

1



2



3



4



5



6

This is **ORAL JEOPARDY!**



**Peter Maroon**  
Saliva Testing Market Development Consultant  
Pmaroon@impetusdx.com

7

This is **ORAL JEOPARDY!**

## Categories

CONNECTING DOTS   AMMUNITION   END-FLAMMATION   ALLIANCES   WHAT THE HEALTH   MALADIES

Our favorite answer and question game show with a twist

8

**ANSWER:**  
Registered Dental Hygienist!

12

**QUESTION:**  
Who has the biggest impact in transforming patient lives and clinical outcomes?

13

**Ammunition**

**Measure and treat what we CANNOT see...**

- Salivary Bacteria
- Sleep Disordered Breathing
- Blood Glucose

**A Dental Hygienist May Very Well Save Your Life!**

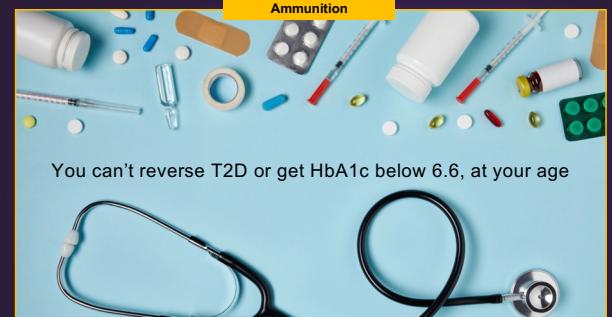


©Gina Pritchard DNP

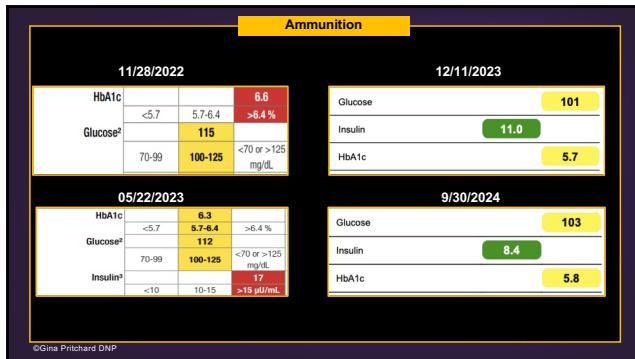
14

**Ammunition**

You can't reverse T2D or get HbA1c below 6.6, at your age



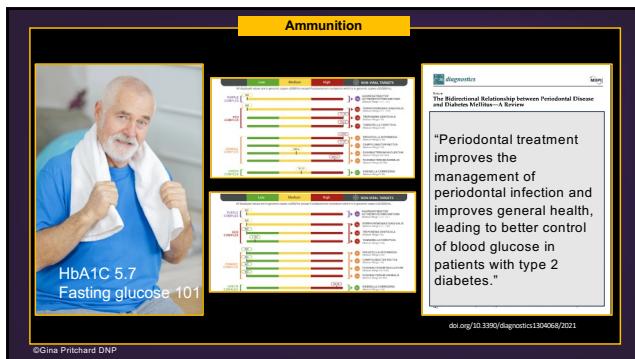
15



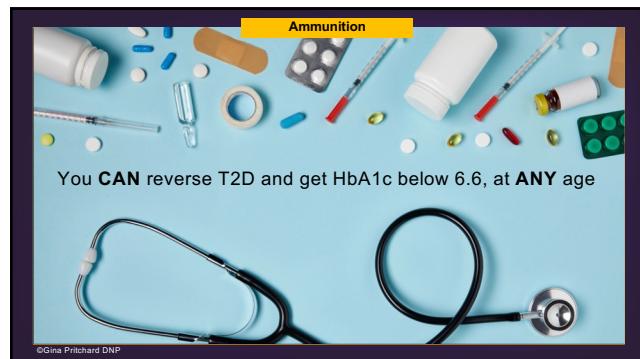
16



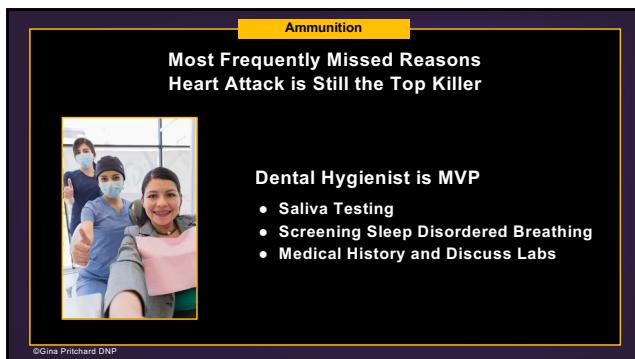
17



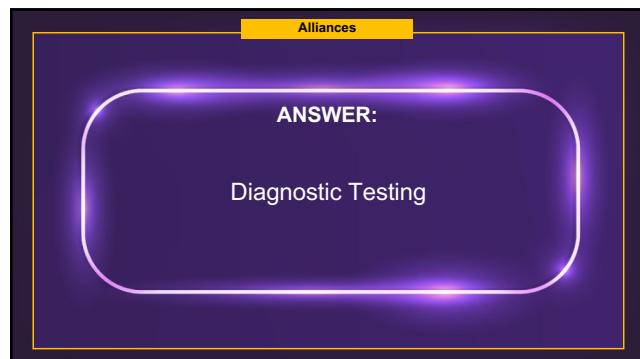
18



19



20



**Alliances**

**QUESTION:**

How do you easily collaborate between dentistry and other disciplines?

23

**Alliances**



**Bridging the gap between dentistry & medicine**

24

**Alliances**

**Comprehensive Diagnostic Testing in Modern Dentistry**



**Saliva Test**

- Oral pathogens
- Inflammatory burden
- Oral-systemic risk

**Glucose Test**

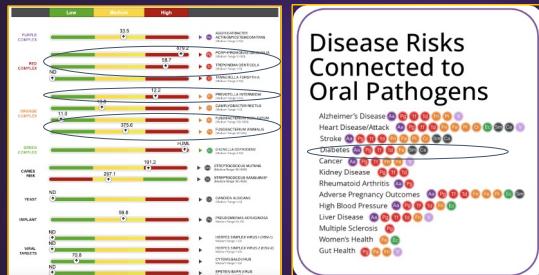
- Metabolic risk
- Bi-directional
- Oral-systemic risk

**Sleep Test**

- CBCT
- Airway risk
- Oral-systemic risk

25

**Alliances**



**Disease Risks Connected to Oral Pathogens**

- Alzheimer's Disease
- Heart Disease/Attack
- Stroke
- Obesity
- Cancer (various types)
- Kidney Disease
- Respiratory Disease
- Adverse Pregnancy Outcomes
- High Blood Pressure
- Liver Disease
- Multiple Sclerosis
- Women's Health
- Gut Health

26

**Connecting Dots**

**ANSWER:**

This is a polymicrobial test measuring bacteria, yeast, and viruses

28

**Connecting Dots**

**QUESTION:**

What is a saliva test?

29

**Connecting Dots**

### Saliva Testing

- Simple Non-Invasive
- Identifies bacteria, viruses, bio-markers, & risk factors
- Insight into oral-systemic health connections
- Routinely used within both dental & medical practices
- Early detection, risk stratification, & personalized care



30

**Connecting Dots**

### How it works:



- Collection: Saline, swish & spit
- Analysis: lab based qPCR, Next Gen Sequencing, or POC
- Reports: bacterial, fungal, viral, inflammatory or genetic markers

31

**Connecting Dots**

### How Do I Decide?

1. What measurements are on the test
  - Bacteria, Caries, Yeast, Viral, Genetic Markers, etc.
1. What is the LOD (Level of Detection)
  - Start at 250 or 10,000 copies of DNA
1. What is the accuracy
  - 70% - 100%



32

**Connecting Dots**



11 tests on market and many more everyday...

33

**What The Health**

**ANSWER:**

This complex of bacteria control the oral microbiome

35

**What the Health**

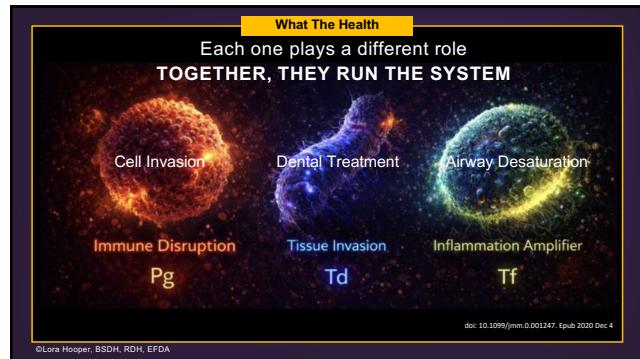
**QUESTION:**

What are red complex?

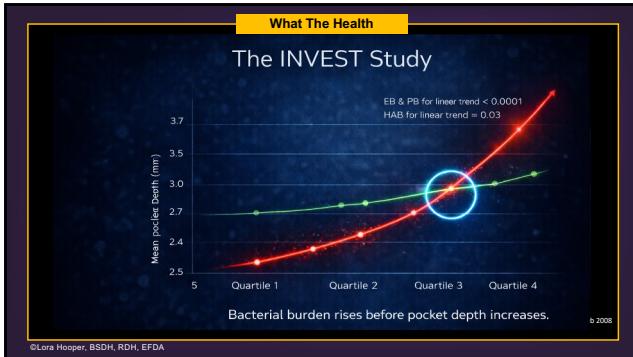
36



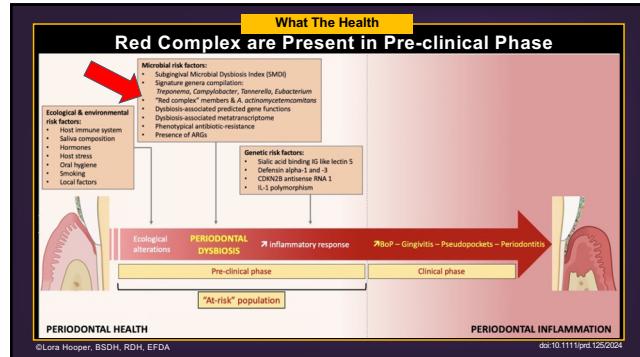
37



38



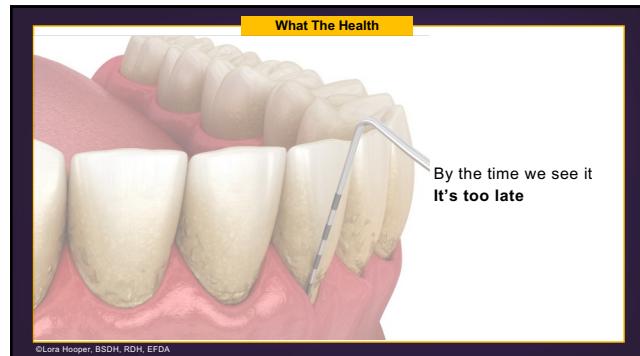
39



40



41



42

43

Maladies

**ANSWER:**

This pathogen's virulence factors are linked to neuroinflammation, complement activation, and the formation of tau tangles in Alzheimer's disease.

45

Maladies

**QUESTION:**

What is Porphyromonas gingivalis?

46

Maladies

Bacteremia + Neural Routes + Endothelial Injury

Translocation

- Chronic periodontal pockets drive transient bacteremia, sending Pg into circulation
- OMVs circulate systemically, target vascular endothelium promoting endothelial dysfunction & early BBB stress
- Neural pathways and TLR2/4 activation enable CNS entry & sustained oxidative stress & neuroinflammation

doi:10.1016/j.neuro.2022.105282

©Anne Rice, RDH, BS, FAAOSH, CDP

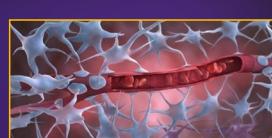
47

Maladies

Gingipains & BBB Breakdown

Virulence Factors

- Pg gingipains degrade host, structural & immune proteins
- Cleavage of tight-junction proteins (e.g., claudin-5) weakens the BBB & amplifies brain inflammation

A 3D rendering of a blood vessel within the brain. The vessel is shown in red, surrounded by a dense network of blue-stained glial cells. The endothelial barrier is depicted as a thin, semi-transparent layer lining the inside of the vessel. The overall image is set against a dark, textured background representing brain tissue.

BBB - tightly regulated endothelial barrier protecting the brain. TIP: watch BP, sleep, lipid & sugar balance

doi:10.1056/jnurim.2022.105202

doi:10.1016/j.jneurosci.2023.02.006

©Anne Rice, RDH, BS, FAAOSH, CDP

48

Maladies

## Neuroinflammation, Complement Activation, & Tau Pathology

### Downstream Effects In the Brain

- Microglial activation by gingipains & LPS  
→ chronic neuroinflammation ( $\uparrow$  IL-1 $\beta$ , TNF- $\alpha$ , IL-6)
- Complement activation → synapse pruning - hallmark early Alzheimer's pathology
- Pg drives amyloid- $\beta$  (antimicrobial response) &  $\uparrow$  tau phosphorylation



[doi.org/10.1038/s41467-021-22354-2/](https://doi.org/10.1038/s41467-021-22354-2/)

©Anne Rice, RDH, BS, FAAOOSH, CDP

49

EndFlammation

51

EndFlammation

**QUESTION:**

**What is the #1 cause of  
leaky arteries?**

52

## Leaky Arteries

53

**Bacteria Have a Direct & Deadly Impact in and on the Arterial Wall Aa, Pg, Td, Tf, Fn**

**1st** Increase LDL- "bad cholesterol"  
 Monocyte → Macrophage  
 Periodontal Bacteria  
 Apopt and infl.DL  
 LPS  
 Migration/IMC

**2nd** Increases permeability "passes"  
 Endothelial permeability of infiltration allowing adherence and penetration of monocytes and T-lymphocytes

**3rd** Sticks in wall of artery- "plaques"  
 Endothelial permeability of infiltration allowing adherence and penetration of monocytes and T-lymphocytes

**A. Atherosclerosis lead**  
 Endothelial permeability of infiltration allowing adherence and penetration of monocytes and T-lymphocytes

**B. Periodontitis lead**  
 Endothelial permeability of infiltration allowing adherence and penetration of monocytes and T-lymphocytes

doi:10.1136/postgradmedj-2016-134279

54

55

Connecting Dots

**ANSWER:**

This syndrome causes permeability which allows bacterial translocation.

57

## Connecting Dots

## QUESTION:

What is the leaky syndrome?

58

## Connecting Dots

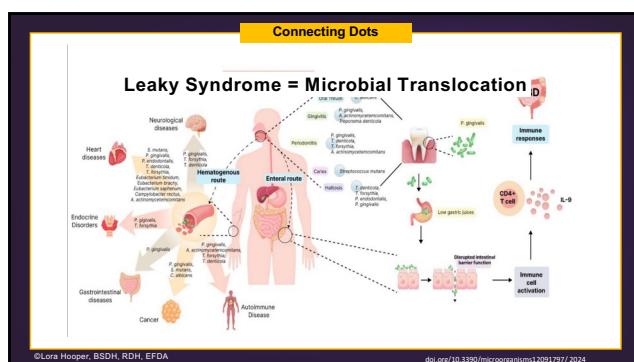
When The Mouth Leaks  
The GI & Body Pays The Price

doi.org/10.3390/microorganisms12091797/2024

59

## Connecting Dots

## Leaky Syndrome = Microbial Translocation

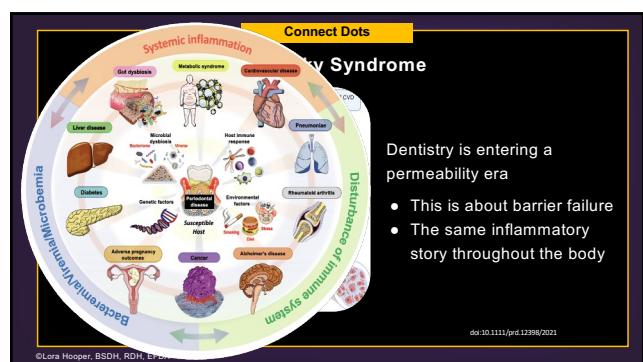


doi.org/10.3390/microorganisms12091797/2024

60

## Connect Dots

## Leaky Syndrome



doi:10.1111/jid.12398/2021

61

## What The Health

## ANSWER:

Patients with periodontal disease, gingivitis, peri-implantitis, heart disease, dementia, cancer, high blood pressure or sleep apnea.

63

## What The Health

## QUESTION:

Who are patients that need a saliva test?

64

What The Health

- Test everyone!
- Patients with bleeding while charting or treatment
- Patients with unexplained inflammatory biomarkers like hsCRP
- All patients pre & post restorative care procedures
- Those currently pregnant or actively pursuing pregnancy
- All patients with chronic medical conditions

65

What The Health

The secret of getting ahead is getting started.  
Mark Twain

66

What The Health

**ANSWER:**

This condition, worsened by chronic periodontal inflammation, increases systemic cytokine load & raises the brain's risk for embolic stroke & cognitive decline.

68

What The Health

**QUESTION:**

What is Atrial Fibrillation?

69

What The Health

**Irregular Heartbeat or Arrhythmia**

Blood Flow  
Cognition  
Periodontal Disease  
Therapy

Treating gum disease in the 3-months after a radiofrequency catheter ablation to correct AFib may reduce recurrence - JAHAD 2024

Pg translocated to the heart, when reaching the atria, worsened atrial fibrosis increasing AFib risk - March 2025, Circulation, Miyauchi S. et al

©Anne Rice, RDH, BS, FAAOSH, CDP

70

What The Health

**Vascular & Degenerative Pathways**  
**Homocysteine**

- Strong, independent risk factor for dementia & AD (CVD, stroke)
- ↑ OS, DNA damage, apoptosis  
↓ blood flow, stirs inflammation, vessel damage, BBB integrity, brain atrophy

Elevated levels of HCY observed in patients with chronic periodontitis

©Anne Rice, RDH, BS, FAAOSH, CDP

doi: 10.1138/541467-022-33624/v/2022  
doi: 10.1126/science.1241224/2013  
doi: 10.1161/JAHA.125.024123/2025

71

**What The Health**

**Hypertension**

- Accelerates brain shrinkage, lesions & inflammation
- #1 preventable factor for CVD, kidney disease, cognitive decline & dementia (TIA, stroke, MCI)
- Direct relationship b/t subgingival bacteria & BP
- Bacterial endotoxins impair NO signaling, stiffen vessels, and raise blood pressure.
- Higher on the arm, feet on the floor, no chatting, NO MORE "A little bit high"



©Anne Rice, RDH, BS, FAAOSH, CDP

doi:10.1212/WNL.00000000000029715/2024  
doi:10.1212/WNL.00000000000030387/2024  
doi:10.1212/WNL.0000000000004602/2019

72

**EndFlammation**

**ANSWER**

This metabolic marker often misses prediabetes & insulin resistance.

77

**EndFlammation**

**QUESTION:**

What is Hemoglobin A1C (HbA1C)?

78

**EndFlammation**

**Hemoglobin A1C**  
AVERAGE Blood Glucose / 90 days

- 6.4 Very Concerning!
  - Need more data ASAP
- 5.7-6.4 Concerning!
  - Need more data ASAP
- 5.7 is NOT a reassuring number
  - We do not know ???
  - Need more data
  - Insulin resistance, prediabetes, diabetes



doi:10.1007/s00125-011-2342-y/2012

79

**EndFlammation**

**What data do we need to know?**

Blood Panel

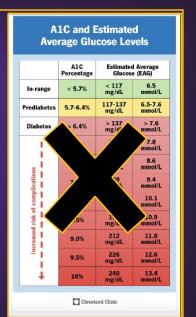
- Fasting glucose: Under 90
- Fasting insulin: Under 6
- Triglycerides: Under 90

Lower Trend: Trending upward is a problem

Liver Enzymes: GGT, AST, ALP, ALT

Measure at Home

- Glucose readings
- Ketone readings
- Continuous Glucose Monitor: CGM



©Gina Pritchard, DNP

80

**EndFlammation**

Meet your patient where they are!

"I just want to lose weight."

"I am desperate to lose weight."

"I am severely depressed & on many medications for depression because I must lose weight."

Triglycerides & liver enzymes high  
GGT 219, ALT 75  
(normal for both is <40)

©Gina Pritchard, DNP

81

**EndFlammation**



**Collaborative Care**

- Non-surgical Intervention
- Salivary Assessments
- Daily Disease Control
- Dietary Support
- Restorative Care

©Gina Pritchard, DNP

82

**Ammunition**

**ANSWER:**

This sensor is utilized during the treatment of periodontal disease in its bidirectional relationship with diabetes

84

**Ammunition**

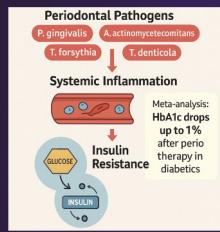
**QUESTION:**

What is a continuous glucose monitor?

85

**Ammunition**

**Glucose Is A Missing Periodontal Metric**



**Periodontal Pathogens**  
*P. gingivalis* *A. actinomycetemcomitans*  
*T. forsythia* *C. denticola*

**Systemic Inflammation**  
 Red blood cells

**Glucose** **Insulin Resistance** **INSULIN**

Meta-analysis: HbA1c drops up to 1% after perio therapy in diabetics

**Bidirectional relationship**

- Diabetes increases inflammation
- Inflammation causes permeability
- Pathogens feed off glucose

©Lora Hooper, BSDH, RDH, EFDA

doi: 10.1007/s00125-011-2342-y. Epub 2011

86

**Ammunition**

**Biosensor (CGM) = Real-time Biofeedback**



- Identifies glycemic spikes
- Explains refractory inflammation
- Guides nutrition & treatment planning
- Related to bacteria, sleep, & hormones



©Lora Hooper, BSDH, RDH, EFDA

doi: 10.1007/s00125-011-2342-y. Epub 2011

87

**Ammunition**

**10 Glucose Goddess Hacks**

The next charting metric won't be probing depth... It will be metabolic stability



**Hack #1 Eat foods in the right order**  
 Eat protein and fiber before carbohydrates to slow down the absorption of carbohydrates.

**Hack #2 Veggie starters**  
 Start with a salad or vegetable before your meal to increase satiety and eat less at the meal.

**Hack #3 Stop counting calories**  
 Counting calories can be overwhelming and defeating. Instead, focus on eating whole foods and avoiding processed foods.

**Hack #4 Savory breakfast**  
 Start your day with a savory meal instead of a sweet breakfast to keep blood sugar levels stable throughout the day.

**Hack #5 Have any type of sugar, they're all the same**  
 All types of sugar are processed by the body the same way, so it's important to limit all types of sugar.

**Hack #6 Pick dessert over a sweet snack**  
 Instead of reaching for a sweet snack, opt for a dessert that is low in carbohydrates and high in protein.

**Hack #7 Vinegar**  
 Add a splash of vinegar to your meal to help regulate blood sugar levels.

**Hack #8 After you eat, move**  
 Exercise after a meal can help regulate blood sugar levels.

**Hack #9 If you have to snack, go savory**  
 Snack on a savory meal instead of a sweet one to keep blood sugar levels stable.

**Hack #10 Put "clothes" on your carbs**  
 Add fiber to your carbohydrates to help regulate blood sugar levels and reduce the risk of spikes.

©Lora Hooper, BSDH, RDH, EFDA

88

## Connecting Dots

## ANSWER:

These long-chain lipids improve cognition & reduce risk of cognitive decline while simultaneously lowering pocket inflammation & improving periodontal outcomes.

## Connecting Dots

## QUESTION:

What are Omega 3 fatty acids?

90

91

## Connecting Dots

**Dietary Allies - Mouth and Brain**  
**Omega 3 Fatty Acids**

DHA - neurotransmission, ↓ neuroinflammation  
positive impact on healing & inflammation  
w/NSPT



B vitamins - signal, repair, RBC production, helps control HCY, associated w/ brain shrinkage OH - epithelial integrity (cell turnover), immunity, collagen

Fiber - ↓ inflammation, ↑ blood flow  
More fiber = better cognition

doi: 10.1016/j.jad.2010.08.009/2010  
doi: 10.1017/gmb.2011.3

©Anne Rice, RDH, BS, FAAOSH, CDP

92

## Connecting Dots

Antioxidant Polyphenols  
(berries, pomegranate, green tea, cocoa, olive oil)



Vitamin D (fatty fish, cod liver oil, egg yolks, sunshine w/cofactors magnesium, K2)



Vitamin A, C, E  
A - liver, eggs, leafy greens, C - citrus, berries, broccoli E - nuts, seeds, avocados



Zinc (oysters, beef, lamb, pumpkin seeds, chickpeas, lentils, & dairy)



DOI: 10.3945/an.111.004176/2013

93

## Connecting Dots

**Insulin Resistance**  
**Glucose**

Brain - highly metabolic tissue dependent on glucose metabolism - energy, neurotransmitter synthesis, protection, memory, attention & learning



Earlier the onset T2D higher lifetime risk, accelerates grey matter loss, speeds up brain aging, smaller hippocampal volume

Glucose Rich Foods - turnips, kiwi, grapes, rutabagas, red beets, whole grains, onions

doi: 10.1093/NEJMoa121574/2013  
doi: 10.2337/diab.2425/2000

©Anne Rice, RDH, BS, FAAOSH, CDP

94

## Ammunition

## ANSWER:

Real Food  
Low Carbohydrate  
Ketosis

96

**Ammunition**

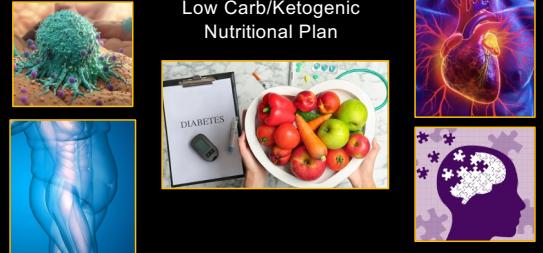
**QUESTION:**

What nutritional plan is the #1 most effective & rapid approach to achieving metabolic flexibility & reversing Type 2 diabetes?

97

**Ammunition**

**Low Carb/Ketogenic Nutritional Plan**



©Gina Pritchard DNP

[doi.org/10.3900/nu17063047/2025](https://doi.org/10.3900/nu17063047/2025)

98

**Ammunition**

**Measure Ketosis**



• Mild 0.5 to 1.0 mmol/L  
 • Moderate 1.0-3.0  
 • High ketosis >3.0

©Gina Pritchard DNP

99

**Ammunition**

**Real Food: Protein Priority. Fat Friendly. Carb Conscious**



©Gina Pritchard DNP

100

**Ammunition**

**Low Carbohydrate/Ketosis**

**≤ 30 g Carbs**



1/2 cup Blueberries = 11 grams



1 Medium Apple = 25 grams

12 oz Soda = 39g

12 oz Green Tea or Black Coffee = 0 grams

©Gina Pritchard DNP

101

**Maladies**

**ANSWER:**

This vitamin deficiency puts you at a 300% increase risk for an implant failure.

103

**QUESTION:**  
What is vitamin D3?

104

**Nutritional**

**D3**

- Immune health + bone gatekeeper
- 300% increased implant failure risk when deficient
- K2 is needed with D3 for absorption

©Lora Hooper, BSDH, RDH, EFDA  
doi:10.1111/jcd.00017/2023

105

**Implants Don't Fail Randomly, They Fail in Deficient Biology**

- **Nutritional**
  - K2/D3, CoQ10, B complex
- **Bacterial**
  - Pa- 50% of implant failures
- **Fungal**
  - Aggressive infection
- **Viral**
  - Host immunity

©Lora Hooper, BSDH, RDH, EFDA  
doi:10.1111/jcd.00037/2023

106

**Metallosis**

- Corrosion by products & bacteria
- 30 minutes bacterial attachment
- Pg & Sm are some of the fastest

The future isn't better titanium — it's **better biology**

©Lora Hooper, BSDH, RDH, EFDA  
doi:10.1002/jcd.20286/2021

107

**Implant Failures Are Microbial**

- **Bacteria**
  - Pa
  - Red complex
  - Orange complex
- **Yeast**
  - Candida
  - Blocks immune recognition
- **Virus**
  - HSV1, HSV2, CMV & EBV
  - Suppress immunity

Pseudomonas  
Candida  
Red Complex

©Lora Hooper, BSDH, RDH, EFDA  
doi:10.1111/jcd.00342/2020

108

**Implants**

Pseudomonas  
Candida  
Red complex

- \$10B by 2030
- 50% of implants affected
- Clinical, physiological & financial impact

©Lora Hooper, BSDH, RDH, EFDA  
doi:10.1038/s41522-020-00355-7/2020

109

**Maladies**

**ANSWER:**

A common virus that targets nerves, stays dormant for life and may trigger brain inflammation.

114

**Maladies**

**QUESTION:**

What is HSV1?

115

**Maladies**

Enter nervous system through peripheral nerves - neuroinflammation

ApoE4 carriers - 12x's greater risk of AD (less viral particle clearance)

Reactivation & cell death - direct neuronal damage

Host genes might determine the response (TLR's, OAS1, HLA, CD8...)

©Anne Rice, RDH, BS, FAAOSH, CDP  
doi:10.3390/cms54176047/2025  
doi:10.3390/cms54176047/2025

116

**Maladies**

**I am not a Pharmacist Prescriptions**

Valacyclovir (Valtrex)  
2 g twice in one day, taken 12 hours apart

Acyclovir (Zovirax)  
400 mg 3x daily for 5 days, sometimes 200 mg 5x's daily for 5 days

Famciclovir (Famvir)  
1.5g once (alternative 500 mg x3 once/day)

©Anne Rice, RDH, BS, FAAOSH, CDP  
doi:10.3390/cms54176047/2025  
doi:10.3390/cms54176047/2025

117

**Maladies**

**How to Help**

- LLLT - doesn't eliminate a virus but can slow replication, reduce pain, duration & possibly interval reoccurrence
- Protect yourself - viruses can enter the respiratory tract from aerosolized droplets
- HSV 1 relies on arginine to replicate (nuts, seeds, chocolate, shellfish, chicken)

©Anne Rice, RDH, BS, FAAOSH, CDP  
doi:10.3390/cms54176047/2025  
doi:10.3390/cms54176047/2025

118

**EndFlammation**

**QUESTION:**

This acid-producing oral bacteria thrives in low-saliva, mouth-breathing patients and is strongly linked to caries risk.

120

EndFlammation

**ANSWER:**

Streptococcus Mutans

121

EndFlammation

**Streptococcus Mutans, Not Just A Cavity-causing Bacteria**

Oral infections don't stay oral



- Acid production & biofilm formation
- Bloodstream accessible
- Cardiovascular inflammation, endocarditis, & stroke

122

EndFlammation

**Dental Caries**

Dental caries is not "routine dentistry"  
it is a **global infectious disease epidemic**



- Most prevalent infectious disease worldwide
- Transmissible, preventable, and often undetected
- Increased over the past 31 years

Measuring the Bacteria Matters

World Health Organization Global Burden of Disease Study. The Lancet Global Health. 2017;5(1):e103-e114. doi:10.1016/j.lancetgh.2016.11.002

123

What The Health

**ANSWER:**

One of the most overlooked root causes of periodontal disease.

125

What The Health

**QUESTION:**

What is sleep disordered breathing?

126

What The Health

**The Airway Drives Microbiome Behavior**

Sleep disordered breathing is a **root cause**, not a side symptom

- Nasal breathing → nitric oxide → vascular support
- Oral breathing → desaturation → pathogen growth



©Lora Hooper, BSDH, RDH, EFDA

doi:10.3390/pathogens10101290/2021

127

**What The Health**

**You Can't Heal What You Can't Oxygenate**

- Mouth breathing changes environment
- Promotes dysbiosis of oral pathogens
- Tf is first red complex to develop



doi: 10.3390/pathogens1001283/2021

©Lora Hooper, BSDH, RDH, EFDA

128

**What The Health**

**Desaturation Shifts Oral Bacteria Causing Vascular Permeability that contributes to Plaque Formation**



©Lora Hooper, BSDH, RDH, EFDA

129

**Alliances**

**ANSWER:**

This essential neurologic state is the brain's cleanup window—without it, Alzheimer's-related waste accumulates.

131

**Alliances**

**QUESTION:**

What is Sleep?

132

**Alliances**

**Brain Benefits**

- Consolidates memory & learning
- Clears toxins
- Fatigue skews memory towards negative
- Fuels creativity & problem solving

**DURATION**

30 yr. cohort of 8K, ages 50-70, sleep 6 vs 7 hrs = 30% increased risk of dementia

**TIPS**

Cool the Core, AM Light, Eat Fiber, Ω3's, Cognitive Off-Ramp, Lengthen Exhalation, Right Side Sleep, Nasal Breathing



doi: 10.1093/ajh/41.1067.021;2254-2703

©Anne Rice, RDH, BS, FAAOSH, CDP

133

**Alliances**

**Deep N3 Sleep**

**Glymphatic System**

- Expands interstitial space by ~ 60%
- A<sub>β</sub> ↑ 5% against healthy controls after 1 single night of sleep deprivation
- RCT, SDB participants (no memory loss, no sleepiness complaints) had ↑ amyloid, less grey matter than healthy controls

"These results support the need to screen and treat for SDB, especially in asymptomatic older population, to reduce Alzheimer's risk" - JAMA Neurology 2020



doi: 10.1038/s41467-022-33624-y/2022  
doi: 10.1126/science.1241224/2013  
doi: 10.1073/pnas.1713074115/2003

134

**Alliances**

**Nasal Breathing**

- Oral breathing can interfere with performance of working memory, attention, executive function
- We can absorb ~18% more O<sub>2</sub> as compared to mouth breathing
- Nasal breathing boosts NO, improving cerebral blood flow
- Improves CO<sub>2</sub> retention (stable neuronal excitability) Bohr effect



©Anne Rice, RDH, BS, FAAOSH, CDP  
doi:10.1513/annalsATS.201306-170M  
doi:10.3889/fnurn.2018.00083

135

**Maladies**

**ANSWER:**

Endothelial Dysfunction/Atherosclerosis, Increased Inflammation & Oxidation, High Blood Pressure, Reduced Blood Flow to Heart & Brain, Brain Fog, Fatigue, Mood Changes, Impaired Sexual Function (Men & Women), Impaired Glucose Uptake - Insulin Resistance, Exercise Intolerance/Poor Stamina, Delayed Wound Healing, Cold Hands & Feet, Poor Circulation

137

**Maladies**

**QUESTION:**

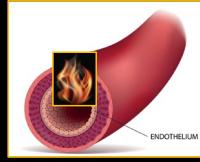
What are the dangers of low Nitric Oxide?

138

**Maladies**

**Mouth Breathing Reduces Nitric Oxide**





Low Nitric Oxide reduces vasodilation, increases arterial stiffness, elevates blood pressure, & promotes inflammation

Acts as a catalyst to promote adverse outcomes

©Gina Pritchard DNP

139

**Maladies**

**Desaturations are Dangerous**





©Gina Pritchard DNP

140

**Maladies**

Goal is not to sterilize the mouth

Daily/twice daily use lowers NO

Acute versus chronic use to maintain balance



©Gina Pritchard DNP  
doi:10.1016/j.mox.2017.09.004  
doi:10.1080/09600512019.1680270

141

**Maladies**

Goal is not to sterilize the mouth

Daily/twice daily use lowers NO

Acute versus chronic use to maintain balance

"The indiscriminate routine use of antibacterial mouthwash products may cause more harm than good in light of recent studies...suggesting potential detrimental impact of mouthwash use of NO bioavailability, blood pressure and development of diabetes."

doi:10.1016/j.mox.2017.09.004  
doi:10.1002/OMSD.2013.560270

©Gina Pritchard DNP

142

**Connecting Dots**

**ANSWER:**

Knowing the species present changes the treatment.

144

**Connecting Dots**

**QUESTION:**

Why you need a saliva test?

145

**Connecting Dots**

The chart includes sections for:

- Antibiotics:** Shows a color-coded legend for treatment response (red, green, blue) across various dental conditions.
- No Antibiotics:** Shows a color-coded legend for treatment response across various dental conditions.
- Gingivitis:** Shows a color-coded legend for treatment response across various dental conditions.
- Cavities:** Shows a color-coded legend for treatment response across various dental conditions.
- Yeast:** Shows a color-coded legend for treatment response across various dental conditions.
- Antifungal:** Shows a color-coded legend for treatment response across various dental conditions.
- Antibiotics:** Shows a color-coded legend for treatment response across various dental conditions.
- Anti Viral & Immunity:** Shows a color-coded legend for treatment response across various dental conditions.
- Periodontal Disease:** Shows a color-coded legend for treatment response across various dental conditions.
- Perio & Implantitis:** Shows a color-coded legend for treatment response across various dental conditions.
- Immunity:** Shows a color-coded legend for treatment response across various dental conditions.

Annotations on the right side of the chart indicate:

- Resistant to treatment & products
- Responds to treatment & products
- Resistant to treatment & products
- Responds to treatment & products

©Lora Hooper, BSDH, RDH, EFDA

146

**Connecting Dots**

- Identify active disease
- Treat based on test results
- Measure treatment effectiveness

147

**Connecting Dots**

**Staying Competitive in a Transformative Era**  
Clear data drives better decisions, better outcomes, and better business

**Patient Education**

- More efficient treatment plans improving patient outcomes

**Increase Treatment Acceptance**

- Say yes to treatment more often
- First 10 tests are key to success

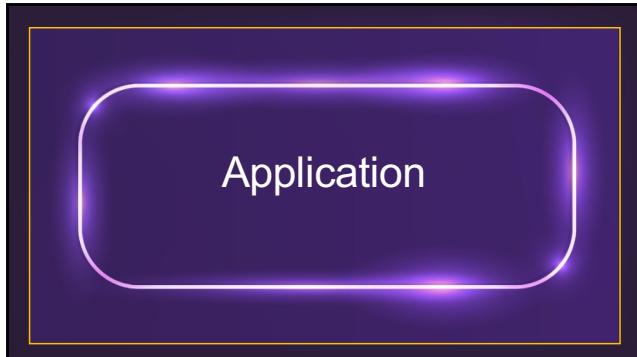
**Create Referral Stream**

- Educated patients refer more friends to providers they trust
- Medical professionals will create additional referral streams for your office

148

## Application

149



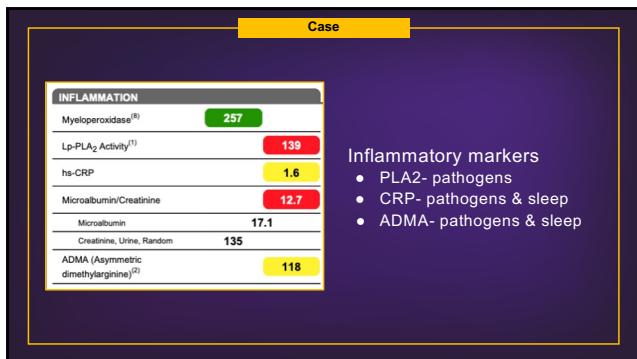
Case

**She came in to lose weight...**

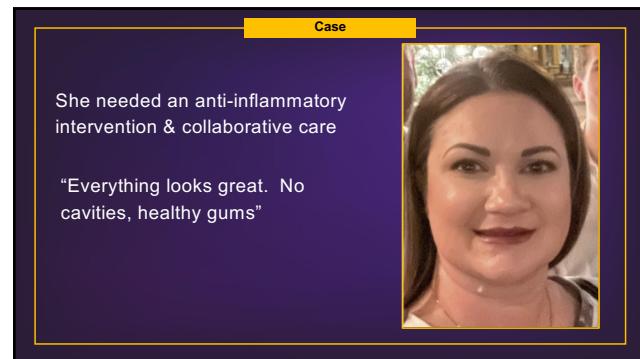
1. 41 year- old female
2. Successful teacher
3. Doesn't sleep well
4. Depression
5. No pain, beautiful smile

A close-up photograph of a woman with dark, shoulder-length hair. She is smiling warmly at the camera. She is wearing a light-colored top and a thin necklace. The background is slightly blurred, showing what appears to be an indoor setting with other people. The entire image is framed by a thick yellow border.

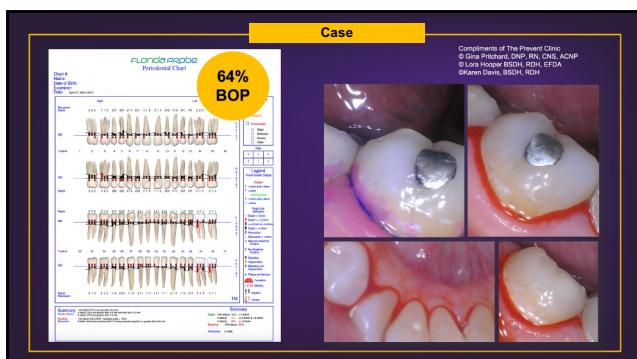
150



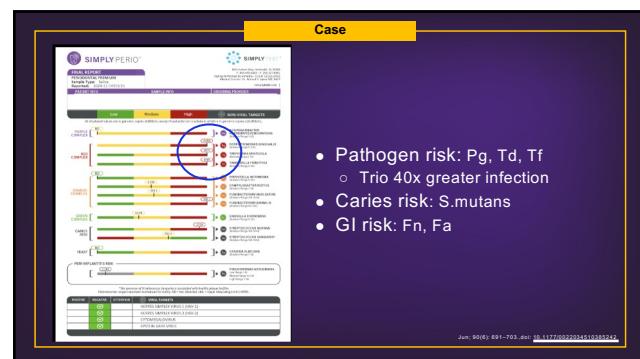
151



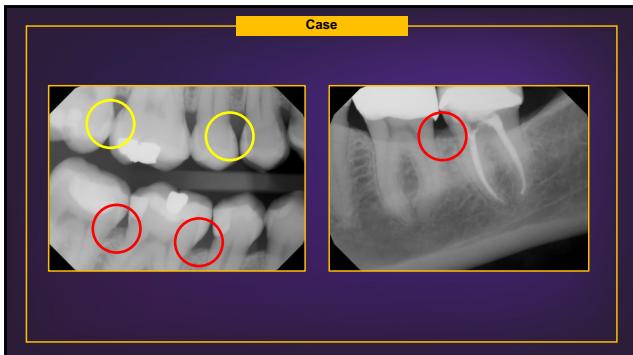
152



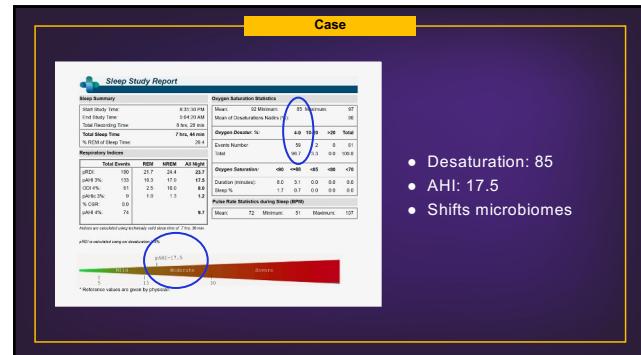
153



154



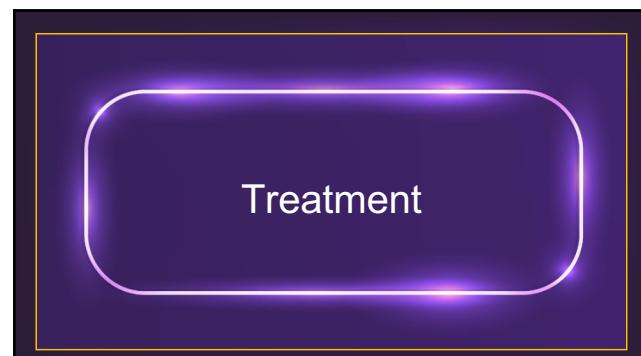
155



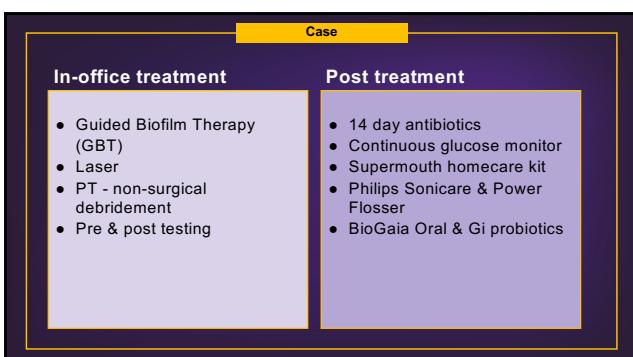
156



157



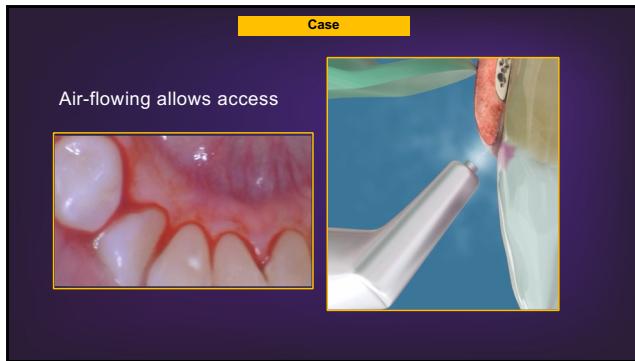
158



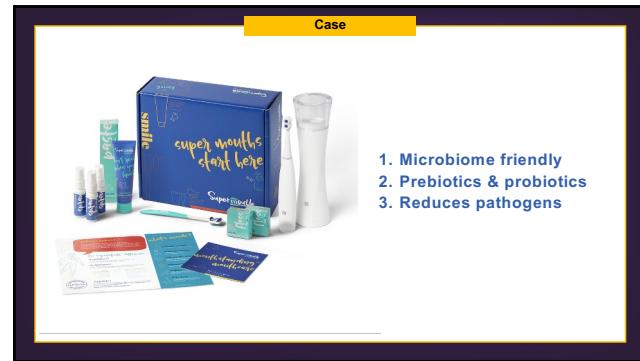
159



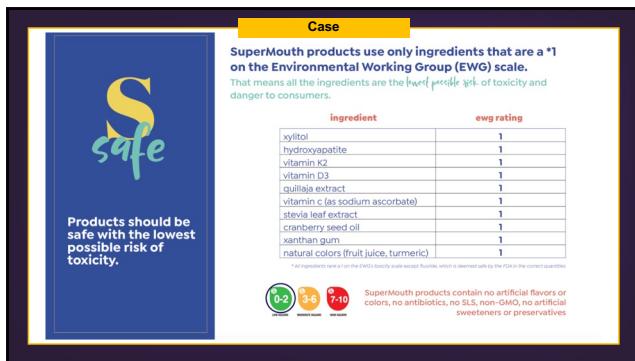
160



161



162



163



164



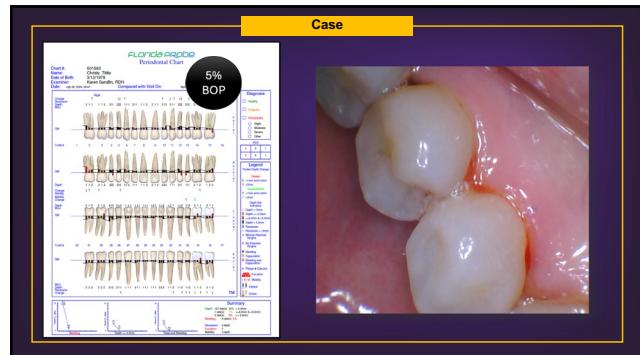
165



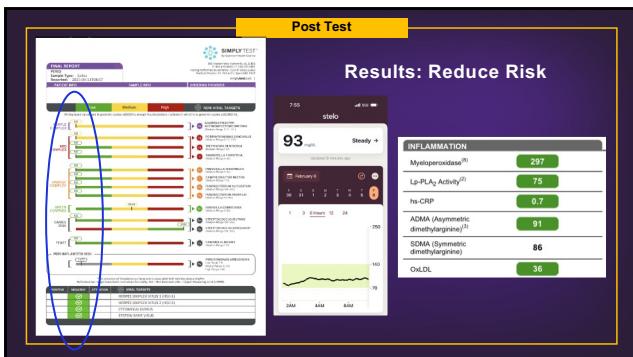
166

Case		
Nutrient	Why It Matters (Brain)	Why It Matters (Oral / Systemic)
Antioxidants (C, E, carotenoids)	Reduce OS & neuroinflammation	Protect tissues; support collagen & healing
Polyphenols (flavonoids, catechins)	Modulate microglia; improve cerebral blood flow	Reduce biofilm virulence; dampen periodontal inflammation
B Vitamins (B1, B6, B9, B12)	Neurotransmitters, myelin, ↓ homocysteine	High homocysteine linked to periodontal breakdown
Omega-3s (DHA, EPA)	Neuronal membrane integrity; anti-inflammatory	Reduce host inflammatory response in periodontitis
Vitamin D	Neuro-immune regulation; cognition support	Bone metabolism; immune modulation in periodontium
Magnesium	NMDA regulation; stress & sleep resilience	Bone health; wound healing; inflammatory balance
Zinc	Synaptic signaling; immune defense	Saliva, taste, immunity, tissue repair
CoQ10	Mitochondrial energy; ↓ OS	Improves gingival inflammation in studies
Nitrate-rich foods	↑ NO → cerebral blood flow	Oral bacteria convert nitrates → NO (oral-vascular link)

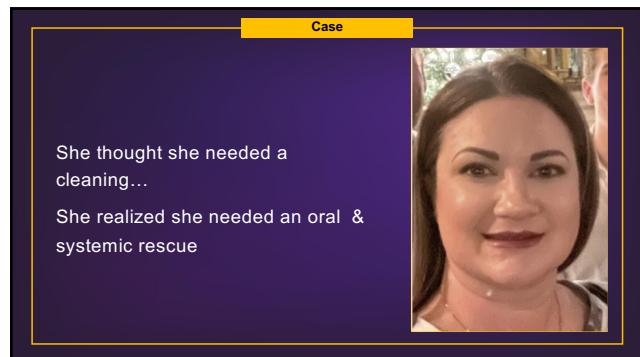
167



168



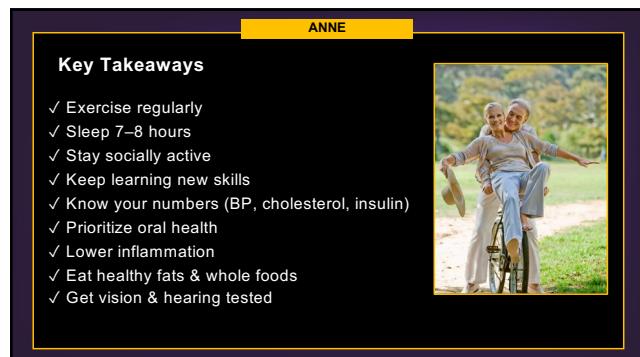
169



170



171



172

For More Information  
RetainyourBrain (web, socials)  
IND.org/learn

173

**LORA**

**Key Takeaways**

- ✓ Start testing
- ✓ Use microbiome friendly products
- ✓ Repopulate the Oral & GI microbiomes
- ✓ Red complex control entire oral microbiome
- ✓ Break up biofilm for treatment & products to work



174

**PETE**

**Key Takeaways**

- ✓ Caries is infectious disease - Not just tooth decay
- ✓ What happens in the mouth doesn't stay in the mouth
- ✓ Pathogens can move from biofilm to bloodstream
- ✓ Chronic oral infection increases systemic inflammatory risk
- ✓ If you don't measure bacteria, you're managing disease blindly

175

**GINA**

**Key Takeaways**

- B.L.E.S.S.E.D. Lifestyle
- 7 Verbs for Vibrant Health and Longevity
- Breathe: Slow Nasal Breathing, Hum!
- Love: Supportive Relationships, Community
- Eat - Real Food:
  - Protein Priority, Fat Friendly, Carb Conscious
- Sleep - Desaturations are Dangerous
- Mild Sleep apnea is NOT Mild
- Stress - Bliss - Talk with patients about your journey
- Exercise - Movement is magic
- Squats Between Patient appointments
- Discover - Test, Trend, Tweak, Repeat



176

**Q & A**

What's going on in there?



177