The NETs Nutritional " Cultural-Traditional" Adaptations A patient- professional interaction QOL Functional Nutritional treatment Personal – Personal

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The NETs Nutritional
" Cultural-Traditional" Adaptations

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Nutritional Challenges

- NET are a heterogeneous group of tumors that have a distinct impact on patient's morbidity and QOL due to the tumor location, general effects of malignancy, hormonal hyper-secretion, and treatment.
- Malnutrition, vitamin deficiencies, and food intolerances are prevalent but currently under recognized in this population.
- If left untreated, these complications can significantly impact on patient's QOL, physical function, and survival.
- There are significant gaps in knowledge with regards to screening for malnutrition, dietary modification, and nutritional deficiencies in this patient group.
- Despite this, a validated tool should be used for malnutrition screening with all NET patients, and prophylactic supplementation and testing for vitamin deficiency in at-risk NET patients should be considered as part of standard care and nutritional treatment by nutritionists should be given to everyone .
- Large cross-sectional and longitudinal studies are required to better understand the nutritional impact of these complex tumors and to underpin the development of evidence-based nutrition guidelines for patients with GEP NETs.

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Neuroendocrinology 2020;110:430–441

Many Nutritional Complications I

Table 1. Effects of GEP NET on symptom presentation [3, 6, 8]

Presence of malignancy					
Fatigue Low appetite Weight loss General malaise Nausea					
Tumor mass					
primary tumor	metastasis				
Pain Organ dysfunction Low appetite	Pain Organ dysfunction Liver: pain, nausea, fatigue, loss of appetite, fever Peritoneum: pain, bowel obstruction, ascites, bleeding Lung: shortness of breath, cough Lymph nodes: pain, compression of adjacent structure causing dysfunction				
Tumor location					
small intestine	colon/rectum	pancreas	stomach		
Bowel obstruction Bowel ischemia Nutrient malabsorption Steatorrhea Diarrhea Abdominal pain Bleeding	Bowel obstruction Bowel ischemia Diarrhea Abdominal pain Bleeding	Altered blood glucose Altered exocrine enzyme function Nutrient malabsorption Diarrhea Steatorrhea Abdominal pain Biliary obstruction	Early satiety Abdominal pain Reflux/heartburn Bleeding Obstruction		
Hormone secretion (tumor type)					
serotonin (carcinoid)	insulin (insulinoma)	gastrin (gastrinoma)	glucagon (glucagonoma)	vasoactive intestinal peptide (VIPoma)	somatostatin (somatostatinoma)
Flushing Fatigue Diarrhea Food intolerance Pain Small bowel ischemia Carcinoid heart disease Pellagra	Hypoglycemia Dizziness Headache Weakness Confusion Loss of consciousness	Peptic ulceration Abdominal pain Diarrhea Heartburn Weight loss Bleeding	Hyperglycemia Glucose intolerance Diarrhea Weight loss Necrolytic migratory erythema	Severe diarrhea Hypokalemia Dehydration	Diabetes Cholelithiasis Steatorrhea Diarrhea Weight loss

GEP NET, gastroenteropancreatic neuroendocrine tumors.

Neuroendocrinology 2020;110:430–441

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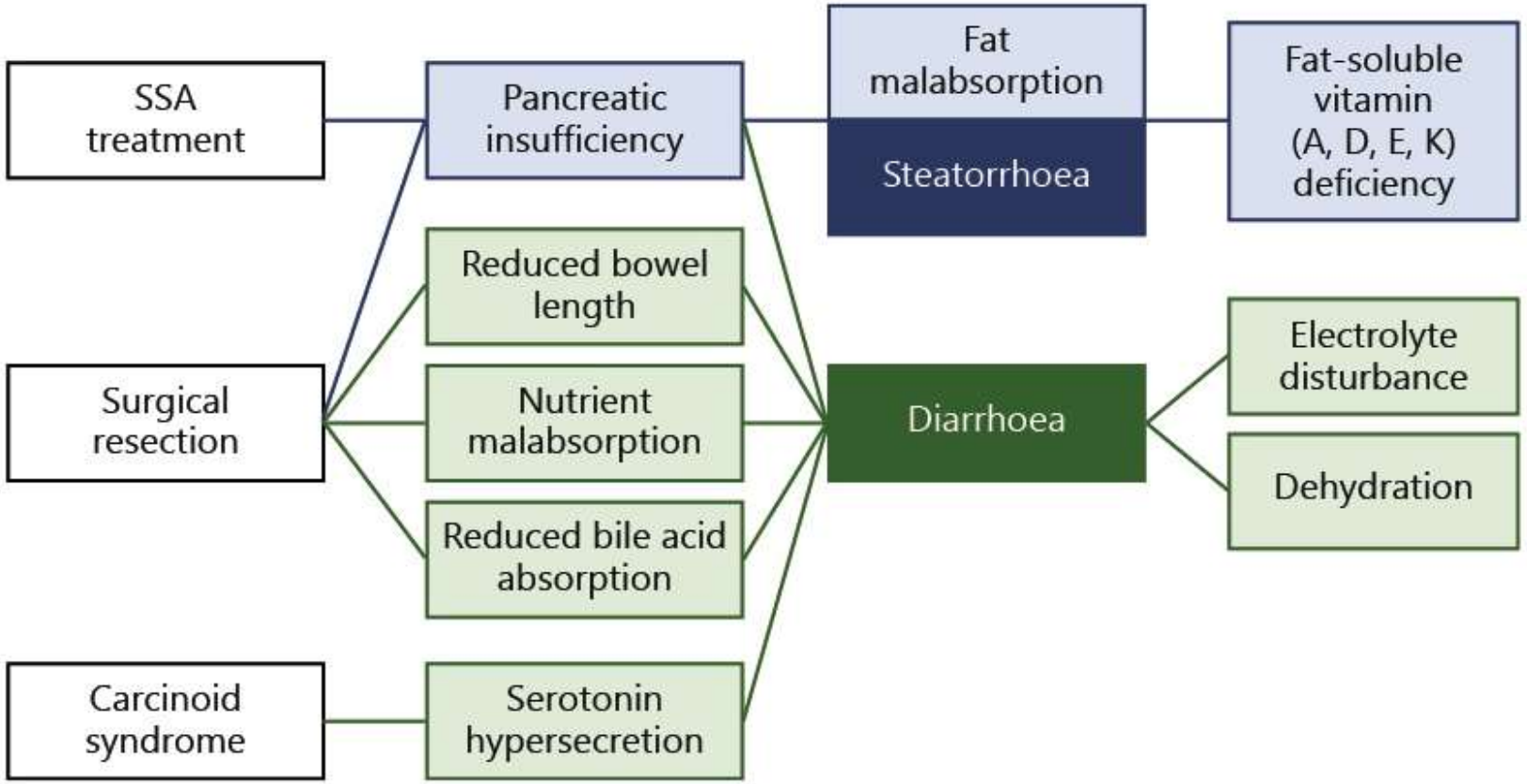
Many Nutritional Complications II



Neuroendocrinology 2020;110:430–441

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Many Nutritional complications

Nutrition complication	Recommendation	Suggested future research
Niacin deficiency	– Niacin supplementation is effective to treat deficiency – Consider supplementation (40–80 mg daily) in patients with carcinoid syndrome or high serotonin production – If deficiency known, supplement with at least 100 mg niacin per day – 24-h urine collection is the best method of testing, if available – Not useful to diagnose Pellagra based upon clinical symptoms alone and niacin testing is recommended to confirm it	– Interventional or randomized controlled trial is required to determine the most effective dose and method of niacin supplementation – Longitudinal prevalence studies looking at risk of niacin deficiency over time in patients with carcinoid syndrome
Fat-soluble vitamin deficiency	– If evidence of steatorrhoa commence PERT – Post small bowel resection, particularly if <200 cm small bowel remains, test for fat-soluble vitamin deficiency twice per year – Patients on fat-soluble vitamin supplementation may still require monitoring to ensure supplementation is effective – Consider testing fat-soluble vitamins twice per year in patients on long-term SSA >1 year	– Prospective research examining the effectiveness of PERT on the status of fat-soluble vitamins in NET patients – Comparison of vitamin D deficiency in NET patients versus the general population
Vitamin B12 deficiency	– Consider testing and supplementation post-stomach and small bowel resection – Supplementation via IV be more appropriate in patients with severe deficiency and major bowel resection	– Explore prevalence of deficiency through prospective cross-sectional and longitudinal studies, particularly post small bowel resection
Malnutrition	– All NET patients should be screened for risk of malnutrition at diagnosis, and at regular intervals during treatment – NET patients admitted to hospital, with high grade NET, progressive disease and undergoing chemotherapy are at greatest risk of malnutrition – Appropriate malnutrition screening tools include the MST, MUST and NRS – Assessment of nutritional status is best performed by a dietitian or other trained health professional using validated tools such as the PG-SGA	– Prospective longitudinal research is required to determine the change in nutritional status over time/ during treatment – Prevalence of malnutrition in NET outpatients should be established – Interventional studies testing the most appropriate method of nutrition therapy for malnutrition in NET patients
Dietary change and food intolerance	– Screen symptomatic NET patients for dietary changes and restrictions, as these are at risk of under-recognition – Food intolerances should not be assumed without thorough assessment from a NET dietitian and gastroenterologist – In some patients with carcinoid syndrome, foods containing high amounts of amines may exacerbate symptoms	– Prospective interventional studies testing the effectiveness of diet modification for symptom control – Prospective observational and interventional studies testing the impact of dietary amine consumption on the severity of carcinoid syndrome

PERT, pancreatic enzyme replacement therapy; NET, neuroendocrine tumor; SSA, somatostatin analogue; MST, malnutrition screening tool; MUST, malnutrition universal screening tool; NRS, nutrition risk screen; PG-SGA, patient generated subjective global assessment.

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Neuroendocrinology 2020;110:430–441

Nutritional and vitamin status in patients with neuroendocrine neoplasms

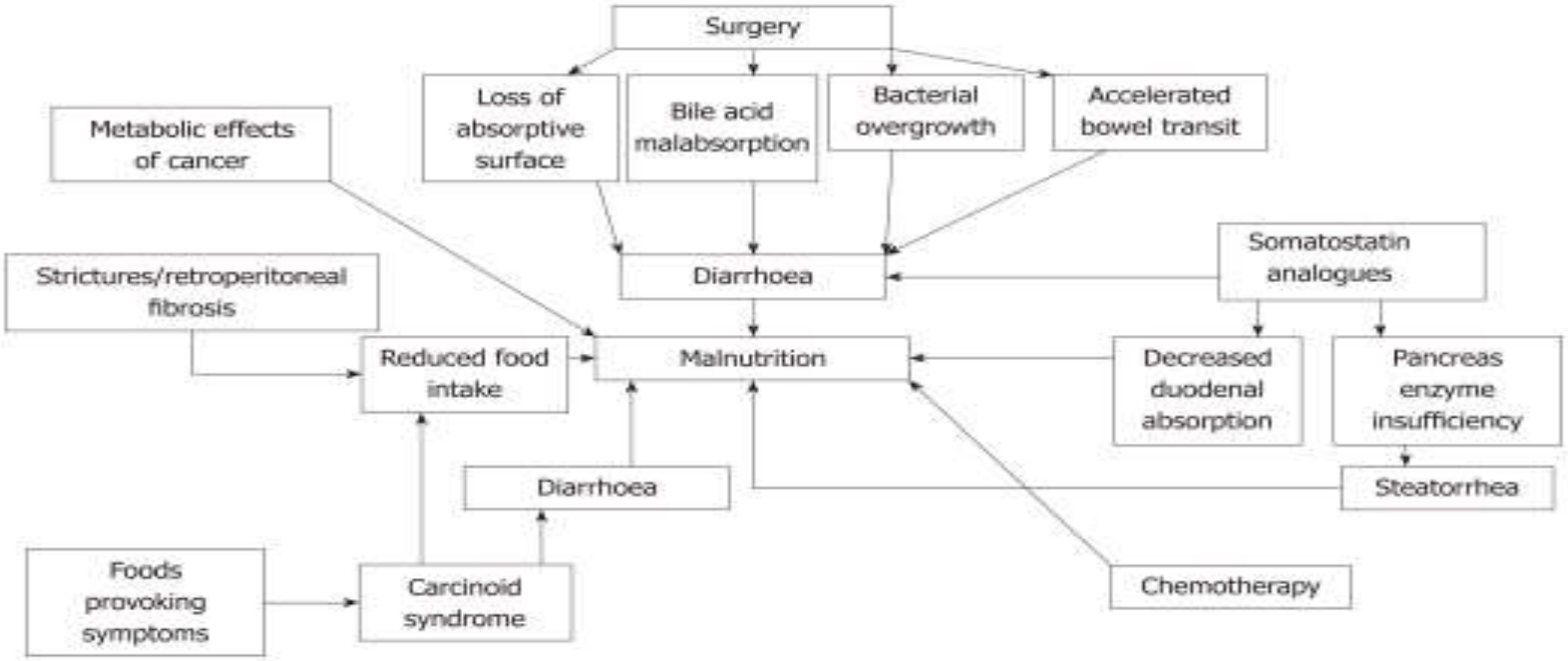

Figure 1 Factors influencing malnutrition in patients with gastroenteropancreatic neuroendocrine neoplasms. Summary of factors influencing the development of malnutrition in patients with gastroenteropancreatic neuroendocrine neoplasms.

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World J Gastroenterol 2019 March 14; 25(10): 1171-1184

Nutritional and vitamin status in patients with neuroendocrine neoplasms

Many nutritional complications

Clement DS *et al*. Malnutrition in patients with neuroendocrine neoplasms

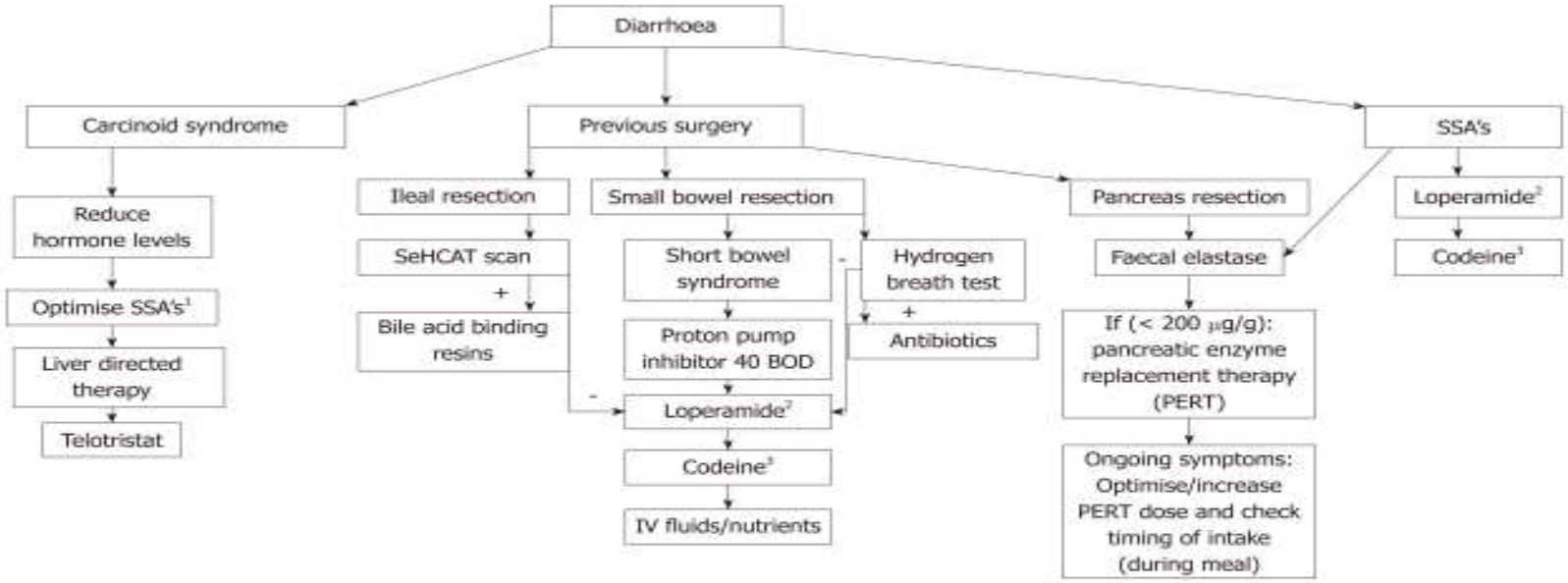

Figure 2 Approach to patients with diarrhoea. Summary of causes of diarrhoea in patients with gastroenteropancreatic neuroendocrine neoplasms, how to analyse and treatment advise. [1]Optimise SSA's: Increase dose, shorten interval or add short acting dose; [2]Advise loperamide: Increasing dose 2-4-8 mg 4 times a day, up to 12-24 mg 4 times a day in short bowel syndrome; [3]Advise codeine: 15-60 mg 4 times a day; Advise PERT: 1 × 25000 units of lipase per small meal 2 × 25000 units lipase per large meal, titrate up may need > 80000 units per large meal. SSA's: Somatostatin analogue's; SeHCAT: Selenium homotaurocholic acid conjugated with taurine; BOD: Twice a day; PERT: Pancreatic enzyme replacement therapy.

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World J Gastroenterol 2019 March 14; 25(10): 1171-1184

Impact of Nutritional Status on Neuroendocrine Tumors (NET) Aggressiveness

A novel association between nutritional status and aggressiveness of NETs in a selected cohort of adult patients.

This association potentially extends the benefit of adherence to the MD to NET patients and suggests that this may be used as tools for the nutritional management of these patients and as markers of tumor aggressiveness.

Therefore, the assessment of nutritional status should be recommended as good clinical practice in the evaluation of NET patients, in order to identify high-risk subjects with a more aggressive tumor who could better benefit from a nutritional intervention promoting the Mediterranean food pattern.

Thus, a skilled nutritionist should be part of the multidisciplinary health care team in NETs management, adapting the specific nutritional needs to the course of the disease.

Future well-designed dietary intervention trials on larger population samples are needed to define specific dietary guidelines for NETs and elucidate the beneficial effects of the MD on the survival outcomes of NET patients

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Nutrients 2018, 10, 1854

Starting with our 2019 National Nutritional Recommendations

The Mediterranean Diet Emphasis

The Major Advantages in four interconnected dimensions:

1. Health
2. Environment
3. Social-Cultural
4. Economic

https://www.health.gov.il/PublicationsFiles/dietary%20guidelines%20EN.pdf

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The Israeli 2020 Regulations

- Regulatory labeling on the front of the package, indicating that this product contains high quantities of sodium, sugar and/or saturated fat “Red” .
- Back Labeling the amount of sugars among the total carbohydrates, and expressing that amount of sugar in teaspoons .

- The “Green” labeling is a prominent symbol , on the front of packages or on the shelf signage of unpackaged foods, whose composition is consistent with the nutritional guidelines.

Encountering NETs Nutritional Challenges

MAJOR POINT

There's a need for individual nutritional treatment with NET or NEC

"Sewing " personal Functional- Cultural Plan TOGETHER

The UNIQNESS of the work of our Team is "The Cultural "

Adaptation input in this project and the Local Adjustments to our country and its traditional dishes

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NETs Nutritional Handbooks Available in Three languages

Hebrew

Arabic

Russian

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SPECIAL THANKS to Mr. Michael Rozenberg

What has been done so far ?
Our Patients- Professionals Initiative

1. A joint seminar for the Net patients and the professionals [on which the British team joined and shared their knowledge and experience]
2. An Israeli Seminar for Nutritionists about NETSq Limor Ben Haim
3. The NET patient foundation Handbook was translated and culturally adapted for three different cultures in their own languages [Hebrew, Arabic and Russian]
4. The subject will be learned as a part of the Oncology Course for professionals

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Thank you for your attention

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Nutrition division MOH

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