

Leukemia Survival Rates Have Improved:

But Disease Still a Challenge for Modern Medicine

BY: SEAN DOUGHERTY

Treatment and survival for both adult and pediatric leukemias (blood cancers), has improved remarkably, despite variations of the disease that resist treatment. The biggest improvements have come in treating pediatric leukemia, but many adult leukemias also have been tamed, according to John Cunningham, MD, Chief of Pediatric Hematology/Oncology and stem cell transplantation at the University of Chicago Medical Center. Survival rates for pediatric acute lymphoblastic leukemia now approach 90 percent. Breakthrough genetic targeting of cancer cells has produced similar results in adult acute promyelocytic leukemia and in chronic myelogenous leukemia (CML).

Improved leukemia survival rates result from team efforts marrying research with clinical practice, including input from geneticists, oncologists, immunologists, clinical transplanters and stem cell biologists. "With this combination of specialists working together, we are rapidly identifying the genetic changes that induce cancer, which will allow us to develop new small molecule agents targeting these defects," adds Dr. Cunningham.

His colleague, Wendy Stock, MD, professor of medicine at the University of Chicago Medical Center, notes that

among the first breakthroughs in the 1970s were findings by Dr. Janet Rowley and her colleagues. Their research showed that genes broke apart and reformed abnormally, resulting in the production of abnormal proteins that triggered leukemia development. Subsequent research identified gene targets that arrest the formation of specific leukemias or restore proper blood cell production in leukemia patients. One of the most dramatic breakthroughs in cancer treatment resulted from these early observations, and most patients with CML can now

be treated effectively by taking a pill to block the activity of a protein that causes this type of leukemia.

"Our goal is to unravel the heterogeneity of these diseases and find targeted therapies," says Dr. Stock. "This requires a focused and committed basic science and clinical research staff working together to share ideas and develop the most effective therapeutic plan for each patient." In some cases, specific targeted therapies are not yet available, but other innovative strategies to cure resistant leukemias are being explored. One

such approach is developing effective blood stem cell transplantation for all potential recipients. According to Dr. Cunningham, achievement of this goal requires "novel blood stem cell purification strategies." University of Chicago investigators are exploring strategies to make this type of blood stem cell transplantation available to more high-risk leukemia patients, through therapies that require lower doses of chemotherapy to suppress

the immune system, novel approaches to donor selection, and additional post transplant therapies to maximize destruction of residual leukemia cells.

Leukemia remains a challenging group of diseases, but investigators are optimistic that rapidly emerging knowledge of the genetic changes in blood stem cells that cause leukemia will continue to produce successful treatment options.



Members of the leukemia team at the University of Chicago Medical Center