

Philosophy prenatal testing proposal



**ASSIGN
BUSTER**

| PHI2394 A Proposal| Prenatal Testing| || Laura Wismer: 6013173Lauren Rose: 6036390Fahad Chowdhury: 598770110/20/2011 | | PHI 2394 Proposal

1) Choice of Topic: Prenatal Testing Thesis: “ The importance of the impact prenatal testing has on society due to its development through scientific thought and medical technology” 2) Relation to Personal Backgrounds: All members of the group have been influenced and impacted by people we personally know who are diagnosed with Down Syndrome, Trisomy 18, open neural tube defects (ie. spina bifida) or other exceptionalities. We either know them from summer/winter camps, family and/or friends.

Therefore we have curiosity in this topic of screening for these specific genetic conditions. 3) List of words that define our topic: * Integrated Prenatal Screening (IPS) * Diagnostic testing * Genetics * Medical/genetic tests * The “ perfect” result * Abortion * “ Your” Choice * Chance of having mental and physical disabilities * “ Positive” and “ Negative” test results * Accuracy of screening/tests 4) Library Search and Additional Resources: [1] Interview with Dr. Sandra Wismer: Family physician. 19 Autumn Hill Crescent Kitchener. 8 Oct. 2011. [2] Vugt, John M. G. Shulman, Lee P. Prenatal Medicine. Informa Healthcare. 1 Jan. 2006. (pg 122) [3] Young, Ian D. Medical Genetics. Oxford; New York : Oxford University Press. 2005. (pg 219) [4] Kaplan, Deborah. Prenatal Screening and Diagnosis: The Impact on Persons with Disabilities. 2011. . [5] Rapp, Rayna. Testing Women, Testing the Fetus. New York, NY: Routledge. 2000. [6] Gabe Jonathan, Conrad Peter. Sociological Perspectives on the New Genetics. Malden, MA: Blackwell Publishers Ltd. 1999 [7] Herrera-Vega, Eliana. “ Class Notes: Humanism and Structure; Philosophy of Technology. University of Ottawa. Ottawa, n. d.

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<http://www.tbdhu.com/NR/rdonlyres/A792B615-AC33-42DF-91B6-59CD2DAE8BA5/0/integratedprenatalscreening.pdf>> [9] MOHLTC – Children’s Health – Ontario Prenatal Screening – Diagnostic tests: health.gov.on.ca. Ontario Ministry of Health and Long-Term Care, n. d. Web. 15 Oct. 2011. [10] Ihde, Don. Technology and the Lifeworld: From Garden to Earth.

Indiana University Press. 1990. [11] Are you Pregnant? Integrated Prenatal Screening. Pamphlet: The Ontario Serum Screening Steering Committee. 8 Oct. 2011. [12] For Women and Their Families. Brochure: The Genetics Education Project. 8 Oct. 2011. [13] Amniocentesis. 2011. MedicineNet Inc. 6 Oct. 2011. [14] Down Syndrome: Canada. com. 2011. MedicineNet Inc. 1 Oct. 2011. [15] Down Syndrome: Genetics Home Reference. 011. U. S. National Library of Medicine. 3 Oct. 2011. [16] Integrated Prenatal Screening. Medical Genetics Program of Southwestern Ontario. 9 Oct. 2011. [17] What is Trisomy 18?. 2010. Trisomy 18 Foundation. 12 Oct. 2011. [18] Fraser, F. Clarke and Ian Ferguson MacKay. Prenatal Diagnosis: Background and Impact on Individuals. Canada: Canada Communications Group, 1993. [19] Studies/Participation: Neural Tube Defects. 006. Duke Center for Human Genetics. 1 Oct. 2011. < <http://www.chg.duke.edu/diseases/ntd.html> > Questions and Answers: 5. 1) How has science created prenatal testing? (Identify the scientific truth and the scientific production in the creation of prenatal testing) With the discovery of analyzing DNA through new means (looking for levels of a specific protein), and by relating this to a pattern of

observation between the DNA analysis and the corresponding physical genetic disorders seen in society, scientists have proven the scientific truth behind prenatal testing. 5.) How is scientific method responsible for prenatal testing? Without the scientific method behind prenatal testing, we would not be able to determine the same information we can now. It allows technicians and scientists to analyze DNA samples for specific data and then come to conclusion (using the data) with respect to the state of the fetus. 5. 3) How can you consider prenatal testing as technology? Prenatal testing is used to see if an unborn baby has any birth defects or diseases, such as a genetic condition. In the past, this was impossible to do since we cannot inspect the unborn child as it is in the mother's womb.

Now, with the scientific knowledge of fetal growth, birth defects and human genetics, along with advances in medical technology, it is possible to inspect the baby, though not directly with our eyes, but with the help of prenatal technology. 5. 4) How does prenatal testing fulfill society's needs? Society is always longing for answers to help cope with the uncertain future. Prenatal testing allows families to understand their pregnancy and understand their chance of delivering a child with Down syndrome, Trisomy 18 or open neural tube defects. The society can become more informed of their ear future allowing fulfillment of society's needs. On a positive note society can cope with their uncertain future by preparing for the new born. However society can also develop more worry or stress because of a different/unknown journey of life is in their near future, thus coping with the uncertain future becomes difficult. 5. 5) How does prenatal testing impact society? Prenatal screening impacts society through their moral values (" what is the perfect

baby? ”), free will (to gain more knowledge, and what to do with that knowledge) and shaping who belongs in society. Introduction

Prenatal testing is used to detect diseases or conditions in a fetus before it is born. This tests for genetic abnormalities such as Down syndrome, Trisomy 18 and open neural tube defects. These tests require an extensive knowledge of medical science and use of technology. We plan to explore the importance of the impact prenatal testing has on society due to its development through scientific thought and medical technology. We will be investigating the development of the scientific truth/method, the advancements of prenatal technology, the role society played in its upbringing and the impact prenatal testing has on humanity.

Scientific Method Prenatal Testing Breakdown Prenatal testing can be broken down into 2 sections: integrated prenatal screening and prenatal diagnosis. IPS (integrated prenatal screening) consists of an early ultrasound and two blood tests within the 11th and 13th week of pregnancy. A second blood test will be done (ideally) within the 15th and 16th week for the earliest results. Once all of these tests have been done, the results will be sent to the corresponding practitioner (this includes the first and second tests). This screen determines if you have a higher chance of having a baby with select genetic diseases [11].

IPS is used only for this reason and for no other tests. IPS tests for Down syndrome, Trisomy 18 and open neural tube defects. Prenatal diagnosis or a prenatal diagnostic test is the second of the 2 sections for prenatal testing. This test produces definite results regarding the genetic health of the fetus.

The results from the IPS will determine whether the mother will complete a diagnostic test. If the mother wishes to have a diagnostic test (from a positive IPS), then two options are available. If the doctor wants to test for Down syndrome or Trisomy 18, amniocentesis or Chronic Villus Sampling (CVS) will be used.

Amniocentesis is performed around the 15 to 22 week period of pregnancy, while CVS can be performed earlier around the 11 and 13 week period. Both of these procedures run a small risk of miscarriage [12]. In order to test for open neural tube defects, another ultrasound is used, and occasionally amniocentesis is performed for a better result and more detailed analysis.

Results and Reality The results from IPS are typically as follows. From a study of 1000 women of any age, 2-4% will have a “screen positive” for Down syndrome, Trisomy 18, or an open neural tube defect.

This means 20 – 40 women have a higher chance of having a baby with Down syndrome than the other 980 – 960 women. Of those positive screens, 19 – 39 women will have a false “screen positive” and therefore there is usually only 1 true positive screen per 1000 pregnant women. For those who wish to have prenatal diagnosis, these results will usually come back negative, confirming no genetic abnormalities. In order to qualify for this diagnostic testing, IPS results must be positive or the mother’s age is 35 years or older. There is always a slight increased risk of miscarriage during the diagnostic testing.

Amniocentesis increases this risk by 0.2% and CVS increases this risk by 1% [12]. For the mother’s who receive a positive test result, a genetic counsellor

can be used to assist the decision of whether to continue or terminate the pregnancy. The Tested Conditions Down Syndrome: Down syndrome is a genetic disability with both mental and physical impacts. The most common type of Down syndrome also referred to as Trisomy 21, accounts for 95% of all cases in Canada. “ Prior to or at conception, a pair of chromosomes 21 (in either the sperm or the egg) fails to separate.

As the embryo develops, the extra chromosome is replicated in every cell of the body. At present, researchers are not sure what causes the presence of an extra chromosome 21. ” [14] Although the reason for this is unknown, the egg (as opposed to the sperm) is most often the culprit of a failed separation of chromosomes 21. The chance of this happening in a pregnancy increases with the age of the mother, although women of any age can still have a baby with Down syndrome. Trisomy 18: Like Down syndrome, Trisomy 18 is caused by chromosomal abnormalities.

Babies with Trisomy 18 have three 18 chromosomes instead of two 23 chromosomes. This occurs at conception and the exact cause is still unknown to researchers. The chances of a baby having this condition increases with the age of the mother. The developmental issues associated with Trisomy 18 are much more life threatening than those related to Down syndrome. Less than 10% of children with Trisomy 18 will survive to reach the age of 1 [17]. Again, the chances of mother having a baby with Trisomy 18 is low and increases with age.

Open Neural Tube Defects: This genetic disorder is caused by an opening in the spinal cord or brain. The spinal cord of an embryo is originally flat, and

will then roll into a tube around a month after conception (also known as the neural tube). Open neural tube defects are caused when the spinal cord does not completely close into a tube. The brain/spinal cord can be exposed through a defect in the skull or vertebrae which can result in spina bifida, anencephaly, and encephalocele [19]. Prevention of this disorder involves taking folic acid supplements one month prior, and three months following conception.

However, like Down syndrome and Trisomy 18, not all cases can be prevented [19]. History of Prenatal Testing Prenatal testing has been around for approximately 100 years [18]. The ability of scientists to determine specific information from this testing has increased significantly over the last 50 years. Before this time, pregnant women had little or no information concerning the true health of their unborn baby. For parents at risk of having a genetically disabled child, the options were black and white: to either take a chance, or refrain completely.

In this sense, prenatal testing has allowed parents to see into the development of their child, opening many doors which used to be closed. Since the 1950s, prenatal testing has been used to analyze DNA samples from the fetus. The first uses at this time were to monitor the baby for fetal distress. From further discoveries of sex chromatin, scientists could determine if a male offspring had a higher chance of carrying a genetic disease from the mother through amniocentesis [18]. By the 1960s, Canada had introduced amniocentesis (a form of prenatal diagnosis testing) to a select few hospitals; however its practise was limited.

Society was not well informed about the service, laboratories were not fully equipped and the workers were untrained. By 1971, there were 13 centres practising prenatal testing in Canada. As the practise grew internationally and within Canada, the capabilities of the testing also increased. Although the service was growing, the restrictions of the testing were debatable because prenatal testing was so new. Early on, it consisted of volunteers who were interested in abortions for various reasons, and were not concerned with the final results.

Some of these results included dry taps (no retrieval of amniotic fluid), damage to the umbilical cord, infection, and miscarriage (although it was often undetermined whether it was directly from the testing or natural causes) [18]. Scientific Truth in Prenatal Testing Through the development of instruments such as ultrasound machines, needles and microscopes, DNA samples can be withdrawn from a child bearing mother and analyzed thoroughly to determine certain aspects of the fetus's health. IPS – Integrated Prenatal Testing

In this case, ultrasound technology and blood samples can be used in the 11th and 13th week of pregnancy to measure the thickness of the skin at the back of the neck of the fetus (nuchal translucency) and the PAPP protein levels. The second blood test, taken between the 15th and 20th week, measures the levels of alpha-fetoprotein (abnormal levels suggest possibility of open neural tube defect), estriol (low levels indicate possibility of Down syndrome/Trisomy 18) and chorionic gonadotropin (abnormal levels show increased risk of Trisomy 18/Down syndrome).

Using all of this information, a conclusion can be formed as to whether the chance the fetus might have Down syndrome, Trisomy 18 or an open neural tube defect is higher [16]. Diagnostic Testing For positive IPS results, there are two diagnostic options. For suspected Down syndrome and Trisomy 18, amniocentesis or CVS is used. Amniocentesis involves using an ultrasound to carefully insert a needle through the abdomen and into the amniotic sac. The doctor takes a small amount of fluid (no more than 1 ounce) for testing.

During CVS, a small piece of tissue is removed from the placenta [12]. By analyzing the amniotic fluid and/or tissue, technicians can check the fetal culture cells for specific genes and certain protein levels that can indicate a genetic abnormality [13]. Relation to Philosophy In previous times, people with disabilities were an indication of fright. Since there was little to no knowledge about the origins of genetic disabilities, people perceived these problems as intimidating and mysterious.

In movies, scary characters were sometimes portrayed as people with genetic exceptionalities, which led to the myth that these people were comparable to the movie characters in real life. With this preconceived notion, scientists developed a curiosity as to how and why these genetic disorders came to be. This curiosity led to research which, in return, developed prenatal testing, that now allows scientists to test for these genetic conditions as they form. The amount of knowledge we have about genetic exceptionalities and prenatal conditions continues to grow and shape the way we mentally classify disabled individuals.

Technology Is Prenatal Testing Considered as Technology? Prenatal testing is definitely considered as technology as it is primarily an application of the scientific knowledge of fetal growth, birth defects and human genetics. At this point in time, prenatal testing can be seen as an extensive technological artefact as it is not necessarily accepted to be a mandatory step to take during pregnancy. Some may see this technology as very beneficial and a logical step to add to the “ quasi-evolutionary process” of mankind [7].

Others, however, may see this technology as destructive since the unborn child’s life can be threatened by the judgemental eyes of their parents if a problem is discovered, or even threatened by the technology itself (depending on the type of prenatal testing). A broad variety technological artefacts are used for each and every step of the various prenatal testing methods practised today. Such artefacts include: ultrasound machines used to produce sonographic images of a fetus; tools such as needles, syringes, catheters, etc. used to obtain a specific sample from the mother for testing; and various digital machines used to test the samples and analyze the data obtained. These technological artefacts can certainly be seen as intermediary since they are necessary for prenatal testing, and are thus readily used by the technicians as if they were an extension of their bodies. At the same time, the technicians would realize these are just technological artefacts which should always be maintained and, if possible, improved in order to achieve the best results. [7] How is it Done? Each testing method is done differently and during different timeframes of the pregnancy.

Of all the testing methods, Integrated Prenatal Screening (IPS) is very commonly done as it is extremely safe to perform and can screen for

problems such as Down syndrome, Trisomy 18, and open neural tube defects. It is relatively more accurate than other types of screening, but it does not give definite results. For IPS, the test is done in two parts. First, an ultrasound is done between 11 weeks and 13 weeks, 6 days of pregnancy to measure the nuchal translucency, which is the thickness of the skin at the back of the neck of the developing baby. A sample of the mother's blood is also taken following the ultrasound.

Then, another blood sample is taken from the mother between 15 and 18 weeks, 6 days of pregnancy. Data from these blood samples, combined with the nuchal translucency, is used to determine the chance the baby may have any of mentioned problems above. [8] If the screening gives a positive result for an open neural tube defect, another ultrasound is performed to further examine the developing baby's back and head. On the other hand, if the screening gives a positive result for Down syndrome or Trisomy 18, further prenatal diagnostic testing can be done such as amniocentesis or Chorionic Villus Sampling (CVS).

These give extremely accurate results, but also carry the risk of causing miscarriages. [9] Ihde's Analysis Applied to Prenatal Testing The technological artefacts incorporated into prenatal testing can be further distinguished to possess some of the various intermediary roles proposed by Don Ihde. They are as follows: * Ultrasound Machines: For the technicians who use this machine regularly in order to gather the information they need, they perceive this technology as an instrument panel (Ihde II).

They operate the machine to observe and gather information about what is happening inside the womb; the machine is part of the world they are observing and analyzing. For the patient, who is simply observing, it is more of an embodiment relation (Ihde I); she is focused on seeing her unborn child, and the machine is withdrawn from her consciousness. [10] * Syringes, Needles, Catheters, etc: The technicians use these artefacts as if they are an extension of their bodies; in their eyes these devices are manufactured to work and appear natural to use.

Thus the technicians would experience the Horizontal phenomena (Ihde VI) with these artefacts. For the patients, their main concern when dealing with these devices is the fact that something will be taken from them as a sample. They know by what means this was achieved (i. e. they are aware of the syringe used to take their blood), but they don't consider the technology behind it. As such, the technology shares a background relation (Ihde V) with the patients. [10] * Digital Machines: The technicians operate these machines in order to run tests and collect data.

They then analyze the data and interpret the information they need from them. Thus, a Hermeneutic relation (Ihde III) is shared with this technology. For the patients, however, this technology is not visible to them; they have simply provided the samples required and then wait for the results. As such, they share a background relation (Ihde V) with this technology. [10] How Technology of Prenatal Testing Affects Humanity Man has always been dependant on technology in order to thrive and survive as they are not born with any other form of defence against nature; “ Technology is an ontological necessity for Man” [7].

Prenatal testing technology plays an advanced role in this fight against nature: it gives us critical information long before the baby is born, giving the parents' time to prepare and overcome the challenges that may arise with the baby, thereby increasing its chances to survive and live a healthy life. That being said, the use of this technology can easily lead to inappropriate actions taken against the baby, which can be either intentional or unintentional.

For example, if a problem is discovered with the baby early on, the pregnant mother may not see any reason to take extra precautions for the sake of the baby's health, which could unintentionally lead to even more problems for the baby when it is born. Also, for people who want only the "perfect baby", they would choose abortion due to their hubris, regardless of how inaccurate the diagnosis may be. Society Who IPS/Diagnostic Testing Affects IPS and diagnostic testing impacts people globally and in our local society. On a global scale, prenatal testing affects the international scientific community.

Canada has a large presence in the scientific community because Canada funds both prenatal genetic screening and testing [1]. Therefore the Canadian government/economy is affected by the genetic testing because the society's tax money goes into the health care system. On a local level IPS, diagnostic testing and later development of children with exceptionalities form jobs for the community [4]. And as a close contact situation, the family unit and mother are directly impacted by prenatal screening and testing. The Impact of IPS/Diagnostic Testing on Society

Prenatal testing affects many people, as listed above, but exactly how the testing affects them is important. IPS/diagnostic testing positively impacts the global society of scientific research [1]. The genetic testing allows scientists to explore and understand genetics (a fairly new concept to society). Analysing genetics with IPS and diagnostic testing can possibly lead to finding cures to genetic disorders. These scientists use Ihde's typology of hermeneutic relations with the technology used during prenatal testing. Researchers use the technology to influence the human race to further understanding the new world of genetics.

Prenatal testing impacts the Canadian government/economy and the society's judgement on the government about the topic [1]. The Canadian government has free prenatal screening, impacting society to feel that their female rights are supported. All women have more autonomy about their pregnancy because all pregnancies are offered IPS or some sort of prenatal screening. Allowing feminist's/women to perceive and feel proud that the country's money is put into the right cause [1]. When the decision is made to continue pregnancy on positive test result, the Canadian economy can improve or weaken productivity.

The economy improves because more jobs are created to support people with exceptionalities. However, more tax money is needed to appropriately accommodate people with exceptionalities, which some may say, even burden society [4]. IPS/diagnostic testing affects society's social and mental well being. The testing provokes society to put labels on people with disabilities and the possibilities of inappropriate judgements can be made about socially accepting them into society [1]. The testing promotes society

to have immoral thoughts; when positive results appear, the family is offered the choice of eliminating the ‘problem’.

Providing society to make their decision about who can be part of society (terminating the pregnancy) based on genetics, is not ethical [5]. The results and the choice of prenatal testing can impact the family unit/mother. In Canada, testing does not affect the family financially because the testing is free. Therefore there is no financial burden on families. During the interview with a local family physician, she felt that, her perspective with her patients experiencing the opportunity of choice to have genetic testing, had no emotional impact on the patient or the patient’s family [1].

It is a standard to take the testing, and only a few patients will analyse the process if the testing is right for them and their family [1]. Ihde’s typology of the sense that technology is part of our world is applied; the technology of prenatal testing is in the background because patients do not think about the science/emotions behind the prenatal testing process. It is something there, so they take it. Pregnant patients are not analysing the bad or the good that comes from the prenatal testing [1]. According to the local physician, 9 in 10 pregnant patients will take the screening because it will not physically affect them or the baby.

There is no rational thinking about the decision present. There is no thought of the impact of what a positive test can create on the family [1]. However, there are cases where the testing positively impacts the family unit, allowing them to prepare for the uncertain future [4]. Conversely, there are women and families who experience a negative impact from positive test results.

The “burden of worry” and the “burden of bad news” create stress, and therefore, bad judgement calls can be made (ie. termination) or separation of the family unit etc. [1].

Screening/Diagnostic Tests: Better or Worse for the Greater Good

Screening/diagnostic tests can be thought of a slippery slope [1]. Looking at the big picture, genetic testing can enhance mankind. Genetic tests allow scientists to study the mystery of genetics and discover and perhaps cure ‘abnormal’ genetics; thus, demonstrating the fact that the science aspect of IPS/diagnostic testing is better for the greater good. However the testing is worse for the greater good for several reasons. Testing thrives on the need for perfection [6], which provokes inappropriate judgment upon others.

For the majority, prenatal screening creates the burden of worry and even increased stress levels when the mother goes through the process alone [5]. This additional stress is unnecessary and is not needed because our mental health as a culture is already fragile enough [1]. It is also negative thought for society to have the right to the decision of terminating the pregnancy based on uncertainty. “Any child entering the world is a blessing” [1].

Screening/Diagnostic Testing Applied to Kant’s Theory The thought of prenatal testing being universal must be considered to determine if prenatal testing is morally acceptable.

If every pregnancy undergoes IPS or diagnostic test, chaos would occur and irrational judgement would emerge [1]. Not all countries have laws that restrict abortion like Canada. If everyone is provided with prenatal testing, abortion rates have the possibility to increase dramatically because there is

a higher trend for families to not desire an “ abnormal” child [5]. In countries with a deficiency in education, a large amount of the population would make improper judgment and do not acquire the knowledge as to what a positive screening or test means (ie. the accuracy of the test). Therefore making decision to terminate the pregnancy would only be based on a screening alone, which only shows the baby’s chance of being diagnosed with one of the three genetic problems [1]. Since the screening and testing promotes the possibility of enlightenment (free will of parent to make their own rational judgement about their test results) the consequence of disorder can occur because they now have the decision as to who deserves life.

Prenatal testing is not morally acceptable universally when considering Kant’s theory, mainly due to the undeveloped knowledge (in certain countries) of people with exceptionalities [1]. IPS Applied to the Semantics of Society Screening/diagnostic tests are a way allowing society to cope with the uncertain future. However, it can make the future more or less hectic based on what a parent’s perspective is before receiving the testing [1]. A parent can observe the testing as something that will prepare them for the future.

Therefore, keeping the best interest for the baby will aid the family, and help them cope with the future. Families can cope with the uncertain future by using the idea “ Prevention of family disruption” [5] allowing families to adapt their home structure/setting, buy special equipment, find social assistance, talk to other families who have children with exceptionalities, etc. [4]. On the other hand, some patients take the test thinking they have the perfect baby and/or want the “ ideal” baby.

This predetermined mindset will only induce anxiety when a positive test occurs, preventing the family to cope with their future and possibly ending a life or relationship [1]. Conclusion With scientific truth/method, technology and society taken into consideration we have laid a foundation regarding the importance of prenatal testing. There are still questions that remain, which we must explore in order to understand the importance of the impact that prenatal testing has on humanity. Proposed Questions to be Answered:
Society: Will ‘ perfecting’ the ideal baby perfect society? Will society improve when all genetic disorders are cured?