Cappagh National Orthopaedic Hospital is Ireland’s major centre for elective orthopaedic surgery. It has been the pioneer of orthopaedic surgery and is the biggest dedicated orthopaedic hospital in the country, with 159 beds, catering for both public and private patients.

The hospital provides the full range of orthopaedic services including:
- Major Joint Replacements (Hip, Knee, Shoulder, Elbow, Foot and Ankle)
- Spinal Surgery
- Primary Bone Tumour Services
- Management of Sports Injuries

Your journey if you come to Cappagh Hospital
As elective surgery is planned well in advance there is a clearly identified pathway for you to travel from referral to discharge following surgery:

Cappagh Hospital Foundation raises funds for Cappagh National Orthopaedic Hospital. The funds raised support the hospital to continue to provide the highest quality patient care, improve patient mobility and advance the science of orthopaedic surgery through research, education and development.

Our Patrons are Mr. Francis Brennan and Mrs. Mary O’Rourke.

Cappagh Hospital Foundation is an Irish Registered Charity, No. 9282.
The Charities Regulatory Authority Registered Number is 20023201.
It is a company limited by guarantee, company registration No. 136818.

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What is the musculoskeletal system?

Our musculoskeletal system is composed of our muscles, bones, tendons, ligaments, cartilage, joints and other connective tissues. It acts as the supporting framework to our bodies, providing stability, structure, movement and agility.

Musculoskeletal basics

Bones – the body’s framework

Our bones are living tissues, composed of bone marrow and a matrix of mineral-based fibres. Bone marrow plays a role in blood production, while collagen (the main protein in bone) and minerals, such as calcium and phosphorus, contribute to bone structure and strength. Both childhood and the adolescent years are critical stages for bone growth and development, setting the foundations for life. Throughout life, our bones constantly undergo a natural process of 'remodelling' where old bone is replaced by new bone. The ability to remodel bone naturally slows down as we age. This can contribute to age-related bone loss, making bone health a priority throughout life.

Muscles – the power within

Keeping muscles healthy is not just a task for athletes; we need our muscles to perform everyday activities such as housework or going up the stairs. A focus on building and maintaining muscle throughout life can help us to stay strong, active and independent, particularly as we age. Our muscles are vital for movement, supporting our skeleton and positioning our posture, but they also play a vital role in our metabolism. Having an adequate muscle mass can help to improve disease outcomes so it is particularly important at times of illness, injury or following surgery.

Joints – let’s twist and turn

Our joints allow us to bend our knees and elbows, twist our hips and turn our heads so that we can perform everyday movements such as walking, putting on our shoes or dancing around the kitchen! The cartilage and other joint tissue reduce friction occurring between our bones by acting as a cushion to help absorb any impact during movement. Maintaining a healthy body weight and having strong muscles can help to alleviate pressure and wear and tear on our joints.

Anatomy of the Joint

Bones – stability and support
Muscles – strength and movement
Tendons – connect muscle to bone
Ligaments – connect bone to bone
Cartilage – protective padding at the end of bones

Musculoskeletal health is particularly important as we progress into our later years, as it is a time when loss of muscle and bone strength can occur naturally. A strong musculoskeletal system helps in the prevention of injury and in optimal recovery following surgery. It is also significant throughout life for the prevention of injury or for optimal recovery following surgery.
Common conditions impacting the musculoskeletal system

As we get older our body’s ability to adapt to the stress and strain of everyday activities can affect people to a varying degree. Factors such as birth deformities, age, lifestyle (e.g. smoking, alcohol, inactivity), as well as some medications can make us more susceptible to certain musculoskeletal conditions.

Osteoporosis
Osteoporosis is a disease resulting from a loss of bone tissue. As bones become ‘porous’ or less dense, they weaken, which increases the risk of fractures (broken bones), even following a minor bump or fall. Quite often, osteoporosis is not diagnosed until a fracture occurs. The most common site for a fracture to occur is the hip, wrist or spine. At present, approximately 300,000 people in Ireland have osteoporosis with one in two women and one in four men over 50 years of age predicted to develop a fracture in their lifetime. Although older females are most at risk, osteoporosis can affect both genders and all age groups.

Sarcopenia
The word sarcopenia describes a progressive decline in muscle mass and strength, which leads to frailty and loss of function. Generally speaking, after the age of 50 we naturally lose about 1% of our muscle mass per year, particularly if we are inactive. Depending on our initial muscle reserves, these small losses can go mostly unnoticed, but over time they can accumulate to around 30% muscle loss by the time we reach our eighties. Sarcopenia can lead to a loss of independence as it increases the risk of falls and fractures. It is also associated with poorer disease outcomes. Efforts to maintain muscle mass as we age are important in the prevention of sarcopenia. Inactivity resulting from the pain of conditions such as arthritis can lead to loss of mobility, and therefore an increased risk of sarcopenia.

If concerned…
If you are concerned about your bone, muscle or joint health, speak to your healthcare practitioner (GP, Chartered Physiotherapist, Nurse, Consultant). They can give you specific advice, tailored to your individual concerns and needs. Early diagnosis is important for the best treatment and results.

X- Rays, bone density (DXA), CT, and MRI scans are examples of painless imaging techniques that may be used when examining the tissues of your musculoskeletal system.

Osteoarthritis
Just as the padding on the brakes of a car or bicycle can wear away with time or heavy use, the protective padding (cartilage) in our joints can also get worn away, resulting in osteoarthritis. It is the most common chronic condition affecting the joints and the symptoms usually develop progressively over years. Symptoms include joint pain with stiffness after periods of rest and/or swelling after periods of activity.

Rheumatoid Arthritis
Rheumatoid arthritis is a condition in which the body fights against itself and is known as an ‘auto-immune’ disorder. The joint lining becomes inflamed and damaged, which reduces the shock absorption ability of the joint. This leads to changes within the joint often resulting in deformity, which can be disabling. Damage to the musculoskeletal system can be managed with rehabilitation exercises or medication but, in some cases, surgery may be necessary to achieve the best outcome.
Top tips for a healthy musculoskeletal system

Our musculoskeletal health and strength is determined to a significant extent by factors beyond our control such as genetics, gender and age. However, there are factors that we can control such as our diet, physical activity and lifestyle habits.

- **Staying strong**: Weight-bearing, resistance-style exercises are particularly important for bone and muscle health; these include activities where your body must work against a force, such as gravity. Examples include skipping, running, tennis, dancing, brisk hill walking or simply climbing stairs.
- **Stretching**: Exercises such as stretching, Pilates or yoga can be particularly beneficial for posture and supple joints. Stronger core muscles (abdominals and back) improve balance, helping to prevent falls.
- **Nutrition**: A balanced diet which provides adequate nutrients, including calcium, protein, phosphorus, vitamin C and vitamin D, are essential for musculoskeletal health (see pages 7-10).
- **A healthy body weight**: Being either underweight or overweight can have a negative impact on musculoskeletal health. Being very thin or losing weight quickly can result in a low muscle mass (see sarcopenia, page 4). Alternatively, being overweight increases pressure on joints such as the knees, hips and back, thereby increasing the risk of pain and injury.
- **Smoking and Alcohol**: Refrain from smoking and if you consume alcohol, do so in moderation.

The National Guidelines on Physical Activity recommend that adults take part in at least 30 minutes of moderate intensity activity on five days a week (or 150 minutes a week). Following surgery your chartered physiotherapist can advise you on specific exercises that are tailored to match your rehabilitation needs and capabilities.

Nutrition focus

Energy and nutrient needs vary depending on factors such as gender, age, body size and activity levels; as well as circumstances such as illness or recovery from surgery. Although our nutrient needs may vary at specific points throughout our life, a balanced diet forms the foundations of healthy eating.

In Ireland, we use the Department of Health’s Food Pyramid as a guide to the types and amounts of foods needed for good health. The Food Pyramid divides foods into groups based on the main nutrients they provide. It also guides us on portion sizes and daily serving recommendations.

<table>
<thead>
<tr>
<th>Foods and drinks high in fat, sugar and salt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fats, spreads and oils</td>
</tr>
<tr>
<td>Meat, poultry, fish, eggs, beans and nuts</td>
</tr>
<tr>
<td>Milk, yogurt and cheese</td>
</tr>
<tr>
<td>Wholemeal cereals and breads, potatoes, pasta and rice</td>
</tr>
<tr>
<td>Vegetables, salad and fruit</td>
</tr>
</tbody>
</table>

The Food Pyramid guidelines apply to the general healthy population. When needed, a dietitian may provide tailored dietary advice to meet your specific nutrient needs; particularly at times of illness, before or after surgery.
Key nutrients for bones, muscles and joints

Along with a balanced diet and sufficient energy intakes, there are certain nutrients which play specific roles in our musculoskeletal health:

**Protein**
- Protein contributes to the maintenance of normal bones and growth of muscle.
- Timing and quality are important. Spread intakes across the day to ensure the constant supply needed by active muscles and joints is provided.
- Animal-based proteins e.g. milk, yogurt, cheese, lean meat, poultry, fish and eggs are the richest sources. Nuts, seeds, beans and lentils also provide some protein.

**Calcium and Phosphorus**
- Calcium and phosphorus are needed for normal bone development and maintenance. Calcium also plays a role in muscle function.
- Dairy foods such as yogurt, milk and cheese are among the best sources of dietary calcium and phosphorus.
- The calcium in dairy foods is easily absorbed and used by the body. Take care if choosing a milk alternative by ensuring it is fortified with calcium and vitamin D. Milk alternatives often fall short of the wide range of nutrients naturally present in cow’s milk.
- Other sources include dark green vegetables such as broccoli, soft bony fish such as sardines, pulses, nuts and fortified cereals.

**Vitamin D**
- Vitamin D assists with the absorption of calcium and phosphorus and is needed for the maintenance of normal bones and muscles. It also helps to reduce the risk of falling associated with poor balance and muscle weakness.
- Although vitamin D is known as the ‘sunshine vitamin’, we are particularly reliant on dietary sources in Ireland e.g. oily fish such as salmon or mackerel, liver, egg yolk and dairy products/cereals that are fortified with vitamin D.
- If you do not eat these foods or have limited exposure to sunshine, talk to your doctor or pharmacist about taking a vitamin D supplement.

**Vitamin C and Zinc**
- Vitamin C and zinc are essential nutrients for immune function and are therefore important following surgery or when wounds are healing. Vitamin C also contributes to normal collagen formation and normal function of the bones and cartilage.
- Good sources of vitamin C include fresh fruit and vegetables such as oranges, strawberries, kiwis, tomatoes, peppers and potatoes.
- Zinc is mainly found in meat, shellfish, poultry and cheese. It is also present in nuts and beans.

**Supplements: are they needed?**
A variety of supplements such as vitamins, minerals, omega-3, glucosamine or chondroitin are often associated with musculoskeletal health. However, the best way to ensure you are getting the wide variety of nutrients that your body needs is to consume a balanced diet with a wide range of foods. As some substances can interact with medications, it is important to consult your GP before taking any supplements.
What about dairy?

Dairy foods such as milk, yogurt and cheese provide many of the key nutrients that contribute to normal musculoskeletal health. Dairy is well recognised as a natural source of bioavailable calcium, which means that it is easy to absorb by the body. In addition, dairy foods contain a matrix of other nutrients which have important roles in health (see page 10). Dairy foods are versatile, nutritious and convenient foods that can be enjoyed across the day in meals and snacks, in cooking and baking. The Department of Health’s guidelines recommend three servings from the ‘milk, yogurt and cheese’ food group each day as part of a healthy, balanced diet. Between the ages of 9-18 years, five servings daily are recommended due to the importance of calcium during this life stage. Examples of one serving includes 200ml of milk, 125g of yogurt or 25g of cheddar-type cheese.

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Milk

**is perfect over wholegrain cereal, in smoothies, or to make a milky latte.**

Yogurt

**is ideal over homemade granola & berries; in a smoothie or as an on-the-go snack.**

Cheese

**is delicious on wholegrain toast or grated over a baked potato.**

The matrix of nutrients in milk contributes to the normal functioning of many processes in our bodies:

- Iodine
- Phosphorus
- Calcium
- Protein
- Potassium
- Vitamin B12
- Vitamin B5
- Protein

- **Iodine**
  - Bone development
  - Healthy teeth
  - Energy metabolism

- **Phosphorus**
  - Bone development
  - Muscle function
  - Energy metabolism

- **Calcium**
  - Bone development
  - Healthy teeth
  - Energy metabolism

- **Protein**
  - Muscle growth
  - Bone development

- **Potassium**
  - Nervous system function
  - Blood pressure

- **Vitamin B12**
  - Energy metabolism
  - Reduction of fatigue
  - Red blood cell formation
  - Immune system function

- **Vitamin B5**
  - Energy metabolism
  - Reduction of fatigue
  - Mental performance

Source: EU Register of Nutrition and Health Claims made on foods.
Preparing for your surgery

It is vital that you do everything you can to be in the best of health going into surgery because this will aid your recovery afterwards. Key considerations that will help when preparing for surgery are a healthy diet and staying active.

If you are overweight now is the time to address this issue to reduce the risk of complications following surgery, and to prevent your new joint being put under undue stress and strain. Likewise, if you are underweight you will be advised to focus on gaining some weight by increasing your calorie and protein intake to assist with your recovery.

If you are advised to lose weight, here are some tips:

• Eat smaller portion sizes and avoid second helpings. Using a smaller plate and keeping serving bowls off the table can help.
• Add extra salad to sandwiches or vegetables to stews, soups and casseroles for added bulk with less calories.
• Eat slowly – be mindful when eating to enjoy the taste, flavour and texture and to give the body a chance to feel full and satisfied.
• As fats such as oils, dressings and spreads are high in calories, try to use these sparingly. Alternatives to frying include steaming, baking, boiling or grilling.
• Foods high in fibre and protein can help you feel fuller for longer e.g. make porridge with milk, berries and seeds.
• Remember that alcohol is high in ‘empty’ calories e.g. a pint of beer contains about 210 kcals and a small glass of wine contains about 85 kcal.
• If you feel you would benefit from further advice, ask your doctor to refer you to a dietitian.

If you are advised to gain weight, here are some tips:

• Eat little and often. Aim for 3 meals daily as well as 2-3 snacks.
• Try not to have drinks just before meals to avoid feeling too full to eat.
• Avoid low-fat/light/diet versions of foods as these will be lower in calories. Choose full-fat versions.
• Include protein-based foods at each meal e.g. scrambled eggs or yogurt at breakfast; legumes (e.g. beans) or cheese at lunch; and fish, chicken or meat at dinner.
• Avoid junk foods and choose nutritious snacks such as a handful of nuts or a fruit smoothie made with protein-milk and honey.
• Aim to have a serving of bread, potatoes, rice or pasta with each meal.
• Aim to include 5 portions of fruit and vegetables per day. These can be fresh, frozen or tinned.
• Use whole milk in sauces, desserts, cereals and drinks. Try swapping coffee for a whole-milk latte or try warm milky drinks before bedtime.

These tips can also be used if you have a poor appetite following surgery.

If you are unable to gain weight despite following the above advice you may need to see a dietitian. Please ask your doctor to refer you to a dietitian.

Stay active

Staying fit and active is encouraged before surgery to maintain function, avoid stiffness and loss of muscle and optimise recovery. Any gains in fitness, strength and muscle mass can make a dramatic difference in accelerating recovery after surgery. Please ask your chartered physiotherapist about the right exercise programme for you. They will customise the advice to match your limitations, e.g. cycling or swimming are less stressful on the joints than running or hiking.
Increased requirements for calories and protein

Being injured or having orthopaedic surgery can put additional demands on the body through wound healing, inflammation and regeneration of new tissue. Good nutrition is vital to meet the body’s increased nutrient requirements at this time, to ensure an efficient return to healthy, active and independent living. There is an increased risk of muscle loss at this time, which can be detrimental to those that are already weak or underweight. Therefore, a diet high in calories and protein may be advised to help rebuild and regain strength (see tips for gaining weight on page 12).

Loss of appetite

Appetite loss can be common following surgery and can have multiple causes including medications, fatigue, pain or feelings of anxiety. In addition, temporary alterations in sense of smell or a dry mouth can make some food less appealing. Remember that this should pass in a few days but try to eat small amounts as often as possible to ensure you are getting the supply of nutrients needed at this critical stage of recovery. Scrambled eggs, or cheese and tomato on wholemeal toast can make a light and nutritious meal (for more ideas, see page 12).

Constipation

Many patients experience constipation following surgery and it can result from lack of activity, dehydration or medications. To avoid the discomfort of constipation, ensure you are consuming plenty of fluids (about 8 glasses per day), staying as active as possible and consuming plenty of fibre e.g. fruit and vegetables, seeds, wholegrain products. Try adding sliced lemons, cucumber or mint to chilled tap water to make it more appealing.

Planning ahead

Planning ahead and being prepared for going home is very important in advance of your surgery. Remember that following some surgeries you will not be able to drive or bend down to the ground for several weeks.

**Top tips:**

1) Stock up the freezer with chopped fruit and vegetables, stews, curries and other supplies.
2) Organise your family/friends to do the supermarket shop for the first 2-3 weeks following your surgery.
3) Have easy to prepare foodstuff in the cupboards e.g. rice, pasta, tinned fish, beans and chopped tomatoes.
4) Move essentials from high and low shelves to middle shelves for easier access.
Fresh fruit and vegetables
Add fresh fruit to desserts, berries to porridge and salad vegetables to meals to boost vitamin C intake, which is important for normal collagen formation as connective tissue is being repaired. Read about other important nutrients on pages 7-8.

Keeping mobile
For the first few weeks after surgery you may be feeling restricted and frustrated if surgery has limited your mobility, but equally you may be reluctant to move due to soreness or drowsiness. You will go home with a series of exercises from your physiotherapist who will have been treating you throughout your stay. You should persevere with the exercises you have been given – if in doubt ask your physiotherapist about the best rehabilitation exercises to assist with your recovery.

After your surgery - the future
When you go home following your orthopaedic surgery, you will be reviewed by your consultant about six weeks later. At this appointment check with your consultant regarding when you can return to work, sport and the hobbies you enjoy. Remember that this surgery is key to keeping you as active and well as possible for the future.