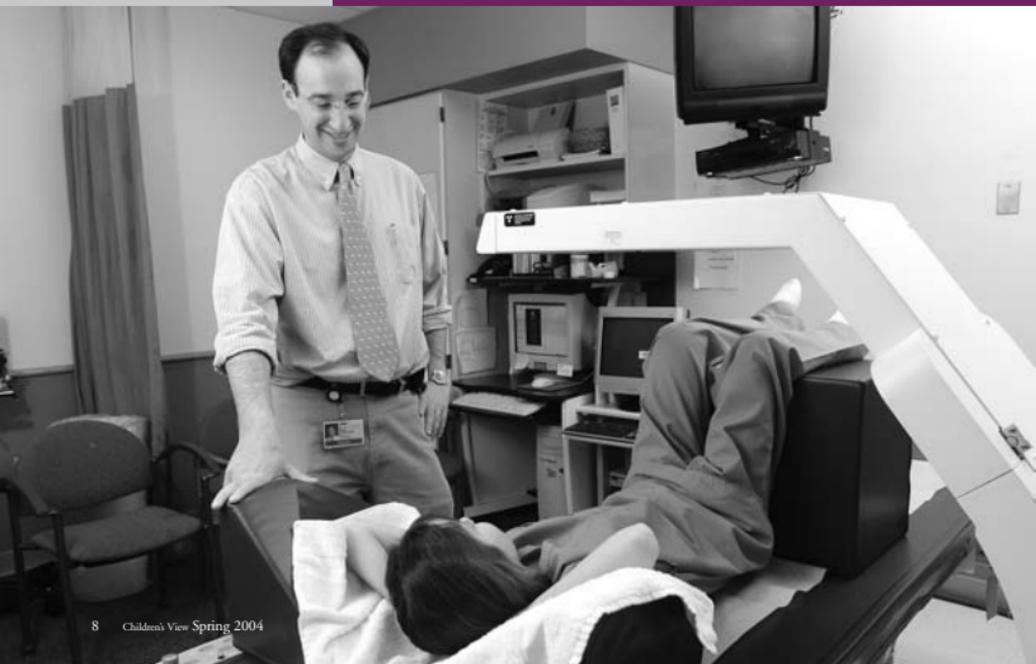


The word “arthritis” conjures images of elderly people with gnarled fingers and stiff, painful joints. While most people think of arthritis as an adult disease, thousands of children suffer from the condition.

Fighting Arthritis Through





Joint Research

Above: Randy Cron, M.D., Ph.D., and Terri Finkel, M.D., Ph.D., chief of the Division of Rheumatology, work to uncover some of the mysteries of treating Juvenile Rheumatoid Arthritis (JRA).

Chronic arthritis, a disease in which the immune system attacks its own joints and causes inflammation, afflicts one in 1,000 children in the United States. One- to 3-year-olds are more likely to develop the disease than older children, and girls more likely than boys. The disease, one of the most common chronic childhood illnesses, runs in families and is more common than diabetes and cystic fibrosis. Arthritis causes inflammation, decreased muscle strength, osteoporosis and in some cases, delayed puberty.

The Children's Hospital of Philadelphia's ability to take research findings from the lab bench directly to the patient makes this institution uniquely positioned to advance both

research and medical treatment for children with Juvenile Rheumatoid Arthritis, or JRA, says Terri Finkel, M.D., Ph.D., chief of the Division of Rheumatology.

"Like many diseases, it's usually the adults who are studied and not the kids" at most institutions, she says. "We're unique in having the strongest basic science program in immunology and being able to move our research rapidly to clinical care."

Children's Hospital's rheumatologists conduct research in areas including bones and joints, pain, the genetics of JRA and medicines targeting angiogenesis — a treatment originally designed to treat cancer that cuts off the blood supply to diseased tissues.

On Page 8: Sandy Burnham, M.D., studies the bone density in JRA patient Rachel Rossi, and those like her, to determine what type of patient is more likely to experience a bone fracture.



Members of the Division of Rheumatology at Children's Hospital include (from left) David Sherry, M.D., Terri Finkel, M.D., Ph.D., Sandy Burnham, M.D., and Randy Cron, M.D., Ph.D. These physician-scientists are bringing lab bench research in JRA directly to the patient.

The broad spectrum of research conducted at Children's Hospital may one day directly help patients like Rachel Rossi, age 11. A JRA patient at Children's Hospital, Rachel is participating in a bone density study, one of several bone studies at the institution. Rachel suffered a severe fracture of the humerus (upper-arm bone), likely a complication of her JRA. This research study may ultimately lead to information about how to reduce the risk of fractures in children with arthritis.

Sandy Burnham, M.D., whose expertise is in osteoporosis, leads the study. He is reviewing large banks of data from arthritis patients to determine what type of patient is more likely to experience a bone fracture. Bones in children with JRA don't develop the same mass that they do in children without arthritis, so Dr. Burnham plans an intervention program to help make up for bone deficiencies, including nutritional plans and weight-bearing exercises. He uses the Growth and Nutrition Lab at Children's Hospital, where researchers can analyze bone density and strength.

"The resources and methodologies developed here to study bones will be generalizable to other hospitals," Dr. Burnham says. "The future of pediatrics is to anticipate roots of major public health problems, such as osteoporosis, during childhood, when preventive measures will be most successful."

Physicians currently treat JRA with a range of medicines that decrease joint inflammation. David Sherry, M.D., is studying how best to decrease pain in arthritic children's medical treatments, such as designing a less painful cortisone injection, a common arthritis treatment.

"Children have developing joints, and when you get arthritis in a growing joint, development is stalled," he says. "Drugs help, but they're not a cure. We need to do more research and find better treatments to improve kids' lives."

Randy Cron, M.D., Ph.D., is studying arthritis in the Temporomandibular Joint, or TMJ. Arthritis can wear down the joint and lead to a small, underdeveloped jaw, which affects children's physical appearance, as well as their ability to eat and speak. In most joints, inflammation caused by arthritis spurs growth — such as the knuckles and knees — but not in the jaw, where the bone growth plates are in closer proximity to the destructive inflammation.

"This is an underdiagnosed, undertreated condition in kids with chronic arthritis, and it has devastating effects on the jaw," says Dr. Cron. "Growing occurs at the end of the jaw bones, so if you destroy the joints, the bones don't grow."

Dr. Cron's research aims to find the incidence of TMJ disease in children with chronic arthritis, using MRI and ultrasound to detect fluid in the joint before outward symptoms develop. If he detects disease, he plans to give corticosteroid injections and test the patients several months later to see if their conditions have improved.

While these and other research advances have vastly improved care for juvenile rheumatoid arthritis, Dr. Finkel says there is still much to do.

"A lot of government and philanthropic resources go toward infectious diseases, but that doesn't change the fact that there are urgent needs in other areas, including chronic diseases of childhood," she says. "The momentum in arthritis research has made the outlook for the disease far better."

“When I met with Terri, she talked about all of the projects they were currently working on. It wasn’t a matter of waiting and seeing, it was, ‘Here’s what we are doing today,’” says Chip Nickolett.

Seeds of Opportunity

Ronald “Chip” Nickolett had a common reaction when his daughter Heather, now age 5-and-a-half, was diagnosed with Juvenile Rheumatoid Arthritis (JRA).

“I had never heard of this disease and never would have thought of children getting arthritis,” says Chip, who lives in Wisconsin with his wife Jackie, along with Heather and 2-and-a-half-year-old twins, Jacob and Paige.

After Heather’s diagnosis in 1999, Chip and Jackie started a fund at the Children’s Hospital of Wisconsin, and continued to search for institutions where they could more immediately benefit JRA research. That is when they learned about a variety of projects taking place at The Children’s Hospital of Philadelphia (see story on Page 8).



Jackie, Paige, Heather, Jacob and Chip Nickolett have provided research funding for pilot projects in the Division of Rheumatology to help researchers better understand JRA.

Chip came to Philadelphia and met with Terri Finkel, M.D., Ph.D., chief of the Division of Rheumatology, and her team. “When I met with Terri, she talked about all of the projects they were currently working on. It wasn’t a matter of waiting and seeing, it was, ‘Here’s what we are doing today,’” Chip says. “The facilities, the equipment, the people — everything was right there at the Hospital.”

In the fall of 2003, Chip looked to make several contributions. “We had a good year with the company (Comprehensive Solutions®, an information technology consulting firm) and wanted to do something positive in this area,” he says. Chip spoke to Dr. Finkel about funding opportunities. She creatively suggested providing seed money for pilot projects

directed toward better understanding or treatment of JRA. Such pilot projects are critical in generating the supporting data to bring in larger grants for JRA research. Today, the Nickoletts fund the research projects of Children’s Hospital physicians Randy Cron, M.D., Ph.D., of the Division of Rheumatology and Mary Leonard, M.D., of the Division of Nephrology. The family also created an endowed fund for JRA research at Children’s Hospital.

According to Chip, Heather is doing well, due in part to the care she has received in both Wisconsin and Philadelphia. He says he is truly pleased to be able to be a part of the future of JRA research at Children’s Hospital. “To me, providing the seed money to an institution that can immediately leverage it for JRA research is ideal. I’m very optimistic about the advances Dr. Finkel and her team can make in this area,” he says.