

Treatment of COVID-related Smell Disorders

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Disclosure Statement

I have no relevant financial or nonfinancial relationships to disclose

I will discuss the off-label use of
Trigeminal Nerve Stimulation (TNS)
transcranial Focused Ultrasound (tFUS)

Importance of Olfaction

Nutrition

what & when we eat



Safety

identifying dangers



Social Behavior

sweat-based communication



Mood

emotion regulation



COVID-19 Exposed the Need for Evidence-based Treatments for Chemosensory Dysfunction

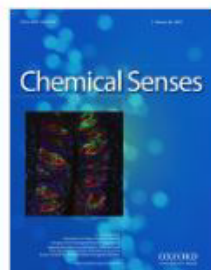


ORIGINAL ARTICLE | [Free Access](#)

Smell dysfunction: a biomarker for COVID-19

Shima T. Moein MD, PhD, Seyed MohammadReza Hashemian MD, FCCM, Bab Khorram-Tousi MD, Payam Tabarsi MD, Richard L. Doty PhD, FAAN [✉](#)

First published: 17 April 2020 | <https://doi.org/10.1002/alr.22587> | Citations:



Volume 46
2021
(In Progress)

Recent Smell Loss Is the Best Predictor of COVID-19 Among Individuals With Recent Respiratory Symptoms FREE

Richard C Gerkin, Kathrin Ohla, Maria G Veldhuizen, Paule V Joseph, Christine E Kelly, Alyssa J Bakke, Kimberley E Steele, Michael C Farruggia, Robert Pellegrino, Marta Y Pepino ... [Show more](#)

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Chemical Senses, Volume 46, 2021, bjaa081, <https://doi.org/10.1093/chemse/bjaa081>

Published: 25 December 2020 **Article history** ▼



COVID-19
Expert Q&As

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Why lost sense of smell from COVID-19 is a serious threat to patients' quality of life

Anosmia disconnects you from the world, and from other people, in a profound way.

Steven Munger Opinion contributor

Published 6:00 a.m. ET Mar. 17, 2021 | Updated 1:28 p.m. ET Mar. 17, 2021



COVID-19 Exposed the Need for Evidence-based Treatments for Chemosensory Dysfunction

anosmia/hyposmia



parosmia/phantosmia



Prevalence of COVID-related Dysfunction



Persistence of COVID-related Dysfunction



COVID-19 Exposed the Need for Evidence-based Treatments for Chemosensory Dysfunction

anosmia/hyposmia



“...my sense of smell is still not completely back and I had COVID over 3 years ago. I’d say it’s about 50% of what it used to be...”

“...I can smell some things, but it’s a light whiff and then it’s just gone...”

“...It’s embarrassing, I have to ask my girlfriend if I smell ok because I can’t smell myself...”

“...I haven’t been able to smell anything since COVID...I’m afraid for my safety. I burned toast the other morning and didn’t even know it until my husband smelled it from upstairs...”

“...I miss smelling my boys, I know that sounds weird, but I use to smell their skin when we hugged or when they were close to me...”

“...I’m sad because I don’t enjoy cooking or eating anymore. I’ve stopped going out to restaurants with my friends, I just don’t want to spend money for food I can’t taste...”

COVID-19 Exposed the Need for Evidence-based Treatments for Chemosensory Dysfunction

parosmia/phantosmia



“...things smell different...like coffee, it doesn’t smell the same, but I’ve learned what it smells like now and can recognize it, but I know it’s not the same smell that it used to be...”

“...everything smell terrible...like chemicals...I used to love cucumbers, now the smell of them makes me sick...”

“...a couple of months after COVID, I would smell these intense odors...I can’t describe them...it’s like nothing I ever smelled before...it doesn’t happen so much anymore, but my sense of smell is still not the same as before COVID...”

“...I can’t live like this...it is unbearable...I’d rather not be able to smell at all, than deal with this”

<https://www.tiktok.com/t/ZTjXpcnEp/>

Olfactory Assessment

Threshold - lowest concentration detectable

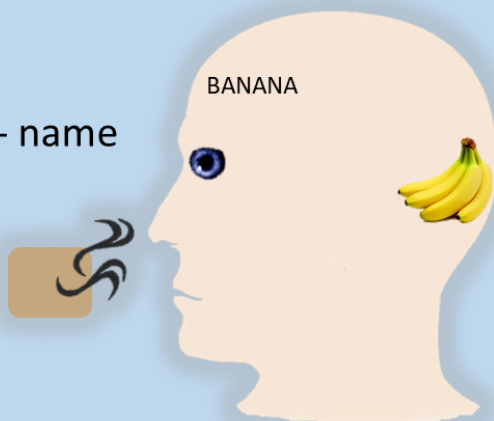


Discrimination – recognize differences



Identification - name

- ☐ campfire
- ☐ leather
- ☒ banana
- ☐ lemon



Odor ratings (VAS)

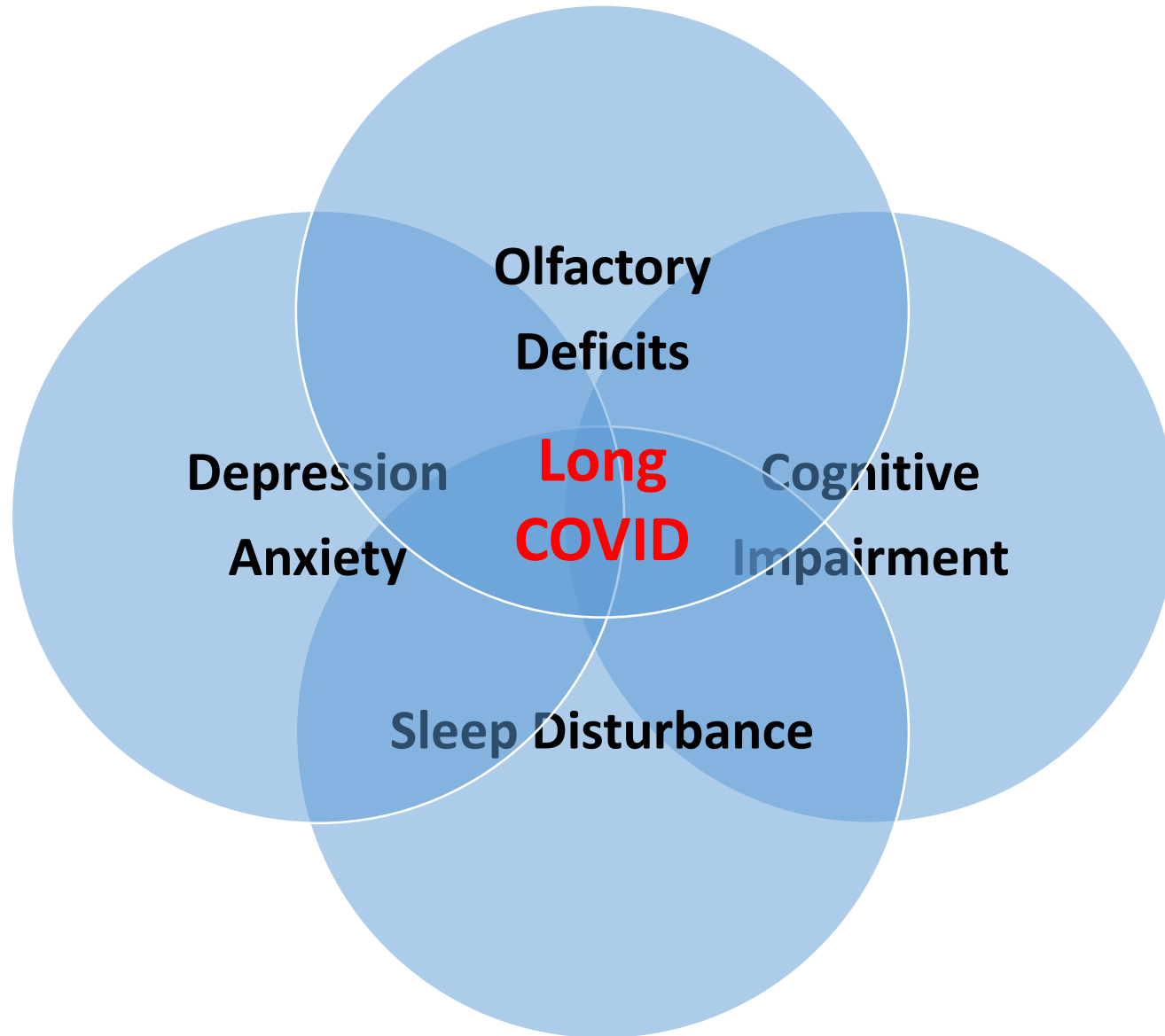
intense _____
not at all extremely

valence _____
very unpleasant very pleasant

causes distress _____
not at all extremely

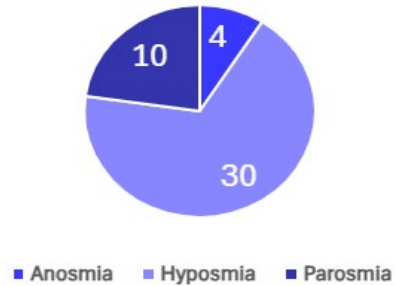
smells like it should _____
not at all extremely

Long COVID Overlapping Symptoms

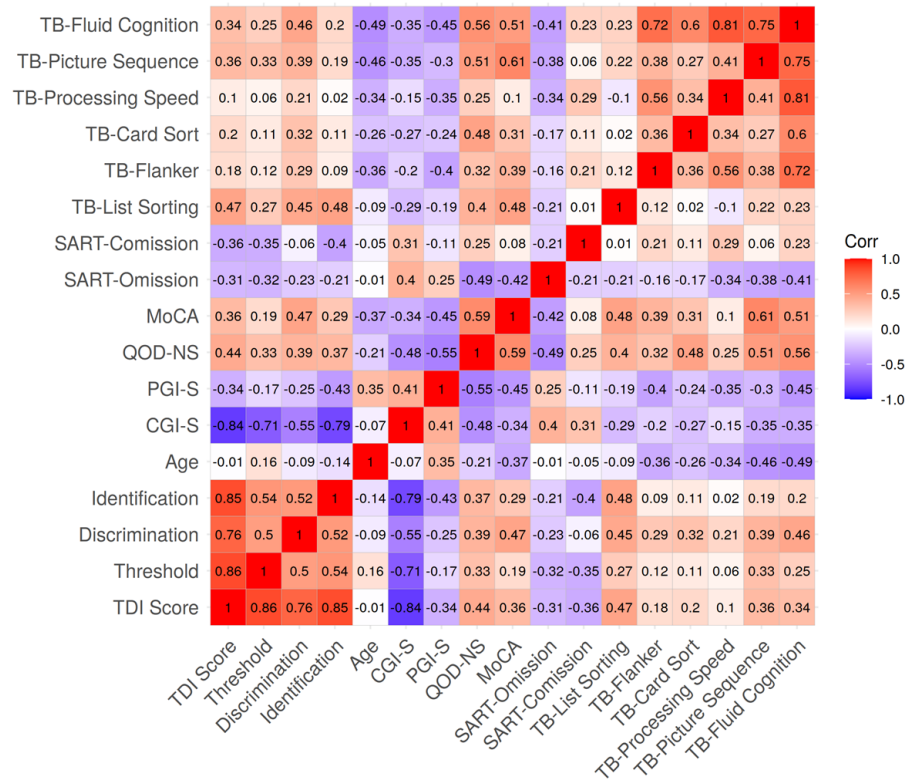


Long COVID Deficits: Relationships to Smell Impairment

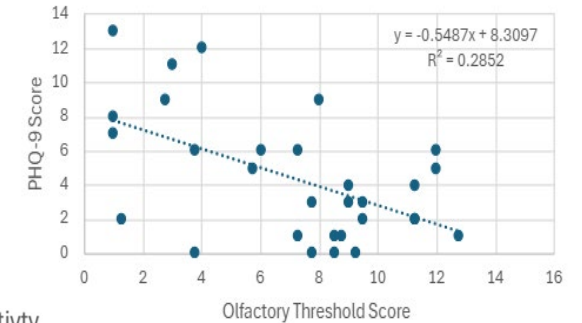
Smell Deficits Within Participants



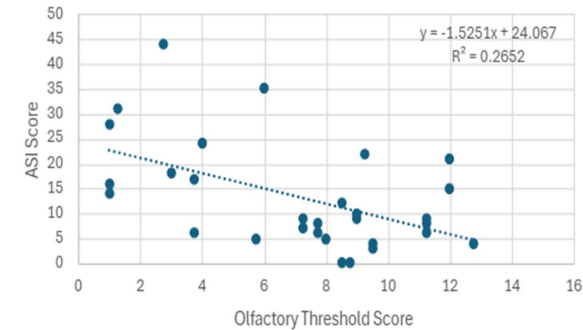
Smell and cognitive ability significantly relate to each other



Odor Detection and Depression Severity

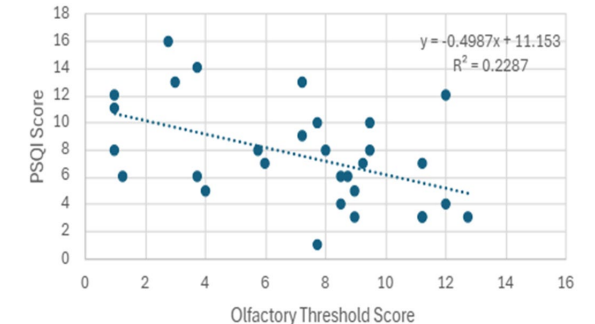


Odor Detection and Anxiety Sensitivity



Greater impairment in smell relates to severity of depression and anxiety symptoms & sleep disturbance

Odor Detection and Sleep Quality



COVID-19 Exposed the Need for Evidence-based Treatments for Chemosensory Dysfunction

The New York Times

Covid Stole Your Sense of Smell? Try Physical Therapy for Your Nose.

Doctors are recommending smell training for patients with lingering olfactory problems.

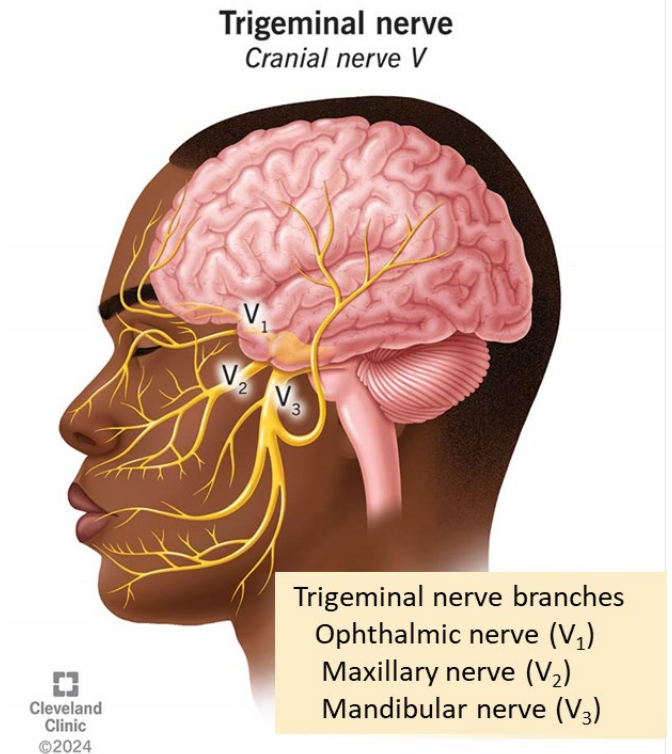
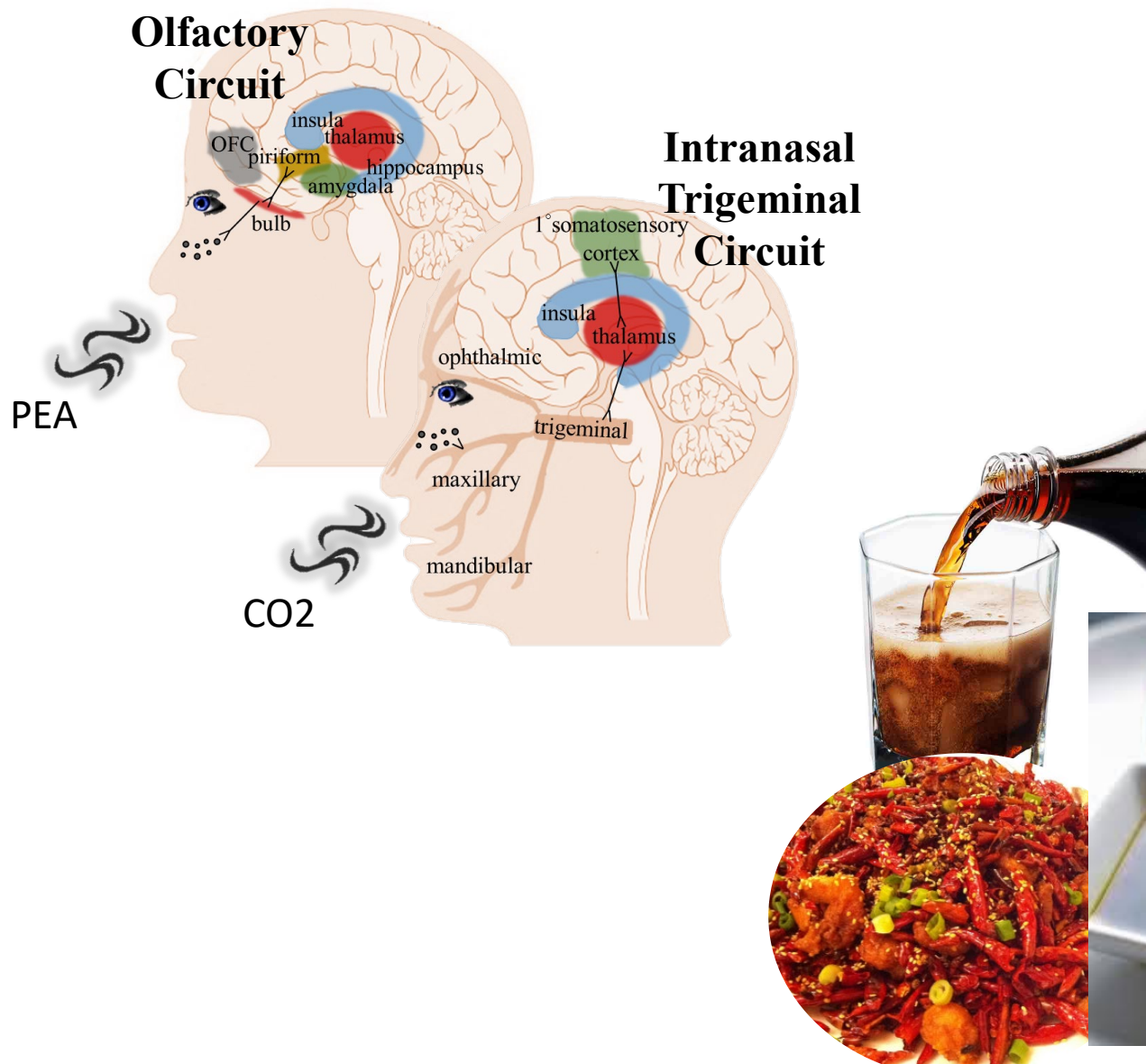
Strengths

- ❖ Easy and safe to use
- ❖ Home-based
- ❖ Low-cost

Limitations

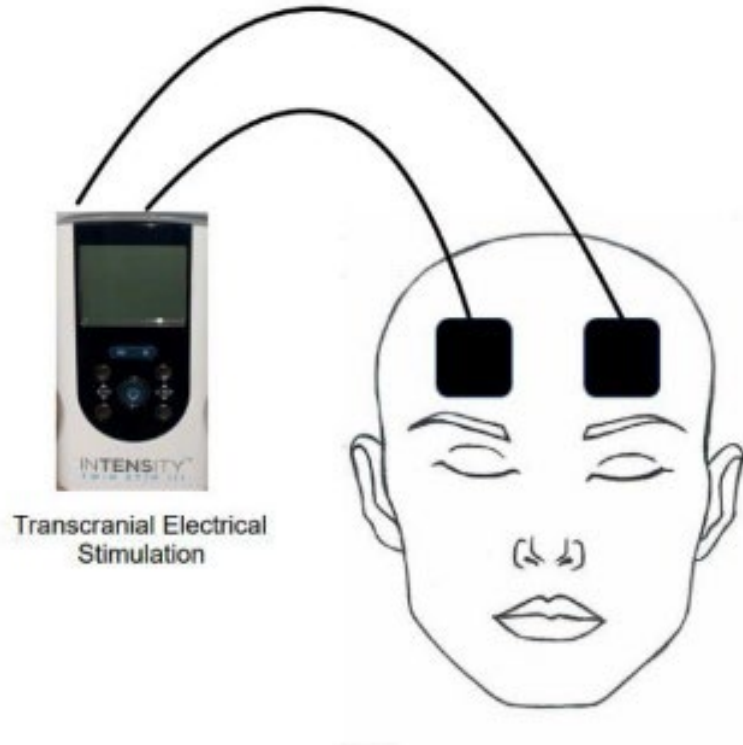
- ❖ Only preliminary efficacy
- ❖ Requires months of training
- ❖ Non-compliance and drop-out

Intranasal Olfactory-Trigeminal Function



Branches of the trigeminal nerve innervate the face and forehead, transmitting pain and tactile information to the brain.

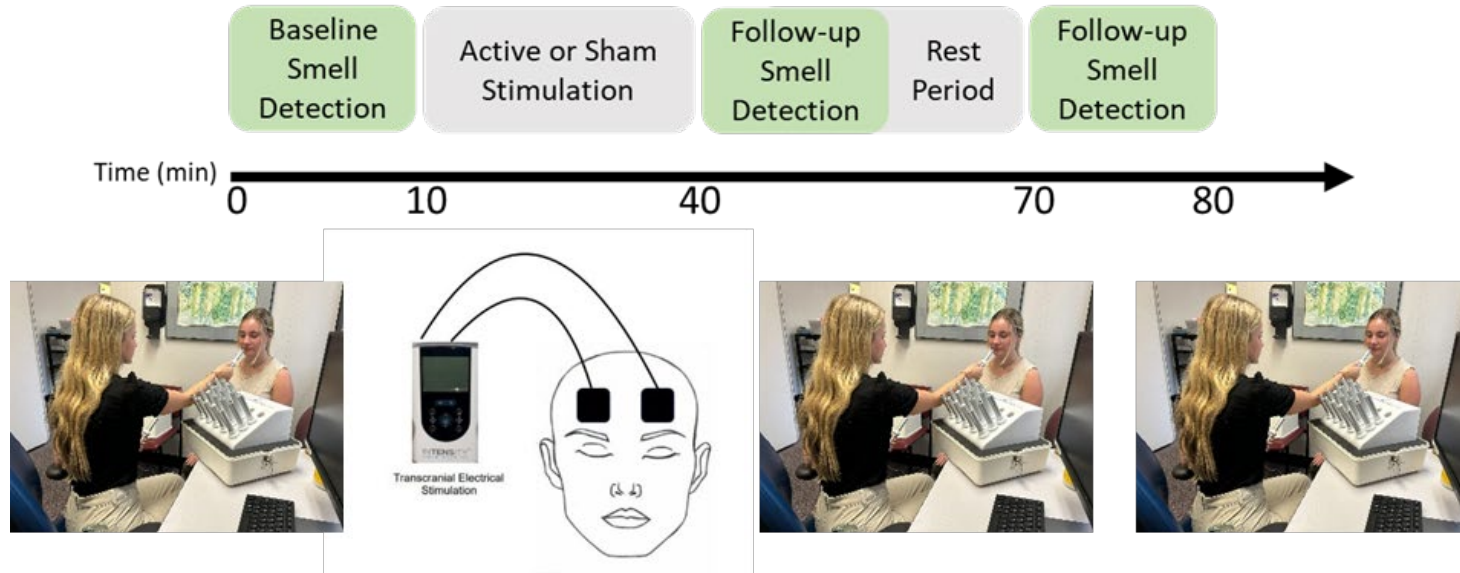
Can the Olfactory-Trigeminal Relationship be Leveraged to Improve Smell Function?



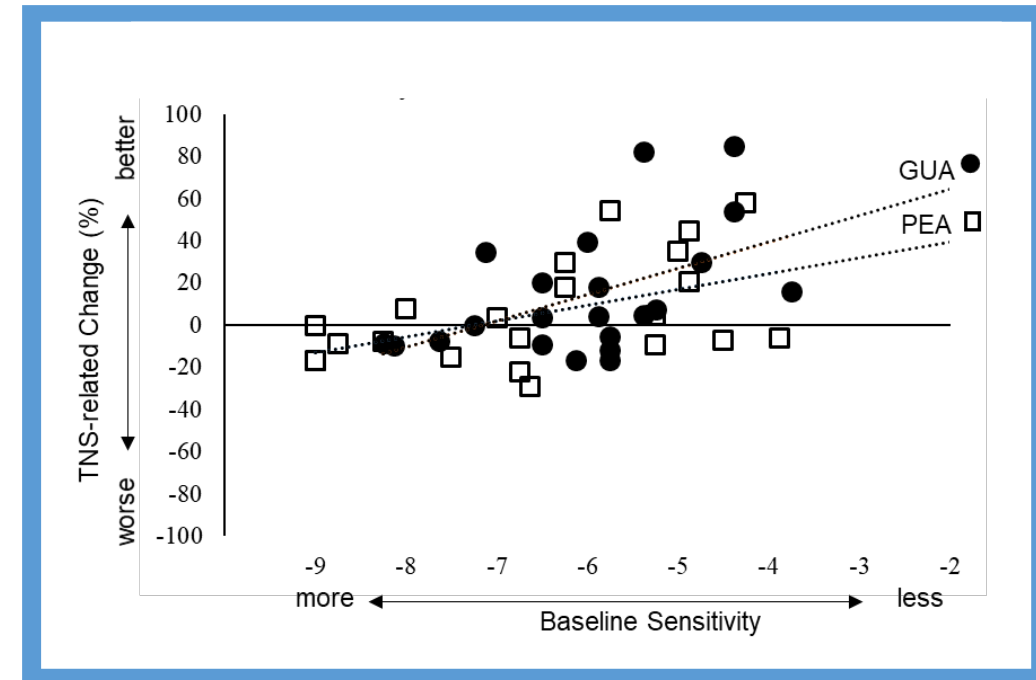
Trigeminal Nerve Stimulation (TNS) - non-invasive neuromodulation method that delivers mild electrical current to the ophthalmic branch of the trigeminal nerve via forehead patch electrodes.

Proven efficacy in treating:	migraines trigeminal neuralgia ADHD (pediatric)
Under investigation for:	epilepsy stress-related disorders anxiety depression cognitive impairment

Pilot RCT of Trigeminal Nerve Stimulation (TNS) in Healthy Adults



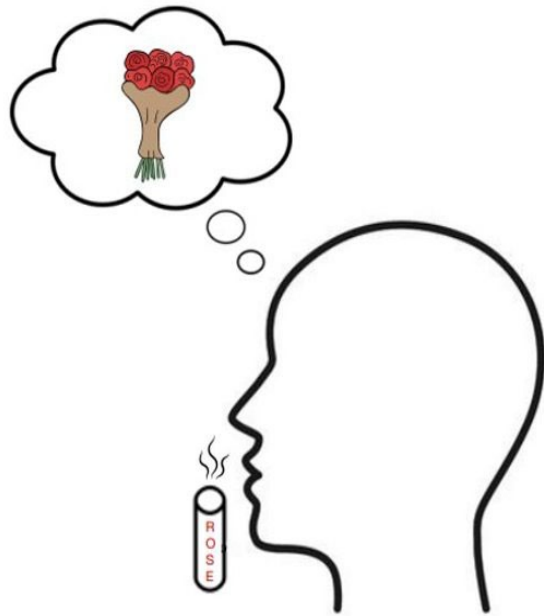
The TNS-produced Increase in Odor Sensitivity is Demonstrated Mostly by the Participants who had Lower Odor Sensitivity at Baseline



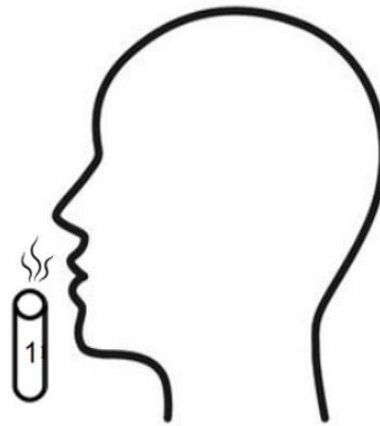
SCENT 4 Long COVID

Study of Chemosensory Enhancement through Neuromodulation Training

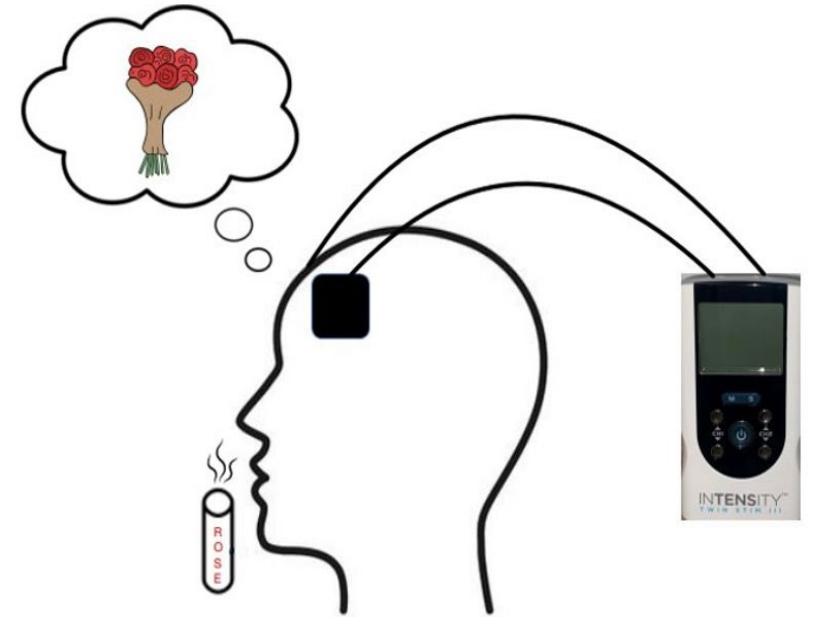
Study Interventions



Active Smell Training
(ST)



Placebo Smell Training
(PBO)



TNS with Active Smell Training
(TNS-enhanced ST)

SCENT 4 Long COVID

Study of Chemosensory Enhancement through Neuromodulation Training

Aim 1: Determine effects of smell training on Long COVID related smell deficits

Aim 2: Determine TNS-enhanced smell training effects on Long COVID related smell deficits

Aim 3: Determine smell training or TNS + smell training effects on mood, sleep, and cognition

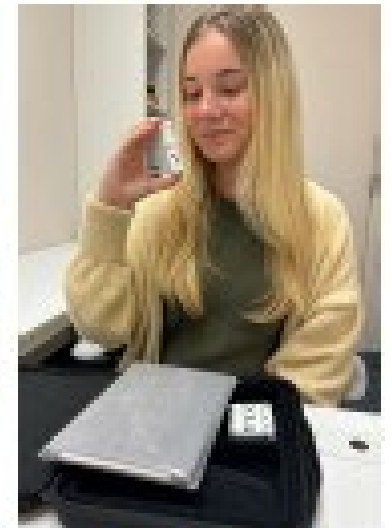
SCENT Trial Interventions



**TNS-Enhanced
Smell Training
(TNS + ST)**



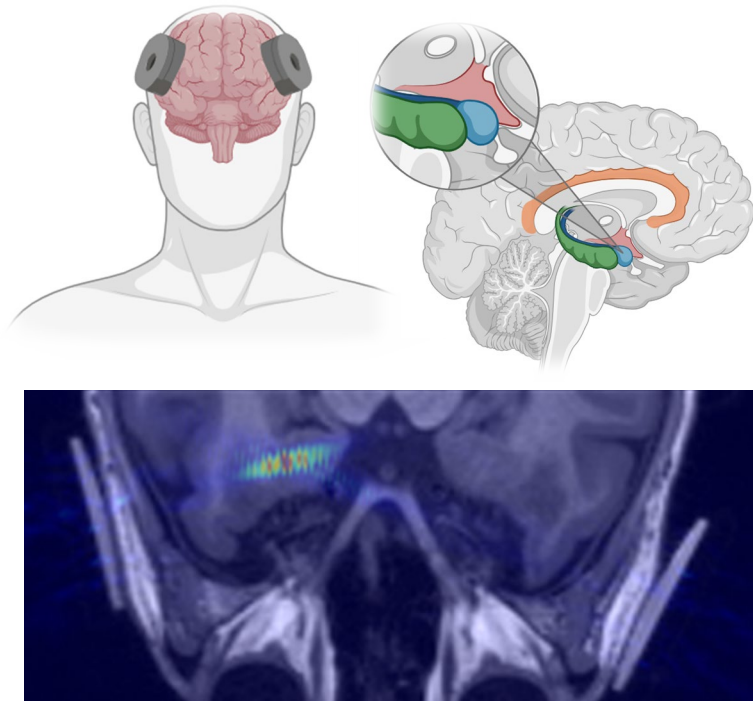
**Active Smell
Training
(ST)**



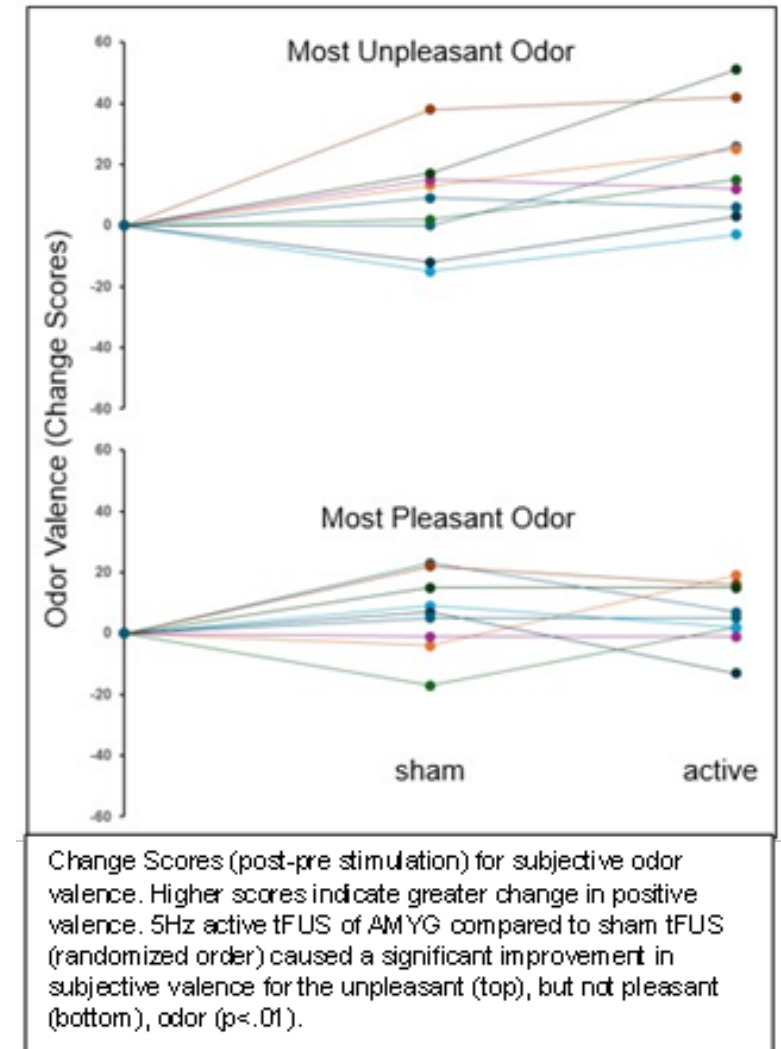
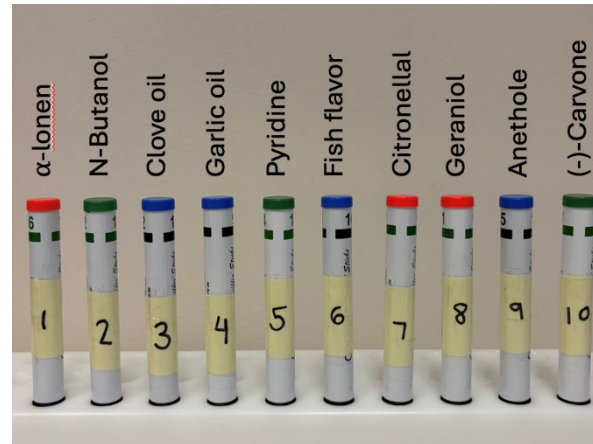
**Sham Smell
Training
(SHAM)**

Modulating Odor Valence through Non-invasive Transcranial Focused Ultrasound Stimulation (tFUS) of the Amygdala

tFUS modulation of the Amygdala



Pleasant & Unpleasant Odors



Still Can't Smell After COVID?

MUSC is conducting a research study on a new treatment to help with COVID-related smell loss.

Adults aged 18-65 with smell loss who had covid before May 2021 may be eligible to participate.



Interested In Participating?

Call or Text:
(843) 790-3449

Scan The QR Code



Acknowledgements

SCENT 4 Long COVID Team

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