Collagen: Ancient Medicine Meets New Research

Implications for your Practice and Clients

An Interview with Pamela Schoenfeld, MS, RD, LDN
Author, *The Collagen Diet*

skelly SKILLS Building Better Dietitians

1

Learning Objectives

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

1. Define various types of collagen and a good food source of each.
2. Explain two uses of collagen throughout history.
3. List three benefits of collagen for gut health.
4. List the outcomes of three studies on collagen for diabetes and blood glucose management.
5. List four benefits of collagen for bone and joint health.
6. Explain why glycine is important for glutathione production and detoxification.
7. Explain the proposed role of glycine in sleep and mental health.
8. List three considerations when recommending a collagen supplement to your clients.

skelly SKILLS Building Better Dietitians

2

About The Presenter

Pam Schoenfeld, MS, RD, LDN

Pam is passionate about the power of nutrition to help children grow and thrive. As a mother herself, she converted her young family's diet to a more ancestral pattern and saw benefits immediately. She then returned to school at 45 years of age in order to share her passion professionally with other women who also wanted more for their families. She is the author of *The Collagen Diet*, which weaves the importance of collagen within the context of a nourishing diet for every age and stage of life. Pam runs a busy, functional nutrition practice in Raleigh, NC: Women and Family Nutrition LLC.

skelly SKILLS Building Better Dietitians

3

Introduction to Collagen

- 28 different types of collagen have been ID'd in humans
- 90% of our collagen is one of four types:
  - Type I: most abundant; tendons and bones; most prominent in skin. Properties vary depending on where they are found
  - Type II: found exclusively in joint cartilage

4

Introduction to Collagen

- 90% of our collagen is one of four types:
  - Type III: forms the main structural components of the blood vessels. High amounts in childhood; decreases in adults
  - Type IV: does not form triple-stranded helix structure.
    - Web-like pattern instead--forms basement membrane

5

Introduction to Collagen

- Collagen underlies the strength and structure of our bodies
- Needs to be constantly turned over
- Good nutrition is the foundation for producing good-quality collagen in our bodies

6

Part 1: Research on Collagen and its Benefits

skelly SKILLS Building Better Dietitians

7

Collagen Use Through History

- China: donkey-hide gelatin used for overall energy, blood flow, and treating coughs and insomnia for 2000 years
- US: gelatin historically used for digestive disorders--Francis Pottenger rec'd for heartburn, ulcers, spastic colon and 'nervous digestion'--gut dysbiosis
- France: 17th century pressure-cooker to effectively extract gelatin
- Many traditional dishes around the globe center around collagen-rich foods: *muktuk, caldillo de congrio,* oxtail

skelly SKILLS Building Better Dietitians

8

Collagen for Gut Health

- Gelatin and gelatin-rich bone broths form hydrophilic colloids that enhance digestion.
- Collagen protein builds and maintains the connective tissue that lines the entire digestive tract
- Research suggests 'Leaky gut' may be improved by addition of homemade bone broth
- Glycine and proline supplementation increased intestinal villi and mucous layer size-->improved nutrient uptake

skelly SKILLS Building Better Dietitians

9

Collagen for Diabetes and Blood Sugar Mgt

- Most studies utilize marine or fish collagen peptides for diabetes.
- Marine collagen peptides in Type 2 diabetes led to lower fasting BG and HbA1C levels, serum lipid profiles and inflammatory markers improved
- Marine collagen peptides may function by inhibiting the enzyme DPPIV, much like DPP4 inhibitor meds but without potential for negative side effects.

10

Collagen for Diabetes and Blood Sugar Mgt

- Blood glycine levels are lower in those with Type 2 diabetes and prediabetes
- Glycine seems to blunt BG rise after high-carb intake. 4.5 grams reduced overall increase in blood glucose by half that of controls.
- Glycine and proline may also help to moderate hypoglycemia through effects on glucagon secretion and modulating the rise and fall and blood glucose levels.

11

Collagen for Inflammation and Mobility

- Daily hydrolyzed gelatin consumption resulted in positive bone remodeling markers in kids
- Collagen peptides appear to inhibit bone breakdown:
  - in senior men and post-menopausal women
  - both with osteoporosis and without
  - in combination with other supports, such as glucosamine and calcitonin

12

Collagen for Inflammation and Mobility

- Fortibone (patented specific collagen peptide) led to an increase in spinal and femoral bone mineral density after 12 months in post-menopausal women with low-bone density
- Participants also saw improvement in blood pressure!
- Evidence unclear for women with osteopenia--dosage?

skelly SKILLS Building Better Dietitians

13

Collagen for Inflammation and Mobility

Osteoarthritis:

- research review in 2018: collagen hydrolysate performed better than 17 other popular supplements for short-term pain improvement (mid-range for medium/long-term improvements)
- UC-II (BioCell)--research showed reduction in pain and superior to blucosamine and chondroitin
- May prevent muscle loss in aged?

skelly SKILLS Building Better Dietitians

14

Collagen and the Starring Role of Glycine

- Collagen protein is rich in glycine, *but most other proteins that we eat are not*
- We tend to overconsume methionine and underconsume glycine (both need to come in at roughly same ratio)
- Too much methionine can be detrimental, particularly if glycine is low
- Methionine regulates dopamine. Over- or under-methylation can cause mental health symptoms. Glycine prevents excessive methylation of dopamine and also increases serotonin release (sleep)

- Glycine is key component of glutathione: the body's master detoxifier

skelly SKILLS Building Better Dietitians

15

Collagen and the Starring Role of Glycine

- Collagen needs to turn over quickly:
  - older collagen--negative chemical changes: oxidation, glycation and excessive cross-linking
  - glycine key to ensure collagen turns over quickly and replaced with high quality new collagen
- "Nutritional and clinical studies during the past 20 years indicate that the amount of glycine available in humans is not enough to meet metabolic needs and that a dietary supplement is appropriate."

Source: Meléndez-Hevia, et al, 2009.

skelly SKILLS Building Better Dietitians

16

Part 2: Integrating Collagen into Your Practice: Sources and Recommendations

skelly SKILLS Building Better Dietitians

17

Good Dietary Sources of Collagen

- Type I: Bovine, porcine, marine good sources
- Type II: chicken
- Type III: bovine and porcine
- Type V and X: eggshell membrane
- Important to eat meat near cartilage/joints in animals for high amounts of collagen: chicken sternum, feet, beef tendons
- Many Asian foods high in collagen, particularly porcine: ramen, pho, pig trotters, pork stew
- Poultry and salmon skin

skelly SKILLS Building Better Dietitians

18

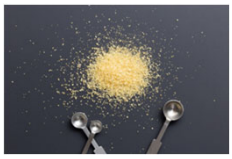
Good Dietary Sources of Collagen

- Stewing and slow-cooking meats creates dishes high in collagen
- Bone broth:
  - Real, homemade version has more active ingredients than does collagen protein.
  - Vary widely in amounts of key amino acids that support collagen synthesis
  - Use bone from pastured animals raised in rural areas

19

Collagen Supplements

- All collagen protein products are derived from intact collagen proteins
- collagen peptides and collagen hydrolysate are gelatin that has been further processed:
  - enzymatic process which yields small fragments of collagen protein
  - readily dissolve into a beverage
  - in digestive tract, become biologically active molecules with special benefits



20

Collagen Supplements

- How much? 2.5g seems minimum and this was for skin
- Depends on condition but 10-12 g daily for benefits from variety of conditions in research.
- Organic, non-GMO and free range whenever possible!!
- Select the type of collagen and/or gelatin protein that research shows can help client meet health goals

21

Caveats & Supportive Nutrients

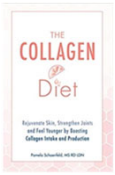
- Pay attention for:
  - headaches
  - history of kidney stones
- Bovine: mad cow disease--??
- Maximizing collagen's impact:
  - vitamin A
  - zinc (watch out for copper)
  - vitamin C
  - iron
  - biotin
  - other antioxidants

skelly SKILLS Building Better Dietitians

22

More On This Topic

- Questions?
- Thank you for attending!
- Learn more about collagen research and your clients with *The Collagen Diet (11 CPEUs)*



skelly SKILLS Building Better Dietitians

23