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Nutrition After ICU

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KEY POINTS:

- **Muscle wastage is common following critical illness**
- **There are several different factors that can lead to muscle loss**
- **Nutrition is a modifiable risk factor that may help reduce losses**
- **Protein is an important nutrient for repairing and rebuilding lean body mass**
- **Consuming high amounts of protein alone won't lead to increased muscle mass. Exercise and timing of protein must also be considered**
- **Protein intake needs to be considered alongside calorie intake to avoid deficiencies or excesses of energy**
- **Individual advice and support should always be sought from a doctor or qualified health professional**

Critical Illness and Muscle Wastage

Critical illness is associated with changes in metabolism that can severely affect physical functioning, both at the time of the event and also in the longer term.

Muscle wastage/loss is a common problem amongst patients treated in the ICU, especially in those who have experienced traumatic or neurological injury, a period of sedation, prolonged mechanical ventilation or sepsis. Patients can lose as much as 1kg of lean body mass per day.

There are several factors that can lead to muscle wastage. Firstly, the inflammation that is often observed can increase the body's metabolic rate and nutritional needs. It can also influence the way the body uses energy; muscles can be broken

down to be used as fuel to fight the illness and recover from injury.

Secondly, the presenting illness or injury may directly damage the muscles and/or the nerves and vessels supplying them.

Thirdly, sedation can disrupt the signals sent to the muscles from the nervous system. These signals are important for stimulating the muscles to move and maintain their form and function.

Finally, immobility from bed rest, inadequate nutrition, development of infections, surgical procedures, prolonged healing of wounds and pre-existing medical conditions can also contribute to reduced muscle mass.

It is not uncommon for those who have been critically ill to experience problems with muscle weakness for many months and even years afterwards. Rehabilitation forms a crucial part of recovery and can be needed for an extended period, often continuing beyond the duration of the initial hospital admission.

Patients may need ongoing support from a number of specialists including dietitians, physiotherapists, occupational therapists, speech and language therapists and psychologists.

The good news is, that with the right approach and combination of specialist support, it is quite possible to treat loss of lean body mass as part of the rehabilitation process to improve strength and conditioning.

The Role of the ICU Dietitian

Many ICUs now employ specialist dietitians to assess the nutritional status of critically ill patients on admission to the unit.

During the early phase of illness, patients often require artificial feeding via a tube into the stomach, intestine or vein to meet their nutritional needs. The ICU dietitian will use their

specialist clinical knowledge, skills and experience to calculate how much energy, protein and other nutrients the patient will need each day.

There is increasing evidence that providing the right amount of nutrition, particularly protein, in this early stage can help to reduce severity of complications and loss of lean body mass, both

in the short and longer term.

The ICU dietitian will work closely with the medical team and other specialists to adjust nutrition according to daily requirements.

During the recovery phase, the dietitian can support patients to select suitable diet and fluids that will help them get the most out of their rehabilitation.

Consequences of Poor Protein Intake

Protein is formed from linking lots of amino acids (the building blocks) together. Different proteins can be made from different combinations of amino acids, and these have different properties and functions in the body.

Most of the protein found in the human body is located in muscles and our capacity to store protein elsewhere is limited. This means that when dietary protein intake is too low, we don't have much readily available to make up

the short fall. Under these conditions, the muscles may break down to supply the body with the extra protein and energy that is needed by other cells and tissues.

There are certain amino acids that we need to get from our diet. These essential amino acids play an important role in building muscle when supply is adequate.

Appropriate dietary protein intake will supply all of the essential amino acids that are needed to prevent breakdown

of muscle and also support the body to build more. Protein-deficient diets can negatively affect this process.

During both the early and recovery stages of critical illness, the body needs to make lots of new proteins to battle infection, make new cells and repair and rebuild damaged tissues. If protein intake is too low to meet these demands then this can exaggerate the loss of muscle that may already have been set in motion by other factors.

What to Eat?

Different people will have different protein needs depending on their medical status, body stature and composition, mobility and daily activities.

It is possible to meet daily protein needs through dietary sources, however vegetarians will require a larger variety of food sources. For those with restrictions or limited preferences, consulting a dietitian about supplements may be helpful.

Including protein foods as a main component at mealtimes is important.

Eating the right amount of energy (calories) is also needed for building muscle. If energy intake is too low, protein will be used for energy rather than building muscle. On the other hand, high energy intake from fats and carbohydrates can lead to increased body fat, which might negatively affect

mobility and physical function.

Those with a low body weight, frailty or active medical problems should consult their GP or local dietetic service for nutritional support.

Others who are without any active problems and wish to lose weight may find the [NHS Weight Loss Plan](#) helpful.

Protein Timing

Increasing protein intake alone will not automatically lead to increases in muscle.

Exercise is needed to make sure that the protein targets the right areas and is delivered to the muscles.

Further, getting the timing of meals and snacks to complement an exercise programme is crucial.

A general rule of thumb is for people to consume a dose of protein within 1-2 hours of an exercise session. This can be as a meal or snack and should provide around 15-20g of protein.

Meals and snacks that provide high carbohydrate or high fat with little protein will be ineffective to support the building of muscle following a workout.

Planning meals and snacks in advance is useful to make sure that any additional snacking provides enough protein and energy without leading to excess calories and unwanted weight gain.

Having enough energy to perform exercise without fatigue is an important consideration, so gradual rather than drastic reductions in carbohydrate and fat are recommended when aiming for weight loss.



NUTRITIONAL CONTENT OF FOODS

Food	Portion Size	Protein (g)	Calories (kcal)
Whole Milk	1 pint	20	370
Semi-skimmed Milk	1 pint	21	270
Skimmed Milk	1 pint	21	200
Plain Greek Yogurt	200g	11	266
Plain Fat-free Greek Yogurt	200g	14	110
Sweetened Soya Milk	1 pint	18	250
Unsweetened Soya Milk	1 pint	14	150
Low-fat Fruit Yogurt	1 pint	8	114
Cheddar Cheese	45g	11	187
Cottage Cheese	45g	4	46
Half-fat Cheese	45g	15	123
Feta Cheese	45g	7	113
Boiled Egg	Medium—60g	8	86
Fried Egg	Medium—60g	8	140
Beef	90g	27	200
Chicken Breast	130g	42	192
Bacon	1 rasher	6	74
Lamb	90g	23	273
Sausage	1 average	6	116
Cod	120g	29	120
Salmon	120g	30	278
Prawns	60g	9	42
Baked Beans	200g	9	156
Chickpeas	100g	9	164
Lentils	125g	12	145

Table 1: List of common sources of protein.

Information is based on ready-to-serve portions. These figures are to be used as a guide only and will vary depending on brand and source of product. Please consult relevant and validated data sources for accurate figures regarding nutritional content of foods.

A healthy diet that includes a variety of food groups will provide all of the essential nutrients that are needed to support rehabilitation and recovery.

Although protein is an important part of the diet, including the right amount of energy from wholegrains and healthy fats is also needed. Fruits and vegetables can also provide important nutrients including vitamins, minerals and fibre.

If you would like more information about how to achieve a healthy diet, please visit the [NHS Website](#).

