

News from the Center on Human Development and Disability at the University of Washington Health Sciences Center

Medical Genetics Clinic offers diagnosis, counseling for individuals and families with inherited disorders

The clinic waiting room at the University of Washington's Center on Human Development and Disability is frequently filled, usually with parents seeking help for their young children who have developmental disabilities. But on some clinic days, multiple generations of extended families gather to meet with experts in the center's Medical Genetics Clinic and learn how an inherited disorder has affected members of their family.

"Our waiting rooms are often full," said Robin Bennett, M.S., CGC, clinic manager and senior genetic counselor. "As a genetic counselor, you see a whole family and you recognize the spectrum of their particular disorder, where some are moderately affected and some more severely." Also on staff are genetic counselors Corrine Smith, M.S., CGC, Whitney Neufeld-Kaiser, M.S., CGC, and Mercy Laurino, M.S.; social worker Catherine Kendall, MSW, and program coordinator Debra Olson, B.S.

The clinic has seen marked growth since the advent of genetic testing for many inherited disorders, said Bennett, who joined the clinic in 1984 and is now president of the National Society of Genetic Counselors. "For many years we saw 200 to 300 patients a year. Now, we see more than 1,200 people a year in our two locations at CHDD and University of Washington Medical Center."

Last year the clinic saw people from all over the Northwest with almost 200 different genetic diseases, with a focus on neurogenet-

ics, connective tissue disorders, hereditary skin disorders and cancer genetics. Among the disorders more commonly seen are Huntington's disease, Turner syndrome, the hereditary ataxias such as spinocerebellar ataxia, Marfan syndrome, Ehlers-Danlos syndrome, neurofibromatosis and Von Hippel Lindau disease. The UW has been named a National Center of Excellence for many of these disorders.

While many genetic conditions can be confirmed by testing at UW laboratories, often blood or tissue samples must be sent away for analysis. "Some diseases we see are so rare that only one laboratory in the world is equipped to do the test," said Bennett.

During an initial visit, a genetic counselor takes an extensive family history, usually involving three or four generations, to determine who in the family has the disorder and who does not, and how it manifests itself. Medical records are collected to document the condition in various family members. A family tree called a pedigree

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Robin Bennett, MS, CGC

National practice guidelines for counseling individuals with fragile X syndrome

Robin Bennett has been a leader of national efforts to write genetic counseling practice guidelines for inherited disorders, including fragile X syndrome, the most common inherited cause of mental retardation. The guidelines are published on the website of the National Guideline Clearinghouse, www.ngc.gov.

In addition to mental retardation, fragile X syndrome often includes emotional and behavioral problems and seizures, as well as characteristic physical features: a long face, large ears, flat feet and hyperextensible joints. Individuals with fragile X syndrome have a mutation of the FMR1 gene on the X chromosome, a "fragile site" where there is an expanded DNA sequence (a triplet repeat). Since it is an X-linked disorder, males are affected more severely than females, who have a gene on their other X chromosome that functions normally.

The Center on Human Development and Disability is es-

tablishing a national center of research into the molecular mechanisms of fragile X syndrome, with the goal of contributing knowledge that could lead to effective treatment. Research-oriented clinicians will increase the clinical presence at CHDD of patients with fragile X, work collaboratively with laboratory scientists, and interact with colleagues at other sites.

The genetic counseling guidelines of which Bennett is an author state that working with individuals and families with fragile X syndrome requires a long-term commitment on the part of the genetic counselor. Counseling includes taking a family history of three or more generations, a detailed medical history and a pregnancy history of carriers at risk, as well as educating the family, assessing risk for other family members, testing for the gene, addressing psychological and ethical issues, and following up with education, referrals to professionals and support groups.

Neurogenetics Clinic counsels people at risk for inherited neurological disorders

The Neurogenetics Clinic, a subspecialty clinic of the Medical Genetics Clinic, offers genetic diagnosis for neurodevelopmental and neurodegenerative disorders. Established in 1974, it was the first neurogenetics clinic for adults in the United States. The medical director is Thomas Bird, M.D., professor of medicine, neurology and medical genetics, CHDD research affiliate and coordinator of CHDD's Research Emphasis Area on Neurodegenerative Disorders.

The clinic focus is on inherited neurological disorders as they affect adolescents and adults, including Huntington's disease, Charcot-Marie-Tooth disease (a common inherited neurological disorder in which those affected gradually lose sensation and use of their limbs as nerves in the extremities degenerate), some forms of muscular dystrophy, and the hereditary ataxias (which involve degeneration of the cerebellum, a part of the brain that governs coordination), as well as disorders that may have a genetic component, such as Alzheimer's disease, Parkinson's disease and ALS (Lou Gehrig's disease).

The disorder seen most frequently at the Neurogenetics Clinic is Huntington's disease (HD). HD is an autosomal dominant disease: each child of a parent who carries the gene for the disease has a 50/50 chance of inheriting it. "Some people have the test for HD because they are having symptoms, and they are confirming the diagnosis," Bennett said. "Others are not symptomatic and want to know whether they inherited the gene."

People at risk for HD meet with a genetic counselor before testing. "We talk about the pros and cons of testing, and how the knowledge of their status will impact their lives, as well as the lives of their family," said Bennett. "They talk about life decisions they might make differently based on the test results."

The decision to be tested for HD is often excruciatingly difficult, since there is no treatment as yet for this progressive and ultimately fatal neurodegenerative disorder. Those at risk because HD runs through their family must decide whether it is preferable to live with uncertainty or to know one's future, positive or negative. The decision to be tested is sometimes made in the context of whether to have children, since HD symptoms may not appear until after the prime child-bearing years. After counseling, those who decide to be tested make a return visit to the clinic for a neurological exam with Dr. Bird and more counseling. They return once more to receive the laboratory results.

"While you would think there is a great sense of relief to learn that one has not inherited HD, many people have a hard time with the good news," said Bennett, "because it doesn't take away the disease in the family. There is 'survivor's guilt' that can be very strong. Some people have lived their lives as if there is no tomorrow, because they think it's almost literally true. Then, when they have their futures given back to them, they have a hard time dealing with it. They may regret past decisions about personal relationships or having chosen not to have children. As genetic counselors, we help them to deal with these issues."

Medical Genetics Clinic (from page 1)

is drawn up, to illustrate the presence of the malfunctioning gene in family members through the generations. Genetic diseases are inherited in various ways: some manifest themselves in every generation; others affect only males in the family, coming down, for example, through unaffected mothers to their sons. "People come to our clinics because they're not sure whether they have inherited a disorder that they might pass on to a child," Bennett said. "Perhaps they have a brother or sister with a developmental disability, and they wonder whether there is a genetic cause. We need to evaluate the sibling to know what genetic test should be done." While the clinic assists people in making general decisions about childbearing, the UW has a separate prenatal diagnosis clinic for couples expecting a child.

"Genetic conditions frequently affect multiple systems in the body, so people are seen by an interdisciplinary team with a wide range of expertise," said Bennett. "Genetic counselors are always present, because we are experts at giving information to people in an understandable way, getting them into support groups, doing follow-up, and helping with any genetic testing. We take care of the whole person, and we work with the individual's health care provider in their home community. We're a consultative service, as well as a multidisciplinary management site.

"For some people, there is a sense of relief to finally have a diagnosis for a condition that may have affected their family for generations," said Bennett. "They are gratified that we know the name of their disorder, we can spell and pronounce it, and we can refer them to support groups and other services. At the same time, it may be a shock to learn that others in their family are at risk. There can be a lot of grief, which is one of the reasons that this special field of genetic counseling exists. We counsel and support the whole family."

Reprinted from CHDD *OUTLOOK*, published by the Center on Human Development and Disability (CHDD) at the University of Washington Health Sciences Center. An electronic version is at <http://depts.washington.edu/chdd/OUTLOOK/OUTLOOK.html>

CHDD is an interdisciplinary center dedicated to the prevention and amelioration of developmental disabilities through research, training, clinical service and community outreach. CHDD includes the University Center of Excellence in Developmental Disabilities and the Mental Retardation and Developmental Disabilities Research Center.

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