Duane Alexander
Oral History Interview
2005

Claudia Wassmann: December 16, 2005. My name is Claudia Wassmann, and I'm doing an interview with Dr. Duane Alexander.

Duane Alexander: Okay. NICHD's interest in the Neuroimaging field has been largely in magnetic residence imaging for a variety of reasons. First, we wanted to use it to study the developing brain and then to be able to use it in children, who are less cooperative, perhaps, than adults in their ability to sit still long enough for a procedure. So the kinds of things that we have done are trying to support the shortening of the time that a person needed to be still for a procedure, supporting research largely done at the Kennedy Krieger Institute at Johns Hopkins with psychologists developing ways to try to train children to sit still -- lie still in the machine long enough to get the images, and using really operant conditioning techniques to do this. And this was done, not with just normal children who could communicate fairly well, but with younger children and with children with intellectual disabilities, cognitive problems so that they were not able to understand instructions as well.

This is -- studies of children with mental retardation syndromes is a particular interest of the institute, and it was a real challenge because of the need to do these studies in these kids in as short a time as possible but get kids first to accept going into the instrument and lying there and then holding still while they were there. And these investigators really worked with operant conditioning types of principles and techniques to get the children, both normal and mentally retarded to hold still during the procedure so they could get the images without the distortion and blurring caused by movement.

CW: How young were the children? How far…?

DA: We could get them down to preschool, preschool kids. The other interest we had was trying to do infants, and only the technology that markedly shortened the time for imaging has permitted the study in younger kids. An outgrowth of this has been an interest in looking at the developing brain normally. Because we, in pediatrics, have to deal with growth and development all the time. And it's just as true with the brain and the nervous system as it is of anything else. What we have done in this area has really been to put together a consortium of institutes interested in imaging and children. Mental health, Neurology, in particular, and drug abuse to build a library, a reference standard of the normal brain with MRI at various ages of kids, and following the same children longitudinally to get pictures of how the brain changes as the child gets older and develops. Because without normal standards, Neuroradiologists really don't have any basis for comparison of whether this is normal for this age or abnormal for this age or whatever. So we have really tried to build the reference standard of what the MRI image of the brain is normally at various ages and particularly the younger ages.

So that's been a project that's been going on for several years now with excellent cooperation from -- and funding, co-funding from the institute participating in this.

CW: So did you recall when it started, approximately?

DA: That effort started about five years ago.

CW: Five years ago, and is there someone I should talk to who was the initiator?

DA: Yeah, Lisa Freund from our institute has been the main driver and leader from that group from NICHD, and she has counterparts in the other institutes that have worked with her. And the other thing that has evolved has been the functional MRI. And as that has developed, we've also wished to try to get normative standards for FMRI for children at various ages and stages of development as well. So that's a process that hopefully we're going to be able to build onto the just regular MRI standards and get standards for FMRI as well. The other thing that NICHD has contributed from its intramural program has been diffusion tensor imaging. So our physical scientists in the intramural program have helped to develop that whole new imaging technique. That offers a major edge on to what a regular MRI does. So hopefully this is starting to enter into wider use now, and we're probably going to have to do the same things in terms of building the database for the normal standards for DTI that we've done for MRI.

CW: Okay.

DA: That's it.

CW: Thank you very much. That was wonderful.

DA: Yeah, that's just about all I know.

CW: So at the moment that your institute got involved in imaging was pretty much in the mid-'90s or…?

DA: Yeah, probably. Oh, let me say -- add another thing. One of very most valuable uses we've had with this has been with FMRI, when it came along, using it with kids with reading disability and other learning disabilities, showing how the brains of Children who are normal except for reading disability differ from children who are normal and don't have a reading disability. And how that pattern of F1 FMRI changes with appropriate instruction for these kids who do have a disability and how it tends to change in some instances toward a normal pattern, but in other instances toward a different abnormal pattern that bypasses the usual normal pattern but still allows these kids to develop the reading skill and to function. So that's been very instructive as a means of studying these kids with this particular learning disability. And we suspect that it will carry over into kids with other learning problems as well. But that's been a major contribution of FMRI to our study of these kids with learning disabilities.

CW: And who is the person I should talk to in regards to that?

DA: From NICHD, probably Peggy McCardle in our Human Learning and Behavior branch or Child Development and Behavior branch. And she's in the same branch with Lisa Freud, whose name I gave you.
CW: Okay, well, thank you very much.

DA: Okay. That's about all I have to contribute to this one.