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Basic client information:

- John, Male
- 42 years old
- No significant medical history
- 15 lbs above normal weight (around 6.8 kg)
- Not on any medications or nutritional supplements
- Denies any food allergies or intolerances
- Good, low stress workplace
- Good relation to family and friends(1).

Symptoms:

- Nausea
- Indigestion (dyspepsia)
- Belching
- Wind (flatus)

The symptoms remains between 2-3 hours after eating his lunch meal (1).

Problem:

- High amount of fat consumed with his fast food meal at his favourite restaurant during lunch, which has been confirmed by his doctor.
- The size of his lunch meal is big, and he eats it fast to be able to be back at work on time after his lunch break(1).

1. **Which particular organs in the digestive system are involved in fat digestion? How do these organs work together to digest fat.**

The digestive system, known as the gastrointestinal tract, consists of the mouth (oral cavity), with its teeth, grinding the food, and the tongue, which kneads he food and mix it with saliva to form a bolus. Then there is the throat (pharynx); the esophagus; the stomach; the small intestine, which consist connectively of the duodenum, the jejunum, and the ileum; and the large intestine (colon), consisting of the cecum, the ascending colon, the transverse colon, the descending colon, and the sigmoid colon, ending with the rectum. There are several glands contributing with digestive juices; the salivary glands, the gastric glands, the pancreas, the liver, the gallbladder and bile ducts. All of these organs and glands contribute to the physical and chemical breaking down of ingested food and to the eventual elimination of nondigestible wastes(1,2).

I will below give few details over each system part of the digestive system as mentioned above.

Oral cavity:

Chewing is the first mechanical process to which food is subjected. Movements of the lower jaw in chewing are brought about by the muscles of mastication. Chewing is not the most essential part of

emphasise on the importance of being physical active in his daily life, the difference is that exercising is a specific activity to develop or maintain ones level of fitness(26). For most people, exercising means workouts that is involving a gym, equipment or special clothing. Physical activity is defined as bodily movement that requires energy expenditure. By being physical active John would burn calories and improves his body's ability to use insulin. With our current lifestyle; driving, public transport, sitting at a desk and working we have eliminated many of the physical demands of daily living, in Johns case we need to make physical activity part of his daily routines(27), find opportunities for activity. It can be difficult with Johns work to find the time to add exercise to his schedule, but he is much more likely to succeed and sustain his lifestyle changes if he could find a way to integrate more physical activity into his daily routine(27). This could be simple suggestions such as:

- Get off the bus one stop earlier
- Walk to the supermarket when grocery shopping
- Stand up and move around while making phone calls or take a break every 30 minutes – 1 hour.
- Cut back on e-mails and deliver the message in person if possible.
- Taking the stairs instead of the elevator.
- Park a bit further away from the supermarket or work place.
- Take a walk around the building at lunch or when taking a break at work.

It is important to set achievable goals for John, as he is not used to being physical active, there are also ways to make it a bit more fun, he could start swimming, bowling, or play tennis. Go to a museum or art gallery. Gather some friends or colleagues and walk together a lunch break at work or start a walking club. As he is not exercising at the moment I would recommend for him to start slowly and increasing his time until he can do a total of 30 minutes of moderate exercise per day. A pedometer could be an example of a tool to help him measure how much change this makes to his daily routine(27). If John is able to, it would be an idea to start in a gym under supervision from an instructor where he might feel a bit more secure that what he is doing is correct and to workout at a correct heart rate level, as a physiotherapist, I would be able to take him there myself and make him a tailored program. According to government recommendation, adults aged 19-64 should try to be daily active with at least 150 minutes of moderate activity such as cycling or walking fast a week and strength exercise on at least two days a week(28). There are many health benefits of exercising and being physical active on a daily basis, it lowers the rate for coronary heart disease, high blood pressure, stroke, type 2 diabetes, metabolic syndrome, colon and breast cancer, and depression(29). Physical inactivity on the other hand increases the risk of heart disease and stroke by 50%. Obesity is another risk factor, which increases cardiovascular disease and make us predisposed to diabetes, diabetes is also a risk factor for cardiovascular disease(10

Reference:

1. Blackford Centre, Module 2; Digestion and anatomy page 1-23.
2. Hightower C, Nicholas Carr. Senior Consultant, Department of Gastroenterology, Scott and White Clinic and Scott and White Memorial Hospital, Temple, Texas. Human digestive system. Enctclopaedia Britannica. 11/18/2015. Available From: http://www.britannica.com/science/human-digestive-system/Intestinal-gas
3. Herbert M. Shelton Hygienic System Vol. II – Orthotrophy. Ebook. Dr. Shelton's Health School 1975. Available From: https://books.google.co.uk/books?id=vuhO6-