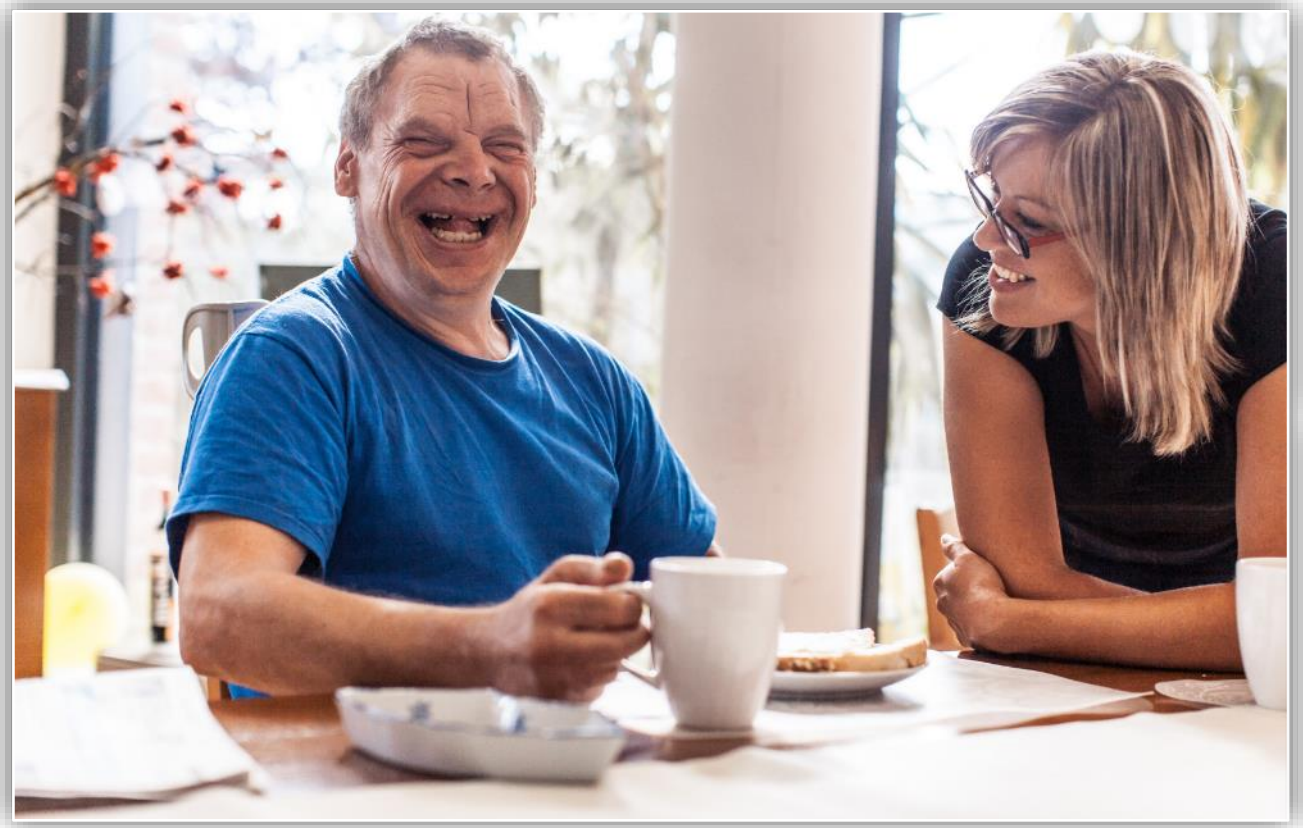
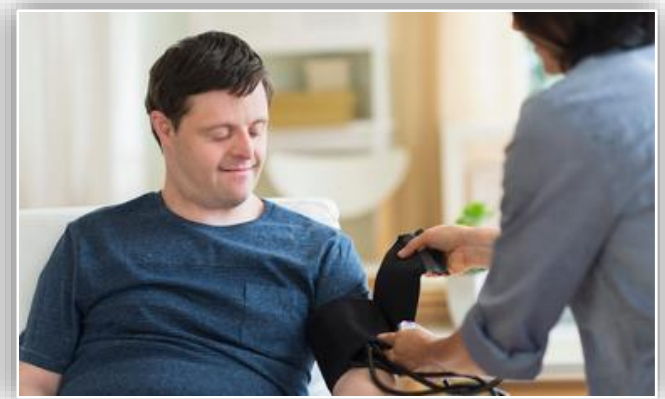




But I'm Not a Scientist!

Why, How, and When Families should consider participating in Down Syndrome Research

Kate O'Neill *VP, Marketing & Community Engagement*

Aisha Vanderhorst *Senior Project Manager, Clinical Operations*

AGENDA

I. Introductions & Background

II. The Importance of Participation (WHY)

III. Ways to Get Involved (HOW & WHAT)

IV. Research Opportunities (WHEN)

V. Choosing an Opportunity (HOW)

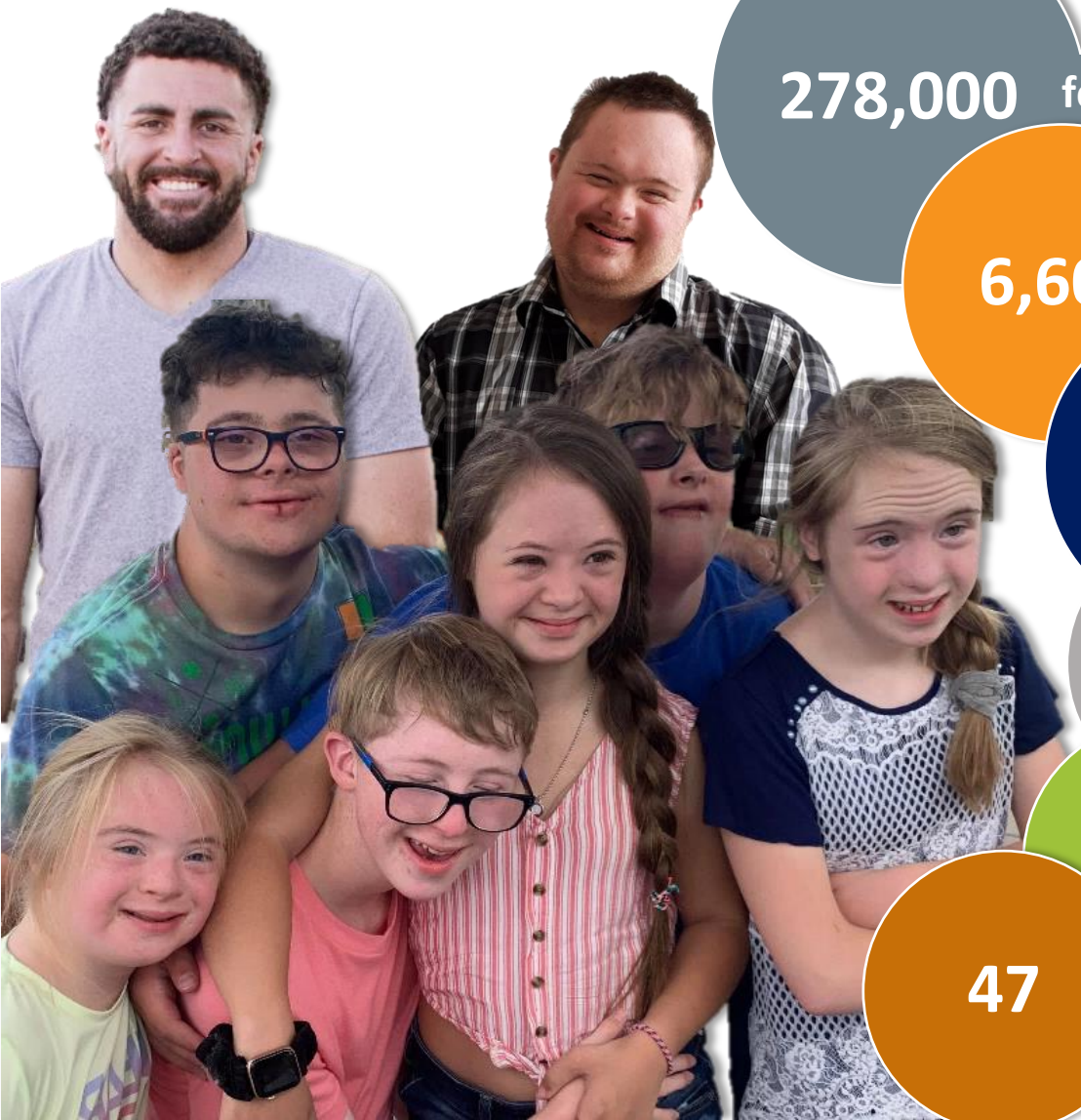
Hi. We're LuMind IDSC!

Founded by families who sought better research and more meaningful connections, today LuMind IDSC envisions a world where every person with Down syndrome thrives with improved health, independence, and opportunities to reach their fullest potential.

To realize our vision, we…

- **accelerate research** to increase availability of therapeutic, diagnostic, and medical care options
- **provide resources and support** to a dynamic community of individuals with Down syndrome and their caregivers
- **serve as a connector, a bridge** between the Down syndrome community and the research community

LuMind IDSC's Community



278,000 followers on 5 social media platforms

6,600 digital survey participants & clinical research studies

3,800+ people from 50 states and 13 countries are members of myDSC, our free digital resource library

1500+ Research participants in 21 observational studies and interventional clinical trials

130 scientists at 32 institutions conduct research for LuMind IDSC

47 local, national, and international organizations we count as partners

LuMind IDSC collaborates globally, nationally, and regionally

Why We Accelerate Research & Promote Research Awareness

95% risk of Down syndrome-associated Alzheimer's disease at age 65. It is the leading cause of death for adults with DS.

100% of adults with DS experience obstructive sleep apnea. 60% of kids with DS experience abnormal sleep by age 4.

97% of families report lack of independence as a critical concern for their loved one.

99% almost all children and adults with Down syndrome have speech and cognitive delays.

When we succeed, people with Down syndrome will have:

- Improved diagnosis, new treatment options and equal early treatment access for Alzheimer's disease
- Best-in-class clinical care for multiple medical conditions
- Useful and convenient diagnosis and treatment of sleep apnea
- Maximized independence as they age

WHY

The Importance of Participation

Why now?

Life expectancy for people with Down syndrome has increased dramatically.

1960s

Life expectancy was 10 years.

1980s

Life expectancy was 25 years.

2020s

Life expectancy is 65+ years.

Why now?

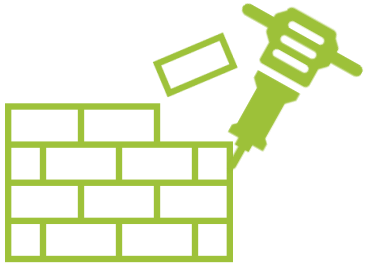
- This is the first generation of people with Down syndrome to live to retirement age.
- Parents, siblings, and caregivers are aging along with their loved one. Everyone needs more support, info, and solutions.
- New treatments and therapies for Alzheimer's disease, sleep apnea and other conditions associate with Down syndrome are on the near horizon.
- As new treatments are made available, people with Down syndrome should be able to access the latest medical advancements.
- **But first, doctors need to know those treatments are safe to prescribe to people with Down syndrome.**

A road map to healthy, independent lives for adults with Down syndrome...

We invest in **translational research**

We build **awareness** of Down syndrome research & the importance of **participating** in it

We remove **barriers** to clinical trials



Therapies and drugs are deemed **safe and accessible** to people with DS

People with Down syndrome live **longer and more independently** than any generation before.

Down Syndrome Research Momentum is Growing

- Human Trisome Project
- Include Data Coordinating Center

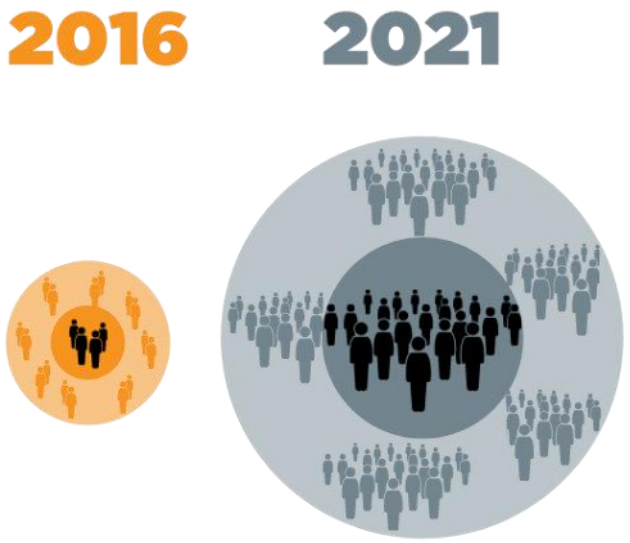
- DS-CTN network with 14 sites
- LIFE-DSR natural history study
- Industry Research Consortium

- NIH Include Project ($70M+ more/year)
- NIH DS Connect Registry
- NIH ABC-DS natural history study
- NIH ACTC-DS network 17 sites
- Include Data Coordinating Center

- LonDowns natural history study
- DABNI natural history study
- Horizon21 network 10 sites

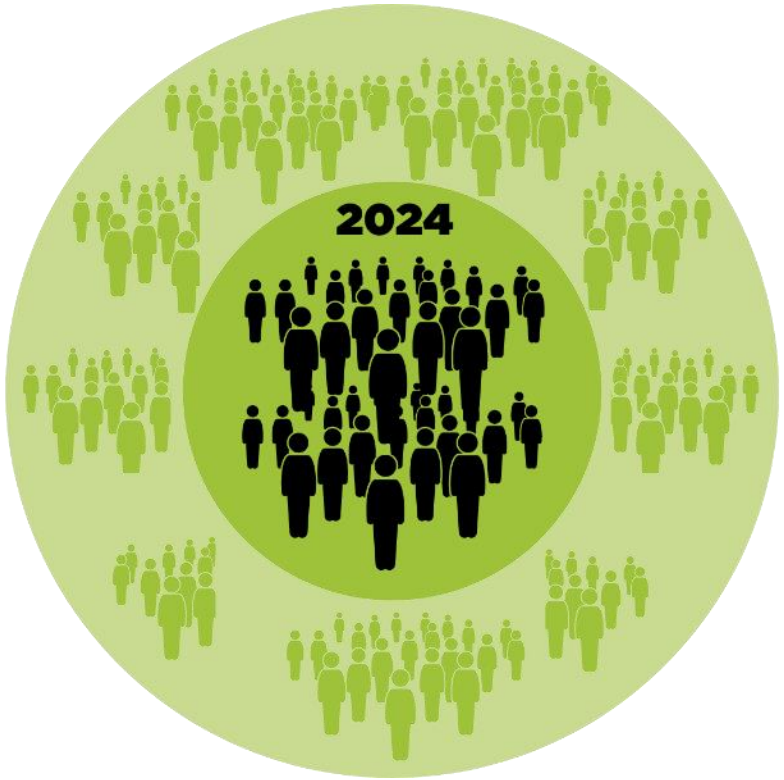
Research Participation is Needed

The number of clinical trials and observational studies in adults with Down syndrome grew from one trial in 2016 to four in 2021.

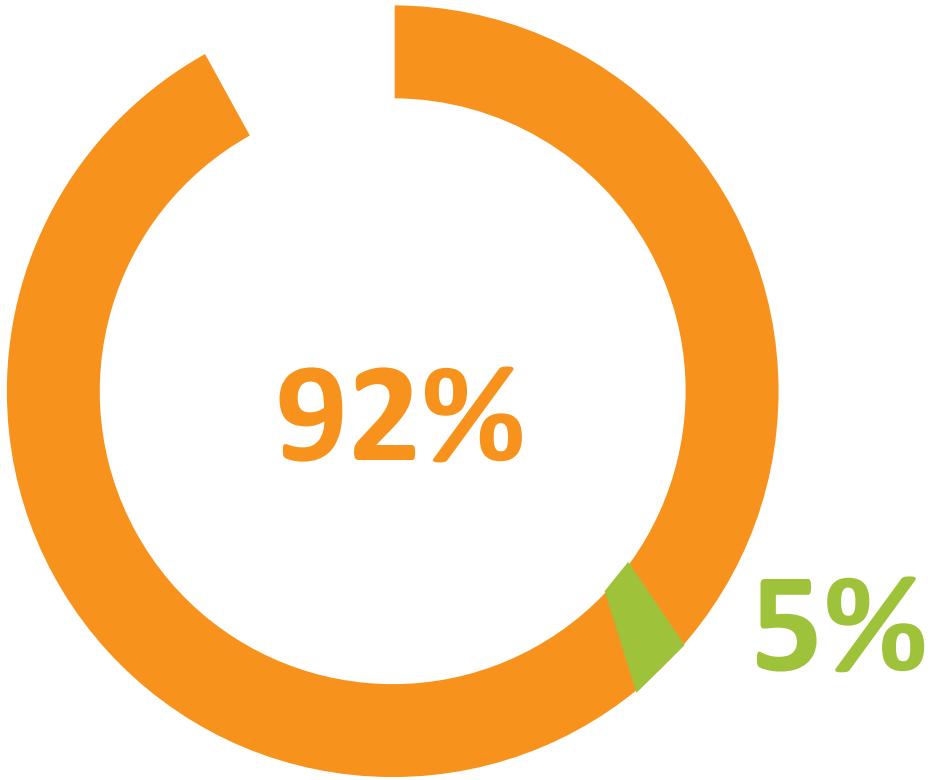


5-10 studies are expected by

2024



The Research Participation Disparity



92% of families surveyed by LuMind IDSC indicated they wanted clinical trials to focus on the health care needs of people with Down syndrome.

Fewer than **5%** of families said they had ever participated in a clinical trial. N.White, 2021

CONCLUSION: We need to raise awareness of research opportunities, and de-mystify research for our families.

Research Terms: First Things First

Translational Research

Translational research is conducted with the goal of solving a particular problem; for example, reducing the risk of Alzheimer's disease in adults with Down syndrome. It's the process of transforming research discoveries from the laboratory into practical medical or therapeutic protocols, policies, approaches, and treatments.

Natural History Study

A natural history study collects information about the natural history of a condition in the absence of an intervention, from the condition's onset until either its resolution or the individual's death. Researchers observe participants as they are by recording medical, physical, and behavioral data points, like: height, weight, blood/ plasma samples, key behaviors, sleeping patterns, and blood pressure. Researchers use the information collected from all study participants to better understand the clinical profile of a given condition, such as DS.

Survey

A survey gathers information either digitally or in person, in the form of data points, feedback, opinion, and the iteration of experience. Surveys can vary significantly in scope and length. In the Down syndrome community, surveys are often completed by a caregiver in observation of their loved one's lived experience, health, behavior, etc.

Research Terms: What is a Clinical Trial?

- **Clinical research** that is performed on humans, typically involving some measure of intervention like a drug, device, or behavior modification.
- **Double-blind placebo-controlled trials** are the gold standard for determining the safety and efficacy of a new treatment.
- There are usually **3 phases of clinical trials** in the drug development process. Each phase is designed to highlight a different aspect of safety, efficacy, and replication.

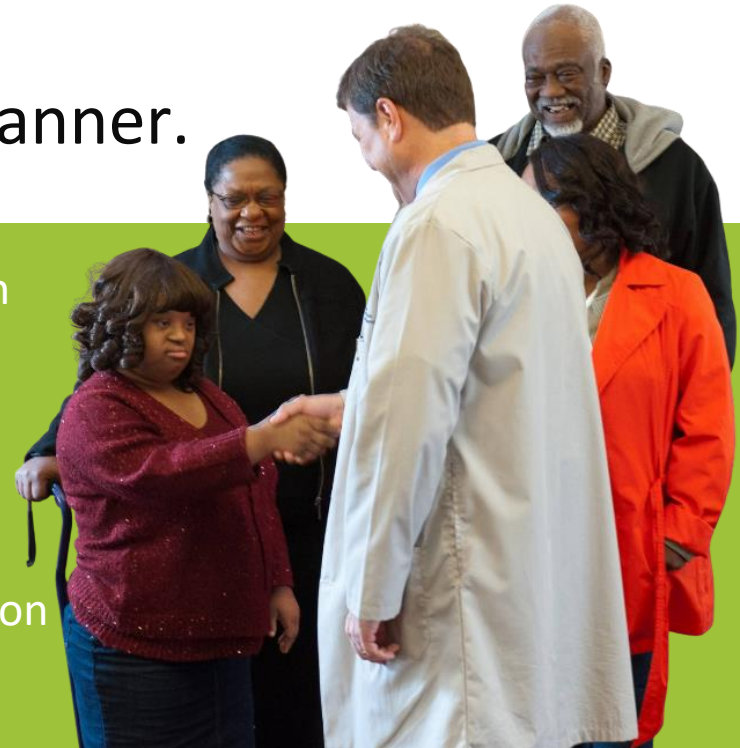
The U.S. National Institutes of Health (NIH) define a clinical trial as: A research study in which one or more human research subjects are prospectively assigned to one or more interventions (which may include placebo or other control) to evaluate the effects of those interventions on health-related biomedical or behavioral outcomes. Interventions may be medical products, such as drugs or devices; procedures; or changes to participants' behavior, such as diet.

What makes a good clinical trial?

- Independent oversight of trials ensures high **ethical standards - IRB.**
- **Properly designed and executed** clinical trial is key**.**
- **Informed consent** is used to protect the rights of people participating in clinical trials.
- Clinical trial **results should be published** in a timely manner.

IRB (Institutional Review Board) An IRB is defined by the FDA as a group that has been formally designated to review and monitor biomedical research involving human subjects. An IRB has the authority to approve, require modifications in (to secure approval), or disapprove research and any corresponding materials (such as marketing/advertising content).

FDA regulations require that IRBs have at least five members and take into consideration race, gender, and cultural background to build a diverse membership.



90% Lifetime risk of Down syndrome-associated Alzheimer's disease. It is the leading cause of death for adults with DS.

60% of children with Down syndrome experience obstructive sleep by age 4.

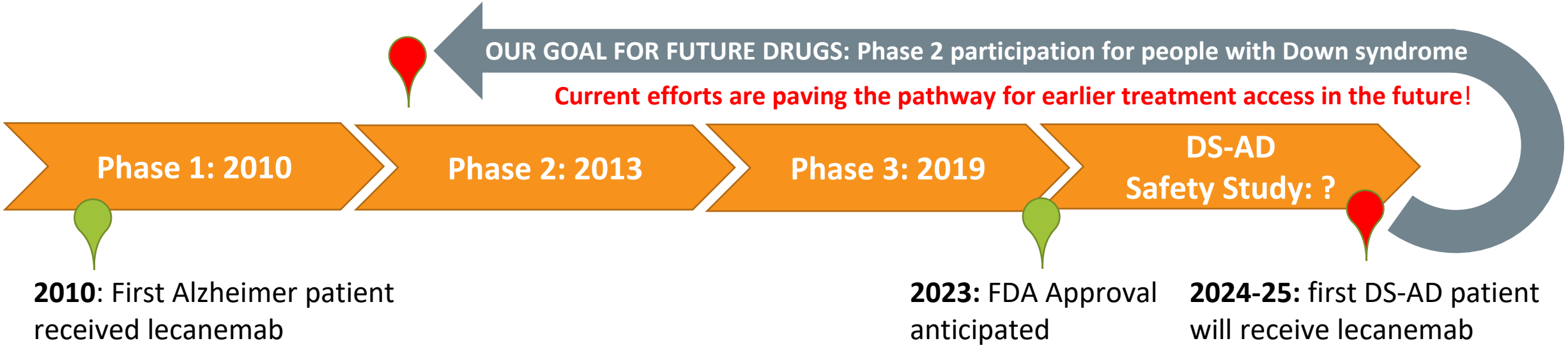
100% Nearly 100% of adults experience obstructive sleep apnea.

99% Almost all children and adults with Down syndrome have speech and cognitive delays.

The impact of research participation on the future health and wellbeing of people with DS

AN EXCLUSION PROBLEM: Out of 4,410 trial participants, 0 adults with DS were included in these trials

OUR GOAL: Include adults with DS in drug trials, specifically safety studies



Why we're hopeful

More people than ever before have indicated they are interested in participating in Down syndrome research.

- LuMind IDSC activities (research awareness & person-centric research to simplify participation process for families)
- Increased general awareness (public, pharma, government)
- CMS public comments in 2022
- Awareness of social justice issue of clinical trials exclusion
- NIH DS Connect registry
- Efforts from other organizations (e.g., NDSS sharing of available research projects)

The Washington Post

Forbes

STAT+

E&C REPUBLICANS

FIERCE Biotech

HOW

Learning About Research & Getting Involved

3 Ways to Get Involved in Research

1. **Get educated about research –** learn about the current status of Down syndrome research and stay updated

1. **Engage around research–** with other families, LuMind IDSC, NIH, other research organizations, researchers and clinicians. Talk to your loved one's doctor!

1. **Participate in research –** in surveys, observational studies and therapeutic clinical trials

How Can I Get Educated About Research?

What is myDSC?

A free, online library of trusted resources and useful tools for people with Down syndrome and their families that can be personalized to each member's interests

- 800+ resources, many related to medical, behavioral issues and linked to reputable research you can count on
- Membership (it's free!) means you will stay up-to-date on latest Down syndrome research news, research opportunities, publications, etc.
- Opportunities to connect with other families, online and in person

LIFE-DSR Research Study

Why are observational studies important? Why is LIFE-DSR important?

- Data collected will help researchers better understand the link between DS and Alzheimer's
- Understanding physiology of people with DS may help solve other health and Quality of Life challenges
- Increased understanding of biomarkers (reliable predictors and indicators of disease) in DS-AD can be used as bridge to AD biomarkers in general population to better understand disease progression and drug effects
- **This study does NOT involve drug or therapy interventions/trials. It is observational.**

LIFE-DSR: What do participants do?

Once per year for three years, a 3-4 hour visit at a local clinic site includes:

- Informed consent and medical history
- Physical & neurological exam
- Questionnaires and assessments for the participant
- Questionnaires and assessments for the caregiver
- Optional tests at some sites could include MRI, PET or LP
- Blood sample

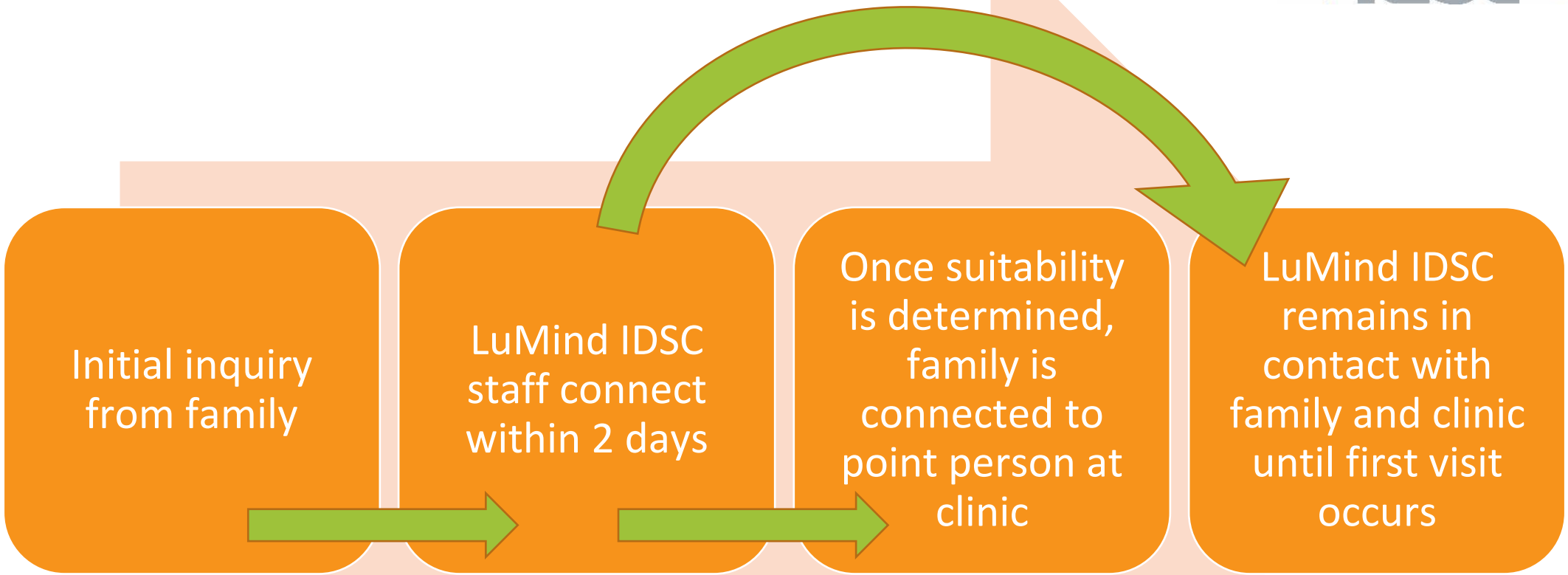
LIFE-DSR: How does it work?

LuMind IDSC staff and on-site clinic staff work with families to construct an easy, fun visit!

Supports available to families include:

- Travel reimbursement
- Help with travel logistics
- Overnight lodging if applicable
- Convenient appointment times with scheduled breaks as needed
- Team approach and continuity of staff

LIFE-DSR: How does it work?



DSResearch@LuMindIDSC.org

LuMindIDSC.org/research

Other research resources

For research under the auspices of the National Institutes of Health

National Institutes of Health

DS-Connect® is a registry for people with Down syndrome and their families to:

- Express interest in participating in certain clinical studies on Down syndrome, including studies of new medications and other treatments.
- Take confidential health-related surveys. These surveys are aimed at better understanding the health of people with Down syndrome across their lifespans.

Other research resources

National: clinicaltrials.gov the NIH central repository, is searchable by geography, diagnosis, etc.

Your local/regional Down syndrome clinic:

- Massachusetts General Hospital
- Boston Children's Hospital
- UMass Memorial Children's Medical Center

Online:

- LuMindIDSC.org
- MDSC.org

WHEN

When is a good time to get involved in research?

When Should We Get Involved?

When you find a study or trial that aligns with:

- Your family's interests, concerns
- Your geography
- Your demographic
- Your lifestyle

AND…

- You understand what is involved in participating
- You trust the researcher, the organization, the sponsor, and/or the person who referred you to the study.

Examples of Participation: Low Involvement

- Caregiver completing an online survey or mail-in survey
- Caregiver completing a phone survey
- One-time visit by caregiver/self-advocate to clinic or testing center when all tests or procedures are conducted at once with no follow-up visits necessary
- An initial “orientation” visit to clinic or testing center, follow-up charting behaviors or activities at home by caregiver/self-advocate
- One-time video chat for sharing information/interview by caregiver/self-advocate

Examples of Participation: Medium Involvement

- An initial “orientation” visit to clinic or testing center, followed by several weeks or months of charting behaviors or activities at home
- Multiple follow-up visits or video check-ins over sustained period of time
- Participation in non-invasive tests/procedures like: cognitive/behavioral assessments, blood draw, medical assessment
- Virtual clinical trials from home
- Screening or diagnostic studies

Examples of Participation: High Involvement

- Drug trial (including placebo) participation – typically regular visits for 6 to 24 months
- More invasive procedures to obtain data: lumbar puncture, MRI, PET, imaging
- Surgical intervention: preparation, procedure, follow-up
- Device implantation, training, tracking

HOW

How do I know if a research opportunity is good?

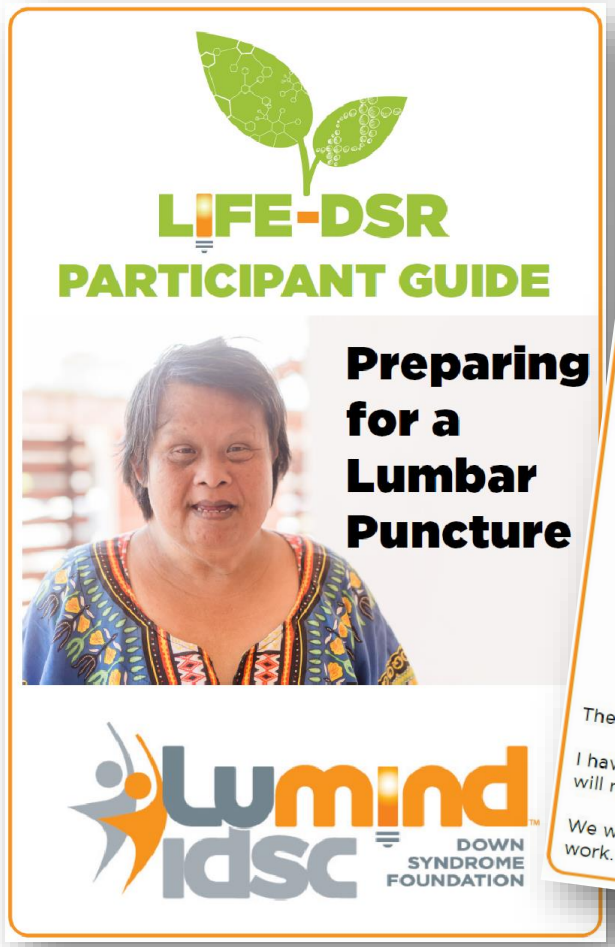
How Do I Know if a Study is "Good"?

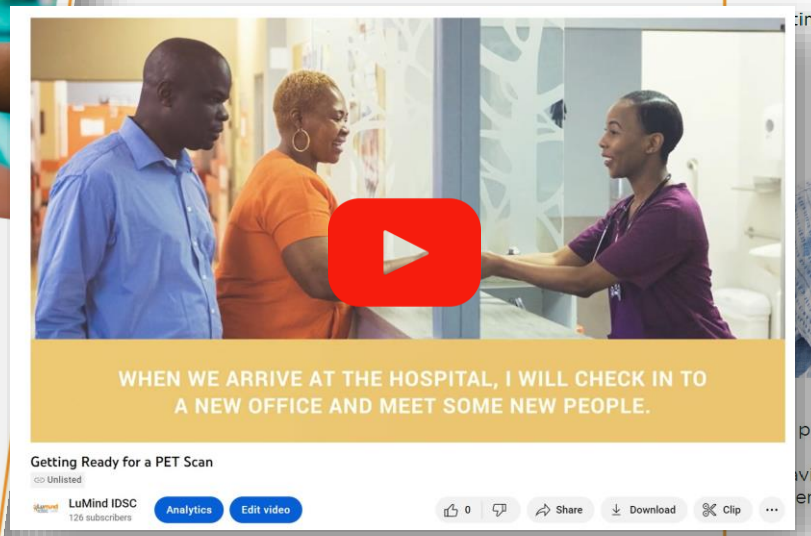
When considering a research participation opportunity, we suggest you make sure the recruitment flyer, web page, etc. contains, in clear and family-friendly language:

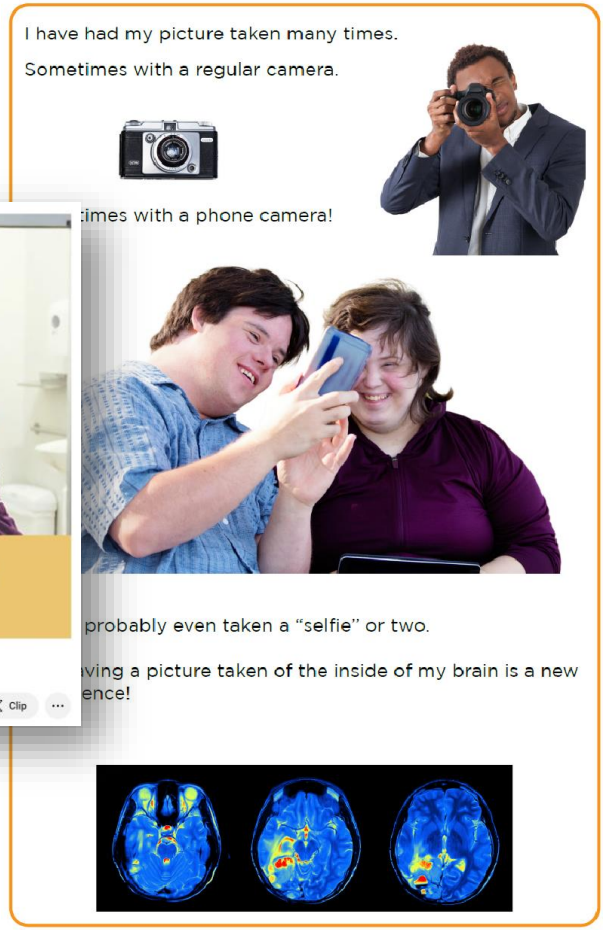
- The contact information and credentials of the requestor or the individual who will be the main point of contact for questions
- A thorough explanation/description of the study/trial/survey
- Proof of regulatory oversight (IRB, ERB, etc.)
- Outline of participant inclusion parameters
- Timeline components of the request (project anticipated start or end date), and any other relevant information

We can help! LuMind IDSC is always a resource!

What do “family-friendly,” “person-centric” materials look like?







Other issues to consider:

QUESTIONS TO ASK WHEN YOU ARE REVIEWING A REQUEST:

- Is the researcher connected to a respected academic, government, or healthcare institution?
- Were people with Down syndrome and/or their caregivers included in the study design? If not, was expertise from the DS clinical community included?
- Are there other sponsors/partners associated with this study whose mission does not align with family's values?
- Are the outreach materials easy for you to understand?
- Are the risks for participation clearly iterated (in family-centered language) and are the risks minimal?
- Is the language around the study/trial/survey factual and not sensational?
- Does the study promise anything outrageous or improbable?

Follow Your Instincts

When considering research participation for your loved one (or yourself), pay attention to your gut. You know your loved one, you know your family culture and capacity! Choosing to participate in a study that will suit your family is the first step toward success.

Is this study asking my loved one to do something that is outside their comfort zone? If so, could/should my loved one be motivated to go outside their comfort zone?

Is it realistic for my family to:

- Commit to multiple clinic visits over time?
- Have the space and technology to participate in video communication?
- Travel to the testing/clinic site?
- Record or otherwise track daily/weekly/monthly behaviors or activities?

Person-centric research

LuMind IDSC works directly with researchers to help make their overall experience - processes, materials, and protocols – as “family-friendly” as possible.

What do YOU think makes an experience person-centric/family-friendly?

What can we tell study designers about your family’s wants and needs?

What would make the research experience better for you and your loved one?

QUESTIONS

Who? What? How? When?