

# REFERRING PHYSICIAN INFORMATION



Fred Hutchinson Cancer Research Center  
University of Washington Academic Medical Center  
Children's Hospital & Regional Medical Center

## SCCA Services

The Alliance forms the most comprehensive cancer treatment program in the Pacific Northwest, spanning all ages and disease areas. We offer a variety of treatment options, designed from the latest research findings, for malignant and non-malignant diseases including:

- Blood Disorders
- Breast Cancer
- Brain & Nervous System Cancers
- Digestive System Cancers
- Gynecologic Cancers
- Head & Neck Cancers
- Kidney & Bladder Cancers
- Leukemia
- Lymphoma
- Liver Cancer
- Lung Cancer
- Melanoma
- Mesothelioma
- Multiple Myeloma
- Pancreatic Cancer
- Pediatric Cancers
- Prostate Cancer
- Sarcoma

Research-based treatment protocols are available using stem cell and marrow transplantation, gene therapy, specialized antibody therapies, high dose chemotherapy, radiation therapy, immunotherapy, minimally-invasive surgical techniques, and other specialized therapies.

## Appointments & Referrals:

For referrals and inquiries related to pediatric and adult oncology services, call (206) 288-1024 or use your existing referral contacts.

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Seattle, WA 98109-1023  
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## BONE-MARROW AND STEM-CELL TRANSPLANT TREATMENT OPTIONS AT THE SEATTLE CANCER CARE ALLIANCE

The Fred Hutchinson Cancer Research Center is recognized as a leader in cancer research. The Center's clinical research is focused on improving therapies for adults and children through the conduct of clinical trials, many involving bone marrow and stem-cell transplantation. Hutchinson Center researchers continue to strive to develop therapies that offer increased benefit while reducing toxicity. Their efforts have resulted in a therapy referred to as mini-transplantation, a form of stem-cell transplantation that offers alternatives and hope for older patients, and patients with limited treatment options.

### Mini-transplantation

For many, bone marrow transplantation has been proven as a successful treatment for leukemia, lymphoma and a number of

other blood and genetic disorders. While long-term survival after transplantation has increased significantly over the years and many people survive to live healthy and productive lives, a number of people are unable to tolerate the rigors of the therapy, especially people over age 50.

These people now have another alternative. Researchers at the Fred Hutchinson Cancer Research Center currently offer a phase II trial for a non-myceloablative stem-cell transplant, also known as a mini-transplant, as a treatment for a variety of diseases. The patient experience is dramatically different between mini and conventional bone-marrow transplant procedures in a number of ways:

- Patients require less hospitalization, most undergoing the procedure in an outpatient setting.

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## Fred Hutchinson Cancer Research Center

The Fred Hutchinson Cancer Research Center is an independent, nonprofit research institution dedicated to the development and advancement of biomedical technology to eliminate cancer and other potentially fatal diseases. Recognized internationally for its pioneering work in bone-marrow transplantation, the Center's four scientific divisions collaborate to form a unique environment for conducting basic and applied science. The Hutchinson Center opened its doors in 1975. It is the only National Cancer Institute-designated

comprehensive cancer center in the Pacific Northwest.

Its research and treatment efforts in bone-marrow transplantation. The excellence of the Fred Hutchinson Cancer Research Center's Bone Marrow Transplant Program will continue at the Seattle Cancer Care Alliance. Patients undergoing treatment on a Hutchinson Center protocol will be cared for by the same highly experienced medical teams in the Alliance's state-of-the-art patient care environment.



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From left to right, Drs. Rainer Storb, Michael Maris and David Maloney.

## Fred Hutchinson Cancer Research Center's Mini-Transplant Team

The Fred Hutchinson Cancer Research Center has long been known for its "team" approach, both in the scientific arena and in patient care. Researchers at the Hutchinson Center meet frequently to share information and data. Members of the Center's transplantation biology group combine basic and translational research into a biological understanding of how stem cells work.

Research studies are directed at understanding and eliminating major barriers to successful hematopoietic transplantation. These barriers include graft rejection, graft failure, acute and chronic graft-vs.-host disease and other regimen-related toxicities. The program's overall goal is to create therapies for patients with malignant and nonmalignant hematologic diseases. An additional focus has been to further improve transplantation results for patients over age 65 and to extend transplantation to include autoimmune diseases.

The mini-transplant team is comprised of researchers Drs. Rainer Storb, Brenda Sandmaier, David Maloney, Lyle Feinstein, Michael Maris and Ann Woolfrey; nurses Steve Minor, Kathryn Keegan and Mary Hinz; and a coordinator, Debbie Bassuk. Each member plays a key role overseeing protocol administration, data collection, registering patients, evaluating eligibility, interacting with hometown physicians and following patients through their treatment and after transplantation.

## *Bone Marrow and Stem-Cell Transplant Treatment Options (continued)*

- Clinic visits are two to three times a week the first month and once or twice a week for the duration of their recovery period.
- Treatment-related toxicities are mild to moderate. The radiation doesn't cause nausea, vomiting or diarrhea, and patients do not lose their hair.
- More significantly, blood counts never drop below levels the body needs to fight infections and stop bleeding.

To date, 350 mini-transplants have been performed. Approximately 100 of these transplants have involved stem cells from unrelated donors. The longest surviving patients are more than three years out from transplant. The procedure works by using just enough radiation to suppress the patient's immune system without ablating, or wiping out, the bone marrow.

Hutchinson Center researchers recently reported results showing that low-dose radiation therapy, combined with immunosuppressive drugs, allows donor stem-cell transplants in patients who cannot have conventional stem-cell

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transplants. It is known that the toxic effects of conventional stem-cell transplants are a major problem for older patients or younger patients with medical problems. Mini-transplantation establishes a stable state of tolerance between the donor cells and the patient's own tissues, a phenomenon called "mixed hematopoietic chimerism."

"We are deliberately reducing the total-body irradiation from the typical pre-bone marrow transplantation regimen doses of 1,200 to 1,500 centigray, which is equivalent to being close to the epicenter of a nuclear bomb blast, to 200 centigray," says Dr. Rainer Storb, senior investigator of the study. "The revolutionary part of the whole concept is that the cancer is eliminated through the donor T-cells rather than with high-dose chemo-radiation therapy."

Hutchinson Center researchers attribute positive responses in patients to the lower doses of chemotherapy and radiation as well as a graft-vs.-tumor effect, a reaction where the donor T-cells fight and eradicate the host cells. The therapy uses post-engraftment immunosuppression to control graft rejections and graft-vs.-host-disease.

The low-dose radiation suppresses the patient's immune system, then donor stem cells are infused. The patient is given drugs to keep the immune system suppressed to allow the donor stem cells to "engraft," or take hold, and begin producing a full range of blood and immune system cells. Once that happens, the two immune systems, patient and donor, achieve a mutual tolerance for each other, which sets the stage for a subsequent infusion of fresh donor immune cells to initiate what is called a "graft-vs.-leukemia" effect. The donor's immune system produces white blood cells that recognize the patient's cancer cells as foreign and eliminates them, thus creating the graft-vs.-leukemia effect.

The ability to perform low-toxicity donor cell transplants in an outpatient setting may open the door to a new era of tumor immunotherapy in which donor immunity can be exploited eventually for a wide range of cancers and other diseases.

"Achieving a balance of patient and donor blood cells also holds promise for curing non-cancerous blood diseases such as aplastic anemia, thalassemia and sickle cell disease, as well as autoimmune and many other genetic diseases," Storb says.