

# ALZHEIMER'S DISEASE

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HEARING  
BEFORE A  
SUBCOMMITTEE OF THE  
COMMITTEE ON APPROPRIATIONS  
UNITED STATES SENATE  
ONE HUNDRED FIFTH CONGRESS  
SECOND SESSION

**SPECIAL HEARING**

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## **ALZHEIMER'S DISEASE**

**TUESDAY, MARCH 24, 1998**

U.S. SENATE,  
SUBCOMMITTEE ON LABOR, HEALTH AND HUMAN  
SERVICES, AND EDUCATION, AND RELATED AGENCIES,  
COMMITTEE ON APPROPRIATIONS,  
*Washington, DC.*

The subcommittee met at 9:30 a.m., in room SH-216, Hart Senate Office Building, Hon. Arlen Specter (chairman) presiding.  
Present: Senators Specter, Faircloth, Craig, and Harkin.  
Also present: Senator Grassley.

### **NONDEPARTMENTAL WITNESSES**

#### **STATEMENTS OF:**

**PIPER LAURIE, ACTRESS**

**ORIEN REID, SENIOR VICE CHAIR, BOARD OF DIRECTORS, ALZHEIMER'S ASSOCIATION**

**ROSEMARY CRONIN, WIFE OF ALZHEIMER PATIENT**

**ACCOMPANIED BY BOB CRONIN, ALZHEIMER PATIENT**

#### **OPENING REMARKS OF SENATOR SPECTER**

Senator SPECTER. Good morning, ladies and gentlemen. The hour of 9:30 a.m., having arrived, we will begin this hearing of the Appropriations Subcommittee on Labor, Health and Human Services, and Education.

We are delighted to welcome the Alzheimer's Association for our first hearing this morning. This is the 10th anniversary of the Alzheimer's Association Public Policy Forum. This morning's hearing is the kickoff for their Capitol Hill Day.

Alzheimer's disease is tragic, all-encompassing. It has struck some 4 million Americans, at an enormous cost in human suffering, family suffering, and dollars and cents. There is a concern that there may be as many as 14 million people suffering from Alzheimer's disease [AD], by the time the baby boomer generation reaches the age of 65. At 65, the statistics show that 1 in 10 persons has Alzheimer's, and nearly one-half of those over the age of 85 have Alzheimer's disease.

It is enormously expensive. Its impact was brought sharply into the American focus when President Reagan made the public statement that he had Alzheimer's. Just last week, our former colleague, Senator William Proxmire, made a public statement that he has Alzheimer's.

If the incidence of Alzheimer's can be delayed by some 5 years, the estimates are that we would cut costs by as much as \$50 bil-

lion. Those figures are really hard to quantify, but there is no doubt that if Alzheimer's could be delayed, it would be an enormous economic saving to the country. A conservative estimate places the cost of Alzheimer's at something in the range of \$100 billion a year.

There is an effort to increase funding for Alzheimer's by \$100 million this year. That is a laudable goal. The fiscal year 1998 funding was a shade under \$350 million—\$349.2 million. The goal which Senator Harkin and I have, along with this subcommittee, the full appropriations committee, the Senate and the Congress, is to see if we cannot double the National Institutes of Health research funding in the next 5 years.

But candidly, it is easier said than done. On Capitol Hill, you get a lot of smiles and sometimes not much cash. Last year, the Senate passed a resolution unanimously, 100 to nothing, affirming the goal of doubling National Institutes of Health funding in 5 years. National Institutes of Health is where Alzheimer's research gets its money. However, when the budget committee returned the health account, it was short \$100 million.

Senator Harkin and I then offered a resolution to increase the funding for NIH by \$1.1 billion, because we had targeted a 7.5-percent increase. If we added \$1.1 billion it would net down to \$952 million, which was what our goal was. That resolution lost, 63 to 37. So, the Senate was very good in expressing its druthers, but not very good in expressing its dollars.

Senator Harkin and I went back to the drawing board—I hate to say so many good things about him in his absence, but he will be along in a minute or two. [Laughter.]

I know he has another commitment.

We went to work with the sharp pencils, and we found the money in the balance of the budget for our three subcommittees. But, when we take money for NIH, candidly, we are shorting education in some phase, or worker safety. Our funding not only goes for the Department of Health and Human Services, but also for Education and for Labor, which includes labor safety.

However, we were able to work out the \$952 million in the Senate bill. In conference, we retained \$907 million, which was a very, very large addition to the NIH funding, but candidly, in my sense, not enough.

We have a Federal budget of \$1.7 trillion. Do you know how much money that is?

Well, nobody else does either. [Laughter.]

But this large room would have insufficient space to stuff 10,000-dollar bills into it.

And I believe that if we set our priorities right, we could double the funding for NIH in 5 years. [Applause.]

I do not mind being interrupted for applause. [Laughter.]

The hearing we have today, with so many prominent people, will help us in this respect.

I am delighted now to yield to my distinguished colleague, the senior Senator from Iowa. Senator Grassley and I were elected in the same year, 1980. Senator Grassley chairs the Senate Committee on Aging, which has a very large role on Alzheimer's funding and has done an excellent job.

The only disadvantage that Senator Grassley has labored under in his 17 years and almost 3 months in the Senate is that in many quarters he is mistaken for me. [Laughter.]

You can see how erroneous that is, what a good-looking fellow Chuck Grassley is.

I am delighted now to yield to my colleague, Senator Charles E. Grassley. [Applause.]

OPENING REMARKS OF SENATOR CHARLES E. GRASSLEY

Senator GRASSLEY. I appreciate the applause, but it is not quite appropriate for a congressional hearing. And I will just say that so that the chairman will not have to gavel the audience while he is the chairman.

Senator SPECTER. There was not all that much applause.

Senator GRASSLEY. OK. [Laughter.]

First of all, I thank the chairman of this subcommittee, Senator Specter, for inviting me to visit. I am here to advocate more money for research, but I am also here to welcome Mr. and Mrs. Bob Cronin, from the State of Iowa, who are going to testify on the importance of money for Alzheimer's research and also to tell you about the struggle of their family with this disease.

As chairman of the Special Committee on Aging, I am especially concerned about the financial and emotional consequences of Alzheimer's disease. Four million people in the United States suffer from this disease. This number does not include the millions of family members who also have to cope with the disease because of somebody else in the family suffering.

With the aging of the baby boomers, 14 million in the United States are expected to have Alzheimer's disease by the middle of the next century. This will affect tens of millions of family members and friends. Past investments in research have allowed for important advances in the understanding of this disease.

For instance, we now know that the disease process may begin in the brain as much as 20 years before symptoms of Alzheimer's appear. New techniques are now available for diagnosing the disease. And two drugs have shown some success in helping slow the progress of the disease. We are also learning how inexpensive treatments like vitamin E may help to slow or prevent the disease.

So I commend Senator Specter for calling this hearing to highlight the importance of medical research for Alzheimer's disease. The chairman can be certain that I understand the challenges of crafting one of the most difficult and perhaps the most complex appropriation bills Congress must consider each year. And I can say flat out that probably this bill is the most difficult of all 13 that the Appropriations Committee must put together. So Senator Specter has the most difficult job.

To help meet the urgent needs of research, I would like to ask the distinguished chairman to keep in mind the importance of adequate funding for the National Institutes of Health for Alzheimer's Research. The challenges and opportunities surrounding our aging populations has never been greater.

Thank you, Mr. Chairman.

Senator SPECTER. Thank you very much, Senator Grassley.

## OPENING REMARKS OF SENATOR LAUCH FAIRCLOTH

We have just been joined by our distinguished colleague from North Carolina, Senator Faircloth.

Lauch, would you care to make an opening statement?

Senator FAIRCLOTH. Yes, I do, Senator Specter.

I want to thank everyone for your expression of interest in a disease that promises to be the epidemic of the millennium. This epidemic is one marked with the agony of saying goodbye to someone who will linger as a ghost before us for years. I watched this with a member of my family, and I have seen it with others.

What other disease do we know today that can cause someone to intentionally abandon a parent at a baseball game or shopping center just to stop the pain?

It is a tragic disease, and there is no such thing as a mild case or an easy case. Everyone with Alzheimer's will ultimately need full-time care. And with the growing number of two-worker families, how will our society of aging baby boomers and their children cope with this disease?

Thanks to the wonderful people at the Bryan Alzheimer's Research Center at Duke University in my home State of North Carolina, the gene markers for the disease have been identified. The Bryan Center was one of the first of 28 Alzheimer's disease research centers to be established. They were the first center to report on the genetic link to the disease in 1993.

I want to welcome the very distinguished Director of Bryan Center, Dr. Don Schmechel, who will be testifying today. Aside from his world-famous research on the disease, Dr. Schmechel still takes time several days a week to treat Alzheimer's patients and their families.

I had a very, very small part to play in encouraging Mr. Bryan to establish the center. I was with him many nights, in discussing what could be done and what might be done. As many of you might know, my mother-in-law, Mrs. Bryan, had Alzheimer's for about 10 years. So it was a very moving time with him. He was determined to try to do something about it, and in the establishing the center, I think he has.

I thank you, Mr. Chairman.

Senator SPECTER. Thank you very much, Senator Faircloth.

We would now like our panels to come forward: Mr. Bob and Mrs. Rosemary Cronin, Ms. Piper Laurie, Ms. Orien Reid, and Dr. Steven DeKosky, and Dr. Don Schmechel.

We are going to defer the testimony of Mr. and Mrs. Cronin for just a moment or two, because Senator Harkin has not yet finished with a commitment, but will be here shortly. Mr. and Mrs. Cronin are from Iowa so I hope Senator Grassley will not mind that we have both of the Senators from Iowa here when their constituents testify.

## SUMMARY STATEMENT OF PIPER LAURIE

We are very pleased to welcome the distinguished, award-winning actress, Ms. Piper Laurie, nominated for three Academy Awards. This is a propitious time to have you here, Ms. Laurie. She won a Golden Globe for her role in the television series "Twin

Peaks,” an Emmy for the Hallmark Hall of Fame production “Promise.” She has performed in numerous plays, from the “Glass Menagerie,” on Broadway, and, more recently, the “Cherry Orchard.”

We thank you for your interest in helping us focus attention on Alzheimer’s. And we look forward to your testimony. We are asking each witness to limit their testimony to 5 minutes. We will have the green light on, amber at 1 minute and red at stop. And the floor is yours, Ms. Laurie. Please proceed.

Ms. LAURIE. Mr. Chairman, members of the committee, thank you for inviting me here today to testify about an issue that is very important to me, that I know something about on several different levels.

My father, who died 2 years ago from Alzheimer’s, developed it very late in life. He was blessed, because he did not have to suffer through the worst symptoms of the disease. And in a strange way, I have lost not one, but two fathers to the disease. I began my film career in a film, playing Ronald Reagan’s teenager daughter, a movie called “Louisa.” It was my first film. And it was a critical time for me personally and professionally.

Ronald Reagan was so supportive to me. In some ways, he was as important to me as my real father. I know that he had a genuine fondness for me. But I probably no longer exist in his consciousness.

As an actress, I have played a person with Alzheimer’s three times. In order to do research, I tried very hard to get inside, into the mind, into the feelings of the person with Alzheimer’s. I went to many, many day care centers, spent days there, and nursing homes. I talked to doctors. I spent my time eating with the patients, playing games with them. They accepted me as one of them.

I would go home with them and meet with their caretakers. And it is never possible to fully understand another human being, but I did learn a lot.

Having Alzheimer’s is like waking up from a nap and finding yourself on a park bench in a city you have never been to. It is being in your home and not feeling that you are home. It is that ever-present suspicion that the people who are being kind to you and who are just a little bit familiar with you are actually strangers. The yearning to find that one familiar place, comfortable place that you can trust. And especially in the early stages, the constant seeking of approval, the tentative speech, the wanting reassurance that you are not doing something to embarrass yourself.

My father was a very dignified man. And he was very proud of what he had accomplished, even though he was very shy because he had not had much schooling. He had to work in his father’s bakery.

Later, he went into the furniture business and became very successful. He was very proud of that. In his later years, after he retired, he had a routine. He would bound onto his exercycle every morning and pedal away for 20 minutes. And, finally, when he was 92, the exercycle broke down and he did, too.

For my father, the disease brought many indignities to a very dignified man. And then, later on, when he was in a small nursing home, even though the children, the grandchildren and the great



grandchildren would come to visit him, he finally had grown so weary of the confusion and the anxiety that he walked into the backyard one day, removed all of his clothes and laid down on the earth. Someone came up and asked to help him and he whispered, "I just want to go to sleep."

Fifteen or 20 years ago, it was a rare occurrence that you met anyone who had any connection with Alzheimer's. Now, no matter where I go, I always find someone who has a loved one who has the disease. The human costs are staggering. We must find a cure, to prevent the terror and the indignities of this disease.

PREPARED STATEMENT

If I could give a voice to my father and to all of the other people I have known who have the disease, if I could imagine what they would want me to say to you, it would be this: Please, there really is a person here. Listen to my feelings. Do not ignore me. Deal with me. Do not forget me. I am here.

Thank you for letting me speak to you today. [Applause.]

Senator SPECTER. Thank you very much, Ms. Laurie, for that very impressive bit of testimony. We really appreciate your being here.

[The statement follows:]

PREPARED STATEMENT OF PIPER LAURIE

Mr. Chairman and members of the Committee. Thank you for inviting me to testify today about an issue that is very important to me and that I feel I know and understand on many levels. My father, who died two years ago, developed Alzheimer's late in life. He was blessed, not only because he lived only a few years with the worst symptoms of the disease, but also because we found him a wonderful home in Arizona where he was well cared for until he died.

I know this disease because I feel I've lost not one, but two fathers to the disease. I began my film career as Ronald Reagan's daughter in the movie "Louisa." That was my very first film and it was a critical time in my professional development. Ronald Reagan was so supportive of me. In many ways, I suppose, he was as important as my real father. Now he is lost to this disease, too.

As an actress I have played the role of a person with Alzheimer's in three different productions. One was a television series with George C. Scott. Another was in the USA movie "Road to Galveston." And, more recently, I have done readings of a new play, a work in progress based on the documentary, "Complaints of a Dutiful Daughter." To fully understand these roles, I tried hard to "get inside" the people who have this disease. I spent hours and hours in day care centers and nursing homes. I ate meals with the residents. I played games with them. They accepted me as one of them. I talked with them and got to know their families and their caregivers. While it is never possible to fully understand another human being, I did learn a lot.

Having Alzheimer's disease is like waking up from a nap and finding yourself on a park bench—in a city you have never been to—surrounded by people you don't know and things you don't recognize. The terror of that!

Alzheimer's is being in your own home but not knowing you are home. It is that ever-present feeling of wanting to go home, of searching for that safe place. Perhaps this is why so much time is spent packing things. The half acted-upon impulses. The constant seeking of approval, of reassurance that you haven't done anything to embarrass yourself. The wandering. And it is so heart-wrenching that no matter how hard one tries, it is not possible to find that place of familiarity and trust.

I remember a man I met who was a volunteer at a day care center. He had nursed his wife with Alzheimer's for 10 or 15 years. They would go to bed at night and make love. Then she would turn and look at him and scream, "Who are you? Get out of here!" The horror and pain of that!

My father was a dignified man and proud of what he had accomplished, even if a little shy about his lack of education. As a child, he worked for his father in the bakery business and was unable to attend school. He eventually owned his own fur-

niture business, an accomplishment he was very proud of. As his mind slipped away during his last few years, my father talked a lot about the bakery and furniture businesses. These were safe, familiar topics he could grab hold of, an anchor to his past that affirmed him as a person.

For my father, the disease brought horrible indignities to a very dignified man. While living at home in a retirement community where he fortunately knew most people, he would wander in his pajamas. And then later on when he was in a small nursing home in Arizona, he had grown so weary of the confusion and anxiety that he walked into the backyard one day, removed all of his clothes and lay down on the earth. When someone came to help him he whispered, "I just want to go to sleep."

Eventually, my father stopped eating and drinking and only then did he find peace.

Fifteen or twenty years ago it was a rare acquaintance who had any connection with someone with Alzheimer's disease. Today, it is epidemic. Almost everywhere I go I meet someone who has a parent or other loved one with the disease. The human costs are staggering. We must do something to end this epidemic. We must find a cure to prevent the terror, the indignities of this disease.

If I could give a voice to my father and to all the people I have met who have this disease, if I could imagine what they would want me to say, it is this:

please, there is a person here  
listen to my feelings  
deal with me  
don't forget me  
don't ignore me  
please, I am here \* \* \*

Thank you for letting me speak to you today.

#### SUMMARY STATEMENT OF ORIEN REID

Senator SPECTER. We turn now to Ms. Orien Reid, consumer reporter for WCAU-TV in Philadelphia. Ms. Reid has served both on the local board of directors of the Alzheimer's Association of Southeastern Pennsylvania and currently serves as the senior vice chair of the National Board of the Alzheimer's Association. Ms. Reid's family has been afflicted by Alzheimer's disease, with the death of her mother and uncle after a long battle with the disease.

On a personal note, I have known Ms. Reid for many years. I have had the pleasure of being interviewed and questioned by her for many years. I am glad to have the chance this morning to reciprocate. [Laughter.]

Ms. Reid, the floor is yours.

Ms. REID. Thank you, Senator Specter. Thank you, Senator Grassley, Senator Faircloth, for inviting me to testify today at this very important hearing.

I am here to speak not only for my own family and for the hundreds of Alzheimer's families gathered in this room today, but also for the millions of families like us across the country. I serve as senior vice chair of the board of directors of the Alzheimer's Association. It is the only national voluntary health association which exists to represent the interests of persons with Alzheimer's disease and their families, and the only association to support research to find answers to this horrible plague.

In my other life, as you mentioned, I am a consumer reporter for NBC-10 in Philadelphia.

Several years ago, I testified before a House committee on the impact of Alzheimer's disease on a typical family. That was my family, my mother, myself, and my two children. And we asked Congress to consider ways to support families, to relieve some of

the huge financial burden of long-term care. Today I am here for a different reason. And that is to ask you to increase the appropriations for Alzheimer's research by \$100 million this year, to launch a major new research initiative to find a way to prevent Alzheimer's disease.

You have two eminent Alzheimer's researchers here to tell you about the exciting scientific opportunities that are in front of us—opportunities that we will lose if we do not make a major investment now. And I would not presume to talk about the science, but I can tell you about the urgency of the problem the scientists are trying to solve.

As you mentioned, my mother had Alzheimer's disease. It totally devastated me to watch the disease destroy the mind of a woman who had counseled eminent leaders, like the late Dr. Martin Luther King, Jr., and former Atlanta Mayor Maynard Jackson. Shortly after her retirement from Morehouse College in Atlanta, GA, I noticed a radical change in my mother's personality. She had lost her memory, or was losing her memory.

This was a woman who had become docile, had become fearful and a little less attentive to her appearance. So we lost a part of her. It was a shocking change in a woman who had been very eloquent, proud, elegant, and she was a graceful woman, full of Southern charm and strong determination. In the early stages of the disease, I was my mother's long-distance caregiver, I living in Philadelphia and she in Atlanta.

But, finally, I realized I just simply could not let her live alone. So with a great deal of adjustment, I brought my mother to live with me, into my home, where I cared for her for almost 2 years.

My mother's Alzheimer's disease forced a major disruption in my personal and my professional life. And those were sacrifices I was willing to make, and would do so all over again. But it also robbed my son and my daughter of their childhood. It took the money, all of the money, that I had saved for their college education, and it left an indelible mark on their lives that continues today.

My children and I are frightened by the prevalence of this disease in my family. My maternal grandmother died in 1962, with dementia, my mother 30 years later, with Alzheimer's disease. And her brother, my uncle, died just last July 4 with Alzheimer's disease. Her sister, my aunt, now suffers from the disease. And she lives with my cousin, her daughter, in the Washington, DC, area.

My greatest fear is that Alzheimer's disease has already started to eat away at my brain, too, and that my children will be forced to live this nightmare all over again. And the news report just last week about a new study, showing that African-Americans and Latinos may be at a higher risk of Alzheimer's disease does absolutely nothing to ease my mind.

I am not alone in my fears. There are 14 million baby boomers in the United States today who will get Alzheimer's disease if you do not find a way to stop it. Scientists tell us that Alzheimer's disease does not happen overnight, that it may take as long as 20 years for the disease to progress enough and to do enough damage, so that symptoms appear. That means that many of us already, in this room today, have a time bomb that is ticking away in our

brains. And you are the only ones to prevent the explosion, by supporting the research that will find a way to defuse it.

Now, earlier this month, the Bipartisan Commission on the Future of Medicare held its first meeting. The Commission has a daunting task ahead of it, as it seeks ways to find a way to assure the financial stability of the program into the 21st century. The Alzheimer's Association is ready to work with the Commission as it looks for affordable ways to meet chronic health care needs of Medicare beneficiaries.

But it is difficult to see how you can save Medicare if you let 14 million baby boomers get Alzheimer's disease. According to HCFA, Medicare is spending 70 percent more per capita on beneficiaries who have Alzheimer's disease, even though Medicare does not pay for the long-term care they need.

I know from my mother's experience what a threat Alzheimer's disease poses to the health care system. Medicare, of course, did not pay for the long-term care, but it did pay for two lengthy hospitalizations that were a direct result of her dementia. Alzheimer's disease robbed her of her balance, and she fell repeatedly. Once she broke her back. The second time she broke her hip. And it was after that second accident that she died of a pulmonary embolism.

Alzheimer's disease will reach epidemic levels in the 21st century. We cannot wait until the epidemic hits to try and do something about it. By then, it will be too late. That is why the Alzheimer's Association will triple its investment into Alzheimer's research over the next 3 years. We will do everything we can to bring as much private money as we can into the search for answers. But we all know it will take the resources of NIH to harness this disease.

#### PREPARED STATEMENT

And so we are asking you to join us in this fight by increasing funding for Alzheimer's research by \$100 million this year. Time is running out. Please, for all of us in this room, for your children and your grandchildren, please act now.

Thank you. [Applause.]

Senator SPECTER. Thank you very much, Ms. Reid.

[The statement follows:]

#### PREPARED STATEMENT OF ORIEN REID

Thank you very much, Senator Specter, for inviting me to testify today at this very important hearing. I am here to speak for my own family, for the hundreds of Alzheimer families gathered in this room today, and for the millions of families like us across the country. I serve as senior vice chair of the Board of Directors of the Alzheimer's Association, the only national voluntary health association that exists to represent the interests of people with Alzheimer's disease and their families, and to support research to find answers to this horrible plague. In my other life, I work as a television consumer reporter for NBC 10 in Philadelphia.

Several years ago, I testified before a House Committee on the impact of Alzheimer's disease on a typical family—my mother, myself, and my two children—to ask Congress to consider ways to support families and relieve some of the huge financial burden of long term care. I am here for a different reason today—to ask you to increase appropriations for Alzheimer research by \$100 million this year, to launch a major new research initiative to find the way to Prevent Alzheimer's Disease.

You have two eminent Alzheimer researchers here to tell you about the exciting scientific opportunities that are in front of us—opportunities we will lose if we do

not make a major investment now. I would not presume to talk about the science. But I can tell you about the urgency of the problem the scientists are trying to solve.

My mother had Alzheimer's disease. It devastated me to watch the disease destroy the mind of a woman who had counseled imminent leaders like the late Dr. Martin Luther King, and former Atlanta Mayor, Maynard Jackson. Shortly after her retirement from Morehouse College, I noticed a radical change in her personality. She lost her memory. We lost a part of her, as she became docile, fearful and a little less attentive to details like her appearance. It was a shocking change in an eloquent, proud, elegant and graceful woman, full of Southern charm and strong determination.

In the early stages of her disease, I was my mother's long distance caregiver—she in Atlanta, I in Philadelphia. Finally, I could not let her live alone, so with a great deal of adjustment, I brought my mother into my home where I cared for her for almost 2 years.

My mother's Alzheimer's disease forced a major disruption in my personal and professional life. Those were sacrifices I was willing to make. But it also robbed my son and daughter of their childhood, took the money I had saved for their college education, and left an indelible mark on them that continues to affect their lives.

My children and I are frightened by the prevalence of this disease in our family. My maternal grandmother died with dementia in 1962. My mother died from Alzheimer's Disease 30 years later in 1992. Her brother, my uncle, died from Alzheimer's Disease on July 4th of last year. Her sister, my aunt, has the disease now and is living with my cousin, her daughter, in the Washington, DC area.

My greatest fear is that Alzheimer's disease has started to eat away at my brain too, and that my children will be forced to live the nightmare again. The news report last week, about a new study showing that African-Americans and Latinos may be at higher risk of Alzheimer's disease, does nothing to ease my mind.

I am not alone in my fears. There are 14 million baby boomers in the United States today who will get Alzheimer's disease, if we don't find a way to stop it. Scientists tell us that Alzheimer's disease does not happen overnight—that it may take as long as 20 years for the disease to do enough damage that symptoms begin to appear. This means that many of us in this room today have a time bomb already ticking in our brains. And you are the only ones who can prevent the explosion, by supporting the research that will find a way to defuse it.

Earlier this month, the Bipartisan Commission on the Future of Medicare held its first meeting. The Commission has a daunting task ahead of it, as it seeks to find a way to assure the financial stability of the program for the 21st century. The Alzheimer's Association is ready to work with the Commission as it looks for affordable ways to meet chronic health care needs of Medicare beneficiaries.

But it is difficult to see how you can save Medicare, if you let 14 million baby boomers get Alzheimer's disease. According to HCFA, Medicare is spending 70 percent more per capita on beneficiaries who have Alzheimer's—even though Medicare does not pay for most of the long term care they need. I know, from my mother's struggle with the disease, what a threat Alzheimer's poses to the health care system. Medicare did not, of course, help pay for her long term care. But it did pay for two lengthy hospitalizations that were a direct result of her dementia. Alzheimer's disease robbed her of her balance and she fell repeatedly. Once, she was hospitalized with a broken back. Another time, with a broken hip. It was shortly after the second accident that she suffered a pulmonary embolism and died.

Alzheimer's disease will reach epidemic levels in the 21st century. We cannot wait until the epidemic hits to try to do something about it. By then, it will be too late. That is why the Alzheimer's Association will triple its investment in Alzheimer research over the next 3 years. We will do everything we can to bring as much private money as we can into the search for the answers. But we all know it will take the resources of the NIH to harness this disease.

We are asking you to join us in this fight, by increasing funding for Alzheimer research by \$100 million this year. Time is running out! Please, for all of us in this room, for your own children and grandchildren, act now.

Thank you.

#### REMARKS OF SENATOR HARKIN

Senator SPECTER. I turn now to our distinguished colleague, Senator Tom Harkin, of Iowa. Senator Harkin is the ranking member of this subcommittee and who has been a real crusader and leader on this subject for the 14 years he has been in the Senate, and before that in the House of Representatives.

Senator Harkin.

Senator HARKIN. Mr. Chairman, thank you very much. I apologize for being late. I had a doctor's appointment this morning I had to make, and so I apologize to our panel for being late here.

But I did want to be here for this panel, especially for Bob and Rosemary Cronin, of Iowa. And I welcome you here. And I will introduce them in just a second.

But I just want to say, Mr. Chairman, thank you for your strong leadership in this area and in all areas of biomedical research. You are here today, all of you are here today, to urge an increase in funding by \$100 million for next year. Well, there is no doubt that you have my support, my total support, and that of Senator Specter. And we have put our votes where our mouths are. Because the only way that we are going to get the kind of support we need is we need your support now and your help in getting members of the Congress to help us with the money.

It is nice to say all these wonderful things, that you are for all of this. We just got a budget. We just got our budget sent down to us. And I do not know what the members of the Budget Committee could possibly have been thinking. They assume that we are going to spend \$1.5 billion more on medical research, and yet we did not get one extra nickel in money for our committee. You know what that means? That means that if we are going to do that, we have to cut things like Head Start programs, public health programs, community health centers, low-income heating and energy assistance for the elderly and the poor, nurses training.

I would like the members of the Budget Committee to come to us and say: Here is what you should cut. And they are not going to tell us that. Because every program—we are down to the nubs on this thing right now. Every program that this subcommittee funds is essential. We have made a lot of cuts in the last few years.

When I was chairman, and later on, after Senator Specter became chairman, we made a lot of cuts. We tightened down on a lot of programs. And a lot of these programs have not gotten the kind of increases that they probably should warrant. And so the only way that we are going to get the money for this is if the Budget Committee allocates us the money.

Now, if they do not do that, we are going to have to get the money from someplace. You know, people can get up. Senator Specter, I know, talked about this earlier. Last year we had an amendment—a bill on the floor, a sense of the Senate resolution to double NIH funding. It passed 97 to nothing.

Within 2 months, I think it was, Senator Specter offered an amendment. He and I worked together on it. He was the chief sponsor of it. It was to just add \$1.1 billion to the NIH budget for all research, which would have helped us, which would have given us some money for Alzheimer's. And he would have just taken a one-half of 1-percent-cut in administrative costs across the board from every agency. That failed 63 to 37.

You have got a lot of people who will say: Hey, we are all for this. We are all for getting more money for Alzheimer's. But every time it comes down to trying to get the money, well, they are just nowhere to be found.

And so we need your help. We need your help in going after Members of Congress, both in the Senate and the House, to say how important this is, and to say that we have got to come up with the money. And it should come from the Budget Committee. They should have allocated that money for us. And they did not do it.

Nice language. But there is no extra dollars there. And if they want to tell us to cut Head Start, let them tell us that. If they want to tell us to cut community health centers, let them tell us that, too. But they will not do that.

So as you can see, I am probably equally as frustrated as the chairman sitting next to me. Alzheimer's is on the cutting edge right now. You talk about saving Medicare. You want to save Medicare? I tell you what. You double the research for Alzheimer's in the next 5 years, you will not have to worry about Medicare. [Applause.]

We know that if you just put the onset of Alzheimer's off for 5 years, just the onset, we will not have any problems in Medicare. And we are very close to finding the interventions and the cures for Alzheimer's—very close. But it is not going to happen unless we make sure that the researchers have the resources to do that. And we cannot continue to rob Peter to pay Paul on this. We just cannot continue to do that. We have got to find a different source of funding.

Senator Specter and I have joined forces to try to set up a national fund for health research, S. 441. We may have some opportunity this year in the tobacco settlement, if we get a tobacco settlement. We may have an opportunity there to get some money for NIH. And I am hopeful that that will happen.

But I just urge all of you to put the maximum amount of pressure on people here in the Congress to devote the money for this, not just to vote for nice language and to vote for sense-of-the-Senate resolutions, but to actually vote the hard money.

And I can assure you that there is no one that has fought harder for this than our chairman. And he has my full and unqualified support in his efforts.

#### SUMMARY STATEMENT OF ROSEMARY CRONIN

And if I might, I would just like to welcome Bob and Rosemary Cronin, from Dubuque. Bob is 58. And he was diagnosed with early onset Alzheimer's in July 1994, at age 54. Since his diagnosis, he has had to retire from his job. And because of complications, he is almost blind. He is a former college professor, who studied in China. He taught languages and communications at Loras College in Dubuque. He still lives at home.

Rosemary is working full-time, and is able to adjust her schedule to meet Bob's needs. Both Bob and Rosemary have taken part in numerous media appearances, and they have been featured in local newspaper articles.

The Mississippi Valley Chapter staff highly recommends them as excellent witnesses. They have two children in their late twenties who are worried about whether they are at risk also for Alzheimer's disease.

And let me just say, Bob and Rosemary, I thank you very much for your courage to get out in front of this. But we need more peo-

ple like you, who are unafraid to step out and say: Here are the problems and here is what needs to be done. And I just welcome you here to this committee. And, again, thank you for your bravery and your courage.

Mrs. CRONIN. Thank you, Senator.

Senator SPECTER. Senator Grassley, before we officially welcome and turn the microphone over to Mr. and Mrs. Cronin, would you care to give a word of introduction?

Senator GRASSLEY. I already, in my opening statement, thanked them for coming. And I think Senator Harkin said it, and I would associate my remarks with Senator Harkin's about the Cronins.

Senator SPECTER. Well, then, there is nothing more to be said, Mr. and Mrs. Cronin, before introducing you. I will say a word or two anyway. We sympathize with what Mr. Cronin has gone through. We note his work as a professor, studying in China and teaching languages. Obviously, this disease it is a very tragic occurrence.

The microphone is yours, Mr. Cronin, Mrs. Cronin, and you may proceed as the two of you see fit.

Mrs. CRONIN. Thank you, Senator. Thank you for giving us the opportunity to speak today.

As you said, my name is Rosemary Cronin. I am from Dubuque, IA. And I am here with my husband, Bob, who has Alzheimer's disease.

It is really ironic that I am the one speaking today, because Bob was a professor of speech communication at Loras College, in Dubuque, IA, for 23 years. His bachelor's, master's and Ph.D., degrees are in English literature, film, drama, and speech communication. He is a prize-winning playwright, a skilled photographer, and a craftsman, who enjoyed creating silver jewelry. His love of gardening is equalled only by his passion for classical music.

Alzheimer's disease has robbed him of his ability to read, to write, to operate a computer, to drive a car, and it is slowly robbing him of his sight. Bob was diagnosed on the first day of summer in 1994. He was 54 years old. He had elected to undergo a brain biopsy, a procedure not commonly performed, but at that time the only way to obtain a definitive diagnosis.

Our first reaction was: But he is too young; this is an old people's disease, and 54 is not old. What we discovered, however, is that although the majority of Alzheimer's patients are over 60, an increasingly large number of early onset patients are in their thirties, forties, and fifties.

As we drove home from the University of Iowa Hospital on that terrible day, I remember trying to see the road clearly enough through my tears, and saying to him: Well, what do you want me to tell people? They know you have had the biopsy. And Bob's reply was simply: Tell them. Tell them I have Alzheimer's. And tell them that I am going to beat it. And so we began our fight.

The first thing we had to do was learn how to spell it. [Laughter.]

Then we began to read everything we could get our hands on. We found that the disease was affecting the part of Bob's brain that controls vision and spatial skills. But when we told people that Bob was losing his sight, their reaction was: Well, that is not Alz-



heimer's, is it? And we slowly began to realize that just as we had to educate ourselves about this disease, we also had to educate our family and our friends.

And began searching to find anything that we could do to slow the progress of the disease. We began to consider how we could get involved in Alzheimer's research. Denise Heinrichs, from the Alzheimer's Association, Mississippi Valley Chapter, entered our lives as the most wonderful resource person and friend. Through her interventions, we were able to enroll Bob in an NIH study, knowing that the study would probably not directly help Bob, but realizing the importance of the research data not only for our children, but also for other Alzheimer's families.

In addition to that first NIH study, Bob has participated as a research subject in studies at the University of Iowa, at MIT. He was in a clinical trial for acetyl-l-carnitine, which produced very positive results for 2 years. And he is now in a clinical trial for Aricept.

Our frustration with all the research and all the tests and all the drugs is simply: It is not enough. We want answers now, not 20 years from now. We have been committed to research from the beginning of our struggle with this disease. And it is the only way that we can prevent Alzheimer's from becoming an epidemic in the next century.

So we are here today to urge Congress and the President to support a major commitment of resources to new basic and clinical research that is focused on prevention. We know the heartache that Alzheimer's has caused in our own family. Bob has four sisters, all of whom are worried about the genetic links to the disease.

Our children are young adults, trying to start careers, who suddenly have the specter of Alzheimer's disease forever in their consciousness. They have watched this disease rob their father of his career, his sight and his memories. They wonder if and when they will get Alzheimer's.

As we started this fight, we realized how fortunate we have been for the help we have received along the way. The incredible staff at NIH have made such a difference in our lives. So when we read the statistics reporting the NIH's 1997 budget for cancer research was \$3.1 billion and the budget for Alzheimer's was \$323 million, we wanted to scream and say: Hey, wait a minute, we are out here, too, and our families are out here. We need help. And we need the research not only to continue, but also to increase.

As we have heard, projections tell us that 14 million Americans could have Alzheimer's by the middle of the 21st century. And that is so frightening. I cannot honestly comprehend the impact of the disease on that many people. And that figure only counts the patients; it does not count the husbands and the wives and the children and the brothers and the sisters.

From a very personal perspective, I know the physical, the emotional and financial struggles that this disease has cost our family. We had often said that when our last child graduated from college, we would have about 10 years to work toward building our retirement fund and planning the last stages of our lives. Our daughter graduated from the American University here in Washington in May 1994. Bob was diagnosed in June 1994. So, instead of 10 years, we had 1 month.

And perhaps foolishly, we had not gotten around to purchasing long-term health care insurance. After all, we were still young. And now, although I am able to do so, no insurance company will ever let us buy a policy for Bob.

Senator Tom Harkin put it very clearly in a talk he gave in Iowa, which is faced with a rapidly aging population. He said, and I quote: "Caring for 14 million patients by the year 2010 will bankrupt this country. We are only rearranging the deck chairs on the Titanic if we do not put money into finding the cure for Alzheimer's disease."

I would like to end with a quote from Elizabeth Kubler-Ross' book "On Death and Dying." She says, and I quote: "Learn to get in touch with the silence within yourself, and know that everything in this life has a purpose. There are no mistakes, no coincidences. All events are blessings to learn from."

#### PREPARED STATEMENT

Well, I would have to say that Alzheimer's disease is indeed a mixed blessing. And if we are to learn from it, we need the money for research to find a cure. So we have come here today to ask you to spend the money that is needed now. Please do not hesitate. The iceberg of ignorance is too costly. We need the dollars now. And with these research dollars and Bob's spirit, we will beat this terrible disease.

Thank you. [Applause.]

Senator SPECTER. Thank you very much Mrs. Cronin for those very strong and emotional words. And thank you, Mr. Cronin.

[The statement follows:]

#### PREPARED STATEMENT OF ROSEMARY AND BOB CRONIN

Thank you for giving us the opportunity to speak today. My name is Rosemary Cronin and I am from Dubuque, Iowa. I am here with my husband, Bob, who has Alzheimer's disease.

Bob was a professor of Speech Communication at Loras College in Dubuque, Iowa for 23 years. His bachelors, masters, and Ph.D., degrees are in English literature, film, drama, and speech communication. He is a prizewinning playwright, a skilled photographer, and a craftsman who enjoyed creating silver jewelry. His love of gardening is equaled only by his passion for classical music. Alzheimer's Disease has robbed him of his ability to read, to write, to operate a computer or drive a car, and it is slowly robbing him of his sight.

Bob was diagnosed on the first day of summer 1994. He was 54 years old. He had elected to undergo a brain biopsy, a procedure not commonly performed but, at that time, the only way to obtain a definitive diagnosis. Our first reaction was, "But he's too young. This is an old people's disease and 54 isn't old." What we discovered, however, is that although the majority of Alzheimer's patients are over 60, an increasingly large number of early-onset patients are in their 30's, 40's and 50's.

As we drove home from the University of Iowa Hospitals on that terrible day, I remember trying to see the road clearly through my tears and saying to him, "Well, what do you want me to tell people? They know you've had the biopsy." And Bob's reply was simply, "Tell them. Tell them I have Alzheimer's. And tell them that I'm going to beat it!" And so, we began our fight!

The first thing we had to do was to learn how to spell it!

Then we began to read everything we could get our hands on. We found that the disease was affecting the part of Bob's brain that controls vision and spatial skills, and that his language, memory and social abilities were still relatively intact. But when we told people that Bob was losing his sight, their reaction was, "Well, that's not Alzheimer's. Is it?" And we slowly began to realize that just as we had to educate ourselves about this disease, we also had to educate our family and friends. We also tried to find something—anything that we could to slow the progress of the disease.

Because we were so committed to fighting this disease, we began to consider how we could get involved in Alzheimer's research. Denise Heinrichs, from the Alzheimer's Association Mississippi Valley Chapter, entered our lives as a wonderful resource person and friend. Through her interventions we were able to enroll Bob in an NIH study, knowing that the study would probably not directly help Bob. Nevertheless, we realized the importance of the research data not only for our children, but also for other Alzheimer families.

In addition to that first NIH study, Bob has participated as a "research subject" in studies at the University of Iowa and MIT. He was also in the clinical trial for Acetyl-L-Carnitine for patients between the ages of 45-65, which produced positive results for two years. He is now in a clinical trial for Donepezil, also known as Aricept.

Our frustration with all the research and all the tests and all the drugs is simple—it's not enough. We want answers NOW, not twenty years from now. We have been committed to research from the beginning of our struggle with this disease. It is the only way we can prevent Alzheimer's from becoming an epidemic in the next century. We're here today to urge Congress and the President to support a major commitment of resources to new basic and clinical research that is focused on prevention. We know the heartache that Alzheimer's has caused in our own family. Bob has four sisters, all of whom are worried about the genetic links to the disease. Our children are young adults trying to start careers who suddenly have the specter of Alzheimer's Disease forever in their consciousness. They have watched this disease rob their father of his career, sight and memories. They wonder if and when they will get Alzheimer's.

As we started this fight—which we certainly never wanted to do—we realized how fortunate we have been for the help we have received along the way. The incredible staff at NIH have made such a difference in our lives. So when we read statistics reporting the NIH's 1997 budget for cancer research was \$3.1 billion and the budget for Alzheimer's was \$323 million we want to scream and say, "Hey, wait a minute—we're out here, too. And our families are out here." We need help and we need the research not only to continue but also to increase. Projections tell us that 14 million Americans could have Alzheimer's by the year 2010. That is so frightening.

I can't honestly comprehend the impact of the disease on that many people. And that figure only counts the patients who are affected, not the husbands and wives and children and brothers and sisters. From a very personal perspective, I know the physical, emotional, and financial struggles that this disease has cost our family. We had often said that when our last child graduated from college we'd have about ten years to work toward building a retirement fund and planning the last stages of our lives. Our daughter graduated from the American University here in Washington in May 1994. Bob was diagnosed in June of 1994. So instead of 10 years, we had one month. And, perhaps foolishly, we hadn't gotten around to purchasing long term care insurance. After all, we were still young. And now, although I am able to do so, no insurance company will ever let us buy a policy for Bob.

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I would like to end with a quote from Elizabeth Kubler-Ross' book "On Death and Dying." She says, "Learn to get in touch with the silence within yourself and know that everything in this life has a purpose. There are no mistakes, no coincidences. All events are blessings to learn from."

Well, I would have to say that Alzheimer's Disease is, indeed, a mixed blessing. And, if we are to learn from it, we need the money for research to find a cure. We have come here today to ask you to spend the money that is needed now. Please don't hesitate. The iceberg of ignorance is too costly. We need the dollars now.

## STATEMENTS OF:

**STEVEN T. DeKOSKY, M.D., PROFESSOR OF PSYCHIATRY, NEUROLOGY, NEUROBIOLOGY, AND HUMAN GENETICS, WESTERN PSYCHIATRIC INSTITUTE CLINIC, UNIVERSITY OF PITTSBURGH MEDICAL CENTER**

**DON SCHMECHEL, M.D., DIRECTOR, JOSEPH AND KATHLEEN BRYAN ALZHEIMER'S DISEASE RESEARCH CENTER, DUKE UNIVERSITY MEDICAL CENTER**

## SUMMARY STATEMENT OF DR. STEVEN DE KOSKY

Senator SPECTER. I want to turn now to our medical experts. First, Dr. Steven DeKosky, professor of psychiatry, neurology, neurobiology, and human genetics, Western Psychiatric Institute Clinic, and director of the Alzheimer's Disease Research Center the University of Pittsburgh Medical Center. His interests include the neurochemistry of Alzheimer's disease and the underlying cause of memory loss. He is a graduate of Bucknell College and the University of Florida Medical School. Dr. DeKosky is chairman of the Scientific Advisory Board for the Alzheimer's Association. Perhaps his biggest plaudit is that he is the father of Allison DeKosky, who is one of my key staffers on this subject. [Laughter.]

I am going to introduce at the same time, Dr. Donald Schmechel, the director of the Joseph and Kathleen Bryan Alzheimer's Disease Research Center at Duke University Medical Center. Dr. Schmechel, a graduate of Yale College and the Harvard Medical School, published numerous papers on the underlying biology of Alzheimer's disease. Our distinguished colleague, Senator Faircloth, is a major, if I may say, multi-million-dollar contributor to that very important center. I may be disclosing more than Senator Faircloth wants me to here this morning.

For those who are standing in the rear, we have chairs in the front, quite a number, and you can even take the chairs at the witness table without jeopardy. But I think you may be more comfortable sitting than standing.

We are going to turn to you first, Dr. DeKosky. When you finish, Dr. Schmechel will be next in line. I have to excuse myself for a minute or two, to go into the anteroom. I shall return momentarily. Dr. DeKosky, the floor is yours.

Dr. DeKOSKY. Thank you, Senator.

Chairman Specter, Senator Harkin, Senator Faircloth, and Senator Grassley, and members of the committee, I am pleased to appear before you today to discuss the excitement of Alzheimer's research. I direct the Alzheimer's Center at the University of Pittsburgh. I sit on the Neuroscience Study Section at the National Institute of Aging. And I chair the Medical and Scientific Advisory Council of the Alzheimer's Association.

I see patients. I conduct my own research, and I direct a team of extraordinary scientists at the University of Pittsburgh. And I have had the opportunity to review the work of Alzheimer's researchers from across the country, who come either to the Alzheimer's Association or to the National Institute of Aging for financial support.

You have already heard about the impact of Alzheimer's disease on the lives of people, like Mr. and Mrs. Cronin, and the fears about the future from people like Orien Reid. You have received

the Alzheimer's Association National Program to Conquer Alzheimer's Disease, which describes how Alzheimer's disease may bankrupt both Medicare and Medicaid.

What I would like to do is try to describe to you the scientific evidence that supports these predictions, and the opportunities we have to change the course of the disease for the 21st century—opportunities that will disappear if we do not seize them now. I will explain the demographic forces that are bringing on the epidemic, the extraordinary progress we have made in a relatively short period of time that resources have been devoted to Alzheimer's research, and the exciting possibilities for discovering a way to prevent Alzheimer's by slowing or stopping the disease process in baby boomers so that many of them will never be disabled by the disease.

What is the demographic imperative?

Alzheimer's disease is not normal aging, but it is closely associated with age. And that is why estimates of the prevalence in the United States of Alzheimer's disease rise so sharply during the first half of the next century—growth that is a direct result of increased life expectancy in the aging of the baby boomer population. This is demonstrated by the charts that are appended to my testimony.

The crisis of Alzheimer's disease is upon us because we are living longer. The prevalence of probable AD rises sharply as we grow older, from 4 percent of those between the ages of 65 to 74, to close to 50 percent of those 85 and older. As the boomers enter their age of greatest risk, beginning in the second decade of the next century, Alzheimer's disease will explode, reaching the number that you have heard and talked about, of approximating 14 million people by the middle of the century.

These are estimates from Denis Evans. Other demographic studies result in somewhat different estimates. Some are higher. Some are lower. But every study shows the same inevitable course of the disease rising dramatically as the population ages. And recent findings indicate that our African American and Hispanic citizens have even more frequent development of dementia than the white population on whom these statistics are based.

We do not necessarily need to look at these figures with alarm. Rather, we should see them as a challenge. We have the scientific capability to find a way to change the course of AD. We can keep millions of baby boomers ever from suffering from Alzheimer's disease, but only if we make a major investment now. Let me explain that.

We have accumulated a great deal of knowledge about AD. No area of science today is more exciting or more productive than brain research, and especially Alzheimer's research. That is not an accident. You in Congress decided, in the early 1990's, to make a targeted investment on Alzheimer's. You more than doubled the NIH resources, from \$127 million in 1989, to \$279 million in 1991.

Those resources attracted some of the best minds to Alzheimer's research. They built an infrastructure for cooperative research among more than 30 of the leading academic institutions in the country, and they allowed pursuit of multiple strategies that have brought us to our current state of knowledge. That is why you have

seen the steady flow of discoveries over the past several years in AD research.

We now understand the basic mechanisms of AD, how the characteristic plaques and tangles of Alzheimer's disease are formed by amyloid and tau proteins, and how this causes brain cells to die. We are steadily learning more about the genetics of the disease. Genes associated with the disease have been identified on four different chromosomes in the human genome.

We now have identified the actual genes, and the mutations, or mistakes, in gene code for the rare form of the disease—early onset familial Alzheimer's. And we have found the susceptibility gene, or risk gene, for apolipoprotein E, that was alluded to earlier, which opens the door for new scientific inquiry about the interactions of genetics in the environment. And we are finding, and we will find, more such risk genes, which are all clues to disease mechanisms that we turn toward therapy.

Most exciting for all of the families who are confronting Alzheimer's disease, we have real leads to potential treatments. The two drugs that have been approved by the FDA for specific treatment of Alzheimer's are not magic bullets, but they are having a modest impact on a small number of people. We are also finding effective ways to treat the behavior, such as agitation, anxiety, depression, or sleep disturbance, that often cause the greatest challenges for patients and their families—not just drugs, but nondrug therapies, as well.

The work that holds the most promise for the future is beginning to show potential preventive effects of readily available treatments, with nonsteroidal inflammatory drugs like ibuprofen; antioxidants, like vitamin E; and nerve and growth-enhancing factors, such as estrogen. Behind all of these discoveries is the accumulated knowledge that brings us to understand the basic reality of Alzheimer's disease. This was not something that happened overnight.

We know the brain cells deteriorate decades before people begin to show clinical symptoms. That means, if we are going to stop the disease before the beginning of the next century, we have to find a way to intervene before large numbers of cells die. This will take a major investment in research on prevention, an investment that we cannot make at current levels of funding for Alzheimer's research. We know what needs to be done.

At the top of the list, we need to launch large-scale, multisite clinical trials in healthy people, on the scale of the Women's Health Initiative. These studies need to be done over an extended period of time, to determine which therapies can delay or prevent onset of disabling symptoms of the disease. That is why the studies need to begin now, because they take years, and will need to be completed before the baby boomers hit the starting edge of the high age at risk.

We need to speed up efforts to identify risk factors, biological markers and reliable tests to find people most at risk, before symptoms appear, and permit earlier diagnosis so that treatment can begin soon enough to make a difference. And we need an infrastructure to develop and make available to the scientific community laboratory models of AD, which were unthought of 10 years ago, to learn how the disease progresses and to test promising

therapies without putting humans at risk. Incredible advances in our ability to genetically manipulate mice to establish models of AD, in which to test medications to stop the disease, are a major focus.

However fast we move toward prevention, for millions of Americans the answer will be too late. They have already lost too many brain cells to stop the disease. For them, we must continue research to develop and demonstrate cost-effective methods of care and treatment to prevent excess disability, to improve their quality of life, and develop new systems of care their families and taxpayers will be able to afford.

If you want to do something about Alzheimer's disease before the baby boomers reach the age of greatest risk, then you have to make the investment in prevention now. That is why the Alzheimer's Association has made its commitment to triple its research investment, from \$10 million to \$30 million, over the next 3 years, and it is why the Association is asking you to increase appropriations for AD research at the NIH by \$100 million in fiscal year 1999.

#### PREPARED STATEMENT

Over the past 5 years, funding for AD research has lagged behind funding for NIH in general. If you let this continue, we will lose physicians and other scientists to other fields of research. Today's window of opportunity for finding preventive strategies before the baby boomers hit the age of risk will be lost, and we will lose another generation to the ravages of this disease.

Thank you very much. [Applause.]

[The statement follows:]

#### PREPARED STATEMENT OF DR. STEVEN T. DEKOSKY

Chairman Specter, Senator Harkin, Members of the Committee. I am delighted to appear before you today to discuss the excitement of Alzheimer research. I direct the Alzheimer's Disease Center at the University of Pittsburgh, sit on the Neuroscience Study Section of the National Institute on Aging, and chair the Medical Scientific Advisory Council of the Alzheimer's Association. I conduct my own research, direct a team of extraordinary scientists at my Center, and have the opportunity to review the work of Alzheimer researchers across the country who come to the Alzheimer's Association or the NIA for financial support.

You have already heard about the impact of Alzheimer's disease on the lives of people like Mr. and Mrs. Cronin, and the fears about the future of people like Orin Reid. You have received the Association's National Program to Conquer Alzheimer's Disease, which describes how Alzheimer's disease may bankrupt Medicare and Medicaid. What I will try to do is describe to you the scientific evidence that supports these predictions, and the opportunities we have to change the course of the disease in the 21st century—opportunities that will disappear if we do not seize them now.

I will explain:

- The demographic forces that are bringing on the epidemic of Alzheimer's disease;
- The extraordinary progress we have made in the relatively short time that resources have been devoted to Alzheimer research; and
- The exciting possibilities for discovering a way to prevent Alzheimer's, by stopping or slowing the disease process in baby boomers, so that many of them will never be disabled by the disease.

#### THE DEMOGRAPHIC IMPERATIVE

Alzheimer's disease is not normal aging, but it is closely associated with age. That is why the estimates of prevalence in the United States rise so sharply during the first half of the next century—growth that is the direct result of increased life ex-

pectancy and the aging of the babyboomers. This is demonstrated in the charts attached to my testimony.

The crisis of Alzheimer's disease is upon us because we are living longer. The prevalence of probable Alzheimer's rises sharply as we grow older—from less than 4 percent of those between the ages of 65 and 74, to over 47 percent of those 85 and older. As the babyboomers enter the age of greatest risk, beginning in the second decade of the next century, Alzheimer's disease will explode, reaching as many as 14 million people by the middle of the century. These are the estimates of Denis Evans; other demographic studies result in somewhat different estimates—some higher, some lower. But every study shows the same inevitable course of the disease—rising dramatically as our population continues to age. And recent findings indicate that our African-American and Hispanic citizens develop dementia even more frequently than the white population, on which all of these statistics are based.

We do not need to look at these figures with alarm. Rather, we should see them as a challenge—a challenge that we can clearly meet. We have the scientific capability to find a way to change the course of Alzheimer's disease. We can keep millions of babyboomers from ever suffering from Alzheimer's disease—but only if we make a major investment now. Let me explain.

#### THE ACCUMULATED KNOWLEDGE ABOUT ALZHEIMER'S

No area of science today is more exciting—or more productive—than brain research, and especially Alzheimer research. That is not an accident. You in Congress decided in the early 1990's to make a targeted investment in research on Alzheimer's disease. You more than doubled the NIH resources—from \$127 million in 1989 to \$279 million in 1991. Those resources attracted some of the best minds to Alzheimer research; they built an infrastructure for cooperative research among more than 30 of the leading academic institutions in the country; and they allowed pursuit of multiple strategies that have brought us to our current state of knowledge. That is why you are seeing the steady flow of discovery over the past two years.

We now understand the basic mechanisms of Alzheimer's disease—how the characteristic plaques and tangles of Alzheimer's disease are formed by the amyloid and tau proteins, and how this causes brain cells to die.

We are steadily learning more about the genetics of the disease. Genes associated with the disease have been identified on four chromosomes. We now have identified the actual genes, and the mutations, or mistakes in the gene codes, for the rare form of the disease—early onset, familial Alzheimer's disease. And we have found a susceptibility, or risk gene—apolipoprotein E—which opens the door wide for new scientific inquiry about the interaction of genetics and environment.

Most exciting of all for families who are confronting Alzheimer's, we have real leads to potential treatment of the disease. The two drugs that have been approved by the Food and Drug Administration for the specific treatment of Alzheimer's disease are not magic bullets—but they are having a modest impact in a small number of people. We are also finding effective ways to treat the behaviors such as agitation, anxiety, depression, or sleep disturbance, that often create the greatest challenges for people and their families—not just drugs but non-drug therapies as well. The work that holds the most promise for the future is beginning to show potential preventive effects of readily available treatments—with non-steroidal anti-inflammatory drugs such as ibuprofen, anti-oxidants like Vitamin E, and nerve growth enhancing factors including estrogen.

#### THE CRITICAL NEXT STEPS

Behind all of these individual discoveries is the accumulated knowledge that brings us to understand the basic reality of Alzheimer's disease. This is not something that happens overnight. We now know that brain cells begin to deteriorate as much as 20 years before the disabling symptoms of the disease appear. That means, if we are going to stop this disease, we have to find a way to intervene before large numbers of brain cells die. That is going to take a large investment in research on prevention—an investment we cannot make at current levels of funding for Alzheimer research.

We know what needs to be done.

—At the top of the list, we need to launch large-scale multi-site clinical trials in healthy people, on the scale of the Women's Health Initiative. These studies need to be done over an extended period of time, to determine which therapies can delay or prevent onset of the disabling symptoms of the disease. That is



why such studies need to begin now—because they take years and will need to be completed by the time the baby boomers start reaching the age of risk.

—We need to speed up efforts to identify risk factors, biological markers, and reliable tests to find those persons most at risk, before symptoms appear, and to permit earlier diagnosis—so that treatment can begin soon enough to make a difference.

—We need an infrastructure to develop and make available to the scientific community laboratory models of Alzheimer's disease, to learn how the disease progresses and to test promising therapies without putting human subjects at risk. Incredible advances in our ability to genetically manipulate mice to establish models of AD in which to test medications to stop the disease are a major focus.

However fast we move toward prevention, for millions of Americans the answers will be too late. They have already lost too many brain cells to stop the disease. For them, we must continue research to develop and demonstrate cost-effective methods of care and treatment—to prevent excess disability, to improve their quality of life, and to develop new systems of care that families and taxpayers will be able to afford.

If you want to do something about Alzheimer's disease before the baby boomers reach the age of greatest risk, then you have to make this investment in prevention now. That is why the Alzheimer's Association has made a commitment in its new strategic plan to triple its investment in research over the next 3 years—from \$10 million to \$30 million. And it is why the Association is asking you to increase appropriations for Alzheimer research at NIH by \$100 million in fiscal year 1999.

Over the past 5 years, funding for Alzheimer research has lagged behind funding for NIH in general. If you let this continue, we will lose scientists to other fields of research, today's window of opportunity will be slammed shut, and we will lose another generation to the ravages of Alzheimer's disease.

Thank you.

#### PREPARED STATEMENT OF SENATOR LARRY CRAIG

Senator FAIRCLOTH [presiding]. We have been joined by Senator Larry Craig.

Senator Craig, would you care to make a comment or statement?

Senator CRAIG. Thank you very much, Mr. Chairman.

No; let us get on with the testimony of our witnesses. I would ask unanimous consent that my prepared statement become a part of the record.

Thank you all for being here.

Senator FAIRCLOTH. Well, certainly, it will be.

[The statement follows:]

#### PREPARED STATEMENT OF SENATOR LARRY E. CRAIG

Mr. Chairman, I want to thank you for holding this hearing today on Alzheimer's disease. As you know, Alzheimer's is a devastating disease affecting not only the life of the patient, but those around them as well. I want to thank all of our witnesses for coming here today and sharing their experiences with this devastating disease.

As an adult child with aging parents, I feel quite fortunate not to have had to face Alzheimer's disease personally. However, the experiences of other family members, friends and many of my constituents is very real. The drain on family members is both emotional and financial. Therefore, I appreciate this Committee's efforts to take a closer look at Alzheimer's, and how our health care system is addressing the needs of patients and their families. I hope we can gain a better understanding of the problems surrounding this disease, and act swiftly to help those who suffer today.

Scientists have made some significant strides in researching brain disorders. They have especially made progress researching Alzheimer's disease. That gives us hope. We should look at all the progress that has been made in this area and build on our successes. We should also be aware of the amount of work that is left to be done and focus on finding a cure for these kinds of diseases.

Mr. Chairman, Alzheimer's disease depletes human resources, causes physical and emotional hardship for care-givers, and is a tremendous financial burden on families. Given the devastating nature of this disease, it deserves ample attention from the Congress.

I look forward to hearing from today's witnesses and discussing ways that we, as a nation, can better address this problem in a way that will meet the needs of those who are afflicted, and their families.

SUMMARY STATEMENT OF DR. DON SCHMECHEL

Senator FAIRCLOTH. And now, Dr. Don Schmechel, from Bryan Center at Duke University.

Dr. SCHMECHEL. Thank you, Senator. I appreciate your very kind introduction, and the invitation of this committee to speak to you.

I am the director of the Joseph and Kathleen Bryan Alzheimer's Disease Research Center at Duke. And this center represents an amazing gift from the Bryan family and the successful attraction of National Institute of Aging funds—money well spent in the pursuit of cures and answers for Alzheimer's disease, as it is true of the many NIH centers across the country.

We take for granted, really, our ability to remember from moment to moment in our thoughts, in our conversation with others. It is really amazing to talk to patients and find out what it feels like to have memory problems. I remember a patient very well, from the early eighties, who I saw. And he told me: Having this problem is like seeing a rack of books on a shelf. I know the book I want to take, but as I reach out to get that book, my hands obscures it and I cannot get it back.

This is the picture of Alzheimer's disease, a very, very serious and tragic illness which everyone here is fighting and wants your support in trying to get rid of. I brought you a graphic illustration of the effects of Alzheimer's disease on the human brain—some brains from the Kathleen and Joseph Bryan Alzheimer's Disease Brain Bank. This is an example of a brain in advanced stages of Alzheimer's disease, with shrinkage of the folds of the brain, and showing the changes that occur during Alzheimer's disease. Unseen within are nerve cell loss, inflammation and many other things taking place. This is in contrast to the brain of a young person, where no such shrinkage has occurred, and yet, as other speakers have said, there may be genetic and environmental risk of the illness.

This is very important to take home as a message of the severity and the need to answer this illness. We really take for total granted our ability to remember. But Alzheimer's disease is progressive and disabling, and robs our loved ones of their ability to communicate to the rest of their families.

In the "Book of Deuteronomy," there is a verse that says: "Remember and teach these things to your children and grandchildren." But in Alzheimer's disease, this natural expectation of communication from generation to generation is taken away. Alzheimer's can strike as early as 50 years, or even earlier than that. And then, each decade that goes on after that, basically, the rest of us are in the boat of risk.

The research that you have heard about over the last 20 years has produced amazing advances—amazing advances. But yet, here is where we are at. Look to your left. Look to your right. One of the three of you may carry the apolipoprotein E-4 risk factor gene, which occurs in about 20 to 30 percent of our population. This risk factor gene increases the likelihood of Alzheimer's disease in your

sixties to eighties, and may well interact with other environmental factors.

The rapid advances in research that you have heard about across the United States in the ADRC's and other research centers have identified at least five genes and associated proteins that affect the genetic risk of Alzheimer's disease, and are found in the disease process within the brain. These genes are presenilins 1 and 2, amyloid precursor polypeptide, apolipoprotein E, and a new gene being sought for on chromosome 12.

The last two operate in many of the common AD cases occurring after age 50. And, really, as I mentioned to you, are really putting most of us in a boat of risk and increasing our possibilities of Alzheimer's disease. The day is soon approaching where it will be possible to analyze a person's individual risk of Alzheimer's disease by looking at their genetic makeup and analyzing their environmental risk factors.

Significant environmental risk factors that have already been identified and are being studied include: prior history of head injury, lack of estrogen after menopause. Factors that actually decrease your risk may include having arthritis, using arthritis medications, or using estrogen after menopause.

It is clear that there are a finite number of genetic factors and a finite number of environmental factors that interact to produce risk of Alzheimer's disease. It is really imperative that research money be spent to deal with this problem, both to continue what is going on now and to move further.

It is very clear to me that the genetic risk and the disease process may well begin when the brain still looks like this, in early- or mid-adult life. And it is very important to be looking at this issue of early identification and treatment of this illness.

#### PREPARED STATEMENT

I had more prepared remarks that if I may ask could be put into the record. I can only say amen to the Cronin family's testimony about the need for more research money and support for this illness.

Thank you very much. [Applause.]  
[The statement follows:]

#### PREPARED STATEMENT OF DR. DONALD E. SCHMECHEL

Good morning. I appreciate the opportunity to present you with a perspective on Alzheimer's Disease from the viewpoint of a clinician and researcher. We take for granted our ability to remember and to organize our life from moment to moment in our thoughts, in our conversation with others, in our reading, watching events, doing things. This last Thursday, I had a patient 84 years old who told me that he had stopped taking all of his medicines because he was healthy and had no physical problems. The wife and family of this patient told a sad story of his behavioral change with irritation and his severe problems with memory. Both behavior and memory problems had gradually developed over the last one to two years. Physically, this patient appeared hale and hearty; but on questioning quickly proved to be disoriented and incapable of retaining verbal information. This is the picture and tragedy of Alzheimer's Disease. At this and later stages of illness, the human brain progressively shrinks and atrophies as in this example from an autopsy of an AD patient (hold up example) compared to the brain of a normal, non-demented individual (hold up example).

The degree of obvious tissue shrinkage and the underlying nerve cell loss, inflammation and damage seen in the AD patient are not tolerated well by the brain, a

sensitive organ with non-renewable resources in adulthood. This progressive and disabling disease robs persons of their wisdom and counsel and tremendously impairs and disables family life from the burden of care giving. In the Book of Deuteronomy, scriptures looked to by Christianity, Judaism, and Islam, the verses say "Remember and teach these things to your children and grandchildren". Alzheimer's disease takes away this natural human expectation of contact and communication between generations. Alzheimer's disease (AD) can strike as early as 50 years of age in certain persons at great genetic risk and in increasing numbers of other persons in each successive decade.

The government, private sector and industry sponsored efforts in Alzheimer's Disease Research over the last 20 years has yielded great advances in diagnosis, evaluation, and treatment, but has also revealed the true immensity of this health problem. Look to your left. Look to your right. Either yourself or one of your neighbors probably bears at least one copy of the Alzheimer Disease risk factor gene, apolipoprotein E4, which increases likelihood of AD in the ages 60–80, and likely interacts with one or more environmental factors. This gene may influence 50 percent of late-onset AD cases. Other genetic factors are being discovered also.

This normal apolipoprotein E (APOE) gene exists in three "forms" APOE2, 3, and 4 in humans. Since we each carry two copies, there are six possible genetic combinations. These combinations are APOE4/4, APOE3/4, APOE2/4, APOE3/3, APOE2/3, and APOE2/2 with one copy is inherited from mother and one copy, from father. The relative abundance of these forms in the human population is such that 2 percent of persons are APOE4/4 (high risk of AD) and 20–30 percent of persons have at least one APOE4 copy (APOE4/4, APOE2/4, APOE3/4). The rapid advances in AD) have identified at least 5 genes and associated proteins that affect the genetic risk of AD and whose protein products are involved in the disease process in the brain. These genes are presenilins 1 and 2, amyloid precursor polypeptide, apolipoprotein E and a probable gene on chromosome 12. The first three genes convey absolute risk of developing AD for the rare autosomal dominant genetic forms (less than 120 families worldwide). The last two operate in many of the more common AD cases occurring after age 50–60 and convey an increased, but by no means total, risk of developing AD. The effects of these genetic risk factors for late-onset AD are now evident in the aging population of our century and will be in the next as more and more of the population lives into age-ranges untouched by most persons before 1900.

The day is soon approaching where analysis of a person's individual risk of AD may be determined by inventory of the person's DNA (blood sample or even tissue smear from the inside of the cheek) for AD related genes and inventory of environmental risk factors. At present, there is no recommendation for genetic analysis of pre-symptomatic persons since there is no curative treatment available and no easily applied biological markers of disease activity or progression.

Significant environmental and non-genetic factors may also interact to determine why one person, for example, a high-risk APOE4/4 develops Alzheimer's Disease while another person is untouched. Factors associated with increased risk may include prior serious head injury, estrogen lack through early hysterectomy or menopause without estrogen replacement. Factors associated with decreased risk include the presence of significant arthritis and/or the use of certain medications such as non-steroidal anti-inflammatory agents or H2 blockers, and apparently the use of estrogen replacement in post-menopausal women. Current research makes clear that a definite number of genetic factors that are inherited and non-controllable at present interact with a definite number of environmental factors to result in Alzheimer's Disease in a given person. We are, therefore, far from done with the problem of AD despite these amazing successes of the past 20 years. In fact, the challenge posed by our knowledge is immense.

Studies of families at high genetic risk, the well-popularized study of nuns and their earlier writing performance, ongoing studies of the epidemiology of large populations (genetically defined for research purposes, of course, anonymously), patients with Down's syndrome suggest that the AD disease process may well begin in early adulthood as a silent process. At these stages, there may be only subtle physiologic or mental changes. These changes are undetectable at present by isolated test measurements such as brain scan, PET scan, neuropsychological testing of a single individual.

The normal brain that I showed you initially could well represent the brain of someone at genetic or environmental risk of AD with silent brain injury occurring in a similar manner to silent atherosclerosis or heart disease. This person might be already on a path towards ultimately developing clinically obvious AD later in life. That person could be you, or the person to your right or the person to your left.

Increased research funding aimed at early detection and treatment of AD is essential to supplement the ongoing research and treatment programs directed at persons

already well into the disease process. Such research requires a synergistic effort between government, private funding, and pharmaceutical and industrial sources to address the many different levels of AD research—basic science, clinical detection, behavioral therapy, family support, treatment, and so on. This effort will be fruitful and timely given the present state of the field and a cost-effective and rational response to the healthcare crisis and Baby Boomer challenge.

#### SYMPTOMS

Senator SPECTER [presiding]. Thank you very much, Dr. Schmechel. Your full statement will be made a part of the record.

We are now going to go to questions, 5-minute rounds by members. And let me begin with you, Mrs. Cronin.

One of the things that so many people are apprehensive about is the onset of Alzheimer's and what symptoms and warning signs there may be. There is a lot of concern, a lot of interest about President Reagan's onset of Alzheimer's, as to when it first started, whether it had any impact on his term in the White House.

Are there any insights that you could share with us as to what happened to your husband, Bob, as to when you first started to see perhaps only incipient signs of the disease, when you first became aware of it?

Mrs. CRONIN. Bob has been an absent-minded professor for 25 years. [Laughter.]

So it is a little difficult, because he never remembered things.

Senator SPECTER. He smiles a lot, Mrs. Cronin. When you called him an absent-minded professor, he broke into a big grin here. [Laughter.]

Mrs. CRONIN. For Bob, his case is a little atypical because of the visual variant of the disease process. He first noticed it in a classroom, where he had taught the class for 20 years, and suddenly could not remember and could not continue the class. The class was delighted. They were dismissed early. But it sent a warning to him.

I think my first notice of it was erratic driving, to the point where we had a little discussion and I said: I will not drive with you anymore and I will not be in the car with you when you drive.

Because of the way the disease is presenting itself with Bob, it was very difficult. Because he has lost his sight and not the memory, per se, or not the ability to communicate or to speak. So it varies. Every family faces this in a different way.

How you notice it, I think, with the memory loss or the word loss—he can still talk and still can communicate very well, but it was the other parts.

Senator SPECTER. Ms. Piper Laurie, along the same line, you prepared to play the role of an Alzheimer's patient, as I am told, by living among actual patients. I would be interested in two aspects of the work which you have done and the serious study which you undertook, not on a casual way, but really trying to get inside the problem.

What, in your opinion, represent the patients' experiences, as you understand it. What is the family reaction to this slow process of disintegration, with the person being there physically but not emotionally or recollective wise or psychologically?

Ms. LAURIE. There is an overriding charmingness to many of the patients. They are reaching out constantly. But I remember one woman, who was in her late forties, who had been caring for her

mother for 15 years. She had given up any chance of having any kind of personal life. She did not know any men. And all she could see, really, was taking care of her mother until her mother died.

I do not know if I am really answering what you want to know.

Senator SPECTER. Well, I think you are on track. Of course, you had the experience with your own father. You described President Reagan as a second father. Have you seen him in his state of decline?

Ms. LAURIE. Only from a great distance. I had the great pleasure of knowing him before there was any, I am sure, suspicion or any reality of the disease taking hold.

Senator SPECTER. Dr. DeKosky, before my time runs out, you described the difficulties of analysis with large-scale clinical trials. This subcommittee has been pushing NIH to do more on clinical trials. Could you expand upon your thinking as to what we might do in a professional, scientific manner with your medical advice to stimulate more clinical trials by NIH on this important subject?

Dr. DEKOSKY. The nature of prevention versus treatment is the same as when Ben Franklin made his comments about an ounce of prevention being worth a pound of cure. We work with patients who have manifest disease, because that is the standard model in which our physicians are taught to deal with disease. The difference is that if we look back at the public health advances which have made the most difference in the United States, and in fact in most of the world, they center on issues that relate to preventive medicine.

In the case of Alzheimer's disease, we will need to start with people who are normal, who are not having any manifestations. And we will have to follow them, large numbers of them, long enough, with some particular medication, and compare the incidence of Alzheimer's disease in people who take the medication versus those who do not. This is essentially what is happening in the Women's Health Initiative.

And we have never done trials like that for this. And because we first need to identify people at risk, it will take large numbers of people to do it. There is no money in the budget at this point to do this. We would literally have to rob Peter to pay Paul to be able to afford trials like this. They are expensive.

And one of the other problems is they do not fit well into the research mode of grants that go to the National Institutes of Health. That is why WHI, for example, is in a different kind of grant funding than standard peer review. Standard peer review is a 3-year, 4-year, or perhaps 5-year program. These studies are going to take longer than that. If we need a series of three or four that take 15 years, we are into the period already of maximum risk for patients.

Senator SPECTER. I would like to yield now to my colleague, Senator Faircloth.

Senator Craig has joined us, as well. We have another hearing. This is a constant problem—a transportation hearing. Mayor Rendell is testifying in an adjacent room, which I am going to have to excuse myself for. So, Lauch, if you will take your 5 minutes and then yield to Larry, I would appreciate it.

Senator FAIRCLOTH [presiding]. Thank you, Mr. Chairman. I will, Mr. Chairman. I would be happy to do it.

Dr. Schmechel, when was Alzheimer's first identified as a disease? The reason I ask the question is Mrs. Bryan began to have problems in the early seventies. And there was really no identification of it. So when was Alzheimer's as a disease recognizable as such?

Dr. SCHMECHEL. That is an excellent question, Senator. Basically, the disease was first described by scientists at the turn of the century. But in terms of being practically out worked in clinics and doctors making that diagnosis, it is really only as the Nation is aging and these efforts have begun that that has become better. But we are still at a point of sometimes underdiagnosing or misdiagnosing the illness.

And just to further illuminate that issue, most likely this illness has a silent phase for a period of time. So that the person is able to be normal until finally they have a problem, at age 65, 75, 80.

Senator FAIRCLOTH. That really was not my question. At what point did hospitals identify a patient with dementia as having Alzheimer's?

Dr. SCHMECHEL. There were cases described in 1909, basically. But these days, for a period of time in the fifties and sixties, many patients were diagnosed as having hardening of the arteries or other diagnoses. I really think it is with the Institution of the National Institute of Aging Program, where diagnostic criteria were formulated, that then it is a regular diagnosis, Alzheimer's disease, when it is properly looked for. So it is very recent, really, in that context.

Senator FAIRCLOTH. A lot of people were misdiagnosed and exposed to shock treatment and all sorts of things that certainly did not help and probably made it worse.

The genetic connection, how traceable is that?

Dr. SCHMECHEL. Well, we could literally go through this room right now and find out which people have apolipo 4, which is a risk factor. But we underline that it is a risk factor; therefore, we and others do not recommend anyone being tested when they have no symptoms.

And there is a continuing—being worked out, whether this is helpful, once you have the disease, to help in differential diagnosis. But we are rapidly approaching a time, which is why these research funds are needed, that we will be able to read your genetic risk, look at what you have been exposed to—a head injury, whatever—and really be able to come up with an idea of what your risk is and what you should do about it.

Senator FAIRCLOTH. In your testimony, Doctor, you mentioned the role of the private sector as an important contributor to Alzheimer's disease research. And of course, certainly, that is what the Bryan Center is. What are the opportunities and the limits of an expanded private sector role?

Dr. SCHMECHEL. My personal feeling, which is in my testimony, is that there needs to be a synergy and a cooperation between private resources, the National Institute of Aging and Government sources, and industry and pharmaceutical firms. I have just entered on the board of the Eastern North Carolina Alzheimer's Disease Association. And I think their efforts, and the efforts of these

people here, are extremely important in terms of getting everything to function together. And that would be my comment, sir.

Senator FAIRCLOTH. Back to this gene tracing. As you know, Kathleen Bryan was my mother-in-law.

Dr. SCHMECHEL. Yes.

Senator FAIRCLOTH. And she very, very, very slowly drifted into Alzheimer's. It was a slow process. And she really went down in the last 3 or 4 years of her life. And she died at 84. You say this gene would only identify a genetic link—what does having the gene mean about your risk for the disease?

Dr. SCHMECHEL. The risk for someone carrying an apolipo E4, which is 1 out of 50 of us, is probably somewhere between 5 to 10 to 15 times that of some of the other common genes. So it is really a high risk, but it is not absolute. There are well-known cases of people making it through their seventies and eighties without.

That risk factor probably interacts with whether you had estrogen, maybe you had a head injury—some other factors. There are certainly other genes that will come on. And so, in an individual case, that is where the research efforts are needed, to bring not just a general impact on the genetics, but the ability to allow a physician to look at an individual patient and say: What is your risk? What do you need to do about it? What are the factors we need to consider right now if you have a memory problem? And hopefully, soon the day, so that before someone has a memory problem they can be properly protected and treated to avoid it.

And that is the research effort at the Bryan Alzheimer's Disease Center, and across the country, in the other ADRC's.

Senator FAIRCLOTH. Thank you, Dr. Schmechel.

Dr. SCHMECHEL. Thank you.

Senator FAIRCLOTH. I cannot help but think that Mr. Bryan lived to be 99 and 4 months, and his brain was absolutely sharp 2 days before he died.

Dr. SCHMECHEL. Indeed, that was so, sir.

Senator FAIRCLOTH. Thank you, Mr. Chairman.

Senator SPECTER [presiding]. Thank you very much, Senator Faircloth.

Senator Craig.

Senator CRAIG. Thank you very much, Mr. Chairman.

I missed most of your testimony. I have it, and I will read it. Because this is an issue of concern to me both personally and for our Nation. Obviously, I am one who has experienced, as many of us have, either a loved one or a personal friend who developed Alzheimer's and, as a result of that, died and placed the hardship on his loved ones or her loved ones and their families. I went through that with a personal friend, and it was a very tragic affair.

I witnessed with this man, though, something. And I want to ask this of both of the doctors, and you can respond accordingly. He, when he was diagnosed with Alzheimer's, declined very rapidly, from what appeared to be a very bright and alert person to one who declined rapidly and was dead within a period of a couple of years from the time it was diagnosed. And there are others who linger a great deal longer than that.

Are there different types of or different ways in which Alzheimer's impacts the individual as it relates to how they react to



the disease itself? Either of the doctors, or both of you, with your experiences.

Dr. DEKOSKY. There are two major ways that the disease varies. The first is how it presents, and the sequence of symptoms that people have. Most commonly, people begin to lose short-term memory first. Then they begin to have problems recalling the names of objects or recalling exactly what they want to say—the analogy that Dr. Schmechel used, with reaching for a book, but not being able to pull it out. In fact, they have trouble accessing their word dictionary.

After that, they begin to have problems usually with more speech understanding, and then directions, getting lost in space. We know, from where the disease spreads in the brain and where it moves, that that logical sequence is usually reflective of the brain change. Sometimes people will present with different kinds of symptoms, as did Mr. Cronin. Sometimes people will present with socially inappropriate behavior. They will present with social withdrawal. They will begin having delusions or paranoia. And then, only later, when the memory loss comes, that makes everyone think: Oh, this is probably an atypical presentation of AD.

So there are variations in the presentation. That has been a problem with diagnosis. We now know that about 75 percent of cases present typically enough that any physician should be able to make the diagnosis.

The other major variation is what you saw in your friend. And that is with the rate of decline. It is not uncommon to see people, especially earlier onset, cases in their fifties and sixties, who will decline very rapidly. In those cases, if you look in the brain, they have a relatively rapid loss of some of the neurotransmitters that let cells communicate. We do not know exactly why, but we are able to identify these subgroups.

Almost surely it has to do with their genetic endowment and what particular weak links we have, as far as fighting the disease is concerned, and probably and as yet unknown environmental influence on what has happened to them.

Senator CRAIG. Doctor, do you wish to add to that?

Dr. SCHMECHEL. Just to say, and agree, that there is quite a lot of variability in clinical course, so that we have cases that go from 3 to 5 years, up to 25 years, of disease progression. And obviously these factors impact on that.

It is important for the physician to always look for factors that may help that individual patient to exclude other diagnoses and to continually treat that patient very carefully. There is a family of Alzheimer's-like diseases, because of these different genes. And there is both a grouping and a separation as we look at these illnesses. Twenty-five percent of Alzheimer's cases may have seizures at some point. And sometimes strokes or other illness also correspond and come into the clinical picture.

Senator CRAIG. Again, probably this is directed to both of the doctors. Obviously, the competition for dollars here at this level is great. And we understand that. And it is our job to sort that out and to distribute or appropriate where collectively the Congress, by majority, can and does place that money. And of course we would like to invest in a way that bring immediate results. We know that

in the case of clinical research, that just is not true. And in rather amazing kinds of research, from the standpoint of the intricacies of this disease, that is not going to happen.

But could you give us some indication, based on where we are in medicine and diagnosis and understanding today based on what we have done, what is necessary to be done and over what time-frame it is reasonable? Now, obviously, no one holds anybody to this. I am just curious about where we need to go and how much we need to invest, and what might be based on what we now know to be a reasonable outcome. Because obviously we would like to turn the lights on, have this solved, and have the ability to diagnosis or to move in a preventive way very quickly.

That will not happen. But could you give us some reasonable realities based on the dollars and cents involved?

Dr. DEKOSKY. The prevention trials that need to begin, that have a longer time base than the traditional—

Senator CRAIG. And, Doctor, you said these had not in any way begun? These are standard clinical procedures that would necessarily need to be done to move down the path toward resolution of this?

Dr. DEKOSKY. Yes; that is correct. The studies have moved from the kind that we are doing now, with pharmaceutical companies, in collaboration with the NIA centers, at the NIH's request, to leverage the cooperation in studying the disease, from purely treatment of the cognitive symptoms, the acute cognitive symptoms, to studies of patients with Alzheimer's disease who already have the disease, giving them the first medications, to try and slow their progression.

Right now, I can tell you one study you probably heard about, the study looking at vitamin E, trying to slow the progression in people who have the disease, and in that first trial, trying to slow the progression, we slowed things down by about a year, depending on the kinds of ways you do the analyses.

Two major studies underway now to slow the progression: one on estrogen and one on prednisone. Both of those drugs are off patent. Both of those studies are being done by the National Institute of Aging's Alzheimer's Disease Study Consortium that you have funded. And both of them are funded, by the way, under a cooperative agreement. They do not come under the standard peer review system, because the grant time is too short to be able to do those studies.

So we move from symptomatic treatment to slowing the progression in people who have AD, and then back to where we will make our major effect—using the drugs we find that can slow progression, and giving it to people at risk, so that the disease either never emerges or we back up its emergence until they are 80 or 90 or 100.

Senator CRAIG. Do you wish to add to that, Doctor?

Dr. SCHMECHEL. I would just say that I feel there needs to be a healthy, but not luxurious—but underline “healthy”—supply of money, so that these different research theories can all proceed in parallel and there not be wasted time. There is much research needed for the cognitively/slightly impaired thing of the consortium. We work with transgenetic mice so that every time you do

a mouse like that, it takes \$800,000, basically, to create a new one. People are marrying the different mice together—the APP versus apolipo E, to look at what happens to mice. And already very exciting developments are occurring.

Those efforts are needed, because you may identify something in those models that allows you to change what you do in the clinic. Health care delivery and our ability to screen and deal with the actual illness as it now is, is also urgently needed. And more funds are also needed there.

These efforts need to occur in parallel, so they are not competing with each other.

Senator CRAIG. Mr. Chairman, thank you.

Thank you, ladies and gentlemen.

Senator SPECTER. Thank you very much, Senator Craig.

There are so many more things we could talk about, but we have another lengthy panel and we have to conclude our hearings by 5 minutes of 12. As a final comment, Ms. Reid—we have not had a chance to dialog too much with you—as a communicator and television personality, would you give us the benefit of your thinking on how we can better acquaint the American people with the problems of Alzheimer's?

Ms. REID. I think the Alzheimer's Association is one of the ways that we try to get the word out and we try to educate the public. But I think also a commitment and a hearing like this, a commitment from Congress to focus on the problem. And as we hear more about the research into Alzheimer's disease, that, I think, is enough to get the word out to the public and communicate the need to find an answer to this disease.

#### CONCLUSION OF HEARING

Senator SPECTER. Thank you very much, Ms. Reid. Thank you all, ladies and gentleman for being here. We are now going to move to the second panel. That concludes this hearing. The subcommittee will stand in recess subject to the call of the Chair.

[Whereupon, at 10:45 a.m., Tuesday, March 24, the hearing was concluded, and the subcommittee was recessed, to reconvene subject to the call of the Chair.]