



INFORMATION KIT
Use of Aborted Fetal Tissue in Viral Vaccine Production

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Introduction

Many viral vaccines were developed and are still manufactured using cell strains derived from aborted fetuses. This information is not widely known among parents, healthcare professionals and government officials alike. Moral objections are often met with claims that only a few fetuses were used over 30 years ago and that no further fetal cell strains are needed now or in the future. This information kit will outline the facts that refute those claims and help parents and others to not only raise objections, but also seek ethically produced alternatives where available. The scope of fetal cell use is growing so rapidly in the pursuit of advances in health and biotechnology, that this issue will soon affect almost everyone, not only parents of young children or other vaccine users. This is not an issue that will quietly go away if only we ignore it for awhile.

LifeCanada's mandate includes providing the public with life-respecting and life-promoting education. Therefore the discussion of vaccines in this information kit will be limited to how life has been exploited in the production of viral vaccines, and what can be done to counter this. It is not the purpose of this information kit to downplay the achievements of vaccines in reducing suffering and disease for many world-wide, or to discuss vaccine safety. It is meant to equip concerned individuals with the information necessary to make informed decisions in regards to the use of certain viral vaccines.

Parents are responsible for the decisions they make in the care of their children, and in regards to this issue they are faced with a tough dilemma. While vaccination is strongly encouraged, parents are urged to make their objections clearly known to their health care providers and governments. Only then will ethical alternatives be made available. Parents should note that Pentacel, a commonly used childhood vaccine made using aborted fetal cell strains, will soon be replaced with one of two ethical alternatives. All the provinces except Quebec have decided to replace Pentacel with Pediacel, with some provinces making the switch as early as October, 2007. Quebec is also expected to purchase Pediacel when it secures its new vaccine contract. Another ethical alternative to Pentacel that may be made available at a later date is Infanrix (GlaxoSmithKline). However, ethical alternatives are not available in Canada for many other vaccines.

It is in the best interest of governments to provide their citizens with vaccines that can be used with a clear conscience, as the success of immunization is based on its wide-spread use. Strong objections to aborted fetal tissue-derived vaccines will encourage governments to purchase ethically produced vaccines and encourage pharmaceutical companies to renew their production. Pharmaceutical companies will produce products based on demand, so our requests to governments must be very clear.

The contents of the information kit are to be used to that end. This material is for wide distribution. Present it when discussing your concerns with your doctors and public health personnel. Use the sample letter to make your concerns known to provincial governments, or use it as a guide to compose your own. Contact information has been provided.



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Common Questions and Answers about Aborted Fetal Tissue and Viral Vaccines

Question 1: Is it true that tissue taken from aborted fetuses was used to develop and manufacture several routine childhood vaccines?

Yes, cells taken from fetuses aborted in the 1960s, '70s and '80s were used to develop what are known as Human Diploid Cell Strains (HDGS). Several HDGS were then used to develop and are still used to manufacture a number of childhood and adult viral vaccines. In fact, HDGS are quickly becoming the 'growth system' of choice for viral vaccines, over and against cell strains derived from monkeys, chick embryos, and others. (See questions 5 & 8 for further information)

Question 2: What are Human Diploid Cell Strains (HDGS)?

HDGS refer to groups of human cells that maintain the normal human chromosomal number (diploid human number is 46, or 23 pairs) and characteristics, while dividing throughout their limited lifetime in a laboratory setting. In contrast to cell lines, cell strains maintain the normal number of chromosomes throughout consecutive cell divisions, do not produce tumors when injected into humans or animals, and die after an innate number of population doublings.¹ Though research has been done with adult human cell strains,^{2,3,4} HDGS used in viral vaccines were derived from aborted fetuses.^{5,6,7,8}

Note: In this document, HDGS will refer to those derived from aborted fetal tissue.

Question 3: How are HDGS made?

While all the fetal cell strains used in viral vaccine manufacture were made using similar basic procedures, the following briefly explains how in the 1960s at the Wistar Institute in Pennsylvania, researcher Leonard Hayflick developed cell strains WI-1 through WI-25, and later, the widely-used WI-38 cell strain.

Since abortion was illegal in the United States in the early 1960s, fetuses were obtained from Sweden. Erling Norrby reported, "one of my duties as a young student in the laboratory in Stockholm was to dissect human fetuses from legal abortions and send organs to the Wistar Institute. Such material was the source of many important studies of cell lines at the Institute, such as Leonard Hayflick's study of WI-38 cells."⁹

Tissue was taken from the lungs, kidneys, skin, muscles, heart, liver, thymus, and thyroid of 19 electively-aborted fetuses. Batches of cells taken from these tissues were incubated in a laboratory setting. After a cell batch had multiplied sufficiently to form a mass big enough to harvest, the mass was divided up into smaller batches, and incubated again. After about 50 'cell population doublings' the cells divided more slowly and deteriorated. Although cell strains have a finite life-span, by freezing excess cells at each subcultivation, one could have cells available at any given time in almost limitless numbers. The frozen cells can be thawed, subcultivated repeatedly, and the excess from each of these



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subcultivations can, in turn, be frozen and later thawed for use. This pattern can be repeated until the total potential yield of about 20 million metric tons of cells (wet weight) is reached.^{10,11}

Therefore, although cell strains are not, as some claim, ‘immortal’, they are stable sources of huge volumes of cells which can be used for mass vaccine manufacture.^{10, 11, 12}

Question 4: How are HDCS used to make viral vaccines?

Viral vaccines are readily made using HDCS. To explain how this is done, a brief look at viruses is first in order.

Viruses, unlike most bacteria, are not able to reproduce themselves outside of a living host cell. A virus must take over a living cell to reproduce. To do this the virus attaches itself to the wall of a cell, injects its own genetic material into the cell and uses the host cell’s mechanisms to make copies of itself. Eventually the cell bursts, and the new viruses are free to invade another cell. Because viral reproduction is achieved by the host cell, efforts to stop viral reproduction will usually also kill the host cell. Therefore, viral infection is prevented by vaccination (active immunization) or treated with immune globulin (passive immunization).¹³

Viral vaccination involves introduction of small amounts of killed, or live but weakened (attenuated) virus into the body to produce immunity to a specific disease. If the body is later exposed to the same virus, defenses are already in place, and the virus will not cause illness. Attenuated and killed virus vaccines are able to induce enough of a response to achieve immunity, but do not cause full blown illness.¹⁴

To make a viral vaccine, viruses are grown in HDCS or animal cells, and incubated until enough virus is available for harvest. The virus is purified, weakened or killed, and then added to solution for injection.¹⁵

Question 5: Why are HDCS used to make vaccines? How do HDCS compare with animal cell cultures used in vaccine production?

According to researcher Leonard Hayflick, HDSC are a suitable cell system for human vaccine production because they meet several criteria:

- a) HDCS grow many viruses efficiently, while some animal cells can only support specific viruses.
- b) One fetus can be the source of a cell strain with a potential yield of about 20 million metric tons (wet weight) of cells, which can be stored frozen for many years. Many vaccine lots can be produced in cells from a single, tested HDCS over a length of time. In addition, aborted fetuses and/or their organs, are seemingly easy to obtain, and the cost of tissue procurement is ‘negligible.’¹⁶ In contrast, obtaining tissue for primary animal cell cultures are complicated. Monkeys had to be trapped, and/or grown in captivity, and a number of workers involved with this died after being infected with diseases carried by the monkeys. Hayflick also mentions the “cost and burden of housing, feeding, maintaining, and breeding dogs, chickens and ducks and, in addition, shipping and quarantining monkeys.”¹⁷



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- c) While viruses have not been detected in HDCS to date, animal cell cultures (monkey, dog, duck, chicken, etc) have occasionally been shown to harbour unwanted viruses, some of which can cause disease in humans.
- d) Several HDCS were tested for cancer-causing ability directly in human subjects, then used for vaccine production. One HDCS so tested could provide large quantities of several vaccines, minimizing the need for frequent testing. This is impractical and potentially dangerous to do with primary animal cells.^{18,19,20}

HDCS are well-suited to viral vaccine growth. Because of this, HDCS are quickly becoming the cell system of choice for growing vaccines.

Question 6: Which HDCS are used in viral vaccine manufacture?

The two HDCS currently used are WI-38, MRC-5.

WI-38 (Wistar Institute cell strain 38) was developed by Leonard Hayflick at the Wistar Institute of Anatomy and Biology in Pennsylvania in 1962. WI-38 was derived from the lung tissue of a three-month-old female aborted fetus: “This fetus was chosen by Dr. Sven Gard, specifically for this purpose. Both parents are known ... the abortion was done because they felt they had too many children. There were no familial diseases in the history of either parent, and no history of cancer specifically in the families ...”²¹

WI-38 was developed as part of a series. WI-1 through WI-25 were developed using various organs from 19 electively-aborted fetuses. WI-26, derived from the lungs of a male aborted fetus, was used to develop the first polio virus in 1962. Another strain, namely WI-44, is also mentioned, which was derived from the lungs of a three month female aborted fetus.^{22,23}

In 1981 Leonard Hayflick aquired the patent for WI-38.²⁴ “WI-38”, he later stated, “was and still is used as the substrate to produce most human virus vaccines”, which “have been administered to more than a billion people around the world during the last forty years.”²⁵

MRC-5 (Medical Research Council cell strain 5) was developed in the United Kingdom, in 1966 by J.P. Jacobs and colleagues. MRC-5 was derived from lung tissue, taken from a 14-week male fetus aborted for psychiatric reasons from a physically healthy 27 year old woman.^{26,27} MRC-5 is currently used by many pharmaceutical companies in the manufacture of many vaccines.

Question 7: What is the origin of the RA 27/3 rubella vaccines?

Rubella is generally a mild disease in children. However, if a pregnant woman contracts the disease, the virus can cross the placenta, infect the fetus and result in congenital rubella syndrome. If the infection occurs during the first three months of pregnancy, when all the major organ systems are developing, multiple abnormalities often result. Not long ago, pregnant mothers who contracted rubella were strongly encouraged to abort. Vaccination against rubella was and still is considered an important public health objective in protecting non-immune pregnant women and their unborn children.



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All the rubella vaccines currently used in Canada are made using the RA 27/3 strain of rubella virus. The RA 27/3 (Rubella abortus, 27th fetus, 3rd tissue explant) rubella strain was obtained during the 1964 rubella epidemic in the US.²⁸ It was then grown on WI-38.²⁹

Later the same researchers published an article documenting that forty aborted fetuses (not just 27) were used in the study and development of this virus strain.³⁰ Following this, the virus strain was tested on HDCS derived from an additional 29 fetuses. The initial vaccine was first tested on orphans in Philadelphia, before being licensed and widely used.

Other effective strains of rubella obtained from a variety of non-abortion-related sources already existed at the time. Yet, RA 27/3 was and still is the rubella strain most commonly used around the world. While it was initially grown in WI-38 cells, manufacturers now grow it in either WI-38 or MRC-5 cells. Japan is one of the only countries where an alternate rubella vaccine is currently used. In Canada, no rubella vaccines using another virus strain and non-fetal cell strains are approved or licensed for use. Dr. Plotkin maintains that his rubella vaccine has prevented many abortions: “I have no doubt that rubella vaccination has prevented thousands and thousands of abortions. From strictly an arithmetical assessment, the good done by the vaccine – if you are opposed to abortion-- is infinitely greater than any possible harm.”³¹

Question 8: What are the other HDCS currently on the market?

Numerous other cell strains have been made as back-ups for the current strains, and for research.

MRC-9 (Medical Research Council cell strain 9) was derived from the lungs of a female fetus aborted in 1974, and developed by Jacobs and colleagues for research and as a back-up for vaccine manufacture.

IMR-90 (Institute for Medical Research cell strain 90) was derived from the lungs of a sixteen-week old female fetus aborted in July 1975. IMR-90 is designated for “research and related activities.”³²

HEK 293 (Human Embryonic Kidney 293) was made from human embryonic kidney cells in 1972, and is used for research.

PER.C6 was developed in 1995 from embryonic retinal cells obtained in 1985, following the abortion of an eighteen week fetus aborted because “the woman wanted to get rid of the fetus.”³³ PER.C6 was made ‘just for pharmaceutical manufacturing’, according to the Dutch researcher, Dr. van der Erb of the Leiden University, who added that, “as far as I know, more than fifty different companies have taken license for PER.C6”. It is being used in the development of numerous new vaccines against “influenza A, influenza B, ‘avian flu’, tuberculosis, respiratory syncytial virus, HIV, anthrax and various encephalopathic viruses.”³⁴

In 2002, PER.C6 was also “launched into commercial production of fully human monoclonal antibodies” (Mabs), totally unrelated to vaccine production. Mabs are currently used in a broad array of cancer therapies, chronic autoimmune inflammatory diseases such as rheumatoid arthritis and ulcerative colitis, and have potential for use in treating infectious diseases, SARS, rabies and others. While Mabs currently in use were



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not developed using human cell strains, and animal strains have worked well, various biotech companies are aggressively pursuing Mab development using human strains such as PER.C6. In addition gene therapy is being developed using PER.C6.

Although claims are made that no further abortions are needed to manufacture vaccines, it is clear that technology using HDCS is poised to take over the production of vaccines and many other human health products.³⁵

Question 9: Which vaccines use HDCS?

Vaccines developed with the use of aborted foetal cells*

Source: Drug product Database (DPD) Health Canada (<http://search.hc-sc.gc.ca/cgi-bin/query?mssdpd/english/active/simple>) and respective companies' internet sites.

Company	Brand Name (proper name, if applicable) (foetal cell line used)
Sanofi Pasteur	Avaxim and ViVaxim (hepatitis A vaccine inactivated) (MRC-5)
	DT Polio Adsorbed (diphtheria and tetanus toxoids adsorbed and poliomyelitis vaccine) (MRC-5)
	Imovax Rabies (rabies vaccine inactivated [DCO]) (MRC-5)
	Inactivated Poliomyelitis Vaccine – IPV (MRC-5)
	Pentacel (Act-HIB [haemophilus b conjugate vaccine {tetanus protein conjugate}] reconstituted with Quadracel (MRC-5)
	Quadracel (component pertussis vaccine and diphtheria and tetanus toxoids adsorbed combined with inactivated poliomyelitis vaccine) (MRC-5)
	TD Polio Absorbed (tetanus and diphtheria toxoids and inactivated poliomyelitis vaccine adsorbed) (MRC-5)
Berna Biotech	Epaxal (hepatitis A vaccine, inactivated) (MRC-5)
GlaxoSmithKline Inc.	Havrix (hepatitis A vaccine, inactivated) (MRC-5)
	Priorix (measles, mumps, and rubella vaccine, live, attenuated (RA27/3 STRAIN/WI-38)
	Twinrix (hepatitis A and hepatitis B vaccine) (MRC-5)



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Company	Brand Name (proper name, if applicable) (foetal cell line used)
	Varilrix Varicella virus vaccine, live, attenuated [Oka-strain] (MRC-5)
Merck Frosst Canada Ltd., Merck Frosst Canada Ltée	MMR II (measles, mumps, and rubella vaccine, live, attenuated) (RA27/3 STRAIN/WI-38)
	Vaqta (hepatitis A vaccine, inactivated) (MRC-5)
	Varivax III (varicella virus vaccine, live, attenuated [Oka/Merck]) (MRC-5)

Disclaimer: the above information might change in the future, always double check up-to-date vaccine components with your health care provider.

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NOTE: Product monographs which accompany vaccines include this information under headings such as “product description”, “composition” and “ingredients”. Look for WI-38, MRC-5, “human diploid cells”, and in the case of rubella vaccines, “RA 27/3”. However, sometimes a combination vaccine will not list all the ingredients for each separate component. For example, Pentacel is a combination vaccine for tetanus, diphtheria, pertussis, polio and Haemophilus Influenzae B. Although the polio component of the vaccine is made using MRC-5, this is not mentioned on the product monograph for Pentacel. If one were to look at the product monograph for the polio vaccine used in this combination vaccine, it is mentioned there. Most product monographs for vaccines are available online at the Health Canada source listed above the chart, or by checking the manufacturer’s website, or by phoning the customer service phone number provided on the product monograph and elsewhere. The chart should be helpful to determine which vaccines are implicated.

Question 10: Are there any ethical alternatives available that use non-fetal cells?

- a. At the present time, there are no ethical alternatives for the rubella vaccine in Canada. This problem is compounded by the fact that the rubella vaccine is only available in combination with measles and mumps. Alternatives are available in Europe and Japan, but have not been licensed or marketed in Canada. Measles and mumps single dose vaccines are available in the US.
- b. All chickenpox vaccines are made with aborted fetal cell strains. There are no ethical alternatives available world-wide.
- c. Alternative have been approved for use in Canada to Pentacel (against tetanus diphtheris, pertussis, polio and Haemophilus B), of which the polio component is made with MRC-5. Pediacel (Sanofi Pasteur) and Infanrix (GlaxoSmithKline) are made with monkey cells and protect against the same diseases as Pentacel. All the provinces except Quebec have confirmed they are in the process of replacing Pentacel with Pediacel in the routine immunization schedule. While the start date varies somewhat from province to province, the earliest start date is set for October,



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2007. Quebec is also expected to purchase Pediacel instead of Pentacel when it secures its upcoming vaccine contract.
- d. Alternatives are available in Canada for rabies vaccine. Rabavert, made on chick embryos, is the one to ask for.
 - e. Alternatives for Hepatitis A are only available in Japan and Europe. Note that Hepatitis A vaccine is also used in combination vaccines with Hepatitis B (Twinrix), and also typhoid fever (Vivaxim). Some of these are required for travel abroad.

Question 11: What can be done to encourage governments to provide ethical alternatives?

Many parents, healthcare professionals and government officials are unaware of the issue of aborted fetal cell use in vaccines. They need to be informed, and they need to know that many people have objections to using vaccines produced in such a manner. Although ethical alternatives for some of the vaccines do exist, some are not licensed for use in Canada, and acquiring those will take time and continued effort. Concerned parents and physicians should contact their provincial officials to outline their concerns and encourage them to acquire ethical alternatives for the population under their care. Addresses and a sample letter can be found on the LifeCanada website: www.lifecanada.org.

Question 12: Should parents continue to have their children vaccinated using these products?

While this is ultimately the responsibility of parents to decide, pro-life physicians do encourage continued vaccination with these products until ethical alternatives are made available. However, if governments and pharmaceutical companies are led to believe that the public is content with products provided, no changes will be made. Therefore, parents who continue vaccinating their children with these products, as well as those who don't are strongly urged to let their provincial health ministers, chief medical officers of health, doctors, and pharmaceutical companies know that they require alternatives. Addresses and a sample letter can be found on the LifeCanada website: www.lifecanada.org.



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