Nutritional Considerations for Geriatric Patients: An Integrative Approach

A webinar with Functional and Integrative Dietitian Nutritionist and Certified Personal Trainer

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Julie Chudak's passion has always been about helping people live a healthy, vital life, on their terms and, as a result, has turned to integrative nutrition with a private practice focused on digestive health where she helps her clients develop customized solutions to rebuilding their health by identifying and addressing the root causes behind their symptoms.

Julie is a registered dietitian nutritionist, certified personal trainer and certified LEAP therapist. Julie has over 20 years of experience working in a variety of settings including corporate wellness, the inpatient setting, dialysis and long-term care.

You can visit Julie at www.lifelongnutritionandfitness.com.

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Disclosure to Participants

Notice of Requirements For Successful Completion

- Please refer to learning goals and objectives
- Learners must attend the full activity and complete the evaluation in order to claim continuing education credit/hours

Conflict of Interest (COI) and Financial Relationship Disclosures

- No conflicts to disclose

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Learning Objectives

At the conclusion of this webinar, the learner will be able to:

1. State two anti-inflammatory herbs and supplements for longevity promotion
2. State three common changes that occur in the GI tract with age
3. State two lifestyle functional medicine prevention approaches to address gastroesophageal reflux in a geriatric patient
4. State three medications and supplements appropriate for constipation management
5. Describe the three steps to an integrative approach aimed at resolving atopic dermatitis/eczema in older adults
6. State three potential therapeutic diets to promote skin, lung, eyes, and hair health in older adults
7. State four dietary approaches to addressing osteopenia/osteoporosis in older adults.

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Part 1:

Longevity

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Longevity Programs

- Valter Longo, Ph.D., director of the Longevity Institute at the University of Southern California, author of *The Longevity Diet*
- Dan Buettner, author of *The Blue Zones*
    - Researched centenarians around the globe and their diets and lifestyles

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Longevity Diet

- Plant-based diet with occasional fish
- 3 meals daily plus snack for the elderly
- Time-restricted eating: limiting food intake to 11-12 hours each day
- Twice or more per year a 5-day fasting-mimicking diet (FMD) (Dr. Longo's Prolon)
    - Triggers a 'metabolic switch'
    - Promotes cellular autophagy (self-destruction) to remove damaged cells and activate stem cell regeneration

(Longo V., 2018; Lang & Rupprecht, 2019; de Cabo & Mattson, 2019; Long VD., 1999; Guevara-Aguirre J. et al., 2011; Longo VD et al., 2005; Fabrizio P. et al., 2001; de Groot S et al., 2020)

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Blue Zone Diet

- Emphasizes food quality
- Stop eating when 80% full
- Be mindful of circumstantial eating
- Monitor portion control
- Invest in smaller eating/drinking utensils
- Make healthy food accessible
- Eat slowly and avoid eating 3-4 hours before bed

(Buettner D., 2012)

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Anti-inflammatory Herbs and Supplements

- Curcumin
- Quercetin
- *Boswellia*
- Omega-3s
- Green tea (EGCG)
- Saffron
- Glucosamine
- Chondroitin
- MSM
- Vitamin D

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Part 2:

Condition-Specific Approaches

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Age and Gastrointestinal Health

Mouth: dentition, gingivitis, ↓ saliva, change in taste

Esophagus: ineffective LES, poor motility

Pancreas: ↓ enzyme secretion

Stomach: hypochlorhydria

Small intestine: slowing of migrating motor complex (MMC), ↓ vit D receptors

Large intestine: ↓ muscle wall strength and compliance

Brain: ↑ BBB permeability

(Dumic I. et al., 2019)

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Poll Question

Which type of medication may cause dementia?

a) Antacids
b) NSAIDs
c) Proton pump inhibitors
d) Antidiabetics

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Medication and the Digestive Tract

- Antacids
  - Associated with B12 deficiency (Jung SB et al., 2015)
  - May cause constipation, diarrhea, milk-alkali syndrome (Vakil N., 2020; Erckenbrecht J et al., 1982)
- NSAIDs
  - Associated with folic acid, glutathione, vit B12 deficiencies (TRC. Ibuprofen, 2021)
  - May cause diverticular disease, pill esophagitis, anorexia, dyspepsia, peptic ulcer disease, bleeding, acute renal failure, liver injury (Feldman M., 2019; Solomon D., 2020)

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Medication and the Digestive Tract

- Proton Pump Inhibitors
  - Associated with B12 def
  - May cause *C. difficile* diarrhea and malabsorption, acute and chronic kidney disease and acute interstitial nephritis, hypomagnesemia, pneumonia, bone fracture, dementia (Wolf MM., 2021; Schoenfeld & Grady, 2016; Gomm W. et al., 2016)
- Antidiabetics
  - Associated with folic acid, vitamin B12, and dibencozide def (TRC. Metformin, 2021)
  - May cause headache, sore throat, upper respiratory tract infections, HF, MI, hypoglycemia, bone fractures, anorexia, diarrhea, nausea, constipation, indigestion, vomiting, weight changes, flatulence (McCulloch D., 2019; Exenatide, 2020; Dungan K., 2020; Diabetes treatment, Mayo Clinic, 2021)

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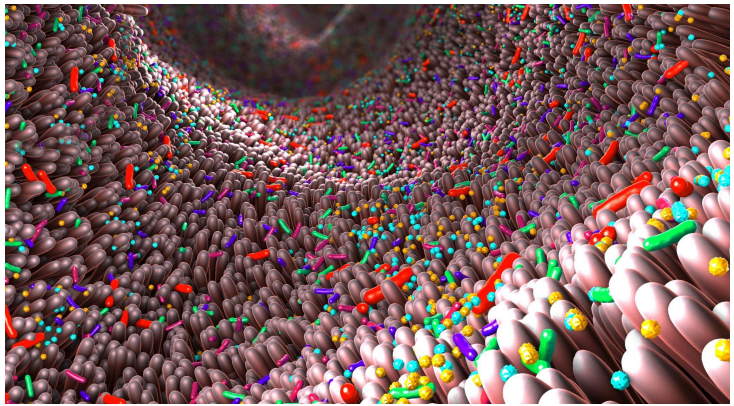
Gut Repair

Institute for Functional Medicine (IFM) framework for repairing the gut

The Five Rs

1. **Remove**: eliminate sources of inflammation (pathogens, inflammatory foods, dysbiosis, meds)
2. **Replace**: supplemental use as needed to replace digestive enzymes, HCL, bile acids
3. **Reinoculate**: probiotics, fermented foods
4. **Repair and regenerate**: healing regimen
5. **Rebalance and retain**: lifestyle factors that impact gut health



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Gastroesophageal Reflux

- Loss of esophageal sensitivity in older adults
- Hallmark complaint of heartburn is often lacking (Devault KR, 2007)

- PPIs ↓ gastric acidity and
  - shift how pancreatic enzymes work (Ketwaroo & Graham, 2019)
  - Alters the gut microbiome
  - ↑ risk of infections and nutritional deficiencies
  - May cause chronic inflammation (Fossmark R. et al., 2019)

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Lifestyle Changes for Gastroesophageal Reflux

- Smaller meals
- Avoid eating 2-3 hours before bed
- Elevate head
- Aim for a healthy weight
- Quit smoking
- Drink 8-10 glasses of water daily
- Assess for hypochlorhydria

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Other Considerations for Gastroesophageal Reflux

- Elimination diet to identify food triggers
- Assess for hypochlorhydria
- Add 1-2 tbsp raw apple cider vinegar in 3 oz of water 20 min before meal to help trigger LES closure (Gunnars K., 2021)

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Supplements to Support GI Health

Supplements for GI Health and Gastroesophageal Reflux

- Demulcent like aloe vera juice to help restore mucosal barrier and soothe inflammation (Sarris & Wardle, 2010)
- DGL 2-4 tablets 380 mg before meals (Myers A., 2021)
- Rice bran oil, 150 mg TID
- Slippery elm, 2 tbsp in water after meals and bedtime (Myers A., 2021)
- Betaine HCL if hypochlorhydria 20 min before meal
- Digestive enzymes with meals

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Poll Question

Which condition should be ruled out when assessing a geriatric client with constipation?

a) Hypochlorhydria
b) Small intestinal bacterial overgrowth (SIBO)
c) H. Pylori
d) Anemia

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Constipation Management

Laxatives:

- Docusate and milk of magnesia 1-2 tbsp daily
- Magnesium citrate: 350-500 mg daily in chelated form (*Magnesium Citrate,* 2020)
- Polyethylene glycol, sorbitol, lactulose, and bisacodyl
- Senna, tea with ½ tsp of senna in cup of water 1-2x daily
- Saline or mineral oil enema

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Lifestyle Changes for Constipation

- Adequate hydration
- 30g fiber daily
- Regular exercise
- Tea or coffee in moderation
- Bowel-habit diary review
- Medication review
- Rule out small intestinal bacterial overgrowth (SIBO)

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Supplements for Constipation

- Short-term use of Aloe vera (less than 1 week): ½ C TID, 40-170 mg dehydrated juice in capsule form
- Short-term use of cascara (less than 1 week): 250 mg BID or TID
- Vitamin C: 500-2,000 mg daily (Traber MG. et al., 2019)
- Wheat or corn bran: 1 tbsp daily
- Probiotic bifidobacteria: at least 4 billion units BID or TID

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Poll Question

Which type of diet is helpful in exploring the root cause of atopic dermatitis/eczema?

a) Mediterranean diet
b) Low-FODMAP diet
c) High-protein diet
d) Elimination diet

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Atopic Dermatitis/Eczema

- Often surfaces in older adults with a history of environmental allergies
- Assess for the most likely contributors to eczema and the accompanying environmental allergies by exploring possible:
  - Food sensitivities: delayed response in body systems
  - Candida overgrowth (symptomatic of dysbiosis)
  - Histamine reactivity: a result of gut dysbiosis and imbalance between internal histamine production, intake of histamine-rich foods, and enzymatic breakdown of histamine

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An Elimination Diet for Eczema

- 6-week elimination diet that includes common food sensitivity triggers and systematic reintroduction of each food type
  - Gluten, dairy, corn, eggs, peanuts, soy
  - Consider food sensitivity testing to personalize the elimination diet

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Nutritional and Botanical Support for Eczema

- Vitamin A: plays a regulatory role in immune functions and skin integrity (Xiang J. et al., 2019)
  - 50,000 IU
  - Food sources: beef liver, sweet potato, spinach, carrots (NIH, 2020)
- Vitamin E: antioxidant and reduces IgE antibodies
  - 400 IU (Jaffary F. et al., 2015)
  - Food sources: vegetable oils, almonds, peanuts, sunflower seeds, spinach, broccoli (NIH, 2020)
- Zinc: anti-inflammatory and antioxidant and ↑ reepithelialization
  - 2.5% zinc sulfate topical formulation (Gupta M. et al., 2014)
  - Food sources: oysters, beef, chuck roast, crab, beef patty, lobster (NIH, 2020)

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Nutritional and Botanical Support for Eczema

- Quercetin : immune-modulating and anti-inflammatory (Choopani R. et al., 2017)
  - 5-40 mg (Jafarinia M. et al., 2020)
  - Food sources: apples, berries, brassica vegetables, capers, grapes, onions, shallots (Li Y. et al., 2016)
- GLA: corrects def in skin lipids
  - 220 mg (Kawamura A. et al., 2011)
  - Food sources: human milk, organ meats, primrose black, borage, fungal oil
- Topical cannabinoids: anti-inflammatory, antimicrobial, anti-pruritus (Mounessa JS. et al., 2017)
  - 1:1 THC/CBD or triple topical THC/CBD/CBDa
    - CBDa is a potent anti-inflammatory and analgesic

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Skin, Lung, Eyes and Hair Health

Therapeutic Diets that promote skin, lung, eyes, and hair health in older adults:

- Elimination Diet
  - Inflammation in the gut impacts epithelial tissue
  - When food sensitivities are resolved, reduction in SIgG levels measured in the gut correlates with eczema reduction (Nosrati A. et al., 2017)
- Mediterranean Diet
- Anti-candida Diet
  - *Candida albicans* may take advantage of a dysbiotic gut environment and a high intake of refined carbs creates a toxic gut environment

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Osteopenia/Osteoporosis

Risk factors:

- Age
- Inadequate calcium intake
- Inactivity
- Caffeine intake
- Hormonal imbalance (Body JJ. et al., 2011)
- Dysfunction in vitamin D metabolism (Bischoff-Ferrari HA. et al., 2009)
- CRF (Ersoy FF., 2007)
- Medication (corticosteroids, PPIs) (Munson JC et al., 2012)
- Blood sugar imbalance (Clarke & Khosla, 2010)
- Oxidative stress and systemic inflammation (Epsley S. et al., 2020)

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Dietary Approaches to Osteopenia/Osteoporosis

- Adequate calcium intake form food and supplements combined
- Physical movement: signals the body to use nutrients to build bone mass
- High protein diets are associated with bone mineral density
- Vitamin K2 supplementation when necessary
- Mediterranean diet: associated with ↓ in hip fractures (Haring B. et al., 2016)
- Anti-inflammatory diet
    - Colorful fruits, veggies, healthy fats, whole grains, nuts, seeds, fatty fish, etc. associated with ↑ bone density
    - Avoidance of oxidants from the diet from fried foods, processed foods with chemical additives, foods high in refined carbs

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Nutritional and Botanical Support for Bone Health

- Calcium
  - 600-1200 mg/day, divided into 300-400 mg TID to minimize cardiac risks (Kogan & Weil, 2018; Bolland MJ et al., 2013)
  - Food sources: dairy, leafy greens, fish with bones, red pepper, fortified OJ, grapefruit juice, kiwi
- Vitamin D
  - 2,000 IU/day (Kogan & Weil, 2018)
  - Food sources: cod liver oil, trout, sockeye salmon, mushrooms, milk (NIH, 2020)
- Vitamin K2 Menaquinones (4 or 7): involved in Calcium transport, preventing calcium deposition in blood vessel wall lining, improves bone density (Shen C-L et al., 2009)
  - 45 mg MK4, 100-500 µg MK7
  - Food sources: fermented *natto* soy foods (MK7), egg yolk (MK4)
  - Human intestinal flora is a major producer of MK7

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Questions?

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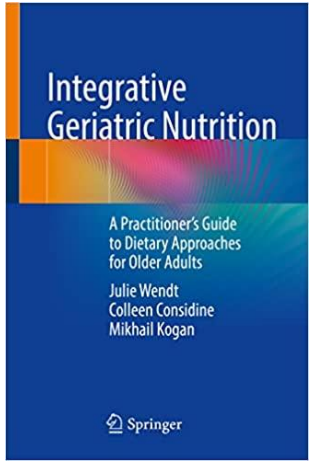
More On This Topic

Thank you for attending!

- Learn more with *Integrative Geriatric Nutrition: A Practitioner's Guide to Dietary Approaches for Older Adults (25 CPEUs)*, at SkellySkills.com. Get 30% off with code through 5/30/22
- Learn more about Julie and her practice at www.lifelongnutritionandfitness.com

- Live attendees: You'll get a link to the feedback survey in one hour/CE Cert tomorrow



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References

1. Bischoff-Ferrari HA, Dawson-Hughes B, Staehelin HB, Orav JE, Stuck AE, Theiler R, et al. Fall prevention with supplemental and active forms of vitamin D: a meta-analysis of randomised controlled trials. BMJ. 2009;339:b3692.
2. Body JJ, Bergmann P, Boonen S, Boutsen Y, Bruyere O, Devogelaer JP, et al. Non-pharmacological management of osteoporosis: a consensus of the Belgian bone Club. Osteoporos Int. 2011;22(11):2769-88.
3. Bolland MJ, Grey A, Reid IR. Calcium supplements and cardiovascular risk: 5 yeras on. Ther Adv Drug Saf. 2013;4(5):199-210.
4. Brandhorst S, Longo VD. Protein quantity and source, fasting-mimicking diets, and longevity. Adv Nutr. 2019;10(Suppl_4):S340-50.
5. Buettner D. The blue zones, Second Edition: 9 lessons for living longer from the people who've lived the longest. Second ed. National Geographic; 2012.
6. Choopani R, Mehrbani M, Fekri A, Mehrabani M. Treatment of atopic dermatitis from the perspective of traditional Persian medicine: presentation of a novel therapeutic approach. J Evid Based Complement Altern Med. 2017;22(1):5-11.
7. Clarke BL, Khosla S. Physiology of bone loss. Radiol Clin N Am. 2010;48(3):483-95.
8. de Cabo R, Mattson MP. Effects of intermittent fasting on health, aging, and disease. N Engl J Med. 2019;381(26):2541-51.
9. De Groot S, Lugtenberg RT, Cohen D, Welters MJP, Ehsan I, Vreeswijk MPG, et al. Fasting mimicking diet as an adjunct to neoadjuvant chemotherapy for breast cancer in the multicentre randomized phase 2 DIRECT trial. Nat Commun. 2020;22(1):3083.

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References

10. Devault KR. Management of reflux disease in elderly patients. Gastroenterol Hepatol (NY). 2007;3(7):527-9.
11. Dumic I, Nordin T, Jecmenica M, Stojkovic Lalosevic M, Milosavljevic T, Milovanovic T. Gastrointestinal tract disorders in older age. Can J Gastroenterol Hepatol. 2019;2019:6757524.Erckenbrecht J, Kienle U, Zollner L, Wienbeck M. Effects of high dose antacids on bowel motility. Digestion. 1982;25(4):244-7.
12. Dungan K. Glucagon-like peptide 1 receptor agonists for the treatment of type 2 diabetes mellitus. [Internet]. UpToDate. 2020 [cited 2020 Mar 4]. Available from https://www.uptodate.com/contents/glucagon-like-peptide-1-receptor-agonists-for-the-treatment-of-type-2-diabetes-mellitus.
13. Epsley S, Tadros S, Farid A, Kargilis D, Mehta S, Rajapakse CS> The effect of inflammation on bone. Front Physiol. 2020;11:511799.
14. Ersoy FF. Osteoporosis in the elderly with chronic kidney disease. Int Urol Nephrol. 2007;39(1):321-31.
15. Exenatide [Internet]. UpToDate. 2020 [cited 2021 Mar 4]. Available from: https://www.uptodate.com/contents/exenatide-drug-information?search=exenatide&topicRef=1772&source=see_link.
16. Fabrizio P, Pizza F, Pletcher SD, Gendron CM, Longo VD. Regulation of longevity and stress resistance by Sch9 in yeast. Science. 2001;292(5515):288-90.
17. Feldman M. NSAIDs (including aspirin): Pathogenesis of gastroduodenal toxicity [Internet]. UpToDate. 2019 [cited 2021 Mar 5]. Available from: https://www.uptodate.com/contents/nsaids-including-aspirin-pathogenesis-of-gastroduodenal-toxicity?search=NSAIDs&topicRef=7989&source=see_link.

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References

18. Fossmark R, Martinsen TC, Waldum HL. Adverse effects of proton pump inhibitors-evidence and plausibility. Int J Mol Sci. 2019;20:5203. https://doi.org/10.3390/ijms20205203.
19. Gomm W, von Holt K, Thome F, Broich K, Maier W, Fink A, et al. Association of proton pump inhibitors with risk of dementia: a pharmacoepidemiological claims data analysis. JAMA Neurol. 2016;73(4):410-6.
20. Guevara-Aguirre J, Balasubramanian P, Guevara-Aguirre M, Wei M, Madia F, Cheng C-W, et al. Growth hormone receptor deficiency is associated with a major reduction in pro-aging signaling, cancer, and diabetes in human. Sci Transl Med. 2011;3(70):70ra13.
21. Gunnars K. 6 health benefits of Apple Cider Vinegar, backed by Science [Internet]. Healthline. 2020 [cited 2021 Mar 4]. Available from https://www.healthline.com/nutrition/6-proven-health-benefits-of-apple-cider-vinegar.
22. Gupta M, Mahajan VK, Mehta KS, Chauhan PS. Zinc therapy in dermatology: a review. Dermatol Res Pract. 2014;2014:709152.
23. Haring B, Crandall CJ, Wu C, LeBlanc ES, Shikany JM, Carbone L, et al. Dietary patterns and fracgures in postmenopausal women: results from the women's health initiative. JAMA Intern Med. 2016;176(5):645-52.
24. Jafarinia M, Sadat Hosseini M, Kasiri N, Fazel N, Faith F, Ganjalikhani Hakemi M, et al. Quercetin with the potential effect on allergic diseases. Allergy Asthma Clin Immunol. 2020;16:36.
25. Jaffary F, Faghihi G, Mokhtarian A, Hosseini SM. Effects of oral vitamin E on treatment of atopic dermatitis:a randomized controlled trial. J Res Med Sci. 2015;20(11): 1053-7.
26. Jung SB, Nagaraja V, Kapur A, Eslick GD. Association between vitamin B12 deficiency and long-term use of acid-lowering agents: a systematic review and meta-analysis. Intern Med J. 2015;45(4):409-16.

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References

24. Kawamura A, Ooyama K, Kojima K, Kachi H, Abe T, Amano K, et al. Dietary supplementation of gamma-linolenic acid improves skin parameters in subjects with dry skin and milk adotpic dermatitis. J Oleo Sci. 2011;60(12):597-607.
25. Ketwaroo GA, Graham DY. Rational use of pancreatic enzymes for pancreatic insufficiency and pancreatic pain. Adv Exp Med Biol. 2019;1148:323-43.
26. Kogan M, Weil A. Common rheumatic diseases in the elderly. In: Integrative geriatric medicine. New York: Oxford University Press; 2018. P. 273.
27. Lang FR, Rupprecht FS. Motivation for longevity across the life span: an emerging issue. Innov Aging. 2019;3(2):igz014.
28. Li Y, Yao J, Han C, Yang J, Chaudhry MT, Wang S, et al. Quercetin, inflammation and immunity. Nutrients, 2016;8(3):167.
29. Longo VD. Mutations in signal transduction proteins increase stress resistance and longevity in yast, nematodes, fruit flies, and mammalian neuronal cells. Neurobiol Aging. 1999;20(5):479-86.
30. Longo V. The longevity diet: discover the new science behind stem cell activation nad regeneration to slow aging, fight disease, and optimize weight. Illustrated. New York: Avery; 2018.
31. Longo VD, Mitteldorf J, Skulachev VP. Programmed and altruistic ageing. Nat Rev Genet. 2005;6(11):866-72.
32. Magnesium Citrate [Internet]. Lexicomp. 2020 [cited 2021 Mar 5]. Available from: https://www.uptodate.com/contents/magnesium-citrate-drug-information?search=magnesium+citrate.

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References

33. Mayo Clinic. Diabetes treatment: medications for type 2 diabetes [Internet]. Mayo Clinic. 2018 [cited 2021 Mar 3]. Available from: https://www.mayoclinic.org/diseases-conditions/type-2-diabetes/in-depth/diabetes-treatment/art-20051004.
34. McCulloch D. Alpha-glucosidase inhibitors and lipase inhibitors for treatment of diabetes mellitus [Internet]. UpToDate. 2019 [cited 2021 Mar 4]. Available from: https://www.uptodate.com/contents/alpha-glucosidase-inhibitors-and-lipase-inhibitors-for-treatment-of-diabetes-mellitus?search=acarbose&source=search_result&selecedTitle=3~26&usage_type=default&display_rank=2#H6.
35. Mounessa JS, Siegel JA, Dunnick CA, Dellavalle RP. The role of cannabinoids in dermatology. J Am Acad Dermatol. 2017;77(1):188-90.
36. Munson JC, Wahl PM, Daniel G, Kimmel SE, Hennessy S. Factors associated with the initiation of proton pump inhibitors in corticosteroid users. Pharmacoepidemiol Drug Saf. 2012;21(4):366-74.
37. Myers A. Restore gut health with 6 herbs and nutrients [Internet]. Amy Myers MD. 2021 [cited 2021 Mar 12]. Available from: https://www.amymyersmd.com/article/restore-gut-health-herbs-nutrients/.
38. NIH. Vitamin A [Internet]. Vitamin A. 2020 [cited 2021 Jan 30]. Available from https://ods.od.nih.gov/factsheets/VitaminA-HealthProfessional/,
39. NIH. Vitamin D [Internet]. NIH National Institutes of Health Office of Dietary Supplements. 2020 [cited 2020 Dec 31]. Available from: https://ods.od.nih.gov/factsheets/vitaminD-HealthProfessional/
40. NIH. Vitamin E [Internet]. NIH Office of Dietary Supplements. 2020 [cited 2021 Jan 30]. Available from: https://ods.od.nih.gov/factsheets/VitaminE-HealthProfessional/.

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References

42. NIH. Zinc [Internet]. NIH Office of Dietary Supplements. 2020 [cited 2021 Feb 5]. Available from https://ods.od.nih.gov/factsheets/Zinc-HealthProfessional/.
43. Nosrati A, Afifi L, Danesh MJ, Lee K, Yan D, Beroukhim K, et al. Dietary modifications in atopic dermatitis: patient-reported outcomes. J Dermatolog Treat. 2017;28(6):523-38.
44. Sarris J, Wardle J. Clinical naturopathy: an evidence-based guide to practice. 1st ed. Churchill Livingstone Australia; 2010.
45. Schoenfeld AJ, Grady D. Adverse effects associated with proton pump inhibitors. JAMA Intern Med. 2016;176(2):172-4.
46. Shen C-L, Yeh JK, Cao JJ, Wang J-S. Green tea and bone metabolism. Nutr Res. 2009;29(7):437-56.
47. Solomon D. Nonselective NSAIDs: overview of adverse effects [Internet]. UpToDate. 2020 [cited 2021 Mar 5]. Available from: https://www.uptodate.com/contents/nonselective-nsaids-overview-of-adverse-effects?search=nsaid%20side%20effects&source=search_result&selectedTitle=2~149&usage_type=default&display_rank=1#H4.
48. Traber MG, Buettner GR, Bruno RS. The relationship between vitamin C status, the gut-liver axis, amd metabolic syndrome. Redox Biol. 2019;21:101091.
49. TRC. Ibuprofen [Internet]. TRC natural medicines. 2021 [cited 2021 Mar 12]. Available from: https://naturalmedicines-therapeuticreserach-com.proxygw.wrlc.org/tools/nutrient-depletion.aspx#N.
50. TRC. Metformin [Internet]. TRC Natural Medicines. 2021 [cited 2021 Mar 12]. Available from: https://naturalmedicines-therapeuticsearch-com.proxygw.wrlc.org/tools/nutrient-depletion.aspx#P./

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References

52. Wei M, Brandhorst S, Shelehchi M, Mirzaei H, Cheng CW, Budniak J, et al. Fasting-mimicking diet and markers/risk factors for aging, diabetes, cancer, and cardiovascular disease. Sci Transl Med. 2017;9(377):eaai8700.
53. Wolf MM. Proton pump inhibitors: overview of use and adverse effects in the treatment of acid related disorders [Internet]. UpToDate. 2020 [cited 2021 Mar 5]. Available from: https://www.uptodate.com/contents/proton-pump-inhibitors-overview-of-use-and-adverse-effects-in-the-treatment-of-acid-related-disorders?sectionName=ADVERSE%20EFFECTS&search=H2%20blockers&topicRef=32&anchor=H59974871&source=see_link#H59974871.

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