



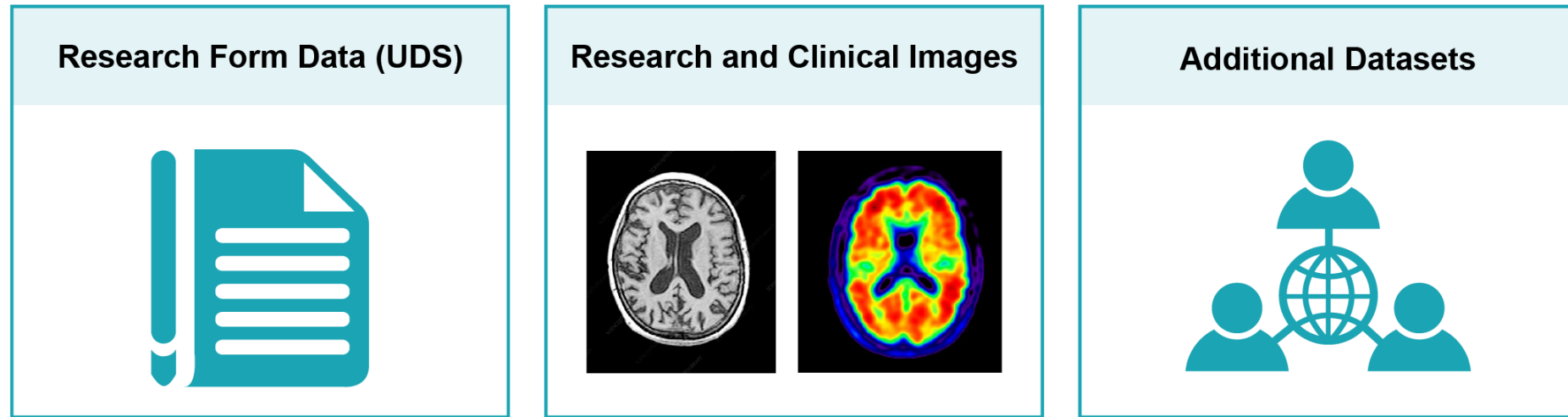
Digital Biomarkers in AD ADRC Meeting

NACC

May 14th, 2022

NACC Overview

The National Alzheimer's Coordinating Center (NACC) coordinates a wide range of data types:



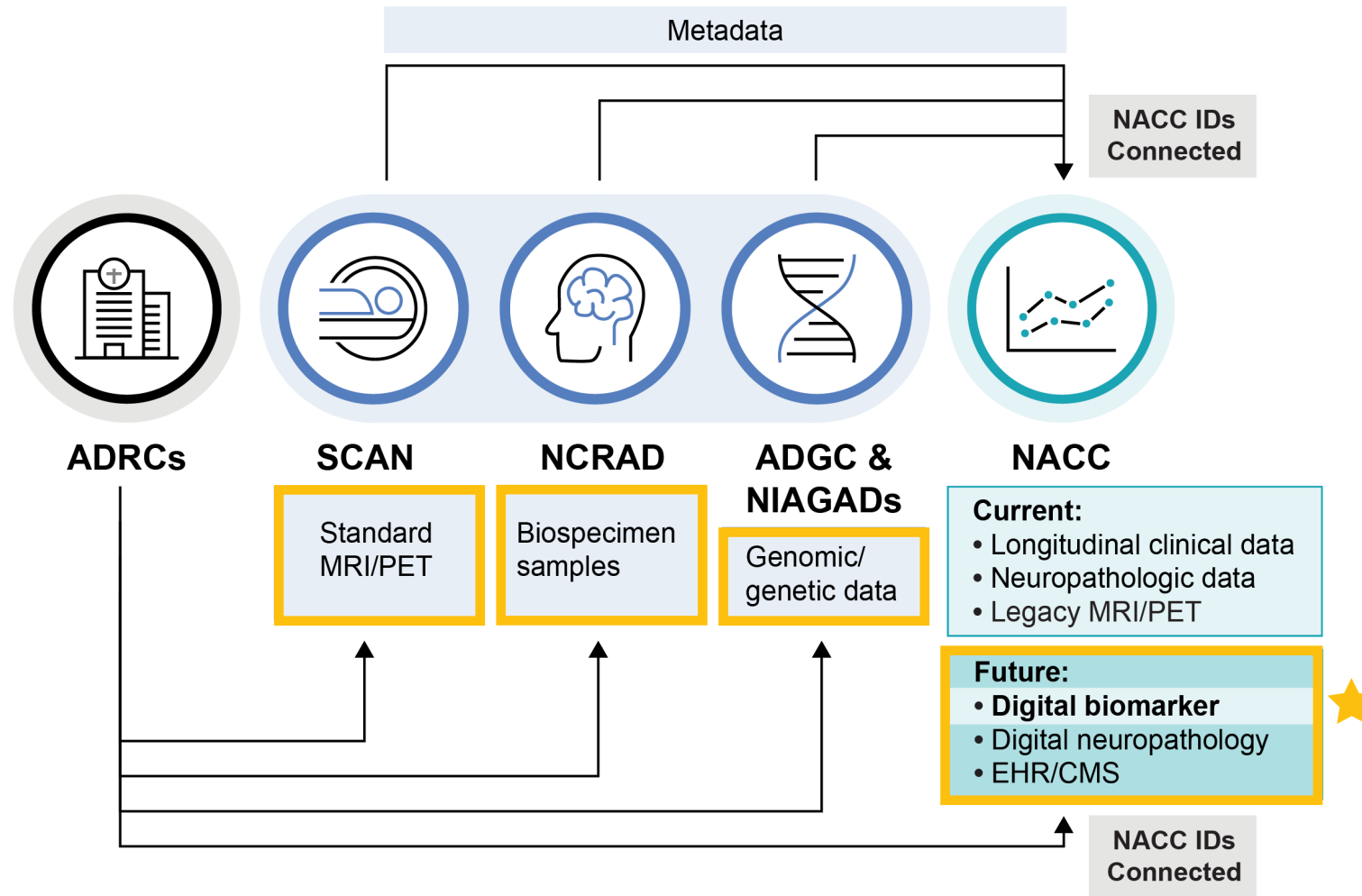
Over time, new modes of data collection have become available for collecting digital cognitive measures and other data using the internet, computers and devices for facilitating patient reported research data.

NACC is modernizing to become a user friendly, self-service data portal that is scalable to new data types and modalities of data collection.

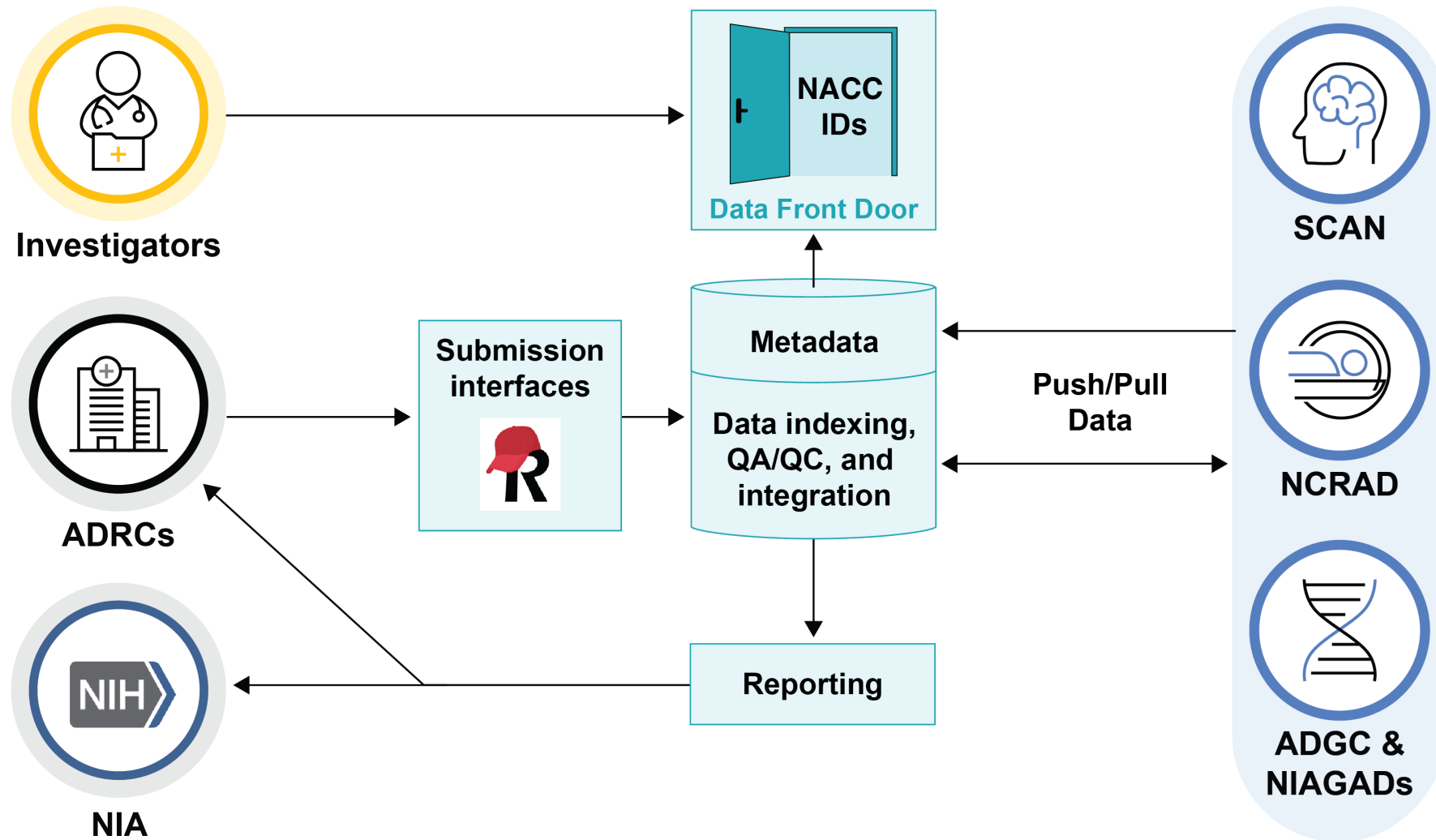
This includes:

- Create a centralized REDCap instance for ADRCs
- Implement the UW Leaf application for self-service data queries and extraction of NACC datasets
- Explore other data types including electronic health record data, CMS claims data, etc.
- Provide long-term support for alternative workflows to collect new datatypes (e.g. device data)

NACC Data Streams



Current Data Flow



What is a Digital Biomarker?

Clinical or patient reported digital measures that are active or passive, validated and predictive of patient trajectories or phenotypes.

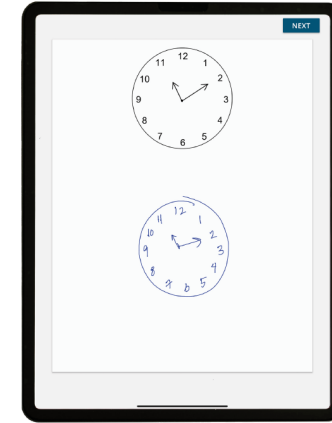


Technical Issues

Digital biomarkers represent a wide range of data collection modalities.

This includes:

- In-clinic tablet 'apps' that replace existing measures using passive and active assessment
- Participant driven active and passive measures from devices such as digital health devices (e.g. fitbit), smart phones, etc.



LINUS HEALTH

Examples:

- Clock drawing test
- Voice
- Eye tracking
- Video
- Steps

Digital Biomarkers Are Gaining Interest

**Evidence suggests that
“cognitive, behavioral, sensory,
and motor changes may
precede clinical manifestations
of AD by several years.”**

Review Article | [Open Access](#) | [Published: 21 February 2019](#)

Digital biomarkers for Alzheimer's disease: the mobile/wearable devices opportunity

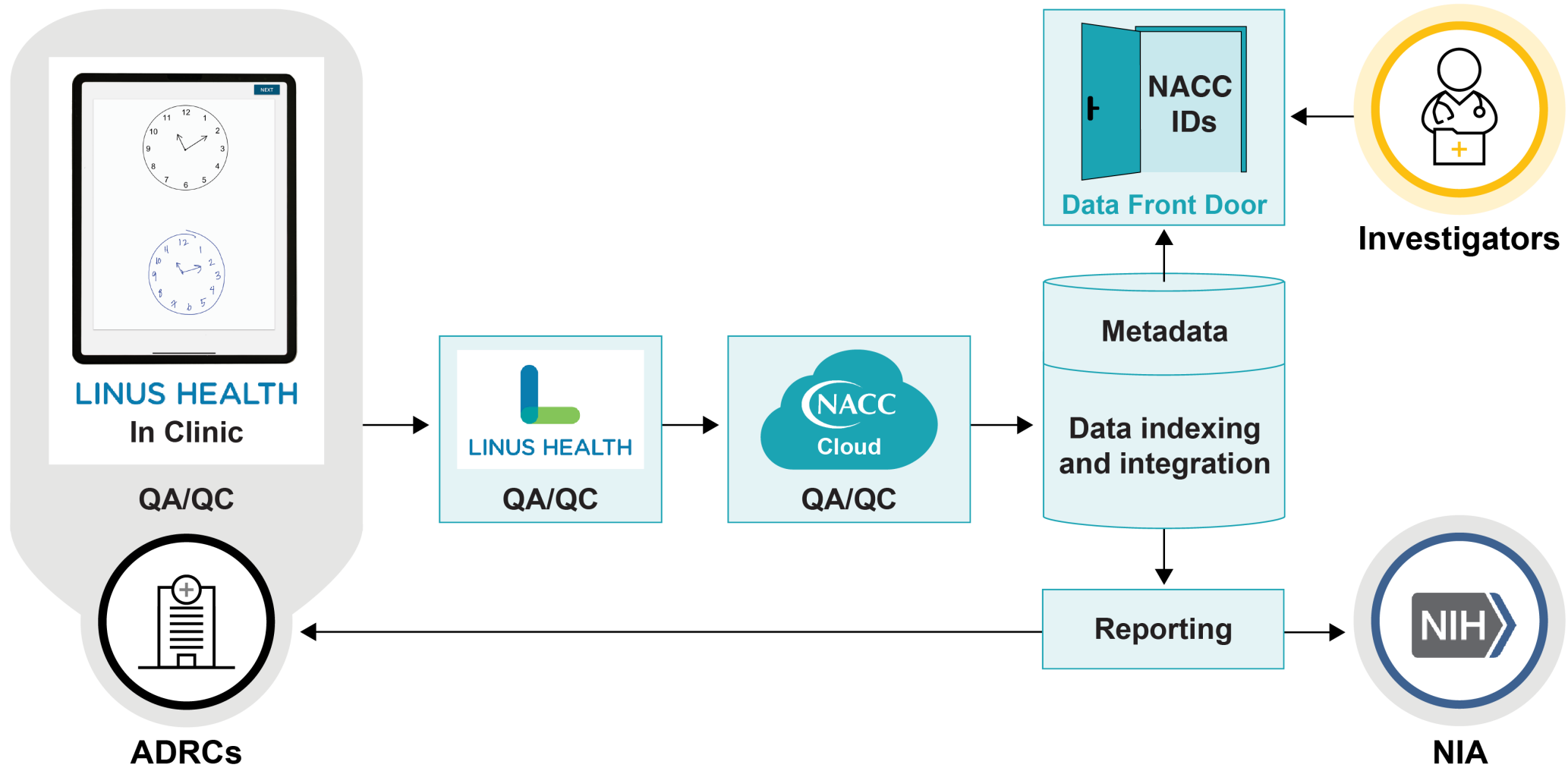
[Lampros C. Kourtis](#) ✉, [Oliver B. Regele](#), [Justin M. Wright](#) & [Graham B. Jones](#) ✉

[npj Digital Medicine](#) 2, Article number: 9 (2019) | [Cite this article](#)

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- Existing cognitive function tests are inaccurate in detecting earliest signs of pathological changes
- Mobile devices can be used to detect early signs of clinical dysfunction
- Sensory or motor changes may lead to early detection by 10-15 years
- NPJ DM paper describes:
 - Active such as memory tests (AD) or listening to vocal response (PD)
 - Passive such as steps on a smart phone

Example Digital Marker Workflow



Open Questions for a Potential Pilot

- There are many questions for how to design a modest pilot
- These could include:
 - Active vs Passive data collection
 - A test that is duplicative of UDS vs novel
 - A test that is Validated vs Innovative
 - In clinic vs active assessments outside of clinical in person visit
- Right now we are looking at 2-3 data collection tests. For example:
 - Digital clock drawing test through an iPad app
 - Digital voice recordings of research visits
 - Perhaps a digital recall/memory test

Modest Demonstration Pilot

GOAL: Establish a common platform and develop processes for ADRCs to collect and share digital biomarker data

Aim 1: Demonstrate intake of existing pipeline with Boston University

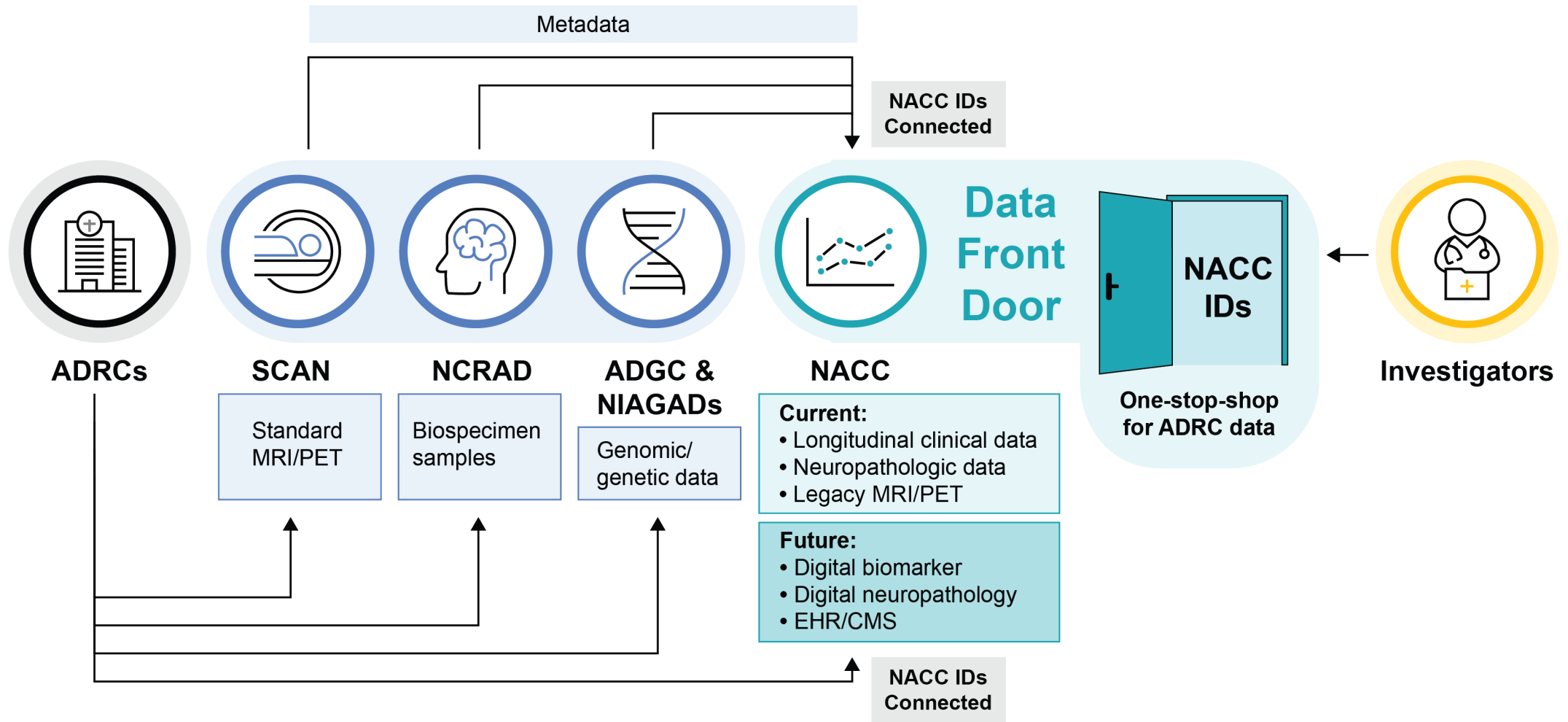
- Send existing data for three tasks that are in Linus to NACC, connected to NACC IDs
 - Clock Drawing Test
 - Picture Description (digital voice)
 - Picture Description (memory/digital voice)

Aim 2: Analyze data within NACC cloud on integrated clinical and digital data

Aim 3: Aim 3: Identify 1-2 other ADRCs to administer the same tasks and send the data to NACC

- Provide Linus tablets to 1-2 sites
- NACC will collect and integrate the data across the sites (20 participants per site)
- NACC would share back the data individually with those sites

Integrated with NACC IDs and available through the DFD



Connect with NACC

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Thank you!

