Wearables Employment in Alzheimer's Disease and Related Dementias Research [WEAR]

Development of Guidelines for Device Selection and Participant Protocols

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NIMLAS - 1/26/2024

Increased prevalence of dementia and related caregiver strain

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Challenges of conducting research with this population

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https://article.murata.com/en-eu/article/solid-state-battery-that-supports-wearables-1

Evidence-based
device selection
and participant protocols?

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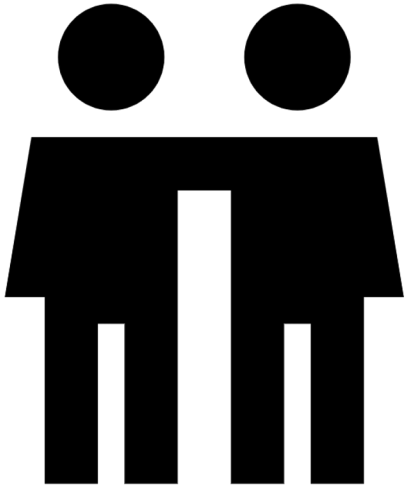
Devices that meet participant needs and preferences



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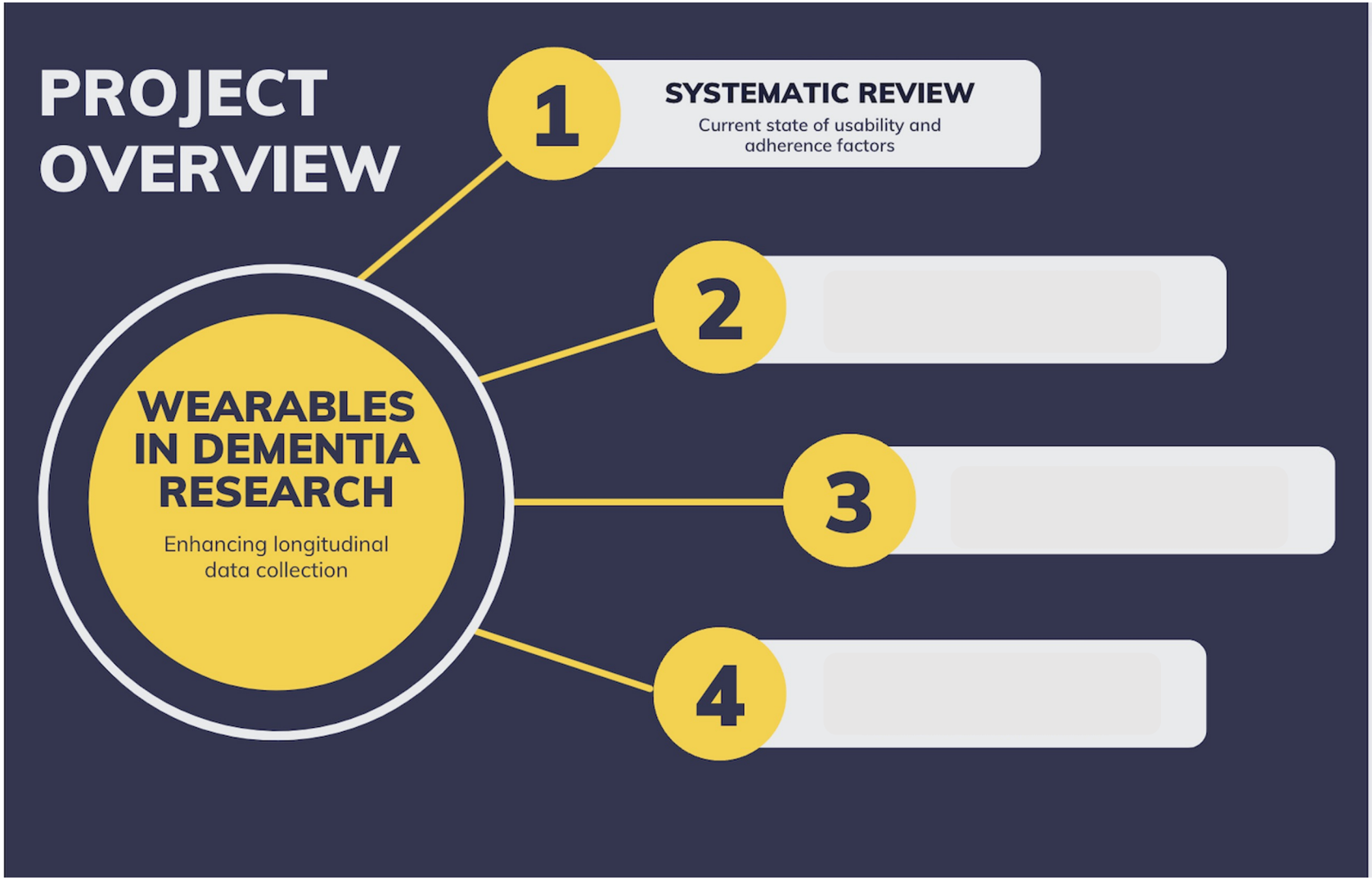
PROJECT OVERVIEW
1
SYSTEMATIC REVIEW
Current state of usability and adherence factors
2
3
4
WEARABLES IN DEMENTIA RESEARCH
Enhancing longitudinal data collection

Inclusion Criteria

Included peer-reviewed, full-text research manuscripts and conference proceedings in English from 2018 and beyond

Regarding or using remote data collection via electronic devices worn by persons with a dementia in non-lab settings

Details on participant preferences, barriers, and facilitators to wearables device acceptability and use

Data could come from interviews, focus groups, survey results, process analyses, etc.

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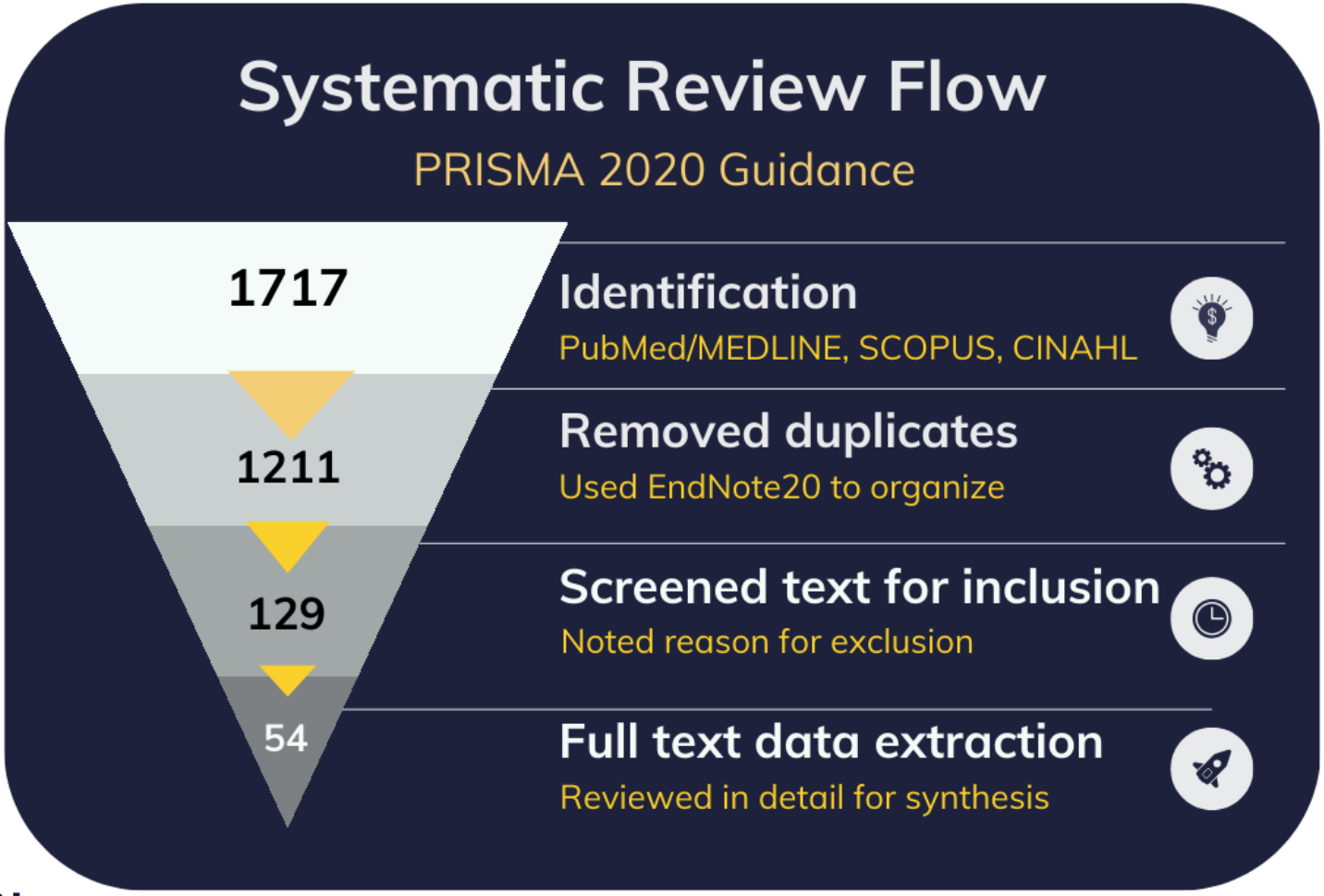
Systematic Review Flow
PRISMA 2020 Guidance
1717
1211
129
54
Identification
PubMed/MEDLINE, SCOPUS, CINAHL
Removed duplicates
Used EndNote20 to organize
Screened text for inclusion
Noted reason for exclusion
Full text data extraction
Reviewed in detail for synthesis

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Provide Personal Benefit

Health insights were the top reason persons with dementia and their carers enroll and stay in wearable studies

Choose multifunctional devices with capacity for participants to monitor their data and offer ongoing access and feedback

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Consider Several Device Factors

Choose comfortable, smaller, and lighter devices that fit Into participant routines. Durability, water resistance, and long battery life are essential

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Privacy concerns outweighed by health access

Persons with dementia feel empowered over their health and engaged in the research

Carers want to balance safety and independence, reduce personal monitoring burden

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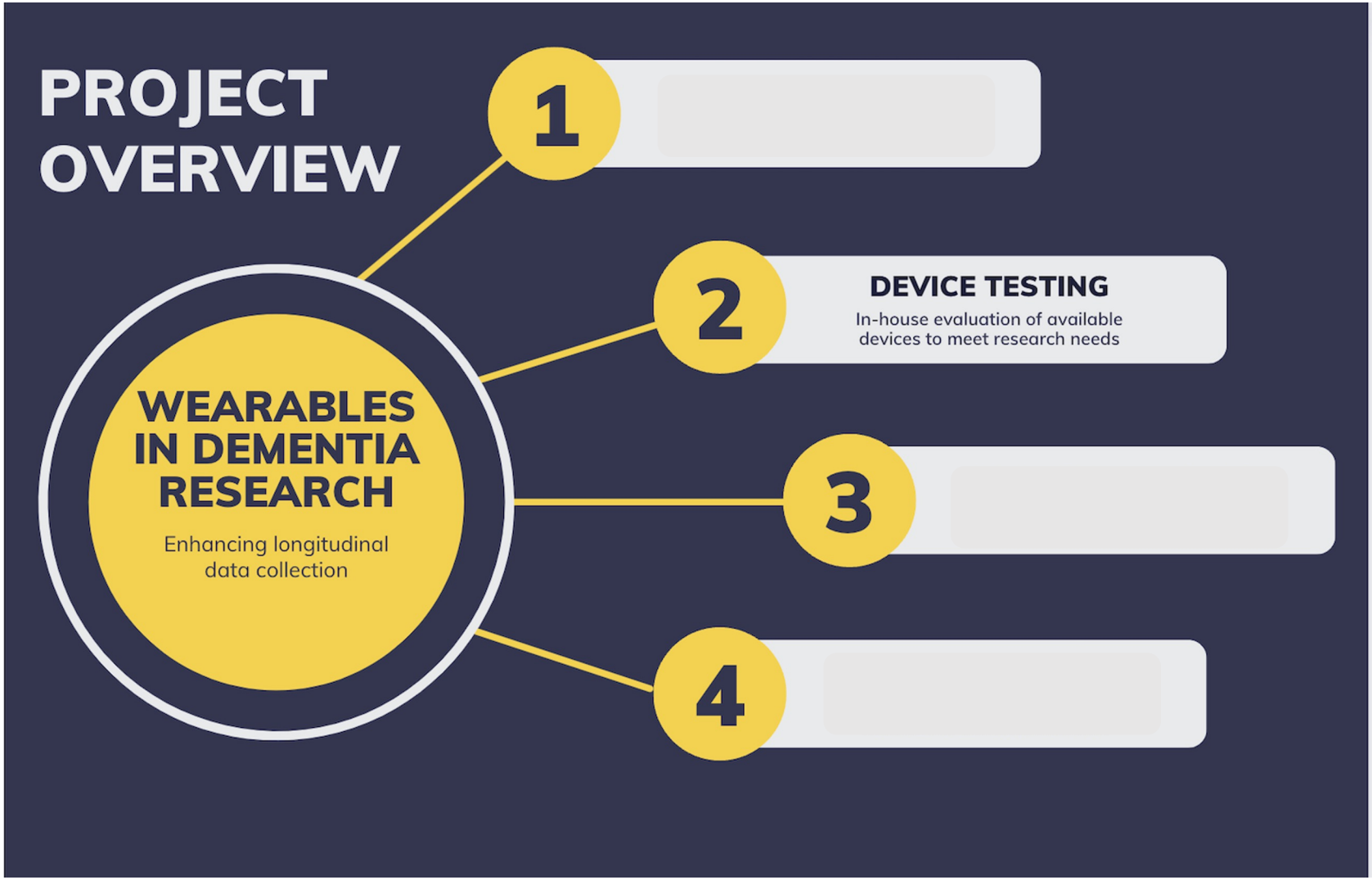
PROJECT OVERVIEW
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DEVICE TESTING
In-house evaluation of available devices to meet research needs
WEARABLES IN DEMENTIA RESEARCH
Enhancing longitudinal data collection
3
4

Wearables candidates

Participant preferences

Variety of forms and data targets

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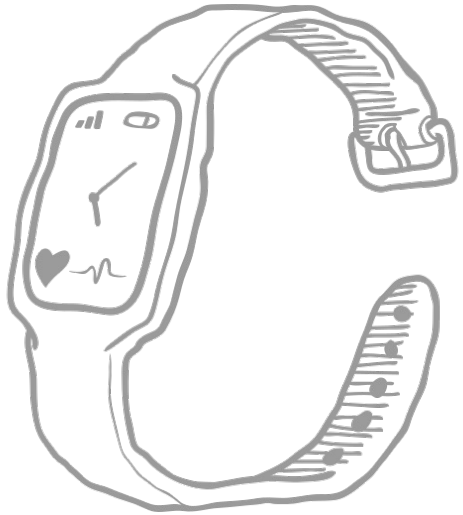
Wearables candidates

Full-featured smartwatches

Lightweight fitness tracker watches

Bluetooth tracking tags

Remote GPS trackers



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Example comparison

Device Class	Name	Manufacturer	App Name	Data Access	Data Location	3rd Party Options	Data Export
Lightweight Fitness Tracker Smartwatch	**Charge 5**	Fitbit	Fitbit App	Mobile Device, Web	Device, App, Cloud	API Access	From App
	PulseHR	WiThings	Withings Health Mate	Mobile Device or We	Device, App, Cloud	API Access + 3rd Party App Integration	From App
	Viviofit 4	Garmin	Garmin Connect	Mobile Device or Web	Device, App, Cloud	API Access	From App

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Device choices

Garmin – Venu 2

WiThings - Pulse HR

AngelSense – SOS Button

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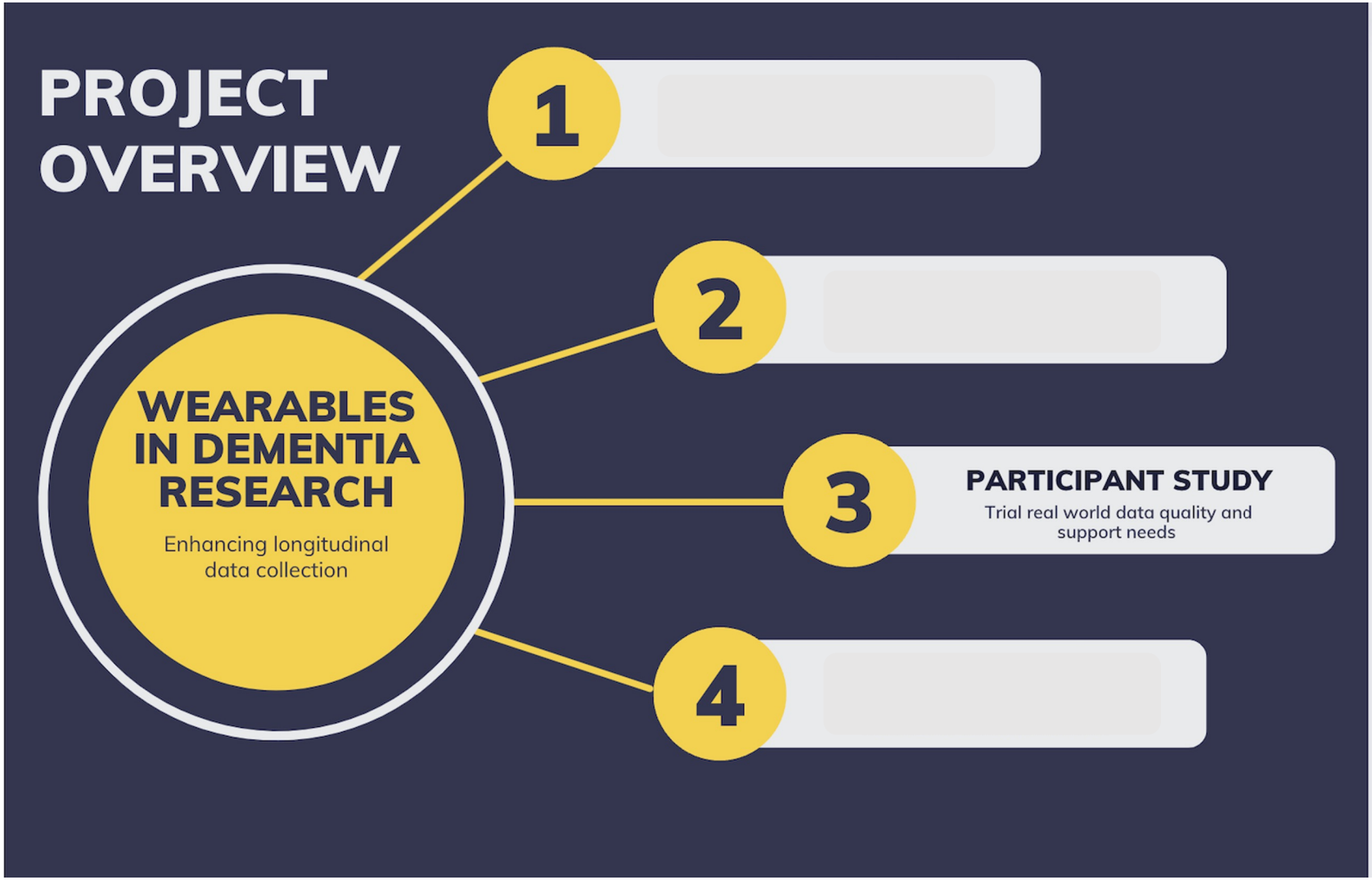
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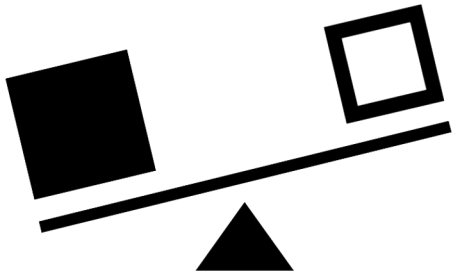
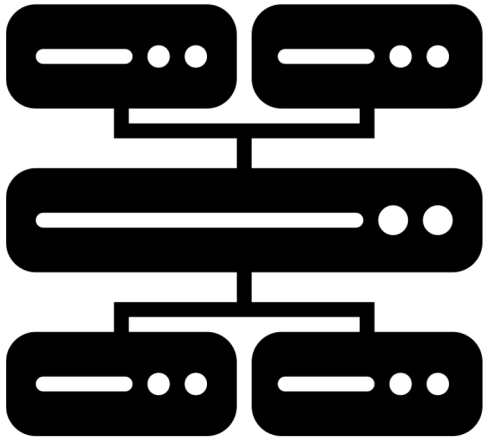
PARTICIPANT STUDY
Trial real world data quality and support needs
4

Study goals

Comparative insights into device (dis)advantages



Adherence and support protocols



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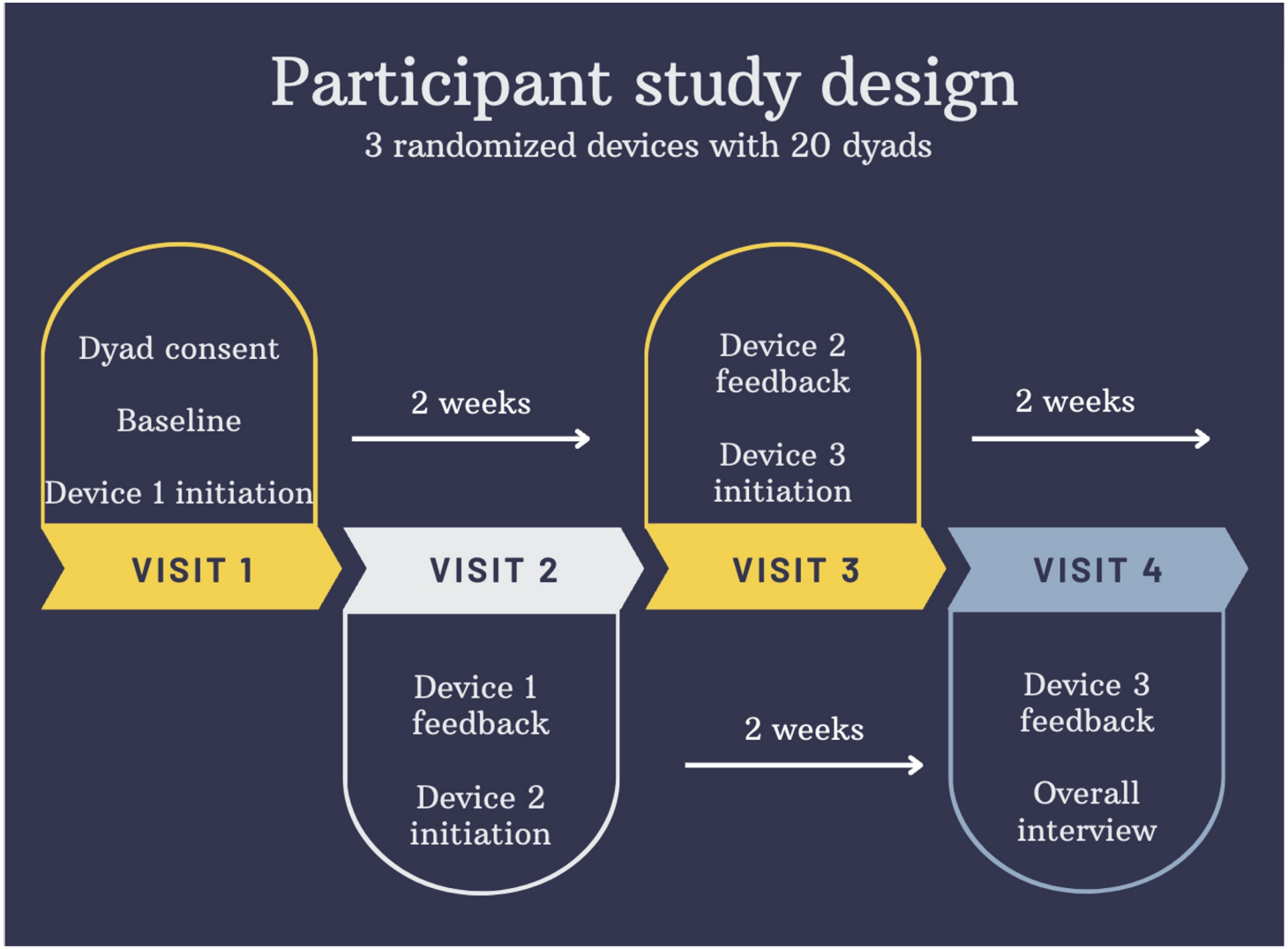
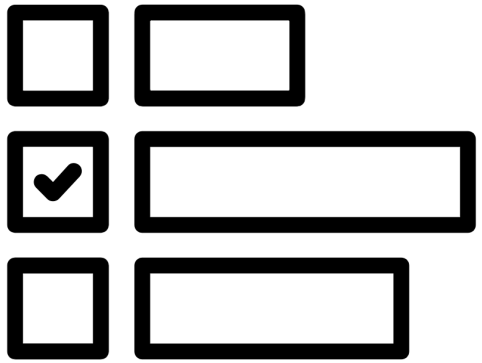

Participant study design
3 randomized devices with 20 dyads
Dyad consent
Baseline
Device 1 initiation
2 weeks
Device 2 feedback
Device 3 initiation
2 weeks
VISIT 1
VISIT 2
VISIT 3
VISIT 4
Device 1 feedback
Device 2 initiation
2 weeks
Device 3 feedback
Overall interview

12 enrolled participants

~50% female caregivers and PWML

CG: 64 yrs old (45-81)
PWML: 73 yrs old (53-89)

50% PWML formal dementia diagnosis



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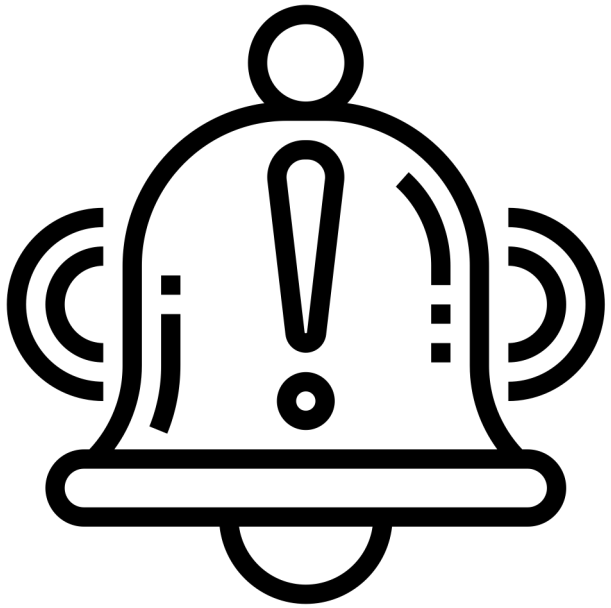
Results (preview)

Onboarding to personalize alert settings is important



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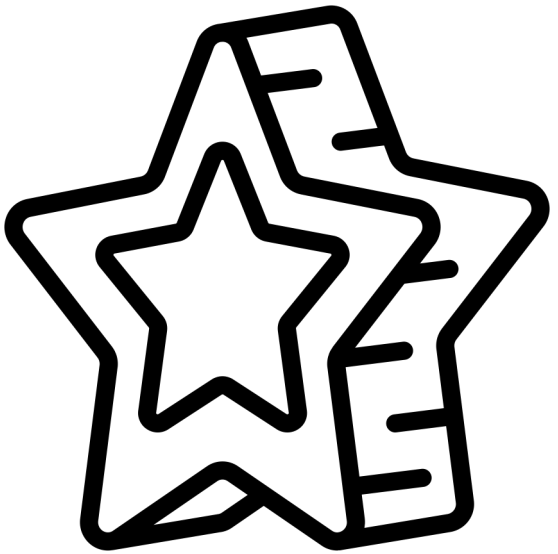
Results (preview)

Most said easy to wear

Limited self-report of non-use



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TBD

Qualitative analysis of interview

Device quantitative comparison

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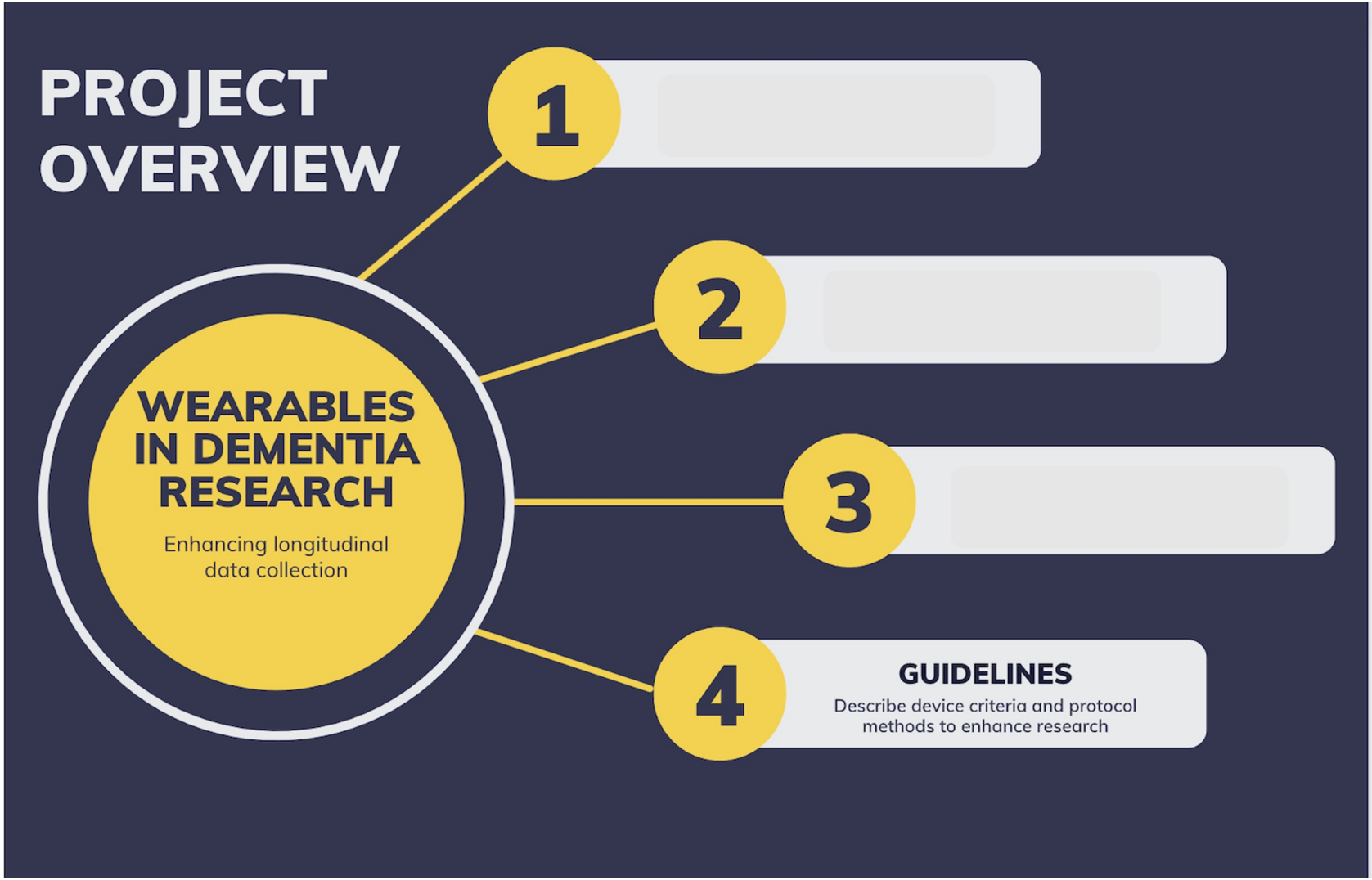
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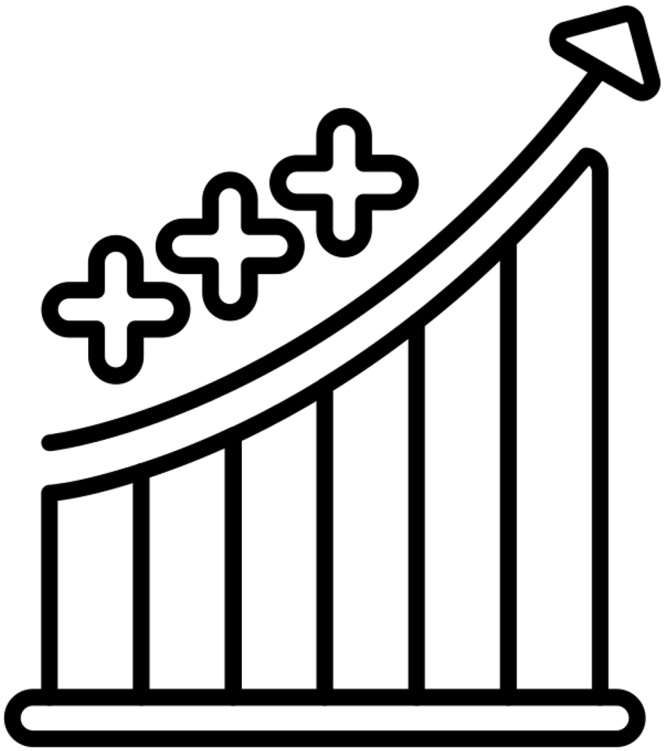
GUIDELINES
Describe device criteria and protocol methods to enhance research

Achieving the objective

Support superior long-term wearables research with dementia populations

Inform longer-term usability and protocol testing matched to specific behavioral targets



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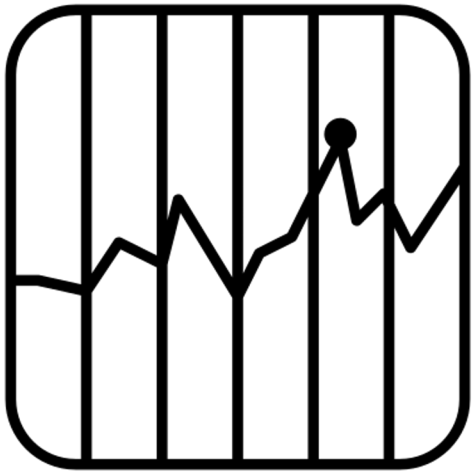
Thank you!

Questions?
Comments?



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