


Diabetes Education SERVICES

Advancing Your Career in Diabetes Education

**Getting to the Gut & Skin
Meet your Microbiome**




Beverly Thomassian, RN, MPH, CDCES, BC-ADM
2022 DiabetesEd.net



Happy Diabetes Month


November Celebration Sales

Free Purple Tote + Medication Pocketcards with All Book & Teaching Tools Orders

Best and Blasting on the roof of U of Toronto in 1921 with Marjorie who lived for 70 days without a pancreas because she received daily insulin injections. Marjorie gave her life for the discovery of the life saving hormone ... Insulin!

November 28th – Cyber Monday Sale, 30% off



Med and Insulin PocketCards




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Name / Insulin	Supplier	Units	Price / Unit	Notes
Glucagon Treatment for Diabetes-Related Hypoglycemia				
Glucagon	Novartis	1 mg/mL (0.5 mL)	175	0.5 mL contains 0.5 mg (1 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (0.5 mL)	175	0.5 mL contains 1.5 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (1 mL)	175	1 mL contains 3 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (2 mL)	175	2 mL contains 6 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (3 mL)	175	3 mL contains 9 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (4 mL)	175	4 mL contains 12 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (5 mL)	175	5 mL contains 15 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (6 mL)	175	6 mL contains 18 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (7 mL)	175	7 mL contains 21 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (8 mL)	175	8 mL contains 24 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (9 mL)	175	9 mL contains 27 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (10 mL)	175	10 mL contains 30 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (12 mL)	175	12 mL contains 36 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (15 mL)	175	15 mL contains 45 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (20 mL)	175	20 mL contains 60 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (30 mL)	175	30 mL contains 90 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (40 mL)	175	40 mL contains 120 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (50 mL)	175	50 mL contains 150 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (60 mL)	175	60 mL contains 180 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (75 mL)	175	75 mL contains 225 mg (3 mg/mL) of glucagon.
Glucagon	Novartis	3 mg/mL (100 mL)	175	100 mL contains 300 mg (3 mg/mL) of glucagon.

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Standards of Care
Meds PocketCards
Question of the Week
Online Course Viewing

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Meet Your Gut & Skin Bacteria

- ▶ Enjoy the state of wonder
- ▶ Discuss the role of gut and skin bacteria in relation to health.
- ▶ State strategies to improve intestinal health.

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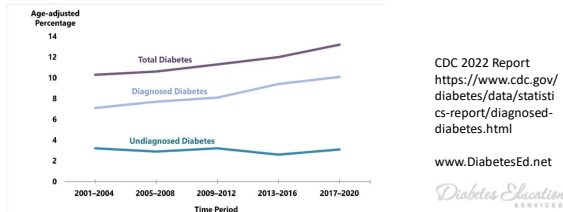
State of Wonder

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Diabetes in America 2022 - CDC

- ▶ 11% of adults have diabetes (37.3 mil)
 - ▶ 23% of those don't know they have diabetes
- ▶ 38% of adults have prediabetes (96 mil)
 - ▶ 19% of reported being told they have prediabetes.

Figure 1. Trends in age-adjusted prevalence of diagnosed diabetes, undiagnosed diabetes, and total diabetes among adults aged 18 years or older, United States, 2001-2020.



CDC 2022 Report
<https://www.cdc.gov/diabetes/data/statistics-report/diagnosed-diabetes.html>

www.DiabetesEd.net



Diabetes in America

Figure 2. Age-adjusted, county-level prevalence of diagnosed diabetes among adults aged ≥20 years, United States, 2013.

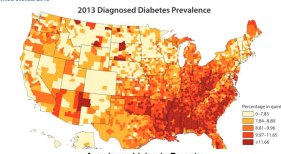


Figure 3. Age-adjusted, county-level incidence of diagnosed diabetes among adults aged ≥20 years, United States, 2013.

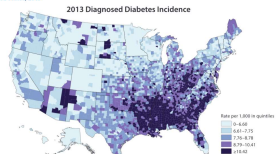


Figure 4. Americans Living in Poverty

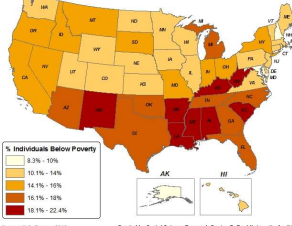
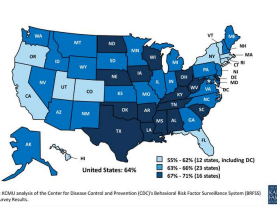
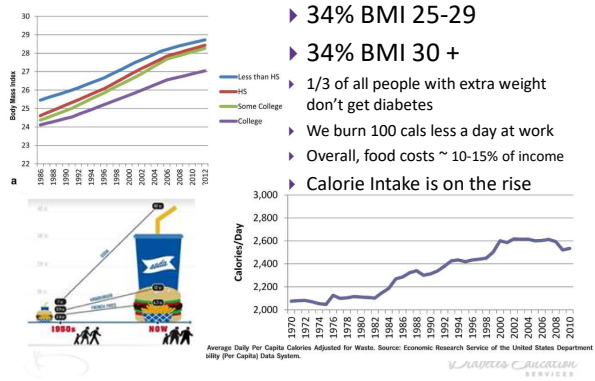


Figure 5. Percent of Adults Who are Overweight or Obese, 2014



Source: KDMU analysis of the Center for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS) 2014 Survey Results.

U.S. Weight - 68% experiencing overweight or BMI >30



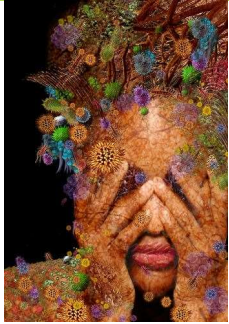
Quick Question 1

- ▶ What do you think is contributing to increasing prevalence of type 2 diabetes?
 - A. Processed foods
 - B. Increased sugar intake
 - C. Toxic Stress /ACEs
 - D. Changes in gut microbiome
 - E. Environment
 - F. All of the above



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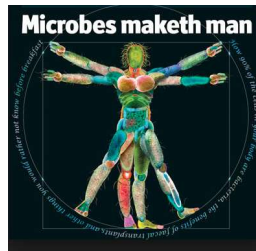
Bacterial Cells Outnumber Human Cells 10 to 1



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Gut Microbiome

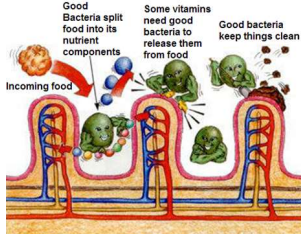
- ▶ Part of endocrine axis
- ▶ Stabilized by 3 years of age
- ▶ Influenced by:
 - ▶ Birth method
 - ▶ Breast fed
 - ▶ Early Antibiotic use
 - ▶ Environment
 - ▶ Travel
- ▶ Help us
 - ▶ utilize energy
 - ▶ fight off invaders



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How do our bacteria help us?

- ▶ Maintain physiological homeostasis and metabolism.
- ▶ Other benefits
 - ▶ pathogen displacement
 - ▶ immune system development
 - ▶ barrier fortification
 - ▶ vitamin production
 - ▶ nutrient absorption
- ▶ Forgotten organ



Quick Question

- ▶ How much does your gut bacteria weigh?
 - A. 24 ounces
 - B. 3 pounds
 - C. Less than 1 pound
 - D. 1.5 pounds



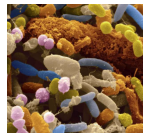
- ▶ How much does your brain weigh?



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3 lbs of Microbes in our Gut

- ▶ Community of bacteria extra 'organ' "microbiome".
- ▶ Evolved together with our microbiome over millions of years.
- ▶ Ratios of these communities has changed over the past 30 years
- ▶ Mirrors global spikes in obesity, diabetes, allergic and inflammatory diseases



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Bacterial Taxis?



For better or worse, we're "host-microbe ecosystems." Microbes shape us from without and also from within.

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Standard American Diet is SAD

- ▶ What are we doing to change these bacteria?
- ▶ 70% of food consumed is processed
- ▶ Low fiber, high sugar
- ▶ Intake of fruit and veggies decreasing
- ▶ We are starving our good bacteria.



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Quick Question 3

- ▶ In general, how does immigrating to the U.S. impact individual's gut microbiota?
- A. Increased diversity due to new food exposure.
- B. A generational decline in bacterial diversity
- C. They experience a sudden increase in Akkermansia muciniphila
- D. Decrease in helicobacter pylori.

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HEALTH

Just Months of American Life Change the Microbiome

Immigrants' gut bacteria "westernize" soon after they move to the U.S., which might influence obesity in immigrants and Americans alike.

OLGA KHAZAN NOV 1, 2018 Atlantic.com Nov 2018



A Hmong woman carries grass in Vietnam. (INSPIRED BY KHAM / REUTERS)

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Moving to America isn't good for your health



Researchers don't know if eating a less-healthy diet increases the rate of obesity *and* changes the microbiome, or if a less healthy diet changes the microbiome so it makes people experience higher BMI.


Atlantic.com Nov 2018

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Keeping our Microbiome Healthy

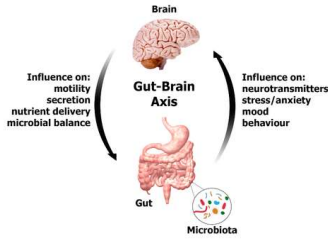
- ▶ Use antibiotics wisely.
- ▶ Reduce the number of the unnecessary Cesarean sections.
- ▶ Promote breastfeeding.
- ▶ Reduce antimicrobial products in our environment.
- ▶ Improve nutrition by increasing the amount of fiber and diversity of foods to promote microbial diversity and benefit health.
- ▶ Adding functional foods containing prebiotics, probiotics to diets.

Gut Health affects our overall health.



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Gut Neurons Direct Messaging



- ▶ Enteric Nervous System = Nervous System of Gut
- ▶ Sometimes referred to as “second brain”.
- ▶ Critical part of Gut-Brain Axis

[New way for gut neurons to communicate with brain.](#) Medical News Today Aug 2020

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Gut’s Messaging Brain

- ▶ Gut has its very own nervous system
- ▶ Functions independently of brain or spinal cord
- ▶ Neurons in gut wall can activate spinal cord neurons
- ▶ Powerful mechanism to transmit info from gut to brain
- ▶ Viscerofugal neurons relay info from gut to sympathetic nervous system
- ▶ Brain can “sense” what is going in gut.
- ▶ Influences our decision, mood, general well being.
- ▶ Most serotonin, a chemical mood messenger, is found in gut
- ▶ Understanding how gut messaging controls other organs can lead to treatment breakthroughs

[New way for gut neurons to communicate with brain.](#) Medical News Today Aug 2020

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Gut Microbiome and Diabetes

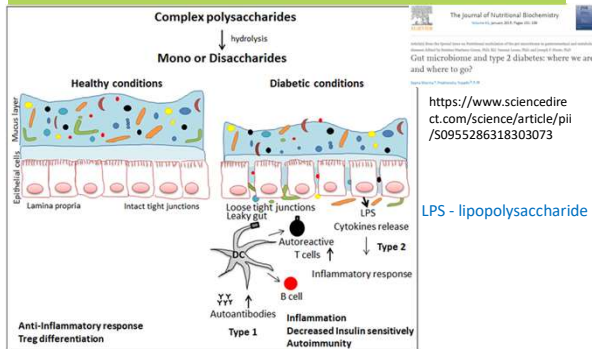



Fig. 1. Interplay between diet and the gut microbiome. Regulatory role of diet and microbiota in healthy (left) and diabetic conditions (right) has different mechanisms. In T1D, the bacterial population in gut modulates gut permeability and signaling mechanisms, thereby initiating an autoimmune response. In T2D, dysbiosis due to carbohydrate hydrolysis causes low-grade inflammation and decrease in insulin sensitivity.

<https://www.sciencedirect.com/science/article/pii/S0955286318303073>

LPS - lipopolysaccharide

TheScientist July 25, 2022
 EXPLORING LIFE, INSPIRING INNOVATION Cleveland Clinic

NEWS & OPINION PUBLICATIONS CATEGORIES TS U



Now, research published July 25 in *PNAS* may have revealed a key piece of the puzzle. The presence of the bacterium *Parabacteroides distasonis* in the gut microbiome causes type 1 diabetes in a mouse model and seems to predict the onset of the disease in humans. This is likely because the microbe produces a peptide similar enough to part of an insulin molecule that it can lead to the production of insulin-targeted antibodies, priming the immune system to launch an attack against insulin and the cells that produce it. Thus, the researchers have identified a microbial culprit for doctors to examine as they look for new ways to screen for and perhaps eventually prevent the disease.

How a Specific Gut Bacterium May Cause Type 1 Diabetes

A bacterium that produces an insulin-like peptide can give mice type 1 diabetes, and infection with the microbe seems to predict the onset of the disease in humans, a study finds.

<https://www.the-scientist.com/news-opinion/how-a-specific-gut-bacterium-may-cause-type-1-diabetes-70414>

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Plant & Fiber Diet = Less inflammation


<p>Plant material rich diet (Fibre-rich)</p> <p>↓</p> <p>Bacterioides ↑, Prevotella ↑, (Akkermansia, Bifidobacterium)</p> <p>↓</p> <p>SCFAs ↑</p> <p>Anabolic enzymes ↑ Butyrate/Propionate/acetate ↑</p> <p>↓</p> <p>Riboflavin/glutamate synthesis ↑ Immune homeostasis (via Treg) ↑ Gut mobility ↑ Insulin sensitivity (via GLP-1) ↑ Non-leaky gut ↑</p>	<p>Animal product rich diet (Fat/protein-rich)</p> <p>↓</p> <p>Firmicutes ↑, Proteobacteria ↑ (Clostridium spp., Bilophila spp.)</p> <p>↓</p> <p>SCFAs ↓</p> <p>Catabolic enzymes ↑ Bile acids, Taurine conjugates ↑</p> <p>↓</p> <p>Inflammatory molecule ↑ (LPS, Peptidoglycan, flagellin) Inflammatory mediators ↑ (TNFα, IFNγ, INOS, COX2) Insulin resistance ↑ Inflammation ↑ Leaky gut ↑</p>	<p>The Journal of Nutritional Biochemistry Volume 53, Issues 3-4, Pages 101-108</p> <p>Introduction: The gut has a beneficial influence on the gut immune system, particularly in obesity. Obesity is linked to increased inflammation and gut permeability. Gut microbiome and type 2 diabetes: where we are and where to go?</p> <p>SCFA – short chain fatty acids</p> <p>https://www.sciencedirect.com/science/article/pii/S0955286318303073</p>
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Fig. 2. Flowcharts representing the effect of diet pattern on bacterial population in the human gut. The flowchart on the left panel (blue) indicates fiber-rich diet and the right panel (red) indicates fat/protein-rich diet.

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Metformin helps gut microbiota in diabetes

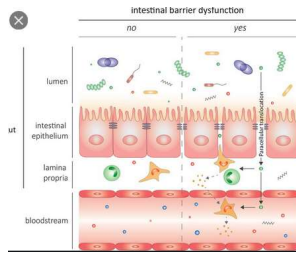


- Induces GLP-1 secretion
- Changes in *Bacteroidetes/Firmicutes* ratio
- Capacity to induce mucin expression similar to *Akkermansia muciniphila*
- Improves the metabolic profile by lowering tissue inflammation in the presence of extra weight

Especially increases Akkermansia and Bifidobacterium.

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Akkermansia Muciniphila



A. muciniphila in our mucus lining is inversely correlated with obesity and diabetes in both mice and humans.

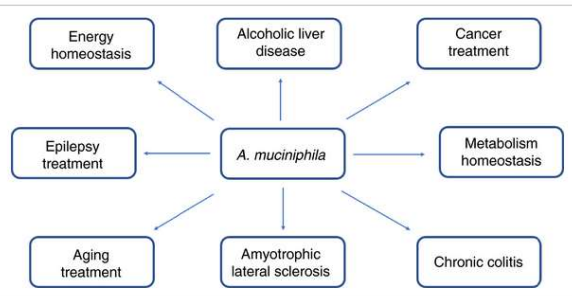
Mucus lining protector and increases presence of short chain fatty acids.

High levels of A. muciniphila is associated with improved health.

"AKK" is associated with enhanced intestinal barrier function and incretin secretion from intestinal endocrine cells. Together, these actions suppress obesity, insulin resistance, and intestinal inflammation.

Depommier C, Everard A, Drumant C, et al. Supplementation with *Akkermansia muciniphila* in overweight and obese human volunteers: a proof-of-concept exploratory study. *Nat Med.* 2019;doi: 10.1038/s41591-019-0495-2.

The benefits of *Akkermansia muciniphila* for the host physiology



<https://sfamjournals.onlinelibrary.wiley.com/doi/10.1111/jam.14911>

Journal of Applied Microbiology
Applied Microbiology International
A review of a potential and promising probiotic candidate — *Akkermansia muciniphila*

Pregnant Moms diet impacts baby's gut bacteria



[What you eat while pregnant may affect your baby's gut microbiota and growth](#) – Oct 21, 2020 Gut Microbiota for Health

- ▶ Mother's diet shapes gut microbiota during pregnancy, in birth and when breastfeeding
- ▶ Impact babies' gut microbial community and infant growth during first 18 months
- ▶ Disruption in gut colonization can lead to extra weight, allergies and CV diseases later in life
- ▶ Diet is one of most powerful factors driving gut microbiota diversity

The Study – 86 Baby Mom Pairs

- ▶ Pregnant women's diet was based on a high amount of dietary fiber, omega-3 fatty acids and polyphenols.
- ▶ Pregnant women's diet with significantly higher intake of carbohydrates, saturated fatty acids and animal protein.



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Results after 18 mo's of Study

High fiber diet & other nutrients

- ▶ Greater presence of *Ruminococcus*
 - ▶ a type of bacteria that produce *butyrate*
 - ▶ Butyrate is a biomarker of gut health and is associated with anti-inflammatory properties.

Less healthy diet

- ▶ Diet mainly composed of carbohydrates, saturated fatty acids and animal proteins, showed a greater presence of *Prevotella*
 - ▶ an oral bacteria linked to an increased risk of disease and complications in pregnancy.
 - ▶ Infants had a higher risk of becoming overweight in the first 18 months.

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Study Implications

- ▶ A maternal diet high in fiber, vegetable protein and omega-3 acids has a significant effect on the baby's microbiome and contributes to a child's development and a health during the first months of life.



One of the best gifts a mother can give her newborn is a balanced, healthy and diverse gut microbiota, and the most efficient way to achieve that is through diet during pregnancy.

What you eat while pregnant may affect your baby's gut microbiota and growth – Oct 21, 2020 Gut Microbiota for Health

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In the Beginning

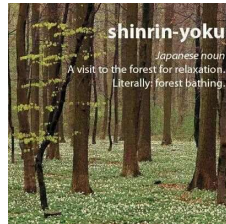
- ▶ Earth
- ▶ Human
- ▶ Spirit



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Humans Benefit from Nature

- ▶ Quiet: think tank of soul
- ▶ Trips to forest, enhance bodies immune system by increasing the number and activity of lymphocytes –
2008 Nippon Med School Tokyo
- ▶ Tranquility lowers BP, reduces muscle tension, decreases stress related illness and improves sleep.

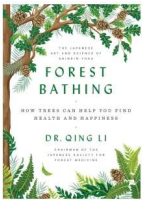


shinrin-yoku
Japanese noun
A visit to the forest for relaxation.
Literally: forest bathing.

Shinrin in Japanese means “forest,” and *yoku* means “bath.” *Shinrin-yoku* means bathing in forest atmosphere, or taking in the forest through our senses.

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Forest Bathing Steps



The key to unlocking the power of the forest is in the five senses.

- ▶ Let nature enter through your ears, eyes, nose, mouth, hands and feet.
- ▶ Listen to the birds singing and the breeze rustling in the leaves of the trees.
- ▶ Look at the different greens of the trees and the sunlight filtering through the branches.
- ▶ Smell the fragrance of the forest and breathe in the natural aromatherapy of phytoncides.
- ▶ Taste the freshness of the air as you take deep breaths.
- ▶ Place your hands on the trunk of a tree. Dip your fingers or toes in a stream. Lie on the ground. Drink

This is your sixth sense, a state of mind.

Now you have connected with nature. You have crossed the bridge to happiness.

Phytoncides – Immune Boosters

- ▶ Exposure to forests boosts our immune system.
- ▶ We breathe in phytoncides
 - ▶ airborne chemicals that plants give off to protect themselves from insects.
 - ▶ Phytoncides have antibacterial and antifungal qualities which help plants fight disease.
 - ▶ When people breathe in these chemicals, our bodies respond by increasing the number and activity of a type of white blood cell called natural killer cells or NK.
 - ▶ These cells kill tumor- and virus-infected cells in our bodies.
 - ▶ In one study, increased NK activity from a 3-day, 2-night forest bathing trip lasted for more than 30 days.
 - ▶ Japanese researchers are currently exploring whether exposure to forests can help prevent certain kinds of cancer.

<https://www.dec.ny.gov/lands/90720.html>



The clinical response to identification of toxic stress should include:

1. Applying principles of trauma-informed care, including establishing trust, safety, and collaborative decision-making.

2. Supplementing usual care for ACE-Associated Health Conditions with patient education on toxic stress and discussing strategies that can help regulate the stress response, including:

- Supportive relationships, including with caregivers (for children), other family members, and peers
- High-quality, sufficient sleep
- Balanced nutrition
- Regular physical activity
- Mindfulness and meditation
- Experiencing nature
- Mental health care, including psychotherapy or psychiatric care, and substance use disorder treatment, when indicated



3. Validating existing strengths and protective factors.

4. Referrals to patient resources or interventions, such as educational materials, social workers, school agencies, care coordination or patient navigation, and community health workers.

<https://numberstory.org/>

Are we over doing it?

Clean



The New Science of Skin

JAMES HAMPLIN



How often did people bathe in the 18th century?

- ▶ As time went on, the rising middle class was particularly attentive to both personal and household cleanliness because the status of “being able to be clean” was significant to people for whom it was important to rise socially.



Deborah Truscott, Researcher and writer on 18th century topics. (Author of the Out of Time series)

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Just for Fun – Poll Question

- ▶ How many times a week do you take a shower or bath?
- ▶ 1-2 a day
- ▶ Daily
- ▶ Every other day
- ▶ A few times a week
- ▶ Once a week or less



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Skin Microbiome

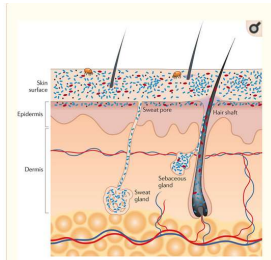


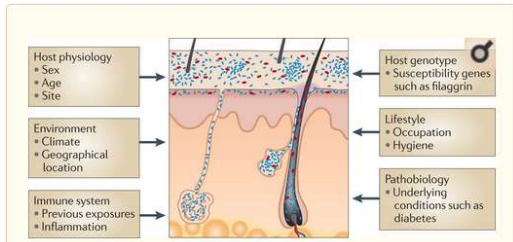
Figure 1 Schematic of skin histology viewed in cross section with microorganisms and skin appendages

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3535073/>

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- ▶ The skin is largest organ
- ▶ Colonized by a diverse milieu of microorganisms, most of which are harmless or even beneficial to their host.
- ▶ Colonization is driven by the ecology of the skin surface, which is highly variable depending:
 - ▶ on topographical location,
 - ▶ endogenous host factors and
 - ▶ exogenous environmental factors
- ▶ The cutaneous innate and adaptive immune responses can modulate the skin microbiota, but the microbiota also functions in education of the immune system

Factors the Affect Skin Microbiome



<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3535073/>

Figure 2

Factors contributing to variation in the skin microbiome

Exogenous and endogenous factors discussed in this Review that contribute to variation between individuals and over the lifetime of an individual.

Original Article

Beyond the gut: Skin microbiome compositional changes are associated with BMI

Michael Brandwein ¹, Idan Katz ², Ariel Katz ³, Ron Kohen ^{4,5,6,7,8}

Show more

<https://doi.org/10.1016/j.jhumic.2019.100063>

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“skin microbiome may therefore be used as a biomarker for disease manifestations”

<https://www.sciencedirect.com/science/article/pii/S2452231719300120>

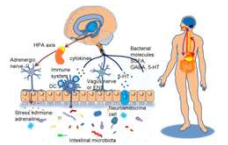
Gut and skin microbial diversity associated with BMI.

- ▶ Gut-Skin microbiome axis – two interconnected systems
- ▶ Diet affects skin physiology and microbiology
- ▶ Western individuals have less skin microbial diversity
- ▶ BMI of 25+ have less microbial diversity



More studies needed

- ▶ Statistical correlation between individuals BMI and skin microbiome.
- ▶ Corynebacterium is significantly correlated with BMI, and can be used as a weight marker.
- ▶ Further studies needed to investigate link between metabolic syndrome and skin microbiome



<https://www.sciencedirect.com/science/article/pii/S2452231719300120>

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Questions

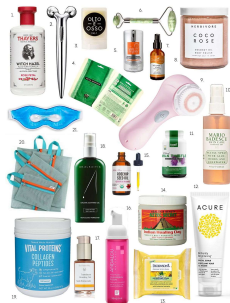
- ▶ Does what we eat affect our skin microbiome?
- ▶ Does our skin microbiome affect our gut microbiome?



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Skin Microbiome and Cleansers

- ▶ Should we suds up less?
 - ▶ Showering uses lots of water takes time
 - ▶ Do we need all these cleaning solutions, plastics?
 - ▶ We have been sold on importance of “getting clean”
- ▶ Is this daily wipe-out of our envelope of bacteria
 - ▶ Unnecessary
 - ▶ Harming us?

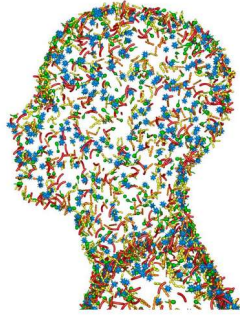


<https://www.pinterest.com/pin/54817320449667694/>

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What is the Ideal Balance?

- ▶ From occasionally jumping in the river to daily shower.
- ▶ Skin immunity is achieved through interaction between the external and internal skin layers and compartments, which operate in balance with the skin colonizing microbes.



<https://www.origimm.com/skin-microbiome/>
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Cultural Norms and Hygiene

- ▶ Cleaning rituals associated with class and wealth signaling
 - ▶ Whitening teeth, wearing deodorant
 - ▶ enormous industry-complex of self-care, skin care, hygiene and cosmetics — which is barely regulated
- ▶ Hygiene
 - ▶ more scientific public health term
 - ▶ Avoidance or disease prevention behaviors
 - ▶ Brushing teeth, hand washing, cleaning open wounds, mask wearing

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Quote from Clean – Dr. Hamblin

- ▶ A steady barrage of exposure to microbes trains our immune systems on how and when to react
- ▶ Yet, our indoor lifestyle has altered the function and role of our primary immune system – the skin
- ▶ If we carry dirt, dust, mud it is considered that we are “unclean”.



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Stop Killing All the Bacteria The Hygiene Hypothesis

- ▶ In studies, mouse raised in clean environment is higher risk for DM than one raised in dirty one
- ▶ “Clean living” may increase risk for autoimmune diseases
- ▶ Diabetes risk is higher in urban than rural settings
- ▶ Daycare, other early exposures, lower risk for DM
- ▶ Children exposed to dirt, farm animals, and other kids have less reactive immune systems



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Just wash your “Bits”

- ▶ Armpits, genitals, feet, hands
- ▶ What do you think?



**WASH
YOUR
BITS**

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Take Home Messages

- ▶ What can we pass on to people and our communities to promote healthy microbiomes?



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Reunite with “Old Friends”

But while your inherited genes are more or less fixed, it may be possible to reshape, even cultivate, your “second genome”



shots - health news

Staying Healthy May Mean Learning To Love Our Microbiomes

July 22, 2015 - Scientists are investigating the microscopic world that lives in and on our bodies. It's becoming clear that these tiny companions play a much more complex and important role in human health than thought. But we don't yet know enough about the microbiome to use it to prevent and treat disease.

Listen 5:59
Playlist Download Embed



Centre For Infections/Science Photo Library/Corbis

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GUT MICROBIOME AND SLEEP



All of the microbes that live in our intestines are known as the gut microbiome. Some even call it our “second brain.”



Taking special care of your gut health can have great effects on the quality of your sleep. This is true even if you are going through a stressful period which would normally disrupt your sleep length and quality.

HOW ARE SLEEP AND MICROBIOME CONNECTED?



Elderly get better sleep with better microbial composition.

Better sleep showed an increase in *Verrucomicrobia* strain which is believed to be linked with better cognitive function.



Study authors hope that improving gut microbiome could lead to a new way of cognitive decline treatment in older adults.

www.sleepline.com

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Diversity matters for health

Find out how to maintain a diverse microbiota through diet.

GUT MICROBIOTA FOR HEALTH BY ESWH

Although gut microbiota has a genetic component, diet, lifestyle, environment and antibiotics influence gut microbiota composition the most.

What you eat can impact the gut microbiota within 24 hours of a dietary change!

The more diverse the diet, the more diverse the microbiota.

How do you eat your way to a diverse microbiota?

Include dietary fibers that can be metabolically used by gut microbes

Good sources include whole grains, legumes and most vegetables, berries, pears, bananas, chickpeas, and artichokes.

Add probiotic foods

Such as fermented milk, yogurt and kefir.

Choose a balanced amount of animal and plant-based proteins

Plant-based: legumes, nuts and seeds and animal-based: breast, fish, shellfish, eggs and dairy products.

Include foods rich in omega-3 and omega-6 fatty acids

Omega-3 sources: fish, walnuts, soybean and flax oils. Omega-6 sources: corn, sunflower and vegetable oils. Sources for both are found in oils.

Eat plenty of vitamins and minerals

Focus on a variety of colorful fruits, vegetables and whole grains. Include your favorite fruits and vegetables, such as berries or leafy greens.

Diversity matters on the plate and in the gut!

@GutMicrobiotaForHealth

www.gutmicrobiotaforhealth.com

#FoodForHealth

<https://www.gutmicrobiotaforhealth.com/how-to-eat-for-a-diverse-microbiota/>

Getting to Better Gut Bacterial Health

Eat more PREbiotics

- ▶ Foods with indigestible fibers that nourish the good bacteria:
 - ▶ High fiber foods like, whole grains, fruits, veggies, nuts
 - ▶ High in prebiotic fibers include: Jerusalem artichokes, onions, kale, Brussels sprouts, bananas, dandelion greens & more

PRObiotics

- ▶ These foods contain healthy bacteria like *Bifidobacterium* and *Lactobacillus*.
 - ▶ Yogurt, Kefir – look for “live or active cultures”
 - ▶ Fermented foods like: Sauerkraut, Kimchi, Miso soup, kombucha

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12 Super Foods to Enjoy

- ▶ Beans
- ▶ Dark Green Leafy Veggies
- ▶ Citrus Fruit
- ▶ Sweet Potatoes
- ▶ Berries
- ▶ Garlic
- ▶ Tomatoes
- ▶ Onions
- ▶ Fish High in Omega-3 Fatty Acids
- ▶ Whole Grains
- ▶ Nuts
- ▶ Fat-Free Milk and Yogurt



Kefir – Fermented Milk

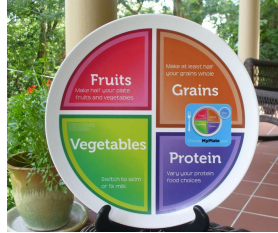
From the Turkish word *keyif*, which means “feeling good” after eating



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GET Lots of Diverse Fiber Foods Goal is 25 – 30 gms day

American Food Project Full Plate Diet



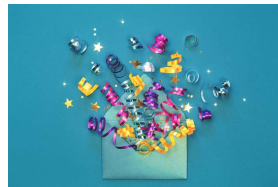
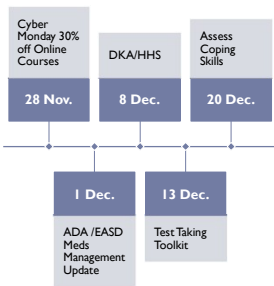
► Helps increase fiber in usual meals

Fiber is suddenly hip. Grandma, it turns out, was just ahead of her time.
—Health & Nutrition Letter
Tufts University
February 2009



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Upcoming 2022 Events



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What is Up for 2023?

Diabetes Fundamentals 2023 Updates | Level 1
6 Classes with Coach Beverly | 9 CE's | \$119
Airs January 10th - January 26th, 2023
Start Your Journey Here

ADA Standards of Care - 2023 | Level 2
Webinar with Coach Beverly | 1.5 CE's | \$29
Airs February 2, 2023
Explore the Latest ADA Standards

Boot Camp 2023 Updates | Level 3
9 Classes with Coach Beverly | 12+ CE's | \$279
Airs February 7th - March 9th, 2023
Get Ready for Certification Success

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- ▶ <https://www.instagram.com/cdcescoach/>
- ▶ <https://www.linkedin.com/in/beverlythomassian/>

Sign up for Blog Bytes – Question of Week

- ▶ <https://diabetesed.net/diabetes-blog-bytes-sign-up/>

Sign Up | Diabetes Blog Bytes



100 Trillion Friends to Call Your Own

From way back when, to current time man and bacteria have been intertwined.

Start with your head, it's a happening place, there's staphylococcus all over your face.

Next up is gums, teeth and mouth, You'll find streptococcus inside and out!

Now to your stomach, to keep the pH, H. pylori is on the case!

Inside the intestines, 30 feet of tube, 3 pounds of bacteria digesting your food.

From Bacteroidetes to keep you lean, to Firmicutes, a junk food digesting machine!

Prevotella another bug on the scene, breaks down fiber, veggies and beans!

Lactobacillus is a newborn's friend, lining birth canal from tip to end.

Down to your feet, in-between the toes, that's where lots of pseudomonas grows!

Short chain fatty acids, you wanna keep them around
Protects gut mucous lining from breakin' down

So here's my message, always nourish your gut
With fresh fruit, grains, veggies, beans and nuts

More kefir, miso, sauerkraut, kimchi
Less sugar and fast foods to keep away disease

Breast feed, get dirty, limit antibiotic use
Let newborns come out through the natural shoot

Be reassured that you're never alone
You've got 100 trillion friends to call your own!



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100 Trillion Friends to Call Your Own by Beverly Thomassian, RN, MPH, CDE, BC-ADM to the tune "Yeal!" in the style of Usher.

Thank You



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