SOCIETY OF ACTUARIES®

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October 27-30
Toronto, Canada

Session 052: Munich Re Session Series Part 2: Voluntary Insurance and the Changing Workplace: An Outsider's Approach to the Changing Landscape

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Topics Covered in this Presentation

1. What is Wellness
2. Why need for Wellness Programs and Disease Stats
3. Do Wellness Programs Work
4. Desirable Features and Workflow of Effective Wellness Programs
5. Attainable Objective Outcomes of Nutrition and Lifestyle Medicine

THE DEFINITION OF WELLNESS

Wellness is defined as "the daily active pursuit of an improved state of health or maintaining an optimal state of health and well being."

Why Wellness (Programs)?

Rob Hollingsworth (vice president and head of insurance sales for Manulife) told a recent advisor briefing, **" that while infectious diseases were the big risk factors 20 years ago, the biggest risks these days are lifestyle choices"**

https://insurance-journal.ca/article/manulife-launches-vitality-in-canada/ (sept 27, 2016)

Compelling evidence has prompted insurance companies and US group benefit plan sponsors to reward consumers and employees/plan members, respectively, who actively engage in wellness behaviours to improve their health profile.

Why Wellness (Programs)?

- Traditional Medicine alone not sufficient to achieve optimal health outcomes

- Evidence-based proactive, health-promoting behaviours (wellness) complement traditional medical care, regarding disease prevention and management

Modern Disease Are Lifestyle Diseases

Cancer – 70-90% preventable via diet and lifestyle (Breast, Prostate, Colon, Lung, Skin)

Heart Disease, Stroke & Related Vascular Disease – most risk factors diet & lifestyle

Alzheimer's Disease – only 2% genetic. Caused primarily by how we allow the brain to age and atrophy – preventable

Diabetes – 80% of adult onset diabetes caused by overweight and lack of fitness – and can be reversed via diet and exercise

Osteoporosis – 1:4 women; 1:8 men over the age of 50 develop this condition- mostly due to faulty diet and sedentary lifestyle

Cancer

Journal of National Cancer Institute 1996
(Willet, W. Estimates of cancer deaths avoidable by dietary change. J National Cancer Instit.1996; 86,14:948)

In Total – 70-90% of cancer shown to be preventable

Type of Cancer	Percent avoidable		
	Doll-Peto (1981)	Willett (1994)	Range (1994)
Lung	20	20	10-30
Colon/Rectum	90	70	50-80
Breast	50	50	20-80
Prostate	(with other)	75	20-80
Pancreas	50	50	10-50
Stomach	35	35	30-70
Endometrium	50	50	50-80
Gall bladder	50	50	50-80
Larynx, bladder, cervix, mouth, pharynx, esophagus	20	20	10-30
Other	10	10	-
Overall estimate	35	32	20-42

Type 2 Diabetes In Canada

- More than 9 million Canadians live with diabetes or prediabetes

- Approximately 90% diabetics have type 2 diabetes. In 80% of cases the individual is over weight at time of diagnosis

- Incidence of type 2 diabetes is increasing dramatically due to a various factors:
  - The population is aging
  - Obesity rates are rising
  - Canadian lifestyles are increasingly sedentary

- Almost 80% of new Canadians come from populations that are at higher risk for type 2 diabetes. These include people of Aboriginal, Hispanic, Asian, South Asian or African descent

Health Complications From Diabetes

- Heart attack – 80% die from heart attack or stroke. Blood sugar lowering drugs do not prevent heart attacks and strokes (Medscape, Oct 5, 2016 (Big Fat Fix Challenges Mediterranean Diet http://www.medscape.com/viewarticle/869636

- Kidney failure

- Vision loss – macular degeneration

- Increased Cancer Risk (and poor prognosis if cancer develops)

- Compromised immunity (infections and cancer)

- Amputation due to gangrene (from reduced blood flow)

Lifestyle is Key Type 2 Diabetes Prevention and Reversal

- In a large study, people at risk of type 2 diabetes were able to reduce their risk by 58% by exercising moderately for 30 minutes a day and by losing 5 to 7% of their body weight

- In people age 60 and older, the risk was cut by almost 71%. Other large studies have shown similar results in reducing risk

  Reference: Canadian Diabetes Association (http://www.diabetes.ca/diabetes-and-you/what/prevalence/)

- Drugs and Standard Medical Care don't prevent diabetes, nor are they sufficient by themselves to reduce morbidity and mortality related to diabetes

- Nathan Pritikin was first researcher to show (in the 1970's) that many cases of type 2 diabetes could be reversed through diet and lifestyle alone, including reductions in lipid, glucose and blood pressure

For every $1.00 spent on wellness programs: Medical costs fall by about $3.27

Absenteeism costs fall by about $2.73

Harvard University - Health
Affairs, February 2010 USD

Wellness programs save about 1.5 to 1.7 days in absenteeism per worker over 12 months, or an estimated $251 per employee per year in savings.

Sun Life-Ivey Canadian
Wellness ROI study meta-
analysis, 2012

Some Features of Effective Wellness Platforms

1. High Level Engagement and Motivation
2. Personalized Health and Lifestyle Management Platform
3. Increased Health Literacy
4. Aggregate Reporting for C-suite or Plan Sponsor
5. Communication Platform

Typical Wellness Platform Workflow

1. **Health Risk Assessment** (including Mental Health Check-Up)

2. **Feedback Report** – personalized wellness strategies to help lower disease risk factors and complement disease management of existing health conditions **(and Aggregate Report for Sponsor**)

3. **Goal Setting** (weight, cholesterol, blood pressure, smoking etc.)

4. **Tracking and Monitoring** – tools and API synch with wearables and apps

5. **On-going Engagement** via in-app, email and push notifications, based on user activity and participation

6. **Other Features of Importance**

1. Health Risk Assessment

Aggregate Reports: Some Examples

- Steps
- Blood Pressure
- Blood Glucose
- Cholesterol
- Overweight
- Asthma
- Stress
- Mood
- Gout
- Diabetes
- Smoking
- Alcohol

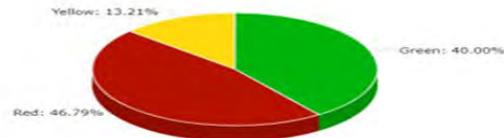# Aggregate Report Blood Pressure

2. Feedback Report

Dietary Feedback

Your Personal Feedback Report

Based upon your responses to the Dietary Assessment portion of the questionnaire, your usual dietary practices have been rated as follows: **19.00**. Refer to the chart below to see your position on the dietary patterns scale.

Less than five	🟩	Excellent
6-10	🟩	Good
11-20	🟨	← Fair
21-30	🟧	Poor
31-40	🟧	Very Poor
40+	🟥	Extremely Unhealthy

In addition to providing you with personalized feedback related to your dietary practices, if you are interested in maintaining, gaining or losing weight, Meschino Health & Wellness is pleased to provide you with a tool that helps you calculate your daily calorie intake and the total calories burned by exercise. Click on the following link to view or use the tool:

In your case, some of the noteworthy areas of your present dietary patterns include:

Your frequent consumption of whole eggs is of some concern. One egg yolk contains approximately 250 mg of cholesterol, which can contribute to elevated blood cholesterol levels. Excess cholesterol in the bloodstream can narrow arteries and contribute to heart attack, stroke and other vascular diseases. Anti-aging experts suggest that you limit your total daily cholesterol consumption to no more than 150-200 mg per day.

Your frequent intake of fried foods is of some concern. Fried foods contribute excessive fat calories to the diet, which promote weight gain, vascular disease and may increase risk of colon and other cancers.

It is impressive that you have maintained a low intake of high fat pastries and related treats. The fat content of these foods significantly contributes to weight gain and depending upon the type of fat present, can increase blood cholesterol levels, which is a key risk factor for heart attack, stroke and other vascular diseases. These high fat foods are linked to increased risk of colon cancer and possibly other cancers.

It is impressive that you have maintained a low intake of fried snack foods and regular chocolate products. Fried snack foods contribute excessive fat calories to the diet, which promote weigh[t]... risk of colon and other cancers. Regular chocolate bars and chocolate products are a rich source of saturated fat, which can elevate blood cholesterol levels, increasing risk of heart attack, stroke and other vascular diseases. Saturated fat intake also contributes to weight gain and is linked to colon cancer and reproductive organ cancers.

Questions?
Please leave a message and we will ...

Diverticular Disease: Nutrition & Lifestyle Adjunctive Management

Nutrition

Nutrition-

Prevention:

- Eating foods high in fiber can help prevent constipation and may decrease the risk of developing diverticulosis. High-fiber foods include whole grains and fresh fruits and vegetables.
- For many years, doctors recommended that patients with diverticulosis and diverticular disease avoid eating nuts, popcorn, and seeds. Eating these foods was thought to cause symptoms and lead to diverticulitis. A study published in the August 27, 2008, issue of *JAMA*, however, showed that this is not the case. The study found that eating nuts, corn, and popcorn do not increase the risk of diverticulitis or diverticular bleeding.

Managing Chronic Diverticular Disease:

- **Fiber**

The National Diverticulitis Study Group (NDSG) has made a level 1 recommendation for dietary fiber greater than 10 g/d and preferably between 20 and 30 g/d for all patients with diverticular disease except for those suffering from an acute attack.

The effectiveness of fiber for managing chronic diverticular disease symptoms still needs to be confirmed with high quality randomized clinical trials.

- **Anticholinergic/Antispasmodic agents**

    The rationale for using anticholinergic and antispasmodic agents is based on the observed hypermotility of the sigmoid colon in many patients with symptomatic disease [Bassotti *et al*. 2004].

    Patients with diverticulosis were found to have higher resting, post-meal pressures in the colon compared with controls [Huizinga *et al*. 1999].

    Altered motility (movement of contents through the gut) is thought to contribute to symptoms of chronic diverticular disease although the definite correlation is yet to be established.

- **Non- absorbable Antibiotic:**

    Rifaximin is a poorly absorbed antibiotic used for hepatic encephalopathy and traveler's diarrhea in the United States. It is effective against Gram-positive and Gram-negative bacteria and has high bioavailability in the gastrointestinal tract.

    It has been shown that rifaximin could be useful in irritable bowel syndrome and small bowel bacterial overgrowth by reducing bloating, abdominal pain, flatulence and loose stools

- **Anti-inflammatory agent: Mesalamine**

    Mesalamine has been investigated in multiple studies as a single agent to achieve and to maintain remission. Studies suggest that mesalamine is not only effective in achieving remission but also in maintaining remission in patients with recurrent symptomatic diverticular disease if given continuously.

Questions?
Please leave a message and we will ...

Diverticular Disease

Back to My Health Issues

| Description | Nutrition | Supplements | Other Considerations |

Supplements

Supplements:

1. **Probiotics**

Probiotic supplementation involves the ingestion of live, friendly bacteria to help populate the large intestine and crowd out the unfriendly bacteria and other undesirable microbes. Probiotics have been used in the management of various colonic conditions including constipation, diarrhea, bloating, Clostridium difficile colitis, irritable bowel syndrome, inflammatory bowel disease and diverticulitis. The rationale for the use of probiotics is based on the theory that the intestinal microflora plays a crucial role in the prevention and development of these disorders [Quigley, 2007].

The use of probiotics helps restore the normal intestinal flora that may have been altered in diverticular disease due to stasis and reduced colonic transit time. There are few data available about the use of probiotics in diverticular disease. Most studies were small and uncontrolled. In one prospective open trial by Fric and Zarovral, *Escherichia coli* strain Nissle 1917 was administered to 15 patients with uncomplicated diverticular disease These patients had longer periods of remission and improved abdominal symptoms after receiving probiotic compared to before treatment. [Fric and Zarovral, 2003].

Diverticular Disease

Description	Nutrition	Supplements	Other Considerations

Other Considerations

Other Considerations

Risk Factors for Diverticular Disease

- **Low Fiber Diet** – debate still exists, but still considered good evidence, as higher fiber intake linked to fewer hospital admissions for diverticulosis and diverticulitis. The exact pathogenesis of diverticular disease of the sigmoid colon is not well established. However, the hypothesis that a low-fibre diet may result in diverticulosis and a high-fiber diet will prevent symptoms or complications of diverticular disease is widely accepted. (C, Daniels L, Vrouenraets BC, Boermeester MA. A systematic review of high-fiber therapy in diverticular disease. Int J Colorectal Dis. 2012 4:419-427 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3308000/)
- **Family History –** 3x greater incidence if sibling with diverticular disease compared to the general population
- **Smoking** – dose-dependent relationship
- **Obesity** – increases risk by 80%
- **Lack of Physical Activity –** Physical activity reduces risk by 25%
- Nuts, corn, and popcorn intake **are not** associated with an increased risk of diverticulitis

Reference: JAMA Patient Page: Diverticulosis and Diverticulitis

https://jamanetwork.com/journals/jama/fullarticle/2552211

Risk Factors Continued:

- **Aging** - The strong association of age with the presence of diverticular disease argues for the important role of the aging process in the disease. Aging causes an increase in collagen in the colonic wall, with a concomitant reduction in tensile strength, that makes herniation more likely. Slower motility results in higher colonic water reabsorption and harder feces, which causes excessive straining and higher intraluminal pressure.
- Another factor in aging that makes herniation more likely is the reduction in the number of neurons containing nitric oxide in the intestinal nerve plexus. These nerve cells play an important role in the relaxation of the muscular coat within the wall of the intestine. These reflexes control muscular contraction to propel food through the gastrointestinal tract, and colonic receptive relaxation is important in allowing for expansion to mass with lower intraluminal pressure. In addition, the residual nitric oxide–containing neurons may be less functional.

Risk Factors Continued:

- Chronic Use of Laxatives - Chronic use of laxatives over a long period of time can damage the colon, a condition gastroenterologists have dubbed the "cathartic colon", making it more susceptible to diverticular disease and other gastrointestinal disorders.
- Irritable Bowel Syndrome (IBS) - In addition to being important for a differential diagnosis, IBS appears to significantly increase the risk of diverticular disease. A 2009 cross-sectional survey reported that subjects with IBS were much more likely to have diverticulosis than were subjects without IBS, and subjects aged 65 and older with IBS had a nine-fold increased risk of diverticulosis. Although the reason for the association is unclear, the authors suggested several possible mechanisms. Noting the higher risk in older individuals, they posited that IBS may act in conjunction with the aging-related changes in smooth muscle and neurons to promote the development of diverticular disease.

Questions?
Please leave a message and we will ...

3. Goal Setting Based on Risk Factor Assessment

Back

Lower your Cholesterol level `Active`

Current Status	Goal	Days Left	Points Available
0.00 mmol/L 🔴	3.90 - 5.20 mmol/L 🟡	0	300

VIDEO

Lower your Cholesterol level

Instructions

First Steps...

Why Recommended

Tracking Tools

Learn & Earns

Apps & Wearables

Essential Resources

Videos

Your goal should be to improve your Cholesterol level by at least one level. If your current status is red, then you should strive to achieve yellow. If your current status is yellow, then you should strive to achieve a status of green.

The number of days you have to complete this goal appears on your active goal page and in the list view of *"My Wellness Planner"*. The days will count down to 0 days, at which time your goal will be validated by checking the most recent value entered in the Cholesterol Tracker. If the most recent value entered in the Cholesterol Tracker falls into the range of your set goal, then you will have achieved your goal and points will be added to your account. A link to the Cholesterol Tracker can be found in the Tracking Tools section of the Active Goal Page.

- Be sure to activate all recommended goals to lower your Cholesterol levels

You can also record and validate your Cholesterol levels with Apple Healthkit or any smart app that syncs with Meschino Wellness. All Tracking Tools and Resources can also be found on the *Health Resources* tab of your Wellness Wallet

TOTAL CHOLESTEROL LEVELS

🟢	< 150 mg/dl
	< 3.9 mmol/L
🟡	150 – 200 mg/dl
	3.9 – 5.2 mmol/L
🔴	≥ 201 mg/dl

4. Track and Monitor Goals

Tracking Tools and Links to Wellness Ecosystem Tracking Tools

Health Resources	My Wellness Library	Report Comparsion

My Personal Diet

Measurements

Blood Pressure Tracker

Blood Glucose Tracker

Cholesterol Tracker

Weight Tracker

Diet & Fitness

Diet & Activity Manager

Nutrition Manager

Calorie Calculator

Lifestyle

Sleep Tracker

Stress

Mood Tracker

Stress Tracker

Recommended Smart Apps & Wearables

Apple Healthkit

Argus

Fatsecret

FitBit

Google Fit

IHealth

Map My Fitness

Microsoft Health

Misfit

Movable

My Fitness Pal

Run Keeper

Strava

Striiv

5. **Motivation and Engagement:** On-going Personalized Feedback and Encouragement, Based on User Activity or Inactivity

- **Emails:**
- Have not logged-in (5-days)
- Have not onboarded
- Have not completed the HRA (Health Risk Assessment)
- Promote a Feature (**Wellness Checklist)**

- **In-App Notifications: Immediate Feedback**
- Recorded their daily steps in step tracker
- Entered a meal in the meal tracker
- Recorded their new weight in their personal profile

- **Push Notifications: Instant Gratification**
- Achieved a Goal
- Reached a Milestone
- Personal Best
- Action Needed Immediately – (i.e. get Glucose level checked)
- Important Announcement – (i.e. new safety video released, or date of next webinar etc.)

Today's Willpower Moment – Psychology or Wellness Success - Mindfulness

MESCHINO
Willpower Moment

VIDEO

Hello Brad,

Today's Willpower Moment: 35

Topic: Part 1 (of 10): Overcoming The Sabotage Thoughts That Set You Up For Failure

In Today's Willpower Moment we start a 10 Part Series, where Dr. Meschino explains how to guard against the 10 Most Common Sabotage Thoughts that prevent people from reaching their weight loss goals and their desire to have a thinner, healthier, more toned, more youthful and vibrant body. If you really want results you need to be on the look out for these sabotage thoughts and have the plan to overcome them. Click on the video link and start guarding your mind against the thoughts that hold most people back from succeeding.

Eat Smart, Live Well, Look Great

Dr. James Meschino

Engagement: Gamification and Community

- Leaderboard - For Various Challenges

- Add Groups

- Create Teams

- Personal challenges - (i.e. 10 Km Run)

- News feed / updates

- Track progress

- Share Insights (Recipes, Personal Trainer at local gym etc.)

My Community

🏅 Leaderboards

Earn Points and Get ahead of your Colleagues!

1st	Keira Knightley	10000
2nd	Jack Sparrow	9000
3rd	Harry Potter	8000

👤 Profile

Trophies Earned

1st Place	100+ Likes	Superstar	Health Diploma	10K Champ	Team Player

Group

Not Part of a Group

[Join a Group]

Team

Accounting
43 Members — [view]

My Team
43 Members — [view]

Personal Challenges

Run 10 km this Week
1000 Bonus Points for Completing — 100%

Log Food 5 days in a row
1000 Bonus Points for Completing — 60%

Sleep 7+ hours 5 day this Week
1000 Bonus Points for Completing — 45%

Team Challenges

Collectively Run 100 km this Week

News Feed | Popular

Today

Ryan C. vs. Brad W. (10k dash)
Ryan C. defeated Brad W. in a 10k jogging challenge.
♡ 23 likes

Ryan C. Climbs 1 spot
Ryan C. passes Harry P. on the top 10 chart.
♡ 23 likes

Keira K. Takes 1st Place!
RKeira K.zooms by the competition. Can anyone Catch her?
♡ 23 likes

This Week

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My Community

🏅 Leaderboards

Rank	Player	Points ˅		Trophies	Wins	Win %	Challenge
1st	Keira Knightley	10000	5	🏆 1st Place 👍 100+ Likes ⭐ Superstar 📋 Health Deploma 🎖 10K Champ	10	0.56	💬
2nd	Jack Sparrow	9000	5	🏆 1st Place 👍 100+ Likes ⭐ Superstar 📋 Health Deploma 🎖 10K Champ	10	0.56	💬
3rd	Harry Potter	8000	5	🏆 1st Place 👍 100+ Likes ⭐ Superstar 📋 Health Deploma 🎖 10K Champ	10	0.56	💬

My Community

My Group   Join Group

1

12
Members

Beginner

View

Mountain Biking

Notification

6

12
Members

Beginner

View

Yoga

Notification

7

12
Members

Beginner

View

Running

Notification

My Community

MY CHALLENGES | PAST CHALLENGES

Rules   Start a Challenge +

Pending Challenges

This Weeks Special Bonus
All Physical Activities   x2 Points

Kira K. Challenged **You** to
Run 10 km this Week   Accept   Decline
Sept. 12 - 4:45pm (7 day Challenge)

Kira K. Challenged **You** to
Run 10 km this Week   Nudge   Decline
Sept. 12 - 4:45pm (7 day Challenge)

Kira K. Challenged **You** to
Run 10 km this Week   Accept   Decline
Sept. 12 - 4:45pm (7 day Challenge)

Kira K. Challenged **You** to
Run 10 km this Week   Accept   Decline
Sept. 12 - 4:45pm (7 day Challenge)

Active Challenges

Run 10 km this Week
1000 Bonus Points for Winning **x2**
Details   Log

You   4,5km
Kira K.   4,5km   **5** Days Left

Log food 5 days in a row
1000 Bonus Points for Winning
Details   Log

You   2/5
Kira K.   4/5   **3** Days Left

Sleep 7+ hours 5 days this Week
1000 Bonus Points for Winning
Details   Log

You   2/5
Kira K.   4/5   **4** Days Left

Don't feel challenged enough?

Challenge a Colleague

6. Other Features: Access From Wellness Dashboard

Notification/Communication Feature

Wellness Checklist, Mental Health Assess, Nutrition Manager, Step Challenge

Health Reminders/ Calendar Features

Prompt individuals who meet inclusion criteria for specific early detection tests to schedule appointments:

- Colonoscopy

- PSA Test

- Bone Mineral Density Test

- Mammograms etc.

Also Medication Adherence (Schedule Reminder)

Health Literacy

Weekly Wellness Update – Health Literacy and Motivation

Lifestyle Medicine Update No 140 (August 20, 2019)

with Dr. James Meschino

Topic: Higher Daily Choline Intake Linked to 28% Decrease in Dementia Risk

Source: American Journal of Clinical Nutrition (July 2019)

It may interest you to know that the brain makes the memory chemical "acetylcholine" from choline and phosphatidylcholine found in various foods. Lower brain levels of choline are known to result in lower brain acetylcholine levels and a decline in memory function. A study published in the 2019 issue of the American Journal of Clinical Nutrition was the first to observe that adequate dietary intake of phosphatidylcholine from day to day is associated with a reduced risk of dementia as we age. And, higher intake of phosphatidylcholine was also linked to enhanced cognitive performance.

In this study, researchers analyzed approximately 2,500 Finnish men aged 42 - 60 years of age for their dietary and lifestyle habits, and health in general. These data were combined with their hospital records, cause of death records and medication reimbursement records after an average follow-up period of 22 years.

In addition, four years after the study onset, approximately 500 men completed tests measuring their memory and cognitive processing. During the follow-up, 337 men developed dementia. The study showed that the risk of dementia was 28% lower in men who had the highest intake of dietary phosphatidylcholine when compared to men with the lowest intake. Men with the highest intake of dietary phosphatidylcholine also excelled in tests measuring their memory and linguistic abilities. In this study, men with the highest intake ingested 325 – 430 mg of choline per day on average.

Choline intake was the key finding linked to memory preservation and higher cognitive function, as the study extensively accounted for other established lifestyle and nutrition-related factors that affect the risk of dementia. Even a genetic test for the APOE4 gene, which predisposes to individuals to Alzheimer's disease was accounted for, and it showed no significant impact on the findings. The researchers conclude, "Higher phosphatidylcholine intake was associated with lower incident dementia and better cognitive performance in men in Eastern Finland."

So, it may interest you to know that US studies show that most adults consume less than the adequate intake of choline, as set out by the US Food and Nutrition Board. The recommended amount of daily choline for men is 550 mg and 425 mg for women. In the US, the average daily choline intake from foods and beverages in adults are 402 mg in men and 278 mg in women. Evidence is accumulating that getting adequate choline each day may be one more important strategy to prevent dementia, and possibly Alzheimer's disease as we age. As such, I have included a chart below showing the amount of choline found in many common healthy foods.

You will see that beef, egg yolk, and beef liver contain significant amounts of choline, but I suggest you refrain from eating these foods or greatly limit their intake due to their negative impact on causing other important health problems that I have reviewed in other video update newsletters. As a quick overview, here are some healthier foods with respectable amounts of choline: soybeans and soy products, chicken breast, Atlantic cod, Shitake mushrooms, potatoes, kidney beans, quinoa, 1% milk, non-fat yogurt, brussels sprouts, broccoli, cottage cheese, canned tuna, peanuts, cauliflower, green peas, sunflower seeds, brown rice, whole-wheat bread or pita bread, cabbage, tangerines and mandarin oranges. See the chart below for exact details.

I personally take 1-2, lecithin capsules (1200 mg) each day to top up my phosphatidylcholine and choline intake. There is approximately 180 mg of phosphatidylcholine in each 1200 mg lecithin capsule.

I've included the references for this information in the text below.

Amount of Choline per Serving

Objective Parameters Attainable via Wellness Practices

Ideal Blood Parameters Goals for Longevity - Largely Influenced by **Diet and Lifestyle**

1. **Total Cholesterol** – at or below 3.9 mmol/L
2. **LDL cholesterol** – at or below 2.0mmol/L
3. **Low HDL cholesterol** – Men: at or above 1.17 mmol/L; Women: at or above 1.42 mmol/L
4. **TC:HDL** Ratio – at or less than 3:1 (upper limit of 3.9:1)
5. **Fasting Glucose** - ideally under 5.0 mmol/L and **HbA1c** – at or below 5.0
6. **Triglycerides** - at or below 1.5 mmol/L
7. **Homocysteine** - at or below 6.3 umol/L
8. **C-Reactive Protein -** less than 0.24 mg/dL (2.4 mg/L)
9. **Uric Acid -** Men: 140 – 440 umol/L; Women: 80 – 350 umol/L
10. **Fructosamine** - 205 – 285 umol/L
11. **Liver Function Tests** (ALT, GGT, etc.) – within standard normal range
12. **Kidney Function Tests**:
    - **Blood Creatinine** - 60-110 μmol/L in adult males and 45-90 μmol/L in adult females
    - **eGFR** - at or above 60 mL/min

Other Key Parameters:

- **Blood Pressure:** under 130/80 mmHg or more ideally 120/70
- **Waist Circumference** – Men at or below 36 inches and women at or below 33 inches
- **Aerobic Fitness, Strength and Flexibility**

Society of Actuaries®