



PARTICIPANT WORKBOOK

Your Nose Knows

Smell, memory and brain health

Humans smell far better than you have been told. In the next hour we will look at how your sense of smell actually works, why it is wired so tightly to memory, what changes in smell can signal, and how to train and track your sense of smell.

Dr. Jamie Knight

Presented through the Olfactory Health Association

Host: _____ Date: _____

BEFORE WE START

Your details

Name: _____

Date: _____ Group: _____

WHAT I HOPE TO LEARN TODAY

HOW IS MY SENSE OF SMELL RIGHT NOW?

There are no wrong answers. We will come back to this at the end.

My smell feels:

- ☐ As good as it ever was ☐ A little weaker than it used to be
☐ Noticeably weaker ☐ Mostly or entirely gone ☐ Not sure

Has anything changed it?

- ☐ A cold or COVID ☐ Sinus trouble ☐ A head injury ☐ Medication ☐ Gradually, over time
☐ Nothing I know of

A note on today. Nothing in this workshop is a diagnosis, and nothing here replaces medical advice. This is about awareness, monitoring and looking after your brain health.

1 A 19th-century myth

You were probably taught that humans are poor smellers, and that dogs leave us far behind. That idea did not come from testing anyone's nose.

In 1879 the French anatomist **Paul Broca** sorted mammals into "smellers" and "non-smellers," and put humans in the second group. His reason was that our olfactory bulb, the structure that receives signals from the nose, looks small next to our large frontal lobes. Freud built on the idea. Textbooks repeated it for over a century.

In 2017 the neuroscientist **John McGann** reviewed the evidence in the journal *Science* under the title "Poor human olfaction is a 19th-century myth." Here is what the evidence shows.

WHAT WE WERE TOLD	WHAT THE EVIDENCE SAYS
Our olfactory bulb is tiny, so smell must be weak.	It holds roughly 10 million neurons , about the same as a rat or mouse. It only looks small because the rest of our brain is large.
Dogs beat us at everything.	Odour by odour, humans win a surprising number of rounds , including some fruit and floral compounds. Each species is tuned to what it needs from an evolutionary standpoint.
Humans can tell apart about 10,000 smells.	That figure was an unmeasured guess from the 1920s. A 2014 study put the number well over a trillion combinations.
Humans cannot track a scent.	People asked to follow a scent trail across a field on hands and knees can do it, and improve with practice .

Why this matters. If you believe your nose is second-rate, you will not notice when it changes, and you will not think it is worth looking after. The rest of this hour is about a sense that is far more capable, and far more connected to your brain, than you were told.

Something that surprised me:

2 How smell actually works

Smells are **volatile chemicals** carried on the air. High inside your nose they land in a patch of mucus holding around **40 million olfactory neurons**, which are replaced every four to eight weeks. Your nose is the one part of your nervous system that renews itself throughout life. That is the whole basis of smell training.

Roughly **390 genes** build your smell receptors, and everyone's set is slightly different. This is why some people find cilantro soapy and some cannot smell asparagus at all. We do not all smell the same.

ORTHONASAL

Scent goes **in through the nostrils**. This is what we usually mean by smelling something.

RETRONASAL

Scent rises **from the back of the mouth** as you chew and breathe out. This is what we usually call taste.



Try it: the jelly bean test

Your tongue only reports five things: **sweet, salty, sour, bitter and umami**. Everything else you call flavour is smell arriving the back way (retronasal).

1. Pinch your nose closed.
2. Put a jelly bean in your mouth and chew. Notice what you get.
3. Keep pinching for a few seconds more.
4. **Let go and breathe out through your nose.**

With my nose pinched I could taste:

When I let go, the flavour was: _____

This is why people who lose their sense of smell say food has lost its taste, and why smell loss is so often noticed first at the dinner table.

Every other sense is routed through a relay station before it reaches the rest of the brain. Smell is not. It goes straight to the **amygdala**, where emotion is processed, and the **hippocampus**, where memories are built.

The hippocampus is the gateway to long-term memory. It takes a short-term impression and consolidates it into something lasting, and it also handles spatial memory, the sense of where you are and how you got there. The olfactory bulb sits close by, with direct connections. That short wiring is why a scent can drop you into a specific memory of a kitchen, a specific year, before you have had time to think.

Three steps of memory. Encoding, noticing something and linking it to what you already know. **Storage**, the brain physically rewiring itself to hold it. **Retrieval**, finding it again when you need it. Smell reaches into all three.

A SCENT THAT TAKES ME SOMEWHERE

Think of a smell that brings back a strong memory. What is the smell, and where does it take you?

WHO ELSE IS IN THAT MEMORY?

4 Smell training: cups 1 to 4

Take two or three normal sniffs, a few inches from your nose. Do not force it. For each cup, circle the words that fit, then write down anything it reminds you of. **Naming and describing is the training**, more than the sniffing.

Guess what each one is before you look. The name is written on the bottom of the cup, and your host will tell you when to turn them over. If a cup smells like nothing to you, write that down. That is useful information, not a failure.

CUP	CIRCLE WHAT FITS	MY GUESS	WHAT IT REMINDS ME OF
1	fresh · sharp · sweet · citrus · clean · faint · nothing		
2	warm · spicy · woody · sweet · medicinal · faint · nothing		
3	cool · sharp · minty · green · medicinal · faint · nothing		
4	floral · sweet · soft · green · perfumed · faint · nothing		

Some cups will smell like nothing to some people, and that is expected. Nineteen percent of adults over twenty have some smell loss, and by the mid-fifties it is about one in four. Most people have no idea until they try certain exercises or tests.

Smell as an early signal

Smell loss is one of the earliest measurable changes in both Alzheimer's disease and Parkinson's disease, appearing years, sometimes decades, before the symptoms those diseases are known for (cognitive decline and motor impairment respectively).

ALZHEIMER'S DISEASE

- Dementia is an umbrella term for symptoms; Alzheimer's is 50 to 75 percent of cases
- Smell identification and discrimination decline **early**
- The first affected region, the entorhinal cortex, sits on the smell pathway
- The degree of decline tracks the amount of change in the brain

PARKINSON'S DISEASE

- Up to **9 in 10** people with Parkinson's have measurable smell loss
- It often starts **years before** tremor or stiffness
- Most people do not notice it themselves
- It is more common than tremor at the time of diagnosis

DOPAMINE: ONE CHEMICAL, TWO JOBS

In the **midbrain**, dopamine neurons keep movement smooth. In Parkinson's they slowly die, and symptoms appear only after most are gone. That is the long, quiet stage.

In the **olfactory bulb**, dopamine neurons do the opposite job: they turn incoming smell signals down, like a volume knob. In Parkinson's this group does not shrink. It roughly doubles. More damping, less signal.

This is why levodopa, which restores movement so effectively, does nothing for smell. And it is why the nose is often the first place the disease shows up.

SMELL TESTING CAN

- Act as an early risk signal
- Reflect brain vulnerability
- Be tracked over time
- Prompt an earlier conversation with your doctor

SMELL TESTING CANNOT

- Diagnose dementia or Parkinson's
- Predict a timeline
- Tell you much from a single test (this is something we repeat over time to look at trajectory)

One test is a data point. **Repeated tests over time are the information.** Smell loss has many ordinary causes too: colds, sinus trouble, head injury, medication, and normal aging.

Your olfactory neurons regenerate. Smell training uses that: short, repeated, attentive exposure to a few distinct scents. It is free, it takes about two minutes a day, and the evidence behind it is good.

THE METHOD

1. **Four distinct scents.** The classic set is lemon, clove, eucalyptus and rose. Geranium works in place of rose and costs far less.
2. **About 20 seconds each**, with your full attention on it.
3. **Actively recall** what the scent should smell like while you sniff.
4. **Name it:** fresh, warm, sharp, sweet, earthy, smoky, zesty, woody.
5. **Twice a day**, morning and evening. Consistency matters more than intensity.
6. **Be patient.** Change shows up over weeks and months, not days (think of the time it takes for the neurons to regenerate and grow).

NO ESSENTIAL OILS? USE THE KITCHEN

Ground coffee, a cinnamon stick, whole cloves, fresh lemon or orange peel, a peppermint tea bag, vanilla extract on a cotton pad, dried lavender, a jar of dried herbs. Pick four that smell clearly different from each other and keep the same four.

TWO-WEEK LOG

Tick each session. In the last column, rate how strong the scents seemed today, from 0 (nothing) to 5 (strong and clear).

DAY	MORNING	EVENING	STRENGTH 0 TO 5
1			
2			
3			
4			
5			
6			
7			
8 to 14 (keep going on the back)			

7 My plan, and my questions

WHAT I WILL ACTUALLY DO

- ☐ Start smell training with four scents, twice a day
- ☐ Put the four scents somewhere I will see them (beside the kettle, by the toothbrush)
- ☐ Mention my sense of smell at my next doctor's appointment
- ☐ Ask about a smell test to establish a baseline
- ☐ Pay attention to whether food still tastes the way it used to
- ☐ Check in with someone I care about about their sense of smell

The four scents I will start with: _____

WHAT I WANT TO REMEMBER FROM TODAY

MY QUESTIONS

Write them here. Your host will collect them and read them out, so you do not have to speak up if you would rather not.

Curiosity is itself protective. Learning about your sense of smell today is already a step toward looking after your brain.

Where to go from here

Short, evidence-based updates on smell, memory and brain aging. No spam, no fear-based messaging. And an **online community launching this fall**, so you can train alongside other people and ask questions between sessions.



OLFACTORY HEALTH

olfactoryhealth.com

Newsletter, smell testing, workshops
and the new online community



DR. JAMIE KNIGHT

drjamieknight.com

Research, talks and writing
on olfaction and healthy aging

Point your phone's camera at a square and tap the link that appears, or simply type the address into your browser. Your host can help.

Thank you for being here. If today was simply about learning something new, that counts too.

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