PART 6

Guidelines for Overweight Prevention Onboard Merchant Ships

Content

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1 Introduction

The International Committee on Seafarers’ Welfare, aware of the importance of lifestyle aspects in the health of seafarers, launches “OVERWEIGHT PREVENTION” as one of the topics in the Seafarers’ Health Information Programme, sponsored by the ITF Seafarers’ Trust.

The ship, where seafarers not only work but spend all their time during a voyage, is seen as the best place for health intervention.

A third of the world’s deaths are due to Cardiovascular Disease, 80% of those in developing countries. Cardio-vascular Diseases make up 10% of the world’s disease burden, 90% of those in developing countries.

A substantial proportion of cardiovascular deaths are attributable to avoidable risk. Therefore, reducing risk means a substantial health gain. Addressing this problem eventually proves cost effective as it reduces the risk of associated diseases.

Of the global cardiovascular disease burden, 75% relates to 6 major risk factors.

- Systolic Blood Pressure
- Cholesterol
- Smoking
- Physical inactivity
- A BMI of >21 kg/m^2
- Eating less than 600 g/ of fruit and vegetables a day

Some risk factors contribute, not only to Cardiovascular Disease but also to diabetes, respiratory diseases, cancer etc… It is worthwhile focussing on these factors.

One of the major factors in chronic health problems is being OVERWEIGHT. It can lead to hypertension, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, respiratory problems, sleep apnoea and endometrial, breast, prostate and colon cancer.

Overweight prevention (and protection from unhealthy food and eating habits) is as essential as protection from workplace chemicals and noise. Obesity accounts for 2-7% of the total health costs in industrialised countries (Food at Work, ILO).

Through information and knowledge seafarers need to learn about the risks associated with being overweight and the negative impact this has on their health. It is important to provide seafarers with the tools needed to control their weight and to prevent or reduce excess weight in a safe and healthy environment onboard ship.

2 Being overweight - a serious problem

People who are overweight are at greater risk of dying prematurely from chronic health problems.

Conditions associated with being overweight are the second most common cause of preventable death in the United States. Smoking is the first.

Strangely, today the world has 1 billion people starving and 1 billion who are obese. In the developing countries the rich are fat and the poor are thin; in the rich countries the rich are thin and the poor are fat.

Among of the causes of weight gain are over eating = over intake of carbohydrates; and lack of physical activity.

Today, activities at work are less physical, daily living tasks have changed and life, in general, is more sedentary. This is also true onboard ships.

Some factors that may increase the risk are:

- Sedentary lifestyles, particularly sedentary occupations and inactive recreational activities such as watching television
- Large portion sizes
- A high intake of drinks containing added sugars

Many factors have been shown to protect against obesity:

- Regular physical exercise
- High dietary fibre intake
- Home, school and work environments that promote healthy food and activity choices
- Having been breastfed

3 Body Mass Index

Measuring the Body Mass Index (=Quetelet Index) is a quick and easy way to make seafarers aware of the importance of weight control.

Using the BMI formula, a person knows if his weight is normal in relation to his body length. BMI = weight (in kg) divided by square length (in metres). A BMI calculator can be found at www.seafarershealth.org .

People with a BMI between 19 and 22 are more likely to live longer than people with a high BMI. If your BMI is too high (25 or above), you're at greater risk than people with a normal BMI of dying prematurely from chronic health problems such as high blood pressure, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, respiratory problems, sleep apnoea and endometrial, breast, prostate and colon cancer.

Regular measurement of BMI enhances the chances of an individual seafarer being able to take effective steps towards controlling weight at a healthy level.

A BMI below 17,5 indicates a person is “underweight”

A BMI between 17,5 and 24,9 indicates a person is of normal weight

A BMI more than 25 indicates overweight

A BMI above 30 means a person is obese or pathologically overweight

Note: Since Body Fat Percentage calculations use total body weight and not estimates of lean muscle mass and fat, the BMI can not accurately determine between the overweight and the more muscular.

4 Waist Circumference

The waist’s circumference and BMI are interrelated, but the waist circumference provides an independent prediction of risk over and above that of BMI. This because body fat that accumulates around the stomach area, so called visceral fat, poses a greater health risk than fat stored in the lower half of the body.

The waist circumference is now an important factor in weight and body-fat assessment.
This is because total body fat is no longer seen as the key indicator of weight-related health problems. The distribution of fat is just as important.

The **apple body shape** (where body fat is stored around the middle - i.e. abdomen, chest and surround internal organs, such as the heart), with a high waist circumference, is linked to health problems such as coronary heart disease, diabetes, stroke, high blood pressure and gallbladder disease.
People most likely to develop an apple body shape are men of any age, suffering from stress and older women who are also suffering from stress. The apple shape of a person’s body can be reduced by following a sensible diet, taking regular exercise and by using stress-reduction techniques.

Using the waist circumference measurement is particularly useful in patients who are categorized as overweight on the BMI scale, although increased waist circumference can also be a marker for increased risk even in persons of normal weight. For example, an athlete with increased muscle mass may have a BMI greater than 25 - making him or her overweight on the BMI scale - but using the waist circumference measurement would probably indicate that he or she is, in fact, not overweight.
However, for someone with a BMI of 35 or over (obese), waist circumference has little added predictive power of disease risk beyond that of the BMI. It is therefore unnecessary to measure waist circumference in an individual with a BMI of 35 or over.
Furthermore, in obese patients, changes in waist circumference are useful predictors of changes in cardiovascular risk factors.

To determine your waist circumference, locate the upper hip bone and place a tape measure around the abdomen (ensuring that the tape measure is horizontal). The tape measure should be snug but should not cause compressions on the skin.

	WOMEN	MAN
High risk	Waist between 80 and 88 cm	Waist between 94 and 102 cm
Very high risk	above 88 cm	above 102 cm

Ethnic specific values for waist circumference

Country / Ethnic group	Waist circumference	
Europids In the USA, the ATP III values (102 cm male; 88 cm female) are likely to continue to be used for clinical purposes	Male	≥ 94 cm
	Female	≥ 80 cm
South Asians Based on a Chinese, Malay and Asian-Indian Population	Male	≥ 90 cm
	Female	≥ 80 cm
Chinese	Male	≥ 90 cm
	Female	≥ 80 cm
Japanese	Male	≥ 90 cm
	Female	≥ 80 cm
Ethnic South and Central Americans	Use South Asian recommendations until more specific data are available	
Sub-Saharan Africans	Use European data until more specific data are available	
Eastern Mediterranean and Middle East (Arab) populations	Use European data until more specific data are available	

People with a **pear body shape** have hips wider than their shoulders because their bodies store fat on the hips and on the thighs. Pear shaped bodies carry their extra weight below the waistline, and do not seem to have as high a risk of developing chronic health problems, than people with an apple body shape.
Pear shaped people usually lose fat in the upper body, so their overall shape doesn't change much when they lose weight.
With time, as insulin resistance worsens, people who store fat below the belt will start accumulating it above the belt too, experiencing all of the health threatening problems of the apple shaped body!

Waist-to-hip ratio (WHR) looks at the proportion of fat stored on the body around the waist and hips. It is a simple but useful measure of fat distribution. Most people store their body fat in two distinct ways: around their middle (apple shape) and around their hips (pear shape).

5 Diabetes

Diabetes is a disease that is linked to the hormone insulin which regulates the level of sugar in the blood.

- Type 1 Diabetes occurs when the body fails to produce insulin.
- Type 2 Diabetes, which is much more common, occurs when the body fails to respond to insulin in a normal way.

Serious complications can result from having diabetes, including blindness, kidney failure, heart disease, and strokes. In the case of type 2 diabetes, lifestyle changes are important in preventing and managing the disease.

The number of cases of diabetes is currently estimated to be around 150 million worldwide, but that number is expected to double by 2025. Inactive lifestyles and excessive weight gain increase the risk of type 2 diabetes, especially when excess fat is stored in the abdomen. Excess fat in the abdomen can contribute to the development of insulin resistance, a condition that underlies most cases of type 2 diabetes. Children of mothers who are affected by diabetes during pregnancy are also at high risk of developing obesity and type 2 diabetes early in life. Consumption of saturated fats may increase the risk of developing type 2 diabetes.

Specific measures can be taken to reduce the risk of developing diabetes, especially efforts that focus on controlling weight and preventing obesity and cardiovascular disease. Measures include:

- Avoiding weight gain of more than 5 kg in adult life and treating excessive weight gain and obesity.
- Maintaining a Body Mass Index (BMI) in the range of 21-23 kg/m².
- Engaging in at least a moderate level of physical activity for one hour or more during the course of the day on most days of the week. Exercising at 80 to 90% of your maximum heart rate for at least 20 minutes five days per week may substantially improve insulin sensitivity
- Ensuring a low saturated fat intake.
- Consuming at least 20g of dietary fibre per day (i.e. whole grain cereals, fruit and vegetables).

6 Cardiovascular Disease

Several independent factors determine the risk of developing cardiovascular disease (e.g. heart attacks and strokes). Some of these factors cannot be influenced by changes in lifestyle but others are lifestyle related.

- **Non-modifiable Risk Factors**
  - Age
  - Gender, men under age 64 are much more likely to die of coronary heart disease than women, although the gender difference declines with age. (The gender difference is less pronounced in black people than in white people, but it is still significant)
  - Genetic factors / Family history of cardiovascular disease

- **Modifiable Risk Factors**
  - Smoking
  - Metabolic Syndrome & Diabetes
  - Elevated cholesterol levels and abnormal cholesterol subtypes
  - Obesity, especially central or male-type obesity; apart from being linked to diabetes, this form of obesity independently increases cardiovascular risk
  - High blood pressure
  - Elevated heart rate
  - Physical inactivity/Sedentary lifestyle
  - Absence of key nutritional elements, such as omega-3 fatty acids (see also “ICSW SHIP - Guidelines for Healthy Food Onboard Merchant Ships”)
  - Exposure to high levels of environmental noise
  - Stress
  - Depression
  - Periodontal disease (tooth hygiene)

7 Metabolic Syndrome

Metabolic syndrome is a cluster of the most dangerous heart attack risk factors:

- diabetes and pre-diabetes
- abdominal overweight
- high cholesterol
- high blood pressure

It is estimated that around a quarter of the world's adult population have metabolic syndrome and they are twice as likely to die from, and three times as likely to have a heart attack or stroke, compared with people without the syndrome.
In addition, people with metabolic syndrome have a fivefold greater risk of developing type 2 diabetes. The clustering of cardiovascular risk factors that typifies metabolic syndrome is now considered to be the driving force for a cardiovascular epidemic.

For a person to be defined as having metabolic syndrome, they should have:

Central obesity (defined as waist circumference > 94cm for European men and > 80cm for European women, with ethnicity specific values for other groups, see table above).

plus any 2 of the following factors:

- **raised triglyceride level (type of blood fat): >150 mg/dL (1.7 mmol/L), or specific treatment for this lipid abnormality**
- **reduced HDL cholesterol:** < 40 mg/dL (1.03 mmol/L) in males and < 50 mg/dL (1.29 mmol/L) in females, or specific treatment for this lipid abnormality.
- **raised blood pressure(BP): systolic BP >130 or diastolic BP > 85 mm Hg, or treatment of previously diagnosed hypertension**
- **raised fasting plasma glucose** (FPG) (blood sugar) >100 mg/dL (5.6 mmol/L), **or previously diagnosed type 2 diabetes**

If diabetes is not already present, metabolic syndrome is a strong predictor for its development, the risk for type 2 diabetes is five times more likely in individuals with the syndrome. While each individual component of metabolic syndrome confers an increased risk of cardiovascular-related death, this risk is more pronounced when metabolic syndrome itself is present. The more components of metabolic syndrome that are evident, the higher is the cardiovascular mortality rate.

There is an overwhelming moral, medical and economic imperative to identify those individuals with metabolic syndrome early, so that lifestyle interventions and treatment may prevent the development of diabetes and/or cardiovascular disease.

8 Energy value

1 calorie (Kcal.) is the amount of energy required to raise the temperature of 1kg of water by 1°C. As a measure for energy the calorie has been replaced by the Joule in many areas. To express the energy content of food however the calorie is still widely used. In fact it is actually a kilocalorie (1Kcal=1000 cal) but most of the time the word Calorie is used.

An average (sedentary) woman needs 1940 Kcal. per day to maintain a healthy weight. An average (sedentary) man needs around 2400 Kcal. per day to maintain a healthy weight.

A typical hot meal delivers about 30 to 35% of the energy needed for one day. The ideal energy value of a complete meal, including soup, drinks and desert should be around 885 Kcal.

Your current weight, age, gender and how active you are all affect how many calories you need to maintain a healthy weight. Tall people need more calories than short people! To calculate your energy need, you have to undergo elaborate medical tests, but in the next section, “BMR (=Basal Metabolic Rate)”, an equation is given which you can use to calculate your daily needs.

Calorie counting is a very effective weight loss method because, unlike following a proprietary diet plan, it helps you to learn real facts about real food and what your body really needs. So when you “calorie count” your way to your weight loss goal you’re much better equipped to maintain your new weight.

Examples of the energy value of some common foods are given in the table below, per portion and per 100g.

MILK & DAIRY	Portion Size	Per 100g (3.5 oz)
Cheese average	110 Kcal (25g)	440 Kcal
Cottage cheese	49 Kcal (49g)	98 Kcal
Cream cheese	200 Kcal (47g)	428 Kcal
Eggs (1 average size)	90 Kcal (60g)	150 Kcal
Ice cream	200 Kcal (111g)	180 Kcal
Milk whole	175 Kcal (250ml/half pint)	70 Kcal
Milk semi-skimmed	125 Kcal (250ml/half pint)	50 Kcal
Milk skimmed	95 Kcal (250ml/half pint)	38 Kcal
Trifle with cream	290 Kcal (1 trifle)	190 Kcal
Yogurt natural	90 Kcal (1 small pot)	60 Kcal
Yogurt reduced fat	70 Kcal (1 small pot)	45 Kcal

BREADS & CEREALS	Portion Size	Per 100g (3.5 oz)
Bagel	140 Kcal (45g)	310 Kcal
Bread white (thick slice)	96 Kcal (1 slice 40g)	240 Kcal
Bread wholemeal (thick slice)	88 Kcal (1 slice 40g)	220 Kcal
Noodles (boiled)	175 Kcal (250g)	70 Kcal
Pasta (normal boiled)	330 Kcal (300g)	110 Kcal
Porridge oats (with water)	193 Kcal (350g)	55 Kcal
Potatoes (boiled)	210 Kcal (300g)	70 Kcal
Rice (white boiled)	420 Kcal (300g)	140 Kcal

MEATS & FISH	Portion Size	Per 100g (3.5 oz)
Bacon average fried	250 Kcal (2 rashers)	500 Kcal
Beef (roast)	300 Kcal (107g)	280 Kcal
Chicken	220 Kcal (110g)	200 Kcal
Ham	6 Kcal (2.5g)	240 Kcal
Lamb (roast)	300 Kcal (100g)	300 Kcal
Lunch meat	300 Kcal (75g)	400 Kcal
Prawns	180 Kcal (180g)	100 Kcal
Pork	320 Kcal (110g)	290 Kcal
Salmon fresh	220 Kcal (122g)	180 Kcal
Sausage pork fried	250 Kcal (78g)	320 Kcal
Trout fresh	200 Kcal (167g)	120 Kcal
Turkey	200 Kcal (125g)	160 Kcal

FRUITS & VEGETABLES	Portion Size	Per 100g (3.5 oz)
Apple	44 Kcal (100g)	44 Kcal
Banana	107 Kcal (165g)	65 Kcal
Broccoli	27 Kcal (84g)	32 Kcal
Cucumber	3 Kcal (30g)	10 Kcal
Grapes	55 Kcal (89g)	62 Kcal
Lettuce	4 Kcal (27g)	15 Kcal
Peas	210 Kcal (142g)	148 Kcal
Spinach	8 Kcal (100g)	8 Kcal
Strawberries	10 Kcal (33g)	30 Kcal

9 BMR (=Basal Metabolic Rate)

We use energy no matter what we are doing, even when sleeping. The Basal Metabolic Rate (BMR) is the number of calories we would burn if we stayed in bed all day.

The BMR decreases with age. Likewise, depriving yourself of food in hopes of losing weight also decreases your BMR, thereby foiling your intentions. However, a regular routine of cardiovascular exercise can increase your BMR, improving your health and fitness when your body's ability to burn energy gradually slows down.

Metric BMR Formula

Women: BMR = 655 + (9.6 x weight in kilos) + (1.8 x height in cm) - (4.7 x age in years)
Men: BMR = 66 + (13.7 x weight in kilos) + (5 x height in cm) - (6.8 x age in years)

Once you know your BMR, you can calculate your Daily Calorie Needs based on your activity level using the Harris Benedict Equation.

The **Harris Benedict Equation** is a formula that uses your BMR and then applies an activity factor to determine your total daily energy expenditure (calories).
The only factor omitted by the Harris Benedict Equation is lean body mass. Remember, leaner bodies need more calories than those that are less lean. Therefore, this equation will be very accurate in all but the very muscular (where it will under-estimate calorie needs) and the very fat (where it will over-estimate calorie needs).

Harris Benedict Formula

To determine your total daily calorie needs, multiply your BMR by the appropriate activity factor, as follows:

1. If you are sedentary (little or no exercise) : Calorie-Calculation = BMR x 1.2
2. If you are lightly active (light exercise/sports 1-3 days/week) : Calorie-Calculation = BMR x 1.375
3. If you are moderately active (moderate exercise/sports 3-5 days/week) : Calorie-Calculation = BMR x 1.55
4. If you are very active (hard exercise/sports 6-7 days a week) : Calorie-Calculation = BMR x 1.725
5. If you are extra active (very hard exercise/sports & physical job or 2x training) : Calorie-Calculation = BMR x 1.9

10 Overweight Prevention

It is very important for everyone to maintain a healthy body weight. If weight is increasing, action should be taken immediately to lose excess weight and prevent further increase in the future..

When trying to lose weight, a combination of diet and exercise works better than diet or exercise alone.

30 min physical activity per day has health benefits for those who are not obese and do not need to lose weight.
45 min. / day can prevent you gaining weight.
60 min. / day can stop you gaining further weight and help you start to lose weight.
90 min. / day is for people that were obese and are trying to maintain a normal weight.

People with a normal body weight (BMI 18,5-25) should monitor their weight regularly and keep an eye on whether their clothes start to feel tighter.
People with a BMI of 25-30 BMI should reduce their daily intake by 250 Kcal. and increase their physical activity by 250 Kcal.
People with a BMI of over 30 should follow the same program as above and eventually reduce their intake by more than 250 Kcal. It is possible that they may eventually need medication to help them lose weight.
People with a BMI of >40 may need surgical intervention.

Fitness - Fatness

Lean people have < 16% fat, people of a normal weight have between 16-25%, and obese people have >25%. Fitness helps protect against death, independent of a person's weight: *unfit lean people are twice as likely to be at risk of suffering from cardiovascular disease than fit people of a normal weight!*
Rather than measuring the time of physical activity / day it is better to count in distance: 10 miles / week is good.

Eliminate Red Meat

Cutting out red meat can go a long way to eating a healthier diet. Build meals around fish or poultry.

Cut out fried foods

Grill, bake, roast, broil or boil food. This also means going without French Fries and snack foods like Potato Strings, Chips,...

Start with a soup or a salad

By starting dinner with a soup or salad, one will curb hunger, which will in turn help keep portion sizes in check and prevent overeating.

Stop Soft Drinks

Soft drinks contain a lot of calories and consumption of soft drinks adds to the total calorie intake per day but has no nutrient value.

Drink water

Reach for the goal of drinking an extra 1.5 liters of water a day.

A combination of physical activity, a varied and balanced diet and extensive social interaction is the most likely lifestyle profile to optimize health, as reflected in increased longevity and healthy ageing. Some available evidence suggests that, within the time frame of a week, at least 20 and probably as many as 30 biologically distinct types of foods, with the emphasis on plant foods, are required for healthy diets.

Reducing the intake of sugars-sweetened drinks and of high-energy foods that are low in nutrients, as well as efforts to curb cigarette smoking and to increase physical activity will have an impact on the health of seafarers. Such changes need the active participation of every stakeholder onboard, in the company and in the maritime industry. The environment, of those who are most at risk needs to change. This is a more targeted and potentially costly approach, but one that has the potential for cost-effective returns even though they will be in the longer term.

Studies have also shown possible links between food portion sizes and weight gain. People may overestimate appropriate portion sizes and therefore eat more than they should. In contrast, eating foods that breakdown slowly, releasing sugars over a long time (low-glycaemic foods) could possibly protect against unhealthy weight gain.

Certain psychological factors may influence eating patterns and therefore increase the risk of becoming overweight. An all-or-nothing approach to eating, dieting, and weight control is probably associated with a higher risk of obesity. The risk is lower for a “flexible restraint” eating pattern with a more gradual approach to dieting in which “fattening” foods are eaten in limited quantities without feelings of guilt. Billions ($) are spent on diet products that do not help. Genetics play a role in the problem but cannot explain the enormous change in the last 10 years.

11 Tips for successful implementation of an"Overweight Prevention" campaign

Encourage and stimulate the crew members to control their weight and eat healthily. Pay attention to overweight prevention in meetings, at medical check-ups etc.

Use a broad approach to inform and motivate the seafarers onboard. Offer variation in food. A healthy menu is not necessarily more expensive than an unhealthy one.

The whole vessel has to be behind the programme: captain and officers have to show their commitment.

It is not only a matter of good policy development but also of good policy implementation. It takes time to implement an overweight prevention programme onboard. Make sure it gets where it is needed. Behavioural changes can take several months and the benefits may even take longer to become measurable.

Make a systematic plan of what you want to achieve in respect to overweight prevention onboard and over what period of time. Involve key persons such as the cook and ship chandler and link this to a company policy on health.

Budget the programme, make sure the activities adopted are evaluated and be prepared to adapt the plan if some initiatives are not as successful as others.

Announce the planning and changes, organise an event to celebrate the start of the plan such as a special menu or distribute apples or other fruit.

Make sure the ship has a calibrated weighing scale that is in good condition and easily accessible, for example, in a gym or mess room.

Provide healthy drinks and healthy snacks. Provide information (posters or leaflets) on overweight prevention in every place where food is available onboard.

Ask crew members to calculate their body mass index, to measure their waist and to use a cardiovascular risk calculator to evaluate their condition. Fill out questionnaires. Give crew members the possibility to make suggestions on overweight prevention activities.

Link OVERWEIGHT PREVENTION with SHIP topics HEALTHY FOOD and FOOD SAFETY. Provide FIT ONBOARD and other SHIP health initiatives.

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If you want to do more and get more information and material to improve the condition of seafarers onboard, go to www.seafarershealth.org where you can download guidelines, posters and leaflets on other health topics for seafarers : Food Safety, Fit onboard, Safe Travel, Healthy Food, Malaria, Overweight prevention and STI, HIV / AIDS.