



















Learning Objectives Exploring the GI Tract Explain the links between diabetes and oral disease. Explore the co-relationship between hyperglycemia and the gastrointestinal system. Describe the pancreatic exocrine dysfunction in diabetes. List new nomenclature and screening guidelines for liver disease.

- Discuss the endocrine function of the intestine and the importance of a healthy microbiome.
- Enjoy a state of WONDER.

n of the second s



Gut Tube -Embryonic Starting Point

- Embryonic endoderm develops into the interior linings of two tubes in the body, respiratory and
- Digestive Tube
- Salivary glands
- Esophagus
- Stomach
- Small and Large Intestine
- Liver
- Gallbladder
- Pancreas
- Thyroid gland
- Parathyroid glands
 - Lose connection with gut before birth to become endocrine organs



- Sweet
- Sour
- Bitter
- Salty
- Umami (savory)
- Tongue might also detect ammonium chloride (USC recent discovery) to avoid harmful substances?



Basic Human Anatomy, A. Pense, 1982

Digestion Gets Started

- Eyes see food and make an appraisal of how to best prepare for incoming load.
- Glands secrete saliva to prepare for chewing.
- Salivary enzymes (amylase) help with initial digestion
- Creates bolus.
- Upper pharynx and esophagus under conscious control, the rest involuntary.
- Esophagus smooth muscle, controlled by brain.
- Lower esophageal sphincter gateway from esophagus to stomach.
 Prevents reflux of gastric contents





Quick Question

- Diabetes is associated with an increased risk of oral disease.
 Which of the following statements is true?
- People with diabetes benefit from vinegar gargles to decrease bacterial load
- b. People with diabetes are at greater risk for tongue cancer.
- c. 1 in 5 cases of tooth loss is linked to diabetes
- d. Diabetes is associated with increased tonsillitis.



Periodontal Disease

- More severe and prevalent with diabetes and elevated A1c levels.
- periodontal treatment associated with better glycemic control
- (A1C 8.3% vs. 7.8%) Benefits lasted for 12 mo's
- People with periodontal disease have higher rates of diabetes.

Bidirectional



- Oral Care Matters
- See dentist at least yearly Dental hygienist twice
- yearly
- Brush twice daily Floss daily

Salivary Dysfunction and Xerostomia (dry mouth) in DM

bone

- Less saliva uptake and excretion = less protection against bacteria
- Hyperglycemia increases glucose levels in saliva, providing medium for bacterial growth- also promotes dry mouth
- Dry mouth increases risk o infection and can alter nutritional intake (due to chewing, swallowing difficulties)



Periodontal disease and Heart Disease

Heart disease link:



- oral bacteria enter the blood stream, attach to fatty plaques in coronary arteries increasing clot formation
- inflammation increases plaque build up, which may contribute to arterial inflammation
- Hyperglycemia = Gingivitis = Heart Disease













Bonus Question

Best definition for borborygmi is:

- A tropical fruit used for nausea
- Stomach rumbling
- Gastric reflux
- Treatment for constipation



What Happens in Stomach?

- Food in fundus serves as a holding and mixing area
- Gastric juice start breaking down larger particles.
- Bolus moved to lower regions and broken into smaller particles through stomach acid and motility.
- Gurgling and stomach rumbling is audible reflection of movement.
- Usual meal takes about 4 hours to pass through or 1-4 kcals per minute.
- Carbs take a few hours to pass through.
- Protein/fatty meals can take up to 6 hours.

Digestion Time based on Calories

▶ 400 cals

- ▶ 1000 cals
- ▶ 4 cals a minute
- ▶ 100 minutes or
- ▶ 1 hour 40 minutes to ▶ 4 hours and 10 digest
- 4 cals a minute
- > 250 minutes or
- minutes



H. Pylori Quick Question

JR is 50, has type 2 diabetes. Referred to G.I. due to six months of stomach pain, intestinal, bloating, and generalized G.I. discomfort. Since they were due for their colonoscopy, provider also ordered an upper endoscopy to biopsy the esophagus, stomach and duodenum.



The biopsy revealed that JR had moderate chronic gastritis and an H. pylori infection. JR wants to learn more about H. pylori infection.

- Which of the following statements are accurate?
- Since H. pylori is found in about half the population, it is a normal finding, and there is no need for treatment.
- 2. Treatment includes double antibiotic therapy and a medication to decrease gastric acidity.
- 3. The preferred treatment is the consumption of prebiotics and probiotics to increase bacterial diversity.
- Most people with H. pylori infection experience stomach cancer within the next 20 years.



H. Pylori Infection Symptoms

- 50% of world's population co-exist with H. Pylori
 Causes inflammation in a small percentage of people
- Main Symptom An aching or burning pain in abdomen which may be worse with an empty stomach.
- H. pylori infection symptoms include:
 Feeling of fullness or bloating with fluid and solid food
 - Hunger and empty feeling in the stomach, often 1 to 3 hours after meal
- Mild nausea that may go away with vomiting
- Loss of appetite
- Weight loss without trying
- Burping
- Bloody or dark, tarry stools or bloody vomit
 About 10% to 15% of people infected with *H* pylori develop peptic ulcer disease.
- About 1-3% develop stomach cancer



risk for H. pylori and vice versa.

H. Pylori Good or Bad?

Drawbacks

- Infection caused by this curved rod bacteria with flagella that burrows through your stomach mucus to infect the mucus & cells of your stomach lining.
- Uses stomach mucous lining for fuel.
- Locally neutralizes stomach acid so that it is not digested (produces a urease that makes ammonia).

Benefits

•

- 50% of the world's population is infected with H. pylori
 it is a human-associated disease, we co-evolved with it in OUR stomachs!
- Different strains in different human groups
- Instructs immune system not to overreact
 People with H. pylori seem to
- People with H. pylori seem to have less asthma and autoimmune conditions, like celiac and less risk of TB
- More research is needed

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6064966/

H. Pylori Infection – Test & Treat

Testing Options

- Breath test -- urea breath test (Carbon
- Isotope-urea Breath Test, or UBT).
 Swallow liquid with urea. If *H pylori* are present, the bacteria turn the urea into carbon dioxide. This is detected and
- recorded in your exhaled breath after 10 minutes.
 Blood test -- measures antibodies to *H pylori* in your blood.
- Stool test -- detects the presence of bacteria in the stool.
- Biopsy -- tests a tissue sample taken from the stomach lining using endoscopy. The sample is checked for bacterial infection.

Treatment

- Combination of antibiotics and proton pump inhibitor for 14 days.
- Antibiotics: Usually two of these antibiotics choices: amoxicillin, clarithromycin (Biaxin[®]), metronidazole (Flagyl[®]) and tetracycline.
- Proton pump inhibitor: include lansoprazole (Prevacid[®]), omeprazole (Prilosec[®]), pantoprazole (Protonix[®]), rabeprazole (Aciphex[®]) or esomeprazole (Nexium[®]).
- Bismuth subsalicylate: Sometimes added to proton pump inhibitor to protect stomach lining.
- Newer medication, Talicia[®], combines two antibiotics (rifabutin and amoxicillin) with a proton pump inhibitor (omeprazole) into a single capsule.

Quick Question: Bloating & Post Meal Hypo

 JR has lived with type 1 diabetes for over 30 years and has been complaining that they feel full and bloated after eating and experiencing more post-meal hypoglycemia.



- Based on this information, what is the most appropriate recommendation for JR?
- a. Evaluate transglutaminase levels.
- b. Encourage small, frequent, low fiber meals.
- c. Suggest a consult for a gastric pacemaker.
- d. Recommend they try avoiding foods with gluten for a few weeks to see if they feel better.





Gastroparesis: affects 20 – 30% of individuals with longstanding diabetes

- Delayed emptying of stomach contents due to nerve damage
- S/S include early satiety, fullness, postprandial hypo, vomiting
- Diagnosis: gastric emptying studies, post-prandial hypoglycemia
- Tx: improve BG, small, low fat & fiber meals & meds

Dietary changes are a high priority in treatment Consider the following dietary modifications: Decrease fiber (may lead to bezoar formation) Evaluate fat intake Fat is a good/high source of calories so limit only after other measures are exhausted

 Liquid fats may be tolerated better

Nutrition for Gastroparesis

- Consider dietary modifications:
 - Multi supplement if intake is insufficient
 - Small and frequent meals
 - Liquid/pureed calories
 - May need to try liquid calories later in the day
 - Chew foods well
 - Sit up for 1-2 hours after eating



Gastric Electrical Stimulator



https://www.frontiersin.org/articles/10.3389/f nins.2022.909149/full

sile/feidl (2017) analyzed the adverse events recorded in the manufacturer registry from 2001 to 2015. Perioperative complications are quite rare, with mainly hematoma after surgery. The complications related to the device mostly occur suring the first 2 years after surgery. The most commonly reported adverse event is abdominal pain after implantation. Pain an effeth or lengend as pain at the pocket or as an electrical shock sensition, with rarely muscle contractions. This sensition could be due to the leads, with also arole of visceral hypersensitive, in the study of Ducrotte et al. (2020), pain vas reported in 16% of atteinst and was always metically managed. Sensitions adverse events area. Stei infection must be suspected in case of fever after surgery (6–1001), and it rarely leads to device explanation 15%; Abell et al., 2008; Ducrotte et al., 2000; Instein doculution has been reported and might be due to the position of the lead and the device. Thus, It is mportant to minimize the intrabdominal length of the leads during surgery, positioning the device in the left upper guadrani (f possible (2016). Rare perforation of the leads has been reported and all or requires explantation, but is rey uncommon. GSS safety during regrapers, has never been assested. One case report in a female with type 1 diabetes reported a favorable outcome (Frugstang and Overier, 2015).



https://www.hopkinsmedicine.org/health/trea

tment-tests-and-therapies/peroral-endoscopic-

myotomy

relax the sphincter, so food can empty freely.

Cannabinoid Hyperemesis Syndrome (CHS)

CHS is defined as recurrent nausea, vomiting and cramping abdominal pain that is associated with at least weekly cannabis use. A common treatment for this syndrome is hot bath or



 Heavier marijuana use increases risk for Cyclic
 Vomiting Syndrome (CVS) with unrelenting nausea and vomiting.

shower.

- Treatment includes abstaining from cannabis for at least a few weeks.
- People with type 1 diabetes and gastroparesis are especially at risk for both CHS and CVS.
- A person with type 1 and gastroparesis at more risk for other neuropathies and the associated chronic, often debilitating pain.

https://diabetesjournals.org/care/article/45/2/481/1 39018/Differentiating-Diabetic-Ketoacidosis-and

Treatment optic ADA Treatment options for overweight and o	bns for ele	vated BM	-
	BN	/II category (kg/m ²)	
Treatment	25.0-26.9 (or 23.0- 24.9 *)	27.0–29.9 (or 25.0– 27.4–)	≥30.0 (or ≥27.5 *)
Diet, physical activity, and behavioral therapy	<u>±</u>	±	÷.
Pharmacotherapy			<u> </u>
Metabolic surgery			±.
Consider using diabetes weight loss, including G	s medications the	at contribute to GLT-2 inhibitors.	
BMI in parenthesis repre	sent ranges for a	Asian Americans	;







Class/Main Action	Name	Dose Range	Considerations	
GLP-1 RA - Glucagon Like Peptide Receptor Agonist "Incretin Mimetic" Increases insulin release with food Slows gastric emptying Promotes satiety Suppresses glucagon	exenatide (Byetta) exenatide XR† (Bydureon)	5 and 10 mcg BID 2 mg 1x a week Pen injector - Bydureon BCise	Side effects: nausea, vomiting, weight loss, injection site reaction. Report signs of acute pancreatitis or intestinal blockage (ileus) and stop med. Increase dose monthy to achieve targets. Black box warning: Thyroid C-cell tumor warning (avoid if family histon	
	liraglutide (Victoza)*†	0.6, 1.2 and 1.8 mg daily		
	dulaglutide* (Trulicity)†	0.75, 1.5, 3.0 and 4.5 mg 1x a week pen injector		
	semaglutide* (Ozempic) (Rybelsus) Oral tablet	0.25, 0.5, 1.0 and 2.0 mg 1x a week pen injector 3, 7, and 14 mg daily in a.m. Take on empty stomach with sip of water	or medulary thyroid tumor), *Significantly reduces risk of CV death, heart attack, and stroke, †Approved for pediatrics 10-17 yrs Lowers A1C 0.5 – 1.6% Weight loss: 4-6% body weight loss.	
GLP-1 & GIP Receptor Agonist Activates receptors for GLP-1 (see above) & Glucose- dependent Insulinotropic Polypeptide (GIP).	Tirzepatide (Mounjaro)	2.5, 5.0, 7.5, 10, 12.5 and 15 mg 1x a week prefilled single dose pen Increase dose by 2.5 mg once monthly to reach targets.	Side effects: nausea, diarrhea, injection site reaction. Report pancreatitis, signs of intestinal blockage. Black box warning: Avoid if family history of medullary thyroid tumor. Lowers A1C ~ 1.8 - 2.4% Weight loss: 7-13% body weight loss at max dose.	

Gut Hormones

- Gut hormones secreted by the L-cell of the intestine. Some in the small intestine, but more the larger intestine.
- People with type 2 make about 50% less of gut hormones, but new study shows that people with type 1 may benefit from GLP-1 therapy early in diagnosis.
- Can slow peristalsis down too much, and lead to an intestinal blockage – Ozempic warning.



GLP-1 RA's as Adjunctive Therapy for Newly Diagnosed Type 1

What were the key findings?

- Within 3 months, participants no longer needed mealtime insulin.
- At six months, 7 out of 10 no longer needed basal insulin.
 Most of the people in the study were able to stop taking any
- insulin after six months of treatment with semaglutide.A1C levels fell from an average of 11.7% at diagnosis to 5.9%
- at six months and 5.7% at one year, Participants also achieved time in range (70-180) of 89%.
- Side effects:
 - Some participants experienced mild hypo while the semaglutide dose was increased. Once the semaglutide dose stabilized, there were no problems with hypoglycemia.
 - There were no reports of <u>diabetic ketoacidosis</u> or other serious side effects.

GLPs & Intestinal Blockage

- More than a dozen reports of intestinal blockage or ileus among people using semaglutide (Ozempic).
- New warning to report any signs of intestinal blockage including:
 - Bloating, abdominal cramps, constipation, nausea, vomiting, and constipation that doesn't subside within a few days.
- Encourage individuals to report these signs and consult with a healthcare provider.





Metabolic Surgery for Weight Loss

Advantages in T2DM

- Diabetes remission in 30-63% of those with RYGB.
- 35-50% of those who go into remission experience recurrence, but median disease-free period is 8.3 years.
- Many with diabetes will sustain glycemic improvement for 5-15 years.
- Additional health benefits _____

Disadvantages

- Costly (but likely cost effective)
- Long-term concerns: dumping syndrome, anemia, osteoporosis, severe hypoglycemia, nutrient deficiency.
- Increased risk of substance use, newonset depression/anxiety



Duodenum, gallbladder, pancreas



Pancreatitis

- Pancreatitis caused by digestion of the organ from pancreatic enzymes normally carried to the – SI through pancreatic duct.
- Detected through elevated Amylase levels & pain
- Causes:
- HIV meds and other meds
- Alcohol ingestion
- Gallstones blocking pancreatic enzyme flow to small intestine
- Elevated triglycerides
- Cancer, injury and other

Pancreatitis

- People with diabetes 2xs risk of acute pancreatitis
- After episode of pancreatitis, one third of people will get prediabetes or diabetes
- Pancreatitis is an exocrine dysfunction:
 - Disrupts global architecture or physiology of pancreas
 - Results in both exocrine and endocrine dysfunction

Exocrine Pancreatic Insufficiency

- Fatty stools
- Abdominal pain especially after high fat meals
- Can happen with both type 1 & 2 diabetes
- May need to take fat soluble vitamins
- Avoid smoking, excess alcohol to protect pancreas.
- Cystic fibrosis





						NETWORK
SYMI	PTOMS 1	ancreatic cancer	may cause only v	igue symptoms.	If you are experie	ncing one
		ir more of these u irges you to see y	our doctor.	oms, the Pancre	hatic Cancer Action	
Y.	Loss of	Jaundice	Weight loss	Nausea	Change in stool	Recent onset

https://pancan.org/







Colorectal Cancer Screening Recommendations – Am Cancer Soc

- All people at age 45 need screening for colon cancer
- Black individuals and those at higher risk need earlier screening
- Prostate cancer screening discussion at age 45 for Black individuals



Chadwick Bozeman

died at age 43 after a 4 year battle with colon

Cancer Screenings and a Commitment to Health Saves Lives



Non-Alcoholic Fatty Liver Disease*

MAFLD* is when fat reaches 5% to 10% of the liver's weight

Without consumption of significant amounts of alcohol defined as:

- Ingestion of less than 21 standard drinks per week in men and
- Less than 14 standard drinks per week in women

over a 2-year period preceding evaluation) or the presence of other secondary causes of fatty liver disease* see new guidelines



Now Called (MAFLD)* Metabolic Dysfunction-Associated Steatotic Liver Disease

 Comprehensive Medical Evaluation and Assessment of Comorbidities: Standards of Care in Diabetes—2023 m

Steatotic Liver Disease (SLD)

Adults with type 2 diabetes.

- NAFLD is prevalent in >70%
 Of those 50% have NASH*
- 12-20% have fibrosis
- Need evaluation for nonalcoholic steatohepatitis and liver fibrosis for those:
- At high risk: type 2 or prediabetes with cardiometabolic risk factors
- Elevated liver enzymes (ALT) or
- Fatty liver on imaging or ultrasound

 Comprehensive Medical Evaluation and Assessment of Comorbidities: Standards of Care in Diabetes—2023 cm



- Increased BMI (30+)
- Cardiometabolic risk factors
- Over 50 yrs
- ALT & AST 30 units/L +

*Now called MASH -Metabolic Dysfunction-Associated

Steatohepatitis.









Liver Nomenclature Update				
Old Terms	New Terms			
Fatty Liver Disease	Steatotic Liver Disease			
 Non-Alcoholic Steatohepatitis (NASH) 	 Metabolic Dysfunction- Associated Steatohepatitis (MASH) 			
 Non-Alcoholic Fatty Liver Disease (NAFLD) 	 Metabolic Dysfunction- Associated Steatotic Liver Disease (MASLD) 			
(F)	Diabetes Education			

Updated Liver Nomenclature List

- Say goodbye to "Fatty Liver Disease". The new overarching term to encompass the various presentations of liver steatosis is Steatotic Liver Disease (SLD)
- Instead of "Fatty Liver" use the term Hepatic Steatosis. This is a more technical and less stigmatizing term that simply means that the liver has excessive fat.
- The term NASH is now MASH MASH stands for Metabolic Dysfunction-Associated Steatohepatitis. This name emphasizes that the condition is a metabolic condition not related to alcohol consumption.
- 4. No more NAFLD. The updated term is MASLD (pronunciation: Ma-zuld), which stands for Metabolic Dysfunction-Associated Steatotic Liver Disease. This term recognizes the various risk factors beyond alcohol consumption, such as body weight, insulin resistance, and other cardiometabolic risk factors.
- Someone can have MASLD and it can be due to metabolic factors (MASLD) or it can be considered MetALD (pronunciation: Met A-L-D) predominant if they meet the alcohol intake threshold.
- The alcohol intake threshold for Alcohol-related Liver Disease ALD starts with a weekly intake of 140 g (10 drinks) for females and 210 g (15 drinks) for males.
- There are other factors that can cause Steatotic Liver Disease (SLD), including drug-induced, genetic conditions and other unknown reasons.
 See summary chart from <u>AADSL</u> that reflects these changes

Quick Question: Detecting Fatty Liver Disease

EV is 58 years old with type 2 diabetes and a BMI of 33. In addition, EV has hypertension and hyperlipidemia, with elevated liver enzymes (ALT and AST). To determine if EV is at risk for liver fibrosis and cirrhosis, which of the following would provide a risk calculation?

- A. UACR
- B. FIB-4
- c. GAD or ICA
- D. Weight in (kg) divided by the square of height in meters (m2)





Screening for NASH – FIB-4 Fibrosis-4 (FIB-4) Calculator FIB-4 estimates risk of hepatic cirrhosis (age 35+): Calculated by imputing: Age (rears) AST 58 x 90 Age ALT (U/L) 85 217 plasma aminotransferases (AST and ALT) The American College of and platelet count Gastroenterology considers Upper limit of normal ALT levels: FIB-4 Risk Levels ▶ Lower risk is <1.3 > 29–33 units/L for males Intermediate 1.3 to 2.67 ▶ 19–25 units/L for female High risk >2.67 individuals considered as having a high probability of advanced (mdcalc.com/calc/2200/fibrosis-4fib-4-index-liver-fibrosis). fibrosis (F3–F4).

www.DiabetesEd.net



Contraction and a second and a	Fibr • CA • CA	FibroScan Results CAP & kPa CAP Fat Score S0 - S3 kPa Fibrous Score F0 – F4 				
	CAPScore	Steatosis g	rade Portion of y	our liver affected by faity ch		
	23810 260 dB/	in SI	Less than 15	(11% to 3.2%)		
	260 to 290 cB,	/m 52	Between 15	and % (34% to 66%)		
		/m 53	More than 9	5 (67%)		
	Non-alcoholic	2 to 7 kPa	F0 to F1	is normal.		
4490 4490 4390	Fatty Liver Disease (NAFLD cr NASH)	7.5 to 10 kPa	F2	Has moderate scarring		
	- N	10 to 14 kPa	F3	Has severe scarring.		
		Micha or history	64	Max clashooth		



Actions To Decrease Fatty Liver

Increase activity

- Strength training
- Yoga or Thai Chi
- Walking & aerobics

Thoughtful eating

- More fiber
- Less processed foods & less added sugar (especially sugary beverages)
- Less alcohol
- See RDN
- Prevention

Treatment

Actos

GLP-1

Statins

- Cancer Screenings
 - Decrease inflammation



Ileum to Anus

- Ileum last 2 meters of intestine. To move from the ileum to the cecum (first part of large intestine), food passes through the ileocecal valve.
- The appendix hangs out near this juncture. It traps harmful bacteria and contains lymphoid cells similar to tonsils. If appendix gets blocked with bacteria and white blood cells, can lead to appendicitis
- Large intestine The bacterial party center of your GI Tract
 - Ascending
 - Transverse
 - Descending
 - Sigmoid colon makes and Sideway S as it enters the iliac fossa
- Then the rectum
- Anus 2 sphincters internal and external
- External sphincter anal skeletal muscle under voluntary control and internal anal muscle not





Bowel Issues - Diarrhea

Defined and Treatment

- 3 or more bowel movements a day
- Treat & Determine Cause
- Improve glucose levels
- Eat whole foods including whole grains and fiber.
- Drink plenty of water.
- Get regular exercise.
- Quit smoking and using tobacco
- products.
- Limit alcohol.
- Take medications as necessary.

- Possible Causes
 Elevated glucose
 - Autonomic neuropathy
 - Metformin
 - ▶ GLP-1 RA's
 - Celiac disease
 - Bacterial /yeast infection
 - Exocrine pancreatic
 - insufficiencyIrritable bowel syndrome
 - Sugar free foods
- Other

Bowel Issues

Constipation

- Defined as less than 3 bowel movements a week.
- More common in diabetes
- GLP-1 RA can contribute
- Treatment
- Get glucose to target
- Increase fiber, activity, H2O
- Bulking agents (psyllium)
- Laxatives or other agents
- Bathroom habits review



Pooping Position Matters



Promoting Colon Health

- Nourish gut bacteria
- Get enough sleep
- Keep active
- Drinking enough fluids
- Consider alcohol intake
- Quit smoking
- Go outside
- Thoughtful antibiotic use
 Meditation may enhance helpful gut bacteria



Fiber – the New "F" Word

- Goal:
 - 14 gms / 1000 calories ~ 30 gms a day
- How?
- Whole, intact grains, beans, fruits, veggies, nuts, avocados
- Why?
 - Associated with lower mortality for people with type 2.
- Fiber intake inversely associated with type 2 diabetes
- Avoid highly processed foods
 If label says 0-2gms of fiber per serving, low fiber food.



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

These foods contain healthy bacteria like

PRObiotics

- healthy bacteria like Bifidobacterium and lactobacillus.
- Yogurt, Kefir look for "live or active cultures"
- Fermented foods like: Sauerkraut, Kimchi, Miso soup, kombucha

Kefir – Fermented Milk

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





Take Home Messages

- Get Dirty
- Limit Unnecessary C-Sections
- Breastfeed if possible
- Limit early antibiotics
- Eat a wide variety of fiber foods



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. و 🕻 🐌 Down to your feet, in-between the toes, that's where lots of pseudomonas grows! Short chain fatty acids, you wanna keep them around

0

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!

Copyright Diabetes Education Services® May not be used without written permission. www.DiabetesEd.net 100 Trillion Friends to Call Your Own by Beverly Thomassian, RN, MPH, CDE, BC-ADM to the tune "Yeah" in the style of Ushe















- February 29, 2024 Boot Camp 6: Medical Nutrition Therapy | 1.75 CEs
- March 12, 2024 Boot Camp 7: Microvascular Complications & Exercise | Screen, Prevent, Treat | 1.75
 CEs
- March 14, 2024 Boot Camp 8: Coping & Behavior Change | 1.75 CEs
- March 19, 2024 Boot Camp 9: Test-Taking Coach Session (48 Questions) | No CE







