Banner
Research

Banner Research Annual Report 2024

Accelerating Breakthroughs

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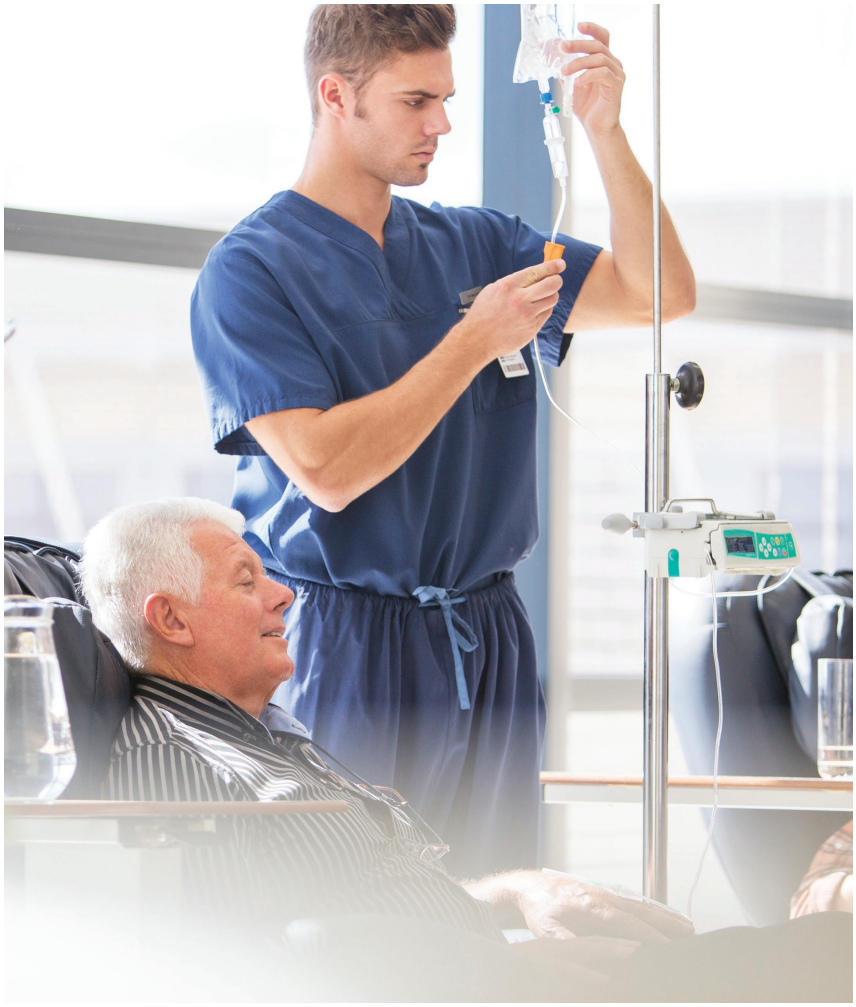
Discovering, Developing and Delivering Solutions

Banner Research transforms discoveries into new diagnostic, treatment and prevention methods for diseases such as Alzheimer's, Parkinson's, cardiovascular disease and cancer. In this 2024 Annual Report, learn how our work is the catalyst for bringing groundbreaking scientific discoveries to the forefront in finding new ways to treat, prevent and detect illnesses.

Accelerating Research-Clinical Integration

Applying Scientific Research to Benefit the Community

Banner optimizes patient access to new Alzheimer's disease-slowing drug



Within months of the official approval of the new Alzheimer's disease drug lecanemab (with the brand name Leqembi) developed by Eisai Inc. and Biogen, Banner Alzheimer's Institute performed its first patient infusion of the disease-modifying therapy in March of 2024. Since then, Banner has delivered lecanemab in 34 active infusions in patients with Alzheimer's-related mild cognitive impairment or early dementia.

As a national leader in care and management of Alzheimer's disease, Banner Alzheimer's and Banner Sun Health Research Institute have long offered the most advanced comprehensive evaluations and diagnostics, targeted treatment therapies, a variety of medical and non-medical support, and access to cutting-edge clinical trials. The health system's newly established "Lecanemab Care Pathway" underscores the transformative, collaborative approach that Banner pursues to provide patients and families with the best possible care.

Treatments like lecanemab hold the promise of improving the quality of life of many patients and their families living with Alzheimer's. However, the drug is not an appropriate treatment option for all individuals with disease symptoms. Banner's lecanemab care pathway aims to achieve appropriate use of the drug and direct patients to the care management course optimal for their individual circumstances.

This expert care pathway is a multi-department, multi-institution effort involving Banner Alzheimer's in Phoenix and Tucson, Banner Sun Health Research Institute, and several infusion, pharmacy, and imaging centers.

The Quality Review Board (QRB) is a key element of the pathway. Its 15-plus members have a range of expertise. The board evaluates patient cases for safety and their potential to see benefit from lecanemab and makes referrals for care and consultations. In 2024, the QRB reviewed 73 referrals to consider for lecanemab therapy. In addition, the lecanemab core care team provides expert care management, delivering patient and family support, education, and adherence to the appropriate use guidelines, in addition to completing symptom checklists prior to each infusion and working with patients' insurance for coverage.

Dementia Care Partners expands through CMS GUIDE model

Managing care and support for a loved one with Alzheimer's disease or other dementia can be rewarding, but also comes with a host of physical, emotional, and financial burdens. That's why Banner Alzheimer's Institute and Banner Sun Health Research Institute established the Dementia Care Partners program in 2019 to provide education, support and resources for people living with memory loss and their caregivers.

The program got a boost this year when Banner was selected by the Centers for Medicare and Medicaid Services (CMS) to participate in a nationwide test of a new Medicare alternative payment model designed to support original Medicare beneficiaries living with dementia and their caregivers.

CMS is assessing the "Guiding an Improved Dementia Experience (GUIDE) Model" to cover a comprehensive package of care coordination and care management, caregiver education and support, and respite services through Medicare payments. The goal is to improve quality of care for families living with dementia.

GUIDE aims mirror those of Banner's Dementia Care Partners program. As Banner's Family and Community Services Director Lori Nisson said, "This expansion will improve quality of life for more people living with dementia, reduce strain on their unpaid family caregivers, and better enable people living with dementia to remain in their homes by preventing or delaying nursing home placement."

Care through Dementia Care Partners is guided by health coaches who help caregivers manage from day to day. Care is overseen by an interdisciplinary team including physicians, advanced care providers and clinical social workers. The program also offers follow-up calls and virtual visits.

Banner is among 390 GUIDE participants nationwide contributing to the eight-year effort to determine how to optimize the model and the services it covers.

Clinical trials pave the way for new Alzheimer's treatment options

Through several vital clinical trials, Banner Alzheimer's Institute's collaboration with drug maker Eli Lilly has been blazing trails to new disease-slowing therapy options for people facing Alzheimer's disease.

Clinical research on new drug candidates succeeds in proving or disproving their potential because of the people who generously agree to participate and the medical center researchers, who help guide participants in enrolling if they qualify and supporting them during the studies.

As an essential partner in the TRAILBLAZER-ALZ 1, 2 and EXT trials, Banner Alzheimer's enrolled individuals with early-onset disease in a quest that determined Lilly's drug candidate donanemab (with the brand name Kisunla) can slow the pace of cognitive decline at this disease stage. The study results earned donanemab official Food and Drug Administration approval as one of the first drugs to slow progression of the memory-robbing disease.

Now, Banner Alzheimer's is giving qualifying individuals at high risk the opportunity to take part in the TRAILBLAZER-ALZ 3 trial, which is testing donanemab's effectiveness in staving off the onset of disease before clinical symptoms appear.

The ongoing TRAILBLAZER-ALZ 3 trial leveraged Banner's GeneMatch program, run by the Banner-hosted Alzheimer's Prevention Registry, to help identify potential participants. This has been essential in identifying qualified and at-risk participants, since they don't have symptoms. As noted by Banner Alzheimer's CEO Eric Reiman, MD, one of the leaders of the collaboration between Banner and Lilly on TRAILBLAZER-ALZ 3, this is one of the novel ways the research partnership is increasing the size, speed, and ease of participating in Alzheimer's medication trials.

While donanemab and lecanemab, like other similar drugs, do not offer a cure, slowing Alzheimer's progression, even by a modest amount, is a very important step in the view of all who are dealing with this disease.

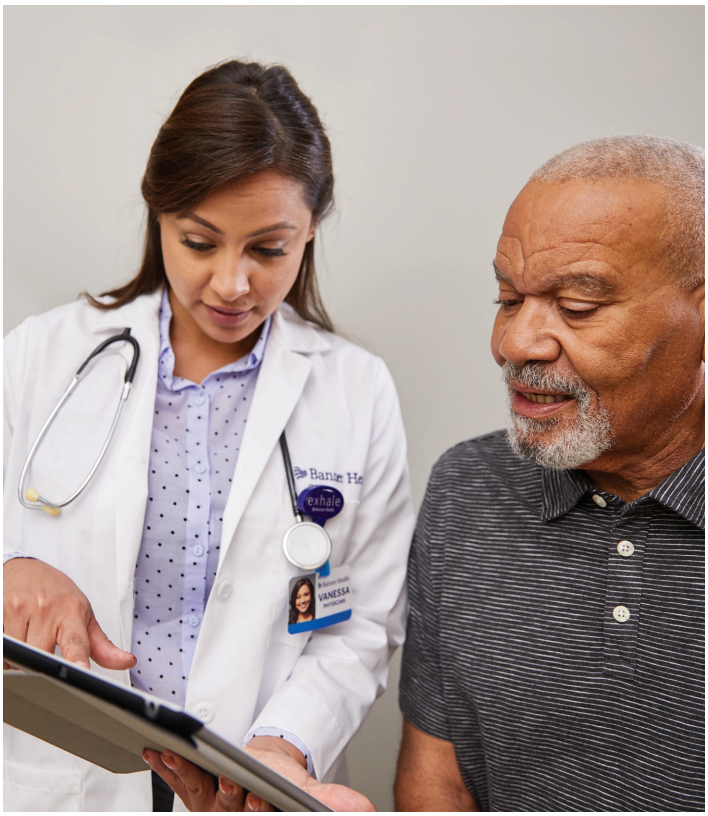
With work at Banner and elsewhere to develop blood tests to identify people with risk factors for Alzheimer's early on, plus ongoing work to advance drugs that can slow disease symptoms, perhaps Alzheimer's eventually can be managed as a chronic disease until a cure can be found.

Banner MD Anderson Research Division integrates clinical research, comprehensive cancer care

Banner MD Anderson Cancer Center's Clinical Research Division was formed in 2015 with the goal of building a premier cancer research program that would enable clinical investigators to conduct cutting-edge research in a safe and ethical manner. Founded on the expertise and resources of both Banner Research and MD Anderson Cancer Center, and together with regional and national community and academic partners, we facilitate high-impact collaborative projects to elevate the quality of cancer care.

In 2024, this division helped advance several key trials of potentially revolutionary therapies:

- Led pivotal research trials leading to FDA approval of CAR-T therapy that increases the likelihood of cures in patients with diffuse large B-cell lymphoma (DLBCL), chronic lymphocytic leukemia, follicular lymphoma, and marginal zone lymphoma.
- Third-highest enroller globally on a trial to evaluate whether CAR-T can replace chemotherapy for newly diagnosed high-risk DLBCL.
- Conducted a trial that has demonstrated a safe pathway to developing CAR-T for patients with solid tumors such as colon, pancreatic, lung, ovarian and head/neck cancer using a precision-medicine based approach.
- Evaluating the use of NK cells to treat lymphoma to avoid side effects commonly associated with CAR-T.
- Conducted a trial evaluating the fresh collection, production, and reinfusion of dual-targeted CAR-T cells that may prevent production capacity from limiting availability to this treatment, thereby increasing the number of patients that would have access.
- Leading enroller globally of patients to a novel antibody-directed chemotherapy for blastic plasmacytoid dendritic cell neoplasm, an ultra-rare hematologic malignancy. This therapy is expected to soon replace the current standard of care.



- Leading enroller to a novel trispecific antibody therapy for multiple myeloma that harnesses the immune system to treat multiple myeloma.
- Participated in a phase-I NRG trial testing an oral radiosensitizer in combination with head/neck radiation therapy for patients who are not eligible for treatment with the traditional chemo drug cisplatin. The hope is to replace cisplatin someday with an equally effective drug with fewer toxicities.
- Supported development of LIBTAYO, a PD1 inhibitor, which was FDA approved as the preferred immunotherapy agent based on the phase-1 study on cutaneous squamous cell carcinoma, and which is widely used clinically.
- Supported early development of an oncolytic immunotherapy, a type of immunotherapy by which modified viruses harness the immune system to attack tumors. Results were presented at multiple international conferences and submitted for FDA approval.

Investing in Leading-Edge Technologies

Refining Tools & Techniques to Transform Prevention, Diagnosis & Treatment

Team of experts perform milestone implant of Total Artificial Heart

Fifty-one-year-old Stephan Crudup of Tempe, Arizona, describes himself as "thriving, surviving and living better" now that his failing heart has been replaced with a transplanted organ. But like many of the thousands of people in the U.S. with heart failure, he had faced a long wait for one of the limited number of organs available for transplant each year.

In a milestone procedure at Banner – University Medicine Phoenix, Crudup received a BiVACOR Total Artificial Heart, which supported him for nearly a month until his transplant. With this surgery, the hospital became just the third in the world to successfully implant the BiVACOR device in a person.

The procedure was carried out by the Banner – University Medicine Advanced Heart Failure Program team as part of a Food and Drug Administration early feasibility study. Its purpose is to evaluate the new artificial heart device's safety and efficacy as a bridge-to-transplant, helping to keep patients alive as they await a donor heart.

"As a leading destination in the Southwest for heart transplantation, we are constantly looking for ways to advance the future of medicine and improve outcomes for our patients," said Francisco Arabia, MD, the program's physician executive and the implant team's lead. "The BiVACOR Total Artificial Heart is a promising device for heart failure patients, and we're proud to be on the forefront of investigating its performance for this landmark study."

More than 6 million U.S. adults live with heart failure. Transplants are limited to fewer than 6,000 procedures per year globally, making it necessary to reserve them for those with the most severe heart damage. The National Institutes of Health estimated that up to 100,000 patients could immediately benefit from mechanical circulatory support.

Fluid Biomarker Program launches to discover, evaluate spinal fluid & blood tests

Getting a diagnosis of one's risk for Alzheimer's disease currently involves a months-long process of clinic visits for brain scans, lumbar punctures and consultations. But a new generation of blood tests hold promise to open a path to simpler, more efficient diagnoses.

Banner Health brought new expertise and scientific vigor into its Alzheimer's disease diagnostic research efforts this year with the launch of the new Banner Research Fluid Biomarker Program and the hiring of Nicholas Ashton, Ph.D., a pioneer in the field, as its senior director.

Finding simpler, easier and less costly ways to evaluate people's risk is vital for both care and research. Getting an early diagnosis could allow people earlier access to drugs recently approved to treat Alzheimer's disease. In addition, such tests could also help researchers more efficiently conduct clinical trials assessing potential new drugs to slow disease progression.

The new program is dedicated to discovering spinal fluid and blood tests for other common causes of dementia, such as Lewy body dementia and frontotemporal dementia. The program is also pioneering new technology and simpler ways to get a biomarker result, including pinprick blood tests for Alzheimer's testing. The lab is also providing high-quality assessment of different blood tests from national and international research studies and trials, characterizing and comparing their performance, and using them to help transform the understanding, diagnosis, treatment, and prevention of these diseases.

The lab is expected to perform more than 100,000 tests in 2025.

The Fluid Biomarker Program is based at Banner Sun Health Research Institute and involves researchers and clinicians from there and Banner Alzheimer's Institute.

"I'm thrilled to develop a new biomarker program, capitalize on Banner's remarkable resources and leadership roles, build on my existing relationships, and fulfill our shared scientific and clinical goals together," said Dr. Ashton.

eSMARTER study tackles need for scalable ways to disclose Alzheimer's risk

eSMARTER
ALZHEIMER'S PREVENTION INITIATIVE

Recent years have brought much to celebrate in the field of Alzheimer's disease research, with the approval of new drugs to treat the disease in its early stage and rapidly advancing work to develop simpler, more easily accessible tests to diagnose it at Banner Alzheimer's Institute and elsewhere.

For people seeking new Alzheimer's treatments, it's recommended that they know their risk for the disease. Other people will just want to know more about their risk as tests become more accessible.

This will lead to more and more people taking these tests, spurring the need for quick, effective ways to give people information about their risk – especially in cases in which results may go straight to patients before their doctor is able to speak with them. Disclosure also must be able to be done on a large scale.

Recognizing this need, principal investigator Jessica Langbaum, Ph.D., and other members of the Alzheimer's Prevention Initiative (API) launched the **eSMARTER** study.

The study is comparing how people respond to two different ways of learning their Alzheimer's gene and biomarker test results, either taking themselves through an interactive website or online chat that gives them information about their results, or having a virtual, live meeting with an expert healthcare provider.

If the trial determines that learning results from a website or chat is an effective option, it could give patients more time to prepare questions for their doctor and enable doctors to spend more time on patient care. It could also help patients understand their results sooner, given the availability of counselors to serve as guides.

The name eSMARTER stands for Evaluation of Self-Mediated Alternatives for Risk Testing Education and Return of Results. It builds off the Banner Alzheimer's co-led API Generation Program trials and its ancillary CONNECT 4 APOE study, which together helped to demonstrate the safety of disclosing Alzheimer's gene results.

The eSMARTER study began enrolling its first participants in October.

Brain, body donors help find new ways to better study memory, movement disorders

Prior to recent research, individuals and family members of someone exhibiting symptoms indicative of Alzheimer's disease either had to wait until a post-death examination of brain tissue or never learned for sure.

Thanks to participants across the U.S. and the Phoenix metro area who donated their brains upon death, studies of those brains by the **Brain and Body Donation Program** at Banner Sun Health Research Institute led to the world's first FDA-approved imaging methods to diagnose Alzheimer's in people before death. Having this diagnostic capability supports earlier and more effective use of emerging therapies to delay or lessen symptoms.

The program is doubling down on these efforts, as it is currently the central neuropathology lab for two new studies testing next-generation diagnostic agents developed by Life Molecular Imaging and Meilleur Technologies respectively to further improve the accuracy of diagnoses. All told, the program has served as the central lab for four of the six past and current studies to date testing such diagnostic agents, and participated in the other two trials.

The Brain and Body Donation Program's reputation for being able to reliably conduct this type of study is why it has been repeatedly approached by life science companies to participate in these FDA-licensing trials. The imaging methods involve using radiolabeled compounds and positron emission tomography, or PET, scans to detect either the amyloid plaques or tau protein tangles that are hallmarks of Alzheimer's onset.

Thanks to the program's donors, the program is now sharing more than 20,000 human tissue samples with scientific groups worldwide every year, greatly amplifying scientific impact. In addition to Alzheimer's, the program is contributing to research on Parkinson's disease, other brain diseases and normal brain aging, with more than 50 scientific publications in the past year. Thomas Beach, MD, and Geidy Serrano, MD, lead the program.

Strengthening Partnerships

Amplifying Our Impact and Expanding Opportunities

Banner & University of Arizona lead way in *All of Us* recruitment success

All of Us RESEARCH PROGRAM

For more than six years, the University of Arizona and Banner Health have partnered to advance the recruitment of participants in the National Institutes of Health ***All of Us*** Research Program. In September 2024, the partnership embarked on its seventh year of helping this ambitious research initiative achieve full representation of the U.S. population with awards through the years totaling more than $83 million.

Unlike research studies that focus on one disease or group of people, *All of Us* is building a highly representative database with health information shared by more than a million people to inform thousands of studies on a variety of health conditions and questions.

Some highlights of the University of Arizona and Banner Health partnership's achievements in the past year include:

- Enrolling more than 6,428 participants in the *All of Us* database since the start of 2024, and more than 88,679 since initial launch in 2017, becoming the nationwide leading enrollment site for the program.
- Excelling at recruiting populations historically underrepresented in biomedical research. More than 90% of people enrolled by the partnership come from these populations and 1 out of 4 Hispanic/Latino participants were enrolled by the partnership.
- Contributing as one of five locations selected nationwide to conduct a pilot phase of recruiting pediatric participants ages 0 through 4. Children's participation in research requires different considerations than adults, hence the need to assess processes. Partnership sites enrolled 48 children during the pilot phase.
- Opening a new location at Banner Wyoming Medical Center in Casper, which supports a major initiative to enroll more participants from rural communities.

Collaborations enhance Banner's leadership in advanced heart research

With several exciting new clinical studies launched and under way this year, Banner – University Medicine continues to advance groundbreaking research in cardiovascular disease treatment and its facilities' reputation as destinations for top-quality heart health care.

The FACILE VT Ablation Trial is comparing two procedural methods for treating a life-threatening irregular heart rhythm (ventricular tachycardia) developed from research led by internationally recognized cardiology and electrophysiology expert Roderick Tung, MD. As director of the Cardiovascular Center at Banner – University Medical Center Phoenix and division chief of cardiology at the University of Arizona College of Medicine – Phoenix, Dr. Tung was awarded a $3.47 million grant for the trial, which is amongst the largest investigator-initiated trials from Abbott. The research hypothesis is based on new mechanistic observations that can identify the arrhythmia target faster, and which holds promise for increasing the efficiency and safety of catheter ablation.

Dr. Tung was also tapped by pharmaceutical maker Eli Lilly as principal investigator for Banner – University Phoenix as a recruiting site for the international TRIUMPH OUTCOMES study. This first Phase III trial is testing the potential of novel "triple G" weight loss drug retatrutide, made by Eli Lilly, which extends building the science behind Ozempic and Wegovy, to improve outcomes for high-risk patients with obesity plus cardiovascular disease and/or chronic kidney disease. The degree of weight loss observed in Phase II was 25% of body weight. This trial marks the first partnership between Lilly and Banner – University Medicine Heart Institute to optimize cardiometabolic health.

Device company Synaptic Medical turned to Wilber Su, MD, director of cardiac electrophysiology at Banner – University Phoenix, to lead the national SENSATION study assessing its cryoballoon ablation system in patients for whom drugs proved ineffective at treating their paroxysmal atrial fibrillation. The study reinforces Banner's leadership in pioneering innovative solutions for complex arrhythmia care.

FACT CRT is an NIH-funded trial to evaluate the response to cardiac resynchronization pacing in patients with atypical forms of electrical conduction disease. In this multicenter effort, Dr. Tung's team aims to improve ways to predict patients' responses to device therapy and improving their heart failure outcomes.

Banner, UofA College of Medicine – Tucson partner to administer first dose of experimental Parkinson's cell therapy

For now, hearing a diagnosis of Parkinson's disease means facing an inevitable worsening of symptoms, as there are currently no approved therapies that stop or prevent disease progression. But hope got a boost in the spring of 2024 as a patient received the first dose of an experimental cell therapy at Banner – University Medical Center Tucson, the lead dosing site for Aspen Neuroscience's ASPIRO trial.

The patient was the first adult in the first study cohort with moderate to severe Parkinson's selected for the study testing the safety and tolerability of ANDPD001. This therapy involves inducing a patient's skin cells to turn into early-stage nerve cells that are intended to replace the patient's damaged or destroyed dopamine-producing neurons. ASPIRO is assessing how well the transformed cells mature and produce dopamine after they're surgically injected into specific brain regions.

The pioneering experimental procedure was performed by one of the foremost experts in the field of interventional MRI-guided stereotactic surgery, Banner neurosurgeon Paul Larson, MD, professor of neurosurgery at the University of Arizona College of Medicine – Tucson. He leads one of the top clinical research teams in intracranial delivery of novel therapies for neurodegenerative diseases. The team has been the solo or lead group in a dozen cell and gene therapy studies since 2004.

Aspen's approach of using each trial participant's own, or autologous, cells means that immunosuppressive drugs aren't necessary to prevent their immune system from attacking the surgically implanted cells.

"By the time of diagnosis, it is common for people with Parkinson's to have lost the majority of dopaminergic neurons," Dr. Larson noted. "This is the first use of the autologous approach in a formal clinical trial, and it is an honor to be part of this important study."

Seven patients have received the experimental therapy at Banner so far. ASPIRO is an early-stage Phase 1/2a trial and additional studies will be needed to determine how effective ANDPD001 is at slowing symptom progression.

Oncology research aims to improve treatment for adults, children

Banner MD Anderson Cancer Center's clinical investigators conducted cutting-edge research in 222 oncology studies in 2024.

Founded on the expertise and resources of both Banner Research and MD Anderson Cancer Center in Houston, and together with regional and national community and academic partners, including SWOG Cancer Research Network, we facilitate high-impact collaborative projects to elevate the quality of cancer care.

Current research at Banner MD Anderson includes trials involving breast, prostate, brain, gynecological, gastrointestinal and genitourinary cancers, head and neck cancer, lung cancer, lymphoma and melanoma, among several others.

Since 2016, more than 2,300 patients have participated in nearly 450 clinical trials in Arizona and Colorado, with 17 of these trials resulting in new cancer drug approvals by the FDA.

Separately, Banner Research is also involved in studies supported by the National Cancer Institute-funded Children's Oncology Group, or COG, and Banner Research helps to support advancing the research efforts at University of Arizona Cancer Center in Tucson.

These trials include frontline treatment for many types of childhood cancers, studies aimed at determining the underlying biology of these diseases, and trials involving new and emerging treatments, supportive care, and survivorship.

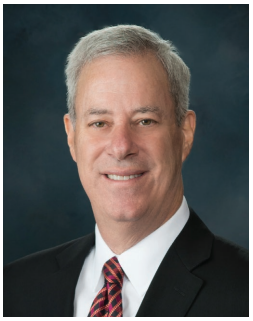
The studies focus on lymphoma, supportive care, long-term follow-up, osteosarcoma, central nervous system tumors, germ cell tumors, and renal cell carcinoma, among others.

Spreading Knowledge & Thought Leadership

High-Impact Publications

Banner Research experts served as co-authors on more than 435 medical journal articles spanning a wide range of research in areas including Alzheimer's, dementia, cancer and Parkinson's disease. This extensive work greatly advances knowledge worldwide.

A sample of this high-impact research includes:



Eric Reiman, MD

Banner Alzheimer's Institute and Arizona State University researchers, along with their collaborators, discovered a surprising link between a chronic gut infection caused by a common virus, and the development of Alzheimer's in a subset of people. It is believed most humans are exposed to this virus – called cytomegalovirus or HCMV – during the first few decades of life.

The research in *Alzheimer's & Dementia: The Journal of the Alzheimer's Association* found that in some people, the virus may linger in an active state in the gut, where it may travel to the brain via the vagus nerve – a critical information highway that connects the gut and brain. Once there, the virus can change the immune system and contribute to other changes associated with Alzheimer's.

If the researchers' hypotheses are confirmed, they may be able to evaluate whether existing antiviral drugs could treat or prevent this form of Alzheimer's disease. They are currently developing a blood test to identify people who have an active HCMV infection and who might benefit from antiviral medication. Eric Reiman, MD, CEO of Banner Alzheimer's, was the senior author on this study.

Banner's Brain and Body Donation Program provided tissue samples and resources that were critically important to this research.

Alireza Atri, MD, Ph.D.

A special issue of the journal ***Alzheimer's & Dementia: The Journal of the Alzheimer's Association*** highlighted the new "Alzheimer's Association Clinical Practice Guideline for the Diagnostic Evaluation, Testing, Counseling and Disclosure of Suspected Alzheimer's Disease and Related Disorders," co-written by Alireza Atri, MD, Ph.D., chief medical officer of Banner Research and director of Banner Sun Health Research Institute.

The guideline summarizes the process of diagnostic evaluation and disclosure for people suspected of potentially having cognitive-behavioral impairment due to Alzheimer's or Alzheimer's-related neurodegenerative disorders. Similar American guidelines are more than 20 years old and aimed at specialists or dementia subspecialists.

"This first U.S. interdisciplinary national evaluation guideline, designed for broad clinical settings, provides a comprehensive foundation summarizing a high-quality and personalized process within which specific tests are slotted and can be updated as the field evolves," Dr. Atri said.

Jessica Langbaum, Ph.D.

Robert Alexander, MD

In a *Lancet Neurology* article, Banner Alzheimer's Institute researchers said they hope to find and support access to an effective "secondary Alzheimer's prevention therapy," one that averts the onset of cognitive impairment in healthy persons with blood test evidence of the disease, within two years. They also hope to find and support access to a "primary Alzheimer's prevention therapy," one that completely averts onset of the disease and ensuing cognitive impairment in at-risk persons prior to blood test evidence of the disease, by the end of 2028. Authors of the article, "A chance to prevent Alzheimer's disease sooner than you think," included Dr. Reiman, Jessica Langbaum, Ph.D., and Robert Alexander, MD.

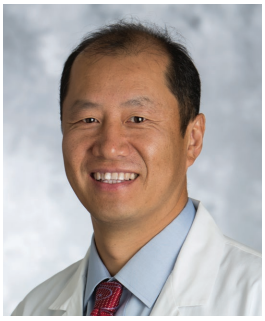
Nicholas Ashton, Ph.D.

Nicholas Ashton, Ph.D., senior director of the Fluid Biomarker Program, was listed amongst the world's most highly cited researchers by Clarivate for the second year in a row. "Of the world's population of scientists and social scientists, Highly Cited Researchers are 1 in 1,000," according to Clarivate.

Dr. Ashton published research on blood tests for dementia in Alzheimer's and Dementia: The Journal of the Alzheimer's Association. He and his co-authors focused on a type of gene mutations that can lead to decreased progranulin levels, one of the most frequent causes of inherited frontotemporal dementia (FTD). They found progranulin levels can be accurately determined from finger-stick blood samples. This can enable regular and remote monitoring of this protein in FTD therapeutic trials and potentially serve as a first-level screening test for the gene mutations.

Fade Mahmoud, MD

Fade Mahmoud, MD, and colleagues from Banner MD Anderson explored the potential benefit of a neoadjuvant immunotherapy in stage-3 melanoma. This results of this real-world experience in a community setting was presented by Dr Mahmoud and his co-authors at the annual ASCO meeting.



Jason Niu, MD

Jason Niu, MD, co-director of the lung program at Banner MD Anderson Cancer Center, evaluated a novel targeted combination therapy for thyroid cancer. He and his team presented their findings at the European Society of Clinical Oncology meeting, offering a potential treatment option for this challenging patient group and was published in *Annals of Oncology*.

Madappa Kundranda, MD

Madappa Kundranda, MD, division chief for cancer medicine at Banner MD Anderson, conducted a multiomics analysis of a novel drug BPM 31510 for treating patients with pancreatic cancer. Dr Kundranda and his co-authors presented the data of the phase-2 study of BPM31510 in combination with gemcitabine in advanced pancreatic ductal adenocarcinomas at the annual GI ASCO Conference. A phase-3 randomized study in advanced pancreatic cancer is planned.

Major grants and contributions

Researchers to use $74.5 million NIH grant to launch Alzheimer's prevention trial

Can a single medication or a combination of medicines clear and prevent the recurrence of amyloid plaques in the brains of people at unusually high risk for developing Alzheimer's disease by their mid-40s?

ALZHEIMER'S PREVENTION INITIATIVE

That's the focus of an ambitious, two-part study launched this year by Banner Alzheimer's Institute and the University of Antioquia (GNA) in Medellin, Columbia, with $74.5 million in funding from the National Institute on Aging, part of the National Institutes of Health.

The trial is powered by a registry maintained at the Alzheimer's Prevention Initiative (API). This registry includes more than 6,000 members of a broad kindred group in Columbia identified by GNA, many of whom carry a genetic mutation that predestines them to developing Alzheimer's disease at an average age of 44.

Study participants will first receive donanemab, a new symptom-slowing drug developed by Eli Lilly, to clear plaque build-ups from study participants' brains. Participants will then either continue to take donanemab, or instead receive RG6289, an oral drug candidate developed by Roche that's intended to limit production of amyloid protein, or receive a combination of both drugs or take a placebo.

The NOMIS Foundation based in Zurich, Switzerland, awarded API a $3 million dollar grant this year to continue assessing about 2,000 kindred members, to support enrollment in the trial, and to provide education and social support for kindred families irrespective of their participation in the study. API is led by Banner Alzheimer's.

The new trial builds on an earlier study co-led by Banner Alzheimer's and GNA that launched a new era in Alzheimer's prevention research when it was announced by the NIH in 2012. Although the drug candidates in the earlier trial did not show clinical benefit, the study introduced ways to speed up the evaluation of promising prevention therapies, found ways to do so in a vulnerable population in a developing country and set foundations for additional prevention trials.

The new trial will begin enrolling in late 2025 or early 2026.

Banner continues major role in study to refine ways to diagnose CTE

Researchers from Banner Alzheimer's Institute will participate in a new $15 million, multi-center study called DIAGNOSE CTE Research Project II that will further refine methods to detect and diagnose a serious brain disease known as chronic traumatic encephalopathy, or CTE, in former football players before death.

The new federally funded study will build on and extend the initial DIAGNOSE CTE project that characterized the clinical features of CTE and developed clinical criteria for detecting and diagnosing the disorder. Banner Alzheimer's was one of the research centers that conducted the initial study.

Results of the new study aim to further differentiate the features of CTE from other types of Alzheimer's disease and related dementias, conditions for which definitive diagnoses cannot be made prior to death. By providing insight into the detection, diagnosis and prognosis for people living with the brain disease, DIAGNOSE CTE II will pave the way for new treatment trials.

CTE, a degenerative disease that occurs in individuals with repetitive head injuries, has been described most extensively in former football players and boxers, though it is not limited to them. CTE is characterized by changes in behavior, mood and memory, and may lead to the development of dementia and Parkinson's disease.

Eric Reiman, MD, chief executive officer of Banner Alzheimer's Institute and Banner Sun Health Research Institute, will oversee Banner's participation in the study. Banner will receive nearly $960,000 of the study grant awarded by the National Institute of Neurological Disorders and Stroke, which is part of the National Institutes of Health.

Donors turn grief into gifts to fuel answers on neurodegenerative diseases

Losing a loved one to Alzheimer's disease or related disorders has propelled many individuals through the years to donate to the Banner Alzheimer's Foundation to support research they hope will save future families from this loss. Their contributions provide invaluable support for Banner's research, as well as care programs, supportive services, community outreach, and education initiatives. Collectively, in 2024 the Foundation received than $5.8 million toward funding these efforts.

Notable gifts this past year include:

- A $1 million gift to support the Michael T. Zuendel Family Biomarker Laboratory at Banner Sun Health Research Institute by Zuendel and his family. A member of the Banner Alzheimer's Foundation board and international speaker and advocate for Alzheimer's disease patients, Zuendel is committed to ending this memory-degrading disease.
- A $100,000 gift from Dr. Stuart Ghertner of Henderson, Nevada, to establish the Pamela Ghertner Memorial Fund in honor of his late wife, who was a patient of Dr. Pierre Tariot at Banner Alzheimer's for many years. The fund will support ongoing research to end Alzheimer's and includes contributions from many of the Ghertners' friends and family members.
- A $125,000 gift to support post-doctoral fellows from an anonymous donor who lost her husband to Alzheimer's disease in 2024. Inspired by a presentation she heard by Nick Ashton, Ph.D. on Banner's Fluid Biomarker Program, she contributed to support his recruitment and teaching of post-doctoral fellows to expand the next generation of researchers.

Major grants and contributions (cont.)

Philanthropic grants power Banner's neurodegenerative disease research

Grants from philanthropic organizations help fuel Banner's work leading to breakthroughs in diagnosing, treating and preventing Alzheimer's disease and related neurodegenerative disorders, and to improved care management for patients and their families now. Two philanthropies in particular provided significant support this past year.

- A new nearly $500,000 grant supports a two-year joint project aimed at using the extensive samples and data collected through the Banner-led Arizona Study of Aging and Neurodegenerative Disorders to increase accuracy in distinguishing different forms of these disorders. Other aims are to assess biomarkers that would enable preclinical detection of Lewy body disorders and improve predictive rates for cognitive and motor decline.
- A new $76,700 award continues support for Banner's contributions to a study assessing the protein alpha-synuclein's potential as a biomarker for Parkinson's disease.
- Banner is in the second year of a three-year $68,000 planning grant to create a data bank and a brain tissue inventory to support research on Parkinson's disease and related disorders.
- A new $53,000 grant supports Banner's contributions to the Global Neurodegeneration Proteomics Consortium, an international protein biomarker discovery effort.
- An allocation of $229,000 continued Banner's work with Gates Ventures to co-develop and implement a digital platform that will increase the efficiency of analysis, management and sharing of complex neuroscience data to enhance research.
- This marked the fourth year of a $3 million grant to establish an internationally available research resource of blood samples provided by participants in the Banner-hosted Brain and Body Donation Program. These samples are crucial for developing and validating blood-based biomarkers.

Sharing Inspiration

Alzheimer's research participant finds hope in helping others

Bob and his wife, Charlotte Chang

Bob paragliding

Bob Ehlers was diagnosed with Alzheimer's disease four years ago. He has mild cognitive impairment from the disease, which affects nearly 7 million Americans and is projected to impact 13 million people in the U.S. by 2050.

"Whether it's minor or major (for me) depends on the day," said Ehlers, 62, of Litchfield Park, Arizona.

He chose to empower himself and help many others by enrolling in a clinical trial at Banner Alzheimer's Institute called Clarity AD, designed to evaluate an investigational drug for adults who suffer from memory loss.

"I knew there weren't a lot of alternatives to stop the progression of the disease. There's a lot of symptom treatment, but not a lot that actually acts on the cause," he said. "Taking part in a clinical trial has felt encouraging, and my experience has been terrific."

Ehlers has been involved in the study for more than four years. "Being able to get into state-of-the-art treatments with state-of-the-art people and state-of-the-art resources supporting me, that has been a godsend," Ehlers said.

Mesa breast cancer survivor inspired to volunteer for study

Rebecca with granddaughters, Isla and Ruby

Rebecca Gardner learned she had breast cancer on the same day she got the great news her twin granddaughters had just been born.

Inspired by the newborns Isla and Ruby and her lifelong passion for helping others, Gardner volunteered to take part in a research study in tandem with her treatment at Banner MD Anderson Cancer Center. The phase III study, Alliance A011801, studies how well trastuzumab emtansine (T-DM1) and tucatinib work in preventing breast cancer from coming back in patients with high-risk, HER2 positive breast cancer.

"Everyone from the doctors, nurses, assistants, to the volunteers – they make you feel like you're the star patient, because they get to know you and pay so much attention to you," said Gardner, 55, of Mesa.

After 21 rounds of chemotherapy, 20 rounds of radiation and two surgeries, Gardner celebrated the end of treatment with an emotional bell-ringing ceremony. She's now excited to be in remission and enjoying time with her granddaughters.

2024 Key Statistics

More than
1,300
studies

$66.5
million in revenues

38 new grant awards totaling **$88** million

400
team members

Banner Alzheimer's Foundation
received more than **$5.8** million in donations

Banner Health Foundation
raised more than **$530,000** for Banner MD Anderson Cancer Center research

Brain and Body Donation Program shared
20,000
tissue samples with scientific groups worldwide

Banner Research
Experts co-authored more than **435** publications