JOHNS HOPKINS
BIOMEDICAL ENGINEERING

ScentCare: A Novel At-Home Olfactory Training and Testing Device

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PROBLEM:

OLFACTORY DYSFUNCTION

OD is defined as the **reduced** or **distorted** ability to smell when sniffing

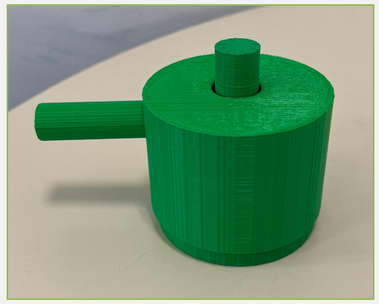
SAFETY	TASTE	MEMORY	HEALTH
Smell can be a way to recognize potential danger around us.	Much of our sense of taste comes from our ability to smell.	We commonly associate certain smells with memories.	Scents can stimulate our appetite, which drives us to eat.

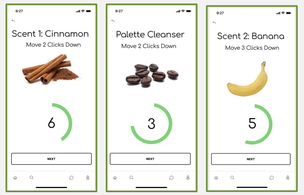
REDUCED QUALITY OF LIFE[1]

NEED:

Physicians need a **consolidated at-home method** for **screening and training olfactory function** across their patients in order to aid in the differential diagnosis of conditions in which olfactory dysfunction is a symptom.

OUR DEVICE:





- At-home
- Non-Invasive
- Consistent Results
- Standardized
- Progress Tracking

AFFECTED GROUPS:

AGED > 55
Patients at high risk for neurodegenerative diseases and frailty

VIRUS
Patients at risk due to viral infection or sickness

REHAB
Post-operative patients at risk due to surgery or anesthesia

25% OF THE WORLD POPULATION[2]

PROPOSED SOLUTION:

NEUROPLASTICITY
The neuronal reorganization after sensory loss, meaning that **neurons can regain function** after damage, disease, infection[3]

+

OLFACTORY TRAINING
Deep inhalations of a set number of odorants several times a day for a prolonged period of time[3]

→

IMPROVED SENSE OF SMELL
1. Increased expression of olfactory receptor
2. Improved olfactory receptor neurotransmission

REFERENCES:

[1] Boesveldt, S., & Parma, V. (2021). The importance of the olfactory system in human well-being, through nutrition and social behavior. Cell and Tissue Research, 383(1), 559–567. https://doi.org/10.1007/s00441-020-03367-7
[2] Hummel T, Whitcroft KL, Andrews P, et al. Position paper on olfactory dysfunction. Rhinology. 2016;56(1):1-30. doi:10.4193/Rhin16.248
[3] Reichert, Johanna L., and Veronika Schöpf. “Olfactory Loss and Regain: Lessons for Neuroplasticity.” The Neuroscientist 24, no. 1 (February 2018): 22–35. https://doi.org/10.1177/1073858417703910.