

# How Oral Bacteria Could Influence Your Dementia Risk

### Description

Could the microbial inhabitants of your oral cavity serve as indicators of your susceptibility to dementia?

Recent studies are revealing intriguing connections between the oral microbiome—an intricate community of bacteria residing in our mouths—and cognitive health. The nature and composition of these microbial populations may significantly influence brain function as we advance in age, potentially contributing to normative aging or the onset of dementia.

Scientific investigations are uncovering unexpected correlations between the bacterial flora in our mouths and neurological well-being. A <u>recent study</u> conducted by my colleagues and me indicates that certain bacterial species may bolster memory and cognitive abilities, while others could signal early cognitive decline.

This prompts the fascinating hypothesis that dietary choices and interventions aimed at modulating our oral microbiome could ultimately play a role in preserving cognitive function as we age.

Our research involved analyzing saliva samples from 115 adults aged over 50, wherein 52% exhibited healthy cognitive function, while the remaining 48% displayed preliminary signs of memory and cognitive decline.

Our analysis revealed that individuals with elevated levels of specific bacterial groups, namely *Neisseria* and *Haemophilus*, performed significantly better on cognitive assessments. Notably, these individuals exhibited enhanced memory skills and greater capacities for attention and complex task execution.

Additionally, these participants displayed increased levels of nitrite ions in their oral cavities, a compound generated by bacteria during the decomposition of dietary nitrates—naturally abundant in a vegetable-rich diet.

The breakdown of nitrite into nitric oxide, a molecule known to improve vascular circulation, including cerebral blood flow, underscores the potential cognitive benefits of consuming nitrate-rich vegetables, such as leafy greens and beetroot. This could prove particularly relevant as we age.

Our ongoing research is exploring the possibility of utilizing nitrate-rich beetroot juice to enhance cognitive function among older adults by capitalizing on oral bacteria.

Conversely, certain bacterial populations may pose risks rather than benefits; our study identified specific groups potentially linked to diminished cognitive health.

Specifically, the *Porphyromonas* group, often associated with periodontal disease, was found to be more prevalent in individuals exhibiting memory impairments compared to their healthier counterparts. Additionally, the bacteria *Prevotella* were correlated with lower nitrite levels and were more frequent in individuals possessing the APOE4 gene, a risk factor for Alzheimer's disease.



These findings accentuate the notion that some bacteria may adversely affect cognitive health throughout aging. They also raise the prospect of integrating regular evaluations of oral bacterial flora into standard dental check-ups to facilitate the early detection of cognitive decline.

# **Significant Implications**

The implications of this research are noteworthy. Should specific bacteria serve to support cognitive health while others contribute to deterioration, interventions aimed at altering the bacterial balance in the mouth could emerge as innovative strategies for dementia prevention.

Encouraging the proliferation of beneficial, nitrite-producing bacteria like *Neisseria*, while diminishing *Prevotella* and *Porphyromonas*, may help sustain cognitive function over time. Such adjustments could be achieved through dietary modifications, probiotics, enhanced oral hygiene practices, or targeted treatments that reshape the microbiome.

While we remain in the nascent stages of comprehending the complex interrelationships between oral bacteria and cognitive health, our findings warrant further exploration.

Future research may validate the hypothesis that the oral microbiome plays a critical role in sustaining cognitive function. By paying closer attention to our oral bacterial populations, we may uncover novel pathways for the detection and potential delay of dementia.

In the interim, maintaining good oral hygiene, regular dental check-ups, and a diet rich in nitrates—such as leafy green vegetables—remains advisable to support the beneficial bacteria in our mouths.

Joanna L'Heureux, Postdoctoral Researcher, Public Health and Sport Sciences, University of Exeter.

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# **Vocabulary List:**

- 1. **Microbiome** /,mai.krəʊ.bai.oʊm/ (noun): The community of microorganisms that inhabit a particular environment such as the mouth.
- 2. **Cognitive** /'kpg.n1.t1v/ (adjective): Relating to the mental processes of perception memory judgment and reasoning.
- 3. Interventions /,In.tə'ven.ʃənz/ (noun): Actions taken to improve a situation especially in health care.
- 4. **Correlations** /,kɔ:r.ə'leɪ.ʃənz/ (noun): A mutual relationship or connection between two or more things.
- 5. **Deterioration** /dI,tIərIə'reIJən/ (noun): The process of becoming progressively worse.
- 6. **Proliferation** /prə,lɪf.ə'reɪ.ʃən/ (noun): Rapid increase in numbers or multiplication.



# **Comprehension Questions**

#### **Multiple Choice**

1. What is the potential role of the oral microbiome in cognitive health?

Option: Influencing brain function as we age Option: Causing immediate memory loss Option: Contributing to physical strength Option: Enhancing taste perception

2. Which bacterial groups were found to be associated with better cognitive function according to the research?

Option: Staphylococcus and Streptococcus Option: Neisseria and Haemophilus Option: E. coli and Salmonella Option: Clostridium and Lactobacillus

3. What compound is generated by bacteria during the breakdown of dietary nitrates in the oral cavity?

Option: Caffeine Option: Vitamin C Option: Nitrite ions Option: Melatonin

4. Which type of diet may have potential cognitive benefits according to the article?

Option: High-sugar diet Option: Protein-rich diet Option: Carb-heavy diet Option: Nitrate-rich diet

5. What potential strategy could help in preventing dementia according to the implications of the research?

Option: Avoiding all bacterial exposure Option: Promoting oral hygiene through candy consumption Option: Altering the bacterial balance in the mouth Option: Ignoring oral health practices

6. What might help sustain cognitive function over time according to the article?



Option: Consuming processed foods Option: Using mouthwash excessively Option: Dietary modifications and probiotics Option: Ignoring oral health completely

#### **True-False**

7. The oral microbiome has no connection to cognitive health.

8. The breakdown of nitrite into nitric oxide does not impact vascular circulation.

- 9. A nitrate-rich diet could potentially provide cognitive benefits.
- 10. The study identified Staphylococcus and Streptococcus as harmful bacteria for cognitive health.
- 11. Regular dental check-ups could help in the early detection of cognitive decline.

12. Consuming nitrate-rich beetroot juice has no impact on cognitive function according to the ongoing research.

#### Gap-Fill

13. Individuals with elevated levels of specific bacterial groups like Neisseria and Haemophilus performed

significantly better on cognitive assessments, exhibiting enhanced \_\_\_\_\_\_ skills and

greater capacities for attention and complex task execution.

14. The breakdown of nitrite into nitric oxide could improve vascular circulation, including cerebral

\_\_\_\_\_ flow.

15. Encouraging the proliferation of beneficial, nitrite-producing bacteria like Neisseria could help sustain

cognitive function over \_\_\_\_\_\_ .

16. Certain bacterial populations may pose risks rather than benefits; the study identified specific groups

like Porphyromonas, often associated with periodontal disease, which were more prevalent in individuals



exhibiting memory \_\_\_\_\_\_.

| 17. | The article suggests that | interventions a | aimed at | altering the | bacterial | balance in | the mouth | could |
|-----|---------------------------|-----------------|----------|--------------|-----------|------------|-----------|-------|
|     |                           |                 |          | a            |           |            |           |       |

emerge as innovative strategies for dementia

18. Future research may validate the hypothesis that the oral microbiome plays a critical role in sustaining

cognitive \_\_\_\_\_\_.

### Answer

Multiple Choice: 1. Influencing brain function as we age 2. Neisseria and Haemophilus 3. Nitrite ions 4. Nitrate-rich diet 5. Altering the bacterial balance in the mouth 6. Dietary modifications and probiotics True-False: 7. False 8. False 9. True 10. False 11. True 12. False Gap-Fill: 13. memory 14. blood 15. time 16. impairments 17. prevention 18. function NEWS.CO

## Vocabulary quizzes

#### Multiple Choice (Select the Correct answer for each question.)

- 1. What are small dark shapes that people may sometimes see moving in their field of vision?
  - **Option: Bacteria Option:** Floaters **Option:** Plasma **Option:** Antibiotics
- 2. What term refers to the community of microorganisms that live in and on the human body?
  - **Option: Neurons Option: Microbiome Option: Fossils Option: Herbivores**
- 3. What is a term for an action taken to improve a medical condition or situation?

**Option: Resolution Option:** Intervention **Option: Inflation Option: Mutation** 



4. What is the ability of an organism to detect magnetic fields for navigation and orientation?

**Option: Magnetoreception Option: Hydration Option:** Erosion **Option: Inversion** 

- 5. Which term relates to processes such as thinking learning and remembering?
  - **Option:** Cognitive **Option: Metabolic Option:** Synthetic **Option:** Conductive
- 6. What term describes a mutual relationship or connection between two or more things?

**Option:** Correlations **Option: Distortions Option: Luminosity Option: Repudiation** 

7. What word describes an increase in the rate or speed of something? ESL-NEWS

**Option: Decelerated Option: Accelerated Option: Stagnated Option: Deviated** 

- 8. Which term refers to favoring or making changes that are revolutionary or extreme?
  - **Option: Traditional Option: Radical Option:** Conservative **Option:** Conventional

9. What term refers to the forces or properties that stimulate growth progress or change within a system or process?

**Option: Statics Option:** Dynamics **Option: Kinetics Option: Mechanics** 

10. Which term refers to new methods ideas or products introduced for the first time?

**Option: Traditions Option:** Concepts **Option:** Innovations **Option:** Conventions



### Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

| 11.  | is the rapid increase or spread of something.  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|
| 12.  | Doctors often prescribe medications to help pain and discomfort.                       |  |  |  |  |  |  |  |
| 13.  | Yoga and meditation can help expand the mental of individuals.                         |  |  |  |  |  |  |  |
| 14.  | . The success of the project was easily through specific metrics.                      |  |  |  |  |  |  |  |
| 15. /  | Aging is often associated with the of certain bodily functions.                        |  |  |  |  |  |  |  |
| 16.  | One of the challenges in investing in the stock market is the of future returns.       |  |  |  |  |  |  |  |
| 17.  | Mount Everest presents a challenge to even the most experienced climbers.              |  |  |  |  |  |  |  |
| 18.  | The volcanic caused widespread destruction in the surrounding area.                    |  |  |  |  |  |  |  |
| 19. <sup>-</sup>   | The process of involves reasoning from specific cases to general principles.           |  |  |  |  |  |  |  |
| 20. Technological have revolutionized many aspects of modern life.                         |  |  |  |  |  |  |  |  |
| Matching Sentences ( Match each definition to the correct word from the vocabulary list. ) |  |  |  |  |  |  |  |  |
| 21   | 21. The rapid of fake news on social media platforms is a growing concern for society. |  |  |  |  |  |  |  |
| 22   | 22. Effective medical can significantly improve a patient's health outcomes.           |  |  |  |  |  |  |  |
| 23   | 23. Neglecting regular maintenance can lead to the of machinery over time.             |  |  |  |  |  |  |  |
| 24   | 24. Deep in the glacier posed a danger to the team of explorers.                       |  |  |  |  |  |  |  |
| 25   | 25. The study of Earth's field helps scientists understand magnetic phenomena.         |  |  |  |  |  |  |  |
| 26   | 26. His dedication and hard work the values of our organization.                       |  |  |  |  |  |  |  |
| 27   | 27. The interaction of electrical currents and magnetic fields is a key principle in . |  |  |  |  |  |  |  |
| 1  |  |  |  |  |  |  |  |  |
| 28   | 3. The implementation of new technology the pace of production in the factory.         |  |  |  |  |  |  |  |



29. Natural such as the auroras are awe-inspiring displays in the sky.

30. The company decided to take a approach to redesigning its business model.

### Answer

**Multiple Choice:** 1. Floaters 2. Microbiome 3. Intervention 4. Magnetoreception 5. Cognitive 6. Correlations 7. Accelerated 8. Radical 9. Dynamics 10. Innovations

**Gap-Fill:** 11. Proliferation 12. Alleviate 13. Capacities 14. Quantifiable 15. Degeneration 16. Unpredictability 17. Formidable 18. Eruption 19. Induction 20. Innovations

Matching sentence: 1. Proliferation 2. Interventions 3. Deterioration 4. Crevasses 5. Geomagnetic 6. Epitomize 7. Electromagnetism 8. Accelerated 9. Phenomena 10. Radical

#### CATEGORY

1. Sci/Tech - LEVEL5

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