

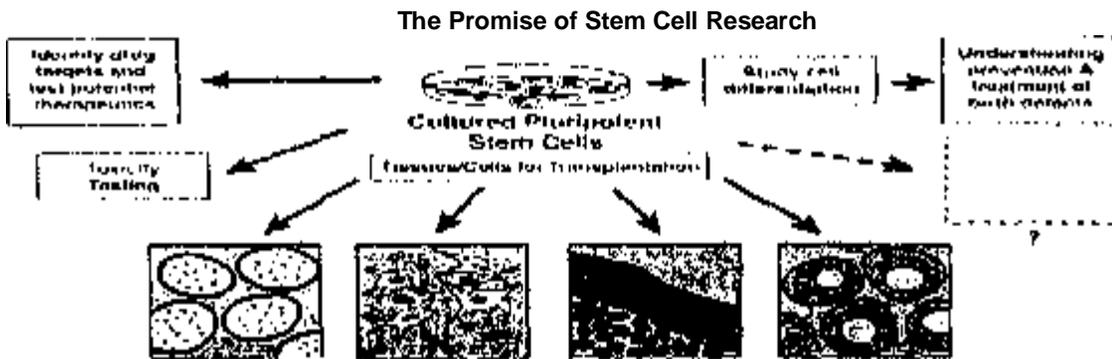
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Human Dignity or Freedom of Research? An Ethical Debate on the Embryonic Stem Cell Research

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Introduction



The discovery, isolation and culturing of human embryonic stem cells has been described as one of the most significant breakthroughs in biomedicine of the century.¹ This promising area of science has led scientists to investigate the possibility of cell-based therapies to treat disease, which is often referred to as regenerative or reparative medicine. Stem cells give rise to multiple specialized cell types that make up the heart, lung, skin, and other tissues and offer the possibility of a renewable source of replacement cells and tissues to treat diseases including Parkinson's and Alzheimer's diseases², spinal cord injury, stroke, burns, heart disease, diabetes, osteoarthritis, rheumatoid arthritis, etc. The Stem Cell Research (SCR) has become the centre of public attention, both as a fascinating area of biomedical research and as a permanent focus for ethical and legal controversy.³ The controversy is not because of its goals, but rather because of the means of obtaining cells. The crux of the debate centres on derivation of embryonic stem cells which require the destruction of an embryo.

1. What are Stem Cells?

Stem cells have two important characteristics that distinguish them from other types of cells. First, they are unspecialized cells that renew themselves for long periods through cell division. The second is that under certain physiological conditions, they can be induced to become cells with special functions such as the beating cells of the heart muscle or the insulin-producing cells of the pancreas. Scientists primarily work with two kinds of stem cells: embryonic and adult stem cells of animals and humans. Scientists discovered ways to obtain or derive stem cells from early *mouse* embryos more than 20 years ago. Many years of detailed study of the biology of mouse stem cells led to the discovery of how to isolate stem cells from *human* embryos and grow the cells in the laboratory in 1998.⁴ The embryos used here were created for infertility purposes through *in vitro fertilization*⁵ procedures and when they were no longer needed for that purpose, they were donated for research with the informed consent of the donor.

1.1 What are embryonic stem cells?

An embryonic stem cell is a primitive type of cell that can be coaxed into developing into most of the 220 types of cells found in the human body (e.g. blood cells, heart cells, nerve cells, brain cells, etc). Immediately after the fertilization the cells divide once every 12-18 hours. Each cleavage-stage cell is called a *blastomere* and the 3- to 5-day-old embryo is called a *blastocyst*.⁶ A fertilized egg is considered *totipotent*⁷ meaning that its potential is total; it gives rise to all the different types of cells in the body. Stem cells extracted from early embryos can become all cell types of the body because they are *pluripotent*.⁸ In contrast adult stem cells are generally limited to differentiating into different cell types of their tissue of origin. Thus they are normally *multipotent*.⁹

1.2 What are adult stem cells?

An adult stem cell is an **undifferentiated** cell found among differentiated cells in a tissue or organ, can renew itself and can differentiate to yield the major specialized cell types of the tissue or organ. Some scientists use the term somatic stem cell instead of adult stem cell. The primary role of adult stem cells in a living organism is to maintain and repair the tissue in which they are found. They are a very small number of stem cells in each tissue. They reside in a specific area of each tissue where they may remain quiescent (non-dividing) for many years until they are activated by disease or tissue injury. The history of research on adult stem cells began about 40 years ago. In the 1960s, researchers discovered that the bone marrow contains at least two kinds of stem cells. One population, called hematopoietic stem cells, forms all the types of blood cells in the body. A second population, called bone marrow stromal cells, was discovered a few years later. In 1990s scientists discovered that the adult brain does contain stem cells that are able to generate the brain's three major cell types — *astrocytes* and *oligodendrocytes*, which are non-neuronal cells, and *neurons*, or nerve cells. A number of experiments over the last several years have raised the possibility that stem cells from one tissue may be able to give rise to cell types of a completely different tissue, a phenomenon known as plasticity. Examples of such plasticity include blood cells becoming neurons, liver cells that can be made to produce insulin and hematopoietic stem cells that can develop into heart muscle. Therefore, exploring the possibility of using adult stem cells for cell-based therapies has become a very active area of investigation by researchers.

1.3 Successes of adult vs Failures of embryonic SCRs

Researchers in China met with a disastrous result. Fetal tissue injected into a patient's brain produced temporary improvement, but within two years the patient developed a brain tumor and died. An autopsy revealed that the fetal cells had taken root, but had then metamorphosed into other types of human tissue — hair, skin and bone. These grew into the tumor, which killed the patient. At Columbia University's College of Physicians and Surgeons, the implanted embryonic cells apparently grew too well in some of the patients, churning out so much of a chemical that controls movement that they writhed and jerked uncontrollably. Dr. Paul E. Greene called the uncontrollable movements developed by some patients as *"absolutely devastating."* He said, *"They chew constantly, their fingers go up and down, their wrists flex and distend. It's a real nightmare. And we can't selectively turn it off. No more fetal transplants. We are absolutely and adamantly convinced that this should be considered for research only."*¹⁰

In stark contrast to the failures of embryonic SCR, the future looks very promising for treatment with adult stem cells. The following are a sampling of research breakthroughs with adult stem cells.¹¹

Researchers at Harvard Medical School say adult stem cells may eliminate the need for embryonic ones. The researchers experienced a permanent reversal of Type 1 diabetes in mice by killing the cells responsible for the diabetes. The animals' adult stem cells took over and regenerated missing cells needed to produce insulin and eliminate the disease. The results hold promise for rheumatoid arthritis, multiple sclerosis, lupus and more than 50 other ailments.

At the University of Texas MD Anderson Cancer Center in Houston, a man with a rare, potentially fatal skin disorder that was so severe that he could no longer eat is now symptom-free after receiving a transplant of his own adult stem cells.

Doctors at Northwestern Memorial Hospital in Chicago extracted the adult stem cells from the blood of two Crohn's patients and successfully used them to rebuild their faulty immune systems.

Researchers at the University of South Florida in Tampa have found that adult stem cells from the umbilical cord blood may be able to help repair damaged brain tissue after a stroke.

Dr. Edward Holland of the Northern Kentucky Eye Laser Centre in the greater Cincinnati metropolitan area is using adult stem cell transplants as part of a treatment to dramatically improve the eyesight of his patients.

The Albert Einstein College of Medicine in New York came to a similar conclusion. A study by the Institute for Stem Cell Research in Milan, Italy, showed that certain cells from the brains of adult rats can be used to generate muscular tissue.

Scientists at the University of Medicine and Dentistry of NJ have found that bone marrow cells may be converted into replacement nerve cells, able to treat brain and nerve injuries. Dr. Ira Black and his team were able to convert 80% of the bone marrow cells into nerve cells.

Diane Irving, Ph.D., a former professor of biology at Georgetown University and former biochemist with the National Cancer Institute, said, *"I have argued that adult stem cells are better because they are closer to the stage of differentiation than embryonic or fetal cells - therefore they do not have as long a distance to travel differentiation-wise as the younger cells. Therefore there is far less of a chance for genetic errors to be accumulated in the implanted cells and less side effects for the patient to deal with."*

Cloning holds even less promise for success than research with embryonic stem cells does. It took 277 attempts to get Dolly. Scientists estimate an overall failure rate for cloning farm animals to be 95% or greater. One shudders to think how many living human embryos will be sacrificed in attempts to clone humans.

2. SCR in India: The Emerging Scenario

The establishment of new human Embryonic Stem Cell (hESC) lines from spare, supernumerary embryos is permissible with prior approval of the Institutional Committee for Stem Cell Research and Therapy (IC-SCRT) and Institutional Ethics Committee (IEC) provided appropriate consent is obtained from the donor as per the guidelines for SCR¹³, which have been formulated jointly by the Department of Biotechnology (DBT), Ministry of Science and Technology (MST) and Indian Council of Medical Research (ICMR). Besides many other SCR centres, the following institutes are the ones which deal exclusively with embryonic stem cell researches in India.¹⁴

- ❖ National Institute for Research in Reproductive Health, Mumbai;
- ❖ National Centre for Biological Sciences, Bangalore;
- ❖ National Centre for Cell Science, Pune;
- ❖ National Brain Research Centre, Manesar;
- ❖ Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram;
- ❖ Centre for Human Genetics, Bangalore; and
- ❖ Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore.

This reality reveals that there is liberality and possibility of Embryonic Stem Cell Research in India. Even Indian scientists wanted to try and harvest stem cells from fresh human embryos, not frozen ones. Deepa Bhartiya and Indira Hinduja are among scientists in India who wanted national ethical guidelines revised to allow the creation of human embryos exclusively for research.¹⁵ There were also requests from scientists at the Hyderabad SCR symposium to allow therapeutic cloning and embryonic stem cell research in India keeping its potential in view.¹⁶ Presently the major programmes of SCR in India include among others: establishment of hESC lines, use of limbal stem cells to repair corneal surface disorders caused by limbal stem cell deficiency, isolation, purification and characterization of haematopoietic, mesenchymal, and liver stem cells; differentiation of stem cells into neural, cardiac cell lineages, etc. Apart from the government, some industry research organizations are also involved in SCR. There has been a tremendous success of adult stem cell researches in India. For example, "More than 300 patients suffering from limbal stem cell deficiency have been treated using limbal stem cells at LVEPI, Hyderabad."¹⁷

3. Global Regulations on SCR

Legislation governing HESC research varies from country to country. Some countries like India, Israel, Singapore, China, Australia, Italy, Sweden, United Kingdom and other European countries have relatively liberal and research-favourable regulatory policies, while others are still struggling to draft regulatory policies. Most of these countries have a liberal policy to use the left over embryos *in vitro*. The table below shows the global Regulations of Human Embryonic SCR.¹⁸

Country	Policy
Australia	Approved SCR on human embryo isolated from supernumerary embryo after getting consent from the donors.
Canada	Assisted Human Reproductive Act allowing researchers to derive embryonic stem cell lines from left over embryos.
China	Human embryonic stem cells used for research purpose can only be derived from surplus IVF embryo, embryos created from fully-donated gametes and by nuclear transplantation.
France	France permitted research on embryo-derived cells in July 2004. French decree authorizing import of embryonic stem cells derived from supernumerary IVF embryos with the consent of the donors and research on the imported cells.
Germany	Prohibits the derivation and use of human embryonic stem cells from blastocysts.
India	Establishment of new hESC lines from spare, supernumerary embryos is permissible with prior approval of the Institutional Committee for Stem Cell Research and Therapy (IC- SCRT) and appropriate consent is obtained from the donor as per the draft guidelines.
Ireland	Prohibition of the creation of human embryos for research purposes and for the procurement of stem cells from human embryos by law.
Singapore	Allow the creation of human embryos for research purpose with somatic cell nuclear transfer technique as well as use of supernumerary embryos for procurement of human embryonic stem cells.

South Korea	Guidelines set by the Ministry of Health and Welfare issued after the South Korean Parliament in January 2004 banned human cloning but left room for stem cell research for curing diseases.
Spain, Sweden, Denmark, Finland, Greece, The Netherland	Allow the procurement of human embryonic stem cells from supernumerary embryos. Allow the creation of human embryos for research purpose by <i>in-vitro</i> fertilization, with somatic cell nuclear transfer technique as well as use of supernumerary embryos for procurement of human embryonic stem cells.
United States	Allow surplus frozen embryos from <i>in vitro</i> fertilization clinics for SCR with the permission of donors.

As per the national guidelines in India, SCR has been classified under *permissible, restricted and prohibited* categories. However, embryonic stem cell research falls under *restricted* category. It *can be* carried out with the approval of Institutional Committee (IC-SCRT) at the institutional level and National Apex Committee (NAC-SCRT) at the national level. Research pertaining to reproductive cloning, introducing animal embryos in human, etc. has been categorized as *prohibited*.

4. The Key Problem

The embryonic stem cell research presents us with a moral problem of destruction of the embryo in the process. It brings into tension two fundamental moral principles: one principle enjoins the alleviation of suffering, and the other directs us to respect the value of human life. It is true that the harvesting and culturing of embryonic stem cells has considerable potential to bring about remarkable benefits in the way of alleviating debilitating medical conditions. Thus it satisfies the first principle to a very great degree. On the other hand, the harvesting of human embryonic stem cells violates the second principle in that it results in the destruction of human life with value (i.e. human embryos).¹⁹ Accordingly, both principles apparently cannot simultaneously be respected in the case of embryonic stem cell research. The question then is which principle ought to be given precedence in this conflict situation. Should we give more weight to the first, and permit destructive embryonic stem cell research because of its remarkable potential benefits? Or should we give more weight to the second, and prohibit destructive embryonic research because it violates respect for the value of the embryo as the beginnings of a human life? This is the central ethical problem here.

Surplus embryos left over from *in-vitro* fertilization procedures in fertility clinics are thawed. The inner cell mass of an embryo is extracted. Stem cells are all that remain. The embryo is killed in the process. This raises the same ethical questions and conflicts as the ethics of abortion. Much of the controversy on stem cells has revolved around the status of the early human embryo. However, there are no major ethical concerns about the extraction of adult stem cells, from umbilical cords, skin, bone marrow, etc., as long as the donor gives permission. They are the ethically preferable avenue for research, as they are presumed to be ethically trouble free. For these obvious reasons, it has been advanced most forcefully by opponents of human embryo research.²⁰

4.1 Extracting Embryonic Stem Cells without Killing the Embryo?

There was a report on 10 January 2008 in the subject journal "Cell Stem Cell" the American Robert Lanza of the Biotechnology Company of Advanced Cell Technology, Worcester in Massachusetts would succeed together with his research team to win stem cells without killing the embryo. With the new procedure, a cell is taken from an embryo in the eight cell stage in order to breed trunk cells from it. The taken cell was spent in nutritional liquid and was stimulated to the division, with what a culture grew up with embryonic trunk cells. One assumes that the embryo after the cell removal normally survives, since this procedure is applied diagnostics as with the Preimplantations. Most of these original embryos would not be damaged according to statements of the researchers and would still develop normally in test tubes for some days, until they were frozen.²¹ However, this method does not exclude itself from the ethical problem of the newly separated or created cell, which is capable of growing into an embryo.

There was another report on a new methodology, namely, *induced Pluripotent Stem cells* (iPS).

The Yamanaka and Thomson research teams have shown that ordinary skin cells can be driven back to a primitive, embryonic state of pluripotency. But no one knows yet exactly where the limits of this reprogramming technique lie. Perhaps iPS cell researchers will discover that skin cells can be driven back even further in development to a totipotent state, that is, to a single zygote-like cell capable of generating not only all three germ layers but also all the supporting extra-embryonic tissues. If this were to happen, then one could argue that any cell in a person's body has the biological potential to give rise to another complete human being under the right circumstances, regardless of whether the original, horticultural sense of the Greek word *klon*-that is, "twig".²²

With the iPS methodology, the adult stem cells can be reprogrammed into pluripotent cells, thus it could be possible to turn it into powerful pluripotent stem cells or possibly even into totipotent embryonic stem cells. Human iPS cells, if they are truly pluripotent, should be capable of generating human sex cells. But then this would entail that ordinary skin cells could be transformed into human sperm and eggs. This fact could radically alter our commonsense notions of human fertility and infertility. It is worth noting that human iPS cell research carries the familiar ring of old philosophical questions about reproduction, life, and what it means to be human.

4.2 The Embryos in vitro

July 25, 1978, marked a decisive step in reproductive science, when at Oldham in Northwest England, a 30 year old woman Lesley Brown delivered by caesarean section a normal healthy baby girl as a result of 'fertilization in vitro' of one of her ova with sperm of her husband Gilbert.²³ With this medical success of IVF arose certain moral problems like artificial insemination through an illicit procurement of sperm by masturbation, loss of fertilized ova; and the very authenticity of the sacrament of the marriage and its conjugal love. *Time* magazine reported that before the successful embryo transfer with Mrs. Brown, hundreds of attempts were made and those perhaps in halves of them ova were fertilized.²⁴ This means that so many fertilized ova were lost in the experiment. The loss of fertilized ova calls for serious reservations about the treatment of human life. A large number of these embryos would die spontaneously. This could be regrettably seen in parallel the loss of normal conceptions that do not implant or do not survive beyond the first few days of fertilization. It would be nature's way of screening the unfit. Indeed there are more failures in *in vitro* than loss in nature.

Gene Outka²⁵ defends that embryos do have intrinsic moral value but it might be still permissible to use embryos that are surplus for *in vitro* fertilization (IVF). The idea here is that if embryos are definitely not going to be implanted then 'nothing is lost' by their being used for ES cell research. Such claims imply that it might be acceptable to us spare embryos for ES cell research even if it is the case that they have the moral status of persons. This argument has found favour in some countries which sanction the use of surplus IVF embryos for research but not the creation of embryos specifically for that purpose. The distinction here is between using, for an important medical purpose, embryos that have been created by a couple who are trying to have child but which have to be destroyed because they cannot be implanted and deliberately creating 'ethical embryos' with the aim of destroying it.²⁶ The latter, it is argued, is immoral because it treats the embryo as a mere commodity.²⁷

It was reported in *Time*²⁸ "Had the doctors detected any serious problems, Lesley Brown would have quickly received an abortion. Another incident of 1961 in which an Italian experimenter Daniel Petrucci destroyed a human embryo which he had fertilized *in vitro* on the 29th day because it was turning monstrous. He rightly received condemnation from many people. Embryos are persons and not play tools. Yet another incident that occurred in Australia in June 1984 brings out the complexity of the problem and the need for great caution in the whole matter. A couple died in an accident when their tiny embryo was still in deep freeze awaiting implantation. What is to be done in such cases? Destroy the embryo? Thaw it and allow it to die? Implant them in a surrogate mother? Suppose this is done, who is the legal mother? Has the child any right to the property of the original parents?"²⁹

Should poor countries like India be pouring money into life-creating technologies when basic health needs go unmet? We should consider whether costly experimentation with serious ethical problems should be carried on to the neglect of other more urgent needs. Therefore, "Research should be evaluated not only in terms of its effects on the subjects of the experiment but also in terms of its connection with existing patterns of oppression and domination in society."³⁰ There is also a considerable body of writing that explores the impacts of new reproductive technologies on the interests of women, particularly how those technologies might contribute to oppression.³¹ Women who donate ova are at risk of exploitation to the extent that male-dominated medical practice appropriates their reproductive labour for research and commercial benefits. They are at risk of being alienated from their reproductive labour and of being commodified, and their acts of altruistic donation demeaned, if downstream users can develop commercial applications for stem cells developed from their ova and embryos.³²

4.3 Therapeutic Cloning

Tissues grown from adult stem cells are immunologically compatible with the person from whom the stem cells are harvested. This means that those tissues can be transplanted into that person without fear of the body rejecting them. Tissues produced from embryonic stem cells for the purpose of regenerative therapy, however, are unlikely to be immunocompatible, like the use of immunosuppressant drugs (with its possible serious side effects). Two potential solutions to this immunological limitation have been suggested. The first proposes a "tissue bank" with a sufficiently large number of different embryonic stem cell types to generate tissues that can be immunologically matched with different recipients. Wayne Hall, however, points out, "this would require a huge number of human embryonic stem cell lines (the number being a matter of debate). Such an embryonic stem cell bank would be technically difficult and expensive to generate. The number of embryos that would be required to produce the cell bank would probably test public support."³³

The second possible way of overcoming the problem of immunological incompatibility is through what has been called "therapeutic cloning". In this process, the nucleus of a human oocyte or egg is removed and

replaced with the nucleus of a cell taken from the body of the intended tissue recipient. The new egg is induced to develop into an embryo, from which immunocompatible stem cells are harvested. The embryo will be a human embryonic clone of the recipient, with all his/her exact genetic characteristics. To date, there have only been one or two reported attempts at human cloning that have met with some success.³⁴ Another suggested solution to the problem of destroying viable embryos is to create embryos that cannot develop to term. This may be done by inducing unfertilised eggs to develop as if fertilisation had occurred, producing 'parthenogenetic' embryos that can go through the early cleavage divisions to the *blastocyst* stage but cannot develop into a foetus.³⁵ Those with absolutist religious views are likely to regard the creation of such 'embryos' as unnatural and immoral, while some scientists object that ES cells created in this way are likely to have abnormalities that will seriously limit their usefulness.

Therapeutic cloning too meets ethical objections revolving around the creating of an embryo, and moreover, the creating of an embryo for a use that will destroy it. These objections and arguments usually rely centrally on certain views about the value or moral status of the embryo. Whatever benefit the *pluripotency* of embryonic stem cells has in generating immunocompatible tissue, this benefit is likely to be possible only at the cost of having to engage in either the morally contentious practice of human (therapeutic) cloning, or the morally contentious practice of using (and destroying) a large number of embryos to create a sufficient range of embryonic stem cell lines for organ banks. Hence, any kind of human cloning, including therapeutic cloning, should be prohibited.³⁶

5. The Moral Status of the Embryo

There is a wide spectrum of opinions in relation to the moral status of embryos. There are those who believe that an embryo has full moral status and is deserving of the same rights, protection and respect as an adult human being from the moment of conception. There are also those who believe that embryos gradually gain moral status as they develop (known as the gradualist approach). Others consider the appearance of a nervous system or the ability of the foetus to feel pain as critical points in development. Those who hold the gradualist view consider that the therapeutic possibilities offered by embryonic stem cell research may outweigh the infringements of the respect and dignity of the embryo. The debate regarding the moral status of embryos is also linked to the debate about personhood. Most prominent philosophical arguments to justify the destruction or use of human embryos have been from the question of 'personhood'.³⁷

1. John Locke defined a person as "a thinking, intelligent being that has reason and reflection, and can consider itself as itself, the same thinking thing, in different times and different places."³⁸ According to this explanation, embryos are not human persons, although they may or may not be human beings, and thus they do not merit the full protection that is due to a person. The definition of person given by John Locke is best exemplified by strong and self-conscious adults who are able to exercise their freedom and assert their autonomy. This theory excludes the weak, the semi-conscious and the incompetent who are precisely those in greater need of protection. If a human being is a person, embryo is a human being, and then embryo must be a person. A non-person cannot grow into a person. What was not already cannot become one. According to Boethius a person is an individual being of a rational nature. At all stages this individual being is nothing more or less than another human being. Therefore, the human embryo is not a potential person, but a person with potential. Embryo as a person grows with all its potentialities. All human beings share this common nature, and this is the reason for vindicating human rights for all who share this nature. Here we must emphasise the virtue of *philanthropia* - love of fellow human beings (especially of not yet born) in the protection of their humanity.³⁹

2. A difficulty was raised by R.G. Edwards and J. Diamond against the view that the human individual begins at the zygote stage on account of the phenomenon of identity twinning.⁴⁰ It followed, according to this argument, that the pre-embryo⁴¹ was not a 'person', given that the concept of personhood is often taken to imply indivisibility or individuality. Embryos, particularly the very early pre-implantation *blastocysts* involved in stem cell research, do not, for instance, have consciousness, individuality, the ability to reason, or the ability to form courses of action in life and to choose between them. However, it could be argued on the contrary that even in the case of identical twinning, the zygote has the natural capacity to become one or more human beings by virtue of its own inherent active potentiality. The infant has an *inherent* natural active capacity to develop to the stage of being able to exercise self-conscious and rational acts while retaining the same ontological identity as a human individual. Thus an embryo is a person already because its nature enables it to develop to the age of reason without loss of ontological identity.⁴²

3. Hans Dreisch (1867-1941) says that the embryo must possess something like a soul because, when it was divided, it did not die or produce two-half-beings but rather developed into two complete individuals. Aristotle says something similar in relation to animals that continue to live when divided 'in each of the two [separated] parts, all the parts of the soul are present' (*On the Soul* 1.5). Each new part becomes new wholes. Aquinas would hold that where there is a whole unified organism, there is a soul. The soul is not multiplied by the body, but souls are multiplied according to the number of bodies (*ST* Ia Q.76 art.2). Fisher (1991) and Flannery (2003) hold that as twinning results in a multiplication of human embryos, then God gives new souls appropriately. This could be explained away with an analogy. We are familiar with taking cuttings from a plant to generate new plants. Here

the original plant has given rise to two new plants, which themselves are also new wholes. An embryo gives rise to two new embryos, which are two new identical wholes. All this can only further allow us to affirm that the original embryo is potential of dividing and giving rise to new beings.⁴³ Identical twins are genetically identical and derive from the same fertilized egg, but they are separate individual human beings.

4. Some argue that in moral terms a more developed nervous system should be the focus of concern, such as the emergence of the first components of the central nervous system and developments in the brain that allow sustained awareness.⁴⁴ Some philosophers contend that full moral status is only reached when an individual possesses self-consciousness.⁴⁵ As this does not appear to develop until some months after birth, on this view not only the embryo and foetus, but also the newborn baby and the young infant, lack the moral status of a fully self-conscious person. Central to this position is the claim that it is the capacity for self-consciousness and self-valuing that gives humans their unique status as moral agents. Such views have not only ethical but also scientific flaws. Self-consciousness cannot be a criterion for evaluating the status and dignity of human beings, for it excludes the semi-conscious and the incompetent persons and persons in a coma stage.

5. There are serious dangers in seeking to define some point in postnatal development at which the life of a child begins to command full respect, and which strengthens the grounds for sustaining his or her life. Any attempt to define clearly and without prejudice the moment at which a developing child acquires full moral status is likely to fail. Non-controversial could be the position, if we accept that the life begins at conception. Anything against such a position would involve ethical complications. Only in the context where the life of the mother is seriously threatened, "indirect" abortion is permissible.⁴⁶ However, this cannot provide a justification for the use of abortion as the solution to unwanted pregnancy. The *Declaration on Procured Abortion* in paragraphs 12 and 13 gives us a sharp clarity on the matter.

In reality respect for human life is called for from the time that the process of generation begins. From the time that the ovum is fertilized, a life is begun which is neither that of the father nor or the mother, it is rather the life of the new human being (= *Novi viventis humani*) with his own growth. It would never be made human if it were not human already.... The one who will be a man is already one.⁴⁷

6. The Meaning and Significance of Human Dignity ⁴⁸

The word "dignity" comes to us, via the Latin *dignus and dignitas*, from Greek and Roman antiquity, in whose literature it means something like "worthiness for honour and esteem". The school of philosophy in ancient Greece and Rome, the Stoics, believed in dignity as a genuine possibility for all human beings, regardless of their circumstances, social standing, or accomplishments. For the Stoics, human beings have dignity because they possess reason, and the best life, the life according to nature, is available to anyone who chooses to live in a thoughtful or reflective way. Human dignity, according to Höffe, is the "highest moral and legal principle, which gives the human being an absolute value against other highlighted natures of rationality and freedom."⁴⁹

The German philosopher Immanuel Kant has based universal human dignity on a strictly philosophical foundation. For Kant, in agreement with the Stoics, dignity is the intrinsic worth that belongs to all human beings. All men possess dignity because of their rational autonomy, i.e., their capacity for free obedience to the moral law of which they themselves are the authors. His doctrine of human dignity demands equal respect for all persons and forbids the use of another person merely as a means to one's own ends.⁵⁰ "Only the human being considered as person, that is, as subject of a moral-practical reason, is exalted over all price; because as a such one (*homo noumenon*) s/he is not a means to the other, not even to his/her own purposes, but to be estimated as end-in-itself, for s/he possesses a dignity (an absolute inner value)."⁵¹ *Dignity (Würde) is intrinsic but value (Wert) may be added by society.* Kant's celebration of human autonomy and prohibition of the "instrumentalization" of human subjects has had certainly a lasting impact on modern ethical thought and on bioethics in particular. The dignity of the human person demands therefore that we never treat another as a *thing*, as a *means*, even to accomplish the greatest good. Another person is a subject and not an *object/it*. When I treat another as an *it*, I threaten his reality as a person; I cut myself from the rich reality of this other person and so impoverish myself.⁵²

In the *Universal Declaration of Human Rights*, (1948), recognition "of the inherent dignity and of the equal and inalienable rights of all members of the human family" is said to be "the foundation of freedom, justice, and peace in the world." At least thirty-seven national constitutions ratified since 1945 refer explicitly to human dignity, including the *Basic Law (Grundgesetz) of Germany* (1949), which begins: "Human dignity is inviolable. To respect and protect it is the duty of all state authority."⁵³ Human dignity in these documents plays the role of a supreme value, on which all human rights and duties are said to depend, but the meaning, content, and foundations of human dignity are never explicitly defined. What mattered most after 1945 was not reaching agreement as to the *theoretical* foundations of human dignity but ensuring, as a *practical* matter,

that the worst atrocities inflicted on large populations during the war (i.e., concentration camps, mass murder) would not be repeated. The inviolability of human dignity was enshrined in at least some of these documents chiefly in order to prevent a second Holocaust. Thus, for a long time this liberal principle of "respect for persons"—has proved serviceable in resolving many ethical problems. Therefore it must be further asserted that all human beings have rights and freedoms that must be respected equally, even without spelling out too clearly the ground of that assertion.

A broader shared notion of human dignity is found in the Biblical account of humans as "made in the image of God" (Gen 1:27). This teaching, together with its further elaborations in Jewish and Christian scripture, has been interpreted in many different ways, but the central implication seems to be that human beings, because they are in some respects godlike, possess an inherent and inalienable dignity. In this sense, "made in God's image" has the implication that all human beings, not only those healthy and upright but also those broken in body or soul have a share in this God-given dignity. Dignity in this sense would give ethical guidance to us in answering the question of what we owe to those at the very beginning of life, to those at the end, to those with severe disability or dementia, and even to tiny embryos. Seeing human beings as created in the image of God means, in some sense, valuing other human beings in the way a just or loving God would value them.

7. Ethics of Healing

Christian response to sickness is not merely *curing* the disease, but *'healing' the person*.⁵⁴ Healing is in fact *wholing* or restoring the integrity of the person as much as possible.⁵⁵ As Victor Frankl says, the radical cause of sickness is the loss of meaning in life and hence sickness cannot be handled effectively unless that meaning is restored.⁵⁶ He says in his celebrated book *Man's Search for Meaning*, "an incurably psychotic individual may lose his usefulness but yet retain the dignity of a human being. This is my psychiatric credo."⁵⁷ Similarly Mowrer has drawn attention to the importance of handling moral guilt, and not merely psychic guilt feelings in the treatment of illness.⁵⁸ Thus in the field medical care, even the psychosomatic approach to healing is incomplete. Health and illness have a still deeper dimension involving the spiritual area of the human personality. This noble thought would make it clear that physical healing will not alone make a person healthy. In medical care money and health are not the only matters. In such complexities of human life, we cannot attach to the patient the guilt of taking away the life of an embryo for the sake of healing or prolonging one's life.

A Final Word

Using human embryos for any purpose other than to allow it grow into a baby is highly controversial and unethical. It disfigures human dignity. Destroying a human embryo either of the *in-vivo* or the surplus *in vitro* or of *the cloned one* to provide a cure for a disease is wholly unacceptable and morally evil. Human dignity cannot be sacrificed at the altar of research laboratories. Therefore "it is wrong to destroy embryos of any gestational age, for any purpose,"⁵⁹ for "human life develops itself not something unto humans, but as humans."⁶⁰

Notes and References

1. See Thomas B. Okarma, "Human Embryonic Stem cells: A Primer on the Technology and Its Medical Applications," in *The Human Embryonic Stem Cell Debate*, S. Holland, et.al.eds. (Cambridge: MIT Press, 2001).
2. Parkinson's disease (PD) is a very common neurodegenerative disorder that affects more than 2% of the population over 65 years of age. PD is caused by a progressive degeneration and loss of dopamine (DA)-producing neurons, which leads to tremor, rigidity, and hypokinesia (abnormally decreased mobility). PD may be the first disease to be amenable to treatment using stem cell transplantation. Alzheimer's disease constitutes about two thirds of cases of dementia overall (ranging in various studies from 42 to 81 percent of all dementias). Alzheimer's disease is a progressive neurologic disease that results in the irreversible loss of neurons, particularly in the cortex and hippocampus. The clinical hallmarks are progressive impairment in memory, judgment, decision making, orientation to physical surroundings, and language.
3. See Leroy Walters, "Human Embryonic Stem Cell Research: An Intercultural Perspective," *Kennedy Institute of Ethics Journal* 14/1 (March 2004): 3.
4. By a team led by Dr. James Thomson at the University of Wisconsin.
5. In 1978 in vitro fertilization (IVF) led to the first successful human birth.
6. Blastocyst is a *preimplantation* embryo of about 150 cells produced by cell division following fertilization. The blastocyst is a sphere made up of an outer layer of cells (the *trophoblast*), a fluid-filled cavity (the *blastocoels*), and a cluster of cells on the interior (the *inner cell mass*). *Trophoblast* is the extraembryonic tissue responsible for implantation, developing into the placenta, and controlling the exchange of oxygen and metabolites between mother and embryo. The fluid-filled cavity inside the *blastocyst* of the developing embryo. *Inner cell mass (ICM)* is the cluster of cells inside the *blastocyst*. These cells give rise to the *embryo* and ultimately *the foetus*. The ICM cells are used to generate *embryonic stem cells*.
7. Totipotent means "capable of becoming anything".
8. Pluripotent stem cells can give rise to any type of cell in the body except those needed to develop a foetus.
9. Multipotent stem cells can give rise to a small number of different cell types.

10. Cited in Bradley Mattes, "Embryonic Versus Adult Stem Cells? It's Really No Contest." <http://www.Ufeissues.org/cloningstemcell/bradsarticle.html>. Cf. AAAS Policy Brief: Stem Cell Research. Updated December 14, 2007. <http://www.aaas.Org/spp/cstc/briefs/stemcells/>. Accessed on 31.05.08.
11. Ibid.
12. Ibid.
13. *Guidelines for Stem Cell Research and Therapy*, published by N. K. Ganguly, Director General, Indian Council of Medical Research (ICMR) in collaboration with Department of Biotechnology (DBT), November 2007.
14. See Alka Sharma, "Stem Cell Research in India: Emerging Scenario and Policy Concerns," *Asian Biotechnology and Development Review* 8/3 (2006): 43-53.
15. http://www.prolifeblogs.com/articles/archives/2005/10/_embryonic_stem_9.php. "Embryonic Stem Cell Research in India." Accessed on 25.04.08.
16. <http://www.insaindia.org/Scienceservice/Social%20Issues.htm>. A one and half day seminar on "Stem Cell Research: Technological Ethical and Social Issues" was conducted at Hyderabad along with the 71st INSA anniversary meeting which was jointly hosted by CCMB, IICT and NGRI in Hyderabad on 27-28 December 2005.
17. Alka Sharma, 48.
18. Ibid., 52.
19. See Maurice Rickard. "Key Ethical Issues in Embryonic Stem Cell Research," *Current Issues Brief* 5 (2002-03): 4-5.
20. See "Do No Harm," Coalition of Americans for Research Ethics. Accessed in Internet on 22.11.2007. Available at [<http://www.stemcellresearch.org>],
21. Johannes Reiter,, "Menschenwürde oder Forschungsfreiheit?: Die Stammzellforschung bleibt umstritten" *Herder Korrespondenz* 62/4 (April 2008): 173-177.
22. Ibid, 174; Insoo Hyun,, "Stem Cells from Skin Cells: The Ethical Question," *Hastings Centre Report* 38/1 (2008): 20-22.
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24. July 31, 1978:40.
25. Outka, G "The ethics of human stem cell research," *Kennedy Institute of Ethic Journal* 12/2(2002): 175-213.
26. Vogel, G. "Embryo-free techniques gain momentum," *Science* 2005/ 309:240-241.
27. A briefing paper on government proposals to allow 'therapeutic' cloning for stem cell research. December 2000. Available at [<http://www.catholicew.org.uk/CN/00/001201a.htm>]. Accessed on 5.12.2007. Internet.
28. *Time* (July 31, 1978): 43-44.
29. See George Lobo, *Moral and Pastoral Questions*, (Anand: Gujarat Sahitya Prakash, 1985): 266.
30. See S. Sherwin, *No Longer Patient: Feminist ethics and health Care* (Philadelphia: Temple University Press, 1992): 174-5.
31. See for example the survey of views presented by Mary Anne Warren in "IVF and Women's Interests: An Analysis of Feminist Concerns," *Bioethics* 2 (1988): 37-57.
32. See Donna Dickenson, "Property and Women's Alienation from Their Own Reproductive Labour," *Bioethics* 15/3 (2001). Also, Suzanne Holland, "Beyond the Embryo: A Feminist Appraisal of the Embryonic Stem cell Debate" in Holland, et al., eds, *The Human Embryonic Stem Cell Debate*.
33. See Wayne Hall, "Democracy and Embryonic Stem Cell Research: Resolving Contentious Ethical Issues in a Pluralistic democracy." Unpublished paper by the Office of Public Policy and Ethics, Institute for Molecular Bioscience, University of Queensland. 2002, 3.
34. Maurice Rickard, op.cit., 5.
35. See Rogers, N.T., Hobson, E., Pickering, S., Lai, F.A., Braude, P., Swann, K. "Phospholipase causes Ca²⁺ oscillations and parthenogenetic activation of human oocytes," *Reproduction* 128 (2004): 697-702.
36. For an outline of some of the key ethical issues associated with cloning please refer to pages 4-7 of Bills Digest No. 17: 2002-03, "Research Involving Embryos and Prohibition of Cloning Bill," available at [<http://www.aph.gov.au/library/pubs/bd/2002-03/03bd017.html>]. See also Maurice Rickard, "Key Ethical Issues in Embryonic Stem Cell Research," 5.
37. House of Lords Select Committee on Science and Technology: "Stem cell research," 2002. Available at [<http://www.parliament.the-stationery-office.co.uk/pa/ld200102/ldselect/ldstem/83/8301.html>]. Accessed on 5.12.2007. Internet.
38. John Locke, *An Essay Concerning Human Understanding*. With the Notes and Illustrations of the Author and an Analysis of His Doctrine of Ideas (London: William Tegg and Co. 1880): 246. (Chapter XXVII. Identity and Diversity: §9. Personal Identity; § 10 Consciousness makes personal Identity).
39. See David A. Jones, *The Soul of the Embryos: An enquiry into the status of the human embryo in the Christian tradition* (New York: Continuum, 2004): 242.
40. See Norman M. Ford, *When did I begin?:* 111. R.G. Edwards, "Test-Tube Babies: the Ethical Debate," *The Horizon Lecture in The Listener*, (27, October 1983):12; J.J.Diamond. "Abortion, Animation and Biological Hominization," *Theological Studies* 36 (1975): 305-324.
41. In the debate about embryo research, this formation of the primitive streak, around the 14th day after conception, has been suggested as a key cut-off point. The term 'pre-embryo' was introduced in 1985 to describe the early embryo up to this point. One argument that was used to justify drawing a distinction between the pre-embryo and the embryo proper was that it is possible for the pre-embryo to split into two, or twin.
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47. Cited in Norman M. Ford, "The Catholic Position," Op.cit., 60.

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