The Catholic Church *enthusiastically* supports

Stem Cell Research

that promotes, rather than destroys human life.

Rather than funding destructive embryonic stem cell research (as Maryland does), support should be given to legislation that will make Maryland a center for excellence for innovative basic and applied research in ethical stem cell therapies.

Treatments using adult stem cell research has improved and even saved thousands of lives of patients with the following conditions:

Brain Cancer, Retinoblastoma, Ovarian Cancer, Skin Cancer, Merkel Cell Carcinoma, Testicular Cancer, Lymphoma, Non-Hodgkin's lymphoma, Hodgkin's Lymphoma, Acute Lymphoblastic Leukemia, Acute Myelogenous Leukemia, Chronic Myelogenous Leukemia, Juvenile Myelomonocytic Leukemia, Chronic Myelomonocytic, Leukemia, Angioimmunoblastic Lymphadenopathy, Multiple Myeloma, Myelodysplasia, Breast Cancer, Neuroblastoma, Renal Cell Carcinoma, Various Solid Tumors, Soft Tissue Sarcoma, Ewing's Sarcoma, Waldenstrom's macroglobulinemia, Hemophagocytic lymphohistiocytosis, POEMS syndrome, Myelofibrosis, Diabetes Type I (Juvenile), Systemic Lupus, Sjogren's Syndrome, Myasthenia, Autoimmune Cytopenia, Scleromyxedema, Scleroderma, Crohn's Disease, Behcet's Disease, Rheumatoid Arthritis, Juvenile Arthritis, Multiple Sclerosis, Polychondritis, Systemic Vasculitis, Alopecia Universalis, Buerger's Disease, Acute Heart Damage, Chronic Coronary Artery Disease, Corneal regeneration, Severe Combined Immunodeficiency Syndrome, X-linked Lymphoproliferative Syndrome, X-linked Hyper immunoglobulin M Syndrome, Parkinson's Disease, Spinal Cord Injury, Stroke Damage, Sickle Cell Anemia, Sideroblastic Anemia, Aplastic Anemia, Red Cell Aplasia, Amegakaryocytic Thrombocytopenia, Thalassemia, Primary Amyloidosis, Diamond Blackfan Anemia, Fanconi's Anemia, Chronic Epstein-Barr Infection, Limb Gangrene, Surface Wound Healing, Jawbone Replacement, Skull Bone Repair, Hurler's Syndrome, Osteogenesis Imperfecta, Krabbe Leukodystrophy, Osteopetrosis, Cerebral X-Linked Adrenoleukodystrophy, Chronic Liver Failure, Liver Cirrhosis, End-Stage Bladder Disease

Prayer for the Protection of Embryonic Children

Lord God, you lovingly knit us in our mothers' womb. Grant that each human embryo will be respected as a human being, and not dismissed as a product to be manipulated or destroyed.

Grant us the courage and conviction to be your voice for our sisters and brothers at the very earliest stages of their development, and for all defenseless unborn children.

Jesus, Divine Healer, foster in those conducting medical research a commitment to finding cures in ways that respect these little ones and all your vulnerable children.

Holy Spirit, grant us the wisdom to develop morally sound treatments for conditions now thought to be incurable. Help us persevere in defending human life while alleviating suffering.

Show mercy to all who have cooperated in killing our tiniest brothers and sisters. Bring them and all who support destructive embryo research to true conversion. Grant them the ability to see the immeasurable dignity of all human beings even in the first days of life.

Father, we ask this in Jesus' name, through the Holy Spirit. Amen.

Excerpts from ***"Stem Cells and Hope for Patients"*** by Maureen Condic, PhD (2008)

Most Americans know someone afflicted with an incurable medical condition. The possibility of stem cell cures has given hope to many who face such suffering and loss. Unfortunately, there is a tremendous amount of misinformation about stem-cell therapies. To make sound decisions about this rapidly advancing field of research, it is important to understand what stem cells are and what promise they actually offer patients and their families.

A stem cell is simply any cell that, when it divides, can make another cell like itself or make different kinds of cells with specialized functions. Because stem cells replace themselves at every cell division, they may be medically useful for replacing tissue damaged by injury or disease. Following a heart attack, for example, many cells of the heart die, leaving the heart weakened and less able to pump blood. Heart muscle cells produced from adult stem cells can be used to repair the heart and restore normal function.

. . . . *The false promise of embryonic stem cells*

Apart from the grave ethical problem of destroying human embryos for research, there are three significant *scientific* problems with ESCs that must be overcome before they could be considered safe for use in human patients. First, when transplanted into mature tissues, ESCs form tumors that can be fatal if they form in vital organs. They are generally benign, i.e., not cancerous, but recent work has shown that ESCs are also genetically unstable, and tend to accumulate mutations that convert them to cancer cells. Thus, the advantages of ESCs (their flexibility and rapid proliferation) also cause these cells to form tumors and convert to cancer.

A second serious hurdle is the problem of immune rejection. ESCs will be rejected by the patient's immune system unless a very close match is made. Yet, unlike conventional organ transplant, stem cells disperse throughout the body and cannot be removed if the patient's body rejects them.

Also, millions of embryonic stem cell lines would be required to find a good immune match for most patients. Thus, stem cell therapies would almost certainly require the intentional production and destruction of millions of embryos.

Finally, despite more than 25 years of research, no one has been able to coax embryonic cells to become mature, stable cell types that are useful in the clinic. While it is relatively easy to make cells in the laboratory that have some of the properties of mature cell types, laboratory-produced cells generally do not survive when transplanted into mature animals. If not fully mature when transplanted, they often produce fatal tumors.

These three problems (tumor formation, immune rejection and stable differentiation) can all, in theory, be solved. Yet solving these problems is likely to take decades of research and billions of dollars before benefits could be realized for patients.

The real promise of adult stem cells

Adult stem cells can be derived from many of a patient's own tissues, including bone marrow, muscle tissue, nasal mucosa, and even fat. Stem cells from more mature tissues present significant advantages for use in medical therapies. First, these stem cells do not form tumors and are not genetically unstable. Because adult stem cells and their derivatives can be safely transplanted to patients, more than 1,500 clinical studies are currently underway, testing the medical usefulness of adult stem cells for diverse medical conditions, including (among others) diabetes, heart disease, Lou Gehrig's disease, multiple sclerosis (MS), arthritis, sickle cell disorder and many types of cancer. In contrast, in the quarter century since their discovery, not a single clinical study has been approved for ESCs, due to the serious safety concerns discussed above.

Also in contrast to ESCs, stem cells from more mature tissues can be more easily immune matched to patients because cells taken from a patient's own tissues are a perfect match and those from birth-associated tissues are widely compatible. When it is not possible to obtain stem cells from the patient directly, donor registries, similar to the bone marrow registry, could provide a wide range of immune matches. Finally, with over four million births in the United States every year, stem cells from birth associated tissues could provide immune matches for the great majority of American patients.

Lastly, while stem cells from mature tissue may be more limited in the kinds of mature cells they can produce, the flip-side of this limitation is that the cells produced are much more likely to be fully mature and therefore clinically safe and clinically useful.