Name: Catherine Sarchenko

Date: Fall 2014

Project Title: Gallbladder Health & Nutrition Booklet, a creative project

Brief Summary of the Project:

This research paper serves as a reference for the writing of an informational booklet on gallbladder health and nutrition. The purpose of the booklet is to educate and inform regarding: functions of the gallbladder, gallbladder disease, non-surgical options to non-emergency cholecystectomy, nutrition for a healthy gallbladder, and recipes to support the nutritional findings. This booklet will be submitted to Selene River Press Publishing Company for potential publishing and distribution.

Area of Emphasis I: Nutrition Education

Committee Member: Dr. Joan Thompson

Area of Emphasis II: Health Sciences

Committee Member: Dr. Travis Price

Area of Emphasis III: Health Administrative Services

Committee Member: Dr. Carla Wiggins
Gallbladder Health and Nutrition

A Creative Capstone Project

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Cholecystectomy is the number one elective abdominal surgery in the Western world, and increasing in frequency. This paper compiles research on gallbladder health, nutrition, and non-surgical, less-invasive, and less-expensive options to cholecystectomy. It contains a book proposal for an informative book to educate the general population on issues related to the gallbladder. Promoting education and nutrition will help to reduce the number of unnecessary surgeries being performed.
Introduction

In 2012 gallbladder removal surgery was cited as being the most common elective abdominal surgery performed in the United States (Stinton & Shaffer, 2012). When asked, most people have little idea what the gallbladder is and how it functions in the body. The modern American diet, high in processed foods and low in fresh fruits and vegetables and other whole foods, has contributed significantly to a plethora of digestive problems including gallbladder disease. Gallbladder removal has become a popular solution to these digestion problems; however, current research shows that many of these surgeries could be prevented with nutritional intervention and an increased awareness of the important function of the gallbladder for whole-body homeostasis. In addition to the long-term health consequences of life without a gallbladder, non-emergency surgeries also take a huge financial toll on an already suffering health system in the United States. The following paper is divided into three sections. The health science portion will discuss the anatomy and physiology of the gallbladder, gallbladder disease, common medical solutions to gallbladder disease, and current research being done regarding the gallbladder and gallbladder disease. The nutrition portion of the paper discusses nutritional causes of gallbladder disease and dysfunction, nutrition therapy for gallbladder disease, and current research in gallbladder health as related to nutrition. The Health Administration portion of this paper consists of a book proposal for the creative project of the production of an informational book for the general public on gallbladder health and nutrition. It also contains a marketing plan for the book along with a sample manuscript.

With a better understanding and appreciation for the gallbladder, a nutritional initiative for intervention could reduce the number of unnecessary surgeries, health consequences, and costs. The booklet produced as a result of the following research and information will help
educate about the gallbladder and is a step toward reducing the number of gallbladder removal surgeries.

**Health Science**

The gallbladder is located in the upper right quadrant of the abdomen. It is directly inferior and connected to the liver. It stores bile produced by the liver and releases it, on-demand, to aid in the digestion and emulsification of fats consumed in the diet. Bile is alkaline in nature, and is important for helping to neutralize the chyme as it moves through the small intestine. If bile is super-saturated with cholesterol, it crystalizes and gallstones can form. Cholesterol is a normal and vital component of bile; however it is this super-saturation of cholesterol in the bile that leads to the formation of stones. The stones can increase in size, over time and sometimes can get stuck in the bile duct, which is the duct where the bile is released from the gallbladder into the small intestine. The presence of gallstones (cholelithiasis) is often termed gallbladder disease. Signs of gallstones or gallbladder inflammation include: tenderness in the gallbladder (under the ribcage on the right, front of the body), sharp pains in that area if a gallstone is lodged in the bile duct, and a noticeable problem with fat digestion resulting in steatorrhea, or fatty stool. Right shoulder pain is also a common symptom in gallbladder disease. This is because when the gallbladder becomes inflamed or is full of stones, it swells and puts pressure on the phrenic nerve which innervates the right shoulder.

Gallstones are primarily composed of cholesterol in adults; however, gallstones can also have a black pigment if associated with hemolytic disease. Other gallstones contain calcium carbonate which is associated with systemic illnesses, or Down’s syndrome, and can be found in children who have spent time in a neonatal intensive care unit. Stinton and Schaffer (2012) identified several factors associated with gallstone development. These include obesity, females
and over forty years old, and certain ethic groups, such as Caucasians, Mexican-Americans, and Native Americans who consume a diet high in saturated fats, trans-fats and processed foods.

Other causes of gallstones, besides diet, include prescription medications. When the liver detoxification processes are altered due to prescription medications, bile synthesis is altered resulting in increased concentrations of cholesterol in the bile. Other medications, particularly those containing estrogens such as hormone replacement therapy and birth-control pills also increase the formation of gallstones. Tamoxifen (Nolvadex), used in hormone replacement therapy is one of these drugs known to increase gallstones. Over a 5-year study the incidence of gallstones in those taking tamoxifen was 37.4% compared to 2% in those not taking the drug. Foods containing soy, because it contains phyto-estrogens has also been linked to gallstone formation. Pregnancy is also a risk factor for gallstones because of the increase in estrogen during pregnancy. Estrogen is known to suppress bile acids, this leads to the problem of too little bile to aid in fat digestion. Other drugs that contribute to gallstone formation include: cephalosporin ceftriaxone, octreotide, HMG CoA reductase inhibitors, and possibly other lipid lowering drugs (Pizzorono et al., 2008).

Since gallstones are observable by ultrasound imaging, many doctors find gallstones while performing ultrasound on pregnant women. It is very common for a woman to have digestion issues as the baby grows and makes less room for her stomach and other organs. Estrogen in the body is already increased due to the pregnancy. While most of these problems will decrease naturally after the baby is born, many doctors are pre-scheduling gallbladder removal surgeries for the women soon after the birth or even preforming cholecystectomy on the woman while she is still pregnant. Gallbladder removal is the second most common surgery in pregnancy, after appendectomy (Barone et al., 1999). While recovering from childbirth and
caring for a new human, an unnecessary abdominal surgery seems to not be in the best interest of the new mother.

According to *Nutrition Therapy and Pathophysiology*, 20 million Americans each year are affected by gallstones (cholelithiasis) and biliary tract diseases (diseases of the bile duct/tracts). This book also states that there are 500,000 surgeries to removes gallstones performed each year. Laparoscopic cholecystectomy (surgical removal of the gallbladder) is the most common treatment for gallstones. Laparoscopic surgery, as opposed to the conventional open cholecystectomy, has made gallbladder removal much more appealing for patients, partially because the scarring is less; however, laparoscopic cholecystectomy has been associated with significant complications including bile duct injuries (Mulagha & Fromm, 2000). Newer technology has led to a single-port cholecystectomy, going through the umbilicus, to avoid excess scarring. This has been shown to be associated with higher hospital costs and higher risk of incisional hernia (Alptekin et al., 2012).

Lithotripsy is a non-surgical method of dealing with gallstones. This method uses sound waves to break up large gallstones so that they can pass through the bile duct more easily. This can be done on an out-patient basis and is essentially non-invasive. While lithotripsy has proved to be effective especially with cholesterol saturated stones, it is also associated with high cost. In addition, although it is used frequently in other countries, such as Germany, it has not been approved by the FDA for gallstone therapy (Mulagha & Fromm, 2000). The article, Design and Application of a New Series of Gallbladder Endoscopes that Facilitate Gallstone Removal Without Gallbladder Excision, discusses a new technique developed by Chinese researchers (Chiao et al., 2012). This technique involves a scope with a basket on the end that is used to extract the gallstones and remove them without removing the gallbladder. There are also
medications containing ursodeoxycholic acid, which help dissolve stones. Administration of these, however, is only done for patients who may not survive surgery (Nelms et al., 2011) and their use is associated with negative gastrointestinal side effects (Gaby, A., 2009). Procedures such as this can prevent removal of the gallbladder; however, they do not solve the problem of why the patient was making gallstones to begin with. With these procedures that keep the gallbladder intact, “recurrence of gallstones after their disappearance and the development of biliary symptoms are lingering problems (Tsumita et al., 2001, p 94).” An intervention is needed to treat the problem -- not merely the symptoms--of cholelithiasis.

Poffenberer et al. (2011) discuss the fact that while the prevalence of gallbladder diseases in children is still less than that in the general population, it has become increasingly common. The authors concur that this is due to increased awareness and detection of gallstones, the rise in childhood obesity, and the lithogenic (gallstone forming) qualities of the modern diet. It is interesting that only 33% of children with gallbladder disease are asymptomatic, while 80% of adults with gallbladder disease are asymptomatic. Gallstones usually do not cause problems, so simply having one does not mean it needs to be removed. More and more doctors are operating on people who do not even have gallstones, which has been the classic reason for removing the gallbladder in the past (Appel et al., 2007).

There are long-term repercussions of gallbladder removal, technically termed cholecystectomy. Cholecystectomy leads to an increase in free cycling of bile acids because there is no longer a storage sac for the bile. Nervi and Arrese (2013) give examples of post-surgery complications. They claim that NAFLD (non-alcoholic fatty liver disease) is associated with cholecystectomy, but not with gallstones. This suggests that gallbladder removal may be a risk factor for NAFLD, and that the gallbladder and bile acids may play an important role in
metabolic regulation. The authors note that several studies have shown that, “bile acids are signaling molecules that modulate complex enterohepatic (circulation from the liver, to bile, to small intestine, to intestinal absorptive cells, and back to the liver) and systemic metabolic functions, as well as gallbladder mobility (p 960).” The gallbladder is important to controlling bile acid homeostasis within enterohepatic circulation, which this article claims, “may be relevant to whole-body metabolic homeostasis (p. 960).” The article says that the bile acids’ signaling mechanisms are altered in the absence of a gallbladder and that the lack of gallbladder could lead to suppression of hormonal factors that have important roles in lipid metabolism and metabolic homeostasis. One reason that the gallbladder is important in hormonal function is because fats are needed in the production of hormones. Fats are also vital as they are part of cell structure and are needed for the absorption of the fat soluble vitamins A, D, E, and K. Without proper digestion of fats, even if a person is consuming adequate amounts of these fat soluble vitamins, the body cannot absorb and use them for its functions. Deficiencies in these vitamins can lead to numerous problems with symptoms including impaired vision, depression, dry skin and eyes, bone loss from demineralization, and lack of proper blood clotting to name just a few (Andrews, 2013).

Cholecystectomy, but not cholelithiasis (gallstones) is associated with cirrhosis and elevated serum liver enzyme levels. The large number of cholecystectomies being performed, “may have a major impact on public health… the frequency of cholecystectomy determines high direct and indirect costs and represents a very high consumption of resources for society, constituting a major health burden (Nervi & Arrese, 2013, p 959.)”
In researching gallbladder function and disease, it is apparent that the modern American diet is a large contributing factor to gallbladder problems. While gallstones and gallbladders can be surgically removed, removal does not solve the problem of why the body was making the stones to begin with. In fact, the body can still make gallstones without a gallbladder. Nutrition therapy intervention offers a possible solution to the problem of gallstones disease. It is also less invasive and less expensive than surgery.

The textbook *Nutrition Therapy and Pathophysiology* recommends a diet low in fat to relieve symptoms of gallstone attacks. It also recommends smaller, more frequent meals and surgery to remove gallstones. The problems with these recommendations are that they also only deal with relieving symptoms and not solving the problem.

Some dietary fats, such as trans-fats and saturated fats have been correlated with the development of gallstones. The liver synthesizes cholesterol from saturated fats. A diet high in saturated fat increases the risk for gallstones and cholecystectomy. Trans-fats are fats that are formed through the process of hydrogenation or partial hydrogenation. This process takes a liquid fat, such as vegetable oil and converts it to a solid, such as margarine or shortening, to add to the hardiness and longevity of the product. These processed vegetable fats are commonly used as a substitute for saturated animal fats such as butter. It was believed, in the past, that margarine was the healthier alternative to butter; however time has shown excessive intakes lead to a deranged lipid profile, increased triglycerides, LDL and decreased HDL. In fact it has been noted that, “The adverse effect of trans-fatty acids on the ratio of total cholesterol to HDL-C was approximately twice that of saturated fat (Tsai et al., 2005, p 1014).” In a large cohort study it was observed that a higher intake of trans-fatty acids was associated with a higher risk of
gallbladder disease that was not accounted for by other potential risk factors, including other measured dietary variables (Tsai et al., 2005).

For individuals who no longer have a gallbladder, the processing of even essential fats is a problem. The answer for these people is not a fat free diet, as fat and cholesterol are essential for many body functions. What is needed is a way for the body to emulsify, break down and digest those fats without the help of a gallbladder. Even when the gallbladder is removed, the body still makes bile. The problem is that the body cannot store this bile without the gallbladder and also does not release it on demand when fats are consumed. Sometimes bile salts are prescribed to the patient as an aid to help with the emulsification of fats. However all bile salt supplements are not created equal. Standard Process, a whole food supplement company, makes a product named Cholocol that is recommended for patients post-cholecystectomy. This natural supplement is prescribed by many chiropractic and naturopathic physicians. It is taken with meals and has had huge success in relieving symptoms from fat maldigestion resulting from cholecystectomy. According to the Standard Process Clinical Reference Guide commentary on this product by John Courtney,

“Cholocol contains purified bile salt and is designed for bile stasis and gallbladder relief. It is for the bile-deficient patient. It is beef bile salts which have been purified by exposure to activated charcoal. Don’t confuse this product with refined extracts of bile salts, such as dehydrocholic acid. Cholocol is the whole bile substance. The herb, Collinsonia Root, has also been added to the product. Collinsonia supports the vascular system and lessens the likelihood of hemorrhoids and varicose veins, which can be aggravated if bile salts are given
alone. The main symptoms which indicate a need for Cholocol are light-colored stool, inability to tolerate fats or oils in the diet, and constipation—indicating an inability to metabolize fat (*Clinical Reference Guide*, 2012, p 18).”

In addition to reducing amounts of processed foods and supplementing with natural bile salts, food can also be used therapeutically to relieve gallbladder discomfort and reduce the likelihood of stone formation. A proper diet will help ensure optimal gallbladder function. According to a study noted in the July 1, 2004 edition of the *American Journal of Epidemiology*, women who eat vegetables to get their daily protein have a reduced chance of having gallbladder removal surgery in the future (*Good News*, 2004). Vegetable proteins include: Beans (legumes) packing a whopping 9-12 grams of protein per 100 grams; asparagus, cauliflower, spinach, and baked potatoes, providing 3 grams per serving; and corn, brussel sprouts and broccoli containing 2 grams per serving. There is some disagreement whether legumes are beneficial or harmful for the gallbladder. Pizzorono et al. write, “Diets rich in legumes with water-soluble fiber are linked to increased risk for cholesterol gallstones. Legumes increase biliary cholesterol saturation because of saponin content (Pizzorono et al., 2008, p 271).” While legumes may be a rich source of plant protein, further research should be done on their benefits for gallbladder patients. Gaby states in his article, “The possibility that legume consumption promotes the development of gallstones should be weighed against the known beneficial effects of legumes, which include improvements in blood glucose regulation and a reduction in serum cholesterol levels (2009).” Another possible objection to reliance on plant protein is that many consider it to be incomplete protein. Complete proteins are provided by animal sources of protein including muscle meats, dairy products, and eggs; however, animal sources of protein often are high in saturated fats.
Plant proteins are considered incomplete protein as they do not contain all of the essential amino acids in the optimal amounts or proportions; however, if a variety of these plant proteins are consumed along with whole grains, “complete” protein can be achieved.

The modern American diet is very low in fruit and vegetables. Plant foods also have an important detoxifying effect on the liver. This detoxification of the liver is one key factor in solving the problem of gallbladder disease. The article, Fruit and Vegetable Consumption and Risk of Cholecystectomy in Women, discusses the Nurses’ Health Study. This is a cohort study of 77,090 women 37-64 years of age monitoring fruit and vegetable consumption in relation to the risk of cholecystectomy. The findings of this study suggest a protective role for increased fruit and vegetable consumption against the risk of cholecystectomy in women (Tsai et al., 2006). Leafy green vegetables, citrus fruits, vitamin C-rich foods and cruciferous vegetables were shown to be inversely associated with risks. A similar study correlated increased consumption of peanuts and other nuts with a lower risk of cholecystectomy (Gaby, 2009).

Another study found that vitamin C supplementation is associated with reduced incidence of gallstones and appears to be protective against the development of gallstones (Walcher et al., 2009). The mechanism of action of vitamin C is that it is involved in the rate limiting of processing of bile acids by the liver. Many references cite vitamin C deficiency among the risk factors for gallstones. Where the amount of vitamin C supplements taken by the subjects is not listed in the article as the research was done by survey, it is probable that a diet rich in whole foods high in vitamin C would also be protective against gallstones. Vitamin C is one of the easiest vitamins to obtain from food. Foods high in vitamin C include: broccoli, brussel sprouts, cantaloupe, carrots, cauliflower, kiwi, oranges, papaya, red bell peppers, and strawberries (Vita Chart, 2014). These foods are readily available at most grocery stores and are a better choice
than most vitamin C supplements. Vitamin C supplements are mainly ascorbic acid, which is only the outer shell of the C-complex vitamin found in food sources. The whole C-complex also contains the P factor (bioflavonoids), which helps to maintain vascular integrity, vitamin K, which promotes prothrombin (which aids in coagulation of blood), and the J factors, which increases the oxygen-carrying capacity of the blood (*Clinical Reference Guide*, p 12).

Plant foods also provide ample fiber, which is another important recommendation for gallbladder health. Fiber lessens the solubility of cholesterol in the bile by binding the deoxycholic acid produced by gut bacteria from bile acids and excreting them through feces. Good choices of water-soluble fibers include: vegetables, fruits, pectin, buckwheat, and oat bran. A vegetarian diet is protective against gallstones as it is typically high in fiber, whereas animal proteins, such as casein in dairy tend to increase the formation of gallstones (*Pizzorono et al.*, 2008).

The article, *Effects of Various Food Ingredients on Gall Bladder Emptying*, discusses current research done using food ingredients to stimulate the release of bile to aid in fat digestion of foods consumed. Items tested included coffee, tea, milk, curcumin (from red peppers) and potato protease inhibitor. Fat and semi-skimmed milk caused the most volume change, with full-fat milk causing the greatest release of bile from the gallbladder (Marciani et al, 2013). Other researchers have noted that, “Gallstone patients have been shown to be characterized by a higher fasting and residual gall-bladder volume. It can be theorized that these changes may result in bile retention with a consequent risk of stone formation (*Mulagha & Fromm*, 2000, p 241).” Bile stasis, or lack of movement of bile due to poor signaling or improper diet, is one of the factors that initiate cholesterol stone formation (*Pizzorono et al.*, 2008). It seems logical that understanding and using therapeutically foods that stimulate gallbladder emptying can be an
Effective tool to aid in gallstone prevention. Prolonged dietary fat reduction, which is common in those trying to lose weight, can also lead to bile stasis as the gallbladder is not stimulated very often. At least 10 grams of fat are needed daily for proper gallbladder emptying (Pizzorono et al., 2008). Stokes et al. note, “weight cycling, in particular (i.e. weight that is lost and regained) increases gallstone risk, independently of body weight (2011).”

An interesting study researched the effects of the spices capsaicin (from red pepper) and curcumin (from turmeric), and their combination on mice. Curry powder, used in Indian cooking, contains both red pepper and turmeric as ingredients. Both spices are known for their hypolipidemic properties, including improving lipid profile and had been studied previously for their antilithogenic potential in mice. This study showed the combination to be beneficial in both the prevention and regression of cholesterol gallstones (Shuba et al., 2011). If these and other spices are effective in mice, and have been shown to increase gallbladder emptying time, including curry in the diet should be further studied in humans to show benefits in increasing gallbladder health.

Table beets are another commonly recommended food for a healthy gallbladder. One reason is that beets have high iron content. It has been shown in some studies that iron-deficient animals are more prone to gallstones (Gaby, 2009). The article, Liver-Protecting Effects of Table Beet During Ischemia-Reperfusion, lists several other benefits of beet consumption including: increased liver enzymes, increase in zinc and copper that protect liver cells and a decrease in short-chain fatty acids (Vali, L. et al., 2006). The bioactive agent betaine in beets, according to Dr. Royal Lee, “has been widely reported as a lipotropic agent—fat metabolism factor—and the contained betaine in beet leaf juice may be one of the main reasons why beet leaf juice has been useful in the relief of gallbladder congestion (Clinical Reference Guide, 2012, p 1). Standard
Process whole foods supplements have several products made from whole food beet and beet leaf juice that help with gallbladder symptoms. Betafood is one such product that, according to John Courtney, one of the primary original researchers for Standard Process, “tends to flush the bile route; it gets the bile moving (Clinical Reference Guide, 2012, p 1).” According to this research, beets, including the beet leaf, are wise foods to incorporate in to a preventative and restorative gallbladder diet.

Another, somewhat controversial remedy for gallstones, the Liver Flush, also called gallbladder flush. This remedy involves taking a combination of olive oil and lemon juice with a product containing sodium phosphate to stimulate the gallbladder to contract and release gallstones. The article, “Liver Flush: Help or Hoax?” written by Dr. E. McDonagh, D. O. whose patient did the liver flush monthly and documented the stones eliminated as a result. This patient claimed to be stone-free after 14 months. He claimed that after the flush his fatigue was gone, energy increased, digestion had normalized, vision was sharper, and cholesterol was lowered (McDonagh, E., 2009). Several recipes and regimens are available for this flush online and in various natural health books; however, according to Gaby, “if this treatment can promote the passage of gallstones, then it might cause a stone to become trapped in the common bile duct, potentially leading to a medical emergency. However, to this author’s knowledge, such an adverse effect has not been reported (Gaby, 2009, p 265).” While this may be a viable, non-invasive method to remove stones at home, caution should be taken. This flush should only be done while under the care of a physician who is familiar with your condition. According to Gaby, in one study upon chemical analysis these “stones” passed by the gallbladder/liver cleanse contained no cholesterol, bilirubin, or calcium. However, another study did document ultrasonic evidence of a reduction in the number of gallstones following the liver flush.
In conclusion, it is reasonable to suggest that there are nutritional preventative measures that can be taken to help reduce and prevent the prevalence of gallstone. The implementation of a diet designed to promote gallbladder health can help eliminate the need for future cholecystectomy.

Health Administrative Services

Book Proposal

Author Information

The author of Gallbladder Health and Nutrition is Catherine Sarchenko. Mrs. Sarchenko is finishing a Bachelor of Integrated Studies degree from Weber State University in Nutrition Education, Health Science, and Health Administrative Services. She is a certified Chiropractic Assistant through Logan College of Chiropractic in St. Louis, Mo. She and her husband, Dr. Richard Sarchenko, D.C., own and staff Salt Valley Chiropractic and Nutrition Clinic in Layton, Utah, where they strive to inspire and educate patients about whole food nutrition and natural health. Mrs. Sarchenko enjoys giving presentations at local health food stores on various health and nutrition topics. She never wants to stop learning. She understands, firsthand, the struggles in modern American society with eating a healthy diet and teaching future generations how to make good choices with their food. Mrs. Sarchenko plans to continue her education pursuing a double master’s degree in Health Administration and Business. This book is co-authored with her husband to include his clinical experience and recommendations as a chiropractic physician specializing in whole food nutrition.
Marketing Statement

Along with this book being available on the Selene River Press website and at Standard Process seminars and events, it will be promoted by the author visiting and speaking at libraries and bookstores, doctor’s offices, health food stores, and nutrition clinics. A website will be designed and dedicated to promoting the book and educating the public about the importance of the topic. Social media will be used, such as YouTube and Facebook, to promote and raise awareness for this book. The marketing force will consist of the author and the publishing company along with their respective resources, online and in person.

Rationale Statement

Elective gallbladder surgeries are the most common abdominal surgery in the United States and at an all-time high (Stinton & Shaffer, 2012). Most people know very little about their gallbladder, what it does, and why they need it. In general, people want to be educated about their health, bodies, and nutrition, especially if it means being able to avoid unnecessary surgeries. When the author discussed the gallbladder with several physicians at a nutritional seminar earlier this year, they felt that an informational book is needed so that patients, physicians, and nutritionist have a reference for educating about and promoting gallbladder health. The desire and intention is to provide an informative, yet simple explanation of the gallbladder, gallbladder disease, and gallbladder nutrition. The book is intended for the general public, with no previous medical terminology or education required to understand its contents. This book could be equally appreciated by all ages, seeking to gain an understanding of the functions of their body and the importance of this tiny accessory organ. It is important because of the high rate of gallbladder removal surgeries, the lack of knowledge of the general public about
their gallbladder and its functions, and because it offers less-invasive, natural solutions for some people who are having gallbladder discomfort.

**Situation Analysis**

Demographic and Psychographic characteristics of the market, competition, economic, and political climate:

The current market is one that will be receptive to this sort of education. The public is becoming fed up with the medical solutions of drugs and surgeries and is open to more natural, less invasive approaches to health. People want to be knowledgeable about their bodies and realize that they need to take their health into their own hands for important medical decisions. Studies have shown that many patients have a significant mistrust of the health care system and many patients are scared or frightened of surgical procedures so they do not want to have elective cholecystectomy (Abhishek, P. et al., 2014).

The cost of unnecessary surgeries on society and an already broken health system is something that trickles down to the whole population. Several studies have shown that cholecystectomy is not the most cost-effective solution to gallbladder disease. The study by Abhishek, P. et al shows that in older adults whose symptoms are tolerable, observation of the patient is more effective in maintaining quality of life and cost-effectiveness than cholecystectomy. Cholecystectomy is more expensive up front, but also in the long run due to complications and reduced quality of life. Imagine the benefits if this “observation” was paired with nutrition intervention to help these patients not only avoid surgery, but also take care of the symptoms by supplying the proper nutrition for a healthy gallbladder.

Single port cholecystectomy is the newest technology in gallbladder removal to decrease cosmetic results of scarring and incision; however the hospital cost of this procedure is 1.54
times more than laparoscopic gallbladder surgeries and has a much higher hernia rate (Alptekin, H. et al., 2012).

There are several risks associated with cholecystectomy. These include: wound infection, retained bile duct stone requiring endoscopic retrograde cholangiopancreatography extraction, and urinary tract infection (Alptekin, H. et al., 2012). Bile leak and bile duct injuries have also been reported as common risks.

Due to the high cost and risks of cholecystectomy, less-invasive alternative treatments, if available and appropriate, are appealing to many gallbladder patients.

**Threats**

There are a few threats to the success of this book including:

- Misinformation from the internet or other sources
- Patients who are not willing to change their diet
- The conventional health care system, in addition to health insurance reimbursements, which do not support preventative measures as much as surgery and drugs
- The marketing budget of alternative health care books and products in contrast to the marketing budget of Big Pharma and conventional medicine.

**Financial capabilities**

This book will be sold for an average of $10. It will be available in paperback only. Royalties will be paid to the author (usually 10-15%) and the rest will go to the publishing company for its expenses.

If the book is not endorsed and supported by a publishing company, the author will have to invest the money to have this book produced independently. The expense of having this book printed independently will be:
For a 60 page book, full color pictures on a semi-gloss white paper, 5 by 8 inch pages, with paper back cover, publishing costs are estimated at $11.90 per book for 500-1000 copies. This is too expensive to be retailing the book for $10.00. A more realistic scenario would be that the book needs to be black and white interior on crème colored paper, which would bring the expense down to $2.59 per book for publishing costs (fastpencil.com, 2014). This would leave $7.41 profit per book for the author’s time and advertising expenses. The lack of colored illustrations and photographs would draw away from the effectiveness and the appeal of the book as an appealing educational tool, therefore working through a publishing company would probably help to produce a full-color book with greater possibility for sales. A sale of 1000 copies at $7.41 per copy, if published by the author, would amount to a profit of $7,410.00. The publishing company would have to sell 74,100 for the author to make the same amount if they were being compensated at 10% commission. It is the author’s intention to submit the book to Selene River Press for publishing consideration. If it is not accepted, the author will independently publish 500 books at a cost of $1295.00 and seek to sell these online and in person through doctor’s offices and by giving talks at local venues.

**Manuscript Sample**

Table of Contents:

Chapter 1: What is the Gallbladder?

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Chapter 3: Symptoms/Risk Factors of Gallbladder Dis-ease

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Chapter 6: Do I Really Need my Gallbladder? (Long-Term Consequences of Not Having a Gallbladder)

Chapter 7: Functional Medicine and Whole Food Supplementation

Chapter 8: Recipes for Gallbladder Nutrition

Outline

Chapter 1: What is the Gallbladder?

- This chapter will share basic information in anatomy and physiology. It will include a couple simple, fun, and colorful cartoon drawings of the gallbladder and its location in the body.

Chapter 2: What is Gallbladder Disease?

- Chapter 2 will discuss gallbladder diseases such as gallstones, gallbladder cancer, and other common maladies of the gallbladder. This will shed light on why so many people are getting gallbladder surgery.

Chapter 3: Symptoms/Risk Factors of Gallbladder Dis-ease

- This chapter will list and describe common symptoms of gallbladder trouble and various risk factors associated with gallbladder disease and discomfort. It will go into the problem with the Modern American Diet contributing to gallbladder issues, discuss the function of the liver and how liver congestion plays a role in gallbladder function, and touch on the structural influences of the body on gallbladder health from a chiropractic perspective.

Chapter 4: Surgical/Non-surgical Options

- Chapter 4 will discuss common surgical procedures, emergency surgical procedures, and non-surgical alternatives for non-emergency situations
Chapter 5: Current Research Findings in Gallbladder Health and Nutrition

- Chapter 5 will share current information and research being done on gallbladder health, particularly pertaining to nutrition and prevention.

Chapter 6: Do I Really Need my Gallbladder? (Long-Term Consequences of Not Having a Gallbladder)

- This chapter will explain that all organs, like the appendix, have a purpose in the body, sometimes it just takes doctors and researchers a while to figure it out. The chapter will discuss long-term consequences of gallbladder removal and why this organ is worth trying to save, if possible.

Chapter 7: Functional Medicine and Whole Food Supplementation

- Chapter 7 will discuss ours and others’ clinical findings and experience in treating stressed gallbladders with functional foods and whole food supplements.

Chapter 8: Recipes for Gallbladders Nutrition

- This chapter will share practical recipes using the recommended functional foods so that the general public can incorporate them into their diets as a preventative to future surgeries and gallbladder symptoms. It will also provide recipes to improve the health of the people who no longer have their gallbladder.
Excerpt from Book:

Introduction

The gallbladder is often an overlooked and misunderstood organ. Unless it has been surgically removed, everyone has a gallbladder; however, many people know very little about this organ. Gallbladder removal surgery has become the number one elective abdominal surgery in the United States over the past decade. The purpose of this book is to inform about the gallbladder, educate on how to keep it healthy, and hopefully help people to avoid unnecessary surgery.

Chapter 1

What is the Gallbladder?

The gallbladder is a small accessory organ of the liver. It is located in the mid to upper right quadrant of the front of the chest, under the ribcage. A typical healthy gallbladder is roughly the size of an adult thumb. The gallbladder is part of the biliary system in the body which also includes the liver and bile ducts. The liver makes the bile and it is transported to the gallbladder via the bile ducts. Bile is a digestive juice produced in the liver comprised of bile salts, cholesterol, and broken down red blood cells (bilirubin).

The purpose of bile is to emulsify the fats in the digestive tract, so that they can be broken down and used by the body for nutrition and other important functions like building hormones and brain function. Think of bile like a dish-soap that breaks down grease. This breaking down of the fats into fatty acids is important for our bodies to be able to use the fat soluble vitamins from our food, which include vitamins A, D, E, and K (more about the importance of this in chapter 6).
The gallbladder is the storage space for bile. It also concentrates the bile by removing 80-90% of the water from it. When signaled by the consumption of fats, the gallbladder released this concentrated bile, on demand.

Bile, as it is alkaline, also serves the purpose of neutralizing stomach acid as food moves out of the stomach and into the small intestine.

The liver is our detoxifying organ in the body. Toxins from what we eat and from our environment are taken care of in the liver. These toxins are then passed onto the gallbladder and excreted from our bodies via the bile.

Bile is also essential in regulating blood sugar. When fats are broken down and digested this helps us avoid blood sugar spikes from the digestion of carbohydrates. It is common for people who are diabetic to also have gallbladder problems.

When a person understands how many functions the gallbladder serves in the body it is easier to understand why gallbladder removal may not always be the best choice for someone’s health.

Without a gallbladder, the liver does not stop making bile, however there is no storage pouch for it, it is not concentrated, and it is not released on demand. If someone has gallbladder and digestive problems, removing the gallbladder will not fix the problem, it actually can create many more health issues.

Chapter 2
What is Gallbladder Disease?

The medical term for gallbladder disease is cholecystitis, or inflammation of the gallbladder. This inflammation usually occurs when a gallstone is stuck in the bile duct.
**Cholelithiasis** is the *presence of gallstone*. The presence of gallstones does not mean a person has a disease or that they need to have their gallbladder removed. Most people have gallstones and, in adults, 80% of gallstones are asymptomatic. That means that the body passes them without the person’s knowledge. It is important to clarify the difference between disease and dis-ease. Dis-ease is discomfort; a condition of not all body systems not working as they are meant to. If left untreated long enough, dis-ease may progress to disease. Having gallstones is not a disease; however, it may cause dis-ease in some people. Many people have gallstones and never know it. It does not seem to affect them; however, for the people that cholelithiasis or cholecystitis are symptomatic, there needs to be an intervention so that this does not turn into a disease.

In the United States, most gallstones are made up of cholesterol. Cholesterol is an important component of bile; however, it is the super-saturation of cholesterol in the bile that makes the bile thick and sluggish. Thick, stagnant bile can crystalize and form stones. These stones can continue to get larger from further build-up and get large enough to block the bile duct. When the gallbladder contracts as it is stimulated by the consumption of fat-containing foods, if a gallstone is too large to pass through the bile duct, this can lead to extreme pain, sometimes called a “gallbladder attack.”

This super-saturation of cholesterol in the bile is very common in modern, western diets. Some dietary fats, such as trans-fats and saturated fats have been correlated with the development of gallstones. Trans-fats are fats that are formed through the process of hydrogenation or partial hydrogenation. This process takes a liquid fat, such as vegetable oil and converts it to a solid, such as margarine or shortening, to add to the hardiness and longevity of the product. These processed vegetable fats are commonly used as a substitute for saturated
animal fats such as butter. It was believed, in the past, that margarine was the healthier alternative to butter; however time has shown excessive intakes lead to a deranged lipid profile, increased triglycerides, LDL and decreased HDL.

Other causes of gallstones, besides diet, include prescription medications. When the liver detoxification processes are altered due to prescription medications, bile synthesis is altered resulting in increased concentrations of cholesterol in the bile. Other medications, particularly those containing estrogens such as hormone replacement therapy and birth-control pills also increase the formation of gallstones.

Tamoxifen (Nolvadex), used in hormone replacement therapy is one of these drugs known to increase gallstones. Over a 5-year study the incidence of gallstones in those taking tamoxifen was 37.4% compared to 2% in those not taking the drug. Foods containing soy, because it contains phyto-estrogens have also been linked to gallstone formation. Pregnancy is also a risk factor for gallstones because of the increase in estrogen during pregnancy. Estrogen is known to suppress bile acids, this leads to the problem of too little bile to aid in fat digestion. Other drugs that contribute to gallstone formation include: cephalosporin ceftriaxone, octreotide, HMG CoA reductase inhibitors, and possibly other lipid lowering drugs (Pizzorono et al., 2008).

Since gallstones are observable by ultrasound imaging, many doctors find gallstones while performing ultrasound on pregnant women. It is very common for a woman to have digestion issues as the baby grows and makes less room for her stomach and other organs. Estrogen in the body is already increased due to the pregnancy. While most of these problems will decrease naturally after the baby is born, many doctors are pre-scheduling gallbladder removal surgeries for the women soon after the birth or even preforming cholecystectomy on the woman while she is still pregnant. Gallbladder removal is the second most common surgery in
pregnancy, after appendectomy (Barone et al., 1999). While recovering from childbirth and caring for a new human, an unnecessary abdominal surgery seems to not be in the best interest of the new mother.

We have treated many pregnant women in our clinic, some who have gallbladder discomfort that is exacerbated by pregnancy. These patients have been successfully treated with whole food nutrition to relieve their discomfort. When I refer to “whole food nutrition” I am referring to food that has not been processed, pasteurized, or chemically altered. Food as close to its natural state as possible. Most vitamins are synthetically made in a lab and do not contain whole-food complexes. At our clinic we treat using Standard Process products. They are organically grown, whole food supplements that allow us to administer therapeutic doses of food nutrients to patients who are nutritionally deficient. This allows us to determine if it is a nutritional problem that is causing the problem. In the meantime, we educate patients on food sources for the specific nutrients and help them to incorporate these foods into their regular diet. If this nutritional intervention is successful, the patient can avoid more invasive drugs and surgeries. After a condition is stabilized, and if a patient is willing to alter their eating habits to improve their nutrition, the supplementation is rarely needed long term.
Marketing Data

Market sizes are now close to limitless due to the internet. The number of people affected by gallbladder disease is currently: an estimated 20 million Americans (Hoffman, 2011). The numbers of people who have undergone cholecystectomy is 500,000 per year (Nelms et al., 2014).

The largest demographic of those with gallbladder disease are women, those over forty years old, those who are overweight or obese, and those from Caucasian, Mexican, or Native American heritage who are shown to be the largest group consuming processed foods. Gallstone prevalence increases with age. Fifty-seven percent of women ages 70-79 have a history of cholecystectomy or sonographic evidence of gallstones (Abhishek et al., 2014). At the age of 60, one-fifth of the population has gallstones (Mulagaha & Fromm, 2000).

List of competing books already on the market:

Similar books on the market have not been easy to find. A search uncovered other books regarding digestion, but not specific to the gallbladder and informing of its unique importance and role in the body.

There are many blogs on the internet regarding gallbladder health and nutrition; however the book format of this project will lead to greater credibility than an internet blog.

One book that may contain some similar information is, “Are You Stoned” by Claude M. Lewis, Edith Hiett and Leon Hiett; however, this book is out of print and a copy of it could not be found.

BOOK SUMMARY: The following information on gall stones and the gall bladder is from the excellent book “Are you ‘Stoned’?” by chiropractor Claude M.
Lewis, Edith Hiett and Leon Hiett (currently out of print).


Due to this lack of a similar resource, this book is a pioneer in its field in helping educate the public about the gallbladder and create a better appreciation for it.

**Target Market**

While the statistics show that gallbladder disease affect the overweight, the older, and females more than males, those of all ages, and socioeconomic status are having gallbladder problems. If this book is picked up by Selene River Press publishing company, the target market will be physicians, nutritionists, and consumers who are already exposed to this company’s books through its website and seminars. This informational book is designed to be made available to patients as a resource as reading material in a waiting room or lending library of a doctor’s office. It can save time for the doctor or nutritionist in giving patients reading material to take home and read to become more informed about this body system and how they can eat a healthier diet for their gallbladder function and comfort. This book will be available online and at seminars nationally.

**Conclusion**

In conclusion, it is evident that there may be preventative, alternative, and less invasive options to elective cholecystectomy. Understanding the role of the gallbladder in the body is important for patients to seek out alternative treatments for gallbladder disease. Nutrition is a vital part of gallbladder health and recovery. Particular attention to, and knowledge of, nutrition is important for those with gallbladder issues or who have had a cholecystectomy. The book produced as a result of this research will be a valuable tool for practitioners and patients to help reduce the number of non-emergency surgeries in the future.
References


