

Cancer Association of South Africa (CANSA)

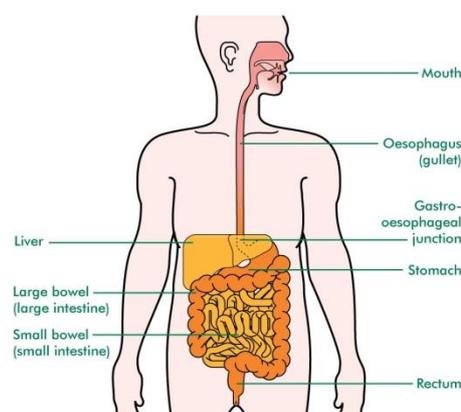


Fact Sheet on Nutritional Guidelines for Individuals Diagnosed with Cancer of the Oesophagus

Introduction

The oesophagus, commonly known as the food pipe or gullet, consists of a fibromuscular tube through which food passes, aided by peristaltic contractions, from the pharynx to the stomach. In humans, the oesophagus is usually 18–25 centimetres long. During swallowing the epiglottis tilts backwards to prevent food from going down the larynx and lungs. The oesophagus travels behind the trachea and heart, passes through the diaphragm and empties into the uppermost part of the stomach.

[Picture Credit: Oesophagus]



The wall of the oesophagus from the lumen outwards consists of mucosa, submucosa (connective tissue), layers of muscle fibres between layers of fibrous tissue, and an outer layer of connective tissue. The mucosa is a stratified squamous epithelium of around three layers of squamous cells, which contrasts to the single layer of columnar cells of the stomach. The transition between these two types of epithelium is visible as a zig-zag line. Most of the muscle is smooth muscle although striated muscle predominates in its upper two thirds. The stomach has two muscular rings or sphincters in its wall, one at the top and one at the bottom. The top sphincter helps to prevent reflux of acidic stomach content back into the oesophagus.

The oesophagus has a rich blood supply and vascular drainage. Its smooth muscle is innervated by involuntary nerves (sympathetic nerves via the sympathetic trunk and parasympathetic nerves via the vagus nerve) and in addition voluntary nerves (lower motor neurons) which are carried in the vagus nerve to innervate its striated muscle.

The oesophagus may be affected by gastric reflux, cancer, prominent dilated blood vessels called varices that can bleed heavily, tears, constrictions, and disorders of motility. Clinical investigations include X-rays when swallowing barium, endoscopy and CT scans.

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

April 2021

Page 1

Deftereos, I., Kiss, N., Isenring, E., Carter, V.M. & Yeungm J.M. 2020.

Background: Malnutrition is highly prevalent in patients with Upper Gastrointestinal (UGI) cancer and is associated with poor outcomes. However, there are no evidence-based guidelines for nutrition support specific to UGI cancer surgery.

Methods: Databases including MEDLINE, PUBMED, CINAHL, Web of Science, Cochrane Central and Clinicaltrials.gov were systematically searched. Abstracts of studies investigating the effect of preoperative nutrition support on nutritional status, functional status, body composition, quality of life and treatment outcomes in adult patients undergoing oesophageal, gastric or pancreatic cancer resection were identified. Screening of studies, quality assessment using the Downs and Black checklist, data extraction, and appraisal of evidence using GRADE were performed by two reviewers. Due to heterogeneity of the studies, results were synthesised narratively. The protocol was registered in PROSPERO (CRD42018111930).

Results: Nine studies with a total of 442 oesophageal and 418 gastric patients were included. Individualised dietary counselling, and enteral feeding in neoadjuvant therapy for oesophageal cancer demonstrated positive effects for weight maintenance and surgical complications, however the GRADE evidence quality was very low. Preoperative nutrition support in gastric cancer decreased the incidence of surgical site infections, length of stay and hospital costs, but GRADE assessment was unable to be completed due to only one study reporting on each outcome measure.

Conclusions: This review demonstrates the lack of strong evidence to determine the most optimal methods of nutrition support prior to UGI cancer resection. Current surgical oncology guidelines should be utilised until further research from high quality trials enable the development of specific clinical practice guidelines.

Sun, Z.W., Jia, J., Yang, Y., Liu, C.L., Xiao, Y.J., Yu, J. & Zhang, X.D. 2020.

Objective: To assess the impact of enteral nutrition support on response and toxicity of the first-line chemotherapy in those patients with advanced or metastatic esophageal cancer.

Methods: We collected the clinical data of 118 patients with unresectable advanced or metastatic esophageal cancer who received the first-line chemotherapy in our center from July 2014 to December 2016. All these 118 esophageal cancer patients were then divided into two groups: the nutrition group (received enteral nutrition support in addition to chemotherapy) and the control group (received chemotherapy only). Differences were analyzed before and after chemotherapy in each of the nutritional indicators including Karnofsky performance status (KPS), weight, body mass index (BMI), hemoglobin (Hb), number of lymphocytes (Lymph), total protein (TP), albumin (Alb), triglycerides (TG), total cholesterol (TC) in both groups. And differences of the efficacy and toxicities of the first-line chemotherapy between the two groups were also analyzed.

Results: (1) Weight, BMI and Hb were all significantly decreased after chemotherapy in the control group ($P < 0.001$), while there was no significant change of weight and BMI in the nutrition group, just with Hb decrease only. However, there was no significant change of all the other nutrition indicators after chemotherapy in both groups. (2) Compared with the control group, the nutrition group had significantly lower incidence of grade 3 to 4 hematologic toxicities after chemotherapy (15.4% vs. 42.1%, $P = 0.004$). In addition, the incidence of grade 3 to 4 nonhematologic toxicities after chemotherapy was also lower in the nutrition group but without statistical significance (0 vs. 9.2%, $P = 0.123$). Logistic regression model was then used for multivariate analysis to identify the factors that affected the toxicity of chemotherapy in these patients, and the results showed that nutrition therapy was an independent influencing factor of grade 3 or higher hematological toxicity after chemotherapy in the patients with esophageal cancer ($P = 0.008$, $RR = 6.048$, $95\%CI: 1.589-23.027$). (3) The response rate of chemotherapy between the control group and the nutrition group had not significant difference.

Conclusion: Enteral nutrition support in addition to chemotherapy could improve nutrition status and reduce toxicity of chemotherapy in advanced or metastatic esophageal cancer patients.

Cancer of the Oesophagus

Cancer of the oesophagus, also known as oesophageal cancer, is an uncommon but serious type of cancer that affects the oesophagus (gullet).

Oesophageal cancer does not usually cause any symptoms in the early stages when the tumour is small. It is only when the tumour gets bigger that symptoms tend to develop. One of the main symptoms of oesophageal cancer is difficulty swallowing (dysphagia). This problem may contribute to weight loss which is another common feature of the condition.

Eating Tips Before, During and After Cancer Treatment

There is no way to know if one will have eating problems and, if so, how bad they will be. One may have just a few problems or none at all. In part, this depends on the type of cancer one has, where it is in one's body, what kind of treatment one has, how long treatment lasts, and the doses of treatment one receives.

Things to do and think about before starting cancer treatment

Until treatment starts one will not know what, if any, side effects or eating problems one may have. If you do have problems, they may be mild. Many side effects can be controlled. Many problems go away when cancer treatment ends.

- Think of the cancer treatment as a time to get well and focus just on self.
- Eat a healthy diet before treatment starts. This helps to stay strong during treatment and lowers one's risk of infection.
- Go to the Dentist. It is important to have a healthy mouth before starting cancer treatment.
- Ask a Doctor, Professional Nurse, or Registered Dietitian about medicine that can help with anticipated eating problems.
- Discuss fears and worries with the doctor or nurse. He or she can discuss ways to manage and cope with these feelings.
- Learn about cancer of the oesophagus and its treatment. Many people feel better when they know what to expect.

Ways to get ready to eat well

- Fill the refrigerator, cupboard, and freezer with healthy foods. Make sure to include items you can eat even when you feel sick.
- Stock up on foods that need little or no cooking, such as frozen dinners and ready-to-eat cooked foods.
- Cook some foods ahead of time and freeze in meal-sized portions.
- Ask friends or family to help you shop and cook during treatment. Maybe a friend can set up a schedule of the tasks that need to be done and the people who will do them.

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

April 2021

- Talk with a Doctor, Professional Nurse, or Registered Dietitian about what to expect.

Ways to get the most from foods and drinks during cancer treatment

During treatment, one may have good days and bad days when it comes to food. Here are some ways to manage:

- Eat plenty of protein and kilojoules when possible. This helps one keep up one's strength and helps rebuild tissues harmed by cancer treatment.
- Eat when one has the biggest appetite. For many people, this is in the morning. One might want to eat a bigger meal early in the day and drink liquid meal replacements later on.
- Eat those foods that one can, even if it is only one or two items.
- Stick with these foods until one is able to eat more.
- One might also drink liquid meal replacements for extra kilojoules and protein.
- One must not worry if one cannot eat at all some days. Spend this time finding other ways to feel better, and start eating when one can.
- Inform the treating doctor if unable to eat for more than 2 days.
- Drink plenty of liquids. It is even more important to get plenty to drink on days when no feeling like eating. Drinking a lot helps one's body get the liquid it needs.
- One should take between 30 and 35ml of fluid per kilogram of body weight per day. Environmental factors such as heat may affect the amount of fluid needed.

Taking special care with food to avoid infections

Some cancer treatments can make one more likely to get infections. When this happens, one needs to take special care in the way one handles and prepares food. Here are some ways:

- Keep hot foods hot and cold foods cold. Put leftovers in the refrigerator as soon as one has done eating.
- Scrub all raw fruits and vegetables before eating them.
- Do not eat foods (like raspberries) that cannot be washed well. One should scrub fruits and vegetable which have rough surfaces, such as melons, before cutting them.
- Wash hands, knives, and counter tops before and after preparing food. This is most important when preparing raw meat, chicken, turkey, and fish.
- Use a different cutting board for meat and one for fruits and vegetables.
- Thaw meat, chicken, turkey, and fish in the refrigerator or defrost them in the microwave immediately before preparing them. Do not leave them sitting out.
- Cook meat, chicken, turkey, and eggs thoroughly. Meats should not have any pink inside. Eggs should be hard, not runny.
- Do not eat raw fish or shellfish, such as sushi and uncooked oysters.
- Make sure that all of juices, milk products, and honey are pasteurised.
- Do not use foods or drinks that are past their freshness date.
- Do not buy foods from bulk bins.
- Do not eat at buffets, salad bars, or self-service restaurants.
- Do not eat foods that show signs of mould. This includes mouldy cheeses such as bleu cheese.

Special diets, vitamins, minerals and supplements

- Talk with the treating Doctor, Professional Nurse, or Registered Dietitian before going on a special diet or taking any vitamins, minerals or supplements.
- To avoid problems, be sure to follow their advice.

Diet and Nutritional Guidelines for Individuals Diagnosed with Cancer of the Oesophagus

This type of cancer can narrow the oesophagus. This can make it tricky or painful to swallow. Treatment can also make it harder for some patients to get proper nutrition. Working with a registered dietitian can help. This member of the care team can help with the following:

- Loss of appetite. This is common during treatment with cancer medicines.
- Dryness and narrowing of the throat and oesophagus. This can happen from radiation.
- Not being able to swallow while recovering from surgery.

Good nutrition is important - especially if one has cancer. Treatment for cancer, and cancer itself, can affect one's appetite and how the body digests, absorbs and uses food. Cancer-related malnutrition can make one tired, weak and unable to receive the treatments one needs to get better.

Avoid all alcoholic beverages – drinking alcohol increases the risk of oesophageal cancer. The chance of getting oesophageal cancer goes up with more consumption of alcohol. Alcohol affects the risk of the squamous cell type more than the risk of adenocarcinoma.

Combining smoking and drinking alcohol raises the risk of oesophageal cancer much more than using either alone. Alcohol is a Group 1 cancer causing agent according the International Agency for Research on Cancer (IARC) and is best avoided.

Smoking – the use of tobacco products, including cigarettes, cigars, pipes, and chewing tobacco, is a major risk factor for oesophageal cancer. The more a person uses tobacco and the longer it is used, the higher the cancer risk. Someone who smokes a pack of cigarettes a day or more has at least twice the chance of getting adenocarcinoma of the oesophagus than a non-smoker. The link to squamous cell oesophageal cancer is even stronger. The risk of oesophageal cancer goes down if tobacco use stops.

Eating when swallowing is difficult – patients need to eat soft foods. Make sure to eat slowly and avoid eating late in the day. Have plenty to drink during and after meals to soften the food and prevent blockages. Eating smaller amounts more often is easier than having large amounts.

Soft diet suggestions - a soft diet can help one eat more comfortably. Try scrambled egg, soups and well cooked pasta. Patients can also:

- use sauces and gravies to moisten food and make it easier to swallow
- soften meat and vegetables with long, slow cooking
- finely chop meat and vegetables in a food processor before or after cooking
- blend or process meat or vegetable casseroles or curries to make soups

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

April 2021

- make fruit smoothies in a blender
- try tinned fruit and add custard or cream
- have ice cream, yoghurts and mousse

Eat foods high in kilojoules and protein. These include whole, full fat dairy products, nut products, and meats. Examples include milkshakes, smoothies with protein powder, peanut butter, beans, eggs, cheese, and yogurt.

Foods to avoid -avoid foods that are hard to swallow and might stick in one's throat, like

- raw fruit and vegetables
- tough meat
- soft, doughy bread

Use a blender to process solid foods.

How to build up one's body - one can help to maintain one's weight by boosting kilojoules in everyday foods. One can:

- have porridge for breakfast – add syrup or sugar and cream
- make instant soups or gravies with milk instead of water
- mix mashed potato with an egg or grated cheese or cream
- make instant coffee with all milk
- drink liquid food supplements such as Ensure plus and Fresubin and sip them throughout the day
- make ice lollies out of smoothies or liquid food supplements

Increase protein consumption - increase the amount of protein by:

- adding a couple of teaspoons of dried milk powder to each pint of milk to use like ordinary milk for drinking and cooking
- adding protein powders and high energy powders to everyday foods

Ask a registered dietitian for advice on what powders or supplements to use – some are available on prescription.

Nutrition support - during the various treatment modalities, whenever inadequate nutritional intake is observed, nutrition support options must be evaluated.

Diet modification – dysphagia significantly impairs food intake. However if voluntary oral food intake is still possible, it should be encouraged and maintained. Small portions of easy to chew foods, aided by sipping liquids slowly may improve tolerance. Puréed and moist foods are also a helpful tool before resorting to full liquid diets.

Oral supplements – are particularly useful in the first stages of dysphagia. Either commercial or home prepared, oral supplements can contribute to sustain adequate nutrient intake and slow weight loss, malnutrition and wasting.

Small frequent amounts of neutral liquid supplements are particularly well tolerated by patients suffering the side effects of chemotherapy (stomatitis, nausea, vomiting) and radiotherapy (esophagitis, odynophagia). Oral supplements are also an easy means of increasing both energy and protein intake.

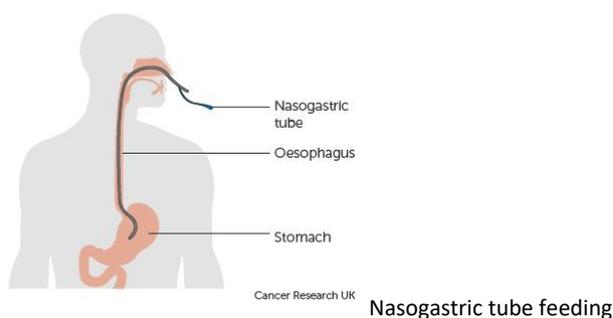
Enteral feeding – the least invasive method of nutrition support is usually the first option for patients with severe dysphagia. However, taking into account the patient's life expectancy, a percutaneous endoscopic gastrostomy (PEG) is the preferred solution. Whenever there is an increased risk of reflux or aspiration a percutaneous endoscopic jejunostomy (PEJ) is the safe choice.

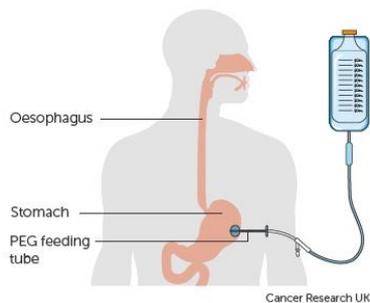
Following oesophagectomy or oesophagogastrrectomy, early postoperative enteral feeding is necessary. Planned placement of a feeding jejunostomy during surgery allows for early postoperative feeding, with preservation of gut function and improved wound healing. Jejunal feeding is both effective and cost efficient in the perioperative period, as well as in the long-term support of esophageal cancer patients.

Early enteral feeding can start within the first 24 hours following surgery, and isotonic formulas are very well tolerated even at full strength, provided they are delivered by pump, with small volumes at a slow infusion rate. Transition to oral intake should be carefully monitored whenever it has been deemed possible.

Parenteral nutrition - should only be considered when all other nutrition support options have been exhausted. However it may often be the right course of action in the case of tracheoesophageal fistulas.

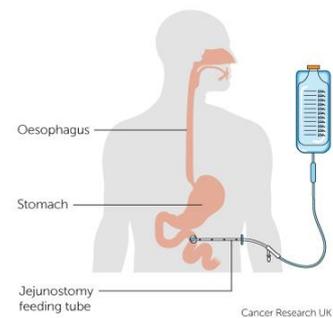
Feeding tubes – some individuals may need a feeding tube down their nose or into their small bowel if they cannot eat and drink enough.





Percutaneous endoscopic gastrostomy tubes (PEG tube)

Percutaneous endoscopic jejunostomy tubes (JEJ or PEJ tubes)



Tube feeding at home - some patients may need to go on using these methods of feeding after they leave hospital. This may seem very scary at first but people usually get the hang of it quite quickly. So try not to worry too much about it. Nurses will show and teach how to run the feeds before patients leave hospital. The doctors monitor patients closely at regular follow up appointments.

Eating after surgery – patients are usually be able to eat normally again in a few months. For some people it takes up to 2 years.

One will need to eat smaller meals about 6 to 8 times a day if one’s oesophagus and part of your stomach has been removed. Patients also need to eat slowly and chew food well or have a soft diet.

Some patients may have these problems after surgery to remove your oesophagus

- dumping syndrome (feeling faint and dizzy after eating)
- diarrhoea
- feeling or being sick
- indigestion and stomach pains

Eating after radiotherapy – during radiotherapy and for a few weeks or months afterwards, some patients may find it hard to swallow. They may also have some soreness and pain when swallowing. Eating a soft diet helps and taking painkillers before meals may be of great help.

Be as active as possible - Exercise may help to stimulate appetite and endorphin production. Being able to eat more and having an enhanced feeling of wellbeing will make your treatments more bearable.

Drink sufficient fluids to avoid dehydration - Choose beverages that contain nutrients and kilojoules. A good starting point is to strive for several glasses of nutritious beverages per day. Only take small sips with meals to avoid excessive bloating, gas or feeling too full to eat. The best time to drink fluids is an hour before or after a meal. Choose beverages that contain kilojoules and nutrients such as juices, smoothies, and liquid nutrition supplements.

A registered dietitian can provide recommendations for which liquid nutrition supplement and how much is best.

Keep a journal - Record eating times, foods consumed, and any effects to track and determine which foods are best tolerated.

Take medication as prescribed – It is essential to take all medication as prescribed.

Maintain a good mass (weight) - It is normal to lose some weight after being diagnosed with pancreatic cancer and beginning on treatment. If losing more than ½ to 1Kg per week continuously, consult a registered dietitian immediately for recommendations on increasing kilojoule intake.

If there are any specific questions regarding any of the guidelines, please contact a registered dietitian.

(American Cancer Society; Cancer Research UK; Today's Dietitian; University of Rochester Medical Center; Kent-Smith).

Medical Disclaimer

These Nutritional Guidelines are intended to provide general information only and, as such, should not be considered as a substitute for advice, medically or otherwise, covering any specific situation. Users should seek appropriate advice before taking or refraining from taking any action in reliance on any information contained in these Guidelines. So far as permissible by law, the Cancer Association of South Africa (CANSA) does not accept any liability to any person (or his/her dependants/estate/heirs) relating to the use of any information contained in these Guidelines.

Whilst CANSA has taken every precaution in compiling these Guidelines, neither it, nor any contributor(s) to these Guidelines can be held responsible for any action (or the lack thereof) taken by any person or organisation wherever they shall be based, as a result, direct or otherwise, of information contained in, or accessed through, these Guidelines.

ADDITIONAL SUPPORT

For individualised nutritional advice, consult a registered dietitian in your area by visiting:
<http://www.adsa.org.za/Public/FindARegisteredDietitian.aspx>

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

April 2021

	MOUTH, PHARYNX, LARYNX (2007)	NASOPHARYNX (2007)	ESOPHAGUS (2016)	LUNG (2007)	STOMACH (2016)	PANCREAS (2012)	GALLBLADDER (2015)	LIVER (2015)	COLORECTUM (2011)	BREAST PREMENOPAUSE (2010)	BREAST POSTMENOPAUSE (2010)	OVARY (2014)	ENDOMETRIUM (2013)	PROSTATE (2014)	KIDNEY (2015)	BLADDER (2015)	SKIN (2007)
Foods containing dietary fibre									Convincing decreased risk								
Aflatoxins								Convincing increased risk									
Non-starchy vegetables¹	Probable decreased risk																
Allium vegetables																	
Garlic									Probable decreased risk								
Fruits²	Probable decreased risk			Probable decreased risk													
Red meat						Probable increased risk			Convincing increased risk								
Processed meat³						Probable increased risk			Convincing increased risk								
Cantonese-style salted fish		Probable increased risk															
Diets high in calcium⁴									Probable decreased risk								
Foods preserved by salting					Probable increased risk												
Glycaemic load													Probable increased risk				
Arsenic in drinking water				Convincing increased risk												Probable increased risk	Probable increased risk
Mate⁵			Probable increased risk														
Alcoholic drinks⁶	Convincing increased risk	Convincing increased risk	Convincing increased risk		Probable increased risk			Convincing increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk					Probable decreased risk	
Coffee						Substantial effect on risk unlikely		Probable decreased risk				Probable decreased risk					
Beta-carotene⁷				Convincing increased risk										Substantial effect on risk unlikely			Substantial effect on risk unlikely
Physical activity⁸									Convincing decreased risk		Probable decreased risk		Probable decreased risk				
Body fatness⁹			Convincing increased risk		Probable increased risk	Convincing increased risk	Probable increased risk	Convincing increased risk	Convincing increased risk	Probable decreased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk
Adult attained height¹⁰						Probable increased risk			Convincing increased risk	Probable increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk	Convincing increased risk
Greater birth weight										Probable increased risk							
Lactation									Convincing decreased risk	Convincing decreased risk							

1 Includes evidence on foods containing carotenoids for mouth, pharynx, larynx. 2 Includes evidence on foods containing carotenoids for mouth, pharynx, larynx and lung.
 3 For stomach, probable increased risk of non-cardia cancer only. 4 For colorectum, evidence is from milk and studies using supplements.
 5 Probable increased risk for oesophageal squamous cell carcinoma only.
 6 For oesophagus, convincing increased risk for oesophageal squamous cell carcinoma only. For liver and stomach, based on evidence for alcohol intakes above around 45 grams per day (about 3 drinks a day). For colorectum, convincing increased risk for men and probable increased risk for women. For kidney, based on evidence for alcohol intakes up to 30 grams per day (about 2 drinks a day).
 7 For lung, evidence is from studies using high-dose supplements in smokers. 8 Convincing decreased risk for colon not rectum.
 9 For oesophagus, convincing increased risk for adenocarcinoma only. For stomach, probable increased risk of cardia cancer only. For prostate, probable increased risk for advanced prostate cancer only.
 10 Adult attained height is unlikely to directly influence the risk of cancer. It is a marker for genetic, environmental, hormonal and nutritional factors affecting growth during the period from preconception to completion of linear growth.

(World Cancer Research Fund International).

Sources and References Consulted or Utilised

American Cancer Society

www.cancer.org/cancer/esophaguscancer/detailedguide/esophagus-cancer-risk-factors

Cancer Research UK

<http://www.cancerresearchuk.org/about-cancer/oesophageal-cancer/practical-emotional-support/eating>

<http://www.cancerresearchuk.org/about-cancer/oesophageal-cancer>

<http://www.cancerresearchuk.org/about-cancer/coping-with-cancer/coping-physically/diet/managing/drip-or-tube-feeding>

Deftereos, I., Kiss, N., Isenring, E., Carter, V.M. & Yeungm J,M. 2020. A systematic review of the effect of preoperative nutrition support on nutritional status and treatment outcomes in upper gastrointestinal cancer resection. *Eur J Surg Oncol.* 2020 Aug;46(8):1423-1434.

Kent-Smith

Luiza Kent-Smith, R.D., Ph.D. Faculdade de Ciências de Nutricao e Alimentacao, Universidade de Porto, 4200-465 Porto, Portugal. phone +351-22-5074-320, fax +351-22-5074-329, email: lks@mail.telepac.pt

NHS Choices

www.nhs.uk/conditions/cancer-of-the-oesophagus/pages/introduction.aspx

National Cancer Institute

Eating Hints: Before, During and After Cancer Treatment. US Department of Health and Human Services. National Institutes of Health. National Cancer Institute. January, 2011.

Oesophagus

<https://www.macmillan.org.uk/information-and-support/oesophageal-gullet-cancer/understanding-cancer/the-oesophagus.html>

Sun, Z.W., Jia, J., Yang, Y., Liu, C.L., Xiao, Y.J., Yu, J. & Zhang, X.D. 2020. Enteral nutrition support reduces toxicity of chemotherapy in patients with advanced or metastatic esophageal cancer. *Beijing Da Xue Xue Bao Yi Xue Ban.* 2020 Apr 18;52(2):261-268.

Today's Dietician

<http://www.todaysdietitian.com/newarchives/011012p28.shtml>

University of Rochester Medical Center

<https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=34&ContentID=17970-1>

Wikipedia

<https://en.wikipedia.org/wiki/Esophagus>

World Cancer Research Fund International

<http://www.wcrf.org/int/research-we-fund/continuous-update-project-findings-reports/continuous-update-project-cup-matrix>

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

April 2021