's first approached and then reached 200,000 cases annually. … According to a special survey conducted in Budapest in 1966, the overall morbidity rate was 41.6 per 1,000

abortions of which 0.9 was due to perforations, 22.7 to post-abortal hemorrhages, and 18.0 to inflammatory complications, i.e., early post-abortal complications had to be reckoned with in every 25th case. **Data in the present study suggest a correlation between induced abortions and the incidence of placenta previa, premature separation of the placenta,** and premature births."

[PubMed Summary] Bognar Z, Czeizel A, Mortality and morbidity associated with legal abortions in Hungary, 1960-1973, American Journal of Public Health. 1976 Jun;66 (6):568-75.

"This was a follow-up study during 1971 – 78 of women who had undergone abortion from 1970 – 74 in Hawaii. It was done by means of record linkage of 16,961 women identified 3,910 women who had one or more subsequent pregnancies who had a spontaneous fetal death or live birth. The control group consisted of 98,046 women which excluded repeat subsequent pregnancies of the same women. Hospital records for 3,589 women were used for comparison and data collection. There were no significant differences between the abortion and the control groups for rates of smoking, alcohol use and diabetes. The abortion had to be done in an accredited hospital and performed before viability. Labor complications were defined … as "placenta previa, abruptio placenta, other hemorrhage, pro-lapse of cords, breech presentation, other malpresentation, prolonged labor, and precipitate labor. … **the higher risk of labor complications for the abortion group proved to be unquestionable when parity was increased by 1 for the control group in the comparison."** (page 117) **For the pregnancy following a first pregnancy abortion, labor complications occurred more often in aborting women than in women who delivered their first child. Aborting women had 398 complications out of 3,327 pregnancies for a complication rate of 11.96%. Women who delivered had 2,826 complications out of 366,290 pregnancies for a complication rate of 7.79%."** (page 119)

[PubMed Summary] Chin Sk Chung, Patricia G. Steinhoff with Roy G. Smith and Ming-Pi Mi, The Effects of Induced Abortion on Subsequent Reproductive Function and Pregnancy Outcome: Hawaii, Papers of the East-West Population Institute, No. 86.

"This retrospective case-control study included a total of 202 singleton pregnancies with placenta previa during a 10-year study period and 1,004 randomly selected simple singleton controls. … The incidence of placenta previa was 0.4%. **Factors significantly associated with a placenta previa development were … history of previous cesarean sections (OR, 2.0; 95% CI, 1.17-3.44), abortions (OR, 2.8; 95% CI, 2.04-3.83),** and presence of various uterine abnormalities (OR, 8.5; 95% CI, 1.75-44.5). **The risk was significantly increased** after two previous cesarean sections (OR, 7.32; 95% CI, 2.1-25) and **after one previous abortion (OR, 4.8; 95% CI, 2.7-8.3).** … The main perinatal complication was preterm birth, with 14-fold higher risk in women with placenta previa. Preterm infants of mothers with placenta previa were more likely to have lower first- (6 vs 10, $p<0.001$) and fifth-minute median Apgar scores (8 vs 10, $p<0.045$). Term infants of mothers with placenta previa had significantly lower birth weight then their controls (3,300 vs 3,500 g, $p<0.001$)."

[PubMed Summary] Tuzovic L, Djelmis J, Ilijic M, "Obstetric risk factors associated with placenta previa development: case-control study," Croatian Medical Journal, 2003 Dec;44 (6):728-33. Department of Obstetrics and Gynecology, Zagreb University School of Medicine;

Medical Studies: Legal Abortion and Retained Placenta

"Both a prospective and a retrospective study were carried out to evaluate longterm consequences of a legally induced abortion. Data used for the study were taken from a WHO (World Health Organization) study of longterm sequelae of induced abortion. Both studies used Danish women and matched controls. **It was found that bleeding before 28 weeks of gestation and retention of placenta or placental tissue in subsequent pregnancies occurred more frequently in women who had previously experienced a legally induced abortion."**

[PubMed Summary] Obel EB, "Pregnancy complications following legally induced abortion," Acta Obstet Gynecol Scand. 1979;58 (5):485-90.

"The results of 6 original papers dealing with the sequelae of legally induced abortion are reviewed. This survey is based on 3 different sets of patient materials: all pregnant women living within the district of Frederiksberg, Copenhagen, Denmark for a period of 2 years … **The following were among the findings: 1) bleeding before 28 weeks of gestation was more frequent after a legally induced abortion than after a previous delivery as well as among women with no previous pregnancies; 2) retention of placenta or placental tissue was more frequent after a legally induced abortion than among women with no previous pregnancies;"**

[PubMed - Summary] Obel EB, "Long-term sequelae following legally induced abortion," Danish Medical Bulletin, 1980 Apr;27 (2):61-74.

"**A study of 576 pregnant women, whose previous pregnancy had been terminated by legally induced abortion, has shown that** … that more infants with a birth weight below 2501 grams were born to women whose cervical canal during abortion had been dilated more than 12 mm, and by women who had been submitted to recurettage. **The latter group also demonstrated a higher frequency of retained placenta or placental tissue**."

[PubMed Sumary] Obel E, "Pregnancy Complications Following Legally Induced Abortion with Special Reference to Abortion Technique," Acta Obstet Gynecol Scand. 1979;58 (2):147-52,

"The obstetric outcome of 285 women with a history of previous multiple induced abortions is compared to that of 285 age matched primigravidas. In the study group, 219 women had 2 previous induced abortions and 66 had 3 or more, the maximum number being 8. There was a higher incidence of unmarried women and smokers in this group but a lower incidence of uneducated women. There was no difference in the incidence of antenatal complications between the 2 groups. The mean gestation at delivery, duration of labour and mode of delivery were comparable. **There was an increased incidence (p less than 0.01) of retained placenta in the subgroup of women with 3 or more previous induced abortions."**

[PubMed Summary] Lopes A, King PA, Duthie SJ, To WK, Ma HK, "The impact of multiple induced abortions on the outcome of subsequent pregnancy." Australian New Zealand Journal of Obstetrics and Gynaecology, 1991 Feb;31 (1):41-3. Department of Obstetrics and Gynaecology, University of Hong Kong, Queen Mary Hospital.

"This study is based on three Danish national registries; the Medical Birth Registry, the Hospital Discharge Registry, and the Induced Abortion Registry. All primigravida women from 1980 to 1982 were identified in these three registries. A total of 15,727 women who terminated the pregnancy with a first trimester induced abortion were selected to the

abortion cohort, and 46,026 women who did not terminate the pregnancy with an induced abortion constituted the control cohort. By register linkage all subsequent pregnancies were identified from 1980 to 1994. Only women who had a non-terminated pregnancy following the index pregnancy were selected to the study. **… A slightly higher risk of placenta complications following an abortion was found. Retained placenta occurred more frequently in women with one, two or more previous abortions, compared with women without any previous abortion of similar gravidity.** Adjusting for maternal age and residence at time of pregnancy, the interpregnancy interval, and the number of previous miscarriages (control cohort only), the odds ratios of retained placenta in deliveries of singleton live births in women with one previous abortion was 1.17 (95%CI=1.02-1.35), and for women with two or more previous abortions it was 1.68 (95%CI=1.23-2.30), respectively, compared with the control cohort of similar gravidity. … **The findings suggest a positive association between abortions and retained placenta in subsequent singleton live births**, but the association was weak and confounding cannot be ruled out.

[PubMed Summary] Zhou W, Nielsen GL, Larsen H, Olsen J, "Induced abortion and placenta complications in the subsequent pregnancy," Acta Obstet Gynecol Scand. 2001 Dec;80 (12):1115-20.. Shanghai Institute of Planned Parenthood Research, Shanghai.

"The outcome of pregnancy was studied in 325 patients with an induced abortion in their previous pregnancy, together with 721 control patients. The patients were matched for age, parity and social class. Smoking and unplanned pregnancies were found to be more common among abortion patients than among the control patients. **As regards pregnancy complications, bleeding during pregnancy and placental retention were found to be significantly more common in the index group.** No statistical differences were noticed in gestation length, birthweight, rate of spontaneous abortion and perinatal mortality in the pregnancy following induced abortion as compared with control patients."

[PubMed Summary] Mandelin M, Karjalainen O, Pregnancy outcome after previous induced abortion, Ann Chir Gynaecol, 68 (5-6): 147-54 1979;

"**In the third stage of labour we must expect an increase of blood lost and placental retentions after preceded interruption**. An accumulation of manual detaching of placenta we ascertained for preceded abortion only."

[PubMed Summary] Knorre P, "Influence of abortions and interruptions of pregnancies on subsequent deliveries. III. After-labor-period and puerperium," Zentralbl Gynakol. 1976;98 (10):595-9 [Article in German]

"Complications of the third stage of vaginal delivery have been studied among 36,312 women in Aberdeen between 1967 and 1981. There was no change in the incidence of retained placenta (RP), but there was a secular increase in postpartum haemorrhage (PPH). **Postpartum haemorrhage was three times more common when there was a retained placenta.** PPH was commoner in primiparae and after induced labour. The main focus of this paper is on the analysis of the risks of repetition among 6615 women with two or three live births between 1967 and 1980. A history of PPH and/or RP increased the relative risks of PPH and/or RP in a subsequent birth by between two and four times compared with women without such a history. **The risk of repetition was increased if the subsequent birth was induced, or if there was an intervening abortion."**

[PubMed Summary] Hall MH, Halliwell R, Carr-Hill R, "Concomitant and repeated happenings of complications of the third stage of labour," Br J Obstet Gynaecol. 1985 Jul;92 (7):732-8.

The effects of previous induced abortion on pregnancy, labor and outcome of pregnancy were measured in a prospective study of 11,057 pregnancies to West Jerusalem mothers … The 752 mothers who reported one or more induced abortions in the past were more likely, at the same interview, to report bleeding in each of the first 3 months of the present pregnancy. **They were subsequently less likely to have a normal delivery and more of them needed a manual removal of the placenta or other intervention in the third stage of labor.** In births following induced abortions, the relative risk of early neonatal death was doubled, while late neonatal deaths showed a 3- to 4-fold increase.

[PubMed Summary] Harlap S, Davies AM, "Late sequelae of induced abortion: complications and outcome of pregnancy and labor," Am J Epidemiol. 1975 Sep;102 (3):217-24 PMID: 1163527

Medical Studies: Legal Abortion and Abruptio Placentae

"We analyzed interview and record review data from 9,823 deliveries to evaluate the relationship between prior history of induced abortion and subsequent late pregnancy outcomes. Complications such as bleeding in the first and third trimesters, abnormal presentations and premature rupture of the membranes, abruptio placentae, fetal distress, low birth weight, short gestation, and major malformations occurred more often among women with a history of two or more induced abortions. A logistic regression analysis to control for multiple confounding factors showed that **a history of one induced abortion was statistically significantly associated with first-trimester bleeding** but with no other untoward pregnancy events, **and a history of two or more induced abortions was statistically associated with first-trimester bleeding, abnormal presentations, and premature rupture of the membranes."**

[PubMed Summary] Linn S , Schoenbaum SC , Monson RR , Rosner B , Stubblefield PG, Ryan KJ, The relationship between induced abortion and outcome of subsequent pregnancies," American Journal of Obstetrics and Gynecology, 146 (2): 136-40 1983;

"We analyzed interview and record review data from 9,823 deliveries to evaluate the relationship between prior history of induced abortion and subsequent late pregnancy outcomes. **Complications such as bleeding in the first and third trimesters, abnormal presentations and premature rupture of the membranes, abruptio placentae, fetal distress, low birth weight, short gestation, and major malformations occurred more often among women with a history of two or more induced abortions.** A logistic regression analysis to control for multiple confounding factors showed that a history of one induced abortion was statistically significantly associated with first-trimester bleeding but with no other untoward pregnancy events, and a history of two or more induced abortions was statistically associated with first-trimester bleeding, abnormal presentations, and premature rupture of the membranes."

[PubMed Summary] Linn S , Schoenbaum SC , Monson RR , Rosner B , Stubblefield PG , Ryan KJ, "The relationship between induced abortion and outcome of subsequent pregnancies," American Journal of Obstetrics and Gynecology, 146(2): 136-40 1983;

Hypertension

Blood pressure is the pressure exerted by circulating blood on the walls of the arteries and veins. It is the result of the volume of blood, the contractions of the heart, and the

interaction of the arteries, veins. The Systolic pressure (higher figure) is measured the aorta and large arteries when the heart contracts, and the diastolic pressure (lower figure) is the period between contractions when blood enters the ventricles of the heart. Hypertension is elevated blood pressure exceeding 140 Systolic /90 mm.

Medical Studies: Legal Abortion and Hypertension

"The relation between pregnancy-induced hypertension and reproductive history was assessed in 29,484 women receiving obstetric care at Parkland Memorial Hospital**. The incidence of pregnancy-induced hypertension was 25.4% in primigravid women, somewhat lower (22.3%) in women whose only previous pregnancy terminated in abortion, and much lower (10%) in women who carried two or more successive pregnancies to viability." (There is no "protective" effect from hypertension from induced abortion, but there is from live birth.-The Authors)**

> [PubMed Summary] Strickland DM, Guzick DS, Cox K, Gant NF, Rosenfeld CR, "The relationship between abortion in the first pregnancy and development of pregnancy-induced hypertension in the subsequent pregnancy," American Journal of Obstetrics and Gynecology, 1986 Jan;154 (1):146-8.

"To assess maternal mortality in New York City, birth certificates and mortality records for New York City from 1988 through 1994 were linked and examined. During these 7 years, maternal mortality in New York City (defined by the International Classification of Diseases, 9th edition [ICD-9], as 630-676) per 100,000 live births significantly exceeded that of the country as a whole (20.2 vs. 8.2, respectively). … **the major factors explaining the excess maternal mortality among blacks were hypertension (mortality ratio of blacks to whites 5.57, 95% confidence interval 2.30-13.39), ectopic pregnancy (4.78, 95% confidence interval 2.40-9.51), and abortion (4.58, 95% confidence interval 1.72-12.22).** These findings confirm a persisting gap in maternal death between black and white women. Indeed, if all New Yorkers who became pregnant enjoyed the survival of the city's non-Hispanic white residents, the difference in maternal mortality between the city and the nation would be eliminated."

> [PubMed Summary] Fang J, Madhavan S, Alderman MH, "Maternal mortality in New York City: excess mortality of black women," Journal of Urban Health. 2000 Dec;77 (4):735-44 Department of Epidemiology and Social Medicine, Albert Einstein College of Medicine;

"A population-based, retrospective, cohort study was conducted based on 140,773 pregnancies delivered between 1993 and 1999 in 49 hospitals in northern and central Alberta, Canada. … The incidence of gestational hypertension was markedly lower in women who previously delivered at term than in primigravid women (2.4% vs. 5.6%) (adjusted OR [aOR]: .41 [.38-.44], $p < 0.001$). **The incidence of gestational hypertension in women with previous preterm birth but without prior abortion or term pregnancy was also lower than in primiparous women (3.9% vs. 5.6%)** (aOR: .72 [.54-.95], $p<0.05$). Moreover, there was a trend toward a decreased incidence of gestational hypertension among women with a longer duration of previous preterm gestation. Although there was a statistically significant decreased incidence of gestational hypertension in pregnancies in women with a previous history of abortion (4.9%) as compared to women without such a history (5.6%) (aOR:.85[95% CI: .77-.93], $p < 0.05$**), 2, 3 or more abortions were not associated with a decreased risk of gestational hypertension,** calling into question the clinical significance of the effect of abortion. **… a**

history of term pregnancy (> or =37 weeks) conveyed the most substantial protection against gestational hypertension in the subsequent pregnancy."

[PubMed Summary] Xiong X, Fraser WD, Demianczuk NN, "History of abortion, preterm and term birth, and risk of gestational hypertension: a population-based study," J Reprod Med. 2004 Nov;49(11):899-907

"The relation between pregnancy-induced hypertension and reproductive history was assessed in 29,484 women receiving obstetric care at Parkland Memorial Hospital. **The incidence of pregnancy-induced hypertension was 25.4% in primigravid women, somewhat lower (22.3%) in women whose only previous pregnancy terminated in abortion, and much lower (10%) in women who carried two or more successive pregnancies to viability."**

[PubMed Summary] Strickland DM, Guzick DS, Cox K, Gant NF, Rosenfeld CR, "The relationship between abortion in the first pregnancy and development of pregnancy-induced hypertension in the subsequent pregnancy," Am J Obstet Gynecol. 1986 Jan;154(1):146-8.

Legal Abortion: Eclampsia and Preeclampsia

Eclampsia is a severe form of pregnancy-induced hypertension which may involve grand mal seizure, coma and swelling. Signs of eclampsia include fever up to 104° F, severe headache, stomach pain, blurred vision. Complications can include brain and / or eye hemorrhage, liver problems, and fluid accumulation in the lungs. Preeclampsia (Toxemia of Pregnancy) is acute hypertension after the 24th week of pregnancy. It occurs in about 5-7% of pregnancies, most often in the first pregnancy.

A 2001 CDC study of pregnancy related deaths from 1979 to 1992 found that 790 of 4,024 maternal deaths (1.5 deaths/100,000 live births) in the US were due to eclampsia and preeclampsia. They noted that: "Black women were 3.1 times more likely to die from preeclampsia or eclampsia as white women. Women who had received no prenatal care had a higher risk of death from preeclampsia or eclampsia than women who had received any level of prenatal care." 22

And a University of Tennessee study found that, "Women with eclampsia who had preeclampsia in subsequent pregnancies had a higher incidence of chronic hypertension as compared with those who were normotensive (normal blood pressure-ed) in subsequent pregnancies (25% vs 2%, p less than 0.0001). Long-term maternal complications included dialysis required in one patient and one case of cardiomyopathy in women with chronic hypertension; there was one maternal death in a women with chronic hypertension." 23

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[22] MacKay AP, Berg CJ, Atrash HK, "Pregnancy-related mortality from preeclampsia and eclampsia," Obstetrics and Gynecology, 2001 Apr;97(4):533-8; Office of Analysis, Epidemiology, and Health Promotion, National Center for Health Statistics, Centers for Disease Control and Prevention, Hyattsville, Maryland

[23] Sibai BM, Sarinoglu C, Mercer BM, "Eclampsia. VII. Pregnancy outcome after eclampsia and long-term prognosis," American Journal of Obstetrics and Gynecology, 1992 Jun;166(6 Pt 1):1757-61; discussion 1761-3; Department of Obstetrics and Gynecology, University of Tennessee, Memphis.

If abortion really were safer for women than childbirth, complications in future pregnancies would be reduced after an abortion. But a British Study of almost 30,000 pregnancies over 11 years found that: "The incidence of proteinuric pre-eclampsia after early abortion (less than 13 weeks), either spontaneous or induced was similar to the population incidence in a first pregnancy … There was an effect of birthweight in that women who had proteinuric pre-eclampsia in conjunction with a low-birthweight baby (less than 2500 g) in their first pregnancy had double the incidence of proteinuric pre-eclampsia in their second pregnancy. Only a pregnancy of 37 weeks or more is likely to offer protection or 'immunity' to pre-eclampsia in a second pregnancy and even then the effect is moderated by the development of pre-eclampsia in the first pregnancy." 24

Studies of Abortion and Eclampsia-Preeclampsia

The study consisted of 20,296 women living in upstate New York who aborted their first pregnancy between July 1, 1970 and June 30, 1971. These aborting women were matched to al like number of controls, which were matched for "age, race, number of previous pregnancies, and socioeconomic status." Possible confounding factors like smoking, birth control use, drug and alcohol intake and some other variables were not available for either the cases or controls. Almost 92% of the abortions were done in hospitals. Over 5% were done at less than 12 weeks gestation with 90% done at less than 18 weeks. Subsequent pregnancy outcomes are presented below for women aborting their first pregnancy to women who delivered their first pregnancy. (For this complication, there were an insufficient number of non whites to track.)

Single Live Births – Second Pregnancy – Adverse Conditions in Pregnancy – pre-eclampsia [hypertension with excess protein in urea, swelling], eclampsia [convulsions after delivery not associated with cerebral hemorrhage or epilepsy], or abnormal uterine bleeding [Table 45]

Whites	% With Conditions Present
Live Birth 1st pregnancy	1.21%
Abortion 1st pregnancy	**2.62%**

Vito M. Logrillo, Principal Investigator, "Effect of Induced Abortion on Subsequent Reproductive Function," contract number NO1-6-2802, National Institutes of Health funded New York State Department of Health, Office of Biostatistics, Published April 18, 1980,.

"A total of 2947 healthy women with a single fetus were prospectively followed up from randomization at 13 to 27 weeks' gestation to the end of pregnancy. Of these, 1465 women were assigned to low-dose aspirin and 1482 to placebo. … Preeclampsia developed in 156 women (5.3%). **Four characteristics predicted the development of preeclampsia: in order of importance, systolic blood pressure at entry, prepregnancy obesity (weight as a percentage of desirable weight), number of previous abortions** or miscarriages, and smoking history. … These risk factors should be of value to practitioners counseling women regarding preeclampsia. Moreover, such risk factors should be considered in the design of future studies dealing with preeclampsia."

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[24] Campbell DM, MacGillivray I, Carr-Hill R, "Pre-eclampsia in second pregnancy," British Journal of Obstetrics and Gynaecology, 1985 Feb;92(2):131-40.

[PubMed Summary] "Risk factors for preeclampsia in healthy nulliparous women: a prospective multicenter study." The National Institute of Child Health and Human Development Network of Maternal-Fetal Medicine Units, Sibai BM, Gordon T, Thom E, Caritis SN, Klebanoff M, McNellis D, Paul RH, American Journal of Obstetrics and Gynecology, 172(2 Pt 1): 642-8 1995;

"The Statewide Perinatal Survey of Bavaria is a collection of perinatal data from all Bavarian maternity units … Data on 106345 singleton births from the 1994 Survey were analysed … **In the multivariate analysis, early preterm birth was associated with premature rupture of the membranes … (OR) 1.6, 95% confidence interval … previous induced abortion (OR 1.8, 95% CI 1.57-2.13**) … premature cervical dilatation (OR 2.3, 95% CI 1.86-2.94) … preeclampsia (OR 4.0, 95% CI 3.20-4.94) … These data identify a subgroup of women at an increased risk for early preterm birth and may benefit from an intensified prenatal care."

[PubMed Summary] Martius JA, Steck T, Oehler MK, Wulf KH, "Risk factors associated with preterm (<37+0 weeks) and early preterm birth (<32+0 weeks): univariate and multivariate analysis of 106 345 singleton births from the 1994 statewide perinatal survey of Bavaria," European Journal of Obstetrics, Gynecology, and Reproductive Biology, 1998 Oct;80(2):183-9. Department of Obstetrics and Gynecology, University of Wurzburg, Germany.

"**A prior birth confers a strong protective effect against preeclampsia, whereas a prior abortion confers a weaker protective effect.** Parous (live birth-ed) women who change partners in a subsequent pregnancy appear to lose the protective effect of a prior birth. … Subjects were nulliparous (no live births-ed), had one prior pregnancy or less, delivered after 20 weeks' gestation … Women without a history of abortion served as the reference group in logistic regression analyses. Women with a history of abortion who conceived again with the same partner had nearly half the risk of preeclampsia (adjusted odds ratio = 0.54, 95 percent confidence interval: 0.31, 0.97). In contrast, **women with an abortion history who conceived with a new partner had the same risk of preeclampsia as women without a history of abortion (adjusted odds ratio = 1.03, 95 percent confidence interval: 0.72, 1.47).** Thus, the protective effect of a prior abortion operated only among women who conceived again with the same partner."

[PubMed – Summary] Saftlas AF, Levine RJ, Klebanoff MA, Martz KL, Ewell MG, Morris CD, Sibai BM, "Abortion, changed paternity, and risk of preeclampsia in nulliparous women," American Journal of Epidemiology, 2003 Jun 15;157(12):1108-14. Department of Epidemiology, University of Iowa College of Public Health.

A National Institute of Health funded study conducted by the State University of New York, Downstate Medical Center at Stony Brook. Long Island of 2,409 women who had prenatal care for a delivery or other pregnancy outcome. Five hundred women had one or more previous induced abortions, and 1,889 did not. African Americans comprised 77.3% of the abortion group. Pregnant women were excluded from the study if the were wearing an IUD, had diabetes, multiple births, drug addiction, or syphilis. The comparison consisted of 455 women who aborted their first pregnancy, and 800 women whose first pregnancy was a live birth delivered at term.
Women aborting their first pregnancy had eclampsia 5.1% (crude rate), as contrasted to 1.6% (crude rate) for women whose first pregnancy was a live birth. The adjusted odds ratio for eclampsia was 2.15 times greater for women abortion verses women delivering their first pregnancy. [page 46]

Table 22 Eclampsia by Previous Pregnancy Outcome (page 46)

Group	Sample Size	Incidence	Crude Rate %
OPPAB	**455**	**23**	**5.1%**
OPPLB	**800**	**13**	**1.6%**
NPP	909	52	5.7%
APPAB	**65**	**6**	**9.2%**
OPPBAD	180	15	8.3%

Glossary: OPPLB (only previous pregnancy live birth); OPPAB (only previous pregnancy abortion); OPPBAD (only previous pregnancy bad outcome i.e., spontaneous abortion or stillbirth); NPP (no previous pregnancy); APPAB (all previous 2-3 pregnancies aborted)

Outcome of Pregnancy Subsequent to Previous Induced Abortion," NICHD Contract No. NO1-HD-6-2803, Final Report January, 1981. Raymond C. Lerner, PhD, MPH., Project Director; Andre O. Varma, MD, MS, Co-Principal Ivestigator.

"The incidence of preeclampsia in 1st term pregnancies was studied in relation to whether or not they were preceded by pregnancies which ended in abortion--spontaneous or induced. 220 patients with previous abortion were studied along with 2 sets of controls, 1 with no previous abortion or pregnancy and 1 with a 2nd term pregnancy. **The incidence of preeclampsia was significantly lower than there had been a previous induced abortion but this was not as low as in cases with a 2nd term pregnancy. This finding may be interpreted as supporting the idea that pregnancy exerts a protective effect against the risk of preeclampsia which may have an immunological basis."**

[PubMed – Summary] Beck I, "Incidence of pre-eclampsia in first full-term pregnancies preceded by abortion," Journal of Obstetrics and Gynaecology, 1985 Oct;6(2):82-4.

"A population-based retrospective cohort study was conducted that was based on 140,773 pregnancies that had delivered between 1993 and 1999 in 49 hospitals in Northern and Central Alberta, Canada. … No significant difference was found in the incidence of preeclampsia in nulliparous women with previous abortion (2.6%) as compared to nulliparous women without previous abortion (2.9% … **However, 2 and > or =3 abortions were not associated with a decreased risk of preeclampsia.** … The incidence of preeclampsia was markedly lower in multiparous women who previously delivered at term (0.9%) as compared to the incidence in primigravida women (2.9%; adjusted odds ratio, 0.29; 95% confidence interval, 0.26-0.33; P <.001). The adjusted odds ratios of preeclampsia for women with 1, 2, 3, and > or =4 previous term pregnancies were 0.32 … 0.27 … 0.22 … and 0.21 … **A history of term pregnancy (> or =37 weeks) conveys a substantial "protection" against preeclampsia in the subsequent pregnancy."**

[PubMed – Summary] Xiong X, Fraser WD, Demianczuk NN, "History of abortion, preterm, term birth, and risk of preeclampsia: a population-based study," American Joournal of Obstetrics and Gynecology, 2002 Oct;187(4):1013-8 Department of Obstetrics and Gynecology, Laval University, Quebec City, Quebec, Canada

Incompetent Cervix

Incompetent cervix is a condition where the cervix is weakened because it has been dilated or expanded artificially before normal childbirth without accompanying labor or pending childbirth. "The cause of cervical incontinence is due to trauma to the cervix resulting from

injury during childbirth, mechanical dilation, or surgery." 25 Removal of a child from the womb during abortion is preceded by the dilation or the widening of the cervix.

Rapid or slow dilation of the cervix before abortion each has its own problems. A Swedish study found that, "Abortion in the late stages of the first trimester should not be considered a totally simple and harmless procedure. The rapid mechanical dilatation of the cervix is traumatic. A laminaria tent for slow dilatation produces an increased infection risk." 26

Studies of Legal Abortion and Incompetent Cervix

"In a study of 104 patients undergoing first-trimester abortion a fall in resistance was found in 12.5% of women in whom the cervix was dilated to 9 mm, and in 66.7% when dilatation reached 11 mm. … Physicians used as electronic force monitor to measure cervical resistance to dilatation in 104 pregnant women (gestation = or 12 weeks) who came to Danderyd Hospital in Danderyd, Sweden to undergo vacuum aspiration to induce abortion. … 61 women had children and 43 women had no children**. Patients who dilated to 11 mm had a significantly higher risk of fall in resistance (indicative of a cervical tear of more than 2 mm) than those dilated to 9 mm (66.7% vs. 12.5%).** The frequency of fall in resistance was essentially the same for both nulliparous and parous women. … The researchers did not know the clinical significance of a tear in the cervix, but **some studies showed that women with a previous first-trimester abortion were at increased risk of second-trimester miscarriage and preterm delivery.** … A wide cervical os has been linked to cervical incompetence."

> [PubMed Summary] Molin A, "Risk of damage to the cervix by dilatation for first-trimester-induced abortion by suction aspiration," Gynecol Obstet Invest. 1993;35(3):152-4, Department of Obstetrics and Gynaecology, Karolinska Institutet, Danderyd Hospital, Sweden.

"**Therapeutic termination of pregnancy performed during the first trimester was associated with a statistically significant increase in the incidence of second trimester abortion and of premature labour in the next pregnancy. In a series of 520 patients who had previously been aborted 8.1% suffered a mid-trimester abortion in their next pregnancy and 8.6% had premature onset of labour (compared to 2.4% (P less than 0.001) and 4.4% (P less than 0.01) respectively in a control series). The incidence of incompetence of the cervix after termination of pregnancy was 4.4%.** … 520 consecutive patients from the Mercy Maternity Hospital and Royal Women's Hospital in Melbourne who had had vaginal termination of a first trimester pregnancy comprised the study group. 500 consecutive patients who had had spontaneous abortion (1st trimester) treated by curettage comprised the control group. … An unexpected result was that a previous mature pregnancy did not protect against complications after pregnancy termination. **It appears that dilatation of the cervix physiologically during normal labor and delivery to a diameter of 10 cm. is more beneficial to cervical function in a subsequent pregnancy than dilatation to 10 mm. before therapeutic abortion of a 1st**

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[25] Broso RP, Garrone C "Cervix incompetence," Minerva Ginecol. 1997 Jul-Aug;49(7-8):329-33, [Article in Italian] Divisione di Ostetricia e Ginecologia

[26] Moberg P, Sjoberg B, Wiqvist N, "The hazards of vacuum aspiration in late first trimester abortions," Acta Obstet Gynecol Scand. 1975;54(2):113-8. [PubMed Summary]

trimester pregnancy. The finding suggests that patients contemplating pregnancy terminations must be told of risk of cervical incompetence; their future obstetricians must also be informed of any abortion performed.

[PubMed Summary] Ratten GJ, Beischer NA, "The effect of termination of pregnancy on maturity of subsequent pregnancy," Medical Journal of Australia, 1979 Jun 2;1(11):479-80

. "**A retrospective study of irregularities in childbirth among 7671 primiparae is presented. 356 of the patients had previously undergone induced abortion. The rate of underweight infants was 13.92% for the children of women who had undergone induced abortion and 7.90% for those who hadn't**. There was also a highly significant increase in the incidence of cervical insufficiency, abortus imminens, and delivery with Shute-forceps among women who had undergone induced abortion. **A shortened pregnancy duration, an increased need for cerclage, and stationary and ambulant morbidity were also significantly more frequent among the abortion patients. Induced abortion involves a health risk during subsequent pregnancies, and the physician must inform his patient of this fact."**

[PubMed Sumary] Grindel B, Zwahr C, Lubinski H, Voigt M, "Induced abortion in primigravidae and subsequent pregnancy, with particular consideration of underweight," Zentralbl Gynakol. 1979;101(16):1009-14, [Article in German]

"Out of a total of 3502 deliveries over a period of two years 254 patients (7.25%) had a surgical closure of the cervix according to Shirodkar because of cervical incompetence. … In the group with Shirodkar operation the percentage of women with a history of spontaneous or induced abortions was almost twice as high as in the comparison group. The reason for the development of cervical incompetence could be a trauma to the endocervix due to mechanical dilatation since diagnostic or therapeutic dilatation and curettage was found five times more often in women with Shirodkar operation than in patients without cervical incompetence. The results show that dilatation and curettage for any indication should be performed as carefully as possible, especially in younger women of childbearing age."

[PubMed Summary] Grunberger W, Riss P, "Cervical incompetence after previous cervical dilatation and curettage," Wien Med Wochenschr. 1979 Jul 15;129(14):390-2. [Article in German]

"The diameter of the internal cervical os was measured in several groups of patients in an attempt to assess any damage caused by suction termination of pregnancy. **Pregnant women who had had a previous abortion by vacuum aspiration had significantly greater cervical diameters than those who had not,** and there was a statistically significant correlation between dilatation of the cervix at operation and cervical diameter at six weeks' follow-up. Cervical dilatation to 10 mm or less was subsequently associated with a normal cervical diameter, but the diameter was often large when the extent of dilatation was greater than 12 mm or not known. Cervical dilatation at termination of pregnancy should, if possible not exceed 10 mm."

[PubMed Summary] Johnstone FD, Beard RJ, Boyd IE, McCarthy TG, "Cervical diameter after suction termination of pregnancy," British Medical Journal 1976 Jan 10;1(6001):68-9

"The Statewide Perinatal Survey of Bavaria is a collection of perinatal data from all Bavarian maternity units … Data on 106345 singleton births from the 1994 Survey were analysed **… In the multivariate analysis, early preterm birth was associated with**

premature rupture of the membranes … (OR) 1.6, 95% confidence interval … previous induced abortion (OR 1.8, 95% CI 1.57-2.13) … premature cervical dilatation (OR 2.3, 95% CI 1.86-2.94) … preeclampsia (OR 4.0, 95% CI 3.20-4.94) … These data identify a subgroup of women at an increased risk for early preterm birth and may benefit from an intensified prenatal care."

> [PubMed Summary] Martius JA, Steck T, Oehler MK, Wulf KH, "Risk factors associated with preterm (<37+0 weeks) and early preterm birth (<32+0 weeks): univariate and multivariate analysis of 106 345 singleton births from the 1994 statewide perinatal survey of Bavaria," European Journal of Obstetrics, Gynecology, and Reproductive Biology, 1998 Oct;80(2):183-9.

Premature Rupture of Membranes

Premature rupture of the membranes occurs when the amniotic sac containing the pre-born child ruptures before normal delivery. The cause of premature rupture of the membranes (PROM) has been associated with "increased frequencies of previous genital operations, cervical operations and lacerations were found in the PROM group, which also contained significantly more heavy smokers." 27

Premature rupture of membranes can be lethal to children. A review of 53 pregnancies with premature rupture of membranes at 16 to 25 weeks gestation found that, "Forty-one percent of patients developed amnionitis, four had prolonged hospital stays (longer than seven days), and one each had sepsis and pelvic thrombophlebitis. Twenty-two mothers (41%) had no complications. … Eighteen patients were delivered after 26 weeks, and there were 13 surviving neonates with birth weights ranging from 740 to 2170 g." 28

Studies of Legal Abortion and Premature Rupture of Membranes

"We analyzed interview and record review data from 9,823 deliveries to evaluate the relationship between prior history of induced abortion and subsequent late pregnancy outcomes. **Complications such as bleeding in the first and third trimesters, abnormal presentations and premature rupture of the membranes, abruptio placentae, fetal distress, low birth weight, short gestation, and major malformations occurred more often among women with a history of two or more induced abortions.** A logistic regression analysis to control for multiple confounding factors showed that a history of one induced abortion was statistically significantly associated with first-trimester bleeding but with no other untoward pregnancy events, and a history of two or more induced abortions was statistically associated with first-trimester bleeding, abnormal presentations, and premature rupture of the membranes."

> [PubMed Summary] Linn S , Schoenbaum SC , Monson RR , Rosner B , Stubblefield PG, Ryan KJ, "The relationship between induced abortion and outcome of subsequent pregnancies," American Journal of Obstetrics and Gynecology, 146(2): 136-40 1983;

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27 Evaldson G, Lagrelius A, Winiarski J, "Premature rupture of the membranes," Acta Obstet Gynecol Scand. 1980;59(5):385-93.

28 Taylor J, Garite TJ, "Premature rupture of membranes before fetal viability," Obstetrics and Gynecology, 1984 Nov;64(5):615-20

"Women with intact membranes participating in a National Institute of Child Health and Human Development multicenter randomized trial of adjunctive antibiotic therapy for preterm labor (24 to 34 weeks) were studied (n = 275). … 253 women whose contractions had ceased composed our study population. Preterm premature rupture of the membranes was diagnosed if ruptured membranes occurred > or = 1 hour before the onset of recurrent preterm labor. As part of the study protocol, most women underwent amniocentesis on admission. … **Preterm premature rupture of the membranes developed in 44% women (17.4%). Women who had preterm premature rupture of the membranes were more likely to be black (p = 0.004), to be multiparous (p = 0.014), to have a history of abortion(s)** (p = 0.001), to have had a preterm birth(s) (p = 0.036), to have early onset preterm labor (p = 0.04), to have more advanced cervical dilatation (p = 0.0001)…"

[PubMed Summary] Guinn DA, Goldenberg RL, Hauth JC, Andrews WW, Thom E, Romero R, "Risk Factors for the Development of Preterm Premature Rupture of the Membranes After Arrest of preterm labor," American Journal of Obstetrics and Gynecology, 1995 Oct;173(4):1310-5. Department of Obstetrics and Gynecology, University of Alabama.

"We used data from a case-control survey, the EUROPOP study; 2938 preterm births and 4781 controls at term from ten European countries were included. Based on national statistics, we distinguished three groups of countries with high, intermediate and low rates of induced abortion. … **Previous induced abortions were significantly associated with preterm delivery and the risk of preterm birth increased with the number of abortions. …** The extent of association with previous induced abortion varied according to the cause of preterm delivery. Previous induced abortions significantly increased the risk of preterm delivery after idiopathic preterm labour, preterm premature rupture of membranes and ante-partum haemorrhage … The strength of the association increased with decreasing gestational age at birth."

[PubMed Summary] Human Reproduction, 2004 Mar;19(3):734-40. Epub 2004 Jan 29. Ancel PY, Lelong N, Papiernik E, Saurel-Cubizolles MJ, Kaminski M, "History of induced abortion as a risk factor for preterm birth in European countries: results of the EUROPOP survey," EUROPOP. Epidemiological Research Unit on Perinatal and Women's Health, INSERM

"We analyzed interview and record review data from 9,823 deliveries to evaluate the relationship between prior history of induced abortion and subsequent late pregnancy outcomes. Complications such as bleeding in the first and third trimesters, abnormal presentations and premature rupture of the membranes … occurred more often among women with a history of two or more induced abortions. A logistic regression analysis to control for multiple confounding factors showed that **a history of one induced abortion was statistically significantly associated with first-trimester bleeding** but with no other untoward pregnancy events, and **a history of two or more induced abortions was statistically associated with first-trimester bleeding, abnormal presentations, and premature rupture of the membranes."**

[PubMed Summary] Linn S , Schoenbaum SC , Monson RR , Rosner B , Stubblefield PG, Ryan KJ, "The relationship between induced abortion and outcome of subsequent pregnancies," American Journal of Obstetrics and Gynecology, 146(2): 136-40 1983;

A National Institute of Health funded study conducted by the State University of New York, Downstate Medical Center at Stony Brook. Long Island of 2,409 women who had prenatal care for a delivery or other pregnancy outcome. Five hundred women had one or more previous induced abortions, and 1,889 did not. African Americans comprised 77.3%

of the abortion group. Pregnant women were excluded from the study if the were wearing an IUD, had diabetes, multiple births, drug addiction, or syphilis. The comparison consisted of 455 women who aborted their first pregnancy, and 800 women whose first pregnancy was a live birth delivered at term.
Premature rupture of membranes occurred in 13.6% [crude rate] for women aborting their first pregnancy, verses 7.5% [crude rate] for women whose first pregnancy was a live birth. The adjusted odds ratio was for premature rupture of membranes was 1.51 times greater for aborting women verses women delivering. [page 48]
Table 26 Premature Rupture of Membranes

Group	Sample Size	Incidence	Crude Rate %
OPPAB	**455**	**62**	**13.6%**
OPPLB	800	60	7.5%
NPP	909	127	14.0%
APPAB	**65**	**6**	**16.9%**
OPPBAD	180	31	17.2%

Glossary: OPPLB (only previous pregnancy live birth); OPPAB (only previous pregnancy abortion); OPPBAD (only previous pregnancy bad outcome i.e., spontaneous abortion or stillbirth); NPP (no previous pregnancy); APPAB (all previous 2-3 pregnancies aborted)
Outcome of Pregnancy Subsequent to Previous Induced Abortion," NICHD Contract No. NO1-HD-6-2803, Final Report January, 1981. Raymond C. Lerner, PhD, MPH., Project Director; Andre O. Varma, MD, MS, Co-Principal Ivestigator.

"37 women, who had legal abortions of their 1st pregnancies, were compared with a group of 133 who had spontaneous abortions before the 28th week, and a group of 129 who delivered their 1st pregnancy. **The legal abortion group showed 3 ectopic pregnancies, while the other 2 groups showed none. Those who delivered their 1st pregnancy showed the best reproductive function … The artificial group showed the highest rate of late spontaneous abortion and premature delivery**. There was a decline in the reproductive function of the artificial abortion group in the 3rd and 4th pregnancies, and an increase in the rate of late abortion. **This group also showed an increased rate of spontaneous primary and premature rupture of the membranes and a trend toward lower newborn weight.**"

[PubMed Summary] Koller O, Eikhom SN, "Late sequelae of induced abortion in primigravidae. The outcome of the subsequent pregnancies," Acta Obstet Gynecol Scand. 1977;56(4):311-7.

"Causes of premature rupture of the fetal membranes were explored in a study of 25,820 pregnancies. … **The following maternal factors had a positive association with premature ruptures:** advanced maternal age, non-white race, multiparity, instrumentation of the cervix prior to pregnancy, cigarette smoking**, incompetent cervix**, low pregnancy weight gain, and recent coitus."

[PubMed Summary] Flood B, Naeye RL, "Factors that predispose to premature rupture of the fetal membranes," JOGN Nurs. 1984 Mar-Apr;13(2):119-22.

"Patients who had surgical abortion at > or = 20 weeks' gestation from 1996 to 2003 and received subsequent prenatal care at The New York Weill Cornell Medical Center were identified. … One hundred and twenty pregnancies in 89 women were identified. Thirteen (10.8%) ended with early miscarriage, and 5 were electively terminated. Of the remaining 102 pregnancies, 7 ended with spontaneous preterm birth. **Those who experienced**

preterm birth were more likely to have undergone abortion due to cervical dilation and/or preterm premature rupture of membranes (PPROM) (27.3% vs 4.4%; P = .03). Those with a multifetal pregnancy in the subsequent pregnancy were more likely to have preterm birth (75.0% vs 4.3%; P < .001)."

[PubMed Summary] Chasen ST, Kalish RB, Gupta M, Kaufman J, Chervenak FA, "Obstetric outcomes after surgical abortion at > or = 20 weeks' gestation," American Journal of Obstetrics and Gynecology, 2005 Sep;193(3 Pt 2):1161-4. Division of Maternal-Fetal Medicine, Weill Medical College of Cornell University.

Prolonged Labor

Birth labor is usually longer in first deliveries than subsequent deliveries. Prolonged labor is labor that lasts over twenty four hours and occurs more often in first births. It usually is the result of inadequate uterine contractions, slow dilation of the cervix, or both.

Studies on Legal Abortion and Prolonged Labor

"We included in the study all 1363 women who had a singleton vaginal live birth. Of these women, 703 were primigravida (non-exposed), 534 had had one previous first trimester induced abortion, and 126 women had had two or more first trimester induced abortions. The duration of third stage labour in minutes was longer in women with one or more previous induced abortions (mean=7.32 minutes) compared with primigravid women (mean=6.79 minutes). Prolonged third stage labour (>30 minutes) following one or more induced abortions was seen for 3.4% versus 1.0% in primigravid women. **After adjusting for a number of potential confounders, women with one or more previous first trimester induced abortions had an odds ratio of prolonged third stage labour of 2.59 (95%C.I.=1.06-6.37) compared with primigravida,** especially after an interpregnancy interval of more than 6 months (OR=3.24, 95%C.I.=1.29-8.13). The odds ratio of prolonged third stage labour was 3.14 (95%C.I.=1.22-8.09) if gestational age at the time of the induced abortion exceeded 49 days. … **It was concluded that a history of one or more first trimester induced abortions was related to an increased risk of prolonged third stage labour in the following pregnancy, particularly if the induced abortion was performed after 49 days of gestation**."

[PubMed Suary] Zhou W, Gao E, Che Y, Olsen J, "Induced abortion and duration of third stage labour in a subsequent pregnancy," Journal of Obstetrics and Gynaecology, 1999 Jul;19(4):349-54, Shanghai Institute of Planned Parenthood Research, People's Republic of China.

A National Institute of Health funded study conducted by the State University of New York, Downstate Medical Center at Stony Brook. Long Island of 2,409 women who had prenatal care for a delivery or other pregnancy outcome. Five hundred women had one or more previous induced abortions, and 1,889 did not. African Americans comprised 77.3% of the abortion group. Pregnant women were excluded from the study if the were wearing an IUD, had diabetes, multiple births, drug addiction, or syphilis. The comparison consisted of 455 women who aborted their first pregnancy, and 800 women whose first pregnancy was a live birth delivered at term.
Prolonged labor in women aborting their first pregnancy was 2.9% (crude rate) verses 0.8% (crude rate) for women delivering their first child. The adjusted odds

ratio for prolonged labor was 2.10 times for women aborting verses women delivering. [page 50]

Table 28 Prolonged Labor (page 50)

Group	Sample Size	Incidence	Crude Rate %
OPPAB	**455**	**13**	**2.9%**
OPPLB	800	6	0.8%
NPP	909	18	2.0%
APPAB	**65**	**3**	**4.6%**
OPPBAD	180	5	2.8%

Glossary: OPPLB (only previous pregnancy live birth); OPPAB (only previous pregnancy abortion); OPPBAD (only previous pregnancy bad outcome i.e., spontaneous abortion or stillbirth); NPP (no previous pregnancy); APPAB (all previous 2-3 pregnancies aborted)
Outcome of Pregnancy Subsequent to Previous Induced Abortion," NICHD Contract No. NO1-HD-6-2803, Final Report January, 1981. Raymond C. Lerner, PhD, MPH., Project Director; Andre O. Varma, MD, MS, Co-Principal Ivestigator.

"The course of pregnancy, labour and puerperium was analysed in 170 women in labour after previous artificially interrupted pregnancy. They were compared with a group of 96 women in first labour. **The women in labour after artificial abortion were older, had during pregnancy more frequently bleeding, gestosis, urinary tract infection. Labour, especially the stages of fetus expulsion and placenta expulsion lasted longer, and blood loss was greater.** Postnatal complications were more frequent. No significant differences in the condition of the newborn were noted."

[PubMed Summary] Krasnodebski J, Potepa M, Rajda M, "Pregnancy and labor after artificial abortion," Wiad Lek. 1989 Jun 15;42(12):794-9, [Article in Polish]

"The obstetrical outcome of 357 pregnancies complicated by "spurious" labour was documented and compared with that in a control group. **Patients with spurious labour were more likely to have had a spontaneous or induced abortion in the preceding pregnancy. In almost 85% of patients,** the painful uterine contractions had ceased within 1 hour of hospital admission and there was no increased fetal morbidity in this group. There was a significantly increased incidence of meconium-stained liquor in patients who continued to have painful uterine contractions, but in whom labour did not ensue. Placental abnormalities were significantly more common in patients with spurious labour."

[PubMed Summary] Quinn MA, Murphy AJ, Gallagher J, "Spurious" labour - does it matter?" Aust N Z J Obstet Gynaecol. 1981 Aug;21 (3):167-9

Bleeding in Pregnancy

Two of the most prevelant causes of bleeding during early pregnancy are spontaneous abortion and ectopic pregnancy. During the middle and late stages of pregnancy, abnormalities of the placenta (placenta previa or abruption placenta) can cause bleeding. And wounds or injuries to the vagina and cervix can cause bleeding at any stage of pregnancy.

Studies on Legal Abortion and Uterine Bleeding

"We reviewed 1791 singleton pregnancies of women with a history of previous induced abortion and compared them with 14,857 pregnancies in mothers with no previous induced abortions. **Therapeutic termination of pregnancy was associated with a statistically significant increase in the incidence of low birth weight infants and bleeding in the first trimester of pregnancy."**

[PubMed Summary] Seidman DS, Ever-Hadani P, Slater PE, Harlap S, Stevenson DK, Gale R, "Child-bearing after induced abortion: reassessment of risk," Epidemiol Community Health. 1988 Sep;42(3):294-8. Department of Neonatology, Bikur Cholim Hospital, Jerusalem.

"The results of 6 original papers dealing with the sequelae of legally induced abortion are reviewed. This survey is based on 3 different sets of patient materials: all pregnant women living within the district of Frederiksberg, Copenhagen, Denmark for a period of 2 years; all pregnant women registered for delivery at the Rigshospitalet and the Frederiksberg Hospital, Copenhagen, Denmark for the April 1, 1974-December 31, 1975 period; and all women who had delivered at the Maternity Ward YA at the Rigshospitalet, Copenhagen, Denmark during the April 1, 1967-March 31, 1973 period. **The following were among the findings: 1) bleeding before 28 weeks of gestation was more frequent after a legally induced abortion than after a previous delivery as well as among women with no previous pregnancies; 2) retention of placenta or placental tissue was more frequent after a legally induced abortion than among women with no previous pregnancies."**

[PubMed Summary] Obel EB, "Long-term sequelae following legally induced abortion," Danish Medical Bulletin, 1980 Apr;27(2):61-74

"The Statewide Perinatal Survey of Bavaria is a collection of perinatal data from all Bavarian maternity units using a uniform numbered questionnaire. Data on 106345 singleton births from the 1994 Survey were analysed … **early preterm birth was associated with premature rupture of the membranes (odds ratio (OR) 1.6, 95% … previous induced abortion (OR 1.8, 95% … preeclampsia (OR 4.0, 95% … uterine bleeding (OR 5.0, 95%** …"

[PubMed Summary] Martius JA, Steck T, Oehler MK, Wulf KH, "Risk factors associated with preterm (<37+0 weeks) and early preterm birth (<32+0 weeks): Univariate and multivariate analysis of 106,345 singleton births from the 1994 statewide perinatal survey of Bavaria," European Journal of Obstetrics, Gynecology and Reproductive Biollogy, 1998 Oct;80(2):183-9, Department of Obstetrics and Gynecology, University of Wurzburg, Germany.

The study consisted of 20,296 women living in upstate New York who aborted their first pregnancy between July 1, 1970 and June 30, 1971. These aborting women were matched to al like number of controls, which were matched for "age, race, number of previous pregnancies, and socioeconomic status." Possible confounding factors like smoking, birth control use, drug and alcohol intake and some other variables were not available for either the cases or controls. Almost 92% of the abortions were done in hospitals. Over 5% were done at less than 12 weeks gestation with 90% done at less than 18 weeks. Subsequent pregnancy outcomes are presented below for women aborting their first pregnancy to women who delivered their first pregnancy. (For this complication, there were an insufficient number of non whites to track.)

Single Live Births – Second Pregnancy – Adverse Conditions in Pregnancy – pre-eclampsia [hypertension with excess protein in urea, swelling], eclampsia [convulsions after delivery not

associated with cerebral hemorrhage or epilepsy], or abnormal uterine bleeding [Table 45] (Insufficient number of non whites)

Whites	% With Conditions Present
Live Birth 1st pregnancy	1.21%
Abortion 1st pregnancy	**2.62%**

Vito M. Logrillo, Principal Investigator, "Effect of Induced Abortion on Subsequent Reproductive Function," contract number NO1-6-2802, National Institutes of Health funded New York State Department of Health, Office of Biostatistics, Published April 18, 1980,.

"The effects of previous induced abortion on pregnancy, labor and outcome of pregnancy were measured in a prospective study of 11,057 pregnancies to West Jerusalem mothers … The 752 mothers who reported one or more induced abortions in the past were more likely, at the same interview, to report bleeding in each of the first 3 months of the present pregnancy. **They were subsequently less likely to have a normal delivery and more of them needed a manual removal of the placenta or other intervention in the third stage of labor."**

[PubMed Summary] Harlap S, Davies AM, "Late sequelae of induced abortion: complications and outcome of pregnancy and labor," American Journal of Epidemiology, 1975 Sep;102(3):217-24.

"We analyzed interview and record review data from 9,823 deliveries to evaluate the relationship between prior history of induced abortion and subsequent late pregnancy outcomes. **Complications such as bleeding in the first and third trimesters, abnormal presentations and premature rupture of the membranes, abruptio placentae, fetal distress, low birth weight, short gestation, and major malformations occurred more often among women with a history of two or more induced abortions.** A logistic regression analysis to control for multiple confounding factors showed that a history of one induced abortion was statistically significantly associated with first-trimester bleeding but with no other untoward pregnancy events, and **a history of two or more induced abortions was statistically associated with first-trimester bleeding, abnormal presentations, and premature rupture of the membranes."**

[PubMed Summary] Linn S , Schoenbaum SC , Monson RR , Rosner B , Stubblefield PG, Ryan KJ, "The relationship between induced abortion and outcome of subsequent pregnancies," American Journal of Obstetrics and Gynecology, 146(2): 136-40 1983;

"A case-control study of the epidemiology of preterm delivery was undertaken at Yale-New Haven Hospital in Connecticut during 1977. The study population consisted of 175 mothers of singleton preterm infants and 313 mothers of singleton term infants. Significant **risk factors of a preterm delivery included … an induced abortion terminating the previous pregnancy;** vaginal spotting or light bleeding during the pregnancy; antepartum hemorrhage and abnormal placental implantation … alcohol consumption prior to the third trimester of pregnancy; and negative attitudinal expression toward the pregnancy."

[PubMed Summary] Berkowitz GS, "An Epidemiologic Study of Preterm Delivery," American Journal of Epidemiology, 1981 Jan;113 (1):81-92.

"Both a prospective and a retrospective study were carried out to evaluate longterm consequences of a legally induced abortion. Data used for the study were taken from a WHO (World Health Organization) study of longterm sequelae of induced abortion. Both studies used Danish women and matched controls. **It was found that bleeding before 28 weeks of gestation and retention of placenta or placental tissue in subsequent**

pregnancies occurred more frequently in women who had previously experienced a legally induced abortion."

[PubMed Summary] Obel EB, "Pregnancy complications following legally induced abortion," Acta Obstet Gynecol Scand. 1979;58 (5):485-90.

"The outcome of pregnancy was studied in 325 patients with an induced abortion in their previous pregnancy, together with 721 control patients. The patients were matched for age, parity and social class. Smoking and unplanned pregnancies were found to be more common among abortion patients than among the control patients. As regards pregnancy complications**, bleeding during pregnancy and placental retention were found to be significantly more common in the index group.** No statistical differences were noticed in gestation length, birthweight, rate of spontaneous abortion and perinatal mortality in the pregnancy following induced abortion as compared with control patients."

[PubMed Summary] Mandelin M, Karjalainen O, Pregnancy outcome after previous induced abortion, Ann Chir Gynaecol, 68 (5-6): 147-54 1979;

"Information on vaginal bleeding and predictors came from the Pregnancy, Infection, and Nutrition Study, which enrolled 2806 pregnant women at 24-29 weeks' gestation during 1995-2000 in central North Carolina, USA. … Women with advanced maternal age and passive smoking exposure were more likely to experience more intense vaginal bleeding during pregnancy, as were women with prior preterm birth. **More intense bleeding was also more likely to be reported among women with multiple prior spontaneous abortions or multiple prior induced abortions,** but not among women with a single prior spontaneous or induced abortion. The combination of prior spontaneous and induced abortion showed a dose-response association with the occurrence of vaginal bleeding during pregnancy."

[PubMed Summary] Yang J, Savitz DA, Dole N, Hartmann KE, Herring AH, Olshan AF, Thorp JM Jr., "Predictors of vaginal bleeding during the first two trimesters of pregnancy," Paediatr Perinat Epidemiol. 2005 Jul;19 (4):276-83.

"Two cases of prolonged intrauterine retention of fetal bones are presented to show that antecedent abortion may … play a role in current gynecologic complaints. In these two cases, symptoms dated to antecedent abortions treated with D&C 13 years and 14 months before diagnosis, respectively. **Complaints included secondary infertility, dysmenorrhea, and dysfunctional uterine bleeding**. Hysteroscopy was necessary to make the correct diagnosis of retained fetal bones. **In both cases, hysteroscopic surgery was unsuccessful in removing all the bony fragments or relieving symptoms.** Though retained fetal bones are an uncommon cause of gynecologic problems, these cases show the necessity of hysteroscopy for diagnosis of persistent gynecologic problems when intrauterine pathology is suspect. These cases also demonstrate that although hysteroscopy is extremely useful diagnostically, it may not be successful therapeutically even for the persistent surgeon."

[PubMed Summary] Melius FA, Julian TM, Nagel TC, "Prolonged retention of intrauterine bones," Obstet Gynecol. 1991 Nov;78(5 Pt 2):919-21, Department of Obstetrics and Gynecology, University of Wisconsin, Madison.

Chlamydia

Chlamydia is the most often reported bacterial venereal disease in the United States with 835,000 cases reported to the CDC in 2002, out of an estimated total of 2.8 million Americans—primarily women--who are infected with Chlamydia every year. 29 The CDC reports that untreated chlamydia infections can lead to premature births. And 40% of untreated chlamydia infections can permanently damage the fallopian tubes and lead to Pelvic Inflammatory Disease. This can cause "chronic pelvic pain, infertility, and potentially fatal ectopic pregnancy (pregnancy outside the uterus). Women infected with chlamydia are up to five times more likely to become infected with HIV, if exposed." 30

These finding are not peculiar to the United States. A study published in 2003 of 309 women with an infertility diagnosis who attended Mexico's National Institute of Perinatology concluded there was a consistent relationship between chlamydia infection and infertility, or just inability to get pregnant at all. 31 A 1988 French study of 558 women found that Pelvic Inflammatory Disease and Chlamydia both were important risk factors for ectopic pregnancy. 32 And a study published in 2002 from Chile of the incidence of Chlamydia trachomatis (Ct) infection and a relationship between couples presenting experiencing first-trimester spontaneous abortions and active Ct infection concluded there was a correlation between active chlamydia infection and spontaneous abortion. 33

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[29] (http://www.cdc.gov/std/healthcomm/fact_sheets.htm.)

[30] (http://www.cdc.gov/std/healthcomm/fact_sheets.htm.)

[31] Guerra-Infante F, Flores-Medina S, Arteaga-Troncoso G, Zamora-Ruiz A, Lopez-Hurtado M, Ortiz-Ibarra FJ, "Risk factors and reproductive sequelae associated with Chlamydia trachomatis infection in infertile women," Salud Publica Mex. 2003;45 Supp 5:S672-80. [Article in Spanish] Departamento de Infectologia e Immunologia Perinatal del Instituto Nacional de Perinatologia, Departamento de Microbiologia de la Escuela Nacional de Ciencias Biologicas del Instituto Politecnico Nacional, Mexico, DF, Mexico.

[32] Coste J, Job-Spira N, Fernandez H, Papiernik E, Spira A, "Risk factors for ectopic pregnancy: a case-control study in France, with special focus on infectious factors," American Journal of Epidemiology, 1991 May 1;133(9):839-49. [PubMed Summary] "A case-control study was conducted in 1988 in seven Paris area maternity hospitals to evaluate the role of several risk factors, particularly infectious factors, in ectopic pregnancy. A total of 279 cases and 279 controls were compared for sociodemographic characteristics, cigarette smoking, sexual, reproductive and surgical histories, and conditions of conception. Pelvic inflammatory disease confirmed by celioscopy (odds ratio (OR) = 5.5, 95% confidence interval (CI) 2.1-13.9) and Chlamydia trachomatis seropositivity (OR = 3.9, 95% CI 2.3-6.7) appeared to be important risk factors for ectopic pregnancy."

[33] Vigil P, Tapia A, Zacharias S, Riquelme R, Salgado AM, Varleta J, "First-trimester pregnancy loss and active Chlamydia trachomatis infection: correlation and ultrastructural evidence," Andrologia. 2002 Dec;34(6):373-8, Unit of Reproduction and Development, Faculty of Biological Sciences, Pontifical Catholic University of Chile, Santiago, Chile. [PubMed Summary] . "The general incidence of Ct infection was 9.4% in females (90 of 961) and 13.9% in males (104 of 750). In women with spontaneous abortions the incidence of Ct was 21.0% (14 of 66) compared with 8.9% (23 of 59) for women without spontaneous abortions and term pregnancies (chi-square, $P < 0.05$). When both partners of the couples were considered (one or both partners infected), the incidence rose to 68.8% (22 of 32) (chi-square, $P < 0.001$). In vitro studies using electron microscopy demonstrated the presence of Ct on the surface of and inside the oocyte.

Furthermore, with the legalization of abortion on demand, venereal disease figures have increased in the population age groups with high abortion rates. By apparently by reducing the immediate "social costs" of non or pre-marital sex, an increase in such behavior has occurred. This is the conclusion of researchers who used CDC gonorrhea and syphilis incidence data from 1969-70 when some states had started liberalizing their abortion laws and contrasted it with other more restrictive abortion states, nationwide abortion legalization in 1973 and also later VD rates. Reporting in the Journal of Legal Studies, the authors note that, "We find that gonorrhea and syphilis incidences are significantly and positively correlated with abortion legalization. Further, we find a divergence in STD rates among early legalizing states and late legalizing states starting in 1970 and a subsequent convergence after the Roe v. Wade decision, indicating that the relation between STDs and abortion is casual. Abortion legalization accounts for about one-fourth of the average disease incidence." 34

And abortion, whether performed surgically or medically with drugs, can carry the same risk of infection, as demonstrated in a survey of 401 women undergoing abortion: "Women with a history of induced abortion had a higher sexual risk profile than those with no such history. They also more frequently reported genital infectious symptoms. The comparison between medical and surgical abortions shows that women who had a medical abortion were more likely to report heavy and prolonged bleeding. On the contrary, we found no difference of infectious symptoms between the two techniques. … Our study does not support the idea of a reduction of infectious complications related to medical as opposed to surgical abortions," 35

Studies of Legal Abortion and Chlamydia

"Chlamydia trachomatis was cultured from the cervix of 70 of 557 (12.6%) patients admitted for therapeutic abortion. Postoperatively, 22 (3.9%) developed acute pelvic inflammatory disease (PID); of these women, 14 (63.6%) had harbored C. trachomatis in the cervix prior to the abortion. Thus, of 70 patients with chlamydia infection, 14 (20%) developed PID postoperatively. Of the chlamydia-positive patients, 6 of 15 (40%) aged 20 years and 8 of 53 (15%) patients aged 20-30 developed PID. 12 of 70

These results indicate a correlation between an active Ct infection and spontaneous abortion."; See also, [PubMed Summary] Elias M, Choroszy-Krol I. II Katedry i Kliniki Ginekologii AM we Wroclawiu, "Chlamydia trachomatis during genital tract infection and in imminent abortion," Ginekol Pol. 1995 Sep;66(9):513-7 [Article in Polish] "Chlamydia trachomatis (Ch.t.) is suspected to be a dominant factor in the etiology of genito-urinary tract infectious diseases. … Ch. t. presence in the cervix of women with adnexitis or with the imminent abortion. 300 women were investigated for the Ch.t. detection. … Ch.t. infection was detected in 27% of examined patients. The positive results was observed the more frequently in the patients showing the clinical symptoms of infection (42%) and in the pregnant women with imminent abortion symptoms (26%)."

[34] Klick J , Stratmann T, "The effect of abortion legalization on sexual behavior: evidence from sexually transmitted diseases," Journal of Legal Studies, 32(2): 407-33, 2003.

[35] [PubMed Summary] Lamarche-Vadel A , Moreau C , Warszawski J , Bajos N, "Side effects of induced abortion: results from a population-based survey," Gynecol Obstet Fertil, 33(3): 113-8 2005.

women with chlamydial infections showed a significant increase in serum chlamydial IgG antibody titers over a 4-week period; 4 of these women developed PID. … Treatment with a single dose of intravenous doxycycline (200 mg) was given prior to and during surgery to about 1/2 of the patients. **In this study, such a regimen had no protective effect against the development of PID associated with C. trachomatis."**

> [PubMed Summary] Qvigstad E, Skaug K, Jerve F, Fylling P, Ulstrup JC, "Pelvic inflammatory disease associated with Chlamydia trachomatis infection after therapeutic abortion: A prospective study," British Journal of Venereal Disease, 1983 Jun;59(3):189-92

"The frequency of infection following induced first-trimester abortion is 3-5%. Duration of hospitalization is often five days, and the total costs per abortion were 5,400 Dkr (approximately pounds 500) in Denmark in 1979. **Sequelae of postabortal infection are similar to and occur with the same frequency as sequelae to "spontaneous" pelvic inflammatory disease. Thus, secondary infertility was found in 10% of women with postabortal infection, spontaneous abortion in 22%,** dyspareunia in 20%, and chronic pelvic pain in 14%. **The risk of ectopic pregnancy is probably also increased. Surgical scrub cannot sterilize the endocervix and, as a consequence, abortion is performed in a contaminated field.** The presence of pathogenic bacteria, i.e. Chlamydia trachomatis, therefore increases the risk of postoperative infection. The organism is found in approximately 7% of those applying for abortion and the risk of sustaining infection is 20%. Other risk factors are previous pelvic inflammatory disease, vaginal infection, first pregnancy and young age."

> [PubMed Summary] Heisterberg L. 'Preventive antibiotics in induced first-trimester abortion," Ugeskr Laeger. 1992 Oct 26;154(44):3056-60. [Article in Danish]

"After termination of a double-blind, randomized study on erythromycin in the prevention of post-abortion infection, 34 women (14 treated with erythromycin, 20 not treated with erythromycin) harbouring Chlamydia trachomatis were followed up within 6 weeks and again 2 to 24 months after the abortion in order to detect an early- and late-onset pelvic inflammatory disease (PID). … **Untreated women with C. trachomatis infection at the time of abortion had a cumulative risk of 72% of developing early and/or late PID, if observed for 24 months.** This cumulative risk was significantly reduced to 8% if the C. trachomatis infection was treated at the time of the abortion. Screening for and treatment of C. trachomatis is warranted, especially in women < or = 25 years old, to avoid early and late-onset PID after induced first trimester abortion."

> [PubMed Summary] Sorenses JL, Thrnov I, Hoff G, Dirach J, "Early- and late-onset pelvic inflammatory disease among women with cervical Chlamydia trachomatis infection at the time of induced abortion--a follow-up study," Infection, 1994 Jul-Aug;22(4):242-6. Dept. of Gynecology and Obstetrics, Rigshospitalet, Copenhagen O.

"The outcome of termination of pregnancy was observed in … 167 women attending a day care abortion unit in Liverpool. Before termination, Chlamydia trachomatis was isolated from the cervix of 19 (11%) of the patients and high counts … of mycoplasmas were found in 30 (18%). Coexistent infections with chlamydiae and high counts of mycoplasmas occurred in only seven (4%) women. … After undergoing termination, seven (4%) women developed … (PID), five (71%) of whom had yielded C trachomatis before undergoing termination. A further 13 (8%) patients developed minor morbidity of the upper genital tract … In contrast, C trachomatis had been isolated from only 11 (8%) and high counts of mycoplasmas from 23 (16%) of the 147 women who had

uneventful recoveries after undergoing termination. … **Neither the history nor clinical examination before termination would have indicated that chlamydial or mycoplasmal infections were present, or that postoperative complications were likely to occur.** Abnormal cervical cytology, however, was found in 86 (52%) of women overall, including 15 (79%) of the 19 women with chlamydial infection."

> [PubMed Summary] Duthie SJ, Hobson D, Tait IA, Pratt BC, Lowe N, Sequeira PJ, Hargreaves C, "Morbidity after termination of pregnancy in first trimester," Genitourinary Medicine, 1987 Jun;63(3):182-7.

"Chlamydia trachomatis was isolated from the cervix of 30 of 218 (13.8%) women admitted for legal termination of pregnancy. During the first two weeks after the abortion seven of the 30 (23.3%) patients developed pelvic inflammatory disease. … among patients admitted for legal abortion in Ullevaal Hospital (Oslo, Norway) … The abortion procedure used was dilatation and vacuum aspiration. ... Patients who harbored C trachomatis were recalled for follow up about 3 months after the abortion. Of the 218 patients, C trachomatis was isolated from the cervix in 30 (13.8%) … and both C trachomatis and N gonorrheae in 2. 7 of the 30 (23.3%) patients harboring C trachomatis developed PID. All the infections occurred in the 1st 2 weeks after the abortion. … Study **findings indicate that patients harboring C trachomatis in the cervix at abortion are at high risk of developing postoperative infections and that C trachomatis is a major etiological agent in salpingitis occurring after abortion."**

> [PubMed Summary] Qvigstad E, Skaug K, Jerve F, Vik IS, Ulstrup JC, "Therapeutic abortion and Chlamydia trachomatis infection," British Journal of Venereal Disease, 1982 Jun;58 (3):182-3.

"A serological test for chlamydial infection was administered to 281 Jerusalem women in order to determine the rate and influence of Chlamydia on pregnancy outcome. Serological indication of active infection was present in 7.8% of the tested women, while 15.3% were shown to be positive for Chlamydia. Among the ultraorthodox subpopulation of Mea Shearim, serological indication of active infection was present among 5.9% of the women, and 12.3% of this population tested positive. In comparison, women from the secular subpopulation had 12.7% serological indication of active infection and 22.95% tested positive ($P < 0.01$). … **Women with a previous history of induced abortions showed a significantly higher evidence of past Chlamydia infection (9.3%) when compared with the women who did not have an infection (1.4%) ($P < 0.006$)**. Among the ultraorthodox women with positive or active infection, 41% had suffered at least one spontaneous abortion, as compared with 25% of the religious women who had no serological evidence of infection."

> [PubMed Sumary] Tadmor OP, Shaia M, Rosenman H, Livshin Y, Choukroun C, Barr I, Diamant YZ, "Pregnancy outcome in serologically indicated active Chlamydia trachomatis infection," Israel Journal Med Sci. 1993 May;29 (5):280-4, Department of Obstetrics and Gynecology, Shaare Zedek Medical Center, Jerusalem, Israel.

"Induced abortion is one of the most frequent surgical procedures in the UK. Even though it is considered safe, it sometimes has complications and long-term sequelae. Pelvic inflammatory disease (PID) is the most prevalent complication and can lead to chronic pelvic pain, pain during intercourse, infertility, and a higher risk of ectopic pregnancy. Chlamydia trachomatis is perhaps the leading etiologic agent for PID among women who have undergone induced abortion and who develop PID. … Most

of the literature suggests that antibiotic prophylaxis does provide some protection against PID but does not clearly indicate who should be screened and for which pathogens and who should be treated and with which antibiotics."

[PubMed Summary] Stevenson MM, Radcliffe KW, "Preventing pelvic infection after abortion," International Journal of STD AIDS. 1995 Sep-Oct; 6 (5):305-12

"We studied associations … Chlamydia trachomatis genital infections with pregnancy outcomes … A sample of 1204 Navajo women enrolling for prenatal care had endocervical C trachomatis, M hominis, and U urealyticum cultures and serum samples taken … Low birth weight (less than 2500 g) was associated with M hominis infection among women with a history of spontaneous abortion. Mycoplasma hominis infection was also associated with postpartum endometritis, … Although **women with recent C trachomatis infection (IgM titer greater than 1:32 on either sample or IgG seroconversion) were at greater risk of low birth weight (19% [3/16]) than women with chronic infection (4.5% [6/133]; relative risk, 4.2),** this subgroup at risk was small (11% of women with classifiable C trachomatis infection)."

[PubMed Summary] Berman SM, Harrison HR, Boyce WT, Haffner WJ, Lewis M, Arthur JB, "Low birth weight, prematurity, and postpartum endometritis. Association with prenatal cervical Mycoplasma hominis and Chlamydia trachomatis infections," JAMA. 1987 Mar 6;257 (9):1189-94

"In April and May 1991 all women requesting abortion in Norway were screened for Chlamydia trachomatis and Neisseria gonorrhoeae. During the study period 2,194 abortions were carried out. The study included 2,110 women with representative tests for C trachomatis from the cervix uteri. Only 1,702 women were tested for N gonorrhoeae. The prevalence of N gonorrhoeae was 0.5% (8:1,702), and of C trachomatis 5.4% (113:2,100). The prevalence of C trachomatis decreased from 9.1% among women less than or equal to 19 years to 2.0% among women greater than or equal to 35 years of age. … Being less than 25 years of age was the best single parameter for identifying chlamydia-positive cases. … **the prevalence of C trachomatis is still high enough to recommend screening of all women less than 25 years of age who request abortion."**

[PubMed Summary] Skjeldestad FE, Jerve F, "Chlamydia trachomatis and Neisseria gonorrhoeae among women seeking abortion in Norway. Results from a nationwide study," Tidsskr Nor Laegeforen. 1992 Jun 20;112 (16):2082-4 [Article in Norwegian] Kvinneklinikken, Regionsykehuset i Trondheim.

"From several prospective studies, **it is clear that nulliparas, women with a history of PID, those bearing Chlamydia trachomatis are at risk of post-abortion infection**. … After an extensive enumeration of microbes found in nonpregnant, pregnant, and PID female genital tracts, it was concluded that only C. trachomatis and N. gonorrheae are clearly associated with PID … **There is evidence that surgical cleansing of the vagina has no bearing on incidence of post-abortal PID, since the responsible organisms come from the endocervix.** 5 controlled clinical trials demonstrated that antibiotic prophylaxis is warranted; that penicillin/ampicillin selectively reduced PID in women with PID history; that imidazoles preferentially reduce PID in the general population without PID history.

[PubMed Summary] Heisterberg L, "Pelvic inflammatory disease following induced first-trimester abortion. Risk groups, prophylaxis and sequelae," Danish Medical Bulletin, 1988 Feb;35 (1):64-75. Department of Gynaecology and Obstetrics, Gentofte Hospital.

"**To determine the rate of chlamydia and other sexually transmitted infections (STIs), and to describe treatment and factors associated with chlamydia in patients presenting for a termination of pregnancy (TOP)** … A retrospective audit of patients attending one of two TOP clinics from 1 February 2003. (Clinic A, n=500; Clinic B, n=501). … **Ten percent of patients tested positive for an STI. Chlamydia was most commonly detected, in 7.7% of all patients. Higher rates of chlamydia were observed at clinic B (10.2% vs 5.2%, p=0.005) and in under 25 year olds (11.2% vs 3.6%, p<0.001).** Rates of chlamydia in Pacific women were 18.6%, in Maori 12.9%, in Asian 7.3% and 4.4% in New Zealand European women."

> [PubMed Summary] Rose S, Lawton B, Brown S, Goodyear-Smith F, Arroll B, "High rates of chlamydia in patients referred for termination of pregnancy: treatment, contact tracing, and implications for screening," New Zealand Medical Journal, 2005 Mar 11;118 (1211):U1348, Department of General Practice, Wellington School of Medicine and Health Sciences, New Zealand.

"The prevalence and patterns of gonococcal and **chlamydial infection were investigated in a prospective microbiological study on 3,395 women requesting abortion** and the sexual partners of culture positive women … Neisseria gonorrhoeae was found in only 1.8% of 3,395 women during the whole study period of 7 years, but **Chlamydia trachomatis in 13.5% of 1,635 women in the last 3 years.** Women with positive cultures were significantly younger (p less than 0.001), and more frequently single (p less than 0.001) than those with negative cultures. Single women had more partners (mean 1.5) than those in an established relationship (mean 1.1). Almost all women with gonorrhea were single. Of the males, 62.7% were examined, of whom 47.3% had positive cultures. Twenty per cent of culture positive males had gonorrhea."

> [PubMed Summary] Oskarsson T, Geirsson RT, Steingrimsson O, Thorarinsson H, "Lower genital tract infection with Neisseria gonorrhoeae and Chlamydia trachomatis in women requesting induced abortion and in their sexual partners," Acta Obstet Gynecol Scand. 1990;69 (7-8):635-40. Department of Obstetrics and Gynecology, Reykjavik Health Centre, Iceland.

"The prevalence of Chlamydia trachomatis infection of the cervix uteri and its possible association with postabortal pelvic inflammatory disease (PID) were investigated in women subjected to first-trimester-induced abortion. **None of the women had signs or symptoms of genital infection at the time of abortion. Chlamydia organisms were isolated from the cervix/urethra in 33 (10%) of 333 women.** Women with a positive Chlamydia culture were comparable to women with a negative culture in regard to gestational age at the time of abortion. However, Chlamydia-positive women were significantly younger and had gonorrhea more often than Chlamydia-negative women. Two hundred seventy (81%) of the women were followed up 1 month after the abortion. Thirty-two of these developed postabortal PID. Eight (28%) of 29 women with a positive Chlamydia culture and 24 (10%) of 241 women with a negative culture developed postabortal PID. **This difference is significant (P less than .025) and indicates that the presence of Chlamydia in the cervical canal at the time of abortion in asymptomatic women increases the risk of postabortal PID."**

> [PubMed Summary] Westergaard L, Philipsen T, Scheibel J, "Significance of cervical Chlamydia trachomatis infection in postabortal pelvic inflammatory disease," Obstetrics and Gynecology, 1982 Sep;60 (3):322-5

"In a prospective study, 288 women were tested for Chlamydia trachomatis (CT) in the cervix prior to legal abortion. … CT was isolated in 14.2% of asymptomatic

women. … The operation was performed as a vacuum aspiration prior to the 12th week of gestation (9). … All cases of postoperative genital infection appearing within 1 month after the abortion were registered. … **In group A, 41 of 288 women were CT carriers … In 32 cases, both culture and DFA revealed the presence of CT. … Among the 247 women with nondetectable CT, 14 developed a postoperative infection (4.9%).** In group B, 25 of 259 women (9.7%) contracted a postoperative infection. In 8 of these women, CT was isolated. On dividing the postoperative infections into 2 groups, those with symptoms appearing within 3-4 days after the abortion and those with later symptoms, 9 of the 14 infections were early in group A and 13 of 25 infections were early in group B."

> [PubMed Summary] Giertz G, Kallings I, Nordenvall M, Fuchs T, "A prospective study of Chlamydia trachomatis infection following legal abortion," Acta Obstet Gynecol Scand. 1987;66 (2):107-9.

"Since 1983 women seeking abortion in the university hospital in Trondheim have been systematically tested for Chlamydia trachomatis. Data on 11,376 abortions (1985-2000) were included in the study and results were analysed with logistic regression. … Age-adjusted prevalence of Chlamydia trachomatis decreased from 9.0% to 5.0% in 1999-2000. The prevalence was highest among the youngest women. **Single and cohabiting women had a higher prevalence of chlamydial infections than married women.** … Women terminating their pregnancy are an excellent population for sentinel surveillance of Chlamydia trachomatis infection because of their young age, high proportion of singles, and relative inconsistent use of contraception."

> [PubMed Summary] Bakken IJ, Skjeldestad FE, Nordbo SA, "Chlamydia trachomatis infection in women seeking termination of pregnancy 1985-2000," Tidsskr Nor Laegeforen. 2004 Jun 17;124 (12):1638-40 [Article in Norwegian] Seksjon for epidemiologisk forskning.

"Out of 432 women applying for termination of pregnancy, 7.9% (34/428) had cervical Chlamydia trachomatis and 0.7% (3/431) genital Neisseria gonorrhoeae. **The prevalence of Chlamydia was 19.2% among the women applying for termination who were under 20 years** and 12.8% among those aged 21-25 years. The finding of Chlamydia among nulliparae was 14.5%. Only 2.8% of the women with Chlamydia had previously had pelvic infections."

> [PubMed Summary] Sorensen JL, Thranov IR, Hoff GE, "Presence of genital Chlamydia trachomatis in abortion seekers--correlates with young age and nulliparity but not with previous genital infection," Ugeskr Laeger. 1992 Oct 26;154 (44):3053-6. [Article in Danish].

"The prevalence of Chlamydia trachomatis, Ureaplasma urealyticum, Mycoplasma hominis, group B streptococcus, herpes simplex virus, and Neisseria gonorrhoeae from cervical cultures obtained from 210 women seeking abortion in Pittsburgh, Pennsylvania, United States of America was 9.3%, 72.9%, 25.2%, 4.3%, 0.9%, and 0.9% respectively. Cultures from 40/203 (19.7%) patients failed to produce any of these organisms. C trachomatis isolation was not associated with age, race, marital status, average family income, number of sexual partners, history of gonorrhoea or syphilis, or previous pregnancies, live births, or abortions, and 82.4% of women with chlamydial infections had had no urogenital symptoms in the preceding six months. … Screening for C trachomatis, is encouraged to prevent neonatal morbidity and the common complication of pelvic inflammatory disease after abortion."

[PubMed Summary] Amortegul AJ, Meyer MP, Gnatuk CL, "Prevalence of Chlamydia trachomatis and other micro-organisms in women seeking abortions in Pittsburgh, Pennsylvania, United States of America," Genitourinary Medicine, 1986 Apr;62(2):88-92.

"We studied the prevalence of genital infections and the frequency of infectious complications in 170 women who requested an abortion in Antwerp, Belgium, where termination of pregnancy is still illegal. **Chlamydia were isolated in 12% of these women, compared to a 0.6% isolation rate for N. gonorrhoeae. After the abortion 5.5% developed PID and 3% endometritis. There was a strong correlation between an infection with C. trachomatis before abortion and the appearance of infectious complications after the aspiration curettage.** No such relationship was found with any other micro-organism. Depending on the prevalence of C. trachomatis in a given population, screening followed by selective treatment or prophylactic use of antimicrobial medication for all women is indicated to prevent post-abortum infections."

[PubMed Summary] Avonts D, Piot P, "Genital infections in women undergoing therapeutic abortion," European Journal of Obstetrics, Gynecology and Reproductive Biology, 1985 Jul;20(1):53-9.

Gonorrhea

Gonorrhea is a bacterial caused venereal disease. Symptoms can take up to 30 days to appear in men, although both men and women can contract gonorrhea and not show any symptoms. In women, symptoms many times are so non-specific that gonorrhea can be mistaken for a bladder infection. A pregnant woman can pass gonorrhea to her child at birth. This can cause blindness, joint infection, or a life threatening blood infection in the baby. It can also cause pelvic inflammatory disease in women, and PID may not present with symptoms. PID can predispose women to ectopic pregnancy, damage to the fallopian tubes resulting in sterility in women, and in men produces a painful condition which can cause infertility--epididymitis. In 2004 there were 330,000 cases reported to the CDC which estimates there are roughly 700,000 new cases a year in the United States. 36

Young people are apparently at greater risk. In a Drexel University Medical School survey in Philadelphia of, "171 women, 106 young adults, and 65 adolescents, with a clinical diagnosis of pelvic inflammatory disease (PID) … The most significant findings were that the adolescents sought health care later in the course of the illness (7.8 vs. 5.6 days; p less than 0.02) and were more commonly infected with the gonococcus (42% vs. 28%; p less than 0.05)." 37

Gonorrhea bacteria have developed a resistance to some medicines. In Hawaii, about 10% of gonorrhea is resistant to conventional medical treatment. The CDC tracks medically resistant gonorrhea in 26 US cities, and found that 21% of gonorrhea strains were resistant

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[36] http://www.cdc.gov/std/Gonorrhea/gonorrhea.pdf

[37] [PubMed Summary] Spence MR, Adler J, McLellan R, "Pelvic inflammatory disease in the adolescent," Adolescent Health Care. 1990 Jul;11(4):304-9, Department of Obstetrics and Gynecology, Hahnemann University School of Medicine, Philadelphia, Pennsylvania

to penicillin, tetracycline or both in 2001. The CDC estimates that nationwide that 6.4% of gonorrhea is resistance to the CDC recommended treatment. 38

It is more and more apparent that drugs cannot keep up with the multiplicity and extent of venereal diseases unleashed by sexual behavioral changes resulting from legal abortion. "Pelvic infections in the form of salpingitis, endometritis, and peritonitis were thought to be caused by gonorrhea in 90% of cases 10 years ago. Now a third are due to gonorrhea, a third are due to chlamydia, and the rest are due to mycoplasma and anaerobes. PID is so difficult to diagnose that 35% of diagnoses are false positives, and perhaps 25% of asymptomatic infertility patients have subclinical chlamydia. Yet the rate of PID seems constant, while STDs multiply. Reported infertile couples are also higher than ever. Whether this increased infertility is a result of tubal infections with STD organisms is not known." 39

Studies of Gonorrhea and Legal, Induced Abortion

"The prevalence and patterns of gonococcal and chlamydial infection were investigated in **a prospective microbiological study on 3,395 women requesting abortion** and the sexual partners of culture positive women (organism identified). Neisseria gonorrhoeae was found in only 1.8% of 3,395 women during the whole study period of 7 years, but Chlamydia trachomatis in 13.5% of 1,635 women in the last 3 years. Women with positive cultures were significantly younger (p less than 0.001), and more frequently single (p less than 0.001) than those with negative cultures. Single women had more partners (mean 1.5) than those in an established relationship (mean 1.1). **Almost all women with gonorrhea were single. Of the males, 62.7% were examined, of whom 47.3% had positive cultures. Twenty per cent of culture positive males had gonorrhea. A high prevalence of positive cultures in the males was only found where chlamydial cultures had been positive in the female**. All women and men with positive culture results received antibiotic treatment before or after the abortion procedure."

> [PubMed Summary] Oskarsson T, Geirsson RT, Steingrimsson O, Thorarinsson H, "Lower genital tract infection with Neisseria gonorrhoeae and Chlamydia trachomatis in women requesting induced abortion and in their sexual partners," Acta Obstet Gynecol Scand. 1990;69(7-8):635-40. Department of Obstetrics and Gynecology, Reykjavik Health Centre, Iceland.

"A cohort study was performed at two family planning clinics and one youth clinic. Of 996 women, 192 (19.3%) admitted a history of induced abortion, whereas the remaining 804 women served as a control group. … Genital chlamydial infection, gonorrhea, genital herpes, genital warts, cervical human papillomavirus infection, bacterial vaginosis, candidiasis, and bacteria associated with bacterial vaginosis were diagnosed. … Both a history of genital infections, with the exception of vulvovaginal candidiasis, and current

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[38] Antimicrobial Resistance and Neisseria Gonorrhoeae
http://www.cdc.gov/std/Gonorrhea/arg/revisedARfactsheet.pdf

[39] Rosenberg MJ, "Fallout from the STD epidemic: salpingitis, ectopic pregnancy, and infertility," Am J Gynecol Health. 1989 May-Jun;3(3-S):19-22

genital symptoms were more common in women with a history of induced abortion, compared with the control group. Age-adjusted odds ratios ranged from 1.5 (history of genital warts, 95% confidence interval … to 5.0 (history of gonorrhea, 95% CI …. **Moreover, a history of gonorrhea, genital chlamydial infection, genital warts, and genital herpes were 1.5-5 times more common among women who experienced induced abortion. As a consequence of the 3-fold increase in the history of STDs, the study found a 4-fold increase of a history of pelvic inflammatory disease in women with induced abortion history."**

[PubMed Summary] Hellberg D, Mogilevkina I, Mardh PA, "Sexually transmitted diseases and gynecologic symptoms and signs in women with a history of induced abortion," Sexually Transmitted Diseases, 1999 Apr;26(4):197-200. Department of Obstetrics, Falun Hospital, Sweden.

"646 women, aged 14-49, who underwent induced abortion in the 6th-17th weeks of pregnancy were tested for gonorrhea, candidiasis, and vaginal trichomoniasis. 2.3% of the women had gonorrhea, all of whom were young and unmarried. 2.3% had trichomoniasis and 10.2% had candidiasis. 1 patient had gonorrhea and a candidiasis infection."

[PubMed Summary] Evjen OC, Haram K, Ulstein M, "Gonorrhea, candidiasis and vaginal trichomoniasis in patients requesting legal abortion," Tidsskr Nor Laegeforen. 1979 Mar 30;99(9-10):470-1 [Article in Norwegian]

"Pelvic infection is the commonest complication of legal abortion. The presence of lower genital tract infections increases the risk of complications, and women requesting abortion are at significant risk of harbouring sexually transmitted diseases (STD). Prophylactic antibiotic treatment can decrease the rate of post-abortal sepsis, but the optimum regime is unclear. … In particular, patients with Chlamydia trachomatis infection, and bacterial vaginosis would appear to be at increased risk … Gonorrhea is another major etiologic agent for PID. Strategies used to try to reduce pelvic infection revolve around administration of antibiotic prophylaxis based on demographic features and on the presence of certain organisms in the genital tract that may increase their risk (e.g., C. trachomatis and Neisseria gonorrhoeae) and universal antibiotic prophylaxis for all women undergoing abortion. Most of the literature suggests that antibiotic prophylaxis does provide some protection against PID but does not clearly indicate who should be screened and for which pathogens and who should be treated and with which antibiotics."

[PubMed Summary] Stevenson MM, Radcliffe KW, "Preventing pelvic infection after abortion," International Journal of STD AIDS. 1995 Sep-Oct;6(5):305-12

"A matched-pair analysis of 228 cases of endometritis occurring over a two-year period in 4,823 elective abortion patients was carried out. Patients with postabortal endometritis were matched with control subjects for age, parity, race, pay status, time of abortion, and type of abortion procedure. **The prevalence of endocervical gonorrhea was 2.7% in the entire group seeking abortion, with 14.7% of patients with gonorrhea subsequently developing endometritis.** The matched-pair analysis detected a threefold increased risk for endometritis in patients with untreated gonoccocal endocervicitis when compared with control subjects (p less than 0.05)."

[PubMed – Summary] Burkman RT, Tonascia JA, Atienza MF, King TM, "Untreated endocervical gonorrhea and endometritis following elective abortion," American Journal of Obstetrics and Gynecology, 1976 Nov 15;126(6):648-51.

"A case history of an 18-year-old woman admitted 2 days after undergoing a therapeutic abortion with acute abdominal pain is reported. The patient denied nausea or vomiting, but she appeared very ill with a temperature of 38.3 degrees centigrade. Pelvic examination was normal. … and neisseria gonorrhoeae were cultured. **The patient had only 1 sexual partner, but that partner had had intercourse with at least 2 other women during the same period he was intimate with the patient.** The patient responded to intravenous penicillin and was discharged after 5 days of treatment. It was suspected that dissemination of the gonococci was during the therapeutic abortion via the fallopian tubes. **Neither the patient nor her partner, it was emphasized, showed genital symptoms, therefore the need to screen potential abortion patients is acute with gonorrhea at the epidemic stage**."

[PubMed – Summary] Portnoy D, Portnoy J, Mendelson J, "Occurrence of gonococcal perihepatitis after therapeutic abortion," Canadian Medical Association Journal, 1979 Feb 17;120(4):408.

"Reported rates of post-abortion pelvic inflammatory disease (PID) range from 5-29%. The risk of infection has been associated with the presence of Neisseria gonorrhoeae, Chlamydia trachomatis, and anaerobic organisms in the lower genital tract. The present study analyzed the prevalence of genital tract infections in 1672 women undergoing induced abortion at 3 centers in Scotland … During the 8-week post-abortion follow-up period, **women managed by the screen-and-treat protocol had slightly less favorable outcomes in terms of hospital readmissions, general practitioner consultations, antibiotic prescriptions, time off work, and limitations on domestic activities than women who received prophylactic treatment**. Differences were statistically significant, however, only for women whose swabs were negative for all 3 infections. The rate of post-abortion PID/endometritis in this groups was 3% among women who received prophylactic antibiotics and 6% in those who were screened and not treated."

[PubMed Summary] Penney GC, "Preventing infective sequelae of abortion," Human Reproduction, 1997 Nov;12 (11 Suppl):107-12. Department of Obstetrics and Gynaecology, Aberdeen Maternity Hospital, UK.

"The aim of the study was to evaluate the prevalence of Chlamydia trachomatis (C. trachomatis) infection in women with adverse pregnancy outcomes. … 258 patients aged 18-43 yrs were enrolled into the study. Among them, 162 women have had spontaneous abortions in the past (group A), 81 had history of intrauterine death of the foetus (group B) and 15 women had experienced preterm deliveries (group C). The control group (group D) included 131 women who were in the second or third trimester of uncomplicated pregnancy. … C. trachomatis was detected in 25.9% patients in group A, 35.8% in group B and 20% in group C and only in 12.7% in group D. IgG specific antibodies were present in 31.5%, 41.9%, 26.6% and 14.5% of patients in these groups respectively. **The highest prevalence of chlamydial infections, regardless the diagnostic method used, was registered in the group of women with a history of 3 abortions (42.3% when direct testing and 45.5% when serological testing) while the lowest prevalence was in women who experienced only l abortion (23.2% and 28%).** … C. trachomatis infection in pregnancy affects its duration as it can lead to miscarriage, death of the foetus and preterm delivery."

[PubMed Summary] Ostaszewska-Puchalska I, Wilkowska-Trojniel M, Zdrodowska-Stefanow B, Knapp, PChlamydia trachomatis infections in women with adverse pregnancy outcome," Med Wieku Rozwoj. 2005 Jan-Mar;9 (1):49-56

"To determine the rate of PID in women with genital Chlamydia trachomatis infection. … MEDLINE and EMBASE were searched over the years 1975-2003 … 9 prospective studies were identified. **The rate of PID in women with a genital C. trachomatis infection varied between 0 and 72%.** Asymptomatic women who were diagnosed with C. trachomatis infection in general screening had the lowest rate of PID: 0-4%. PID occurred in 12-30% of symptomatic women or women with a higher risk of having an STD (e.g. visitor of an STD clinic, double-infection with gonorrhoea, high risk assessed by questionnaire, having a partner with symptomatic C. trachomatis infection). **Women who underwent legal abortion had the highest rate of PID (27-72%)."**

> [PubMed Summary] Boeke AJ, van Bergen JE, Morre SA, van Everdingen JJ, "The risk of pelvic inflammatory disease associated with urogenital infection with Chlamydia trachomatis; literature review," Ned Tijdschr Geneeskd. 2005 Apr 16;149(16):878-84 [Article in Dutch] VU Medisch Centrum, Van der Boechorststraat 7, 1081 BT

Physician Caused Infertility Resulting from Legal Abortion

The Centers for Disease Control defines infertility as the inability of a couple to conceive a child after 12 or more months without using birth control. The CDC suggests that impaired fecundity, which encompasses both married and unmarried women, and which is includes difficulty in getting pregnant or carrying a child to term is related to infertility. The CDC states that while "infertility does not represent a serious public health threat in the United States, it carries significant personal, societal, and economic consequences … Diagnosis and treatment are very costly, time-consuming and invasive, and they can place immense stress on marital and family relations." 40 The federal government's 1988 National Survey on Family Growth reported that one in twelve women aged 15-44 experienced impaired fecundity. 41

If any of the biologically required conditions for conception are impeded, infertility can result. For pregnancy to occur, a woman must release an egg from one of her ovaries; the egg must travel through the fallopian tube to the uterus or womb; a man's sperm must intercept and penetrate the egg during this process, and the new developing human being must implant inside of the uterus. If any of these steps does not take place, pregnancy does not succeed.

Inability to conceive can result from the man, the woman or a combination of both. For example, childhood mumps in a boy, because of high fever, can later make a man infertile or subfertile.

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[40] Anjani Chandra, PhD, Infertility, in From Data to Action, CDC's Public Health Surveillance for Women, Infants and Children, page 63

[41] Anjani Chandra, PhD, Infertility, in From Data to Action, CDC's Public Health Surveillance for Women, Infants and Children, page 66

Personal behavior can affect fertility including the use of drugs or alcohol, or diseases contracted from multiple sexual partners. Clearly, sexually transmitted diseases can and do affect the ability to conceive a "wanted" child.

The CDC acknowledges that, "Sexually transmitted organisms, particularly Chlamydia trachomatis and gonorrhea, lead to upper genital tract infections and eventual tubal scarring. They account for an estimated 30% of infertility in some high-risk populations in the United States." 42 And, as we have seen, legal abortion has as one of its consequences, diseases and pathological conditions which render women incapable of conceiving a child, and this can include the male sexual partners of such women.

Although the CDC has not tracked or compiled complications from abortion since the late 1980's, the CDC's own epidemiological assumptions regarding abortion-caused maternal deaths are applicable to infertility caused by legal abortion: "Abortion Related Death: A death which resulted from a direct complication of an abortion, an indirect complication caused by a chain of events initiated by the abortion, or the aggravations of a preexisting condition by the physiologic or psychologic effects of the abortion. … we include as abortion-related any death which is attributable to abortion, regardless of how long it occurred after the abortion." 43 The same reasoning would apply to infertility which is abortion-related, "regardless of how long it occurred after the abortion."

Because in the chain of causation, infertility does result from legal abortion, this study will identify for the reader the problems experienced by women who use In Vitro Fertilization methods to achieve pregnancy and the children they conceive, a portion of which may be attributable to legal, induced abortion. "Result oriented" individuals who resort to induced abortion, will have few if any, inhibitions, other than perhaps monetary ones, from resorting to IVF and similar technologies for achieving a "wanted" pregnancy.

IVF reproduction is associated with more complications for the mother and children than conventional single or multiple conceptions. The technical answer to this physician-caused problem is physician performed "fetal reduction," whereby a quadruplet pregnancy is "reduced" to triplets, or twins. Or a triplet pregnancy is "reduced" to twins, or a twin pregnancy is "reduced" to a single child pregnancy. All of this is done to increase the health outcome of the remaining children who were not chosen for "reduction," i.e. fetal killing. This can pose additional medical, ethical and psychological problems and dilemmas for women or couples seeking a "wanted" pregnancy and the medical staff carrying out "fetal reduction." Even though fertility clinics "screen" human embryos for "quality control" factors, i. e. eugenic acceptability, some imperfect humans are implanted in women which are discovered via pre-implantation genetic screening or later in pregnancy via amniocentesis. Women are then given the "option" of yet another abortion.

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[42] April 12, 1985 / 34(14);197-9 MMWR, CDC Infertility -- United States, 1982

[43] Centers for Disease Control, "Abortion Surveillance, Annual Summary, 1978" (issued November 1980) US Department of Heath and Human Services, page 7.

Studies of Infertility and Induced Abortion

"The frequency of infection following induced first-trimester abortion is 3-5%. Duration of hospitalization is often five days, and the total costs per abortion were 5,400 Dkr (approximately pounds 500) in Denmark in 1979. Sequelae of postabortal infection are similar to and occur with the same frequency as sequelae to "spontaneous" pelvic inflammatory disease. Thus, **secondary infertility was found in 10% of women with postabortal infection, spontaneous abortion in 22%,** dyspareunia in 20%, and chronic pelvic pain in 14%. The risk of ectopic pregnancy is probably also increased. Surgical scrub cannot sterilize the endocervix and, as a consequence, abortion is performed in a contaminated field. The presence of pathogenic bacteria, i.e. Chlamydia trachomatis, therefore increases the risk of postoperative infection. The organism is found in approximately 7% of those applying for abortion and the risk of sustaining infection is 20%. Other risk factors are previous pelvic inflammatory disease, vaginal infection, first pregnancy and young age. … Women applying for abortion should be examined for C. trachomatis and positive cases treated no later than at the time of the abortion."

[PubMed Summary] Heisterberg L., "Preventive antibiotics in induced first-trimester abortion," Ugeskr Laeger. 1992 Oct 26;154 (44):3056-60. [Article in Danish]

"Pattern of infertility cases attending the gynaecologic out patient clinic of Ogun State University Teaching Hospital, Sagamu Nigeria is presented. **The incidence of infertility was found to be 14.8%** with a mean duration of 3.38 +/- 1.65 years. Secondary infertility predominated with 78.3% incidence. About three quarters (71.1%) were between 25 and 34 years of age and only 6.0% were below 25 years of age Nullipara constituted majority of cases with 56.6%. **Past history of induced abortion was significantly present in those with tubal blockage**."

[PubMed Summary] Olatunji AO, Sule-Odu AO,, "The pattern of infertility cases at a university hospital," West Afr J Med. 2003 Sep;22(3):205-7. Department of Obstetrics and Gynaecology, Obafemi Awolowo College of Health Sciences, Ogun State University, Sagamu, Nigeria.

"The aim was to determine whether induced abortions could increase the risk of secondary infertility. … This was a case-control study; cases were women with secondary infertility, individually matched to two controls who were currently pregnant. … The data were analysed by conditional logistic regression. … The study took place in the Alexandra Maternity Hospital in Athens, Greece, in 1987-88. … 84 women consecutively admitted with secondary infertility and 168 pregnant controls took part. … Eight cases and no controls reported a previous ectopic pregnancy, confirming that the occurrence of a pregnancy of this type dramatically increases the risk of secondary infertility. **Furthermore, the occurrence of either induced abortions or spontaneous abortions independently and significantly increased the risk of subsequent development of secondary infertility.** The logistic regression adjusted **relative risks** (and 95% confidence intervals) **for secondary infertility were 2.1 (1.1-4.0) when there was one previous induced abortion and 2.3 (1.0-5.3) when there were two previous induced abortions.** Tobacco smoking significantly increased the risk of secondary infertility, the adjusted relative risk being 3.0 (1.3-6.8). … Legalised induced abortions, as currently practiced in Greece, appear to increase slightly the relative risk of secondary infertility."

[PubMed Summary] Tzonou A, Hsieh CC, Trichopoulos D, Aravandinos D, Kalandidi A, Margaris D, Goldman M, Toupadaki N, "Induced abortions, miscarriages, and tobacco smoking as risk

factors for secondary infertility," Journal of Epidemiology and Community Health. 1993 Feb;47(1):36-9. Department of Epidemiology, Harvard School of Public Health, Boston, MA 02115.

"Sterility following abortion still occurs in France, but it is not always due to a tubal problem. During the 1st consultation for infertility the woman should be encouraged to describe the circumstances of the abortion, whether it was performed in secrecy, and her feelings about it. A 24-year-old woman who had had an abortion 2 years previously suffered from irregular cycles and was unresponsive to treatment to regulate ovulation. She became pregnant only after violently reproaching her mother for the mother's role in the abortion. … **In a 3rd case a Catholic woman of Irish origin felt such guilt after an abortion that she became pregnant again only after 10 years of infertility and an adoption**. Some cases of infertility after a 1st live birth are explained by a prohibition on the part of the woman's mother, who herself had only 1 daughter. …"

[PubMed –Summary] Cabau A, "Secondary sterility," Soins Gynecol Obstet Pueric Pediatr. 1985 Jun-Jul;(49-50):17-20. [Article in French]

"A screening test was applied to 136 primigravidae, between six months and one year following therapeutic abortion, to check tubal patency, using pertubation, according to Semm. … **Complete tubal occlusion, as a secondary cause of secondary sterility in the wake of therapeutic abortion, was recorded from 2.96 per cent of the above primigravidae.** The rate of tubal infertility (tubal abortion or extra-uterine gravidity) was not significantly increased beyond the figures of other patients (0.96 per cent of all primigravidae, following therapeutic abortion). --Derived from the above results are recommendations for techniques of abortion which should be used on primigravidae."

[PubMed Summary] Schott G, Kreibich H, Ehrig E, "Tubal factors as possible causes of sterility or infertility of primigravidae, following therapeutic abortion," Zentralbl Gynakol. 1981;103 (6):355-62. [Article in German]

"The medical histories of 105 patients with secondary infertility were studied to determine whether or not induced abortion contributes to the occurrence of secondary infertility. One hundred ninety-nine control cases were matched to these cases according to age, number of previous pregnancies, race, marital status, and socioeconomic status. **It was found that women with a history of prior induced abortion did have a sligtly higher risk (risk ratio = 1.31) of secondary infertility**, but that the 95% confidence interval (0.71 to 2.43) was consistent with no association at all. When the analysis was restricted to women without ovulatory problems the risk was of similar magnitude. Prior spontaneous abortion was also found to be unrelated to secondary infertility in this series of women."

[PubMed Summary] Daling JR, Spadoni LR, Emanuel I, "Role of induced abortion in secondary infertility," Obstet Gynecol. 1981 Jan;57 (1):59-61

"The role of induced (and spontaneous) abortions in the aetiology of secondary sterility was investigated. Obstetric and gynaecologic histories were obtained from 100 women with secondary infertility admitted to the First Department of Obstetrics and Gynaecology of the University of Athens Medical School and to the Division of Fertility and Sterility of that Department. For every patient, an attempt was made to find two healthy control subjects from the same hospital with matching for age, parity, and level of education. Two control subjects each were found for 83 of the index patinets. **The relative risk of secondary infertility among women with at least one induced abortion and no**

spontaneous abortions was 3.4 times that among women without any induced or spontaneous abortions (95 per cent confidence interval 1.38-8.37). The relationship was statistically significant and indicated that in Greece, about 45 per cent."

[PubMed Summary] Trichopoulos D, Handanos N, Danezis J, Kalandidi A, Kalapothaki V, "Induced abortion and secondary infertility," British Journal of Obstetrics and Gynaecology, 1976 Aug;83(8):645-50.

"336 women suffering from secondary sterility were subjected to examination and observation. The cause of sterility was inflammatory etiology in 78.9% of the cases, 43.5% of which were provoked by induced abortion. **A high incidence of complications with regard to impaired fertility has been noted among abortions of 1st pregnancies. After the interruption of the 1st pregnancy, twice as many sterile women were found in the group with late menarache** (44) as in the group with the normal appearance of the 1st menstruation (21). As abortion is considered to be a major cause of fertility complications, the reduction of the number of abortions is considered important in the prophylaxis of these problems."

[PubMed Summary] Zivkovic V, Vukovic V, Juras N, "Secondary sterility after artificial abortion," An Klin Bol Dr M Stojanovic. 1975;14 (4):111-6. [Article in English, Croatian]

"A report is presented classifying complications which resulted in 1970 from 436 legal abortions performed by vacuum aspiration in conjunction with iv oxytocin infusion. **39% were pregnant for the 1st time, and 26% had undergone a previous abortion**. The overall complication rate was 10.3%, with 4.4% having complications (i.e., salpingitis, endometritis, rupture of the cervix, or perforation of the uterus), which theoretically could lead to infertility or other secondary complications."

[PubMed Summary] Johansson ED, Nygren KG, "Somatic complications after legal abortion by vacuum aspiration combined with oxytocin infusion," Lakartidningen. 1972 Dec 13;69 (51):6045-8

"Most infections occurring after an interruption of pregnancy (IP) are not due to the physician's negligence but rather to the patient's failure to follow treatment guidelines at home, especially their sexual activity and hygiene. **The causes of secondary sterility were most often found to be parametritis with adnexitide or adnexitis** on 1 or both sides. In a smaller percentage of cases there occurred salpingitis, cervicitis, colpitis, endometritis, and even pelveoperitonitis. … The onset and the intensity of infection after IP is definitely dependent on the technique of the actual operation, the length of hospitalization, care at home after release from the hospital, and on the month of pregnancy when IP was performed."

[PubMed Summary] Kolarova O, "Long-term follow up of secondary sterility following artificial interruption of pregnancy," Cesk Gynekol. 1970 Sep;35 (7):399-400. [Article in Czech]

"Group 1 was composed of 250 women whose pregnancy was terminated by curettage (n=100), prostaglandins (n=100), and vacuum aspiration (n=50). Reproductive function was assessed in this group for 12 months after artificial abortion (1, 3, 6, 12 cycles). Group 2 consisted of 400 women: pregnancy was terminated instrumentally in 250 of the women, and it was done by prostaglandins in 150 women. … The 1st menstrual cycle after both surgical and prostaglandin abortion was biphasic in 88% (220 of the 250 women). Yet, an insufficient luteal phase in the 1st menstrual cycle developed in 20% of women with surgical abortion and in only 10% of the subgroup with prostaglandin-induced abortion. … Examination of the 2nd group revealed reproductive dysfunction in 131 of the 400

women studied (32.7%). … **The rate of postabortion complications in the long term increased by more than 3-fold.** Postabortion complications were more frequent in women with a late menarche and with a history of genital inflammation. Investigation of the menstrual pattern in **women suffering from secondary infertility after artificial abortion showed that 36.6% of the patients preserved the regular menstrual pattern, yet an insufficient luteal phase revealed by functional tests led to infertility**. Impairment of the ovulatory process was the leading symptom in the women with secondary infertility. Ovarian dysfunction was expressed as an insufficient luteal phase 2.4 times more often than anovulation."

[PubMed Summary] Sotnikova EI, Short and long-term results of pregnancy termination by different methods," Acta Med Hung. 1986;43 (2):139-43

"A comparison was made between 535 primiparae with a record of therapeutic termination of previous pregnancies, 305 primiparae with previous abortion, and 501 primiparae without any record of spontaneous or medically induced abortion, all of these being compared for their prepartum, intrapartum, and postpartum phases as well as the conditions of their children delivered in their first intrapartum, and postpartum phases as well as the conditions of their children delivered in their first full-term pregnancy.-- **Significant accumulation of spontaneous abortions, bleeding in the first and second thirds of pregnancy, as well as postpartum complications were recordable from women with record of induced or spontaneous abortions, in comparison with primigravid primiparae.** All probands with record of previous termination of pregnancies exhibited a trend towards premature births, yet, with no significant accumulation of these. Significantly increased use of therapeutic and prophylactic measures, such as cerclage and tocolysis, should be taken into due consideration, in that context."

[PubMed Sumary] Schott G, Ehrig E, Wulff V. "Prospective studies into pregnancies of primiparae with record of therapeutic termination of previous pregnancies or of spontaneous abortion and assessment of fertility," Zentralbl Gynakol. 1980;102 (16):932-8. [Article in German]

"Abortion should be performed as early in pregnancy as possible; this reduces the chance for complications. The discussion of possible complications categorizes them as early and late complications of both early (1st trimester) and late (2nd trimester) procedures. Uterine perforation, cervical laeration, and infection and/or hemorrhage are the likeliest complications of both early and late abortions. Cervical laceration and uterine rupture in late abortion can be caused by overstimulation of uterine contractions through an overdose of PG (prostaglandin) infusion. **Tubal blockage or cervical incompetence, possible late complications of abortion, can have disadvantageous effects on subsequent reproductive performance.**"

[PubMed Summary] Brudenell M, "Gynaecological sequelae of induced abortion," Practitioner. 1980 Sep;224 (1347):893-8;

"**The purpose of this study was to demonstrate if decreased fertility could be shown in women whose previous pregnancy had been terminated by a legally induced abortion.** In 7 270 pregnant women fertility was measured as the time elapsed from the couple started sexual intercourse without using contraception to the present pregnancy. This interval was called "the latent period" and fertility was defined as reduced if it was longer than one year. In women whose previous pregnancy had been terminated by legally induced abortion subsequent decreased fertility could not be shown when compared with

women whose previous pregnancy had ended in a live birth, the frequency of a latent period longer than one year not differing between these groups. **When induced abortion had been complicated by pelvic inflammatory disease the frequency of a latent period more than one year was found to be higher than in women without this complication**."

[PubMed Summary] Obel E. B., "Fertility following legally induced abortion," Acta Obstet Gynecol Scand. 1979;58 (6):539-42

Studies on Legal Abortion Induced Infertility and Assisted Artificial Reproduction

"When couples are faced with the dilemma of a higher order multiple pregnancy there are three options. **Termination of the entire pregnancy has generally not been acceptable to women, especially for those with a past history of infertility. Attempting to continue with all the fetuses is associated with inherent problems of preterm birth, survival and long term morbidity. The other alternative relates to reduction in the number of fetuses by selective termination.** The acceptability of these options for the couple will depend on their social background and underlying beliefs."

[PubMed Summary] Dodd JM, Crowther CA, "Reduction of the number of fetuses for women with triplet and higher order multiple pregnancies," Cochrane Database Syst Rev. 2003;(2):CD003932. Department of Obstetrics and Gynaecology, University of Adelaide, Women's and Children's Hospital, 72 King William Road, Adelaide, South Australia, Australia.

"Multiple pregnancies associated with infertility treatment are recognized as an adverse outcome and are responsible for morbidity and mortality related to prematurity and very low birthweight population. Due to the epidemic of iatrogenic multiple births, the incidence of maternal, perinatal and childhood morbidity and mortality has increased. This results in a hidden healthcare cost of infertility therapy and this may lead to social and political concern. Reducing the number of embryos transferred and the use of natural cycle IVF will surely decrease the number of multiple gestations."

[PubMed Summary] Ombelet W, De Sutter P, Van der Elst J, Martens G, "Multiple gestation and infertility treatment: registration, reflection and reaction--the Belgian project," Hum Reprod Update. 2005 Jan-Feb;11 (1):3-14. Epub 2004 Nov 4. Genk Institute for Fertility Technology, Department of Obstetrics and Gynaecology, Genk, Belgium.

"To examine nurses' attitudes toward pregnancy termination in the labor and delivery setting and the frequency of nurse refusal to care for patients undergoing pregnancy termination. … Six central and northern California hospitals, including Level 1, 2, and 3 facilities. … Seventy-five labor and delivery registered nurses. … Anonymous survey with visual analog scales. … Ninety-five percent of the nurses indicated they would agree to care for patients terminating a pregnancy because of fetal demise, 77% would care for patients terminating a fetus with anomalies that were incompatible with life, and 37% would care for patients terminating for serious but nonlethal anomalies, with a significant drop in agreement as gestation advanced. **Few nurses would agree to care for patients undergoing termination for sex selection, selective reduction, or personal reasons.** Nurses both accepting and refusing patient care assignments were criticized by coworkers.

[PubMed Summary] Marek MJ, "Nurses' attitudes toward pregnancy termination in the labor and delivery setting," Journal of Obstetric and Gynecol Neonatal Nursing, 2004 Jul-Aug;33 (4):472-9 Memorial Medical Center, Sutter Affiliate, Modesto.

"We did a population-based retrospective cohort study in which we compared development of neurological problems in 5680 children born after IVF, with 11360 matched controls. For 2060 twins born after IVF, a second set of controls (n=4120), all twins, were selected. We obtained data on neurological problems from the records of the Swedish habilitation centres. … **Children born after IVF are more likely to need habilitation services than controls (odds ratio 1.7, 95% CI 1.3-2.2). For singletons, the risk was 1.4 (1.0-2.1). The most common neurological diagnosis was cerebral palsy, for which children born after IVF had an increased risk of 3.7(2.0-6.6), a**nd IVF singletons of 2.8 (1.3-5.8). Suspected developmental delay was increased four-fold (1.9-8.3) in children born after IVF. … Our study suggests that children born after IVF have an increased risk of developing neurological problems, especially cerebral palsy. These risks are largely due to the high frequency of twin pregnancies, low birthweight, and prematurity among babies born after IVF. To limit these risks, we recommend that only one embryo should be transferred during IVF."

> [PubMed – Summary] Stromberg B, Dahlquist G, Ericson A, Finnstrom O, Koster M, Stjernqvist K, "Neurological sequelae in children born after in-vitro fertilisation: a population-based study," Lancet. 2002 Feb 9;359 (9305):461-5, Department of Women and Child Health, University Children's Hospital, Uppsala, Sweden.

"Multiple pregnancy rates remain high after assisted conception because of a misconceived assumption that transferring three or more embryos will maximize pregnancy rates. **Maternal morbidity is sevenfold greater in multiple pregnancies than in singletons, perinatal mortality rates are fourfold higher for twins and sixfold higher for triplets, while cerebral palsy rates are 1-1.5% in twin and 7-8% in triplet pregnancies**. Therefore, multiple pregnancies must be considered a serious adverse outcome of assisted reproductive techniques. Primary prevention of multiple pregnancies is the solution. The overwhelming evidence presented in this chapter demonstrates that limiting the embryo transfer in in vitro fertilization to two embryos would significantly reduce adverse maternal and perinatal outcomes by reducing the incidence of high order multiple pregnancies without reducing take-home-baby rates. Secondary prevention by multifetal pregnancy reduction is effective, but not acceptable to all patients."

> [PubMed Summary] Wimalasundera RC, Trew G, Fisk NM, "Reducing the incidence of twins and triplets," Best Pract Res Clin Obstet Gynaecol. 2003 Apr;17 (2):309-29, Centre For Fetal Care, Queen Charlotte's & Chelsea Hospital, Du Cane Road, Hammersmith, London

"This study explores lived experiences of Taiwanese women with multifetal pregnancies who receive fetal reduction. … Six subjects were recruited from a medical center … Most of the subjects were contacted nine times. The total time of observation was 8-10 weeks. The collected data was analyzed by content analysis, and forming themes. The findings are as follows: (1) difficulty in accepting unexpected multiple pregnancies; (2) worry over danger/risk of multiple pregnancies and concern about fetal reduction; (3) decision to take fetal reduction for the safe delivery and health of two babies; **(4) anxiety about the techniques of fetal reduction; (5) growing emotion of attachment to the fetus and guilty feeling; (6) unbearable physical/mental stress when facing the intrusion of fetal reduction;** (7) being enmeshed in fear of unstable pregnancy and guilt; and (8) cloud of uncertainty diminished, return to normal pregnancy. The results indicated that the women

with multifetal pregnancies, who received fetal reduction, encountered a difficult decision. They were exposed to tremendous emotional responses."

[PubMed Summary] Wang HL, Yu Chao YM, "Lived experiences of Taiwanese women with multifetal pregnancies who receive fetal reduction," J Nurs Res. 2006 Jun;14 (2):143-54, Department of Nursing, Jen-Teh Junior College of Medicine, Nursing and Management, Taiwan.

"New reproductive technologies, such as advanced infertility treatments, may have significant implications for women's psychological experience of pregnancy and motherhood. ... Forty-four women who had undergone pregnancy reductions were interviewed about their emotional experience of this medical intervention and their subsequent pregnancies. … **Women experienced having to abort some of their fetuses as a stressful and distressing life event, and a fourth of the women experienced bereavement reactions which impaired their functioning for at least two weeks. Conscious and unconscious responses to the procedure included ambivalence, guilt, and a sense of narcissistic injury, increasing the complexity of their attachment to the remaining babies.** However, the achievement of the developmental goal of parenting healthy birth children helped most women feel that they had made the right decision for themselves and their families. Further research is indicated, including interviews before the reduction and long-term follow-up of mothers and surviving children."

[PubMed Summary] McKinney MK, Tuber SB, Downey JI, Multifetal pregnancy reduction: psychodynamic implications, Psychiatry. 1996 Winter;59 (4):393-407, University of Michigan Psychological Clinic.

"Twenty-one couples with high-order multiple pregnancies resulting from infertility treatment were referred from all over the Netherlands. A total of 36 infants (15 twins and 2 triplets) were included in the follow-up. … Pregnancy reduction by transabdominal approach at a median of 11 (9 to 13) weeks gestation. One assessment took place between the age of 9 months and 6 years after delivery. … Abortion within 4 weeks after pregnancy reduction did not occur in this series. Six infants (13.7%) died perinatally. Two infants (4.4%) died at the ages of 12 days and 3 months, respectively. Early preterm delivery was the cause of death in all cases. The development of the infants was appropriate to gestational age and birth weight. **At follow-up, 14 couples disclosed at the time they were unaware of the risks and the consequences of infertility treatment. Nine couples indicated they had feelings of guilt after pregnancy reduction. These feelings, however, were not disclosed at the time of the interviews,** during which none of the families showed either regret or distress about their decision. Two couples only occasionally experienced some grief and mourning reactions for the reduced fetuses."

[PubMed Summary] Kanhai HH, de Haan M, van Zanten LA, Geerinck-Vercammen C, van der Ploeg HM, Gravenhorst JB, "Follow-up of pregnancies, infants, and families after multifetal pregnancy reduction," Fertility and Sterility, 1994 Nov;62 (5):955-9, Department of Obstetrics, University Medical Centre, Leiden, The Netherlands.

"The Cochrane Library and MEDLINE were searched for English-language articles from 1990 to February 2005, relating to assisted reproduction and perinatal outcomes. … Spontaneous pregnancies in untreated infertile women may be at higher risk for obstetrical complications and perinatal mortality than spontaneous pregnancies in fertile women.. … **Pregnancies achieved by ovarian stimulation with gonadotropins and intrauterine insemination are at higher risk for perinatal complications** … Multiple gestations remain a significant risk of gonadotropin treatment. … **Pregnancies achieved by IVF**

with or without ICSI are at higher risk for obstetrical and perinatal complications than spontaneous pregnancies … Women undergoing ART should be informed about the increased rate of obstetrical interventions such as induced labour and elective Caesarean delivery. … **Singleton pregnancies achieved by assisted reproduction are at higher risk than spontaneous pregnancies for adverse perinatal outcomes, including perinatal mortality, preterm delivery, and low birth weight … The precise risks of imprinting and childhood cancer from ART remain unclear but cannot be ignored.** Further clinical research, including long-term follow-up, is urgently required to evaluate the prevalence of imprinting disorders and cancers associated with ART. … The clinical application of preimplantation genetic diagnosis must balance the benefits of avoiding disease transmission with the medical risks and financial burden of in vitro fertilization. Further ethical discussion and clinical research is required to evaluate appropriate indications for preimplantation genetic diagnosis."

[PubMed Summary] Allen VM, Wilson RD, Cheung A, "Pregnancy outcomes after assisted reproductive technology," J Obstet Gynaecol Can. 2006 Mar;28 (3):220-50, [Article in English, French]

"… we compared neonatal birth weight data of infants born after various ART treatments, including intrauterine insemination (IUI), with those of previously infertile women achieving pregnancy after sexual intercourse. … Between August 1996 and March 2004 the data of all infertile women presenting in the infertility unit of the University Women's Hospital of Basel, Switzerland, were collected prospectively, adding up to 995 intact pregnancies and deliveries. … **Comparison of duration of pregnancy and birth weight of infants born after infertility treatment confirms a shorter pregnancy span and a lower mean birth weight in infants born after IVF and ICSI. If women with pregnancies after ART deliver before term, neonatal birth weight is significantly lower**. … There is a specific effect of ART, mainly IVF and ICSI, on both shortening the duration of pregnancy and lowering neonatal birth weight. Both these parameters seem to be interrelated consequences of some modification in the gestational process induced by the infertility treatment. Freezing and thawing of oocytes in the pronucleate stage had a lesser impact on pregnancy span and on neonatal birth weight.

[PubMed Summary] De Geyter C, De Geyter M, Steimann S, Zhang H, Holzgreve W, "Comparative birth weights of singletons born after assisted reproduction and natural conception in previously infertile women," Human Reproduction, 2006 Mar;21(3):705-12. Epub 2005 Nov 10, Women's Hospital and Department of Research, University of Basel, Basel Switzerland.

"Subjects were 62,551 infants born after ART treatments performed in 1996-2000. … Detailed analyses were performed for 6,377 infants conceived in 2000. … After adjustment for maternal age, parity, and race/ethnicity, **singleton infants born after ART in 2000 had elevated risks for all outcomes in comparison with the general population of U.S. singletons: LBW standardized risk ratio 1.62 (95% confidence interval 1.49, 1.75), VLBW 1.79 (1.45, 2.12), preterm delivery 1.41 (1.32, 1.51), preterm LBW 1.74 (1.57, 1.90), and term LBW 1.39 (1.19, 1.59)."**

[PubMed Summary] Schieve LA, Ferre C, Peterson HB, Macaluso M, Reynolds MA, Wright VC, "Perinatal outcome among singleton infants conceived through assisted reproductive technology in the United States,' Obstetrics and Gynecology, 2004 Jun;103 (6):1144-53, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.

"To determine whether the use of assisted reproductive technology (ART) is associated with an increase in chromosomal abnormalities, fetal malformations, or adverse pregnancy outcomes. … A total of 36,062 pregnancies were analyzed: 34,286 (95.1%) were spontaneously conceived, 1,222 (3.4%) used ovulation induction, and 554 (1.5%) used IVF. … **Ovulation induction was associated with a statistically significant increase in placental abruption, fetal loss after 24 weeks, and gestational diabetes after adjustment. Use of IVF was associated with a statistically significant increase in preeclampsia, gestational hypertension, placental abruption, placenta previa, and risk of cesarean delivery.** … Patients who undergo IVF are at increased risk for several adverse pregnancy outcomes. Although many of these risks are not seen in patients undergoing ovulation induction, several adverse pregnancy outcomes are still increased in this group."

[PubMed Summary] Shevell T, Malone FD, Vidaver J, Porter TF, Luthy DA, Comstock CH, Hankins GD, Eddleman K, Dolan S, Dugoff L, Craigo S, Timor IE, Carr SR, Wolfe HM, Bianchi DW, D'Alton ME, "Assisted reproductive technology and pregnancy outcome," Obstetrics and Gynecology 2005 Nov;106 (5 Pt 1):1039-45, Division of Maternal-Fetal Medicine, Whittingham Pavilion, Stamford Hospital.

"We searched MEDLINE, BIOSIS, Doctoral Dissertations On-Line, bibliographies, and conference proceedings for studies from 1978-2002 … Fifteen studies comprising 12,283 IVF and 1.9 million spontaneously conceived singletons were identified. … **Compared with spontaneous conceptions, IVF singleton pregnancies were associated with significantly higher odds of each of the perinatal outcomes examined: perinatal mortality (odds ratio [OR] 2.2; 95% confidence interval [CI] 1.6, 3.0), preterm delivery (OR 2.0; 95% CI 1.7, 2.2), low birth weight (OR 1.8; 95% CI 1.4, 2.2), very low birth weight (OR 2.7; 95% CI 2.3, 3.1), and small for gestational age (OR 1.6; 95% CI 1.3, 2.0). … Early preterm delivery, spontaneous preterm delivery, placenta previa, gestational diabetes, preeclampsia, and neonatal intensive care admission were also significantly more prevalent in the IVF group**. … Obstetricians should not only manage these pregnancies as high risk but also avoid iatrogenic harm caused by elective preterm labor induction or cesarean.

[PubMed Summary] Jackson RA, Gibson KA, Wu YW, Croughan MS, "Perinatal outcomes in singletons following in vitro fertilization: a meta-analysis," Obstet Gynecol. 2004 Mar;103 (3):551-63 Department of Obstetrics, Gynecology, and Reproductive Sciences, University of California-San Francisco.

"All women known to have had IVF in Sweden 1982-2001. … Using Swedish health registers, women who had given birth after IVF were identified from all Swedish IVF clinics and compared with all women who gave birth. **… IVF women had an increased risk of bleeding in early pregnancy [odds ratio (OR) = 4.59, 95% confidence interval (95% CI) 4.08-5.15] and of ovarian torsion during pregnancy (OR = 10.6, 5.69-10.7). They were also more likely to encounter pre-eclampsia (OR = 1.63, 1.53-1.74), placental abruption (2.17, 1.74-2.72), placenta praevia (3.65, 3.15-4.23), bleeding in association with vaginal delivery (1.40, 1.38-1.50) and premature rupture of membranes (PROM) (2.54, 2.34-2.76).** Interventions including caesarean sections (1.38, 1.32-1.43) and induction of labour (1.37, 1.29-1.46) in singleton pregnancies was more frequent. The type of IVF method had little effect on these results … There was a significant decrease in cancer risk after IVF (0.79, 0.69-0.91) but a suggested increase in

the risk of ovarian cancer both before (2.70, 1.49-4.91) and after (2.08, 1.15-3.76) IVF. …Women treated with IVF had an increased obstetric morbidity. This seems to contribute little to the well-known increased risk of preterm delivery."

[PubMed Summary] Kallen B, Finnstrom O, Nygren KG, Otterblad Olausson P, Wennerholm UB, "In vitro fertilisation in Sweden: obstetric characteristics, maternal morbidity and mortality," British Journal of Obstetrics and Gynecology, 2005 Nov;112(11):1529-35, Tornblad Institute, University of Lund, Lund, Sweden.

"The main perinatal complications of assisted reproduction include congenital malformation, chromosomal aberrations, multiple pregnancy, and prematurity. … a large Australian study has found that by one year of age, the incidence of congenital malformations in IVF/ICSI children is increased in comparison with those naturally conceived. Several investigators found a slight but increased risk of chromosomal aberrations in ICSI children. Multiple pregnancy is a major cause of increased perinatal mortality due to increased incidence of both prematurity and congenital malformations. Even in singleton pregnancies conceived by assisted reproductive technologies, the risk of prematurity and newborns small for gestational age is increased."

[PubMed Summary] Aboulghar MA, "Perinatal complications of assisted reproduction," Croatian Medical Joournal, 2005 Oct;46 (5):751-8.

"We examined the occurrence of serious complications and miscarriages leading to hospitalization or operation after IVF (including microinjections and frozen embryo transfers) and OI treatment (with or without insemination). … Women who received IVF (n = 9175) or OI treatment (n = 10 254) 1996-1998 in Finland were followed by a register linkage study until 2000. … **After the first IVF treatment cycle, 14 per 1000 women had a serious case of OHSS (ovarian hyperstimulation syndrome), with 23 per 1000 throughout the study period (mean of 3.3 treatments).** The corresponding values after OI were very low. The rates of registered ectopic pregnancies and miscarriages after IVF were nine and 42 respectively per 1000 women, with corresponding rates after OI of eight and 42. … Overall, 15% of IVF and 8% of OI women had at least one hospital episode during the study period. … Though there was a low risk of complications after each IVF treatment cycle, repeated attempts resulted in serious complications for many women, and these occurred much more often than after ovulation induction alone.

[PubMed Summary] Klemetti R, Sevon T, Gissler M, Hemminki E, "Complications of IVF and ovulation induction," Human Reproduction, 2005 Dec;20 (12):3293-300. Epub 2005 Aug 26. Research on Practices, National Research and Development Centre for Welfare and Health, Helsinki, Finland.

"Women without a functioning uterus or those whose pregnancy would exacerbate a medical condition were enrolled in the gestational carrier pregnancy program. … IVF cycles using oocytes from genetic mothers (or oocyte donors) were performed, with ET to gestational carriers. … Ten couples underwent a total of 13 cycles using gestational carriers. A clinical pregnancy rate of 69% (9/13) was achieved. **An intrapartum hysterectomy and a late puerperal hysterectomy were required because of severe obstetrical complications.** The late puerperal hysterectomy was performed for placenta accreta in a triplet gestation. **This carrier sustained multiple cerebral infarcts and blindness. One triplet infant died secondary to a hypoplastic left ventricle and complications of prematurity. A second gestational carrier with a singleton gestation underwent a hysterectomy for a uterine rupture, and the infant has cerebral palsy.** …

The past medical and obstetrical histories of potential gestational carriers must be closely scrutinized, and candidates must be thoroughly counseled about the potential risks involved in the procedure.

> [PubMed – Summary] Duffy DA, Nulsen JC, Maier DB, Engmann L, Schmidt D, Benadiva CA, "Obstetrical complications in gestational carrier pregnancies," Fertility and Sterility, 2005 Mar;83 (3):749-54, Department of Obstetrics and Gynecology, Danbury Hospital.

"Retrospective study in a university IVF programme that produced 746 IVF pregnancies with twins at 6 weeks of gestation (1991-1999). … Interestingly**, by 20 weeks gestation, 184 (24.7%) of pregnancies spontaneously reduced to a singleton, whereas 49 (6.6%) lost both twins.** Of the 513 (68.8%) viable twin pregnancies (>20 weeks), 154 (20.6%) went on to term (>37 weeks), whereas 250 (33.5%) delivered between 33 and 36 weeks gestation. The perinatal mortality per 1000 births was 6.5 over 37 weeks, 8.0 for 33-36 weeks, 41.7 for 29-32 weeks and 500 for under 28 weeks."

> [PubMed – Summary] Kovacs GT, Breheny S, Maclachlan V, Lowe P, Howlett D, "Outcome of pregnancies achieved by in vitro fertilisation techniques and diagnosed as twins at the 6 week ultrasound," Australian and New Zealand Journal of Obstetrics and Gynaecology, 2004 Dec;44(6):510-3. Monash IVF, Monash University, Richmond, Victoria, Australia.

"From 1982 to 1990, 629 IVF pregnancies progressed beyond 20 weeks; 115 twins (18.3%), 15 triplets (2.4%), and 4 quadruplets (0.6%). **There was a high incidence of antenatal complications such as abortions (30.3%, 42%, and 20%), premature labor (41.5%, 92.3%, and 75%), pregnancy-induced hypertension (17.0%, 38.6%, and 50%), and gestational diabetes mellitus (3.1%, 38.5%, and 25%) for twins, triplets, and quadruplets, respectively.** The mean gestational age at delivery was 35.5 +/- 3.7, 31.8 +/- 2.7, and 31.0 +/- 1.7 weeks, respectively. There was also a proportionate progressive increase in neonatal complications. The mean weights were 2,473 +/- 745, 1,666 +/- 441 and 1,414 +/- 368 g, respectively. Twins (22.7%), 64.1% of triplets, and 75% of quadruplets needed admission to the neonatal intensive care unit and remained for an average of 12.0 +/- 2.3, 17.4 +/- 14.0, and 57.8 +/- 17.9 days, respectively. There was no difference in the mean Apgar scores or the incidence of congenital malformations in the three groups. The corrected perinatal mortality rates were 38.5, 0.0, and 0.0 per thousand live births, respectively. … Triplet and quadruplet IVF pregnancies have increased obstetrical and neonatal complications compared with IVF twins. The perinatal mortality and the incidence of congenital malformations are, however, comparable in all three groups.

> [PubMed – Summary] Seoud MA, Toner JP, Kruithoff C, Muasher SJ, "Outcome of twin, triplet, and quadruplet in vitro fertilization pregnancies: the Norfolk experience," Jones Institute for Reproductive Medicine, Eastern Virginia Medical School, Department of Obstetrics and Gynecology, Norfolk 23507.

"A MEDLINE search (1965-2000) was performed … Twenty-seven articles met all inclusion/exclusion criteria and were analyzed by meta-analysis. The random-effects summary relative risk of preterm birth in singleton pregnancies resulting from IVF-ET/GIFT was 1.98 (95% confidence interval, 1.77-2.22). … **The risk of preterm birth in singleton pregnancies resulting from IVF-ET/GIFT is twice that of natural conceived pregnancies."**

> [PubMed – Summary] McGovern PG, Llorens AJ, Skurnick JH, Weiss G, Goldsmith LT, "Increased risk of preterm birth in singleton pregnancies resulting from in vitro fertilization-embryo

transfer or gamete intrafallopian transfer: a meta-analysis," Fertility and Sterility, 2004 Dec;82 (6):1514-20, Department of Obstetrics, Gynecology and Women's Health, University of Medicine and Dentistry of New Jersey-New Jersey Medical School

"This case-control study was conducted in a tertiary care medical center. The 322 singleton and 78 twin pregnancies after GIFT or IVF from 1991 through 1996 were evaluated and compared with each other, and with a control group that conceived spontaneously and matched for parity, maternal and gestational age. … **Pregnancy-induced hypertension (PIH) and vaginal bleeding were significantly more frequent maternal complications in the GIFT/IVF singleton groups compared to controls.** … Assisted reproduction was associated with low birth weight only in twin pregnancies when controlled for confounding variables, however perinatal outcome was comparable. … After controlling for parity, maternal and gestational age, **singleton pregnancies conceived by GIFT/IVF are at increased obstetrical risk,** however the perinatal outcome is comparable despite a lower average birth weight."

[PubMed – Summary] Ochsenkuhn R, Strowitzki T, Gurtner M, Strauss A, Schulze A, Hepp H, Hillemanns Prregnancy complications, obstetric risks, and neonatal outcome in singleton and twin Pregnancies after GIFT and IVF," Arch Gynecol Obstet. 2003 Oct;268(4):256-61. Epub 2003 Aug 5, Department of Obstetrics and Gynecology, University Munich-Grosshadern, 81377 Munich, Germany.

"Transvaginal ultrasound guided oocyte retrieval (TVOR) during in vitro fertilization (IVF) treatment was first described in 1985. By virtue of its simplicity and effectiveness, it has gained widespread popularity and **has now become the gold standard for IVF therapy.** Nevertheless, despite the advantages, the aspiration needle may injure the adjacent pelvic organs and structures leading to serious complications. **The most common complications are haemorrhage, trauma and injury of pelvic structures, and pelvic infection. Other complications described include adnexal torsion, rupture of endometriotic cysts,** anaesthetic, and even vertebral osteomyelitis. In the last two decades, several reports have described the complications associated with this technique, and tried to address the risk factors and safety issues. However there is wide variation in the way this common procedure is performed, with room for improvement through published guidelines."

[PubMed – Summary] El-Shawarby S, Margara R, Trew G, Lavery S, "A review of complications following transvaginal oocyte retrieval for in-vitro fertilization," Hum Fertil (Camb). 2004 Jun;7(2):127-33, The IVF Unit, Department of Reproductive Medicine and Science, Hammersmith Hospital, Imperial College School of Medicine, London, UK.

"Twin pregnancies constitute 25% of all in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI) pregnancies. … The study population consisted of all IVF/ICSI twin mothers (n = 266) and the two control groups of all IVF/ICSI singleton mothers (n = 764) and non-IVF/ICSI twin mothers (n = 739) who delivered in Denmark in 1997. The response rate was 89% among IVF twin mothers and overall 81%. … IVF/ICSI twin mothers were more frequently on sick leave (OR 2.5, 95% CI 1.5-4.0) and hospitalized (OR 1.9, 95% CI 1.3-2.8) during pregnancy. **Compared with IVF/ICSI singleton pregnancies, IVF/ICSI twin pregnancies were characterized by a higher incidence of preeclampsia (OR 2.4, 95% CI 1.5-4.2) and a higher frequency of sick leave (OR 6.8, 95% CI 4.4-10.5) and hospitalizations during pregnancy (OR 3.5, (95% CI 2.5-4.9);**

moreover, mean birthweight (p < 0.001) and gestational age (p < 0.001) were lower."

[PubMed – Summary] Pinborg A, Loft A, Schmidt L, Langhoff-Roos J, Andersen AN, "Maternal risks and perinatal outcome in a Danish national cohort of 1005 twin pregnancies: the role of in vitro fertilization," Acta Obstet Gynecol Scand. 2004 Jan;83 (1):75-84. The Fertility Clinic, Rigshospitalet, University of Copenhagen, Denmark.

"In Denmark, 4% of all infants are born after in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI) and 40% of these children are twins. … We investigated neonatal outcome in a complete Danish IVF/ICSI birth cohort including 8602 infants born between 1995 and 2000: 3438 twins (40%) and 5164 singletons (60%). Births conceived after IVF or ICSI were identified by record linkage with the Danish IVF Registry and the National Medical Birth Registry. Data on neonatal outcome were collected from the National Patient Registry. **… IVF/ICSI twins had a 10-fold increased age- and parity-adjusted risk of delivery before 37 completed weeks** [odds ratio (OR) 9.9, 95% confidence interval (95% CI) 8.7-11.3] **and a 7.4-fold increased risk of delivery before 32 completed weeks** (OR 7.4, 95% CI 5.6-9.8) compared with singletons. Correspondingly, ORs of birthweight <2500 g and birthweight <1500 g in twins were 11.8 (95% CI 10.3-13.6) and 5.4 (95% CI 4.1-7.0), respectively. **The stillbirth rate was doubled in twins (13.1/1000) compared with singletons (6.6/1000)** (p = 0.002). The risk of cesarean section and of admittance to a neonatal intensive care unit (NICU) was 4.6- and 1.8-fold higher in IVF/ICSI twins than in singletons. … This study indicates that neonatal outcome in IVF/ICSI twins is considerably poorer than in singletons."

[PubMed – Summary] Pinborg A, Loft A, Nyboe Andersen A, "Neonatal outcome in a Danish national cohort of 8602 children born after in vitro fertilization or intracytoplasmic sperm injection: the role of twin pregnancy," Acta Obstet Gynecol Scand. 2004 Nov;83 (11):1071-8, The Fertility Clinic, University of Copenhagen, Rigshospitalet, Denmark

"IVF/ICSI twins are likely to have a higher risk of prematurity associated with higher morbidity. … National controlled cohort study on hospital admissions and surgical interventions in 3393 IVF twins, 10,239 spontaneously conceived twins and 5130 IVF singletons born between 1995 and 2000 in Denmark. Cross-linkage of data from the Danish IVF Registry and the National Patient Registry enabled us to identify children who were admitted to hospital or underwent an operation. **… The frequency of hospitalized children was 69.8, 69.6 and 49.8%, and of children who underwent a surgical intervention 10.6, 11.2 and 8.5% in IVF/ICSI twins, control twins and IVF/ICSI singletons respectively.** Odds ratios (OR) (95% confidence intervals) of hospitalization in IVF/ICSI twins versus control twins and IVF/ICSI singletons were 1.04 (0.96, 1.14) and 2.44 (2.22, 2.63) and OR adjusted for year of birth, maternal age and parity were 1.00 (0.91, 1.11) and 2.38 (2.17, 2.63) respectively. Also for term birth infants, IVF/ICSI twins were more likely to be hospitalized than IVF/ICSI singletons: adjusted OR 1.37 (1.22, 1.51). Similar risk of a surgical procedure was observed in IVF/ICSI versus control twins. However, IVF/ICSI twins more often underwent a surgical intervention than IVF/ICSI singletons: adjusted OR 1.26 (1.08, 1.47). This risk disappeared when restricted to term infants: adjusted OR 1.00 (0.81, 1.22)."

[PubMed – Summary] Pinborg A, Loft A, Rasmussen S, Nyboe Andersen A, "Hospital care utilization of IVF/ICSI twins followed until 2-7 years of age: a controlled Danish national cohort study," Human Reproduction, 2004 Nov;19 (11):2529-36. Epub 2004 Aug 19, The Fertility Clinic, University of Copenhagen, Rigshospitalet, National Board of Health, Health Statistics.

"To report a case of forearm amputation after ovarian stimulation for IVF-ET. … **A 41-year-old woman,** who had coagulation disorder as a result of an ovarian hyperstimulation syndrome (OHSS) for IVF-ET. … Retrospective evaluation of angiographic studies and surgical treatment. …Medical follow-up after forearm amputation due to OHSS. … The patient underwent many cycles of IVF-ET with administration of purified FSH (75 IU 10 times per day, for 12 days) and chorionic gonadotropin (5,000 IU). **The patient had a coagulation disorder as a result of OHSS**, **with thrombosis of the axillary vein, recurring after thromboarterectomy and leading to the paradoxical result of the amputation of an arm.** … An ethical evaluation of this case is mandatory, since the desire for pregnancy, the role of medical science, health, and human life itself are all factors involved.

> [PubMed – Summary] Mancini A, Milardi D, Di Pietro ML, Giacchi E, Spagnolo AG, Di Donna V, De Marinis L, Jensen L, "A case of forearm amputation after ovarian stimulation for in vitro fertilization-embryo transfer," Fertility and Sterility, 2001 Jul;76 (1):198-200, Institute of Endocrinology, Catholic University of the Sacred Heart, Rome, Italy.

"The implantation rates achieved with intracytoplasmic sperm injection (ICSI) are equivalent to those with conventional in-vitro fertilization (IVF) but … The first series comprised cases of IVF treatment (n = 101) for tubal infertility and ICSI (n = 96) for male infertility**. The proportions of embryos developing to the blastocyst stage was significantly lower after ICSI (8.9%, P < 0.001) than after conventional IVF (23.5%).** In order to investigate the effect of the ICSI procedure in isolation, blastocyst formation was analysed in a second series of eight cases, in which sibling oocytes were non-selectively subjected to ICSI (n = 78) or IVF (n = 67) with spermatozoa from the same semen sample. It was found that 20% of ICSI embryos and 50% of IVF embryos formed blastocysts (P < 0.01), demonstrating that the ICSI procedure contributes to a reduced capacity for blastocyst formation in vitro."

> [PubMed – Summary] Griffiths TA, Murdoch AP, Herbert M, "Embryonic development in vitro is compromised by the ICSI procedure," Human Reproduction, 2000 Jul;15 (7):1592-6, Reproductive Medicine, BioScience Centre, International Centre for Life, Newcastle upon Tyne NE1 4EP, UK.

"Data from the compulsory Danish National IVF Registry from 1994 and 1995 regarding treatments, abortions and complications following assisted reproductive technologies. … Data were generated through registries and compared to pregnancies in Denmark in 1995. Those pregnancies that resulted in a delivery were compared to a matched control group. …: In 1994 and 1995 5219 women were treated in 9471 initiated cycles. ... **The rate of spontaneous abortions was highest for ICSI (25%) and egg donation (27%)**. For IVF and ICSI the birth rates per transfer of 1 embryo was 13, 1%, 2 embryos 25, 4%, 3 embryos 25, 8% and 4 or more 3, 8%. Transfer of 2 embryos resulted in 75% singleton, 25% twin and 0.2% triplet deliveries. After transfer of 3 embryos the corresponding rates were 68%, 29% and 4%. … Totally, 1.4% reported complications to the treatment, the most frequent being ovarian hyperstimulation syndrome."

> [PubMed – Summary] Westergaard HB, Johansen AM, Erb K, Andersen AN, "Danish National IVF Registry 1994 and 1995. Treatment, pregnancy outcome and complications during pregnancy," Acta Obstet Gynecol Scand. 2000 May;79 (5):384-9, National Board of Health, Copenhagen, Denmark.

Ectopic Pregnancy

Ectopic pregnancy, also called tubal pregnancy, means a pregnancy "out of place" and is a potentially life-threatening type of pregnancy in which implantation of the newly conceived human occurs outside the uterus or womb. The human embryo does not proceed to the uterus as in a normal pregnancy. Instead, the embryo settles in the fallopian tubes more than 95% of the time, hence, the name, "tubal pregnancies." The human embryo can also implant in the ovary, abdomen, or the cervix. These are called cervical or abdominal pregnancies.

Since, none of these areas has as much space as the uterus for the child's development, fetal growth can burst the organ where the development is taking place. This can cause serious bleeding and threaten the mother's life.

Ectopic pregnancy has increased at the same time that utilization of induced abortion has increased. And, it has increased in those groups most often resorting to abortion. CDC researchers have noted that, "From 1970 through 1989, more than one million ectopic pregnancies were estimated to have occurred among women in the United States; the rate increased by almost fourfold, from 4.5 to 16.0 ectopic pregnancies per 1,000 reported pregnancies. Although ectopic pregnancies accounted for less than 2% of all reported pregnancies during this period, complications of this condition were associated with approximately 13% of all pregnancy- related deaths. … The risks of ectopic pregnancy and death from its complications were consistently higher for blacks and other racial/ethnic minorities than for whites throughout the period." [44]

Abortion apologists use ingenious, even if scientifically improper methods to eliminate abortion as a causal factor for ectopic pregnancy. A study which concluded there was no relationship between induced abortion and subsequent ectopic pregnancy included women who had abortions in both the test groups and the "control" group. Normal scientific protocol for discovering causation requires that all things being compared should be as identical as possible, EXCEPT FOR THE FACTOR THOUGHT TO CAUSE AN EFFECT. How then, can abortion be isolated as a cause of ectopic pregnancy in such a study? It can't, as the survey found: "Fifty-three (30.5%) of women with ectopic pregnancy, 18 (15.7%) of pregnant control women and 51 (22.5%) of nonpregnant control women had had one or more previous induced abortions. … Among women who had two or more induced abortions, the adjusted odds ratio of ectopic pregnancy was 0.2 (95% CI; 0.04 to 0.9) compared with pregnant control women and 1.8 (95% CI; 0.4 to 7.8) compared with nonpregnant control women. When we used the outcome of the most recent pregnancy, birth as reference, we found no association between an outcome of induced

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[44] [PubMed Summary] Surveillance for Ectopic Pregnancy -- United States, 1970-1989, MMWR 42(SS-6);73-85, Publication date: 12/17/1993 Tatiana E. Goldner, M.D.Herschel W. Lawson, M.D., Zhisen Xia, Ph.D., Hani K. Atrash, M.D., M.P.H., Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion

abortion and subsequent ectopic pregnancy regardless of whether the control women were pregnant." [45]

The surprise is that this made it into a peer review medical publication. CDC researchers, abortionists among them, using data from the National Hospital Discharge Survey and the National Center for Health Statistics also noted that the increase of ectopic pregnancy appears linked to Pelvic Inflammatory Disease: "From 1970-78, approximately 262,000 women aged 15-44 were discharged from US hospitals with a diagnosis of EP. The estimated number of EPs increased steadily from 17,800 in 1970 to 42,400 in 1978, while the EP rate/1000 reported pregnancies increased from 4.5 to 9.4. The EP rate/1000 reported pregnancies increased steadily with age, from 4.5 for women 15-25, 9.7 for women 25-34, to 15.2 for women 35-44. … According to national vital statistics on mortality by cause, 437 women aged 15-44 died from EP between 1970 and 1978. The death-to-case rate declined more than 70% from 35 deaths/1000 EPs in 1970 to .9 in 1978. … A likely cause of the marked increase in EP incidence between 1970-78 is pelvic inflammatory disease." [46]

But of course, these same researchers refuse to collect data that would link PID to induced abortion. Not only that, but CDC abortion apologists have contrived explanations for ectopic pregnancy deaths and abortion which claim that women who were aborting their current pregnancy have ten times fewer ectopic pregnancies than other women, although their ectopic pregnancy death rate is higher among women who abort. Of course, the comparison is irrelevant because the pool of women who are trying to achieve a live birth includes a considerable number of women who previously underwent a so-called "safe, legal, abortion" which could have produced the very ectopic pregnancy in the group trying to have a "wanted" pregnancy.

"During 1971 through 1985, the incidence of ectopic pregnancy concurrent with induced abortions was 1.35 per 1,000 induced abortions compared with 13.6 per 1,000 pregnancies not terminated by induced or spontaneous abortion. … The death to case rate for ectopic pregnancies concurrent with induced abortions was 1.3 times higher than that for women not undergoing abortion. Most of the deaths of women with ectopic pregnancy who underwent induced abortion were attributable to the failure to diagnose the ectopic pregnancy before the woman left the facility where the abortion was performed." [47]

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[45] [PubMed – Summary] Skjeldestad FE, Atrash HK, "Evaluation of induced abortion as a risk factor for ectopic pregnancy. A case-control study," Acta Obstet Gynecol Scand. 1997 Feb;76(2):151-8, Department of Gynecology & Obstetrics, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim.

[46] [PubMed Summary] Rubin GL, Peterson HB, Dorfman SF, Layde PM, Maze JM, Ory HW, Cates W Jr., "Ectopic pregnancy in the United States 1970 through 1978," Journal of the American Medical Association, 1983 Apr1;249(13):1725-9

[47] [PubMed Summary] Atrash, H.K.;MacKay, T.;Hogue, C., "Ectopic Pregnancy Concurrent With Induced Abortion: Incidence and Mortality," American Journal of Obstetrics and Gynecology. 162(3):726-730, March 1990;

The reported "low" ectopic pregnancy incidence figures among aborting women may be suggestive of a refusal to look for problems on the part of abortion providers. Planned Parenthood abortion clinics were surveyed regarding ectopic pregnancy. "A total of 41,753 first-trimester abortions were done over a 4-year period at two Planned Parenthood centers, among which 11 verified cases of ectopic (tubal) pregnancy were discovered. Elective abortion provides an opportunity for the diagnosis of unruptured ectopic pregnancy. Pathologic examination of tissue specimens is important in suggesting the presence of an ectopic gestation." [48]

But in this same time period, unless the women aborting at Planned Parenthood clinics were somehow bioligacally unique, Planned Parenthood should have discovered 312 ectopic pregnancies, not just 11, at the 1975 rate of 7.6 ectopic pregnancies per thousand births, abortions, miscarriages, ectopic pregnancies. Secondly, women with the symptoms of a ruptured or continuing ectopic pregnancy post abortion are not going to return to the abortion clinic for treatment because they are not equipped to treat ectopic pregnancies.. They will go to a hospital. Thus, it is an invalid inference to conclude that because women who do not return to an abortion clinic for treatment of a complication, are not experiencing complications, including ectopic pregnancies.

And that women do go to hospitals for treatment of ectopic pregnancy post abortion is apparent from the following report taken from the cases of a US military hospital emergency room. "The authors report a case of a 27-year-old female who was diagnosed as having a ruptured ectopic pregnancy approximately 12 hours after an elective termination of an intrauterine pregnancy (IUP) was performed. Multiple previous evaluations by an obstetrician for a chief complaint of abdominal pain revealed an IUP but did not disclose the underlying pathology. The ectopic pregnancy was identified by the emergency physician's use of ultrasound in the emergency department." [49]

Another finesse on behalf of "abortion safety" was conducted by Norwegian researchers from the University Hospital of Trondheim, Norway where "3754 Norwegian women 39 years or younger who had at least one induced abortion at the University Hospital of Trondheim during 1987-92 were followed for histologically confirmed ectopic pregnancies through the end of 1993," to see if ectopic pregnancy risk increased with the number of abortions. [50] It was found that women who had two or more abortions had roughly the same ratio of ectopic pregnancies as women who had one induced abortion.

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[48] [PubMed – Summary] 73-5 Schonberg LA, "Ectopic pregnancy and first trimester abortion," Obstetrics and Gynecology, 1977 Jan;49 (1 suppl): page 194.

[49] Burnette RE Jr, Butler RC, "Ruptured ectopic pregnancy after elective termination of intrauterine pregnancy discovered by use of ultrasonography in the emergency department," Acad Emerg Med. 2000 Jul;7(7):830-3, Department of Emergency Medicine, Darnall Army Community Hospital, Fort Hood, TX

[50] Skjeldestad FE, Gargiullo PM, Kendrick JS, "Multiple induced abortions as risk factor for ectopic pregnancy. A prospective study," Acta Obstet Gynecol Scand. 1997 Aug;76(7):691-6, Department of Gynecology & Obstetrics, University Hospital of Trondheim, Norway.

The researchers found that although, "The overall cumulative incidence of ectopic pregnancy among women with an induced abortion history rose from 3.5 per 1000 women at 1 year to 11.1 per 1000 women at 6 years of follow-up. … No dose-response to ectopic pregnancy was found between 2 consecutive (aIDR, 0.9) and 3 or more consecutive (aIDR, 1.1) abortions compared with the reference group. Ectopic pregnancy after the most recent abortion was more likely to occur among women whose first pregnancy ended as an ectopic one than among those whose first pregnancy resulted in a birth. … the present findings suggest that induced abortion does not increase the risk of ectopic pregnancy." [51]

The only possible valid conclusion from such a study is that having two or more abortions does not significantly increase the ratio of ectopic pregnancy beyond that of women having one abortion, which is significantly different from a claim that abortion does not increase the risk of subsequent ectopic pregnancy. And again, the comparison group should have been women with no induced abortion, and with a similar number of pregnancies or births. And even that may be problematic if the order of pregnancy ending in birth or abortion affects the ectopic pregnancy outcome.

Legal Abortion as a Cause of Ectopic Pregnancy

"This study investigated the role of prior history of induced abortion in subsequent ectopic pregnancies. … Data from two French case-control studies were used to examine the effect of induced abortion on ectopic pregnancy risk. Case patients (n = 570) were women admitted for ectopic pregnancy during the study period; controls (n = 1385) were women who delivered in the same center. … The analysis among women with no previous ectopic pregnancy showed that, after control for the main ectopic pregnancy risk factors, **prior induced abortion was associated with an increased risk of ectopic pregnancy (odds ratio [OR] = 1.5**, 95% confidence interval [CI] = 1.0, 2.0); **there was a significant trend between number of previous induced abortions and ectopic pregnancy risk (ORs = 1.4 for 1 previous induced abortion and 1.9 for 2 or more).** … This study suggests that induced abortion may be a risk factor for ectopic pregnancy for women with no previous ectopic pregnancy, particularly in the case of women who have had several induced abortions."

> [PubMed Summary] Tharaux-Deneux C, Bouyer J, Job-Spira N, Coste J, Spira A, "Risk of ectopic pregnancy and previous induced abortion," American Journal of Public Health. 1998 Mar;88 (3):401-5, Hopital de Bicetre, Le Kremlin-Bicetre, France.

"Two entities must be differentiated in ectopic pregnancy (EP) epidemiology: EP occurring in women without contraception (reproductive failure) and with contraception (contraceptive failure). These two entities differ on almost all issues. After a great increase between 1970 and 1990, incidence of EP has decreased over the next 10 years. At the present time, the incidence of EP with contraception goes on decreasing while the incidence of EP without contraception is increasing. Three quarters of EP are ampullary, and 4.5% are extra-tubal. The two main risk factors for EP without contraception are a

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[51] Skjeldestad FE, Gargiullo PM, Kendrick JS, "Multiple induced abortions as risk factor for ectopic pregnancy. A prospective study," Acta Obstet Gynecol Scand. 1997 Aug;76(7):691-6, Department of Gynecology & Obstetrics, University Hospital of Trondheim, Norway.

history of infection or tubal surgery and smoking. Quantitatively, their relationships with EP risk are similar. **The other risk factors are age, prior spontaneous abortion, prior induced abortion, previous use of an intra-uterine device, and history of infertility. The total attributable risk of all these factor is 76%."**

[PubMed Summary] Bouyer J, "Epidemiology of ectopic pregnancy: incidence, risk factors and outcomes," J Gynecol Obstet Biol Reprod (Paris). 2003 Nov;32 (7 Suppl):S8-17, [Article in French] Hopital de Bicetre, INSERM U569-IFR69

"The authors investigated the relationship between induced abortions and the subsequent risk of ectopic pregnancy. Findings are based upon data from a case-control study conducted in Milan, Italy. 158 women of mean age 32 years, in the range 18-43 years, entered the study. All were diagnosed with ectopic pregnancy … Two control groups were selected. The first one included 243 women who gave birth at term to healthy infants at the same hospitals where the cases had been identified, while the second control group was a random sample of 158 women of comparable age interviewed in the same calendar period, admitted to a hospital for a broad spectrum of acute, nongynecological, or obstetric conditions. 22% of cases, 12% of obstetric controls, and 18% of non-obstetric controls reported one or more previous induced abortions. **The risk of ectopic pregnancy was higher in women reporting induced abortions: the estimated relative risks for any induced abortions were 2.9 in comparison with obstetric controls and 2.5 in comparison with women admitted to the hospital for other conditions. The risk increased with number of induced abortions, being 13.1 compared to women with no induced abortion and 3.8 in women reporting two or more induced abortions when the comparison groups were respectively obstetric and nonobstetric controls.** Findings point to an increased risk of ectopic pregnancy after induced abortion."

[PubMed Summary] Parazzini F, Ferraroni M, Tozzi L, Ricci E, Mezzopane R, La Vecchia C, "Induced abortions and risk of ectopic pregnancy," Human Reproduction, 1995 Jul;10 (7):1841-4, Istituto di Ricerche Farmacologiche Mario Negri, Milano, Italy.

"This case-control study was associated with a regional register of ectopic pregnancy between 1993 and 2000 in France. It included 803 cases of ectopic pregnancy and 1,683 deliveries and was powerful enough to investigate all ectopic pregnancy risk factors. The main risk factors were infectious history (adjusted attributable risk = 0.33; adjusted odds ratio for previous pelvic infectious disease = 3.4, 95% percent confidence interval (CI): 2.4, 5.0) and smoking (adjusted attributable risk = 0.35; adjusted odds ratio = 3.9, 95% CI: 2.6, 5.9 for >20 cigarettes/day vs. women who had never smoked). The other risk factors were age … prior spontaneous abortions, history of infertility, and previous use of an intrauterine device. **Prior medical induced abortion was associated with a risk of ectopic pregnancy (adjusted odds ratio = 2.8, 95**% CI: 1.1, 7.2); no such association was observed for surgical abortion (adjusted odds ratio = 1.1, 95% CI: 0.8, 1.6)."

[PubMed Summary] Bouyer J, Coste J, Shojaei T, Pouly JL, Fernandez H, Gerbaud L, Job-Spira N, "Risk factors for ectopic pregnancy: a comprehensive analysis based on a large case-control, population-based study in France." American Journal of Epidemiology, 157 (3): 185-94, 2003;

"This paper reviews the clinical recognition, diagnosis, and management of ectopic pregnancy at the Queen of Angels Hospital for the past 15 years. The incidence of ectopic pregnancy to deliveries is 1:195. … Pelvic inflammatory disease is a factor in the development of tubal pregnancy in some women. … A careful history and thorough

physical examination are important in making a careful diagnosis. … Women who have had a previous ectopic pregnancy have a higher subsequent incidence of persistent infertility, recurrent ectopic pregnancy, and pregnancy wastage; the risk of another ectopic pregnancy increases 30-50 fold. While ectopic pregnancy does recur, it is true that about 1/3 of those women do have successful pregnancies. **Where previous induced abortion has occurred, there is a 10-fold increased risk of ectopic pregnancy**."

[PubMed Summary] Weeks LR, "Ectopic Pregnancy: Current Clinical Trends, a fifteen year study," Journal of the National Medical Association, 1981 Sep;73 (9):823-33.

"137 women, who had legal abortions of their 1st pregnancies, were compared with a group of 133 who had spontaneous abortions before the 28th week, and a group of 129 who delivered their 1st pregnancy. **The legal abortion group showed 3 ectopic pregnancies, while the other 2 groups showed none**. Those who delivered their 1st pregnancy showed the best reproductive function, while the group of spontaneous abortions showed the highest frequency of early abortion. The artificial group showed the highest rate of late spontaneous abortion and premature delivery. **There was a decline in the reproductive function of the artificial abortion group in the 3rd and 4th pregnancies, and an increase in the rate of late abortion.** This group also showed an increased rate of spontaneous primary and premature rupture of the membranes and a trend toward lower newborn weight. A close correlation was noted between induced abortion before the age of 17 and repeated abortion."

[PubMed Summary] Koller O, Eikhom SN, "Late sequelae of induced abortion in primigravidae. The outcome of the subsequent pregnancies," Acta Obstet Gynecol Scand. 1977;56 (4):311-7.

"**Ectopic pregnancy is a serious complication of pregnancy** accounting for 6-13% of all maternal deaths in the U.S. … In the period from January 1, 1965-December 31, 1979, 556 consecutive cases of ectopic pregnancy were treated at The Brookdale Hospital Medical Center in Brooklyn … 3 of these cases had an ovarian pregnancy, 8 had an abdominal, and 545 a tubal pregnancy. … 85% of them had used no contraception prior to the ectopic pregnancy. Maternal age was not a factor in the occurrence of the ectopic pregnancy. **The following factors in the clinical history were found to put the patient in a high-risk category: 1) primary or secondary infertility; 2) previous abortion or ectopic pregnancy;** 3) previous tubal operation, either reconstructive or sterilizing; 4) recent uterine evacuation; and 5) the use of an IUD or its recent removal due to abdominal pain and/or bleeding."

[PubMed Summary] Tancer ML, Delke I, Veridiano NP, "A fifteen year experience with ectopic pregnancy," Surg Gynecol Obstet. 1981 Feb;152 (2):179-82

"**This study investigated the role of prior history of induced abortion in subsequent ectopic pregnancies.** … Data from two French case-control studies were used to examine the effect of induced abortion on ectopic pregnancy risk. Case patients (n = 570) were women admitted for ectopic pregnancy during the study period; controls (n = 1385) were women who delivered in the same center. … The analysis among women with no previous ectopic pregnancy showed that, after control for the main ectopic pregnancy risk factors, **prior induced abortion was associated with an increased risk of ectopic pregnancy (odds ratio [OR] = 1.5, 95% confidence interval [CI**] = 1.0, 2.0); there was a significant

trend between number of previous induced abortions and ectopic pregnancy risk (ORs = 1.4 for 1 previous induced abortion and 1.9 for 2 or more)."

[PubMed – Summary] Tharaux-Deneux C, Bouyer J, Job-Spira N, Coste J, Spira A., American Journal of Public Health, 1998 Mar;88 (3):401-5, Risk of ectopic pregnancy and previous induced abortion. Hopital de Bicetre, Le Kremlin-Bicetre, France.

"We compared the prior pregnancy histories of 85 multigravid women with an ectopic pregnancy and 498 multigravid delivery comparison subjects. **We found a relationship between the number of prior induced abortions and the risk of ectopic pregnancy: the crude relative risk of ectopic pregnancy was 1.6 for women with one prior induced abortion and 4.0 for women with two or more prior induced abortions**; however, use of multivariate techniques to control confounding factors reduced the relative risks to 1.3 (95 per cent confidence interval, 0.6-2.7) and 2.6 (95 per cent confidence interval, 0.9-7.4), respectively. The analysis suggests that induced abortion may be one of several risk factors for ectopic pregnancy, particularly for women who have had abortions plus pelvic inflammatory disease or multiple abortions."

[PubMed Summary] Levin AA, Schoenbaum SC, Stubblefield PG, Zimicki S, Monson RR, Ryan KJ, "Ectopic pregnancy and prior induced abortion," American Journal of Public Health. 1982 Mar;72 (3):253-6

"Two university centers in Debrecen, Hungary and Seoul, Republic of Korea collaborated in **a prospective study of fertility following induced abortion**. Conception rates were compared for 30 months among two groups of women whose last pregnancy outcome was either an induced abortion or a live birth. The cumulative life-table pregnancy rates at each six-month interval for the 30 months of the study were similar in the two groups, although the pregnancy rate was higher in Debrecen than in Seoul for both groups, probably reflecting age differences between the two groups. **In the first six months of the study, 4 of the 229 pregnancies in the induced abortion group were ectopic, whereas none of the 292 pregnancies in the live birth group were ectopic.** Although on the basis of the two populations studied there is no evidence of a reduced ability to conceive following induced abortion**, the occurrence of four ectopic pregnancies in the induced abortion group warrants further investigation."**

[PubMed Summary] World Health Organization Task Force on Sequelae of Abortion, Special Programme of Research, Development and Research Training in Human Reproduction. [No separate authors listed] "Secondary infertility following induced abortion," Studies in Family Planning, 1984 Nov-Dec;15 (6 Pt 1):291-5.

"137 women, who had legal abortions of their 1st pregnancies, were compared with a group of 133 who had spontaneous abortions before the 28th week, and a group of 129 who delivered their 1st pregnancy. **The legal abortion group showed 3 ectopic pregnancies, while the other 2 groups showed none**. Those who delivered their 1st pregnancy showed the best reproductive function, while the group of spontaneous abortions showed the highest frequency of early abortion. The artificial group showed the highest rate of late spontaneous abortion and premature delivery. There was a decline in the reproductive function of the artificial abortion group in the 3rd and 4th pregnancies, and an increase in the rate of late abortion. This group also showed an increased rate of

spontaneous primary and premature rupture of the membranes and a trend toward lower newborn weight."

[PubMed Summary] Koller O, Eikhom S. N., "Late sequelae of induced abortion in primigravidae. The outcome of the subsequent pregnancies," Acta Obstet Gynecol Scand. 1977;56 (4):311-7.

"**Clinical details of 19 cases of cervical pregnancy are presented. None of the women were nulligravida and all had had at least 1 legal abortion.** The interval between the last pregnancy and the cervical pregnancy ranged from 2 months to 8 years. 17 of the women were treated with total hysterectomy and 2 with partial hysterectomy. In all cases the vaginal hemorrhage was uncontrollable."

[PubMed Summary] Shinagawa S, Nagayama M, "Cervical pregnancy as a possible sequela of induced abortion. Report of 19 cases," American Journal of Obstetrics and Gynecology, 1969 Sep 15;105 (2):282-4.

"**From 1964 to 1968, 22,108 abortions were performed, out of which 232 were extrauterine pregnancies, or 1 for every 95.2 abortions. Out of these, 112 were determined to have been caused by previous abortions.** The frequency of ectopic pregnancy for urban areas was 82.33% of total abortions (464 in this case), 59.9% of total for housewives, and 74.2% for those of Macedonian nationality. Fatality for this complication is observed to be nil."

[PubMed Summary] Kurciev K, Lazarov A, Kismanov M, "Abortions as the cause of ectopic pregnancy," God Zb Med Fak Skopje. 1970;16:405-11, [Article in Serbian]

"**Women who were hospitalized for ectopic pregnancy in five hospitals in King County, Washington, were interviewed concerning history of induced abortion**. For comparison, women who delivered a live-born child during this same time period were also interviewed. Relative to women who had never undergone an abortion, the risk in those who had was increased to a modest degree, but this increase could well have been the result of chance (relative risk, 1.4; 95% confidence interval, 0.7 to 2.6). **For women who had two or more abortions, the relative risk was 1.8** (95% confidence interval, 0.5 to 7.1). Our results suggest that legal abortion as performed during the past decade in the United States does not carry a large excess risk for future ectopic pregnancy, but larger studies will be needed in order to determine more precisely the magnitude of any excess that does exist."

[PubMed Summary] Daling JR, Chow WH, Weiss NS, Metch BJ, Soderstrom R, "Ectopic pregnancy in relation to previous induced abortion," JAMA. 1985 Feb 15;253 (7):1005-8.

"Persistent trophoblastic tissue has been described in the abdominal cavity after surgical treatment of tubal ectopic pregnancy. **More infrequently the cause of the ectopic trophoblast is linked to uterine perforation due to surgically induced termination of pregnancy (TOP).** Ultrasonographic images may suggest an ectopic pregnancy. A case of myometrial trophoblastic tissue implantation following surgically induced first-trimester TOP is described."

[PubMed – Summary] Pascual MA, Tresserra F, Dexeus D, Grases PJ, Dexeus S, "Myometrial trophoblastic implant as a complication of surgically induced first-trimester termination of pregnancy," Ultrasound Obstet Gynecol. 2003 Aug;22 (2):194-5 epartment of Obstetrics and Gynecology, Instituto Universitario Dexeus, Barcelona, Spain.

"**We report a case of combined intrauterine and tubal pregnancy in a 23-year-old woman.** The patient came to the emergency department complaining of lower abdominal pain after having had an elective abortion 2 weeks earlier. **Her physician had done pelvic ultrasonography, noting an intrauterine pregnancy before the abortion**. Our working diagnosis in the emergency department was retained products of conception versus postabortion endometritis. Pelvic ultrasonography in the emergency department revealed an ectopic pregnancy without evidence of retained products of conception, and the patient had a right salpingotomy with removal of the ectopic fetus without complications."

[PubMed - Summary] DeFrancesch F, DiLeo L, Martinez J, "Heterotopic pregnancy: discovery of ectopic pregnancy after elective abortion," Southern Medical Journal, 1999 Mar;92 (3):330-2. Department of Internal Medicine, Louisiana State University Medical Center, New Orleans.

"This case-control study was associated with a regional register of ectopic pregnancy between 1993 and 2000 in France. It included 803 cases of ectopic pregnancy and 1,683 deliveries and was powerful enough to investigate all ectopic pregnancy risk factors. The main risk factors were infectious history (adjusted attributable risk = 0.33; adjusted odds ratio for previous pelvic infectious disease = 3.4, 95% percent confidence interval (CI): 2.4, 5.0) and smoking (adjusted attributable risk = 0.35; adjusted odds ratio = 3.9, 95% CI: 2.6, 5.9 for >20 cigarettes/day vs. women who had never smoked). The other risk factors were age … prior spontaneous abortions, history of infertility, and previous use of an intrauterine device. **Prior medical induced abortion was associated with a risk of ectopic pregnancy (adjusted odds ratio = 2.8, 95% CI: 1.1, 7.2);** no such association was observed for surgical abortion (adjusted odds ratio = 1.1, 95% CI: 0.8, 1.6). The total attributable risk of all the factors investigated was 0.76. **As close associations were found between ectopic pregnancy and infertility and between ectopic pregnancy and spontaneous abortion, further research into ectopic pregnancy should focus on risk factors common to these conditions."**

[PubMed Summary] Bouyer J, Coste J, Shojaei T, Pouly JL, Fernandez H, Gerbaud L, Job-Spira N, "Risk factors for ectopic pregnancy: a comprehensive analysis based on a large case-control, population-based study in France," American Journal of Epidemiology, 2003 Feb 1;157 (3):185-94, The French Institute of Health and Medical Research, Le Kremlin-Bicetre, France.

"We report three cases of sudden death resulting from internal hemorrhage associated with the rupture of an ectopic pregnancy. In each case, the woman had undergone therapeutic abortion before death. The ectopic pregnancies, however, were not suspected or identified before the women left the treatment facility. Subsequently, all three women suffered fatal rupture of a tubal pregnancy and associated massive intraperitoneal hemorrhage during the postabortive period (range, 14 to 32 days). Our investigation of these cases has identified the lack of standardized procedures for the adequate monitoring of tissue recovered during therapeutic abortion."

[PubMed Summary] Li L, Smialek JE, "Sudden death due to rupture of ectopic pregnancy concurrent with therapeutic abortion," Arch Pathol Lab Med. 1993 Jul;117 (7):698-700, Department of Forensic Pathology, Tongji Medical University, Wuhan, People's Republic of China.

"In Ohio, a 33-year old woman who had never had an ectopic pregnancy presented at an emergency facility … 2 weeks earlier she had a voluntary intrauterine abortion at 8 weeks' gestation. She had intercourse 1 week before coming to the emergency facility. … The attending physician presumed her to have pelvic inflammatory disease (PID) as a result of either sexual intercourse or the elective abortion. The physician called for a

urinary beta human chorionic gonadotropin test to determine whether placental tissue remained in the uterus. It was positive. 60 minutes after admission, the supine patient's pain increased and her blood pressure dropped to 80/50 mm Hg from 100/60 mm Hg at admission. … A repeat cell count indicated sepsis. Her blood pressure decreased to 60 … After the team stabilized her, they transferred her to a hospital. … **The physician found a tubal pregnancy** and removed the affected tube and ovary. She recuperated completely."

> [PubMed Summary] Nugent PJ, "Ruptured ectopic pregnancy in a patient with a recent intrauterine abortion," Annals of Emergency Medicine, 1992 Jan;21 (1):97-9, Bethesda Hospitals, Cincinnati, Ohio.

"The use of prostaglandin E2 (PGE2) for the termination of pregnancy is quite common and generally is considered safe. Among the complications reported are uterine rupture and dramatic pyrexic and cardiovascular response (6). **A case is reported in which a woman with an ectopic pregnancy that had not been noted at ultrasonography was admitted for abortion with PGE2 with fatal outcome.** At autopsy an insignificant uterine rupture was noted in addition to the main findings."

> [PubMed Summary] Segerberg-Konttinen M, "Maternal death due to unnoticed ectopic pregnancy during prostaglandin-induced abortion," Am J Forensic Med Pathol. 1986 Sep;7 (3):244-5.

"From 1973 through 1978, **the Center for Disease Control identified ten deaths caused by ruptured ectopic pregnancy after attempted legal abortions for those pregnancies**. The women ranged in age from 18 to 31 years, seven were black, three were white, and five were nulliparous. The estimated gestational age was 16 menstrual weeks or earlier. In seven cases tissue obtained at abortion was sent for outside microscopic pathological examination; attempts to contact four of the patients when no products of conception were found were unsuccessful. An important factor in preventing fatal ectopic pregnancy for women who have legal abortions is the identification of products of conception at the time of the abortion procedure while the patient is still available for reexamination and recurretage."

> [PubMed Summary] Rubin GL, Cates W Jr, Gold J, Rochat RW, Tyler CW Jr., "Fatal ectopic pregnancy after attempted legally induced abortion," Journal of the American Medical Association, 1980 Oct 10;244 (15):1705-8.

Abortion Associated with PID and Subsequent Ectopic Pregnancy

"We analyzed the epidemiology of ectopic pregnancy (EP) during a 28 year period, 1970-97 … Hospital records of patients aged 15-54 admitted to our department of gynaecology were reviewed for EP and PID for the period 1 January 1970 to 31 December 1997. EP for the period 1970-4 was based on available statistics. The total number for EP was 1270 and for PID 2559. … **The EP incidences increased from 7.7 per 1000 pregnancies in the first 5 year period to 13.4 in the second,** and continued to rise for another decade reaching the peak figures of 16.6 in 1985-9--that is, more than a twofold increase. Since then and to 1997 the EP incidence has decreased by 30%. … **Reduction of PID was strongly associated with a decline of EP.** … The two to three times higher EP incidence in women > or = 25 years of age was most probably due to a cohort effect as the peak of PID occurred a decade earlier in women < or = 24 years old. Prevention of PID may not only reduce EP but also reduce adverse effects on tubal patency."

> [PubMed Summary] Kamwendo F, Forslin L, Bodin L, Danielsson D, Epidemiology of ectopic pregnancy during a 28 year period and the role of pelvic inflammatory disease," Sexually

Transmitted Infections, 2000 Feb;76 (1):28-32. Department of Obstetrics and Gynaecology, Orebro Medical Centre Hospital, Sweden.

"To assess the risk factors of ectopic pregnancy in Thai women. … From 1999 to 2000, 208 cases of ectopic pregnancy and 781 controls (postpartum women) were included in the study. … By multivariate analysis, **5 variables remained as strong and independent risk factors for ectopic pregnancy: the number of sexual partners > or = 2** (OR = 3.02, 95% CI (1.75-5.23), vaginal delivery > or = 1 (OR = 0.005, 95% CI (0.002-0.0015**), history of pelvic inflamatory disease (OR = 3.17, 95% CI (1.40-7.19),** smoking (OR = 2.49, 95% CI (1.36-4.55), **infertility** (OR = 2.74, 95% CI (1.35-5.54)). … Problems of multiple sexual partners, pelvic inflammatory disease, smoking and infertility were the main risk factors of ectopic pregnancy in Thai women."

[PubMed Summary] Bunyavejchevin S, Havanond P, Wisawasukmongchol W, "Risk factors of ectopic pregnancy," J Med Assoc Thai. 2003 Jun;86 Suppl 2:S417-21, Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

"Between September 1989 and February 1991 in Milan, we conducted a case-control study on 120 cases of ectopic pregnancy and 209 controls. The control subjects gave birth at term (more than 37 weeks' gestation) to healthy infants on randomly selected days at the same hospitals where the cases had been identified. **… Infertility problems or difficulty in conception were reported by 32% of the cases** and 10% of the controls; the corresponding multivariate RR was 4.7 (95% confidence interval [CI] 2.3-9.5). … **Finally, the risk of ectopic pregnancy was higher in women reporting a history of pelvic inflammatory disease (**RR 2.7, 95% CI 0.9-8.7) and increased with the number of sexual partners (chi 2(1) trend 4.51, P = .03)."

[PubMed Summary] Parazzini F, Tozzi L, Ferraroni M, Bocciolone L, La Vecchia C, Fedele L, "Risk factors for ectopic pregnancy: an Italian case-control study," Obstetrics and Gynecology, 1992 Nov;80(5):821-6. Istituto di Ricerche Farmacologiche Mario Negri, II Clinica Ostetrico-Ginecologica, Universita di Milano, Italy.

"Reported rates of post-abortion pelvic inflammatory disease (PID) range from 5-29%. The risk of infection has been associated with the presence of Neisseria gonorrhoeae, Chlamydia trachomatis, and anaerobic organisms in the lower genital tract. Women were randomly allocated to receive either prophylactic metronidazole (immediately before abortion) and doxycycline (for 7 days after abortion) or received antibiotics only if pre-abortion genital tract swabs were positive for any of the 3 infections. During the 8-week post-abortion follow-up period, women managed by the screen-and-treat protocol had slightly less favorable outcomes in terms of hospital readmissions, general practitioner consultations, antibiotic prescriptions, time off work, and limitations on domestic activities than women who received prophylactic treatment. Differences were statistically significant, however, only for women whose swabs were negative for all 3 infections. The rate of post-abortion PID/endometritis in this groups was 3% among women who received prophylactic antibiotics and 6% in those who were screened and not treated."

[PubMed Summary] Penny GC, "Preventing infective sequelae of abortion," Human Reproduction, 1997 Nov;12 (11 Suppl):107-12, Department of Obstetrics and Gynaecology, Aberdeen Maternity Hospital, UK;

"**The presence of infection in the lower genital tract at the time of induced abortion has been associated with an increased risk of postabortion pelvic inflammatory disease (PID).** The present study investigated the prevalences of Neisseria gonorrhoeae, Chlamydia trachomatis, and bacterial vaginosis among 1672 women undergoing induced abortion at four Scottish hospitals in 1995-96. It further compared the effectiveness of two clinical management strategies for minimizing the risk of postabortion infection. … Preabortion lower genital tract screening indicated 3 women (0.2%) were positive for N. gonorrhoeae, 91 (5.6%) for C. trachomatis, and 282 (17.5%) for bacterial vaginosis. … **The postabortion PID/endometriosis rate was 4.6% among women in the prophylaxis group and 6.8% in the screen-and-treat group**. Women in these two groups who were initially positive for 1 or more infection had significantly higher rates of postabortion PID/endometriosis (7.7% and 7.4%, respectively) than those who were initially negative (3.1% and 5.7%, respectively). Antibiotics had to be prescribed postabortion to 13.1% of women initially positive for 1 or more infection compared with 7.8% of those initially negative."

[PubMed Summary] Penney GC, Thomson M, Norman J, McKenzie H, Vale L, Smith R, Imrie M, "A randomised comparison of strategies for reducing infective complications of induced abortion," British Journal of Obstetrics and Gynaecology, 1998 Jun;105 (6):599-604.

"**Induced abortion is one of the most frequent surgical procedures in the UK. … Pelvic inflammatory disease (PID) is the most prevalent complication and can lead to chronic pelvic pain, pain during intercourse, infertility, and a higher risk of ectopic pregnancy.** Chlamydia trachomatis is perhaps the leading etiologic agent for PID among women who have undergone induced abortion and who develop PID. Gonorrhea is another major etiologic agent for PID. Strategies used to try to reduce pelvic infection revolve around administration of antibiotic prophylaxis based on demographic features and on the presence of certain organisms in the genital tract that may increase their risk (e.g., C. trachomatis and Neisseria gonorrhoeae) and universal antibiotic prophylaxis for all women undergoing abortion."

[PubMed Summary] Stevenson MM, Radcliffe KW, "Preventing pelvic infection after abortion," International Journal of STD/AIDS, 1995 Sep-Oct;6 (5):305-12

"**The study in Swansea, UK, was of 401 consecutive patients attending for termination of pregnancy** … 112 (28%) women had the typical bacterial flora of anaerobic (bacterial) vaginosis, 95 (24%) had candidal infection, 32 (8%) chlamydial infection, 3 (0.75%) trichomonas infection, and 1 (0.25%) gonorrhoea. **Postoperative follow-up of 30 of the women with chlamydial infection showed that pelvic infection developed in 19 (63%),** of whom 7 were readmitted to hospital. 9 male partners of women with chlamydial (plus gonococcal in 1 case) infection were examined; 8 were symptom-free, 3 had C trachomatis infection, and 1 N gonorrhoeae. Estimated costs of hospital admissions for complications of chlamydial infection were more than double the costs of providing a routine chlamydia screening programme and prophylactic treatment. … Male partners of women infected with chlamydia are often symptom-free, but they must be traced to avoid reinfections."

[PubMed Summary] Blackwell AL, Thomas PD, Wareham K, Emery SJ, "Health gains from screening for infection of the lower genital tract in women attending for termination of pregnancy," Lancet, 1993 Jul 24;342 (8865):206-10. Department of Genito-Urinary Medicine, Singleton Hospital Trust, Swansea, UK.

"In a prospective study the rate of ectopic pregnancies of women with prior induced abortion was contrasted to two sets of comparison groups: a large set of unmatched observations and a smaller subset of matched and refined data. … No significant association was detected between history of induced abortion and ectopic pregnancy … However, **there was a clear association between the presence of post-abortion infection or retained secundines and ectopic pregnancy with a fivefold increase for those pregnancies of women with a history of these complications** over those without these complications within the induced abortion cohort."

> [PubMed – Summary] Chung CS, Smith RG, Steinhoff PG, Mi MP, "Induced abortion and ectopic pregnancy in subsequent pregnancies," American Journal of Epidemiology, 1982 Jun;115 (6):879-87.

"Four hundred and thirty two women **who were to undergo induced abortion before 12 weeks gestation** were randomized to be treated either with prophylactic erythromycin or a placebo. … The women were randomized to receive a placebo or erythromycin, 500 mg twice a day for 7 1/2 days starting the evening before the abortion. **All the women were investigated for Chlamydia trachomatis and Neisseria gonorrhoea before the abortion. … Fifty four women were excluded after randomization. The frequency of PID was 11%** (20/189) in the erythromycin group and 16% (30/189) in the placebo group … The prevalence of C. trachomatis was 19% (15/78) in women less than or equal to 20 years of age, 13% (14/109) in women between 21 and 25 years and 2% (5/241) in women greater than or equal to 26 years of age. In women positive for C. trachomatis erythromycin prophylaxis significantly reduced the frequency of PID to 8% (1/13) compared with 43% (6/14) in the placebo group (P = 0.051, logistic regression analysis). Erythromycin had no effect on other potential high risk groups (first pregnancy, nulliparous, less than 20 years of age, and women with previous PID). **… Cervical C. trachomatis is a risk factor for postabortal PID**, and prophylaxis with erythromycin significantly reduces the frequency of PID. However, only a few women with PID had cervical C. trachomatis, and the prevention of post-abortal PID remains a major challenge requiring further studies."

> [PubMed Summary] Sorensen JL, Thranov I, Hoff G, Dirach J, Damsgaard MT, "A double-blind randomized study of the effect of erythromycin in preventing pelvic inflammatory disease after first trimester abortion," British Journal of Obstetrics and Gynecology, 1992 May;99 (5):434-8. Frederiksborg County Hospital, Department of Surgery, Horsholm, Denmark.

"**To evaluate the association between ectopic pregnancy and 22 potential risk factors, we conducted a population-based case-control study**. The investigation included 274 cases diagnosed from 1935 through 1982 in residents of Rochester, Minn, and 548 matched controls selected from live-birth deliveries. … four variables remained as strong and independent risk factors for ectopic pregnancy: current intrauterine device use (relative risk, 13.7; 95% confidence interval, 1.6 to 120.6**), a history of infertility (relative risk, 2.6; 95% confidence interval, 1.6 to 4.2), a history of pelvic inflammatory disease (relative risk, 3.3; 95% confidence interval, 1.6 to 6.6**), and prior tubal surgery (relative risk, 4.5; 95% confidence interval, 1.5 to 13.9). Theoretically, any condition that prevents or retards migration of the fertilized ovum to the uterus could predispose a woman to ectopic gestation."

> [PubMed – Summary] Marchbanks PA, Annegers JF, Coulam CB, Strathy JH, Kurland LT, "Risk factors for ectopic pregnancy. A population-based study," JAMA. 1988 Mar 25;259(12):1823-7. Reproductive Health, Centers for Disease Control, Atlanta.

"To further understanding of the etiology of ectopic pregnancy, selected background variables and pregnancy histories were compared **among 205 women treated for ectopic pregnancy and 2 groups of controls--110 women in early pregnancy intending to carry the pregnancy to term and 101 women seeking voluntary pregnancy termination.** The study findings suggested that previous ectopic pregnancy, abdominal surgery**, infertility, and pelvic inflammatory disease (PID) may be involved in the etiology of ectopic pregnancy.** 37% of ectopic pregnancy cases reported a history of involuntary fertility of at least 1 year's duration compared with 18% of the delivery controls and 3% of the abortion controls. 15% of cases had a history of prior ectopic pregnancy compared with 2% of the delivery controls and none of the abortion controls. 44% of cases but only 17% of both groups of controls had a history of abdominal surgery, i.e. laparotomy. Finally, a history of PID was found in 34% of cases compared with 21% of delivery controls and 15% of abortion controls."

[PubMed – Summary] Thorburn J, Berntsson C, Philipson M, Lindblom B, "Background factors of ectopic pregnancy. I. Frequency distribution in a case-control study," European Journal of Obstetrics, Gynecology, Reproductive Biology, 1986 Dec;23 (5-6):321-31.

"The association between spontaneous abortion and ectopic pregnancy was evaluated in a case-control study conducted on 161 women (cases) with recurrent spontaneous abortions (two or more consecutive spontaneous abortions) and 170 control subjects who delivered normal infants. **The risk of ectopic pregnancy in women with a history of recurrent spontaneous abortion was about fourfold that of controls (relative risk adjusted for age and number of pregnancies = 4.3; 95% confidence interval 1.4-14.7).** This association was confirmed by comparing the observed number of extrauterine pregnancies in women with recurrent spontaneous abortions with the expected number computed from regional data on the frequency of ectopic pregnancies; the estimated relative risk was 3.7, with a 95% confidence interval of 2.2-7.0. The present report found an association between spontaneous abortions and ectopic pregnancies, suggesting some common risk/etiologic factors for these two reproductive failures."

[PubMed – Summary] Fedele L, Acaia B, Parazzini F, Ricciardiello O, Candiani GB, "Ectopic pregnancy and recurrent spontaneous abortion: two associated reproductive failures," Obstetrics and Gynecology, 1989 Feb;73 (2):206-8, Universita di Milano, Italy.

"**There was a significant correlation between the incidence of ectopic pregnancy and the incidence of gonorrhea.** The 160 cases of ectopic pregnancy from University Hospital reviewed in detail included all ectopic pregnancies admitted from 1960 to 1975. Findings revealed 56% were white women with an average age of 26.8 years and average parity of 2.49. Pain (97.5%), amenorrhea (83%), and abnormal uterine bleeding (68%) were the most common presenting complaints, while abdominal tenderness (85%) and pelvic mass (54%) were the common physical findings. … **Thirty-nine percent had a history of pelvic inflammatory disease and 8% a previous ectopic pregnancy**. Admission diagnosis was correct in 67%. Unilateral adnexal procedure was the treatment in 81%. … Postoperative complication rate was 55%. Follow-up pregnancy rate was 50%, and future ectopic pregnancies occurred in 6% of these."

[PubMed Summary] Kallenberger DA, Ronk DA, Jimerson GK, "Ectopic pregnancy: a 15-year review of 160 cases," Southern Medical Journal, 1978 Jul;71(7):758-63.

Miscarriage or Spontaneous Abortion

A spontaneous abortion, also called miscarriage, is the loss of the child in the womb due to natural causes occurring before 20 weeks of pregnancy or fetal development. A pregnancy loss after the 20th week is called a preterm delivery. The term "spontaneous abortion" refers to naturally occurring events, not elective or induced abortions designed to cause the death of a developing child.

Most spontaneous abortions result from fetal genetic abnormalities, not always related to the mother's genetic makeup. Other causes for spontaneous abortion include infection, physical problems the mother may have, hormone imbalance, immune responses, and serious maternal diseases such as diabetes or thyroid problems.

The five factors underlying miscarriage can derive from both men and women, and include "genetic factors such as blood group incompatibilities … psychopathology, including psychic stress and behavioral disorders (e.g., drug and alcohol abuse); **infectious diseases such as gonorrhea**, malaria, tuberculosis, and **postabortion infection**; …" [52]

A missed abortion is the death of a child which is not delivered. An incomplete abortion means that not all of the child's body parts are expelled. A threatened abortion means symptoms indicate that a miscarriage is possible. Inevitable abortion means that the symptoms cannot be controlled and a miscarriage will happen.

Medical Studies of Induced Abortion and Miscarriage

"An investigation was undertaken regarding subsequent pregnancy in 619 women who had their preceding pregnancy terminated by legal abortion, compared with an age- and parity-matched group of 619 women who continued with the pregnancy to delivery. The groups were compared for complications such as first and second trimester abortion, cervical incompetence, pre-term delivery, ectopic pregnancy and sterility. The total complication rate was 24.3 per cent in the abortion group, and 20.2 per cent in the controls. No significant difference was found between the two groups for any of the parameters examined, **except for a significantly higher rate of complications amongst women who had not had a previous delivery: 25.5 per cent as opposed to 13.2 per cent in the control group. … There were 9.1% of early spontaneous abortions in the abortion group and only 3.6% in the control group.** Most of the other late complications were slightly, but not significantly, more frequent in the abortion group than in the control group. The only significant finding was a much higher complication rate among aborters who had never delivered previously. It is concluded that, except for the nulliparous woman, induced abortion carries no risk as to the next pregnancy."

> [PubMed Summary] Dalaker K, Lichtenberg SM, Okland G, "Delayed reproductive complications after induced abortion," Acta Obstet Gynecol Scand. 1979;58 (5):491-4

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[52] [PubMed – Summary] Mcfalls Ja J., "Frustrated fertility: a population paradox," Population Bulletin, 1979 May;34(2):3-43.

"The study is a pregnancy cohort study. It was conducted among 15 general hospitals or maternity and infant health institutes in Shanghai, China from November 1993 to March 1998. The abortion cohort consisted of pregnant women whose previous pregnancies were terminated by vacuum aspiration (98%). The reference cohort consisted of primigravidae. Subjects were recruited at 35-63 days of gestational age. A total of 2953 pregnant women were enrolled; 1502 in the abortion cohort, 1451 in the reference cohort. … There were only 62 women lost to follow-up. The remaining 2891 women had 2732 live births, and 137 miscarriages. **About 5.5% of pregnancies in the abortion cohort were miscarried and 4.0% in the reference cohort**. Once potential confounders were controlled for by logistic regression, odds ratio (OR) of miscarriage between the abortion cohort and the reference cohort was 1.55 (95% CI: 1.08-2.23). **The adjusted OR were 2.44 (95% CI: 1.16-5.15) among women who were recruited within 49 days of gestational age, and 1.72 (95% CI: 1.09-2.72) for the first-trimester miscarriage. … Induced abortion by vacuum aspiration is associated with an increased risk of first-trimester miscarriage in the subsequent pregnancy."**

[PubMed Summary] Sun Y, Che Y, Gao E, Olsen J, Zhou W, International Journal of Epidemiology, 2003 Jun;32(3):449-54. Int J Epidemiol. 2003 Jun;32 (3):449-54. Shanghai Institute of Planned Parenthood Research, 2140 Xie Tu Road, Shanghai 200032, China.

"**We have previously shown that induced abortions result in a slightly increased risk of spontaneous abortion and preterm delivery in subsequent pregnancies**. Danish records show that approximately 4% of women who undergo surgically induced abortions have complications related to the procedure. We examined whether it was women who had the short-term complications that carried an excess risk of spontaneous abortion and preterm delivery in the subsequent pregnancy. … Two cohorts of women who had had an induced abortion and a subsequent pregnancy were followed. The cohort with no reported complications comprised 12,972 women, and the cohort with complications 605 women. … The cohort with complications did not have more spontaneous abortions or preterm births. **They did, however, have a higher risk of stillbirth, mainly seen in women whose induced abortion had been complicated by an infection."**

[PubMed Summary] Zhou W, Olsen J, "Are complications after an induced abortion associated with reproductive failures in a subsequent pregnancy?" Acta Obstet Gynecol Scand. 2003 Feb;82 (2):177-81; The Danish Epidemiology Science Center, University of Aarhus, Aarhus, Denmark.

"The cohort study is based on the … Danish national registries: the Medical Birth Registry (MBR), the Hospital Discharge Registry (HDR), and the induced Abortion Registry (IAR). All primigravid women in the time period from 1980 to 1982 were identified … A total of 15,727 women who terminated the pregnancy with a first trimester induced abortion were selected as the induced abortion cohort, and 46,026 women who did not terminate the pregnancy with an induced abortion constituted the control cohort. By register linkage all subsequent pregnancies which were not terminated by induced abortion were identified from 1980 to 1994. Only women who had a non-terminated pregnancy following the index pregnancy were selected. Women whose first pregnancy was terminated following a first trimester induced abortion had a risk of spontaneous abortion of 11.0% vs. 9.4% in the control cohort. This relative difference of 1.17 was not statistically significant in logistic regression analyses. **An increased risk was only found for women who had an interpregnancy interval of less than 3 months (OR=4.06, 95% C.I.=1.98-8.31). The abortion method, vacuum aspiration with dilatation or evacuation with dilatation did**

not modify this elevated risk. Overall the study did not show an increased risk of spontaneous abortion following one or more induced abortions, except for women with a short interpregnancy interval between an induced abortion and a subsequent pregnancy."

[PubMed Summary] Zhou W, Olsen J, Nielsen GL, Sabroe S, "Risk of spontaneous abortion following induced abortion is only increased with short interpregnancy interval," Journal of Obstetrics and Gynaecology, 2000 Jan;20 (1):49-54; The Danish Epidemiology Science Centre, Aarhus University, Denmark.

"Of 7823 induced abortions which were performed between 1970 and 1978, 798 were performed on 13-18 year old primigravidae. About 88% of these women were 16-18 years of age. The 2 most frequent early complications were fever (4.27%) and palpable evidence of infection … (6.4%). Most complications were observed after the use of Hegar dilation and vacuum aspiration. 390 of the patients who underwent abortion between 1976 and 1978 were examined 14 days and 3 months after the abortion. 1.79% reported residual bleeding at both examinations … 1.79% reported menstrual irregularities 3 months after the operation. **The rate of spontaneous abortion following a previous induced abortion among all patients increased from 1.68% in 1970 to 17.54% in 1978. 652 of the 796 adolescents were interviewed in 1977: 418 were married. Of these, 10.29% had had spontaneous abortions,** 11% premature births, 64.11% had had normal births, and 5.5% secondary sterility"

[PubMed Summary] Kreibich H, Ludwig A, "Early and late complications in induced abortions of primigravidae," Z Arztl Fortbild (Jena). 1980 Apr 1;74 (7):311-6. [Article in German]

"137 women, who had legal abortions of their 1st pregnancies, were compared with a group of 133 who had spontaneous abortions before the 28th week, and a group of 129 who delivered their 1st pregnancy. The legal abortion group showed 3 ectopic pregnancies, while the other 2 groups showed none. Those who delivered their 1st pregnancy showed the best reproductive function, while the group of spontaneous abortions showed the highest frequency of early abortion. **The artificial group showed the highest rate of late spontaneous abortion** and premature delivery. **There was a decline in the reproductive function of the artificial abortion group in the 3rd and 4th pregnancies, and an increase in the rate of late abortion.** This group also showed an increased rate of spontaneous primary and premature rupture of the membranes and a trend toward lower newborn weight. A close correlation was noted between induced abortion before the age of 17 and repeated abortion."

[PubMed Summary] Koller O, Eikhom SN, "Late sequelae of induced abortion in primigravidae. The outcome of the subsequent pregnancies," Acta Obstet Gynecol Scand. 1977;56(4):311-7.

"**A significant increase in the incidence of spontaneous abortion or premature birth after a preceding induced abortion** (p less than .01) was observed in a material of 5200 induced abortion patients at the Regional Hospital at Zwickau between 1970 and 1975. A follow-up study of 360 13-18 year old women from this material was undertaken in 1977 to determine the effect of induced abortion on later pregnancies. 62.78% of the women were married, of these 64.16% had had children. There was a 10.78% premature birth rate and **10.17% spontaneous abortion rate. 5.75% had undergone an induced abortion 1 or 2 additional times.** … Sterility was found in 5.30% of the married women; there were 2 cases of ectopic pregnancy. … **A 10.17% (n=23) spontaneous abortion rate was**

recorded among 226 women who wanted children, in 41.86% of the cases in the 1st trimester, in 58.44% in the 2nd. In 18 of these cases the preceeding induced abortion had been performed by dilatation according to Hegar followed by vacuum aspiration. In both the premature and full-term births observed after a previous abortion, a decrease in the average birth weight was found. **In … 70% of the pregnancies which directly follow an induced abortion, the birth occurs in the 37th-39th week of pregnancy."**

[PubMed Summary] Kreibich H, Ehrig E, "Effect of abortion on subsequent fertility with special reference to the abortion process." Zentralbl Gynakol. 1978;100(19):1254-60. [Article in German]

"**Two hundred and eleven patients who had undergone vaginal termination and were pregnant again were investigated; 43.2% had become pregnant within one year of termination. The overall fetal loss in the 211 patients was 17.5% compared with 7.5% in a group matched for parity but consisting of patients who were pregnant after a spontaneous abortion. Altogether 4.3% of pregnancies after legal abortion ended as first trimester abortions, 8-5% as second trimester abortions,** and 13.7% in premature delivery. Among 11 women whose cervices had been lacerated at the time of legal termination the fetal loss in subsequent pregnancy was 45.5%, and only one pregnancy went beyond 36 weeks. … Several patients had asked that their general practitioner should not be told of their termination, and such patients may not admit their termination during a subsequent pregnancy, which could thus be jeopardized."

[PubMed Summary] Richardson JA, Dixon G, "Effects of legal termination on subsequent pregnancy," British Medical Journal 1976 May 29;1(6021):1303-4.

"The study population consisted of a cohort of 1229 pregnant women, of whom 868 were referred for delivery and 361 for first-trimester abortion. … **In 839 women without previous induced abortion, a history of pelvic inflammatory disease was associated with an increased risk of spontaneous abortion (odds ratio 1.55,** 95% confidence interval [CI] 1.03-2.33); women above age 33 had a lower risk of spontaneous abortion (odds ratio 0.53, 95% CI 0.30-0.96). In 382 women with previous induced abortion, the influence of age on the rate of spontaneous abortion was continuous so that an increase of 1 year of age reduced the risk of spontaneous abortion by 0.91 (95% CI 0.85-0.96). Women with any previous pelvic inflammatory disease, when compared with those without, more often had dyspareunia (14 versus 3%; odds ratio 3.87, 95% CI 2.35-6.37) and chronic pelvic pain (6 versus 0.4%; odds ratio 13.07, 95% CI 10.09-16.04). Age was inversely associated with the incidence of dysmenorrhea (odds ratio 0.94, 95% CI 0.91-0.97). … **Pelvic inflammatory disease is associated with later spontaneous abortion,** whereas age correlates inversely with the rate of spontaneous abortion. Spontaneous and postabortal pelvic inflammatory diseases carry significantly elevated risks of dyspareunia and chronic pelvic pain."

[PubMed Summary] Heisterberg L, "Factors influencing spontaneous abortion, dyspareunia, dysmenorrhea, and pelvic pain," Obstetrics and Gynecology, 1993 Apr;81(4):594-7. Department of Gynecology and Obstetrics, Gentofte Hospital, University of Copenhagen, Denmark.

A comparison was made between 535 primiparae with a record of therapeutic termination of previous pregnancies, 305 primiparae with previous abortion, and 501 primiparae without any record of spontaneous or medically induced abortion, all of these being compared for their prepartum, intrapartum, and postpartum phases as well as the conditions of their children delivered in their first intrapartum, and postpartum phases as

well as the conditions of their children delivered in their first full-term pregnancy.-- **Significant accumulation of spontaneous abortions, bleeding in the first and second thirds of pregnancy, as well as postpartum complications were recordable from women with record of induced or spontaneous abortions, in comparison with primigravid primiparae.** All probands with record of previous termination of pregnancies exhibited a trend towards premature births, yet, with no significant accumulation of these."

[PubMed Sumary] Schott G, Ehrig E, Wulff V. "Prospective studies into pregnancies of primiparae with record of therapeutic termination of previous pregnancies or of spontaneous abortion and assessment of fertility," Zentralbl Gynakol. 1980;102 (16):932-8. [Article in German]

"Therapeutic termination of pregnancy performed during the first trimester was associated with a statistically significant increase in the incidence of second trimester abortion and of premature labour in the next pregnancy. In a series of 520 patients who had previously been aborted **8.1% suffered a mid-trimester abortion in their next pregnancy and 8.6% had premature onset of labour (compared to 2.4% (P less than 0.001) and 4.4% (P less than 0.01) respectively in a control series)**. The incidence of incompetence of the cervix after termination of pregnancy was 4.4%.
… Studies have shown conflicting results regarding the increase in the incidence of second trimester abortion in subsequent pregnancies following termination of pregnancy during 1st trimester. This prospective study attempts to evaluate the effect of abortion on subsequent reproductive performance. 520 consecutive patients from the Mercy Maternity Hospital and Royal Women's Hospital in Melbourne who had had vaginal termination of a first trimester pregnancy comprised the study group. 500 consecutive patients who had had spontaneous abortion (1st trimester) treated by curettage comprised the control group. The results showed that the incidence of 1st trimester abortion was the same in both control and study groups. The incidence of spontaneous 2nd trimester abortion was 8.1% in the study group, compared with 2.4% in the control group (P 0.001). The study group also had a significantly higher incidence of premature delivery (8.6%) compared to the controls (4.4%; P 0.01). **An unexpected result was that a previous mature pregnancy did not protect against complications after pregnancy termination. It appears that dilatation of the cervix physiologically during normal labor and delivery to a diameter of 10 cm. is more beneficial to cervical function in a subsequent pregnancy than dilatation to 10 mm. before therapeutic abortion of a 1st trimester pregnancy. The finding suggests that patients contemplating pregnancy terminations must be told of risk of cervical incompetence**; their future obstetricians must also be informed of any abortion performed. In future pregnancies, patients with a history of abortion should be evaluated for evidence of incompetence for proper medical management."

[PubMed Summary] Ratten GJ, Beischer NA, "The effect of termination of pregnancy on maturity of subsequent pregnancy," Medical Journal of Australia, 1979 Jun 2;1(11):479-80,

"In order to study the effects of abortion on subsequent pregnancy, 13,144 secundigravidae were studied. In 879 of those women the 1st pregnancy had ended in miscarriage, in 820 it ended in abortion, in 25 in tubal pregnancy, in 7 in molar pregnancy, in 294 in premature delivery, and in 11,119 in normal delivery at term. … **In the 2nd half of pregnancy, miscarriage was about twice as common among women who had had an abortion or miscarriage during their 1st pregnancy as it was in women whose 1st pregnancy was not interrupted.** Furthermore, women who had miscarried or aborted the 1st pregnancy were twice as likely as women who delivered at term to give birth to infants weighing less

than 2500 gm. … Thus it appears that interruption of a 1st pregnancy - either by abortion or miscarriage - significantly increases the risk of miscarriage in a subsequent pregnancy.

[PubMed Summary] Macků F, Rokytová V, Titman O., "Artificial interruption of pregnancy in primigravidae as a risk-factor for further pregnancies," Cesk Gynekol. 1978 Jun;43(5):340-3

"We compared prior pregnancy histories of two groups of multigravidas--240 women having a pregnancy loss up to 28 weeks' gestation and 1,072 women having a term delivery. **Women who had had two or more prior induced abortions had a twofold to threefold increase in risk of first-trimester spontaneous abortion, loss between 14 to 19 and 20 to 27 weeks. The increased risk was present for women who had legal induced abortions since 1973.** It was not explained by smoking status, history of prior spontaneous loss, prior abortion method, or degree of cervical dilatation. No increase in risk of pregnancy loss was detected among women with a single prior induced abortion. **We conclude that multiple induced abortions do increase the risk of subsequent pregnancy losses up to 28 weeks' gestation."**

[PubMed - Summary] Levin AA, Schoenbaum SC, Monson RR, Stubblefield PG, Ryan KJ, "Association of induced abortion with subsequent pregnancy loss," JAMA. 1980 Jun 27;243 (24):2495-9

"The aim of the study was to determine the impact of midtrimester abortion with extra-amniotic PGE(2) on future fertility and reproduction. Two hundred and fifteen women were enrolled. The mean induction-to-abortion interval was 21.3 h. The complication rate was 11.7%. Twenty women (9.3%) were lost to follow-up, 82 patients (38.1%) used contraception. Spontaneous pregnancy occurred in 110 out of 113 women who desired fertility (97%). Three patients were defined as infertile but conceived following treatment. The average time between the abortion and the next conception was 15.9 months (range 1-77 months). Seventy patients (63.7%) delivered at term. Premature delivery occurred in 18 patients (16.4%). **Eighteen women aborted spontaneously in the first and 3 in the second trimester.** One extrauterine pregnancy occurred. Second-trimester abortion with extra-amniotic PGE(2) … may be associated with an increased rate of premature deliveries in future gestations."

[PubMed Summary] Debby A, Glezerman M, Sagiv R, Sadan O, Malinger G, Golan A, "Reproductive performance following midtrimester termination of pregnancy," Gynecol Obstet Invest. 2003;56 (3):168-72. Epub 2003 Oct 9, Department of Obstetrics and Gynecology, Edith Wolfson Medical Center, Tel Aviv University, Tel Aviv, Israel.

"About complications in 2147 interruptions of pregnancy, carried out between February 15, 1974 and December 31, 1976 was reported.—48.4 per cent was nullipare or primipare. The rate of early complications was 5.28 per cent. During the period of report 7.03 per cent of patients became pregnant again. The fates from these pregnancy were following: 37.6 per cent interruptions of pregnancy once more. 15.2 per cent abortion and 18.4 per cent premature birth. Prenatal mortality was 3.1 per cent.
PIP: A study of 2147 induced abortions was undertaken to determine the frequency of complications and to determine the effect of an abortion on a subsequent pregnancy. 9.4% of the patients were 17 years of age or younger, 36.5% were single, 25.1% were nulliparae. The overall complication rate was 5.28%. … **151 of the patients became pregnant during the 2 years following the abortion; 87 carried the pregnancy to term. The incidence of spontaneous abortion among these patients was 25.3%,** of cervical

insufficiency 20.7% and of premature birth 13.8**%. Only 35.6% of the pregnancies proceeded without complication. Perinatal mortality was 3.1%. Steps must be taken to prevent the use of induced abortion as a contraceptive measure, especially among young primigravidae."**

[Pub Med Summary] Schulze G, Herold C, Zentralbl Gynakol, 1978;100 (19):1261-5, "Abortion complications and their effect on subsequent pregnancies," [Article in German]

"First Trimester spontaneous fetal loss of subsequent pregnancy among women aborting their first pregnancy showed 258 fetal losses out of 3,764 pregnancies, or 6.85% of pregnancies ending in fetal loss. Among women delivering their firs pregnancy, there were 5,792 fetal losses out of 93,857 pregnancies for a pregnancy loss rate of 6.17%. **So, aborting women had roughly 10% more fetal losses in subsequent pregnancies than women carrying their first child to term."** (Table 18 page 54)

Chin Sk Chung, Patricia G. Steinhoff with Roy G. Smith and Ming-Pi Mi, The Effects of Induced Abortion on Subsequent Reproductive Function and Pregnancy Outcome: Hawaii, Papers of the East-West Population Institute, No. 86. This was a follow-up study during 1971 – 78 of women who had undergone abortion from 1970 – 74 in Hawaii. It was done by means of record linkage of 16,961 women identified 3,910 women who had one or more subsequent pregnancies who had a spontaneous fetal death or live birth. The control group consisted of 98,046 women which excluded repeat subsequent pregnancies of the same women. Hospital records for 3,589 women were used for comparison and data collection. There were no significant differences between the abortion and the control groups for rates of smoking, alcohol use and diabetes. The abortion had to be done in an accredited hospital and performed before viability.

"During May 1987-November 1989 in Montreal, Quebec, both 331 cases of first spontaneous abortion and 993 controls with a normal pregnancy and no previous spontaneous abortion at the time of the study were enrolled in a case control study to examine the relationship between past induced abortions and subsequent spontaneous abortion. 90 (20.2%) cases and 240 (18.1%) controls had had at least one previous induced abortion. **When comparing women who had had a previous pregnancy with primigravidae, women whose 1 previous pregnancy ended in induced abortion, those whose 2 previous pregnancies ended in induced abortion, and those who had at least 1 induced abortion in their 3 or more previous pregnancies faced an increased risk of spontaneous abortion (odds ratio [OR] = 1.41, 4.43, and 1.35, respectively).** The researchers found the same risk when they adjusted for vaginal infection. **Second trimester abortions were associated with an increased risk of first spontaneous abortion (OR = 4.63). Women whose last induced abortion occurred 12-24 months before the current pregnancy with no pregnancy in between the induced abortion and the current pregnancy faced an increased risk of spontaneous abortion (OR = 2.28).** There was no increased risk of spontaneous abortion when the induced abortion occurred at least 24 months before with no pregnancy in between the induced abortion and current pregnancy, suggesting that the uterus requires time to recover before successful future implantation."

[Pub Med Summary] Infante-Rivard C, Gauthier R, "Induced abortion as a risk factor for subsequent fetal loss," Epidemiology. 1996 Sep;7 (5):540-2, McGill University, Montreal, Quebec, Canada.

"**Patients who had surgical abortion at > or = 20 weeks' gestation** from 1996 to 2003 and received subsequent prenatal care at The New York Weill Cornell Medical Center

were identified. … **One hundred and twenty pregnancies in 89 women were identified. Thirteen (10.8%) ended with early miscarriage**, and 5 were electively terminated. Of the remaining 102 pregnancies, 7 ended with spontaneous preterm birth. Those who experienced preterm birth were more likely to have undergone abortion due to cervical dilation and/or preterm premature rupture of membranes (PPROM) (27.3% vs 4.4%; P = .03). Those with a multifetal pregnancy in the subsequent pregnancy were more likely to have preterm birth (75.0% vs 4.3%; P < .001). In patients who underwent dilation and evacuation (D&E) for reasons other than cervical dilation and/or PPROM, rates of spontaneous preterm birth were identical between those who had intact dilation and extraction (D&X) and D&E using forceps (4.2% vs 4.5%; P = 1.0). .."

[PubMed Summary] Chasen ST, Kalish RB, Gupta M, Kaufman J, Chervenak FA, "Obstetric outcomes after surgical abortion at > or = 20 weeks' gestation," American Journal of Obstetrics and Gynecology, 2005 Sep;193 (3 Pt 2):1161-4. Division of Maternal-Fetal Medicine, Weill Medical College of Cornell University.

"A case-control study of neonatal sepsis was conducted using the Washington State Birth Registry. Cases of sepsis were selected among singleton livebirths during the period 1984-90, and compared with a control group for the occurrence of spontaneous or induced abortion in previous pregnancies. The risk estimates were calculated using a stratified analysis. After exclusion of primigravidae, **the age-adjusted odds ratio (OR) was 1.68, with a 95% confidence interval (CI) 1.33, 2.11 for previous spontaneous abortion, and 2.20 (95% CI 1.73, 2.79) for induced abortion, compared with previous livebirth**. After exclusion of nulliparous women, the OR decreased to 1.19 (95% CI 0.90, 1.58) for spontaneous abortion and 1.45 (95% CI 1.03, 2.04) for induced abortion. After controlling for the effect of parity, induced abortion is associated with an increased risk of neonatal sepsis in a subsequent pregnancy … **The authors suggest that the procedures involved in a therapeutic abortion might produce a latent, sub-clinical infection that persists until the next pregnancy, and is then transmitted to the newborn**."

[PubMed – Summary] Germain M, Krohn MA, Daling JR, "Reproductive history and the risk of neonatal sepsis," Paediatr Perinat Epidemiol. 1995 Jan;9 (1):48-58, Department of Epidemiology, University of Washington, Seattle.

"Of 7823 induced abortions which were performed between 1970 and 1978, 798 were performed on 13-18 year old primigravidae. About 88% of these women were 16-18 years of age. The 2 most frequent early complications were fever (4.27%) and palpable evidence of infection (parametritis/salpingitis) (6.4%). Most complications were observed after the use of Hegar dilation and vacuum aspiration. 390 of the patients who underwent abortion between 1976 and 1978 were examined 14 days and 3 months after the abortion. 1.79% reported residual bleeding at both examinations, even though placental residue was not found. The incidence of infection fell from 4.62% to 3.58%. 1.79% reported menstrual irregularities 3 months after the operation. **The rate of spontaneous abortion following a previous induced abortion among all patients increased from 1.68% in 1970 to 17.54% in 1978.** 652 of the 796 adolescents were interviewed in 1977: 418 were married. **Of these, 10.29% had had spontaneous abortions, 11% premature births, 64.11% had had normal births, and 5.5% secondary sterility.** Of the 234 single women, 78.63%

used oral contraceptives, 6.84% had undergone subsequent induced abortion(s), and 5.98% had undergone spontaneous abortion."

[PubMed Summary] Kreibich H, Ludwig A, "Early and late complications in induced abortions of primigravidae," Z Arztl Fortbild (Jena). 1980 Apr 1;74(7):311-6. [Article in German]

"A significant increase in the incidence of spontaneous abortion or premature birth after a preceding induced abortion (p less than .01) was observed in a material of 5200 induced abortion patients at the Regional Hospital at Zwickau between 1970 and 1975. A follow-up study of 360 13-18 year old women from this material was undertaken in 1977 to determine the effect of induced abortion on later pregnancies. 62.78% of the women were married, of these 64.16% had had children. There was a 10.78% premature birth rate and 10.17% spontaneous abortion rate. 5.75% had undergone an induced abortion 1 or 2 additional times. 4.42% of the married women used oral contraceptives regularly. **Sterility was found in 5.30% of the married women; there were 2 cases of ectopic pregnancy.** Of the 134 single women, 78.36% used oral contraceptives regularly, 7 had undergone a subsequent abortion. **A 10.17% (n=23) spontaneous abortion rate was recorded among 226 women who wanted children, in 41.86% of the cases in the 1st trimester, in 58.44% in the 2nd**. In 18 of these cases the preceeding induced abortion had been performed by dilatation according to Hegar followed by vacuum aspiration. In both the premature and full-term births observed after a previous abortion, a decrease in the average birth weight was found. In … 70% of the pregnancies which directly follow an induced abortion, the birth occurs in the 37th-39th week of pregnancy."

[PubMed Summary] Kreibich H, Ehrig E, "Effect of abortion on subsequent fertility with special reference to the abortion process." Zentralbl Gynakol. 1978;100 (19):1254-60. [Article in German]

"**To evaluate the impact of surgically induced first-trimester abortion on the risk of miscarriage in a subsequent pregnancy.** … The study is a pregnancy cohort study. It was conducted among 15 general hospitals or maternity and infant health institutes in Shanghai, China from November 1993 to March 1998. The abortion cohort consisted of pregnant women whose previous pregnancies were terminated by vacuum aspiration (98%). The reference cohort consisted of primigravidae. Subjects were recruited at 35-63 days of gestational age. A total of 2953 pregnant women were enrolled; 1502 in the abortion cohort, 1451 in the reference cohort. … There were only 62 women lost to follow-up. The remaining 2891 women had 2732 live births, and 137 miscarriages. **About 5.5% of pregnancies in the abortion cohort were miscarried and 4.0% in the reference cohort. Once potential confounders were controlled for by logistic regression, odds ratio (OR) of miscarriage between the abortion cohort and the reference cohort was 1.55 (95% CI: 1.08-2.23). The adjusted OR were 2.44 (95% CI: 1.16-5.15) among women who were recruited within 49 days of gestational age, and 1.72 (95% CI: 1.09-2.72) for the first-trimester miscarriage**. ... **Induced abortion by vacuum aspiration is associated with an increased risk of first-trimester miscarriage in the subsequent pregnancy**."

[PubMed Summary] Sun Y, Che Y, Gao E, Olsen J, Zhou W, "Induced abortion and risk of subsequent miscarriage," International Journal of Epidemiology, 2003 Jun;32(3):449-54 Shanghai Institute of Planned Parenthood Research, 2140 Xie Tu Road, Shanghai 200032, China.

"137 women, who had legal abortions of their 1st pregnancies, were compared with a group of 133 who had spontaneous abortions before the 28th week, and a group of 129 who delivered their 1st pregnancy. The legal abortion group showed 3 ectopic pregnancies, while the other 2 groups showed none. **Those who delivered their 1st pregnancy showed the best reproductive function,** while the group of spontaneous abortions showed the highest frequency of early abortion. **The artificial group showed the highest rate of late spontaneous abortion** and premature delivery. **There was a decline in the reproductive function of the artificial abortion group in the 3rd and 4th pregnancies, and an increase in the rate of late abortion.** This group also showed an increased rate of spontaneous primary and premature rupture of the membranes and a trend toward lower newborn weight. A close correlation was noted between induced abortion before the age of 17 and repeated abortion."

[PubMed Summary] Koller O, Eikhom SN, "Late sequelae of induced abortion in primigravidae. The outcome of the subsequent pregnancies," Acta Obstet Gynecol Scand. 1977;56 (4):311-7.

"**Two hundred and eleven patients who had undergone vaginal termination and were pregnant again were investigated; 43.2% had become pregnant within one year of termination. The overall fetal loss in the 211 patients was 17.5% compared with 7.5% in a group matched for parity but consisting of patients who were pregnant after a spontaneous abortion. Altogether 4.3% of pregnancies after legal abortion ended as first trimester abortions, 8-5% as second trimester abortions**, and 13.7% in premature delivery. Among 11 women whose cervices had been lacerated at the time of legal termination the fetal loss in subsequent pregnancy was 45.5%, and only one pregnancy went beyond 36 weeks. … Several patients had asked that their general practitioner should not be told of their termination, and such patients may not admit their termination during a subsequent pregnancy, which could thus be jeopardized."

[PubMed Summary] Richardson JA, Dixon G, "Effects of legal termination on subsequent pregnancy," British Medical Journal 1976 May 29;1 (6021):1303-4.

"**An investigation was undertaken regarding subsequent pregnancy in 619 women who had their preceding pregnancy terminated by legal abortion**, compared with an age- and parity-matched group of 619 women who continued with the pregnancy to delivery. The groups were compared for complications such as first and second trimester abortion, cervical incompetence, pre-term delivery, ectopic pregnancy and sterility. The total complication rate was 24.3 per cent in the abortion group, and 20.2 per cent in the controls. No significant difference … except for a significantly higher rate of complications amongst women who had not had a previous delivery: 25.5 per cent as opposed to 13.2 per cent in the control group. … **There were 9.1% of early spontaneous abortions in the abortion group and only 3.6% in the control group**. … The only significant finding was a much higher complication rate among aborters who had never delivered previously. It is concluded that, except for the nulliparous woman, induced abortion carries no risk as to the next pregnancy."

[PubMed Summary] Dalaker K, Lichtenberg SM, Okland G, "Delayed reproductive complications after induced abortion," Acta Obstet Gynecol Scand. 1979;58 (5):491-4.

"**Therapeutic termination of pregnancy performed during the first trimester was associated with a statistically significant increase in the incidence of second trimester abortion** and of premature labour in the next pregnancy. **In a series of 520 patients who**

had previously been aborted 8.1% suffered a mid-trimester abortion in their next pregnancy and 8.6% had premature onset of labour (compared to 2.4% (P less than 0.001) and 4.4% (P less than 0.01) respectively in a control series). The incidence of incompetence of the cervix after termination of pregnancy was 4.4%.
This prospective study attempts to evaluate the effect of abortion on subsequent reproductive performance. 520 consecutive patients from the Mercy Maternity Hospital and Royal Women's Hospital in Melbourne who had had vaginal termination of a first trimester pregnancy comprised the study group. 500 consecutive patients who had had spontaneous abortion (1st trimester) treated by curettage comprised the control group. The results showed that the incidence of 1st trimester abortion was the same in both control and study groups. **The incidence of spontaneous 2nd trimester abortion was 8.1% in the study group, compared with 2.4% in the control group** (P 0.001). The study group also had a significantly higher incidence of premature delivery (8.6%) compared to the controls (4.4%; P 0.01). **An unexpected result was that a previous mature pregnancy did not protect against complications after pregnancy termination. It appears that dilatation of the cervix physiologically during normal labor and delivery to a diameter of 10 cm. is more beneficial to cervical function in a subsequent pregnancy than dilatation to 10 mm. before therapeutic abortion of a 1st trimester pregnancy.**"

[PubMed Summary] Ratten GJ, Beischer NA, "The effect of termination of pregnancy on maturity of subsequent pregnancy," Medical Journal of Australia, 1979 Jun 2;1(11):479-80,

"We report a case-control study with 331 cases of first spontaneous abortion and 993 controls with no previous spontaneous abortion and a normal pregnancy at the same period of pregnancy. **In comparison with primigravid women, the odds ratio for a fetal loss in the current one was 1.41 [95% confidence interval (CI) = 0.81-2.43] among women with one previous pregnancy ending in induced abortion, 4.43 (95% CI = 1.46-13.36) among those with two previous induced abortions out of two pregnancies, and 1.35 (95% CI = 0.64-2.82) among women with three or more previous pregnancies ending in one or more induced abortions**…. **The researchers found the same risk when they adjusted for vaginal infection. Second trimester abortions were associated with an increased risk of first spontaneous abortion (OR = 4.63)**. **Women whose last induced abortion occurred 12-24 months before the current pregnancy with no pregnancy in between the induced abortion and the current pregnancy faced an increased risk of spontaneous abortion (OR = 2.28).**"

[PubMed Summary] Infante-Rivard C, Gauthier R., "Induced abortion as a risk factor for subsequent fetal loss," Epidemiology. 1996 Sep;7(5):540-2, Department of Occupational Health, Faculty of Medicine, McGill University, Montréal, Québec, Canada.

Table 21 Spontaneous Mid Trimester Abortion (page 44)

Group	Sample Size	Incidence of Losses	Crude Ratio
OPPAB	**256**	**7**	**2.7%**
OPPLB	**403**	**5**	**1.2%**
NPP	426	11	2.6%

"An induced abortion of a first pregnancy prior to 14 weeks puts the subsequent pregnancy at 1.57 times the risk for a bad outcome [fetal loss, still birth, low birthweight, short gestation] compared to a woman whose second pregnancy was preceded by a live birth." [page 39]

"The odds of producing a low weight baby in a pregnancy subsequent to a first trimester abortion are 1.69 when compared to OPPLB [Only Previous Pregnancy ended in a Live Birth]" page 28
"Only women who entered the study before the 28th week of gestation were included. Mid-trimester abortion was defined as pregnancy termination between 98 and 195 days." (page 43)

> This National Institute of Health funded study was done by the State University of New York, Downstate Medical Center at Stony Brook. Long Island, "Prospective Study of the Outcome of Pregnancy Subsequent to Previous Induced Abortion," NICHD Contract No. NO1-HD-6-2803, Final Report January, 1981. Raymond C. Lerner, PhD, MPH., Project Director; Andre O. Varma, MD, MS, Co-Principal Ivestigator.
> This was a controlled study of 2,409 women who had prenatal care for a delivery or other pregnancy outcome. Five hundred women had one or more previous induced abortions, and 1,889 did not. African Americans comprised 77.3% of the abortion group. Pregnant women were excluded from the study if the were wearing an IUD, had diabetes, multiple births, drug addiction, or syphilis. The comparison consisted of 455 women who aborted their first pregnancy, and 800 women whose first pregnancy was a live birth delivered at term.
> For women who aborted, researchers were unable to obtain "about half the number of records because some of the facilities were no longer in existence and the location of their records was inaccessible, or because the record could not be found at an existing facility. In a few instances, facilities refused access to records." (page 5)

"An experimental group of adolescents having become pregnant after induced abortion (n = 320) were compared with 514 primigravid adolescents, 391 women 20-24 years old having become pregnant after induced abortion, and 368 primigravid women of the same age. **Spontaneous abortion appeared more frequently in the experimental group (5.9%) than in all control groups (5.1%, 3.3%, and 3.8% respectively.** Preterm delivery was more frequent in the experimental group (9.3%) than in the control groups (6.8%, 6.4%, 5.7%, respectively). **In the young adolescents (14-16 years old) of the experimental group, spontaneous abortion was almost twice as frequent (10.7%) as in the older adolescents of the same group (5.5%)**…"

> [PubMed Summary] Petering A, Andolsek L, "The effect of induced abortion in adolescence on the manifestations of spontaneous abortion, premature labor and birth weight," Jugosl Ginekol Perinatol. 1986 May-Aug;26 (3-4):49-52, [Article in Croatian]

Low Birth Weight Babies

At present, roughly one in thirteen children born in the United States is a low birthweight baby, and more than 60% of infant deaths involve low birthweight as a factor. Low birthweight or premature babies can face additional problems after birth including mental handicap, cerebral palsy, lung, heart, sight, intestine and hearing problems.

Babies born weighing less than 5 pounds, 8 ounces (2,500 grams) at birth are low birthweight. Very low birthweight is a weight of less than 3 pounds, 5 ounces (1,500 grams). Some full term babies are small-for-date babies which means they are underweight, and this results in part, from a slowing or temporary stopping of growth in the womb.

Multiple births, (twins, triplets, etc.) are often low birthweight, even at full term. Women

who smoke average smaller babies than non-smokers. Alcohol use can limit growth and can even cause birth defects.

Medical Studies of Legal Abortion and Low Birthweight Babies

"To investigate whether the length of the interval between an abortion and the next pregnancy is associated with increased risks of adverse maternal and perinatal outcomes in Latin America. … Retrospective cross-sectional study using information from 258,108 women delivering singleton infants and whose previous pregnancy resulted in abortion recorded in the Perinatal Information System database of the Latin American Centre for Perinatology and Human Development, Montevideo, Uruguay, between 1985 and 2002. Adjusted odds ratios were obtained through logistic regression analysis. … **Compared with the post-abortion interpregnancy intervals of 18 to 23 months, intervals shorter than 6 months were significantly associated with increased risks of** maternal anemia, premature rupture of membranes, **low birth weight, very low birth weight, preterm delivery, and very preterm delivery. …**In Latin America, post-abortion interpregnancy intervals shorter than 6 months are independently associated with increased risks of adverse maternal and perinatal outcomes in the next pregnancy."

> [PubMed Summary] Conde-Agudelo A, Belizan JM, Breman R, Brockman SC, Rosas-Bermudez A. "Effect of the interpregnancy interval after an abortion on maternal and perinatal health in Latin America," International Journal of Gynaecology and Obstetrics, 2005 Apr;89 Suppl 1:S34-40, Latin American Center for Perinatology and Human Development, Division of Health Promotion and Protection, Pan American Health Organization, World Health Organization, Montevideo, Uruguay

"We reviewed 1791 singleton pregnancies of women with a history of previous induced abortion and compared them with 14,857 pregnancies in mothers with no previous induced abortions. **Therapeutic termination of pregnancy was associated with a statistically significant increase in the incidence of low birth weight infants** and bleeding in the first trimester of pregnancy."

> [PubMed Summary] Hadani P, Slater PE, Harlap S, Stevenson DK, Gale R, Child-bearing after induced abortion: reassessment of risk, Journal of Epidemiology and Community Health. 1988 Sep;42 (3):294-8 Department of Neonatology, Bikur Cholim Hospital, Jerusalem.

"**A study of 576 pregnant women, whose previous pregnancy had been terminated by legally induced abortion, has shown that … that more infants with a birth weight below 2501 grams were born to women whose cervical canal during abortion had been dilated more than 12 mm**, and by women who had been submitted to recurettage. The latter group also demonstrated a higher frequency of retained placenta or placental tissue."

> [PubMed Sumary] Obel E, "Pregnancy Complications Following Legally Induced Abortion with Special Reference to Abortion Technique," Acta Obstet Gynecol Scand. 1979;58(2):147-52,

"We reviewed 1791 singleton pregnancies of women with a history of previous induced abortion and compared them with 14,857 pregnancies in mothers with no previous induced abortions. **Therapeutic termination of pregnancy was associated with a statistically significant increase in the incidence of low birth weight infants** and bleeding **in the first trimester of pregnancy.** When other variables were examined, no significant differences were found between the two groups, except for a significantly higher rate of

stillbirths among women who had not had a prior induced abortion. There were no increases in major or minor congenital malformations."

[PubMed Summary] Seidman DS, Ever-Hadani P, Slater PE, Harlap S, Stevenson DK, Gale R, "Child-bearing after induced abortion: reassessment of risk," Journal of Epidemiology and Community Health. 1988 Sep;42 (3):294-8. Department of Neonatology, Bikur Cholim Hospital, Jerusalem.

"This longterm, prospective, controlled cohort study was undertaken at the Joint Royal College of General Practitioners/Royal College of Obstetricians and Gynecologists and was based in general practice in England, Scotland, and Wales. 1311 women whose recruitment pregnancy had ended in induced abortion (abortion group) and 2131 women whose recruitment pregnancy ended naturally (nonabortion group) were included in this study. … In the abortion group, birthweight was an average 23 g lighter (95% CI -76g to +30 g) and the length of gestation was an average of 0.9 days shorter (95% CI -2.2 days to 0.4 days) than in the nonabortion group. **Women who had their abortions in NHS premises had an increased risk of a nonviable outcome (RR 2.55, 95% CI 1.31-4.94) and had babies with significantly lower mean birthweight (-119 g, 95% CI -233 g to +5 g) compared with those who obtained their operations in the private sector**. Women whose abortions had been undertaken by a consultant had the lowest risk of nonviable outcome. Although **these differences remained after adjustment for a number of important variables,** it is possible that factors not measured in the present study, e.g., economic status and occupation, played a contributory role."

[PubMed Summary] Frank PI, McNamee R, Hannaford PC, Kay CR, Hirsch S, "The effect of induced abortion on subsequent pregnancy outcome," British Journal of Obstetrics and Gynaecology, 1991 Oct;98(10):1015-24, Royal College of General Practitioners, Manchester Research Unit .

"… the results of a historical prospective study of the late sequelae of induced abortion in Jerusalem are reported. Information on women who had undergone legal, induced abortions during 1967-76 was used in the study and compared with hospital records for subsequent pregnancies. **Infants of women who had undergone a previous induced abortion, particularly a D and C (dilatation and curettage), exhibited an excess of low birth weight. The birth weight of the subsequent infants was directly related to the amount of dilatation, which would be correlated with cervical damage**. Low gestation ages, leading to low birth weights, were also evident among the infants of women who had undergone previous induced abortions. The abortion group also demonstrated a higher rate of postpartum bleeding as compared to the nonabortion group."

[PubMed Summary] Slater PE, Davies AM, Harlap S, "The effect of abortion method on the outcome of subsequent pregnancy," Journal of Reproductive Medicine, 1981 Mar;26 (3):123-8

"Cohort study using the Danish Medical Birth Registry (MBR), the Hospital Discharge Registry (HDR), and the Induced Abortion Registry (IAR). All women who had their first pregnancy during 1980-1982 were identified in the MBR, the HDR, and the IAR. We included all 15,727 women whose pregnancy was terminated by a first trimester induced abortion in the induced abortion cohort and 46,026 women whose pregnancy was not terminated by an induced abortion were selected for the control cohort. All subsequent pregnancies until 1994 were identified by register record linkage. … **Low birthweight (<2500 g) in singleton term live births occurred more frequently in women with one, two, three or more previous induced abortions, compared with women without any**

previous induced abortion of similar gravidity, 2.2% versus 1.5%, 2.4% versus 1.7%, and 1.8% versus 1.6%, respectively. Adjusting for maternal age and residence at time of pregnancy, interpregnancy interval, gender of newborn, number of previous spontaneous abortions and number of previous low birthweight infants (control cohort only), the odds ratios (OR) of low birthweight in singleton term live births in women with one, two or more previous first trimester induced abortions were 1.9 (95% CI: 1.6, 2.3), and 1.9 (95% CI: 1.3, 2.7), respectively, compared with the control cohort of similar gravidity. High risks were mainly seen in women with an interpregnancy interval of more than 6 months. … This result was unexpected and confounding cannot be ruled out."

[PubMed Sumary] Zhou W, Sorensen HT, Olsen J, "Induced abortion and low birthweight in the following pregnancy," International Journal of Epidemiology, 2000 Feb;29(1):100-6. The Danish Epidemiology Science Centre, Aarhus University, Denmark.

"Included were 13,287 children who were single newborns, after mothers with twins, stillbirths, and abortion histories had been excluded. Children with low birthweight up to 2500 g accounted for 5.4% of these newborns. The investigation was complete in that all newborns were examined in the obstetric department of the Regional Hospital of Schwerin between 1969-77. **Records of premature delivery and induced abortion were found to play a great epidemiological role in the context of children with low birthweight up to 2500 g** but the general trend for such children for the period under review has remained unaffected by the free Medical Abortion Act of 1971. Nevertheless, **mothers with a history of previous abortions during the period studied contributed to a moderate rise in the total number of newborns with low birthweight."**

[PubMed Summary] Zwahr C, Voigt M, Kunz L, Thielemann F, Lubinski H, "Multidimensional investigations to elucidate relationships between case histories of interruption of pregnancy and premature deliveries and low birth weight," Zentralbl Gynakol. 1979;101 (23):1502-9. [Article in German]

"A total population sample of 7286 multigravidae from the Greek National Perinatal Survey (April 1983) was used to determine the association between maternal obstetric history and low birthweight of the subsequent singleton delivery. Significant associations were found with previous early and late fetal losses (miscarriages, induced abortions, stillbirths) and history of haemorrhage during a prior pregnancy. **It was found that mothers who had experienced miscarriage(s), induced abortion(s) or stillbirth(s) had relative risks (RRs) of 1.65, 1.81 and 3.59 respectively compared with mothers without any fetal loss. The risk increased substantially with the increasing number of losses and reached 8.83 for the small group of mothers who had experienced all three kinds of fetal loss.** For mothers with a history of bleeding in a previous pregnancy the risk was double that of mothers without such a history. The results above were changed only slightly when the significant socio-economic characteristics of the family were taken into account."

[Pub Med Summary] Lekea-Karanika V, Tzoumaka-Bakoula C., "Past obstetric history of the mother and its association with low birthweight of a subsequent child: a population based study," Paediatr Perinat Epidemiol. 1994 Apr;8 (2):173-87.

"We analyzed interview and record review data from 9,823 deliveries to evaluate the relationship between prior history of induced abortion and subsequent late pregnancy outcomes. **Complications such as bleeding in the first and third trimesters, abnormal presentations and premature rupture of the membranes, abruptio placentae, fetal**

distress, low birth weight, short gestation, and major malformations occurred more often among women with a history of two or more induced abortions. A logistic regression analysis to control for multiple confounding factors showed that a history of one induced abortion was statistically significantly associated with first-trimester bleeding … and a history of two or more induced abortions was statistically associated with first-trimester bleeding, abnormal presentations, and premature rupture of the membranes."

[PubMed Summary] Linn S , Schoenbaum SC , Monson RR , Rosner B , Stubblefield PG , Ryan KJ, "The relationship between induced abortion and outcome of subsequent pregnancies," American Journal of Obstetrics and Gynecology, 146 (2): 136-40 1983;

"Attention was given to the relationship between induced abortion in primigravidae and the course as well as outcome of subsequent pregnancy. Reference is made to the women hospitalised for childbirth in the obstetric ward of the Regional Hospital of Schwerin, between 1969 and 1977. … A retrospective study of irregularities in childbirth among 7671 primiparae is presented. 356 of the patients had previously undergone induced abortion. **The rate of underweight infants was 13.92% for the children of women who had undergone induced abortion and 7.90% for those who hadn't**. There was also a highly significant increase in the incidence of cervical insufficiency, abortus imminens, and delivery with Shute-forceps among women who had undergone induced abortion. A shortened pregnancy duration, an increased need for cerclage, and stationary and ambulant morbidity were also significantly more frequent among the abortion patients. Induced abortion involves a health risk during subsequent pregnancies, and the physician must inform his patient of this fact."

[PubMed Sumary] Grindel B, Zwahr C, Lubinski H, Voigt M, "Induced abortion in primigravidae and subsequent pregnancy, with particular consideration of underweight," Zentralbl Gynakol. 1979;101(16):1009-14, [Article in German]

"In a historical cohort study the outcome of the first birth after a legal 2nd trimester two-stage abortion induced with saline or prostaglandin F2 alpha was evaluated for 142 nulliparous and 65 parous women. The birth-outcome was compared with that for 180 parity-matched control women and for all women in Sweden 1975. No statistically significant differences were disclosed with regard to means of infants' birthweight and length of gestation, or to occurrence of low birthweight (LBW) infants and preterm deliveries. **The nulliparous women with a previously induced abortion tended, however, to have more LBW-infants than did the other nulliparae**. **More LBW-infants were born to the 29 nulliparae with a previous abortion induced with prostaglandin than to the 113 nulliparae having abortions induced with saline (p = 0.11)**; otherwise no noteworthy differences were found in the birth-outcome for the 39 women with a previous abortion induced by prostaglandin, compared with the 168 having abortions induced by saline."

[PubMED Summary] Meirik O, Nygren KG., "Outcome of first delivery after 2nd trimester two-stage induced abortion. A controlled historical cohort study," Acta Obstet Gynecol Scand. 1984;63 (1):45-50.

"To determine the effect of selective termination of an abnormal twin on the rate of preterm delivery. …The study group consisted of 69 patients with twin pregnancies who underwent selective termination between 1987-1994. The comparison groups consisted of singleton (n = 42,362) and twin pregnancies (n = 825) delivered at our institution during

the same period. … **Terminating the presenting twin was associated with a significantly higher risk of delivery before 37 weeks (adjusted OR 4.1, 95% CI 1.4-12.3) and low birth weight (adjusted OR 3.8, 95% CI 1.3-11.4) compared with terminating the nonpresenting twin.** When the termination was performed at or after 20 weeks' gestation, only the risk of preterm premature rupture of the membranes or preterm labor was significantly increased (adjusted OR 3.7, 95% CI 1.2-11.5). Selective termination patients had a lower rate of preterm delivery than twin pregnancies (40 versus 58%, P < .005) but higher than singleton pregnancies (40 versus 10%,P < .001). … Selective termination of the presenting twin at 20 weeks or later was associated with a worse perinatal outcome than terminating the nonpresenting twin or performing the procedure before 20 weeks."

> [PubMed Summary] Lynch L, Berkowitz RL, Stone J, Alvarez M, Lapinski R, "Preterm delivery after selective termination in twin pregnancies," Obstetrics and Gynecology, 1996 Mar;87 (3): 366-9.

"The odds of producing a low birth weight baby in a pregnancy subsequent to a first trimester abortion are 1.69 when compared to OPPLB. Both the weight difference and the odds ratio are statistically significant at the 5% level. However, when we compare OPBAB to NPP we find no difference. In other words, a prior induced abortion puts the woman in a risk category for low birthweight equivalent to a first pregnancy delivery. … We conclude that a single early abortion appears to introduce no significant risk of low birthweight in subsequent pregnancy." (page 28) *[But the subsequent pregnancy for an aborting women has a statistically significant 1.69 times greater chance of low birthweight! And the second unaborted pregnancy is the SUBSEQUENT PREGNANCY!]* Glossary: OPPLB (only previous pregnancy live birth); OPPAB (only previous pregnancy abortion); OPPBAD (only previous pregnancy bad outcome i.e., spontaneous abortion or stillbirth); NPP (no previous pregnancy); APPAB (all previous 2-3 pregnancies aborted).

> This National Institute of Health funded study was done by the State University of New York, Downstate Medical Center at Stony Brook. Long Island, "Prospective Study of the Outcome of Pregnancy Subsequent to Previous Induced Abortion," NICHD Contract No. NO1-HD-6-2803, Final Report January, 1981. Raymond C. Lerner, PhD, MPH., Project Director; Andre O. Varma, MD, MS, Co-Principal Ivestigator. This was a controlled study of 2,409 women who had prenatal care for a delivery or other pregnancy outcome. Five hundred women had one or more previous induced abortions, and 1,889 did not. African Americans comprised 77.3% of the abortion group. Pregnant women were excluded from the study if the were wearing an IUD, had diabetes, multiple births, drug addiction, or syphilis. The comparison consisted of 455 women who aborted their first pregnancy, and 800 women whose first pregnancy was a live birth delivered at term.
> For women who aborted, researchers were unable to obtain "about half the number of records because some of the facilities were no longer in existence and the location of their records was inaccessible, or because the record could not be found at an existing facility. In a few instances, facilities refused access to records." (page 5)
> Birthweight analysis was not included in the study if one or more of the following conditions was present: labor induced before 37 weeks and date of first day of the last menstrual period was not known, C section was performed; spontaneous abortion, still birth

"The study covered a total of 1,488 pregnant women who came for their first prenatal consultations in about the 19th week of pregnancy. The experimental group consisted of 416 women previous pregnancy ended with artificial abortion. In the control groups there were women who had neither a delivery nor abortion, then women whose previous pregnancy ended with the birth of a live child, and, finally, women in whom the previous

pregnancy ended with spontaneous abortion. … **A larger number of newborns weighing at birth less than 2,500 g was observed in women in whom abortion was performed by vacuum aspiration and not by curettage**. **In women with the abortion performed by vacuum aspiration and becoming pregnant in the first year following abortion, there was a significantly higher number of** premature deliveries and **low birth-weight children."**

[PubMed Summary] Pompe-Tansek M, Andolsek L, Tekavcic B, "The effect of artificial abortion on the course and result of subsequent pregnancy," Jugosl Ginekol Opstet. 1982 Sep-Dec;22 (5-6):118-20, [Article in Croatian]

"In Victoria, previous termination of pregnancy is a risk factor for giving birth to a very low birth-weight infant (less than 1,500 g)--**the risk of giving birth to an infant less than 1,000 g is increased more than 2.5-fold by a prior induced abortion and more than 3.5-fold by 2 or more prior abortions**. However, more than 97% of women with a prior termination gave birth to infants weighing more than 1,500 g. **Subsequent very preterm delivery appears to be a real but rare complication of induced abortion, responsible for about 9% of very low birth-weight infants in 1982-1983**."

[Pub Med Summary] Lumley, J "Very low birth-weight (less than 1,500 g) and previous induced abortion, Victoria 1982-1983," Australian and New Zealand Journal of Obstetrics and Gynecology, 26 (4): 268-72, 1986;

"A **study of 576 pregnant women, whose previous pregnancy had been terminated by legally induced abortion, has shown that … that more infants with a birth weight below 2501 grams were born to women whose cervical canal during abortion had been dilated more than 12 mm,** and by women who had been submitted to recurettage. The latter group also demonstrated a higher frequency of retained placenta or placental tissue."

[PubMed Sumary] Obel E, "Pregnancy Complications Following Legally Induced Abortion with Special Reference to Abortion Technique," Acta Obstet Gynecol Scand. 1979;58 (2):147-52,

"An experimental group of adolescents having become pregnant after induced abortion (n = 320) were compared with 514 primigravid adolescents, 391 women 20-24 years old having become pregnant after induced abortion, and 368 primigravid women of the same age. … **The weight of the newborns in the experimental group (3,155.7 +/- 536.3 g) was significantly lower than that in primigravid adolescents (3,228 +/- 488 g; t = 1.97, p less than 0.05), in women 20-24 years old with an earlier induced abortion (3,303 +/- 556 d; t = 3.49, p less than 0.01), and in primigravid women 20-24 years old (3.331 +/- 508; t = 4.30, p less than 0.001)."**

[PubMed Summary] Petering A, Andolsek L, "The effect of induced abortion in adolescence on the manifestations of spontaneous abortion, premature labor and birth weight," Jugosl Ginekol Perinatol. 1986 May-Aug;26(3-4):49-52, [Article in Croatian]

Second Pregnancy Low Birth weight – under 2501 grams - married and single number of births and percent of low birth weight (table 38)

Race	Live birth 1st pregnancy	Abortion 1st pregnancy	Abortion % difference
White	**203 / 4.8%**	**97 / 7.0%**	**+46%**
Nonwhite	**23 / 8.5%**	**23 / 13.5%**	**+58%**

Low Birth Weight per 1,000 Live Births – second pregnancy – single or married (Table 40)

Race	Live birth 1st pregnancy	Abortion 1st pregnancy	Abortion % difference
White	47.6/1,000	70.0/1,000	+68%
Nonwhite	84.6/1,000	134.5/1,000	+63%

National Institutes of Health funded New York State Department of Health, Office of Biostatistics, Published April 18, 1980, Vito M. Logrillo, Principal Investigator, contract number NO1-6-2802. The study consisted of 20,296 women living in upstate New York who aborted their first pregnancy between July 1, 1970 and June 30, 1971. These aborting women were matched to al like number of controls, which were matched for "age, race, number of previous pregnancies, and socioeconomic status." Possible confounding factors like smoking, birth control use, drug and alcohol intake and some other variables were not available for either the cases or controls. Almost 92% of the abortions were done in hospitals. Over 5% were done at less than 12 weeks gestation with 90% done at less than 18 weeks. Subsequent pregnancy outcomes are presented for women aborting their first pregnancy to women who delivered their first pregnancy.

"The effects of previous induced abortion on pregnancy, labor and outcome of pregnancy were measured in a prospective study of 11,057 pregnancies to West Jerusalem mothers … The 752 mothers who reported one or more induced abortions in the past were more likely, at the same interview, to report bleeding in each of the first 3 months of the present pregnancy. They were subsequently less likely to have a normal delivery and more of them needed a manual removal of the placenta or other intervention in the third stage of labor. In births following induced abortions, the relative risk of early neonatal death was doubled, while late neonatal deaths showed a 3- to 4-fold increase**. There was a significant increase in the frequency of low birthweight, compared to births in which there was no history of previous abortion."**

[PubMed Summary] Harlap S, Davies AM, "Late sequelae of induced abortion: complications and outcome of pregnancy and labor," American Journal of Epidemiology, 1975 Sep;102 (3):217-24

Premature Births

Most children are born 40 weeks after the first day of their mother's last menstrual period. Premature birth, also called pre-term birth is where a child is born earlier than 37 weeks of gomplete gestation. Almost 60% of low-birthweight babies are also preterm babies. Early birth date babies have less developed internal organs. During 2003, in the era of the wanted child, just under 500,000 children born in the United States were premature. These births cost more in terms of infant health and life expectancy. Premature ibabies have greater rates of cerebral palsy, mental retardation, sight and hearing problems, lung disease and gastrointestinal maladies.

Medical Studies on Legal Abortion and Premature Births

"On January 1, 1974, Hungary changed its two decade "abortion on demand" law and established more restrictive medical, social, and economic conditions for induced abortion. Conservative emigrants argued that abortion was genocide, allowing Russia to move into Central Europe. The new legislation results from medical groups, not from this conservative argument. **Research has shown that artificially induced abortions have**

deleterious effects on later pregnancies. Large rises in premature births have been noted recently in Eastern Europe, where abortions are allowed easily."

[PubMed Summary] L. Iffy, Letter to Editor, "Abortion Laws in Hungary," Obstet Gynecol. 1975 Jan;45 (1):115-6.

"Many definitive conclusions are precluded because of design problems …The available studies do suggest that abortion by vacuum aspiration is not a risk factor for complications of subsequent pregnancies, labor, delivery, or of newborns. **Abortion by dilatation and curettage, however, may increase the risk of** subsequent spontaneous abortion, low birth weight, and **prematurity** but these findings need to be confirmed. … Since approximately three-quarters of all abortions performed annually in the United States are on young never-married women who may eventually wish to bear children, further rigorous research to define the risks of induced abortion is urgently required."

[PubMed Summary] Bracken, MB, "Induced abortion as a risk factor for perinatal complications: a review," Yale Journal of Biological Medicine, 51 (5): 539-48 1978

"Using three Danish national registries, researchers at the Danish Epidemiology Science Center identified 61,753 women who had their first pregnancies in 1980, 1981, or 1982. **Of these 15,727 had a first trimester induced abortion. Subsequent pregnancy outcomes for all of these women was tracked until 1994.** Women who had one, two, or more previous induced abortions were, respectively, 1.89, 2.66, or 2.03 times more likely to have a subsequent pre-term delivery. **Prior induced abortion not only increased the risk of premature delivery, it also increased the risk of delayed delivery**. Women who had one, two, or more induced abortions were, respectively, 1.89, 2.61, and 2.23 times more likely to have a post-term delivery (over 42 weeks)."

[PubMed Summary] Zhou, Weijin, et. al., "Induced Abortion and Subsequent Pregnancy Duration," Obstetrics & Gynecology 94(6):948-953 (Dec. 1999).

"**There are many factors that are associated with preterm labor and delivery**. These include maternal conditions such as medical illness, anemia and uterine malformation. **They may be related to** past events such as prior obstetric complication, previous preterm labor, cervical surgery or **induced abortion**. … . Maternal behaviors such as smoking and substance abuse can be risk factors for a short gestation."

[PubMed Summary] Robinson, JN, Regan, JA, Norwitz ER, "The Epidemiology of Preterm Labor," Semin Perinatol, 25 (4): 204-14, 2001.

A survey of all 106,345 Bavarian "singleton births from the 1994 Survey were analysed using univariate and multivariate logistic regression analysis. … early preterm birth was associated with premature rupture of the membranes (odds ratio (OR) 1.6, 95% confidence interval (CI) 1.37-1.86) … **previous induced abortion (OR 1.8, 95% CI 1.57-2.13) …"**

[PubMed Summary] Martius, JA, Steck, T, Oehler, MK, Wulf KH, "Risk factors associated with preterm (<37+0 weeks) and early preterm birth (<32+0 weeks): univariate and multivariate analysis of 106,345 singleton births from the 1994 statewide perinatal survey of Bavaria." European Journal of Obstet. Gynecol. Reproductive Biology, 80 (2): 183-9 1998;

"The authors examined hospital discharge records in 1980-81 for singleton 3rd trimester deliveries in Scotland. They compared 3000 women who had previously experienced induced termination of pregnancy and 4000 who had experienced

spontaneous abortion with primigravidae and with women in their 2nd pregnancy, their first having resulted in a livebirth. 2 aspects of low birthweight were examined: delivery before the 37th completed week of gestation and low birth weight for gestational age. Comparisons were further controlled for maternal height, age, sex of infant, marital status, and social class. Women with previous spontaneous abortions experienced significantly increased risk of preterm delivery but not of low birth weight for gestational age. **Women with a history of induced abortion also experienced increased risk of preterm delivery**, but for women aged 18-24 years, risk of low birthweight for gestational age was significantly reduced compared with primigravidae."

> [PubMed Summary] Pickering RM, Forbes JF, "Risks of preterm delivery and small-for-gestational age infants following abortion: a population study," Br J Obstet Gynaecol. 1985 Nov;92 (11): 1106-12

A survey of all births in France during 1995 using logistic regression analyses, found that, "**The main risk factors of preterm delivery were history of adverse pregnancy outcome (ORa=4. 5), history of induced abortion (ORa=1.5),** 35 year old or more (ORa=1.5) … and inadequate antenatal care (ORa=2.1)."

> [PubMed Summary] Foix-L'HAlias, L, Ancel, PY, Blondel B, "Risk factors for prematurity in France and comparisons between spontaneous prematurity and induced labor: results from The National Perinatal Survey 1995," J Gynecol Obstet Biol Reprod (Paris), 29 (1): 55-65 2000;

"Survey of a national sample of births in France in 1995 … . All public and private maternity hospitals in France. … 12,432 women who had a singleton live birth during one week. … Maternal age, parity, history of previous adverse pregnancy outcome, maternal weight before pregnancy, marital status, educational level, maternal employment status during pregnancy, nationality, smoking during the third trimester of pregnancy and antenatal care were controlled for using multiple logistic regression and polytomous logistic regression. … Twelve percent of women reported one previous induced abortion, and 3% two or more. **Previous induced abortion was associated with an increased risk of preterm birth (OR 1.4; 95% CI 1.1-1.8); the risk of preterm delivery increased with the number of previous induced abortions (OR 1.3; 95% CI 1.0-1.7 for one previous abortion and OR 1.9; 95% CI 1.2-2.8 for two or more).** The relationship was the same for very preterm and moderately preterm deliveries and for spontaneous and indicated preterm deliveries. … This study suggests that a history of induced abortion increases the risk of preterm delivery, particularly for women who have had repeated abortions."

> [PubMed Summary] Henriet L, Kaminski M, "Impact of induced abortions on subsequent pregnancy outcome: the 1995 French national perinatal survey," British Journal of Obstetrics and Gynecology, 2001 Oct;108 (10):1036-42.

"The study covered a total of 1,488 pregnant women who came for their first prenatal consultations in about the 19th week of pregnancy. The experimental group consisted of 416 women previous pregnancy ended with artificial abortion. In the control groups there were women who had neither a delivery nor abortion, then women whose previous pregnancy ended with the birth of a live child, and, finally, women in whom the previous pregnancy ended with spontaneous abortion. … A larger number of newborns weighing at birth less than 2,500 g was observed in women in whom abortion was performed by vacuum aspiration and not by curettage. **In women with the abortion performed by**

vacuum aspiration and becoming pregnant in the first year following abortion, there was a significantly higher number of premature deliveries and low birth-weight children."

> [PubMed Summary] Pompe-Tansek M, Andolsek L, Tekavcic B, "The effect of artificial abortion on the course and result of subsequent pregnancy," Jugosl Ginekol Opstet. 1982 Sep-Dec;22 (5-6):118-20, [Article in Croatian]

"An experimental group of adolescents having become pregnant after induced abortion (n = 320) were compared with 514 primigravid adolescents, 391 women 20-24 years old having become pregnant after induced abortion, and 368 primigravid women of the same age. …. **Preterm delivery was more frequent in the experimental group (9.3%) than in the control groups (6.8%, 6.4%, 5.7%, respectively). … In the young adolescents (14-16 years old) of the experimental group …. preterm delivery two and a half times as frequent (24.0%) as in the primigravid adolescents of the same age (10.3%).** ... **The adolescents of the experimental group had on term deliveries in the 40th to the 42nd week significantly less frequently (31.6%) than primigravid adolescents (47.1%), 20-24 year-old women with earlier induced abortion (47.4%), and 20-24 year-old primigravid women (53.8%)."**

> [PubMed Summary] Petering A, Andolsek L,, "The effect of induced abortion in adolescence on the manifestations of spontaneous abortion, premature labor and birth weight," Jugosl Ginekol Perinatol. 1986 May-Aug;26 (3-4):49-52, [Article in Croatian]

"In continuation of information about complications in pregnancy the complications of first and second stage of labour were analysed. Preceded abortions and interruptions do not influence the duration of first both stages. Against that we found an increase of rupture of amniotic membrane and laceration of cervix in birth after interruption. **The frequency of premature birth is extraordinary increases at I-parae (21%) and II-parae (15%) after interruption.** The Apgar-score showed lower values. The causes of these complications were discussed."

> [PubMed Summary] Knorre P, "Influence of abortions and interruptions of pregnancies on subsequent deliveries. II. Course of labor," Zentralbl Gynakol. 1976;98 (10):591-4, [Article in German]

"… the results of a historical prospective study of the late sequelae of induced abortion in Jerusalem are reported. Information on women who had undergone legal, induced abortions during 1967-76 was used in the study and compared with hospital records for subsequent pregnancies. Infants of women who had undergone a previous induced abortion, particularly a D and C (dilatation and curettage), exhibited an excess of low birth weight. The birth weight of the subsequent infants was directly related to the amount of dilatation, which would be correlated with cervical damage**. Low gestation ages, leading to low birth weights, were also evident among the infants of women who had undergone previous induced abortions.** The abortion group also demonstrated a higher rate of postpartum bleeding as compared to the nonabortion group."

> [PubMed Summary] Slater PE, Davies AM, Harlap S, "The effect of abortion method on the outcome of subsequent pregnancy," Journal of Reproductive Medicine, 1981 Mar;26(3):123-8

"**137 women, who had legal abortions of their 1st pregnancies, were compared with a group of 133 who had spontaneous abortions before the 28th week, and a group of 129 who delivered their 1st pregnancy**. The legal abortion group showed 3 ectopic

pregnancies, while the other 2 groups showed none. Those who delivered their 1st pregnancy showed the best reproductive function, while the group of spontaneous abortions showed the highest frequency of early abortion. **The artificial group showed the highest rate of late spontaneous abortion and premature delivery**. There was a decline in the reproductive function of the artificial abortion group in the 3rd and 4th pregnancies, and an increase in the rate of late abortion. This group also showed an increased rate of spontaneous primary and premature rupture of the membranes and a trend toward lower newborn weight."

> [PubMed Summary] Koller O, Eikhom SN, "Late sequelae of induced abortion in primigravidae. The outcome of the subsequent pregnancies," Acta Obstet Gynecol Scand. 1977;56(4):311-7

"To evaluate the risk of very preterm birth (22-32 weeks of gestation) associated with previous induced abortion according to the complications leading to very preterm delivery in singletons. … Regionally defined population of births in France. … The sample consisted of 1943 very preterm live-born singletons (< 33 weeks of gestation), 276 moderate preterm live-born singletons (33-34 weeks) and 618 unmatched full-term controls (39-40 weeks). … **Women with a history of induced abortion were at higher risk of very preterm delivery than those with no such history (OR + 1.5, 95% CI 1.1-2.0);** the risk was even higher for extremely preterm deliveries (< 28 weeks). **The association between previous induced abortion and very preterm delivery varied according to the main complications leading to very preterm delivery. A history of induced abortion was associated with an increased risk of premature rupture of the membranes, antepartum haemorrhage (not in association with hypertension) and idiopathic spontaneous preterm labour that occur at very small gestational ages (< 28 weeks).** Conversely, no association was found between induced abortion and very preterm delivery due to hypertension. … **Previous induced abortion was associated with an increased risk of very preterm delivery. The strength of the association increased with decreasing gestational age."**

> [PubMed Summary] Moreau C, Kaminski M, Ancel PY, Bouyer J, Escande B, Thiriez G, Boulot P, Fresson J, Arnaud C, Subtil D, Marpeau L, Roze JC, Maillard F, Larroque B; EPIPAGE Group "Previous induced abortions and the risk of very preterm delivery: results of the EPIPAGE study," British Journal of Obstetrics and G.ynecology, 2005 Apr;112(4):430-7.

"Patients who had surgical abortion at > or = 20 weeks' gestation from 1996 to 2003 and received subsequent prenatal care at The New York Weill Cornell Medical Center were identified. Indication for abortion, operative technique, and subsequent pregnancy outcomes were reviewed. Student t test, Fisher exact test, and Mann-Whitney U were used where appropriate. … One hundred and twenty pregnancies in 89 women were identified. Thirteen (10.8%) ended with early miscarriage, and 5 were electively terminated. Of the remaining 102 pregnancies, 7 ended with spontaneous preterm birth. **Those who experienced preterm birth were more likely to have undergone abortion due to cervical dilation and/or preterm premature rupture of membranes** (PPROM) (27.3% vs 4.4%; P = .03). Those with a multifetal pregnancy in the subsequent pregnancy were more likely to have preterm birth (75.0% vs 4.3%; P < .001). In patients who underwent dilation and evacuation (D&E) for reasons other than cervical dilation and/or PPROM,

rates of spontaneous preterm birth were identical between those who had intact dilation and extraction (D&X) and D&E using forceps (4.2% vs 4.5%; P = 1.0). .."

[PubMed Summary] Chasen ST, Kalish RB, Gupta M, Kaufman J, Chervenak FA, "Obstetric outcomes after surgical abortion at > or = 20 weeks' gestation," American Journal of Obstetrics and Gynecology, 2005 Sep;193(3 Pt 2):1161-4. Division of Maternal-Fetal Medicine, Weill Medical College of Cornell University.

"We used data from a case-control survey, the EUROPOP study; 2938 preterm births and 4781 controls at term from ten European countries were included. Based on national statistics, we distinguished three groups of countries with high, intermediate and low rates of induced abortion. … Previous induced abortions were significantly associated with preterm delivery and the risk of preterm birth increased with the number of abortions. … The extent of association with previous induced abortion varied according to the cause of preterm delivery. **Previous induced abortions significantly increased the risk of preterm delivery after idiopathic preterm labour, preterm premature rupture of membranes and ante-partum haemorrhage … The strength of the association increased with decreasing gestational age at birth.**"

[PubMed Summary] Ancel PY, Lelong N, Papiernik E, Saurel-Cubizolles MJ, Kaminski M, "History of induced abortion as a risk factor for preterm birth in European countries: results of the EUROPOP survey," Human Reproduction, 2004 Mar;19(3):734-40. Epub 2004 Jan 29, EUROPOP. Epidemiological Research Unit on Perinatal and Women's Health, INSERM

"We analyzed interview and record review data from 9,823 deliveries to evaluate the relationship between prior history of induced abortion and subsequent late pregnancy outcomes**. Complications such as** bleeding in the first and third trimesters, abnormal presentations and premature rupture of the membranes, abruptio placentae, fetal distress, **low birth weight, short gestation**, and major malformations **occurred more often among women with a history of two or more induced abortions**. A logistic regression analysis to control for multiple confounding factors showed that a history of one induced abortion was statistically significantly associated with first-trimester bleeding but with no other untoward pregnancy events, and a history of two or more induced abortions was statistically associated with first-trimester bleeding, abnormal presentations, and premature rupture of the membranes."

[PubMed Summary] Linn S , Schoenbaum SC , Monson RR , Rosner B , Stubblefield PG , Ryan KJ, "The relationship between induced abortion and outcome of subsequent pregnancies," American Journal of Obstetrics and Gynecology, 146 (2): 136-40 1983;

"Multidimensional retrospective studies were conducted into possible correlations between case histories of induced abortion and premature deliveries on the 1 hand and deliveries of children with low birthweight on the other. Reference was made to the ordinal number of birth. Included were 13,287 childrne who were single newborns … Children with low birthweight up to 2500 g accounted for 5.4% of these newborns. … all newborns were examined in the obstetric department of the Regional Hospital of Schwerin between 1969-77. **Records of premature delivery and induced abortion were found to play a great epidemiological role in the context of children with low birthweight** up to 2500 g … mothers with a history of previous abortions during the period studied contributed to a moderate rise in the total number of newborns with low birthweight."

[PubMed Summary] Zwahr C, Voigt M, Kunz L, Thielemann F, Lubinski H, "Multidimensional investigations to elucidate relationships between case histories of interruption of pregnancy and

premature deliveries and low birth weight," Zentralbl Gynakol. 1979;101 (23):1502-9, [Article in German]

"To test the hypothesis that previous unfavourable pregnancy outcomes increase the risk for premature birth, with (PP) or without (PTB) premature rupture of the amniotic sac (PROM) at the index pregnancy …: Four hundred sixty-three women aged 15 to 45 years who were delivered preterm PROM, full term PROM and preterm without PROM matched with 463 women who delivered full term. All women included in the study had at least one previous pregnancy. … Compared with controls, PP cases had odds ratios of 95 for previous preterm birth, 186 for abortion and prematurity and 158 for fetal loss, abortion/prematurity after controlling for confounding variables. **Compared with controls, PTB cases had an odds ratio of 96.5 for previous preterm delivery, 84 for abortion and prematurity, and 320 for fetal loss/abortion and prematurity after controlling for confounding variables**. … **Previous preterm delivery, abortion and prematurity and fetal loss/abortion and prematurity all increase risk for subsequent preterm birth with or without PROM."**

[PubMed Summary] Ekwo EE, Gosselink CA, Moawad A, "Previous pregnancy outcomes and subsequent risk of preterm rupture of amniotic sac membranes," British Journal of Obstetrics and Gynaecology, 1993 Jun;100(6):536-41.

Abortion, Smoking and Substance Abuse

Because pregnant women are eating, dringing and breathing for two persons what a pregnant woman takes into her body can and does have an effect on her pre-born child. The nicotine from cigarettes is passed from a mother to her developing child. Smoke also prevents a child from being fully nourished and increases the risk of short gestation pregnancies and still birth. Alcohol can cause adverse lifelong physical and behavioral problems in children, including fetal alcohol syndrome (mental retardatipon, birth defects, abnormal facial features, nervous system problems, memory and learning disabilities, vision, hearing and behavioral problems. No amount of alcohol is safe for an unborn child.

A US Health and Human Services survey found that in 2002 and 2003, 4.3% of pregnant women aged 15 to 44 used illegal drugs [marijuana/hashish, cocaine (including crack), inhalants, hallucinogens, heroin, or prescription drugs used nonmedically] in the month before the survey, 4.1% engaged in binge alcohol use [five or more drinks at one time], and 18% reported smoking cigarettes. Younger pregnant women aged 15 to 25 reported greater use of illegal drugs and cigarettes in the previous 30 days than pregnant women aged 26 to 44. [53]

A study reported in the American Journal of Epidemiology, June 15, 2007 reported a link between a mother's use of cigarettes while pregnant and lower fertility in the sons of such mothers later in life. The study of 347 men aged 18-21 were ranked according to their exposure to smoke. The 248 males exposed to 19 or more cigarettes per day in utero had

[53] National Survey on Drug Use and Health, June 2, 2005, "Substance Use During Pregnancy : 2002 and 2003 Update," Office of Applied Statistics, Substance and Mental Health Services Administration, US Department of Health and Human Services, at http://www.oas.samhsa.gov/2k5/pregnancy/pregnancy.htm

19% lower semen volume, 38% lower total sperm count, and 17% lower sperm concentrations than men not exposed to cigarettes by their mothers. [54]

And the reason for inclusing a discussion here on abortion, smoking an dsubstance abuse is that women who abort are more likely to smoke or abuse drugs thtan women who do not abort.

Studies on Abortion, Cigarette Smoking and Substance Abuse

"Smoking habits have been compared in three samples of pregnancies: (1) spontaneous abortions (n = 610); (2) induced abortions (n = 800); and (3) deliveries (n = 1337). … A statistical analysis of the association between smoking and the risk of having a spontaneous abortion was made. The comparisons were made with all types of intra-uterine pregnancies but spontaneous abortions, e.g., deliveries and induced abortions. … **The smoking rates according to pregnancy outcome differ among the samples. In the induced abortion sample 58% smoked compared with 50% in the spontaneous abortion sample and 44% in the delivery sample**."

> [PubMed Summary] Sandahl B, "Smoking habits and spontaneous abortion," Eur J Obstet Gynecol Reprod Biol. 1989 Apr;31 (1):23-31.

"The research design involved interviewing women who gave birth in Washington DC hospitals during 1992. Interview data included pregnancy history (prior births, induced abortions, miscarriages, and stillbirths), desire for the pregnancy (wanted, not wanted, mistimed), socio-demographic information, timing of onset of prenatal care, and substance use (cigarettes, alcohol, and drugs) during pregnancy. … **A history of induced abortion was associated with elevated risk for maternal substance use of various forms; whereas other forms of perinatal loss (miscarriage and stillbirth) were not related to substance use.** Unwanted pregnancy was associated with cigarette smoking during pregnancy, but not with any other forms of substance use."

> [PubMed - Summary] Coleman PK, Reardon DC, Cougle JR, "Substance use among pregnant women in the context of previous reproductive loss and desire for current pregnancy," British Journal of Health Psychol. 2005 May;10 (Pt 2):255-68,

"A nationally representative sample of women was surveyed about substance use during pregnancy shortly after giving birth. Women with a previous induced abortion, whose second pregnancy was delivered, were compared separately with women with one previous birth and with women with no previous births. … **Compared with women who gave birth, women who had had an induced abortion were significantly more likely to use marijuana (odds ratio, 10.29; 95% CI, 3.47-30.56), various illicit drugs (odds ratio, 5.60; 95% CI, 2.39-13.10), and alcohol (odds ratio, 2.22; 95% CI, 1.31-3.76) during their next pregnancy**. The results with only first-time mothers were very similar."

> [PubMed Summary] Coleman PK, Reardon DC, Rue VM, Cougle J, Z"A history of induced abortion in relation to substance use during subsequent pregnancies carried to term," American Journal of Obstetrics and Gynecology, 2002 Dec;187 (6):1673-8

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[54] Reuters Health, June 14, 2007 Parental Smoke May Affect Sons' Later Fertility," by Cynthia Huggins, at http://www.nlm.nih.gov/medlineplus/news/fullstory_50877.html

"Abortion is known to be associated with higher rates of substance abuse … This study examines data for women in the National Longitudinal Survey of Youth whose first pregnancy was unintended. Women with no pregnancies were also used as a control group. **Use of alcohol, marijuana, cocaine, and behaviors suggestive of alcohol abuse were examined an average of four years after the target pregnancy among women with prior histories of delivering an unintended pregnancy (n = 535), abortion (n = 213), or those who reported no pregnancies (n = 1144).** … Compared to women who carried an unintended first pregnancy to term, **those who aborted were significantly more likely to report use of marijuana (odds ratio: 2.0), with the difference in these two groups approaching significance relative to the use of cocaine (odds ratio: 2.49). Women with a history of abortion also reported more frequent drinking than those with a history of unintended birth.** With the exception of less frequent drinking, the unintended birth group was not significantly different from the no pregnancy group."

> [PubMed Summary] Reardon DC, Coleman PK, Cougle JR, "Substance use associated with unintended pregnancy outcomes in the National Longitudinal Survey of Youth," American Journal of Drug and Alcohol Abuse. 2004 May;30 (2):369-83

"The relationship between adolescent drug use and premarital teen pregnancy and abortion as a pregnancy outcome among sexually active women is investigated in a sample of white women from the National Longitudinal Survey of Youth. Event history analysis is used to explore whether prior drug use has a unique effect on premarital teen pregnancy, with controls for personality, lifestyle, and biological factors. Logistic regression is used to estimate whether drug use affects the decision to terminate a premarital teen pregnancy. **The results show that the risk of premarital teen pregnancy is nearly four times as high for those who have used illicit drugs other than marijuana as for those with no history of any prior substance involvement. Furthermore, illicit drug use increases the likelihood of an abortion by a factor of 5."**

> [PubMed Summary] Mensch B, Kandel DB, "Drug use as a risk factor for premarital teen pregnancy and abortion in a national sample of young white women," Demography. 1992 Aug;29 (3):409-29.

"A statistical association between a history of substance abuse and a history of abortion has been identified in several studies… **Analysis of this substance abuse variable showed that a report of substance abuse following a first pregnancy was associated significantly with (a) abortion for all women, (b) abortion for adolescents, and (c) abortion for women over 19 years of age. Women who aborted a first pregnancy were five times more likely to report subsequent substance abuse than women who carried to term, and they were four times more likely to report substance abuse compared to those who suffered a natural loss of their first pregnancy** (i.e., due to miscarriage, ectopic pregnancy, or stillbirth). Women with a history of abortion or a history of substance abuse were significantly more likely to feel discomfort in responding to the survey."

> [PubMed Summary] Reardon DC, Ney PG, "Abortion and subsequent substance abuse," Am J Drug Alcohol Abuse. 2000 Feb;26 (1):61-75.

"To identify the relationship between maternal cigarette smoking and ultrasound-confirmed placenta previa. … A matched case-control design was used. Cases were drawn from the New England Medical Center and Cambridge Hospital from July 1992 through

March 1994. Each case was delivered by cesarean after 24 weeks' gestation and had an antenatal ultrasound examination confirming placenta previa. … **A number of potential confounders were associated with previa:** age (odds ratio [OR] 1.15, 95% confidence interval [CI] 1.05-1.26), gravidity (OR 1.4, 95% CI 1.1-1.7), parity (OR 1.4, 95% CI 1.1-1.9), **prior spontaneous abortion (OR 3.1, 95% CI 1.3-7.4), prior elective abortion (OR 3.0, 95% CI 1.2-7.6)**, and prior cesarean delivery (OR 3.5, 95% CI 1.3-9.9). The crude OR for current smoking was 3.0 (95% CI 1.1-8.6). The OR for smoking ranged from 2.6-4.4, despite controlling for confounders. … Current cigarette smoking is associated with a 2.6-4.4-fold increased risk of placenta previa."

[PubMed Summary] Chelmow D., Andrew DE , Baker ER, "Maternal cigarette smoking and placenta previa," Obstet Gynecol, 87 (5 Pt 1): 703-6, 1996

"In order to identify subgroups of women at elevated risk of induced abortion, personal characteristics and habits, selected medical histories and contraceptive practices of 873 women undergoing legal abortion in various areas of Northern Italy were compared with those of 504 control subjects identified in family planning clinics of the same hospitals or area health authorities. … **Induced abortion was less frequent among ex-smokers and more frequent in heavy smokers**, but was not appreciably influenced by several other indicators of lifestyle habits and history of gynaecological or psychiatric complaints. …"

[PubMed Summary] La Vecchia C, Pampallona S, Negri E, Fasoli M, Franceschi S, Decarli A, "Characteristics of women undergoing induced abortion: results of a case-control study from Northern Italy," 22: Contraception. 1985 Dec;32 (6):637-49.

"**Regression analyses of preliminary data from 8818 consecutive singleton pregnancies in a study (Medical University of Debrecen, Hungary) concerning the effects of smoking during pregnancy and of a history of induced abortion** on birth weight and gestational age are presented. … It was found that smoking during pregnancy decreased birth weight in a dose-response manner. … Previous induced abortion is associated with a downward shift in the gestational age distribution. … **when stillbirths were eliminated, a significant negative effect of abortion on birth weight was seen--an effect apparent only at early gestational ages.** In both aspects of this study, the following variables were controlled: maternal age, parity, education, infant sex, gestational age, and birth weight."

[PubMed Summary] Lampe Lg Batar I, Bernard RP, Kendall EM, Manton KG, Effects of smoking and of induced abortion on pregnancy outcome," IPPF Med Bull. 1981 Apr;15 (2):3

"All Danish-speaking pregnant women attending routine ante-natal care at the Departmetn of Obstetrics and Gynecology, Aarhus University Hospital, Denmark, from September 1989 till Sugust 1996 were invited to participate in the cohort study … Danish women with singleton pregnansies, who had completed the questionnaire for the medical records, were eligible for this study … leaving 24,679 pregnancies for analysis, including 321 spontaneous abortions and 98 induced abortions. … **We conclude from our data that women consuming on average ≥5 drinks per week appeared to have a >3 fold increased risk of experiencing a first trimester spontaneous abortion**."

Kesmodel U, Wisborg K, Olsen SF, Henriksen TB, Secher NJ., "Moderate alcohol intake in pregnancy and the risk of spontaneous abortion," Alcohol and Alcoholism, 2002 Jan-Feb;37 (1):87-92. Perinatal Epidemiological Research Unit, Department of Obstetrics and Gynaecology, Aarhus University Hospital, Skejby Sygehus, 8200 Aarhus N, Denmark.

Apgar Scale

The Apgar test, named after anesthesiologist Virginia Apgar, was developed in 1952 to see in an uncomplicated manner if a baby needs medical assistance just after birth. It is used worldwide by doctors, midwives and nurses in birthing centers and hospitals. It rates a baby's muscle tone, heart rate, reflex response, color, and breathing as a measure of overall health. It is done one minute after birth and again at five minutes after birth. The baby is given a score between 0 and 2 for each characteristic tested. A score from 7-10 means the baby is in good condition and does not need additional or extraordinary medical assistance.

Studies linking Induced Abortion and Low Apgar Scores

"To elucidate maternal characteristics and pregnancy complications associated with low APGAR score, a case-control study of low APGAR score was conducted under matching both gestational age and route of delivery, in full-term deliveries at a Japanese hospital with 102 cases and 204 controls. **Previous induced abortion and occurrence of preeclampsia were more frequently observed in the low APGAR score cases. In the multiple conditional logistic regression analysis, each of these factors more than doubled the risk of low APGAR score.** Even if only those without perinatal troubles were included in the analysis, **previous induced abortion was recognized as an independent risk factor of low APGAR score (odds ratio=2.68, 95% confidence interval:1.01-7.04).** Despite of the potential limitations of this study, previous induced abortion might be a useful predictor of adverse state of newborn infant."

> [PubMed Summary] uka M, Sugimori H, Nakamura M, Haginiwa K, Yoshida K, "Risk factors of low APGAR score in Japanese full-term deliveries: a case-control study," Epidemiol. 2002 Jul;12 (4):320-3. Department of Preventive Medicine, St Marianna University School of Medicine, Kawasaki, Kanagawa, Japan.

"In continuation of information about complications in pregnancy the complications of first and second stage of labour were analysed. Preceded abortions and interruptions do not influence the duration of first both stages. Against that we found an increase of rupture of amniotic membrane and laceration of cervix in birth after interruption. **The frequency of premature birth is extraordinary increases at I-parae (21%) and II-parae (15%) after interruption. The Apgar-score showed lower values**. The causes of these complications were discussed."

> [PubMed Summary] Knorre P, "Influence of abortions and interruptions of pregnancies on subsequent deliveries. II. Course of labor," Zentralbl Gynakol. 1976;98 (10):591-4. [Article in German]

"To determine the significant risk factors of delivery of low Apgar score newborns below 7 at 1 minute, a case-control study was analysed in pregnant women delivered at Rajavithi Hospital between December 1, 1995 and June 30, 1996. Two hundred and two pregnant women who delivered low Apgar score newborns below 7 at 1 minute and four hundred and four pregnant women who delivered normal Apgar score newborns > or = 7 at 1 minute were recruited in the study by simple random, sampling. **Risk factors which were significantly associated with low Apgar scores below 7 at 1 minute were gestational**

age less than 37 weeks or more than 42 weeks, birth weight less than 2,500 g or more than 4,000 g, meconium passage in the amnionic fluid, narcotic analgesic use and breech presentation. The non-significant risk factors were maternal medical or obstetric complications and oxytocin use."

> [PubMed Summary] Kovavisarach E, Juntasom C, "Risk factors of delivery of low apgar score newborn below 7 at 1 minute: a case-control study," J Med Assoc Thai. 1999 Jul;82(7):660-5.

"From 1968 to 1975, 12,795 mothers and their newborns were studied: group 1 (24.8%), were mothers who have had abortions prior to 1st delivery; group 2 (42.3%), mothers having a first delivery with no previous miscarriages or abortions; and group 3 (32.9%), mothers of 2 or more children who had abortions afterwards. **Abortion prior to first delivery increased the number of complications (54.4%) during pregnancy** … Intrauterine dystrophy had occurred in 17% cases and the incidence of premature births was greater, 16%. **29.2% of the infants were in poor condition at delivery according to the Apgar scale (under 4 points)** and 42.4% manifested disturbances in environment adaptability. **The neonatal mortality rate 6.6% was twice that of the infants from the other 2 groups. The authors conclude that abortions are a threat to the health of mothers and during subsequent pregnancies, endanger the fetus and the newborn."**

> [PubMed Summary] Osuch-Jaczewska R, Tomala J, "Effect of past abortions and the sequence of gestations on the course of the next pregnancy and labor as well as the state-at-delivery, maturity, dystrophia and mortality rate of the newborn infants," Ginekol Pol. 1979 Feb;50(2):127-33, Article in Polish]

Studies Linking Low Apgar as Secondary Effect of Possible Abortion Complications

"Pediatricians conducted a prospective study of 35,959 live births at Smt. Sucheta Kripalani Hospital in New Delhi in 1981, 1983, 1986, and 1988 to determine whether or not new technology and equipment, resulting in improved obstetric and neonatal services, have affected the trends in neonatal outcome with low Apgar scores (=or 3) (indicating severe birth asphyxia). **The overall incidence of low Apgar score was 7.6%. … Newborns with low Apgar scores or their mothers were significantly (p** 0.01) more likely to have a cesarean section (36.4% vs. 10.3%; odds ratio [OR] = 4.9), fetal distress (29.1% vs. 7.8%; OR = 4.9), abnormal presentation (18.1% vs. 4.8%; OR = 4.4), **preeclampsia/eclampsia (17.1% vs. 10.2%; OR = 1.8), abnormal labor (13.5% vs. 2.3%; OR = 6.6), PROM** (11% vs. 4.6%; OR = 2.6), twins (5.6% vs. 1.7%; OR = 3.4), and other risk factors (8.3% vs. 3.1%; OR = 2.8). Most newborns with low Apgar scores (85%) had identifiable risk factors compared to only 34% of controls."

> [PubMed Summary] Kumari S, Sharma M, Yadav M, Saraf A, Kabra M, Mehra R, "Trends in neonatal outcome with low Apgar scores," Indian J Pediatr. 1993 May-Jun;60 (3):415-22, Special Care Neonatal Unit, Lady Hardinge Medical College, New Delhi.

Neonatal Death

The death of a child within 28 days of birth is called a neonatal death. Such deaths are associated with premature delivery, maternal high blood pressure or placental problems, pregnancies of twins or greater number, and birth defects. (Perinatal deaths can refer to deaths of a child after 22 weeks gestation and through one week after childbirth.)

We must first establish points of reference in this discussion. Physicians who adhere to the Hippocratic Oath would speak of reducing neo natal deaths in terms of increasing the survival rates of at risk children. When non-Hippocratic Oath physicians speak of public health achievements in reducting neo-natal mortality an explanation is in order.

For example, a discussion of reductions in Canadian neo natal mortality rates reports that: "data suggest that increasing use of prenatal diagnosis for major congenital anomilies and selective terminatipon of affected pregnancies has led to perceptible declines in infant mortality in Canada …. Provinces/territories such as Saskatchewan, which did not have a widespread prenatal screening program, had higher rates of infant death due to congenital anomalies." [55]

With the increasing use of pre-natal diagnosis for birth defects or congenital diseases and subsequent abortion of affected fetuses or pre-born children, Finnish reasearchers question the utility of relying upon peri natal mortality statastics as an indicator of a standard of care. [56]

Studies of Induced Abortion and Neonatal Deaths

"From 1968 to 1975, 12,795 mothers and their newborns were studied: group 1 (24.8%), were mothers who have had abortions prior to 1st delivery; group 2 (42.3%), mothers having a first delivery with no previous miscarriages or abortions; and group 3 (32.9%), mothers of 2 or more children who had abortions afterwards. Abortion prior to first delivery increased the number of complications (54.4%) during pregnancy … Intrauterine dystrophy had occurred in 17% cases and the incidence of premature births was greater, 16%. 29.2% of the infants were in poor condition at delivery according to the Apgar scale (under 4 points) and 42.4% manifested disturbances in environment adaptability. **The neonatal mortality rate 6.6% was twice that of the infants from the other 2 groups. The authors conclude that abortions are a threat to the health of mothers and during subsequent pregnancies, endanger the fetus and the newborn.**

> [PubMed Summary] Osuch-Jaczewska R, Tomala J, "Effect of past abortions and the sequence of gestations on the course of the next pregnancy and labor as well as the state-at-delivery, maturity, dystrophia and mortality rate of the newborn infants," Ginekol Pol. 1979 Feb;50(2):127-33, Article in Polish]

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[55] Liu S, Joseph KS, Kramer MS, Allen AC, Sauve R, Rusen ID, Wen SW; Fetal and Infant Health Study Group of the Canadian Perinatal Surveillance System, "Relationship of prenatal diagnosis and pregnancy termination to overall infant mortality in Canada," JAMA. 2002 Mar 27;287(12):1561-7, Health Surveillance and Epidemiology Division, HPB Bldg 7, Tunney's Pasture AL 0701D, Ottawa, Ontario, Canada K1A OL2. shiliang_liu@hc-sc.gc.ca

[56] Gissler M, Ollila E, Teperi J, Hemminki E., "Impact of induced abortions and statistical definitions on perinatal mortality figures," Paediatr Perinat Epidemiol. 1994 Oct;8(4):391-400. Department of Public Health, University of Helsinki, Finland

"The effects of previous induced abortion on pregnancy, labor and outcome of pregnancy were measured in a prospective study of 11,057 pregnancies to West Jerusalem mothers who were interviewed during pregnancy and who subsequently delivered a single live or stillborn infant. The 752 mothers who reported one or more induced abortions in the past were more likely, at the same interview, to report bleeding in each of the first 3 months of the present pregnancy. … **In births following induced abortions, the relative risk of early neonatal death was doubled, while late neonatal deaths showed a 3- to 4-fold increase.**"

[PubMed Summary] Harlap S, Davies AM, "Late sequelae of induced abortion: complications and outcome of pregnancy and labor," American Journal of Epidemiology, 1975 Sep;102(3):217-24.

"An obstetrical practice based at a university hospital in Jerusalem has studied the offspring of 9,894 women who were pregnant at least once during the years 1966 through 1968, and discovered that **the neonatal mortality rate was 2 to 3 times higher in infants born to women who reported a previous induced abortion.** Among the women studied, 7.2% reported at least 1 previous abortion … A positive correlation was observed between a history of induced abortion and the present age of the mother; smoking; Caesarian section; bleeding during pregnancy; vomiting during pregnancy; and the use of medications during the 1st trimester of the present pregnancy. The women in this study delivered a total of 11,057 infants between 1966 and 1968; **infants born to mothers who reported a previous induced abortion experienced a higher neonatal mortality rate and were more likely to be low birth-weight infants, when compared to the group of infants whose mothers did not report a previous induced abortion."**

[PubMed Summary] Prywes R, Harlap S, Davies AM., "[Neonatal death after induced abortion," Harefuah. 1976 May 16;90(10):453-6, [Article in Hebrew]

"**In the last 3 decades in Hungary, the high prevalence of both prematurity and abortion and the possible correlation between the two has been the focus of professional interest.** … **Preterms contribute mainly to the first 24-hour and 1st-week mortality rates. More than half of the infant mortality and 80% of early neonatal mortality is comprised of the death of preterm babies.** … Hungary had the highest prevalence among the 10 countries shown, and there was a steady increase in the prevalence over the 8 years. … In 1961, 18% of women had undergone at least 1 abortion before their 1st child, 47% before their 2nd child, and 74% before their 3rd child. In 1980-81, the motive for abortion was social and personal in 84% of the abortion seekers and medical in 16%. …. **Irrespective of the age of the mother, her parity, occupation, or where she lived, low birth weight was more common in those who had had a previous abortion** and was even more common in those with multiple abortions. **The harmful effect of abortion is undeniable, yet it is not possible to label it as the only or leading responsible factor for Hungary's high frequency of prematurity.**

Makoi Z., "The impact of abortion policy on prematurity in Hungary," Acta Paediatr Scand Suppl. 1985;319:84-8.

"Data from 25,958 consecutive UCLA deliveries were analyzed to determine the effect of prior abortions and premature births on current pregnancy outcome. **Perinatal death rate, combining stillbirths and neonatal deaths, increased more than threefold among women with at least one prior premature in birth and at least one prior abortion** and

approached 18 per cent of current deliveries when there were three or more prior premature births."

Funderburk SJ, Guthrie D, Meldrum D., "Suboptimal pregnancy outcome among women with prior abortions and premature births," Am J Obstet Gynecol. 1976 Sep 1;126(1):55-60

Fetal Death in Utero

The term "fetal death" refers to the death of a the conceived child before complete expulsion or removal from his/her mother and which is not intended as an induced abortion. The term is somewhat elastic in the medical literature and in the provision of state laws for reporting such events in so far as the length of gestation is stipulated.

Some states require reporting only if 20 weeks of gestation have been reached, others require all know products of conception, while others include minimum weight for inclusion in the reporting statistics.

Induced Abortion and Fetal Death in Utero

"As part of a community-based study in Korea to evaluate the effects of previous induced abortion on length of gestation and pregnancy outcome of subsequent pregnancies, we analyzed data obtained from January 1979 to December 1981 on pregnancies reported to family health workers in Kang Hwa Island, Korea. The preterm, live-birth rates were not significantly associated with previous induced abortion. Overall, **the life table-estimated fetal death rate for women enrolled at the eighth or earlier weeks of gestation was 13.7%, 10.2% for women with no previous induced abortion and 28.9% for women with previous induced abortion. The relative risk for fetal death for women who had undergone a previous abortion was 2.8;** relative risk for parous women compared to nulliparous women was 3.4. After controlling for parity, previous induced abortion was not a significant variable for fetal death rate.

[PubMed – Summary] Park TK, Strauss LT, Hogue CJ, Kim IS., "Previous experience of induced abortion as a risk factor for fetal death and preterm delivery," Int J Gynaecol Obstet. 1984 Jun;22(3):195-202

"Two hundred and eleven patients who had undergone vaginal termination and were pregnant again were investigated; 43-2% had become pregnant within one year of termination. **The overall fetal loss in the 211 patients was 17-5% compared with 7-5% in a group matched for parity but consisting of patients who were pregnant after a spontaneous abortion. Altogether 4-3% of pregnancies after legal abortion ended as first trimester abortions, 8-5% as second trimester abortions, and 13-7% in premature delivery. Among 11 women whose cervices had been lacerated at the time of legal termination the fetal loss in subsequent pregnancy was 45-5%, and only one pregnancy went beyond 36 weeks.** Routine Shirodkar suture may be beneficial when the cervix is known to have been damaged at legal abortion. Several patients had asked that their general practitioner should not be told of their termination, and such patients may not admit their termination during a subsequent pregnancy, which could thus be jeopardised. No evidence was found to suggest that infants of patients with a history of legal termination are small for dates."

[PubMed –Summary] Richardson JA, Dixon G., "Effects of legal termination on subsequent pregnancy," Br Med J. 1976 May 29;1 (6021):1303-4.

"**Danish records show that approximately 4% of women who undergo surgically induced abortions have complications related to the procedure**. We examined whether it was women who had the short-term complications that carried an excess risk of spontaneous abortion and preterm delivery in the subsequent pregnancy. … **Two cohorts of women who had had an induced abortion** and a subsequent pregnancy were followed. The cohort with no reported complications comprised 12,972 women, and the cohort with complications 605 women. … **The cohort with complications did … have a higher risk of stillbirth, mainly seen in women whose induced abortion had been complicated by an infection."**

[PubMed – Summary Zhou W, Olsen J., "Are complications after an induced abortion associated with reproductive failures in a subsequent pregnancy?" Acta Obstet Gynecol Scand. 2003 Feb;82(2):177-81, The Danish Epidemiology Science Center, University of Aarhus, Aarhus, Denmark.

Spontaneous Fetal Deaths Less than 15 Weeks Gestation - Women Seeking Pregnancy (table 53)

Married – by Race	Live birth 1st pregnancy No. SFD/No. Births & %	Abortion 1st pregnancy No. SFD/No. Births & %
White	58 / 4,195 1.4%	**33 / 1,267 2.5%**
Nonwhite	3 / 165 1.8%	0 / 95 0%

National Institutes of Health funded New York State Department of Health, Office of Biostatistics Published April 18, 1980, Vito M. Logrillo, Principal Investigator, contract number NO1-6-2802.
The study consisted of 20,296 women living in upstate New York who aborted their first pregnancy between July 1, 1970 and June 30, 1971. These aborting women were matched to al like number of controls, which were matched for "age, race, number of previous pregnancies, and socioeconomic status." Possible confounding factors like smoking, birth control use, drug and alcohol intake and some other variables were not available for either the cases or controls. Almost 92% of the abortions were done in hospitals. Over 5% were done at less than 12 weeks gestation with 90% done at less than 18 weeks. Subsequent pregnancy outcomes are presented for women aborting their first pregnancy to women who delivered their first pregnancy

Birth Defects/Malformations

The March of Dimes reports that, "About 120,000 babies (1 in 33) in the United States are born each year with birth defects. A birth defect is an abnormality of structure, function or metabolism (body chemistry) present at birth that results in physical or mental disabilities or death. Several thousand different birth defects have been identified. Birth defects are the leading cause of death in the first year of life. … Both genetic and environmental factors, or a combination of these factors, can cause birth defects. However, the causes of about 70 percent of birth defects are unknown. [57]

[57] March of Dimes, Quick REferenec and Fact Sheet, http://www.marchofdimes.com/pnhec/4439_1206.asp

Induced Abortion - Birth Defects/Malformations

"W**e analyzed interview and record review data from 9,823 deliveries to evaluate the relationship between prior history of induced abortion and subsequent late pregnancy outcomes. Complications such as** bleeding in the first and third trimesters, abnormal presentations and premature rupture of the membranes, abruptio placentae, fetal distress, low birth weight, short gestation, and **major malformations occurred more often among women with a history of two or more induced abortions**."

[PubMed Summary] Linn S , Schoenbaum SC , Monson RR , Rosner B , Stubblefield PG , Ryan KJ, "The relationship between induced abortion and outcome of subsequent pregnancies," American Journal of Obstetrics and Gynecology, 146(2): 136-40 1983;

"The effects of previous induced abortion on pregnancy, labor and outcome of pregnancy were measured in a prospective study of 11,057 pregnancies to West Jerusalem mothers … **The 752 mothers who reported one or more induced abortions in the past** were more likely, at the same interview, to report bleeding in each of the first 3 months of the present pregnancy. **They were subsequently less likely to have a normal delivery and …. There were increases in major and minor congenital malformations.** …"

[PubMed Summary] Harlap S, Davies AM, "Late sequelae of induced abortion: complications and outcome of pregnancy and labor," American Journal of Epidemiology, 1975 Sep;102(3):217-24.

"Data from 25,958 consecutive UCLA deliveries were analyzed to determine the effect of prior abortions and premature births on current pregnancy outcome. … **Abnormal live births, defined as** infants with either birth weight under 2,501 grams, gestational age less than 37 weeks, or **congenital anomalies, significantly increased as the number of prior abortions and premature births increased**, each in a range of 0 through 3 or more. For example, among women with at least three prior premature births, there were greater than 50 per cent abnormal live births. The risk was mostly that of low birth weight and low gestational age, although **there was a slight increase in congenital anomalies**."

Funderburk SJ, Guthrie D, Meldrum D., "Suboptimal pregnancy outcome among women with prior abortions and premature births," Am J Obstet Gynecol. 1976 Sep 1;126 (1):55-60.

"Fetal aminopterin/methotrexate syndrome was described nearly 50 years ago when these agents were first used as abortifacients. Physicians essentially stopped using these agents when the associated anomalies were recognized. Over the last several years the use of methotrexate with or without misoprostol for management of ectopic pregnancy and medical terminations of pregnancy has increased. … **A 23-year-old female sought a termination at eight weeks gestation. She was given methotrexate followed by misoprostol.** … **The medical termination was unsuccessful. The patient elected to continue the pregnancy secondary to financial considerations.** She presented at 39 weeks without intervening prenatal care. **She was diagnosed with severe preeclampsia. At delivery the infant was hypotonic and growth restricted with multiple anomalies.** … Physicians are increasingly using methotrexate with or without misoprostol for treatment of ectopic pregnancies and medical terminations."

[PubMed – Summary] Wheeler M, O'Meara P, Stanford M., "Fetal methotrexate and misoprostol exposure: the past revisited," Teratology. 2002 Aug;66(2):73-6, Denver Health Medical Center, Department of Obstetrics and Gynecology, Department of Pediatrics, Denver, Colorado 80204, USA.

"**We report a patient affected with Moebius Syndrome (OMIM 157900) due to the use of misoprostol during the first trimester of the pregnancy, when abortion was intended twice using this drug, vias vaginal (600 mg) and oral (900 mg), with failure to induce abortion on both occasions.** Since the use of misoprostol for abortion, without any medical indication or supervision, appears to be rather frequent in our population and since **there are reports of severe malformations in children born after failed intents of abortion with this medication,** it is necessary to alert the medical community and the population in general about the teratogenic risks of this drug."

[PubMed – Summary] Sánchez O, Guerra D. "Moebius syndrome due to the use of misoprostol. Case report," Invest Clin. 2003 Jun;44(2):147-53, Centro de Microscopía Electrónica, Núcleo Bolívar, Universidad de Oriente, Apartado 83, Ciudad Bolívar, Venezuela 8001-A, [Article in Spanish]

"**Methotrexate and misoprostol are frequently used in combination for medical termination of pregnancy.** … **We present neonatal outcomes in three infants from two different women who had failed medical terminations with methotrexate and misoprostol.** … A young gravida 1, para 0, presented with intrauterine pregnancy complicated by first-trimester exposure to oral methotrexate and vaginal misoprostol. **Ultrasonography determined that the fetus had intrauterine growth restriction and ventriculomegaly. The infant had growth and developmental delays.** A young gravida 4, para 3-0-0-3, also presented after first trimester exposure to methotrexate and misoprostol, and was found to have a twin gestation. **The infants were noted to have … Even single doses of methotrexate and misoprostol used in medical termination of pregnancy can be associated with multiple congenital anomalies."**

[PubMed Summary] Yedlinsky NT, Morgan FC, Whitecar PW., "Anomalies associated with failed methotrexate and misoprostol termination," Obstet Gynecol. 2005 May;105(5 Pt 2):1203-5. Department of Family Practice and Division of Maternal-Fetal Medicine, Womack Army Medical Center, Fort Bragg, North Carolina 28310-5700, USA.

"Methotrexate, a methyl derivative of aminopterin, is a folic acid antagonist and a known human teratogen; misoprostol is a synthetic prostaglandin E1 analog that causes uterine contractions. **Recently, there has been resurgence in the use of methotrexate in combination with misoprostol or of methotrexate alone for the treatment of unwanted or ectopic pregnancies, respectively. This report documents the findings in four infants** who were exposed prenatally to methotrexate alone or in combination with misoprostol in a failed attempt at medical abortion or treatment of ectopic pregnancy. All patients demonstrated growth deficiency, with growth parameters <10th centile, and all displayed features consistent with methotrexate and/or misoprostol embryopathy. Since an increasing number of medical abortions are being performed, **it is important for physicians to recognize the associated teratogenic effects of these abortifacients**. Data from the patients herein described should prompt obstetricians and other health care practitioners who prescribe these medications to counsel their patients regarding these risks, especially if the treatment regimen fails to induce an abortion."

[PubMed Summary] Adam MP, Manning MA, Beck AE, Kwan A, Enns GM, Clericuzio C, Hoyme HE., "Methotrexate/misoprostol embryopathy: report of four cases resulting from failed medical abortion," Am J Med Genet A. 2003 Nov 15;123(1):72-8. Division of Medical Genetics, Department of Pediatrics, Stanford University School of Medicine, Stanford, California 94305-5208, USA.

"The high potential for teratogenicity in continued pregnancy with the use of methotrexate and misoprostol for early termination of intrauterine pregnancies raises the concern that a woman may not complete the medical regimen or may not have a surgical abortion in the event that the drug treatment fails. … **The rate of loss to follow-up after treatment with mifepristone and a prostaglandin analogue reported by Ulmann and Silvestre was 2.8%.** To date, studies of the use of methotrexate and misoprostol for medical abortions have been conducted under conditions in which women are selected carefully, follow-up is rigorous and participants consent to undergo surgical abortion should the medical abortion fail. Nevertheless, **the evidence suggests that it is difficult to follow patients this closely in such interventions.** Wiebe notes that there were problems with patient attendance at follow-up visits."

Lorraine E. Ferris, PhD, CPsych; Antoni S.H. Basinski, MD, PhD, CCFP, MEDICAL ABORTION: WHAT DOES THE RESEARCH TELL US? Canadian Medical Association Journal January 15, 1996, page 186