



Physiotherapy Eating Disorder

UK Professional Network

Physiotherapy in Eating Disorders: A Guidance Document

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1. Production of the guidance document

This guidance document was developed by a project group, consisting of eight Specialist Chartered Physiotherapists who have experience working across a range of eating disorder and mental health services within the National Health Service (NHS) in the United Kingdom (UK), and who are part of a wider specialist interest group - Physiotherapy Eating Disorder UK Professional Network Group. The document was also co-produced with input from two experts by experience. Recommendations within this document were formulated through a combination of available scientific evidence, gathered through systematic review and referenced throughout the document, alongside expert consensus from the wide knowledge base and expert experience within the guidance project group, developed through a combination of over 20 years of clinical practice. Despite emerging research, there is still limited scientific evidence for physiotherapy in eating disorders.

Following completion of the initial draft document by the guidance project group, the document was then reviewed by all members of the network group, and other key healthcare professionals. Amendments were then made to the document based on their feedback.

Although this is the final document it will be regularly reviewed and updated as new evidence emerges, other national guidance changes, and clinical practice develops.

Guidance project group:

Bev Anderson - Specialist Physiotherapist, Avon and Wiltshire Partnership NHS Trust.

Kate Brown - Advanced Specialist Physiotherapist/Mental Health Physiotherapy Lead, Cambridge and Peterborough NHS Foundation Trust

Lynn Hammond - Specialist Physiotherapist, Central and North West London NHS Foundation Trust

Charlotte Maycock - Peer Support Worker, Devon Partnership Trust

Samantha McIver - Clinical Lead Physiotherapist, Midlands Partnership NHS Foundation Trust

Anna Paterson - Clinical Lead Physiotherapist, Aneurin Bevan University Health Board

Sandra Philip-Rafferty - Highly Specialist Physiotherapist (Retired, NHS Grampian)

Rachel Rowles - Senior Physiotherapist, Devon Partnership Trust

Leah Smith - Peer Support Worker Coordinator, Cambridge and Peterborough NHS Foundation Trust

Yvonne Swainson - Highly Specialist Physiotherapist/Team Lead Physiotherapist, NHS Grampian

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2. The role of physiotherapy in eating disorders and aims of this document

“The main aim of Physiotherapists working in mental health is to promote the autonomy of people with physical dysfunction associated with physical or mental illness, and to use physical approaches to influence psychological health.” (Chartered Physiotherapists in Mental Healthcare <https://cpmh.csp.org.uk/>).

Within specialist eating disorder services physiotherapy plays a pivotal role, as part of a multi-disciplinary treatment, using biopsychosocial assessment and interventions. Throughout this document when the term eating disorders is used, it refers to both eating disorders and disordered eating.

Some of the key features of eating disorders are distorted body image and a dysfunctional relationship with exercise, with the two often being interrelated. Physiotherapy can help individuals to overcome these symptoms and to accept their changing body shape as they restore weight, and to develop a healthier relationship with physical activity and exercise. They play a key role in:

- Body image/body awareness
- Managing physical activity and exercise

Furthermore, within the multi-disciplinary team physiotherapy is essential in the overall management of a patient with an eating disorder as malnutrition and dysfunctional exercise can result in several secondary complications including;

- Balance and mobility problems
- Postural problems
- Neuro-musculoskeletal conditions
- Low bone mineral density for age, osteopenia or osteoporosis
- Fractures
- Functional disorders
- Continence problems

Physiotherapy plays a crucial part in the management of these conditions as part of a multi-disciplinary approach. The clinical role of a Physiotherapist working within this field can vary depending on some of the following factors:

- The conditions being treated
- The chronicity of the illness e.g., newly diagnosed to end of life care
- The age group receiving treatment; ranging from children and adolescents to older adults
- Where the individual is receiving care e.g., inpatient, day patient or outpatient and
- The ethos of the multi-disciplinary team

Physiotherapists have extensive skill sets, knowledge base and clinical reasoning skills, that are best placed, alongside their in-depth knowledge of risk assessment, to support and contribute to assessment and treatment of a highly complex patient group.

Rosenbaum *et al.*, (2021) stated that the depth of knowledge and skills that Physiotherapists have in relation to behavioural change, motivational approaches, and educational components, result in specialist exercise delivery, meaning that they are a vital part of the multi-disciplinary team.

There is a limited, but growing evidence base in support of the role of physiotherapy within eating disorders.

“Physiotherapists have specific expertise in both the ‘body’ and ‘the body in movement’, two important issues integral to eating disorder pathology.” (Probst *et al.*, 2013)

An international cross-sectional survey of expert Physiotherapists/Physical Therapists reported that physiotherapy input can result in a wide range of positive mental and physical health outcomes for individuals with eating disorders. The research showed Physical Therapists can play a role in both improving body awareness, and changing unhealthy exercising behaviours (Soundy *et al.*, 2016). Vancampfort *et al.*, (2014) further indicated that supervised physiotherapy interventions such as aerobic exercise, basic body awareness and yoga might reduce symptoms, as well as improve mental and physical health and quality of life. Further research has also supported the role of Physiotherapy in eating disorders, suggesting two main objectives: “rebuilding a realistic self-image” and “curbing hyperactivity, impulses and tensions”, with physiotherapy techniques influencing in both a functional and psychotherapeutic way. (Probst *et al.*, 2013)

In addition, there is a range of evidence that supports the importance of addressing aspects of eating disorders, of which physiotherapy has the knowledge and skill set to support, for example dysfunctional exercise behaviour, and Osteoporosis.

Aims of this guidance document

- To provide a written framework for physiotherapy assessment and interventions for an individual who is receiving treatment for an eating disorder, as part of a multi-disciplinary approach
- To provide a document based on available evidence and expert experience, which guides clinical reasoning and informs the optimal, individualised physiotherapeutic management of a person with an eating disorder, as part of a multi-disciplinary approach (acknowledging that there might be variations in clinical practice depending on the factors discussed above)
- To highlight opportunities for future research to increase the scientific evidence base for physiotherapy practice within eating disorders

Professional target group

This guidance document has been written to provide information for Chartered Physiotherapists within the UK, who encounter people who have an eating disorder in their clinical practice. Physiotherapists may not have had the opportunity to build up experience and/or expertise either at undergraduate or postgraduate levels; this document may therefore provide a starting point for those new to working with this condition within a mental health setting. It could also provide information and knowledge for Physiotherapists who, within their clinical role, are assessing or treating an individual for an unrelated condition, who has an eating disorder. This document will also be useful for all professional members of the multi-disciplinary team who require an overview of the Physiotherapist’s role in the assessment and treatment of individuals with eating disorders in a mental health setting.

Whilst the guidance document may be applicable to Physiotherapists working outside the UK, it cannot be guaranteed that the information complies with their physiotherapy standards or scope of practice, training requirements, or is appropriate for use, in other countries.

The authors welcome and encourage information within this guidance document being shared, however they request that it is correctly cited as the original reference as follows:

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3. Overview of eating disorders

Eating disorders are serious mental illnesses affecting people of all ages, genders, ethnicities, backgrounds and body types. They can cause serious health consequences and may even result in death if left untreated. It is thought that around 1.25 million people in the UK suffer from an eating disorder (Beat, 2023). Although the overall incidence rate of Anorexia Nervosa is considerably stable over the past decades, the incidence among younger persons (aged <15years) has increased. It is unclear whether this reflects earlier detection or earlier age of onset (van Eeden *et al.*, 2021). They are most often reported in adolescents and young women, and it has been reported that up to 13% of youths may experience at least one eating disorder by the age of 20.

Eating disorders are a range of psychological conditions that cause unhealthy eating habits to develop. Individuals with eating disorders use disordered eating behaviour as a way to cope with difficult situations or feelings. These behaviours can include food or fluid restriction, eating very large quantities of food at once, getting rid of food eaten through compensatory behaviours (e.g., making themselves sick, misusing laxatives, fasting, or exercise), or a combination of these behaviours. There is no single cause of eating disorders. Many specialists believe they develop because of a mixture of factors. These include:

- **Biological factors** – such as a family history of eating disorders or changes in the brain or hormone levels
- **Psychological factors** – such as a lack of confidence or self-esteem or being a perfectionist
- **Social factors** – such as bullying, difficulties with school or work, or abuse.

Symptoms of eating disorders	Physical symptoms
<ul style="list-style-type: none"> • Excessive worry about weight and/or body shape • Eating too little or too much food • Avoid socialising when food is involved • Purging/self-induced vomiting or taking laxatives after eating • Dysfunctional exercise • Rigid routines around food • Changes in mood e.g., withdrawn, anxious or depressed 	<ul style="list-style-type: none"> • Feeling cold, tired or dizzy • Poor circulation and paresthesia • Heart racing, fainting or feeling faint • Problems with digestion, such as bloating, constipation or diarrhoea • Weight very high or very low for that individual • Amenorrhea or irregular menses in females • Hair loss • Weakness
Prevalence of eating disorders	Predisposing/precipitating factors
<ul style="list-style-type: none"> • Anorexia Nervosa 0.6% • Bulimia Nervosa 1% • Binge Eating Disorder 3.2% • Other Specified Feeding and Eating Disorder 3% <p>Overview Eating disorders: recognition and treatment Guidance NICE www.nice.org.uk/guidance/ng69</p>	<ul style="list-style-type: none"> • Genetics • Dieting • Weight and shape concerns • Female • Depressive symptoms • Social and/or general anxiety • Childhood sexual or physical abuse • Childhood obesity • Early puberty • Internalisation of thin body ideals • Perfectionism • Rigidity

Classification of eating disorders

The information presented in this section is taken from the ICD-11. The ICD-11 is the eleventh revision of the International Classification of Diseases (2019/2021), it is developed and updated annually by the World Health Organization (WHO). Within the ICD-11 for Mortality and Morbidity Statistics, Feeding and Eating Disorders come under code 06 Mental, behavioural or neurodevelopmental disorders. Anorexia Nervosa (6B80), Bulimia Nervosa (6B81), Binge Eating Disorder (6B82), Avoid-Restrictive Food Intake Disorder (6B83) and Other Specified Feeding and Eating Disorders (6B8Y) are diagnosed using criteria which takes into account behavioural, psychological, and physical symptoms.

Anorexia Nervosa (AN)

The onset of Anorexia Nervosa often occurs during adolescence or early adulthood, between the ages of 10 and 24, typically following a stressful life event. Early onset Anorexia Nervosa (prior to puberty) and late onset Anorexia Nervosa (after age 40) are relatively rare. It is thought to primarily affect adolescent girls and young women, however it can span across all age ranges, affect any gender and affect any cultural group. It is more commonly diagnosed in females (10:1 ratio) with a prevalence of 0.4%. In males the true prevalence is less known but there is evidence that incidence and detection in males is increasing. Anorexia Nervosa has the highest mortality rate of any psychiatric illness, severe underweight status is an important prognostic factor that is associated with high risk of physical complications and substantially increased mortality. In adults, very low Body Mass Index (BMI) has been found to be associated with poorer long-term prognosis among individuals with Anorexia Nervosa, though it is not the sole determinant of medical risk.

A diagnosis of Anorexia Nervosa is made if all the following criteria are met;
<ul style="list-style-type: none">• Restriction of food intake leading to weight loss or a failure to gain weight resulting in significantly low body weight of what would be expected for an individual's height, age, developmental stage or weight history• A commonly used threshold is BMI less than 18.5 kg/m² in adults and BMI-for-age under 5th percentile in children and adolescents• Rapid weight loss, e.g., more than 20% of total body weight within 6 months may replace the low body weight guideline as long as other diagnostic requirements are met.• Children and adolescents may exhibit failure to gain weight as expected, based on the individual developmental trajectory rather than weight loss.• A persistent pattern of restrictive eating or other behaviours aimed at establishing or maintaining abnormally low body weight, typically associated with extreme fear of weight gain.• Excessive preoccupation with body weight or shape. Low body weight is overvalued and central to the person's self-evaluation, or the person's body weight or shape is inaccurately perceived to be normal or even excessive.
Anorexia Nervosa can be classified into the following subcategories
<ul style="list-style-type: none">• Restricting pattern. Behaviours aimed at reducing energy intake can include fasting, choosing low calorie food, excessively slow eating of small amounts of food, and hiding or spitting out food. These can be alone or in conjunction with ways to expend energy e.g., increased exercise, but they don't engage in binge eating or purging/self-induced vomiting.• Binge-eating/purge type; purging/self-induced vomiting and/or misuse of laxatives, diuretics, enemas or omission of insulin doses in individuals with diabetes. This type of Anorexia Nervosa also includes

individuals who exhibit binge eating episodes but do not purge (similar to Bulimia Nervosa except no weight loss criterion for Bulimia Nervosa)
Other behaviours aimed at increasing energy expenditure
<ul style="list-style-type: none"> • High levels of exercise, physical activity and incidental activity • Motor hyperactivity – however, it is important to recognise that sometimes the amount of exercise or activity isn't purely driven by food/calories or concern for weight/shape, but due to the effects of starvation on the body • Deliberate exposure to cold • Use of medication that increases energy expenditure (e.g., stimulants, weight loss medication, herbal products for reducing weight, thyroid hormones).
Preoccupation with weight or shape, when not explicitly reported, may be manifested by behaviours such as:
<ul style="list-style-type: none"> • Repeatedly checking body weight using scales • Repeatedly checking one's body using tape measures, touch, checking bony prominences or reflection in mirrors or windows, taking photographs/videos • Continually monitoring the calorie content of food or searching for information on how to lose weight <p>Or by extreme avoidant behaviours such as:</p> <ul style="list-style-type: none"> • Refusal to have mirrors at home • Avoidance of tight-fitting clothes • Refusal to know one's weight • Purchase clothing with specific sizing • Cutting out labels from clothing
Additional features
<ul style="list-style-type: none"> • Children with Anorexia Nervosa may not be able to articulate body image concerns and emotions related to restrictive eating. Presenting features among children may include avoidance of food intake with denial of the severity of malnutrition for reasons other than body image concerns (e.g., reporting they are 'not hungry' or that they have abdominal pain) as well as non-verbal forms of food refusal. • Children with Anorexia Nervosa are less likely to engage in binge eating and purging/self-induced vomiting or to engage in other compensatory behaviours. • The prognosis for adolescents diagnosed with Anorexia Nervosa is better than the prognosis for adults with Anorexia Nervosa. • Older individuals with Anorexia Nervosa who have had a longer duration of illness often exhibit chronic medical complications. • Some males with Anorexia Nervosa can be preoccupied with being insufficiently muscular or lean and, in response, may exhibit unusual eating behaviours (e.g., excessive protein consumption along with caloric restriction) or engage in dysfunctional (e.g., excessive) exercise for the purpose of attaining and maintaining low body weight or a low percentage of body fat. If low body weight and low body weight idealisation are not part of the clinical presentation, a diagnosis of Body Dysmorphic Disorder may be considered. • Among individuals who are recovering from Anorexia Nervosa who have achieved a healthy body weight, the diagnosis should be retained until a full and lasting recovery is achieved. A full and lasting recovery

includes maintenance of a healthy weight and the cessation of behaviours aimed at reducing body weight for a sustained period (e.g., at least 1 year) following the termination of treatment.

- Although some individuals fully recover after a single episode of Anorexia Nervosa, many experience a chronic course of illness over many years.
- Individuals with severe symptoms of Anorexia Nervosa may require hospitalization to restore weight and address medical complications. These individuals are less likely to experience remission of symptoms.
- Most individuals will experience remission within five years of onset. However, even after an individual no longer meets the diagnostic requirements they are likely to have a lower body weight and increased psychological features associated with Anorexia Nervosa e.g., perfectionism compared to the general population
- Anorexia Nervosa is associated with premature death often due to medical complications of starvation or to suicide.

Bulimia Nervosa (BN)

Bulimia Nervosa is a serious mental illness. It can affect anyone of any age, gender, ethnicity or background. Treatment at the earliest possible opportunity gives the best chance for a fast and sustained recovery from Bulimia Nervosa.

A diagnosis of Bulimia Nervosa can be made with the following criteria;

- Frequent, recurrent episodes of binge eating (e.g., once a week or more over a period of at least 1 month). Binge eating is defined as a discrete period of time (e.g., 2 hours) during which the individual experiences a loss of control over their eating behaviour and eats notably more or differently than usual. Loss of control over eating may be described by the individual as feeling like they cannot stop or limit the amount or type of food eaten; having difficulty stopping eating once they have started; or giving up even trying to control their eating because they know they will end up overeating.
- Repeated inappropriate compensatory behaviours to prevent weight gain (e.g., once a week or more over a period of at least 1 month). The most common compensatory behaviour is purging/self-induced vomiting, which typically occurs within an hour of binge eating. Other inappropriate compensatory behaviours include fasting or using diuretics to induce weight loss, using laxatives or enemas to reduce the absorption of food, omission of insulin doses in individuals with diabetes, and strenuous exercise to greatly increase energy expenditure.
- Excessive preoccupation with body weight or shape. Preoccupation with weight or shape, when not explicitly reported, may be manifested by behaviours such as repeatedly checking body weight using scales; repeatedly checking one's body shape using tape measures or reflection in mirrors; constantly monitoring the calorie content of food or searching for information on how to lose weight; or by extreme avoidant behaviours, such as refusal to have mirrors at home, avoidance of tight-fitting clothes, or refusal to know one's weight or purchase clothing with specified sizing.
- There is marked distress about the pattern of binge eating and inappropriate compensatory behaviour or significant impairment in personal, family, social, educational, occupational or other important areas of functioning.

Additional clinical features

- Binge eating episodes may be 'objective', in which the individual eats an amount of food that is larger than what most people would eat under similar circumstances, or 'subjective', which may involve eating amounts of food that might be objectively considered to be within normal limits but are subjectively experienced as large by the individual. In either case, the core feature of a binge eating episode is the experience of loss of control over eating.
- Additional characteristics of binge eating episodes may include eating much more rapidly than usual, eating until feeling uncomfortably full, eating large amounts of food when not feeling physically hungry, or eating alone because of embarrassment.
- Binge eating is typically experienced as very distressing. This is often manifested in negative emotions such as guilt, disgust, or shame, which also typically negatively affect the individual's self-evaluation.
- Bulimia Nervosa may be associated with weight gain over time. However, individuals with Bulimia Nervosa may be of normal weight or even low weight (though not sufficiently low to meet the diagnostic requirements for Anorexia Nervosa). The diagnosis of Bulimia Nervosa is based on the presence of regular binge eating and inappropriate compensatory behaviours, regardless of overweight status.
- Preoccupation with weight or shape, when not explicitly reported, may be manifested by behaviours such as repeatedly checking body weight using scales; repeatedly checking one's body shape using tape measures or reflection in mirrors; constantly monitoring the calorie content of food or searching for information on how to lose weight; or by extreme avoidant behaviours, such as refusal to have mirrors at home, avoidance of tight-fitting clothes, or refusal to know one's weight or purchase clothing with specified sizing

Course features

- Bulimia Nervosa is characterized by a variable course that can manifest as persistent symptoms or intermittent episodes of remission and exacerbation. The outcome appears to be related to course such that individuals whose symptoms remit for a period longer than one year tend not to experience relapse of the disorder.
- Individuals with Bulimia Nervosa are at a significantly increased risk for substance use, suicidality, and health complications (e.g., gastrointestinal problems) that can lead to premature death.
- Some individuals may cease purging/self-induced vomiting or compensatory behaviours but continue to engage in binge eating. In this case, the diagnosis may be changed to Binge Eating Disorder if all diagnostic requirements are met.
- Stressful life events or a history of Anorexia Nervosa increase the likelihood of the onset of Bulimia Nervosa. A restricting pattern in Anorexia Nervosa may evolve over time into a pattern of bingeing and purging in Bulimia Nervosa. In such cases, the diagnosis may be changed to Bulimia Nervosa after 1 year during which body weight has not been sufficiently low to meet the diagnostic requirements of Anorexia Nervosa.

Binge Eating Disorder (BED)

Binge Eating Disorders can affect any age (typically starting in adolescence or early adulthood, but can also begin in older adulthood), gender, ethnicity or background and it is thought to be the most common eating disorder. Recurrent binge eating, although less common than overeating, is far more severe, and is associated with significant physical and psychological problems. Individuals who seek treatment for Binge Eating Disorder are typically older in age compared to individuals who seek treatment for other feeding or eating disorders. Binge

Eating Disorder, although often persistent, has a higher rate of remission than other feeding or eating disorders, with remission sometimes occurring spontaneously or as a consequence of treatment.

A diagnosis of Binge Eating Disorder can be made with the following criteria;

- Frequent, recurrent episodes of binge eating (e.g., once a week or more over a period of 3 months). Binge eating is defined as a discrete period of time (e.g., 2 hours) during which the individual experiences a loss of control over their eating behaviour and eats notably more or differently than usual. Loss of control over eating may be described by the individual as feeling like they cannot stop or limit the amount or type of food eaten; having difficulty stopping eating once they have started; or giving up even trying to control their eating because they know they will end up overeating.
- The binge eating episodes are not regularly accompanied by inappropriate compensatory behaviours aimed at preventing weight gain.
- The symptoms and behaviours are not better accounted for by another medical condition (e.g., Prader-Willi Syndrome) or mental disorder (e.g., a Depressive Disorder) and are not due to the effects of a substance or medication on the central nervous system, including withdrawal effects.
- There is marked distress about the pattern of binge eating or significant impairment in personal, family, social, educational, occupational or other important areas of functioning.

Additional clinical features

- Binge eating episodes may be 'objective', in which the individual eats an amount of food that is larger than most people would eat under similar circumstances, or 'subjective', which may involve eating amounts of food that might be objectively considered to be within normal limits but are subjectively experienced as large by the individual. In either case, the core feature of a binge eating episode is the experience of loss of control over eating.
- Additional characteristics of binge eating episodes may include eating much more rapidly than usual, eating until feeling uncomfortably full, eating large amounts of food when not feeling physically hungry, or eating alone because of embarrassment.
- Binge eating is typically experienced as very distressing. This is often manifested in negative emotions such as guilt, disgust, or shame, which also typically negatively affect the individual's self-evaluation.
- When there are multiple binge eating episodes per week and these are associated with significant distress, it may be appropriate to assign the diagnosis after a shorter period (e.g., one month).
- Binge Eating Disorder is often associated with weight gain over time and obesity. However, individuals with Binge Eating Disorder may be of normal weight or even low weight (though not sufficiently to meet the diagnostic requirements for Anorexia Nervosa). The diagnosis of Binge Eating Disorder is based on the presence of regular binge eating that is not accompanied by regular inappropriate compensatory behaviours, regardless of overweight status.
- Preoccupation with one's body weight or shape, frequent checking or avoidance of checking body weight or size, and strong influence of body weight or shape on self-evaluation are commonly present, though not required for a diagnosis of Binge Eating Disorder.
- In children, as in adults, Binge Eating Disorder is associated with weight gain, increased body fat, concealing one's eating, and use of binge eating to regulate emotions.
- Binge Eating Disorder is more difficult to diagnose in childhood due to normative difficulty engaging in introspection in order to articulate reasons for binge-eating behaviour. Children are likely to report feeling out of control while eating rather than indicating that the amount of food consumed was excessive.

- Children with Binge Eating Disorder may experience less frequent and briefer binges as compared to adults because they typically cannot gain access to food without the assistance of adults.

Avoidant-Restrictive Food Intake Disorder (ARFID)

The prevalence of Avoidant-Restrictive Food Intake Disorder is similar in females and males, it often starts in early childhood, but initial presentations in older children, adolescents and adults also occur.

A diagnosis of Avoidant-Restrictive Food Intake Disorder can be made with the following criteria;

- Avoidance or restriction of food intake, that results in either or both of the following:
- The intake of an insufficient quantity or variety of food to meet adequate energy or nutritional requirements that has resulted in significant weight loss, clinically significant nutritional deficiencies, dependence on oral nutritional supplements or tube feeding, or has otherwise negatively affected the physical health of the individual.
- Significant impairment in personal, family, social, educational, occupational or other important areas of functioning (e.g., due to avoidance or distress related to participating in social experiences involving eating).
- The pattern of eating behaviour is not motivated by preoccupation with body weight or shape.
- Restricted food intake and consequent weight loss (or failure to gain weight), or other impact on physical health or related functional impairment, are not due to unavailability of food; are not a manifestation of another medical condition (e.g., food allergies, hyperthyroidism) or mental disorder; and are not due to the effects of a substance or medication, including withdrawal effects.

Other Specified Feeding or Eating Disorders (OSFED)

OSFED account for the highest percentage of eating disorders, and anyone of any age, gender, ethnicity or background can experience it. They are as serious as other eating disorders and can develop from or into another diagnosis.

A diagnosis of OSFED can be made with the following criteria;

- The presentation is characterized by abnormal eating or feeding behaviours.
- The symptoms do not fulfil the diagnostic requirements for any other disorder in the feeding or eating disorders grouping.
- The symptoms are not better accounted for by another mental, behavioural or neurodevelopmental disorder (e.g., Primary Psychotic Disorder, Mood Disorder, and Obsessive-Compulsive or Related Disorder).
- The symptoms or behaviours are not developmentally appropriate or culturally sanctioned.
- The symptoms or behaviours are not a manifestation of another medical condition that affects feeding or eating, not better accounted for by another mental disorder, and not due to the effects of a substance or medication on the central nervous system, including withdrawal effects.
- Symptoms/behaviours result in significant risk or damage to health, significant distress, or impairment in personal, family, social, educational, occupational or other important areas of functioning.

Type 1 diabetes and eating disorders (T1DE)

Type 1 diabetes is an auto-immune condition which causes damage to the islet cells of the pancreas, these cells produce insulin. Insulin allows glucose uptake into cells. In its absence glucose is unable to leave the blood stream. In the longer-term high levels of circulating glucose cause damage to the blood vessels and organs they supply, while the lack of glucose getting into the cells means that the body is put into an effective state of starvation. The body then uses its own reserves such as fat, muscle and tissue and excretes excess glucose via urine. If glucose levels rise diabetic ketoacidosis can result.

Type 1 diabetes and eating disorders refers to a range of conditions. When an individual has both Anorexia Nervosa and Type 1 diabetes the incidence of mortality is quadrupled than that of Anorexia Nervosa alone. It is estimated that up to 30% of people with Type 1 diabetes have an eating disorder. Eating disorders are twice as common in people with Type 1 diabetes than people without the condition (Diabetes UK, 2023). Diabetes and food are closely linked. Having diabetes can mean a bigger focus on diet, weight and body image. Behaviours can include insulin reduction or omission after meals, excessive dieting and binge eating and worry about weight and body shape.

Signs and Symptoms
<ul style="list-style-type: none">• Increase in HbA1c or blood sugar levels that are going up and down a lot• Going into diabetic ketoacidosis or near diabetic ketoacidosis episodes• Severely restricting food intake• Binge eating (eating a lot of food very often and not feeling in control)• Secrecy about diabetes management• Trying to lose weight by restricting insulin or other compensatory behaviours• Fear of weight gain and concerns about body image• Depression and anxiety• Fear of hypos• Diabetes distress• Feelings of guilt, shame and judgement about eating habits, blood glucose levels and weight or body shape• Denial of the seriousness of symptoms and conditions• Exercising a lot without eating enough to balance it out

Severe and Enduring Eating Disorders (SEEDs)

Severe and enduring eating disorders may account for a particular group. They often require regular support and care from specialist mental health services, other general hospital services and other care givers/providers. Recovery rates can be low and due to the long-term nature of the illness, they can present with a combination of severe symptoms including serious chronic physical sequelae, for example, osteoporosis and renal failure. They can have marked social isolation and sometimes face stigma around their illness. Furthermore, their care givers can experience carers stress because of the prolonged length of time that they have looked after them and given them support. Within the field of psychiatry severe and enduring eating disorders is a relatively recently described area of eating disorders that requires research and service development so that patients and carers are helped to cope with very serious chronic, but not incurable, conditions (Robinson, 2018)

The 'severe and enduring mental illness' label came into use in 1999 with the National Service Framework for Mental Health (NSF; Department of Health 1999):

'People with recurrent or severe and enduring mental illness, for example schizophrenia, bipolar affective disorder or organic mental disorder, severe anxiety disorders or severe eating disorders, have complex needs which may require the continuing care of specialist mental health services working effectively with other agencies' (p. 43).

This concept allows realistic and compassionate support for these individuals. The inpatient and outpatient treatment pathway may differ for this group of individuals in comparison to those that are presenting for the first time with an eating disorder. For example, treatment may focus on stabilisation or quality of life outcome measures rather than on weight restoration and recovery.

Definitions of Severe and Enduring Eating Disorders
<ul style="list-style-type: none">• Illness longer than seven years• Several extensive attempts with inpatient and outpatient treatment that have not achieved recovery• Full re-nutrition has not lasted or improved psychological outcome• Attempted stabilisation at suboptimal but “functional” weight has not been possible• The illness is “treatment resistant”• Social isolation, impact on relationships and occupation• Serious medical consequences e.g., osteoporosis

Recovery from eating disorders

What is ‘recovery’?

The term ‘recovery’ has many different meanings attached to it – and each person will define recovery in their own unique way. It is a word that, for many, represents the journey that occurs when individuals begin making choices that support their health and wellbeing – decisions that move them closer towards leading a life that brings them meaning and purpose. For others, recovery is about learning to live well with or without symptoms/ challenges.

The table below explores 4 key models of recovery. It is important to be aware of the different models of recovery that exist to ensure that empowerment, control, hope, and opportunity are at the heart of the support being offered.

Medical model	Personal model	Social model	Trauma-informed model
Focuses on symptoms and/or diagnoses .	Focuses on people's individuality, personal meaning, and strengths .	Focuses on the way society impacts on physical and/or mental health.	Focuses on what has happened to someone, instead of what is 'wrong' with someone .
Clinicians / staff are seen as the experts.	Peers are seen as the experts of their own experience/s.	Peers, staff, communities, and environments are recognised for the roles they play in supporting wellbeing.	Peers and staff are recognised for their strengths and roles in facilitating healing.
Support is directed or prescribed by clinical staff .	Support is directed by individuals themselves .	Communities should be involved in providing support to individuals and groups.	Choice and empowerment are central for both peers and staff.
Primarily uses jargonistic / diagnostic / medicalised language .	Promotes accessible, inclusive, and recovery-oriented language .	Uses accessible, inclusive, and non-victimising language .	Uses accessible, inclusive, and non-victimising language .

The purpose of distinguishing between the above models of recovery is not to make comparisons or to identify one as being better than the others – there is space for all of them.

The key message to emphasis is that when talking about the personal model of recovery, it is not possible to apply a single definition to how to understand it. Recovery is self-defined, and this means it will look different for each person. For example, one person may describe recovery as developing a healthier relationship with food and exercise, while another may define recovery as walking for 10 minutes a day rather than 3 hours a day.

Within eating disorder services, there can be a large focus on numerical indicators that measure how close or far away the body is from reaching recovery. These are often defined by medical professionals. As mentioned, there is space for this approach - often, the human body has to be in a place where it is receiving consistently regular food to the point where it is no longer concerned about being in famine or starvation mode before it can engage meaningfully with therapeutic interventions. It is important that alongside this medical model of recovery are opportunities for peers to exert control over decisions about their goals, hopes, and dreams. Physiotherapy can be a fantastic resource for this – where collaboration around goals and ways of working towards them means that power is shared and trusting connections are formed. This, in turn, supports the recovery process/journey, as feeling involved in one's support plan can bring with it a sense of meaning and hope.

An example of recovery from lived experience of an eating disorder: *“Recovery, for me, is about responding to challenging thoughts and feelings in a way that mirrors the compassion and kindness I give to others. It is about celebrating my interests and giving myself permission to have fun. It’s about recognising when I am finding things challenging and seeking/accepting support when and where I need it. It means holding onto hope and making a conscious effort to practice gratitude. It’s watching bees bumbling around from flower to flower; challenging diet culture in spaces I have access to; choosing the scariest option on the menu; having enough thinking space for learning and education; working and earning money to feed my cats; having regular menstrual cycles; living my life in a way that aligns with my core values”*

Recovery rates within eating disorders

In terms of recovery rates within eating disorders; a shorter duration of illness before treatment is thought to result in a more positive outcome in the longer term. For those who recover, it is estimated that it can take on average seven years of repeated attempts at treatment. Recovery rates are higher within the first three years of illness but then gradually reduce, so after twelve years of illness recovery rates are much lower (although recovery can still be possible after more than twenty-one years of illness) (Lowe *et al.*, 2003). This highlights the necessity for early identification of eating disorders and then timely access to specialist treatment care for improved outcomes of recovery.

4. Risk management

Why is risk assessment important in eating disorders?

Individuals with eating disorders have the highest mortality rate of any psychiatric illness and have high risks in terms of both their own health and safety, this is due to the nature and behaviours associated with eating disorders (Arcelus *et al.*, 2011; Derma *et al.*, 2006; Fichter *et al.*, 2016; Sharp *et al.*, 1993). The impact of their eating disorder on physical health and other behaviours contribute to this risk. Although Anorexia Nervosa is thought to have the highest mortality rate, researchers have found that Bulimia Nervosa and other specified feeding and eating disorders have mortality rates that approached the high rates seen in Anorexia Nervosa in an outpatient setting. During the study, about 1 in 20 people with eating disorders died as a result of their illness. Individuals who take large amounts of laxatives or diuretics or who purge/self-induce vomit are at significantly higher risk of sudden death from myocardial infarction due to electrolyte imbalances. Excessive amounts of exercise without adequate rest and nutrition can also increase the risk of death in individuals with eating disorders by increasing the amount of stress on the body (Iwajomo *et al.*, 2021). It is therefore imperative when considering risk factors in terms of impact on physical health, that they are not solely related to low body weight or low Body Mass Index (BMI). There is very limited research in the adult population group to guide determination as to when physical risks might increase at what BMI.

Within eating disorders treatment risk assessments are multifactorial, not only taking into consideration physical/medical and psychosocial risks but other factors such as insight, motivation, consent and the legal framework for interventions. Risk factors will vary considerably for different individuals, and it is important to recognise patients can often “appear well”. For example, an individual can be extremely driven with exercise and activity levels even with lack of nutritional reserve, so they can continue to be very active right up to the point of physical collapse.

Assessing for risks in physiotherapy clinical practice

Risk assessment and risk management in clinical practice allows us to recognise and define potential risks to individuals, ensuring safe and effective care of the patient, and safety of the clinician. Any risks that have been identified should be analysed to understand the nature and level of risk. A full understanding of these is important to appropriately manage each risk.

It is imperative that as much information is gathered from multiple sources to help assess for risk including patient case notes, from other members of the multi-disciplinary team, the patient and their family or carer givers (with patient consent). Within this population group, risk factors can change rapidly and so the process for assessing risk should be ongoing. Any noted risks should be documented clearly within care plans and clinical notes, and these should be regularly reviewed and updated at each stage of treatment.

The following table gives an overview of some of the categories of risk that should be considered in each episode of care.

Patient	Physiotherapist
<ul style="list-style-type: none"> Physical/Medical risks Psychiatric/Psychological risks Psychosocial risks Insight and motivation Capacity Duration of illness Stage of recovery 	<ul style="list-style-type: none"> Level of training Knowledge and Skills Level of experience Communication skills
Team	Environment
<ul style="list-style-type: none"> Staff expertise Staff skill mix Culture Communication Competence Trust Willingness to collaborate 	<ul style="list-style-type: none"> Specialist inpatient, day patient or outpatient/community eating disorder services Acute adult mental health ward Community Mental Health Team (CMHT) Children and Adolescent Mental Health services (CAMHS) General hospital wards Physiotherapy outpatient clinics Physiotherapy in the community

In 2022 the Royal College of Psychiatrists produced a guidance document for all frontline staff on how to respond to Medical Emergencies in Eating Disorders (MEED). This guidance document provides a risk assessment framework tool which assesses risk to life using a “traffic light” system assessing eleven risk areas and includes adjustment for age and gender when applied to children and young people. There is also an accompanying set of summary sheets of tailored advice for the different target readers of the documents, including Physiotherapists.

Positive or therapeutic risk taking

In some circumstances, positive or therapeutic risk taking might be appropriate as part of a team decision regarding an individual's care for example, when balancing physical risks with quality of life for an individual who has a severe and enduring eating disorder.

Positive or therapeutic risk-taking is underpinned by recognition that risk is not solely defined in terms of harm, hazards and danger. Risk can also create possibility, opportunity and achievement (Morgan, 2004). It should be a collaborative process in which individuals with mental health illnesses are supported to make decisions regarding safety and opportunities to enable their own development. Including pursuing goals, counterbalancing focus on harmful actions, instead recognising individual's strengths, supporting autonomy and encouraging self-management

Principles of positive or therapeutic risk-taking should include:

- Decision-making jointly between professionals and patients
- Information is shared clearly to promote informed choice
- Patients' capabilities and strengths are drawn on
- The outcomes of a decision are managed by effective assessment and collaborative planning
- It is accepted that risk-taking may result in positive achievements, not just negative events (Felton *et al*, 2018)

Physical/medical risks

Physical/medical risk factors can arise from a combination of restrictive behaviours with food and in some cases fluid restriction with or without other compensatory behaviours (NICE, 2017).

Physical/medical risk assessment in all settings should comprise of checking an individual's nutritional status including their current intake and any disordered eating behaviours that are present such as restriction, bingeing, purging/self-induced vomiting, laxative use, diuretic use and dysfunctional exercise. Physical health parameters should be reviewed from an individual's most recent physical tests. These could include weight, blood tests, electrocardiography, Holter monitor results, blood pressure, temperature and bone density. It is important to be aware that risk parameters for adults cannot be applied to children and young people without adjustment for age and gender. Weight loss in children and adolescents is often more acute than in adults, due to lower body fat stores, thus medical compromise occurs relatively frequently, and typical features such as amenorrhoea may not be present.

As with any physiotherapy specialty it is important to consider all the risks to help guide clinical reasoning, safe and effective treatment planning, recommendations/advice to colleagues within the MDT and accurate information and advice for the patient, family and care givers. The most important factors to stabilising physical signs and symptoms are weight restoration and a reduction in eating disorder behaviours including the right amount of physical activity and exercise. It is imperative that physiotherapy interventions including therapeutic physical activity and exercise should enhance and support recovery, not negate it. Although there is more favourable evidence emerging to support safe exercise interventions during eating disorder treatment, it is important to understand that eating disorders can be associated with serious medical comorbidities that could contraindicate specific types and/or amounts of exercise and physical activity.

For the body to thrive there needs to be a sufficient energy intake to support an individual's metabolic functioning and their level of activity, this is called optimal energy availability. Low energy availability happens when an individual's energy intake does not adequately cover both exercise and physiological requirements to support vital body functions. It can occur irrespective of weight or body size. Initially low energy availability affects performance and recovery from physical activity. However, if it continues the body needs to adapt and conserve energy wherever possible, by no longer performing non-essential functions such as menstruation, hair growth, mood regulation, executive thinking, as well as reducing cellular metabolism weakening the potency of the immune system. When it falls below optimal levels metabolically active tissue can breakdown to produce energy for survival, and this can include muscle mass (even cardiac muscle) and visceral adipose tissue. There is not a standardised, reliable and valid assessment protocol for measuring energy availability. It is therefore imperative that any risks or contraindications to physical activity and exercise are fully assessed with each individual patient prior to prescribing any physical activity or exercise intervention. (Areta *et al.*, 2021; Mountjoy *et al.*, 2014).

The following table provides examples of some of the common physical signs and symptoms and their possible causes, that an individual with an eating disorder might present with which could then have implications in terms of risk factors for physiotherapy assessment and treatment.

Neuro-musculoskeletal system		
Signs and symptoms	Possible causes	Risk factor implications for physiotherapy assessment and treatment
<p>Osteoporosis/osteopenia/Low bone mineral density for age</p> <p>A Dual Energy X-ray Absorptiometry scan (DEXA) measures quantity rather than quality of bone.</p> <p>A T score compares an individual's bone mineral density (BMD) with the optimal BMD of a 30-year-old adult of the same sex</p> <ul style="list-style-type: none"> - Above -1 standard deviation (SD) is normal - Between -1 and -2.5 SD is defined as mildly reduced bone mineral density compared with peak bone mass - Osteopenia - At or below -2.5 SD is defined as Osteoporosis <p>The Z score compares an individual's BMD with that of someone the same age, gender and ethnicity and people under 30 who haven't reached peak bone mass.</p> <p>Below -2 means that bone density is lower than it should be for someone of that age</p>	<ul style="list-style-type: none"> • Imbalances in hormone levels such as low oestrogen in women and low androgen in men caused by vitamin and mineral deficiencies from restrictive nutritional intake and/or too much activity leads to a reduction in bone production and an increase bone absorption • With weight loss and/or too much activity the size and strength of muscles can be reduced. If this happens bones experience less force from muscles and as result can lose density • Individuals with chronically elevated cortisol levels caused by the stress of the body being in a state of starvation may be at an increased risk of osteoporosis as elevated cortisol levels interfere with osteoblast formation and so can result in reduced bone density 	<ul style="list-style-type: none"> • As part of the assessment process review results of previous DEXA scans. When reviewing results consider factors such as how long ago the individual had the scan and the progress of their illness in the period of time after it and other risk factors e.g., smoker, family history and age • If they haven't had a DEXA scan discuss whether it is appropriate to consider referring for one with consultant/medical staff • When there is a diagnosis of osteoporosis/osteopenia /low bone mineral density for age in this patient group be cautious with the evidence-based exercise interventions for these conditions as these guidelines have been produced and are recommended for those that are in a healthy weight band • Be cautious with medical risk status and physical parameters including weight in relation to rehabilitation interventions • Be aware of an individual's compliance with advice for bone health safety • Following assessment if it is appropriate to prescribe specific exercises monitor these closely to ensure that they don't worsen symptoms in those that have dysfunctional exercise and that the exercise is being undertaken as prescribed and not exceeding the recommended amount • Share any exercise plans with the MDT and clearly document any exercise prescription in their care plan to

		<p>ensure that all staff are aware of the type and amount of exercise that has been recommended</p> <ul style="list-style-type: none"> • Regularly review an individual's exercise prescription and adapt either by progression, periodisation or regression. Update the MDT with any changes to the exercise care plans and ensure these are fully documented in the MDT notes • See below for stress/fragility fractures • For further information see section 6b exercise, activity and osteoporosis with an eating disorder
Stress/Fragility Fractures	<ul style="list-style-type: none"> • Stress fractures most often occur in the weight bearing bones of the lower limbs. The risk factors for these injuries include an increase in load, which can be from an increase in volume, intensity, or duration of exercise, abnormal biomechanical factors and a reduced bone mineral density • When dysfunctional exercise is present in an eating disorder higher amounts of exercise are undertaken, often weightbearing activities, such as walking and running, and frequently without taking adequate rest to recover from these activities which in turn can increase the risk of repetitive injuries • The risk of fragility fractures (low impact/low trauma fractures) are more prevalent in those with Anorexia Nervosa. In the presence of Anorexia Nervosa with low bone 	<ul style="list-style-type: none"> • In the presence of a stress/fragility fractures individuals may have difficulty in adhering to the guidance on the management of these e.g., the recommendations for rest or modified activity for bone remodeling and then phased return to activity • Local orthopaedic protocols or guidelines for the management of fractures and/or post-surgical interventions might need to be adapted in individual circumstances to reflect an individual's eating disorder presentation • If prescribing specific exercises for rehabilitation monitor this closely to ensure that it doesn't worsen symptoms in those that have dysfunctional exercise and that the exercise is being undertaken as prescribed and not exceeding the recommended amount • Be cautious with medical risk status, physical parameters including weight in relation to rehabilitation interventions • Share any exercise plans with the MDT and clearly document them in their care plan to ensure that all staff are aware of the type and amount of exercise recommended • Regularly review an individual's exercise prescription and adapt either by progression, periodisation or regression.

	<p>mineral density there is greater risk of fractures from low impact falls, activities of daily living (ADLs) e.g., housework and coughing/sneezing</p> <ul style="list-style-type: none"> • Self-harm is associated with a wide range of mental health conditions, including eating disorders. Individuals can present with fractures from hitting/kicking objects rather than typical self-harm injuries 	<p>Update the MDT with any changes to the exercise care plans and ensure these are fully documented in the MDT notes</p> <ul style="list-style-type: none"> • If an individual requires a cast or splint to manage their fracture, ensure the MDT is taking this into account when the individual is being weighed • Walking and mobility aids are often prescribed as part of orthopaedic and falls protocols, but this might not be appropriate. Consideration should be given to other factors such as the clinical setting, the presenting condition and the patient's presentation. For example, in certain conditions it could lead to an increased risk of dependence on the provided aid or there could be an increased risk of violence and aggression as the aid could be used as a weapon. Discuss risk vs benefit within the MDT or through local escalation procedures • A patient's current level of nutrition may impact on the healing times of fractures
Soft Tissue Injuries	<ul style="list-style-type: none"> • Changes to the soft tissue structures of the body including muscles, tendons and ligaments occur with reduced nutritional intake and associated hormonal changes, significant weight loss and/or too much activity/exercise increasing the risk of soft tissue injuries • When dysfunctional exercise is present in an eating disorder there can be higher amounts of exercise undertaken and often without taking adequate rest to recover from these activities which could increase the risk of developing soft tissue injuries 	<ul style="list-style-type: none"> • In the presence of a soft tissue injury individuals may have difficulty in adhering to the guidance on the management of these e.g., the recommendations for rest or modified activity for tissue healing to take place and then phased return to activity • If rhabdomyolysis is suspected urgent medical assessment should be sought • When gathering subjective information about the mechanism of injury be aware that there might be reduced collateral history and/or a reluctance to share information to hide dysfunctional exercise behaviours and/or self-harm • Be aware that there may be altered pain behaviours and responses. For example, wanting to feel pain to help

	<ul style="list-style-type: none"> • In addition to exercise an individual can often undertake higher than normal levels of incidental activity which could increase the risk of developing soft tissue injuries • Excessive amounts of exercise without rest in rare cases can lead to rhabdomyolysis. This is a muscle injury where muscles break down and leads to muscle death. When this happens, toxic components of muscle fibers enter the circulation system and kidneys. This can cause kidney damage. It is a life-threatening condition. Symptoms can include muscle swelling, muscle weakness, sore muscles, dark or red coloured urine. Other causes are thought to include side effects from some medications including anti-psychotics and anti-depressants, substance misuse and dehydration or overheating • There can be an increased falls risk which could result in soft tissue injuries • Self-harm is associated with a wide range of mental health conditions, including eating disorders which could result in soft tissue injuries • Individuals can experience other health co-morbidities e.g., hypermobility, which can increase the risk of soft tissue injuries 	<p>manage distressing emotions or thoughts, or due to body dissociation and reduced interoception</p> <ul style="list-style-type: none"> • Be cautious with medical risk status, physical parameters including weight in relation to rehabilitation interventions • If prescribing specific exercises for a soft tissue injury monitor these closely to ensure that they don't worsen symptoms in those that have dysfunctional exercise and that the exercise is being undertaken as prescribed and not exceeding the recommended amount • Share any exercise plans with the MDT and clearly document them in their care plan to ensure that all staff are aware of the type and amount of exercise recommended • Regularly review an individual's exercise prescription and adapt either by progression, periodisation or regression. Update the MDT with any changes to the exercise care plans and ensure these are fully documented in the MDT notes
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Postural Changes	<ul style="list-style-type: none"> • Musculoskeletal changes from reduced bone health and/or a reduction in muscle size and strength due to reduced nutritional intake and associated hormonal changes, significant weight loss and/or too much activity/exercise • Too much exercise/ activity without adequate rest could lead to fatigue of muscles and other soft tissue structures, causing injuries and pain, potentially, causing changes to posture • Other health co-morbidities could potentially contribute to changes to posture e.g., hypermobility spectrum disorder, functional neurological disorders • The psychological impact of eating disorders in terms of impact on mood and/or other mental health co-morbidities that an individual might have such as depression or anxiety could potentially contribute to changes in posture • Eating disorders can lead to altered body awareness due to changes in proprioception, interoception and exteroception which could potentially contribute to changes in posture • Negative body experience can sometimes impact on an individual's posture 	<ul style="list-style-type: none"> • Be aware that there can be an increased vulnerability with skin integrity and development of pressures ulcers/sores, adhere to local pathways and liaise with tissue viability teams • Provide guidance/recommendations to the MDT about appropriate chairs and/or bed/mattress for an individual (depending on local availability) • Be cautious with medical risk status, physical parameters including weight in relation to rehabilitation interventions. • If prescribing specific postural exercises monitor these closely to ensure that they don't worsen symptoms in those that have dysfunctional exercise and that the exercise is being undertaken as prescribed and not exceeding the recommended amount • Share any exercise plans/postural recommendations with the MDT and clearly document them in their care plan to ensure that all staff are aware of the type and amount of exercise and postural recommendations made • Regularly review an individual's exercise prescription and adapt either by progression, periodisation or regression. Update the MDT with any changes to the exercise care plans and ensure these are fully documented in the MDT notes • Be cautious around your communication regarding posture in relation to the words used as these have the potential to increase the negative feelings that they might have about themselves and their body • For further information see section 6c. body image and body awareness
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	<ul style="list-style-type: none"> • Some anti-psychotic medication can cause extra pyramidal side effects; this system regulates our posture and skeletal muscle tone • Environmental factors e.g., availability of appropriate beds/mattresses and chairs, ligature reduction environments 	
<p>Nervous System:</p> <ul style="list-style-type: none"> - Peripheral neuropathies - Nerve palsies - Altered gait pattern - Foot drop - Numbness in the peripheries 	<ul style="list-style-type: none"> • Peripheral neuropathy due to vitamin B12 deficiency leading to numbness or odd sensations in the hands or feet • Pressure nerve palsies due to loss of tissue including subcutaneous fat around exposed nerves e.g., common peroneal nerve around the fibular head and then sitting in sustained postures • Risk of developing diabetic neuropathy in individuals that have Type 1 diabetes and eating disorders 	<ul style="list-style-type: none"> • These conditions could increase an individual's risk of falling. Careful consideration should be given to prescribing walking and mobility aids which normally might be prescribed to reduce falls risk within this clinical setting (as previously described in stress/fragility fractures) • If an individual requires an orthotic ensure the MDT takes this into account when the individual is being weighed • Be cautious with medical risk status, physical parameters including weight in relation to rehabilitation interventions. • If prescribing specific exercises monitor these closely to ensure that they don't worsen symptoms in those that have dysfunctional exercise and that the exercise is being undertaken as prescribed and not exceeding the recommended amount • Share any exercise plans with the MDT and clearly document them in their care plan to ensure that all staff are aware of the recommendations • Regularly review an individual's exercise prescription and adapt by progression, periodisation, regression. Update the MDT with any changes to the exercise care plans and ensure fully documented in the MDT notes

Cardiovascular and circulatory systems		
Common signs and symptoms	Possible causes	Risk factor implications for physiotherapy assessment and treatment
<p>Hypotension - < 90/60mmHg</p> <p>Orthostatic Hypotension - A systolic drop of ≥ 20mmHg or diastolic drop of ≥ 10mmHg or to below 0.4–2 centiles for age, or systolic 96–102 in adult females</p> <p>A significant increase in heart rate on standing is an indicator of cardiovascular instability (increase in HR of over 30 beats per minute (bpm) (35bpm in <16 years)</p>	<ul style="list-style-type: none"> Insufficient food and fluid intake and/or too much exercise and/or activity and/or purging/self-induced vomiting may result in circulating blood volume depletion, or disturbance in key hormones may lead to autonomic dysfunction and/or regulation by the central nervous system by other mechanisms. Low electrolyte concentration can cause a reduction in loss of circulating blood volume Medication side effects Co-morbidities Deconditioning 	<ul style="list-style-type: none"> The priority should always be weight restoration and medical stability ahead of physiotherapy interventions e.g., exercise prescription and/or mobility The effectiveness of physiotherapy interventions will be limited with a significantly low body weight, and they could seriously compromise weight restoration and medical stability Caution should also be applied when considering prescribing activity and exercise for those who are in healthy weight range, as arrhythmias and electrolyte imbalances could still be present If an individual has hypotension and it is safe to introduce activity, ensure exercise is modified to mitigate dehydration If an individual has hypertension ensure they have medical clearance ahead of starting exercise, those with very high blood pressure may require pharmacological intervention Causes of arrhythmias should be investigate before starting exercise Sustained arrhythmias may interfere with cardiac output responses during exercise with the potential to become more complex or impact on haemodynamic stability. Uncontrolled arrhythmias with haemodynamic instability may contra-indicate exercise If an individual has bradycardia exercise should be with caution and supervised Be cautious when an individual informs you that they normally have a low resting heart rate because they are
<p>Hypertension > 140/90mmHg</p>	<ul style="list-style-type: none"> Individuals with Binge Eating Disorder and Bulimia Nervosa have a greater risk of hypertension 	
<p>Arrhythmias e.g., bradycardia, tachycardia Symptoms can include:</p> <ul style="list-style-type: none"> - Fatigue - Weakness - Dizziness - Light-headedness - Fainting - Rapid heart rate - Shortness of breath - Chest tightness or pain - Collapse - Syncope 	<ul style="list-style-type: none"> These can occur because of insufficient food and fluid intake and/or too much exercise and/or activity may lead to low energy availability, malnutrition and/or hypokalemia Arrhythmias can present irrespective of an individual's weight 	

<p>Bradycardia</p> <p>Awake HR < 50 bpm</p> <p>Can present/persist irrespective of weight status</p>	<ul style="list-style-type: none"> • Bradycardia is commonly seen in Anorexia Nervosa • Specific physiological cause not determined but it is thought that they include increased parasympathetic tone and loss of cardiac muscle, vagal hyperactivity and low energy availability to reduce strain on the heart caused by starvation and weight loss • Electrolyte imbalances due to, purging/self-induced vomiting, laxative or diuretic use, water loading or dehydration • Higher amounts of exercise and activity may be associated with a greater severity of symptoms 	<p>“very fit”. Athletes and individuals with eating disorders commonly have a low resting heart rate but for very different reasons. This can be differentiated by looking at changes in heart rate with exertion. In a healthy individual you should expect that on minimal exertion e.g., sitting to standing there will be no significant change in heart rate, and it quickly returns to baseline whereas in an individual with an eating disorder the heart rate will increase significantly and take time to return to baseline</p> <ul style="list-style-type: none"> • Be aware that individuals who have rapid increases or decreases in their weight, may be at higher physical risk • Be aware that there could be an increased falls as a result of these signs and symptoms • Link in closely with the MDT and regularly review physical parameters and medical stability • If a person requires the use of a wheelchair during periods of bed/unit rest due to medical instability, be aware of non-compliance with advice/guidance of safe use for patients and staff e.g., getting out of the wheelchair too quickly, getting out before it is stopped or before brakes applied/foot plates moved out of the way • For further information see section 6a ii Safely Returning to Physical Activity and Exercise • For further information see Medical Emergencies in Eating Disorders (MEED) Guidance on Recognition and Management CR233, May 2022 and Quensnel <i>et al.</i>, (2023).
<p>Tachycardia</p> <p>Resting HR>100 bpm</p> <p>Subtypes:</p> <ul style="list-style-type: none"> - Atrial Fibrillation - Atrial flutter - Ventricular tachycardia - Supraventricular Tachycardia - Ventricular fibrillation 	<ul style="list-style-type: none"> • In Anorexia Nervosa this could indicate a more serious autonomic nervous dysfunction than in bradycardia meaning a poorer long-term outcome • Could happen because of a fault in the electrical system of the heart • Increased heart rate can be a natural stress response • Exercise/activity - be mindful of raised heart rate for an individual who is on bed/unit rest as it might indicate they are exercising secretly • Inflammatory response/Infection 	

<p>Postural Tachycardia</p> <p>Increase ≥ 30 bpm within the first 10 secs of standing or sitting from lying</p> <p>Increase ≥ 40 bpm in those aged 12-19</p> <p>And persists for more than 30 seconds</p>	<ul style="list-style-type: none"> • Insufficient food and fluid intake and/or too much exercise and/or activity leads to low energy availability, autonomic nervous dysfunction, loss of cardiac muscle mass, decreased stroke volume, decreased blood volume and emotional stress • Postural tachycardia mimics the cardiac symptoms of Postural orthostatic tachycardia syndrome, but this syndrome should not be diagnosed in the presence of malnutrition 	
<p>Heart failure</p> <p>Symptoms can include:</p> <ul style="list-style-type: none"> - Fatigue - Cough - Chest pain - Shortness of breath 	<ul style="list-style-type: none"> • Insufficient food and fluid intake and/or too much exercise and/or activity may lead to low energy availability impacting on the cardiac muscle and function • Emotional or physical stress, including some of the stressors associated with eating disorders can trigger some forms of heart disease such as Takotsubo cardiomyopathy • Refeeding syndrome can result in the development of heart failure • Overuse of laxatives 	
<p>Electrocardiogram (ECG) abnormalities</p> <p>The QTc interval is a measure of the same time interval as the QT but has been corrected to account for heart rate - Prolonged QTc interval >460ms in women and >450ms in men</p>	<ul style="list-style-type: none"> • Prolonged QTc can occur in eating disorders but may also suggest independent and reversible causes including hypokalemia, hypomagnesaemia, hypoglycemia or use of psychotropic medications 	

Other physical risks to consider

Common signs and symptoms	Possible causes	Risk factor implications for physiotherapy assessment and treatment
Falls/Fainting/Syncope	<ul style="list-style-type: none"> • Reduction in muscle size and strength as a result of reduced nutritional intake and/or too much activity/exercise. This could have an impact on the body's balance systems including proprioception increasing the risk of falls • Neurological symptoms e.g., peripheral neuropathies, functional neurological disorders can affect gait, balance and proprioception increasing the risk of falls • Previous falls history and fear of falling • Cardiovascular signs and symptoms e.g., postural hypotension, arrhythmias • Hypoglycaemia • Some anti-psychotic medication can cause extra pyramidal side effects, this system regulates our posture and skeletal muscle tone potentially impacting on mobility and balance • Polypharmacy and falls risk • Environmental factors e.g., availability of appropriate chairs and beds 	<ul style="list-style-type: none"> • Weight restoration and medical stability is key • On admission to an inpatient setting all individuals should have a falls multi-factorial assessment, and this should be reviewed regularly including in the event of a fall or a change in condition • If falls risks are identified a falls care plan should be developed to consider how these risks could be reduced/treated • In addition to a falls care plan a mobility care plan should be in place in the MDT notes • Physiotherapy plays a key role within the MDT in helping to identify falls risk factors including strength, balance, gait, movement disorders, neurological symptoms, pain, fear of falling, environment and function • Be cautious with medical risk status, physical parameters including weight in relation to rehabilitation interventions • If prescribing specific falls rehabilitation exercises monitor these closely to ensure that they don't worsen symptoms in those that have dysfunctional exercise and that the exercise is being undertaken as prescribed and not exceeding the recommended amount • Share any exercise plans with the MDT and clearly document them in their care plan to ensure that all staff are aware of the type and amount of exercise recommended • Regularly review an individual's exercise prescription and adapt either by progression, periodisation or regression. Update the MDT with any changes to the exercise care plans and ensure these are fully documented in the MDT notes • Careful consideration should be given to prescribing walking and mobility aids which normally might be prescribed to reduce falls risk within this clinical setting (as previously described in stress/fragility fractures) • Individuals who are diagnosed with functional neurological disorders (FND) can often present with reduced strength, gait abnormalities and reduced balance. Walking and mobility aids are not always

		<p>recommended in these cases (follow physiotherapy guidance for assessment and treatment in FND)</p> <ul style="list-style-type: none"> • In addition to medical review of medication, Physiotherapists can provide advice and guidance to individuals with postural hypotension on safety when transferring and mobilising
<p>Hypoglycaemia</p> <p>Symptoms can include:</p> <ul style="list-style-type: none"> - Confusion - Fatigue - Blurred vision <p>In more severe cases, a person could experience:</p> <ul style="list-style-type: none"> - Heart palpitations - Seizures - Loss of consciousness. 	<ul style="list-style-type: none"> • When your body is deprived of food, your liver can't produce glucose or glycogen meaning vital organs are not able to function when your blood glucose supply is depleted • During exercise and activity, the body needs more energy and therefore uses more glucose even small amounts of exercise can result in hypoglycaemia especially on the background of reduced nutrition 	<ul style="list-style-type: none"> • The priority should be weight restoration and medical stability ahead of physiotherapy interventions e.g., exercise prescription and/or mobility • Exercising while hypoglycaemic can harm the delivery of energy to the organs including the brain and working muscles and exercise can worsen hypoglycaemia and its effects due to the high demand for glucose when exercising. Exercise may therefore be contraindicated in some individuals until it is resolved • When it is safe to introduce exercise or activity discuss with the Dietitian about an individual's overall nutrition state ahead of starting to ensure that the additional energy expenditure will be met by their current meal plan • When it is safe to start introducing activity and exercise into the care plan consider monitoring blood glucose levels pre and post exercise • Be cautious when individuals have prolonged hypoglycaemia as they may not experience symptoms • For further information see section 6a ii Safely returning to physical activity and exercise • For further information see Medical Emergencies in Eating Disorders (MEED) Guidance on Recognition and Management CR233, May 2022 and Quensnel <i>et al.</i>, 2023.
<p>Peripheral Oedema</p>	<ul style="list-style-type: none"> • This can be observed in both Anorexia Nervosa and Bulimia Nervosa • There can be an increased risk of developing peripheral oedema during the refeeding process 	<ul style="list-style-type: none"> • High intensity exercise is contraindicated in the presence of peripheral oedema

	<ul style="list-style-type: none"> • In malnutrition excessive sodium and water retention may be related to abnormalities in sodium-potassium pumps. This type of oedema is generally mild and develops early in refeeding • Purging/self-induced vomiting or overuse of laxatives and/or diuretics can contribute to the development of oedema. Vomiting results in water loss, which prompts our bodies to release antidiuretic hormones that signal the body to hold on to as much water and minerals as possible. This leads to water retention and peripheral oedema. It often occurs upon abrupt cessation of these behaviors and the significant weight gain associated with it can be distressing. It is thought that weight gain peaks between 4 to 10 days after purging stops and can last 2 to 4 weeks without pharmacological intervention 	
Changes in Body Temperature - Hypothermia - Hyperthermia	<ul style="list-style-type: none"> • Hypothermia can occur because of malnutrition and hypoglycaemia. • The state of hypothermia can reduce cardiac functioning and cause muscle rigidity, unconsciousness and death 	<ul style="list-style-type: none"> • Exercise could be contra-indicated in either of these two states • Increases in activity/being outdoors/windows being open/showering can lead to a further reduction in temperature increasing the risk of worsening hypothermia • See section below on dehydration

	<ul style="list-style-type: none"> • Hypothermia can persist during and beyond weight restoration • Hyperthermia can occur because of failed thermoregulation when the body produces or absorbs more heat than it can dispel through sweat. For example, because of excessive metabolic heat and from some medications 	
Dehydration > 10% dehydration could have a higher risk of developing tachypnoea or tachycardia 5-10% dehydration could develop peripheral oedema	<ul style="list-style-type: none"> • Some individuals with Anorexia Nervosa restrict their fluid intake this could lead to dehydration • Purging/self-induced vomiting and overuse of laxatives or anti-diuretics could lead to dehydration • Sweating from exercise/activity 	<ul style="list-style-type: none"> • Consider the impact of dehydration on NEWS/physical observations (e.g., blood pressure) and blood electrolytes. • Evaluate dehydration risks prior to considering restarting mobility, activity and/or exercise • Being severely dehydrated and unable to rehydrate could increase the risk of heat illness and cause haemodynamic instability so exercise could be contraindicated • Consider time of year e.g., in hot weather sweat loss is likely to be greater and so the amount and type of exercise might need to be modified
Re-feeding Syndrome Clinical features: <ul style="list-style-type: none"> - Hypophosphatemia - Hypokalaemia - Hypomagnesaemia - Cardiac arrhythmias - Fluid imbalances - Pulmonary oedema - Encephalopathy - Hyper/hypoglycaemia - Cardiac failure - Liver dysfunction - Myopathy and rhabdomyolysis 	<ul style="list-style-type: none"> • This is a metabolic disturbance that occurs because of reinstitution of nutrition after starvation, when too much nutrition is taken/given either orally, enterally or parenterally • Refeeding syndrome usually occurs within 72 hours of beginning refeeding, with a range of 1–5 days but it can occur late in the most malnourished. 	<ul style="list-style-type: none"> • Individuals at the highest risk of refeeding syndrome are those with very low weight, minimal or no nutritional intake for more than 3–4 days, weight loss of over 15% in the past 3 months, and with abnormal electrolytes and medical comorbidities such as pneumonia or other serious infections, cardiac dysfunction or disease and liver damage • When patients are being re-established on a meal plan and there is the potential risk of re-feeding syndrome developing have increased caution at this time when considering introducing mobility, activity and exercise prescription as there is more of a risk to physical health due to the increased stress on the body from changes in the metabolism • See section 6a ii Safely returning to physical activity and exercise • See Medical emergencies in eating disorders (MEED) Guidance on recognition and management CR233, May 2022

Electrolyte Imbalances

Electrolytes are key regulators of the exchange of fluids, nutrients and waste products in the body they are commonly affected by eating disorders -

potassium, sodium, bicarbonate, phosphate and magnesium

Symptoms can include:

- Dizziness,
- Weakness
- Fatigue
- Constipation
- Muscle pain
- Cramping
- Abnormal skin sensations
- Depression

- Eating disorder behaviours including purging/self-induced vomiting, laxative use and/or diuretic use
- Hypokalaemia can present with purging/self-induced vomiting. It can also occur in malnutrition and during the refeeding process
- Hypophosphatemia can occur during the refeeding process, in malnutrition, due to chronic diarrhoea from laxative use or overuse of diuretics or alcohol
- Hypomagnesaemia can occur due to diarrhoea from laxative use, diuretic use, hormone dysfunction, alcohol intake and some medications
- Hypercarbia (metabolic alkalosis) can occur from purging/self-induced vomiting
- Hyponatraemia is commonly seen in both Anorexia Nervosa and Bulimia Nervosa and occurs due to purging/self-induced vomiting, excessive sweating, malnutrition and excessive fluid intake
- Electrolyte imbalances can underlie cardiac abnormalities (this could lead to rhabdomyolysis)
- Loss of sweat during exercise
- The priority should be weight restoration and medical stability ahead of physiotherapy interventions e.g., exercise prescription and/or mobility
- Biochemical markers usually rectify with improved nutrition and a reduction in eating disorder behaviours
- If a patient is at high risk of developing hypokalaemia, potassium levels must be monitored regularly. If potassium levels are out with normal range exercise may be contraindicated
- In an individual who is at risk of developing hypophosphatemia and experiencing symptoms given that phosphate plays a key role in energy production consider restricting high intensity exercise or longer duration activity
- Strenuous exercise can induce a redistribution of magnesium in the body to accommodate metabolic needs, increasing the body's need for magnesium so it could worsen a current deficiency
- In the presence of hypercarbia resistance training or strenuous aerobic activity should be stopped

<p>Water/Fluid loading</p> <p>This could lead to overhydration causing serum electrolyte imbalances including hyponatremia and potentially cause seizures which could be fatal</p>	<ul style="list-style-type: none"> • Some patients try to falsify their weight recordings to disguise the severity of their eating disorder and/or limited progress/engagement with treatment • Water/fluid loading prior to being weighed as one such method to manipulate weight recording. Health professionals who are recording weight will try to ensure that an individual uses the toilet to fully empty their bladder prior to being weighed 	<ul style="list-style-type: none"> • See electrolyte imbalance section • See section 6a ii Safely returning to physical activity and exercise • Blood test results may show a dilute picture and urine specific gravity can also be used to detect water loading.
<p>Risk of infection</p>	<ul style="list-style-type: none"> • In addition to generating stem cells for bone and cartilage growth, cellular bone marrow is responsible for producing red blood cells, white blood cells, and platelets. Weight loss and malnutrition over a long period of time causes sustained nutrient and energy deprivation and can seriously impact a body's essential organ functions, including compromising the health of bone marrow, causing a reduction in white blood cell count. • There are several different types of white blood cells, including basophils, neutrophils, lymphocytes, eosinophils, and monocytes. Leukopenia can 	<ul style="list-style-type: none"> • In most cases, upon reintroducing nutrition and fluids, people recovering from anorexia will generally notice their white blood cell count returning to normal levels • In an individual whose blood test results have been stable, and activity is introduced subsequent results may show a reduction in white blood cell count. It is important to monitor the response in the body in terms of different types of activity and exercise to ensure it is not causing further depletion balancing between nutrition intake and exercise/activity levels • If an individual has a lower immune response, there could be an associated increased risk of infection and so there should be caution in starting activities that involve being indoors and/or with lots of people

	<p>either be caused by a general shortage in leukocytes or a specific shortage of leukocytes. In the latter case, it means that a person has an acute shortage of a single type of white blood cell. For instance, people who have a low count of neutrophils – the white blood cell type responsible for protecting you against bacterial infections – may suffer from a common subtype of leukopenia known as neutropenia. Having a low white blood cell count means you are at higher risk of infections because they help fight pathogens in your body</p> <ul style="list-style-type: none"> • Water/fluid loading to falsify weight can cause a more dilute picture in blood test results including a reduction in blood count 	
<p>Hormonal imbalances within the Endocrine System</p> <ul style="list-style-type: none"> - Altered body cues for thirst, hunger and fullness - Altered body cues for energy expenditure - The body's circadian rhythm can be altered impacting on sleep. This could impact on the body's ability to heal, provide energy and concentration levels 	<ul style="list-style-type: none"> • A physical response to restriction and malnourishment results in fluctuations in the production and secretion of hormones. The body does this to save energy due to restriction causing the body to be at a deficit. Purging/self-induced vomiting behaviors can have an impact on this system too 	<ul style="list-style-type: none"> • Individuals may not be aware when they are doing too much exercise due altered body cues for energy expenditure and will need clear guidance on the safe amount of exercise • Individuals may not be aware of their body cues to rest if injured or tired and may need support to manage this • If prescribing specific exercises for an injury be cautious that these might not have the desired outcome due to fatigue, poor tissue healing and less ability to build strength • See section 6b exercise, activity and osteoporosis with an eating disorder

<ul style="list-style-type: none"> - Altered menstrual cycles, potentially leading to amenorrhea - Loss of libido and fatigue - Reduced mental focus/mood - Reduced ability to build muscle and strength - Swollen glands and the risk of infection 		
Dysfunctional Exercise	<ul style="list-style-type: none"> • See chapter 6a Physical activity and exercise 	<ul style="list-style-type: none"> • See chapter 6a Physical activity and exercise • The impact of dysfunctional exercise and activity (particularly when it is excessive) is discussed throughout these tables in relation to the risk to an individual's physical/medical stability • Some other aspects to consider are identifying if individuals could be misusing substances such as anabolic or androgenic steroids while excessively training as there can be serious consequences to physical and mental health • It is important to recognise that individuals who over train may have extremely low body fat levels and larger than average muscles. Use of anabolic steroids and vitamin D injections can lead to increased physical risk at higher levels of BMI (and age-adjusted BMI)
Enteral Feeding	<ul style="list-style-type: none"> • In the initial stages of the refeeding process enteral feeding is sometimes necessary to manage the process of refeeding safely • Sometimes enteral feeding is essential for patients who are unable to comply with an oral meal plan and/or have this as part of their treatment plan when they are under a Compulsory Treatment Order (CTO) • In some circumstances enteral feeding is used in the longer 	<ul style="list-style-type: none"> • For individuals that are in the initial stages of refeeding the priority should be weight restoration and medical stability ahead of physiotherapy interventions e.g., exercise prescription and/or mobility. • For individuals who have a severe and enduring eating disorder often goals are focused on quality of life and so it may be appropriate to support a person to be active but there should be continued caution and evaluation of medical risk factors and that the activity is not causing a deterioration to physical health • Take into consideration the physical presence of any enteral feeding tubes when mobilising and/or planning exercise with patients and the safety factors around this including the importance of keeping it in place e.g., risk of individual removing it, attempt to use as a ligature

	term for someone who has a severe and enduring eating disorder	<ul style="list-style-type: none"> • Share any activity/exercise plans with the MDT and clearly document exercise prescription in their care plan to ensure that all staff are aware of the type and amount of exercise recommended • Regularly review an individual's exercise prescription and adapt by progression, periodisation, regression. Update the MDT with any changes to the exercise care plans and ensure fully documented in the MDT notes
Medication	<ul style="list-style-type: none"> • Medications are primarily prescribed in eating disorders to help stabilise patients both mentally and physically. Some of the types of medication could include: <ul style="list-style-type: none"> - Micronutrient supplementation - Psychiatric medications which can include anti-depressants and mood stabilisers. Depression, anxiety, impulse and obsessive disorders are commonly seen in patients with Anorexia Nervosa and Bulimia Nervosa • Alongside these they may also be prescribed medications for co-existing physical health conditions and/or mental health conditions 	<ul style="list-style-type: none"> • Consider any psychiatric medication e.g., anti-psychotics, anti-depressants, anti-manics, hypnotics and anxiolytics that an individual might be prescribed and any associated side effects ahead of any physiotherapy interventions. Side effects can be found in the British National Formulary (BNF) www.bnf.org • Try to establish if an individual is taking any drugs illicitly and discuss this with medical staff/Consultant

In terms of overall management of physical/medical risks it is important to note that:

- Physical/medical risks can change as weight restores or reduces
- Physical/medical risks can change as eating disorder behaviours improve or worsen

Identified risk factors should regularly be reviewed and treatment plan modified accordingly

The following table discusses some of the psychiatric and psychological risk factors to take into consideration when an individual is referred to physiotherapy. Any risks identified should be highlighted in patient case notes. These risk areas might not apply to all clinical settings. It is also important to note that some of these risks might be historic and so may not be of concern at the current time, but they should be kept in mind.

Psychiatric/psychological risks
Impaired neurocognitive functioning
<ul style="list-style-type: none"> • Impaired neurocognitive functioning can occur at any stage of the underlying illness because of the effects of starvation on the brain and the underlying traits of eating disorders, including preoccupation with food and body and obsessional/compulsive thoughts • It is thought to primarily affect executive functioning (bias towards detail and cognitive rigidity) and visual-spatial functioning • Brain structure differences have been found in those with Anorexia Nervosa, the hippocampi and anterior cingulate have shown a reduced thickness of grey matter (Kucharska <i>et al.</i>, 2019)
Self-harm risks
<ul style="list-style-type: none"> • 'Self-harm' is used to describe a wide range of behaviours and is often understood to be a physical response to an emotional pain • The prevalence of self-harm in people with eating disorders is thought to be about 25%, and is higher for those with Bulimia Nervosa • Self-harm and an eating disorder co-exist and for others self-harm can develop to replace an eating disorder and vice versa • For some individuals self-harm and eating disorders could also be a type of punishment and way of expressing self-hatred towards the body • Or self-harm might be a way of punishing themselves for not sticking to a strict routine or to provide relief from the constraints of a strict routine • The relationship between the two conditions is complex and can differ from person to person (Lavis <i>et al.</i>, 2022, Smithuis <i>et al.</i>, 2018, Self Harm UK, 2023)

Suicide risk

- Although medical complications related to malnutrition are the leading cause of death among individuals with Anorexia Nervosa, suicide is believed to follow closely behind
- Suicidal behavior is elevated in patients with Anorexia Nervosa, Bulimia Nervosa and Binge Eating Disorders
- It can occur with any type of eating disorder, but it may be more common among individuals with anorexia binge-purge subtype compared to the restrictive subtype.
- The risk for suicide attempts is higher when the eating disorder occurs with other disorders such as depression or substance misuse
- Suicidality might also be more common among eating disorder patients who have a history of childhood abuse.
- Those experiencing preoccupations with muscularity can be more likely to experience suicidal thoughts and behaviours (Grunewald *et al.*, 2022, Ortiz *et al.*, 2021, Ortiz *et al.*, 2023)

Warning signs might include:

- A change in behavior or the emergence of new behaviours (especially relevant if it occurs after a painful event or loss)
- Reports of feeling hopeless, being a burden, feeling trapped, or unable to deal with the pain and distress anymore
- Behaviors such as increased alcohol or drug use, searching for means to end their lives, withdrawal, and social isolation, sleep changes, calling or visiting people to say goodbye, giving away important possessions, aggression, and fatigue
- Moods such as depression, anxiety, apathy, shame, anger, irritability, or sudden relief (Fichter and Quadflieg, 2016; Portzky *et al.*, 2016; Smith *et al.*, 2018)

Risk of verbal or physical aggression

- Violence and aggression are actions that can or do harm to another person. They can be physical or verbal. Sometimes people with mental health illnesses can become frustrated, upset or angry when they are in health or social care settings, and this can cause them to behave in a violent or aggressive way.
- Individuals with eating disorders can sometimes display signs of anger because of the illness, especially when eating disorder behaviours are being challenged

Risk of absconsion

- Absconding from mental health units is referred to as a patient leaving without permission and can have significant consequences for the patient, family, community, and institution. The varying definitions of absconsion involve breaching security of an inpatient unit, accessing grounds or community without permission, gaining liberty during escorted leave or being absent for longer than permitted from authorised leave or passes from the ward (Cabarkapa *et a.l.*, 2021)

Social and personal risk
<ul style="list-style-type: none"> • Risks to an individual from illness and health and safety aspects • See table below which describes some aspects of psychosocial risk factors
Risk from substance misuse
<ul style="list-style-type: none"> • People with eating disorders can misuse both illicit and over-the-counter drugs. • Illicit substances that are misused e.g., hallucinogenics, opiates, marijuana • Legal substances that are misused e.g., laxatives, diet pills, diuretics • Performance enhancing substances e.g., anabolic steroids
Risk of harm to/from others
<ul style="list-style-type: none"> • Consider the risks that the illness might cause in terms of harm to not only that individual but to those that are close to them (family and caregivers)
Previous trauma
<ul style="list-style-type: none"> • Traumatic events, especially have been found to be significant risk factors for the development of a variety of psychiatric disorders, including eating disorders—particularly Bulimia Nervosa • Some people are at increased risk of stress, trauma, or negative events. This is determined by a combination of biological, psychological, and social factors, such as being prone to anxiety and/or depression and/or having inherited the personality traits of high harm avoidance (shy, fearful, worrying behavior) and/or acting on an impulse • What may seem to be of little or no concern to one person can be very traumatic to another, particularly to one with, or predisposed to, an eating disorder.
Over reliance on exercise as a coping mechanism for emotion regulation
<ul style="list-style-type: none"> • For further information see section 6a Physical Activity and Exercise
Over reliance on medications
<ul style="list-style-type: none"> • Prescription medications play a crucial role in the management of eating disorders, but over-reliance on these drugs has the potential to have serious consequences, from adverse health effects to dependency and addiction

Eating disorders can impact on a few or many aspects of an individual's life because of the nature of the symptoms and behaviours associated with the illness which can cause a negative effect on mental and physical health. As a result of ill health, it can affect occupations and maintaining relationships potentially leading to an individual being at risk of losing things in their life.

The following table describes some of the psychosocial risk factors experienced by individuals.

Psychosocial risks
<ul style="list-style-type: none"> • Financial losses • Housing • Interpersonal/Relationships • Work/Studies/School • Hobbies <p>These key aspects of an individual's life, if stable, can often be a protective factor and reason for motivation for recovery from an eating disorder. If any of these areas are identified as risks, it is important that support is offered from the most appropriate health and social care professional or organisation. As Physiotherapists we should consider referral onwards or signposting.</p>
Insight
<ul style="list-style-type: none"> • Individuals with eating disorders can have reduced insight into the severity of their illness and the need for treatment. One study showed that Anorexia Nervosa with restriction subtype had poorer overall insight than Anorexia Nervosa with binge/purge subtype. Furthermore, only Anorexia Nervosa with restriction patients showed difficulties in awareness of psychological changes, relabelling of their symptoms and recognition of the need for psychological treatment. (Konstantakopoulos <i>et al.</i>, 2011)
Motivation
<ul style="list-style-type: none"> • Ambivalence about treatment can often be present in eating disorders. Despite the serious consequences of eating disorders in terms of impact on mental and physical health, they often provide a reason for individuals to hold on to it. As a result of this individuals with eating disorders can display a low motivation to change. This can lead to reduced engagement with treatment and discharging from care against medical advice (Hoetzel <i>et al.</i>, 2013). Higher levels of motivation to recover from an eating disorder have been shown to have more positive rates in terms of reducing eating disorder pathology, and increasing engagement with treatment (Wade <i>et al.</i>, 2009).
Capacity
<ul style="list-style-type: none"> • Mental health legislation and safeguarding frameworks vary across the different jurisdictions of the UK, particularly in relation to the specific processes of detaining patients for involuntary treatment. Involuntary treatment can be deemed necessary due to reduced insight, ambivalence about treatment and the often serious physical and mental health consequences of eating disorders. • Capacity is the ability to understand, remember, use and weigh and communicate information about a decision. It is time / task specific e.g., an individual can have capacity around certain aspects of their life but not others • Decision making capacity can be impaired in eating disorders due to because of reduced insight, ambivalence about severity of illness or treatment, medical instability, cognitive impairment and mood • Because of these reasons an individual's self-report of their eating disorder including symptoms, meal plan and exercise or physical activity levels are not always accurate, therefore may not be reliable. Therefore, reassessment of the risks should be reviewed regularly and in conjunction with the MDT as an individual's condition could change rapidly • There can also be a risk of collusion within eating disorders – including influence of parents/relatives/care givers

4. Physiotherapy assessment

Carrying out a physiotherapy assessment with an individual with an eating disorder can be complex, given the interplay between physical and psychological health, alongside the need to identify risk factors associated with their eating disorder, reduced bone health and often severely low body weight.

As discussed elsewhere within the guidance document, physiotherapy input needs to be delivered as part of a wider multi-disciplinary team approach. Alongside triage, diagnostic and core medical assessments, physiotherapy assessment can contribute considerable value to the overall assessment and treatment planning of an individual with an eating disorder, with particular focus on the benefit of assessing physical health aspects of an individual's presentation.

The following section has been developed to guide practice when completing a physiotherapy assessment with individuals with an eating disorder. This guidance can be used alongside other physiotherapy assessment tools and outcome measures as patients can present with other co-morbidities.

It is acknowledged that each individual eating disorder inpatient unit or community service will have their own clinical record system, and assessment template, and therefore the information within this section can be used to guide practice, with relevant areas being selected as appropriate.

It is also acknowledged that physiotherapy input can be very complex and not all clinicians will be trained or experienced in areas such as body image or dysfunctional exercise, and therefore the intention is that information within this section can be used as relevant to current practice and clinical need. The role of the Physiotherapist in each clinical setting may also vary, and certain aspects of care may be led by other members of the multidisciplinary team, for example not all Physiotherapists will be required to provide interventions directly for body image and may focus more on management of dysfunctional exercise and bone health. The information within this section can therefore be used flexibly to support individual roles.

Physiotherapists working in non-eating disorder units, such as a medical inpatient unit, may find this assessment information useful as a tool to identify key risk factors to be aware of and an understanding of where physiotherapy input may be helpful for that individual. For example, Physiotherapy input on a gastroenterology inpatient unit may focus on safety with mobility and transfers whilst balancing a patient's urge to be active due to dysfunctional exercising behaviour. On an orthopaedic unit there may be a clear goal of developing a functional rehabilitation programme for a patient but a need to balance the risks of exercise interventions that may compromise weight or physical health. Therefore, a clear multi-factorial physiotherapy assessment, including understanding of exercise history and current exercise behaviours is essential.

History of presenting condition
<p>Background information on eating disorder – diagnosis/type/duration</p> <p>Previous admission(s), treatments and outcomes</p> <p>Current treatment and care pathway</p> <p>Current engagement with multi-disciplinary team</p> <p>Dysfunctional exercise component</p> <p>History of weight, including current weight and BMI – recent weight loss/restoration</p>
Exercise history
<p>Attitudes to, and engagement in, exercise throughout childhood and up until referral/admission</p> <p>Sports/activities at school/extra-curricular/university</p> <p>Family activities and influences</p> <p>Consider gathering information on the following:</p> <p>Transition ages – primary to secondary/university/college/work</p> <p>How has exercise changed over the years for the patient? Contributing factors to change</p> <p>Can they identify a time when exercise became highly valued over other aspects of life?</p>
<p>Current exercise engagement</p> <p>Inpatient or community – type, frequency, intensity, mode, format, location, solitary/group/club</p> <p>Consider structured and incidental exercise</p> <p>Inpatient – consider pre-admission exercise engagement. Has this changed on, or during, admission</p> <p>Are they engaging in any of the following?</p> <ul style="list-style-type: none"> • Pacing? • Incidental activity? • Purposeful movement? • Secretive exercises in bedroom/bathroom? <p>Do they recognise this as exercise?</p>
<p>Function of exercise</p> <p>How does the patient see their relationship with exercise?</p> <p>Does the patient feel that their relationship with exercise is negatively impacting their physical or mental health, and how does this link with their eating disorder?</p> <p>Discuss initiating and maintaining factors for exercise</p> <p>Consider the following examples,</p> <p>Weight/shape (to prevent or control weight restoration, to manage perceived fear of loss of muscle if not exercising, or striving for ideal body shape/muscle definition)</p> <p>Debting behaviour (to feel able/worthy to eat or to compensate for eating)</p> <p>Health/ Fitness (did exercise start with the aim of being for health and fitness?)</p> <p>Compulsion (does the patient feel compelled to exercise and unable to stop?)</p> <p>Rigid rules and exercise routines (what are the rules and beliefs and where did they originate from?)</p> <p>To manage mood/anxiety (do they have other coping strategies?)</p> <p>Enjoyment (can the patient identify if this is pure enjoyment, or due to the positive reinforcement they receive from engaging in exercise that is led by eating disorder thoughts and behaviours?)</p> <p>Sense of self-worth or achievement (is exercise the only way they feel better about themselves?)</p>

Current plan to manage exercise/activity

Does the patient already have a plan of how to manage their activity and exercise? If so, what is it?
Have they had previous physiotherapy support to address any dysfunctional exercise?
Outcome of plan – patient compliance, what works well, what is more challenging?

Is the patient managing the risks of their activity, for example, in an inpatient unit- perhaps the patient is on 1:1 observations/ continuous intervention with nursing staff to manage exercise/activity throughout the day or using wheelchair to maintain safety or are they utilising other coping strategies.

Medical and Physical Health**Musculo-skeletal (MSK) system**

Consider awareness of low body weight and impact on MSK system
Postural changes/muscle imbalance, including psychological impact on positioning and posture
Observe posture and fluidity of movement. Posture can be altered due to mood, negative body experience or changes due to reduced musculature and core strength and stability. Movement can be less fluid/ less free, lack rhythm and coordination due to the above but also increased muscle tension and negative cognitions about the body.
Consider psychological effects on MSK system
Joint or muscle pain
Hypermobility
Changes in joint and muscle function from low body weight and muscle loss
Unexplained injury or overuse injuries associated with dysfunctional exercise

Use a body diagram and/or a specific MSK assessment template if indicated.

Physical functioning & co-morbidities

Reduced food and fluid intake, malnutrition, low body weight and resultant medical instability can impact on physical functioning and a patient's ability to carry out functional tasks safely and independently. Falls risk and falls related injuries are also increased. Patients may also present with other physical health conditions, including frailty, which impact on function and activities of daily living.

Assessment of transfers, gait, mobility and balance may be indicated and can highlight the need for further MDT assessment e.g., a multifactorial falls assessment. It is important to identify the level of support or supervision required for patient safety and promoting independence, whilst balancing with the need for nutritional intake, weight restoration and medical stability.

Bone health

Current bone health status
DXA scan results and date – are they due for review?
Do they know and understand the results?
Are they on bone protection medication?
Hormone replacement/use of contraceptive pill?
Fracture risk
Fracture history and management
Is the patient engaging in any exercise that is contraindicated for osteoporosis?
Offer information leaflet on osteoporosis and exercise with an eating disorder
<https://cpmh.csp.org.uk/content/physiotherapy-eating-disorders>
[Physiotherapy in Eating Disorders | Chartered Physiotherapists in Mental Health \(csp.org.uk\)](https://cpmh.csp.org.uk/content/physiotherapy-eating-disorders)

Menstrual history	<p>Menarche – onset and development</p> <p>Regularity of periods</p> <p>Amenorrhoea/Dysmenorrhea</p> <p>Are they on hormone replacement medication? Contraceptive pill?</p> <p>Current treatment?</p> <p>Testosterone levels in male patients</p>
Cardiovascular health (in conjunction with medical assessment)	<p><i>Hypotension</i></p> <p><i>Dizziness/syncope/fainting</i></p> <p><i>Bradycardia</i></p> <p><i>Arrhythmias</i></p> <p><i>Heart Failure</i></p> <p><i>Circulation</i></p> <p><i>Oedema</i></p> <p><i>Postural Hypotension</i></p> <p><i>Cardiovascular Profile</i></p> <p><i>Heart Rate</i></p> <p><i>Postural Tachycardia</i></p> <p><i>Orthostatic Hypotension</i></p> <p><i>Systolic BP</i></p> <p><i>Prolonged QT/c interval</i></p> <p><i>Arrhythmias</i></p> <p>Refer to ECG results as indicated</p> <p>Consider patients' interpretation of low heart rate as this can often be misinterpreted as a 'heart rate of an athlete'.</p>
Biochemical markers/ Electrolyte disturbances	<p><i>Electrolyte imbalance due to vomiting, laxative or diuretic abuse; water loading or dehydration</i></p> <p><i>Biochemical Profile</i></p> <p><i>Hypokalemia</i></p> <p><i>Hypophosphatemia</i></p> <p><i>Hypomagnesemia</i></p> <p><i>Hypercarbia</i></p> <p><i>Hyponatremia</i></p> <p><i>Hypoglycaemia</i></p> <p>Cardiac markers in blood test results</p> <p>Creatine Kinase (CK) – <i>Serum CK levels can indicate muscle damage and are likely to increase in the presence of inappropriate levels or intensity of exercise in an individual of low body weight or malnourished state. CK levels can therefore be an important marker when addressing an individual's exercising levels or intensities.</i></p> <p>Are they currently in, or at risk of, Refeeding syndrome?</p> <p><i>Are there patterns to these? i.e., low blood glucose in the morning following bedroom exercise pre-breakfast, but post lunch blood glucose normal.</i></p> <p><i>Temperature</i></p>

Additional medical and psychiatric history
<p>Any other physical health problems/symptoms, e.g., respiratory, rheumatological, neurological, diabetes</p> <p>Neurological changes associated with low body weight/poor nutrition?</p> <p>Consider the onset of new co-morbidities, or potential exacerbation of pre-existing conditions, as a result of weight loss</p> <p>Is the patient being physically monitored – frequency and by who?</p> <p>Other medical/acute service involvement in care?</p> <p>Mood disorder, sleep concerns, anxiety, obsessive compulsive disorder, history of trauma, self-harming behaviours, adverse childhood experiences, suicide risk / risk to others</p> <p>Personality, avoidance/withdrawal, drug or alcohol use</p> <p>Developmental history (potential impact on beliefs, behaviours in relation to exercise & functional abilities)</p>
<p>Current medication</p> <p>Consideration of medication and possible side effects which might influence physiotherapy treatment, e.g., sedative effect, low blood pressure, appetite suppression.</p> <p>Bone Health medication?</p> <p>Polypharmacy and falls risk?</p> <p>Pain medication?</p> <p>Medications related to any co-morbidities e.g., insulin</p>
<p>Social and Family History</p> <p>Family and social relationships and interplay with eating disorder symptoms, including dysfunctional exercise.</p> <p>A genogram can be a helpful tool to use when determining family connections and interplay of relationships and family dynamics</p>
<p>Observations/ specific test</p> <p>Appearance, level of eye contact and engagement - verbal and non-verbal communication, mood, physical signs of anxiety</p> <p>Any other physical or mental health assessment outcomes or observations which might influence physiotherapy treatment.</p>
<p>Relationship with social media and health and fitness apps</p> <p>There is growing evidence that the influence of social media including the use of health and fitness/activity apps and trackers can have a direct impact on an eating disorder either in the development or the maintenance of it. Developing an understanding of the patient's use of social media can provide insight and understanding into how it might influence their thoughts and behaviours around exercise, nutrition, and body image/experience.</p> <p>It can be helpful to establish use of social media including:</p> <p><i>What social media platforms do they use?</i></p> <p><i>Are there specific influencers or websites/blogs/vlogs that they follow?</i></p> <p><i>Do they follow recovery sites? Do they follow pro eating disorder sites?</i></p> <p><i>What health and fitness/activity apps and trackers might they be currently using or have used in the past?</i></p> <p><i>Do they use computer-based exercise equipment?</i></p> <p><i>What is the purpose of using them e.g., to track step count, to monitor heart rate, to check for calories burned, to measure distance, to measure times?</i></p> <p><i>Frequency of use, time of day?</i></p> <p><i>Have they been advised to use any as part of their treatment?</i></p>

Are they still able to identify their own physical cues such as fatigue, pain/injuries or are they just going by what their device tells them?

Is the device/equipment worsening the dysfunction relationship with exercise or is it helpful for it?

Discuss the patient's relationship with, and influence of, social media use:

Are they influenced by others on social media?

Do they have exercise rules or goals that have derived from what they have read or seen on social media or what others have shared?

How does their use impact on their mood, relationships and occupations/hobbies?

Are they compelled to use any of their eating disorder behaviours as a result of using social media?

Do they use or are they aware of evidence-based health apps that might help manage symptoms like stress and anxiety?

Body Image

Body image (Body Experience) is a multidimensional, subjective and dynamic concept that encompasses a person's perceptions, thoughts and feelings about his or her body. Negative body experience can be one of the initiating and maintaining factors of dysfunctional exercise and activity and components of an eating disorder.

Some core physiotherapy areas and skills enable clinicians to observe the impact of negative body experience on movement, posture, muscle tension and breathing. Not all Physiotherapists working within eating disorders will have experience, knowledge and training in body experience, however it is still important to use guide questions (see below) and observations alongside some validated outcome measures to help gain information from the patient as to their relationship with their body. Ensure that there is caution in asking these questions as they can be sensitive topics for individuals to explore. If someone has a history of trauma this should be discussed within the MDT or using your local escalation procedure.

Guide questions:

Can you tell me about your relationship with your body?

Do you feel any disconnection from your body?

Do you judge yourself (for example your self-worth) by your weight and shape? Can you tell me when this first started?

Do you experience any negativity towards any specific areas of your body?

Do you check your body in the mirror? If so, how many times a day? *This information will also be picked up using the Body Checking Avoidance Questionnaire (BCAQ)*

Do you avoid looking in the mirror?

Do you pinch or frequently check areas of your body for size and shape? Frequency?

Do you weigh yourself? How often?

How would you like things to be different?

Do you compare yourself to others?

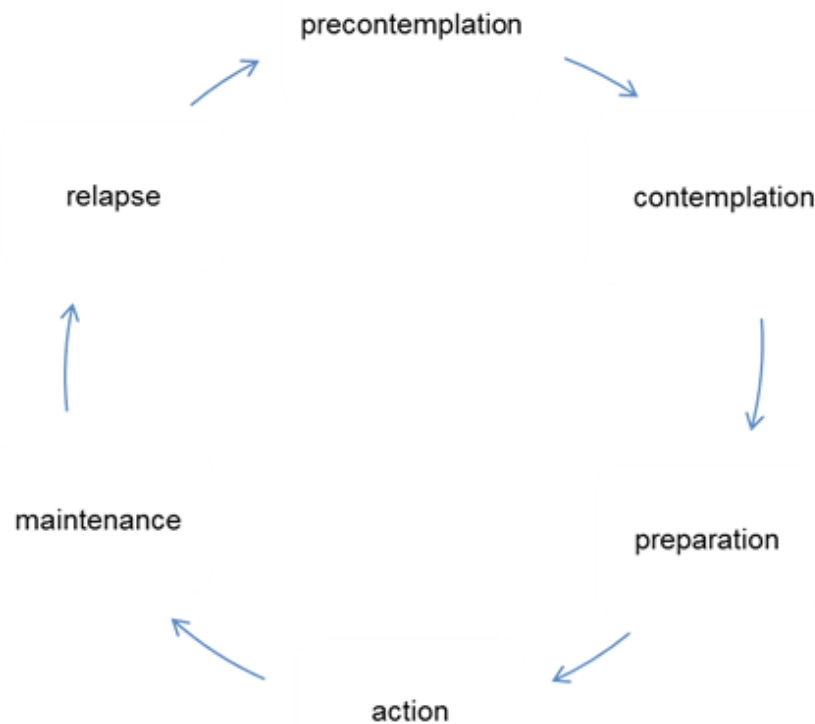
Do you feel that your relationship with your body causes dysfunction in your life? In what way?

Have there been any influencing factors that have affected your relationship with your body?

Are you aware of holding increased tension in your body as a result of negative body experience?

Readiness to change

The Stages of Change Model (Prochaska & DiClemente, 1983) can be a useful tool to identify the patient's motivation to engage in physiotherapy treatment. Therefore, assessing the patient's motivational status and readiness to change will determine the type and appropriateness of physiotherapy intervention at that time, in line with the MDT treatment approach.



*For further information refer to **Stages of Change Model**, Prochaska & DiClemente, 1983*

In addition, assessing the patient's confidence to change, and the level of importance they place on this, using a Likert scale, alongside their readiness to change, will further guide the appropriateness and type of treatment offered.

Potential barriers to physiotherapy assessment or engagement in treatment:

- Consider the patient's level of cognition and concentration. Both cognition and concentration can be greatly affected during starvation and malnutrition, and whilst the individual remains at a low body weight (Walton *et al.*, 2022). Ability to listen to guidance and advice, or engage in psycho-educational sessions, may be limited until the brain is better nourished and cognition improves. For example, a patient may be unreceptive to discussions with a Physiotherapist about their osteoporosis and subsequent recommended management, but becomes more able to acknowledge these discussions, the impact on their eating disorder on their bone health, and able to make changes to improve bone health, after a period of refeeding and/or once nearing a healthy BMI range.

- An individual with an eating disorder may not want to engage because, for example, it feels more manageable not to know the consequences or effects of their eating disorder, than to accept the facts and reality. This is often due to the complexity of the eating disorder, its strong maintaining factors, and the belief that it is keeping the individual safe. They may also be fearful of hearing the facts and acknowledging the impact that their eating disorder has had on their body.
- Patients may also not be willing to accept that they are unwell with an eating disorder. As a result of the eating disorder, the individual may make up excuses or reasons for being at a lower weight, for example a patient may request investigations related to diabetes or coeliac disease – and not be able to or want to acknowledge that they have an eating disorder. Another example is a patient may present with bradycardia, which they believe or portray to be as a result of being ‘athletic’, when in fact it indicates the impact that their eating disorder and low body weight is having on their heart.
- An eating disorder can also lead to the individual being deceptive. It is important to be aware that this is related to the eating disorder and not the person. This deception is likely to lead to the individual being untruthful, for example, about what or how much exercise they are doing.
- Be aware what a strong hold an eating disorder can have on an individual. It is their coping strategy, something that they believe keeps them safe. Building a trusting therapeutic relationship, where the individual feels supported, can be hugely valuable in enhancing both the effectiveness of treatment and the patient's experience with treatment.

Assessment tools / outcome measures

The following outcome measures are useful tools, applicable to eating disorders, and can be used as part of initial assessment and throughout treatment, alongside standard physiotherapy outcome measure tools.

Compulsive Exercise Test (CET)	<p><i>24-item self-report measure designed to assess the core features of dysfunctional exercise in eating disorders.</i></p> <p><i>The CET uses a 6-point Likert scale anchored by 0 (never true) and 5 (always true) with higher scores indicative of greater pathology. Items 8 and 12 are reversed scored. The CET is a validated outcome measure for use within eating disorders.</i></p> <p><i>The CET identifies scoring in each of the following sub-scales:</i></p> <ul style="list-style-type: none"> • compulsivity (e.g., continuing to exercise despite illness or injury, lack of exercise enjoyment, the experience of extreme guilt when unable to exercise, making up for missed exercise sessions), • affect regulation (e.g., the positive and negative reinforcement properties of exercise), • weight and shape driven exercise (e.g., exercising solely to burn calories, compensatory exercise such as debting), • exercise rigidity (rigid adherence to a strict and repetitive exercise routine).
Additional exercise and physical activity outcome measures	<p>Exercise Dependence Score</p> <p><i>Based on the The Diagnostic and Statistical Manual of Mental Disorders - 5 (DSM-5), substance use criteria and developed to determine rates of primary exercise dependence</i></p>

	<p>Physical Activity and Unrest <i>Incorporates questions to identify a patient's exercise drive and level of limitation with restful activity.</i></p> <p>Exercise and Eating Disorder Questionnaire <i>Designed for eating disorders and exercise to assess attitudes and thoughts toward compulsive exercise among patients, including a section for self-reported amount of exercise</i></p> <p>Obligatory Exercise Questionnaire <i>Developed to determine subscales of emotional element of Exercise; exercise frequency and intensity; and exercise preoccupation</i></p>
Body Attitude Test (BAT)	<p><i>Designed for the assessment of eating disorders in women. The BAT measures an individual's subjective body experience and attitudes towards one's own body. It differentiates between clinical and non-clinical subjects and between anorectics and bulimics. It is composed of 20 items which yield four factors:</i></p> <ol style="list-style-type: none"> <i>1. Negative appreciation of body size</i> <i>2. Lack of familiarity with one's own body</i> <i>3. General body dissatisfaction</i> <i>4. A rest factor</i>
Body Checking and Avoidance Questionnaire (BCAQ)	<p><i>BCAQ can be used as a first line outcome measure of if doing specific body image work</i></p>
Body Image Continuum scale	<p><i>Body Image Continuum scale, useful if assessing body image acceptance of if doing body image work.</i> <i>This uses a Likert scale 0-100.</i></p>
Body image – satisfaction/dissatisfaction	<p><i>This outcome measure tool can be used to ascertain the degree of satisfaction and acceptance of specific areas of the body. This measure is most applicable for use during specific body image interventions, as opposed to using the tool for assessment.</i></p>
4 Lens Drawings	<p><i>As with the body image satisfaction/dissatisfaction outcome measure, the 4-lens drawing tool can be useful when carrying out specific body image interventions as part of a body image treatment plan, but not routinely used as part of assessment</i></p>
Patient Specific Functional Tool	<p><i>This outcome measure is an effective validated tool that can be used to relate recovery through specific identified functional goals, in terms of improved physical and mental function.</i></p>

Tragus to Wall Test	<i>Helpful in measuring postural changes associated with reduced bone health and spinal kyphosis, as well as reduced postural muscle strength from low body weight.</i>
Timed Loaded Standing Test	<i>Useful tool for measuring combined trunk and shoulder endurance, that is suitable for individuals with osteoporosis. Also, a helpful indicator of changes in overall strength alongside weight restoration.</i>
Hand Grip Strength (HGS)	<p><i>Using a hand grip dynamometer. It can be a helpful tool to determine overall strength and outcome changes in muscle strength during weight restoration.</i></p> <p><i>HGS is also now used as part of assessing medical risk, with HGS ranges contributing to indicating low, medium and high risk</i></p> <p><i>High risk – males <30.5kgs; females <17.5kgs</i></p> <p><i>Medium risk – males <38kgs; females <23kgs</i></p> <p><i>Low risk – males >38kgs; females >23kgs (RCP, 2022)</i></p>
Becks Anxiety Inventory (BAI)	<i>The BAI is useful if assessing anxiety or doing anxiety management work.</i>
Squat Test and Sit Up Test (Medical Assessment)	<p><i>Eating disorder medical guidelines include assessing individual muscle strength as part of medical risk assessment, and current guidance includes the use of a Squat Test and Sit Up Test (RCP, 2022)</i></p> <p><i>Whilst Physiotherapists are likely to use other methods to ascertain specific muscle strength and function it is important to be aware of the outcome of medical assessment.</i></p>

Additional consideration points for assessment:

Eating disorders are extremely complex in nature and presentation, and result in both limitations and challenges for patients to effectively engage in assessment and subsequent treatment. In order to obtain the best assessment outcomes, it is important to understand the interplay of the psychological components of the eating disorder and co-morbidities, as well as understanding how to best support the patient to overcome barriers and limitations of engagement.

The following points provide guidance on additional areas to consider when carrying out a physiotherapy assessment and are important to be aware of:

- The nature of an eating disorder can mean that patients may often be secretive or guarded with regards to the information that they may feel willing to share. Patients may also share different information with another clinician. As a result, communication and documentation of the physiotherapy assessment is key to ensure consistency and to maintain treatment boundaries without colluding with the patient's eating disorder behaviours; to manage patient safety and minimise the risk of the patient 'splitting' within the MDT. Openness and honesty with the patient about the plans for assessment information to be shared with the team is essential.
- Information that patients report may not match objective findings and astuteness of the clinician is vital during assessment and there is great value in considering the wider picture, along with the

MDT, of assessment findings. For example, patient reports of exercise engagement may not match blood results or weight changes.

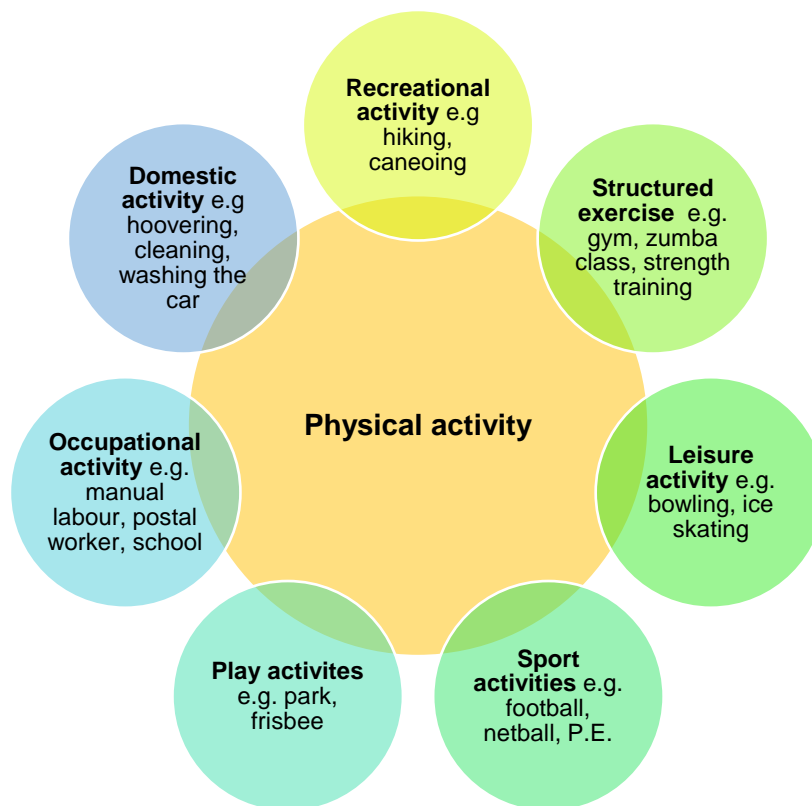
- Sensitivity to clinical assessment is essential. Patients with eating disorders may feel extremely vulnerable and judged during a physical examination. For example, a patient with negative body experience may find physical observations and palpation during a spinal assessment too overwhelming and may misinterpret or have altered perceptions of clinical findings or discussion points, feeling criticism of their body. Sensitivity is needed in carrying out the assessment but also in discussing presentation and outcome of assessment.
- Understanding a patient's psychiatric history is vital when considering assessment techniques, and full clear and open consent is essential for hands on assessment for patients with negative body image experience but also for those who may have a history of trauma. Assessment techniques may need to be adapted accordingly on discussion with the patient. Assessment may also need to be carried out with patients clothed if the patient does not feel comfortable showing a body part during assessment. In contrast a patient may need guidance with appropriate clothing for assessment if disconnected.
- As with all physiotherapy assessments, a calm, open and honest approach to assessment will enhance the potential for building a rapport with the patient so they feel safe and supported in their session, with communication styles adapted accordingly.
- Adapt and prioritise assessment in line with the patient's presentation. A patient may not have the physical and cognitive abilities to engage in a full assessment, particularly if they are at a severe low body weight or starvation phase, or in acute stages of their illness. Physical assessment can risk placing greater demand on the body and therefore prioritise assessment techniques and tools used in order to maintain safety. Consider risks versus benefits of any indicated assessments.
- Adapt and prioritise information gathered and shared in line with the individual's level of cognitive abilities and recall, which can often be compromised when the body and mind are malnourished. Be aware of cognitive and/or acute mental distress that might impact the individual's ability to engage, choosing what is appropriate to discuss or address at the time, and as above, have awareness of the use or terminology and language, to minimise risks of misinterpretation of clinical discussions or triggering of eating disorders beliefs and behaviours.
- Consideration must be made in relation to the patient's stage of change, their individual goals, and the aims of treatment. Patient's goals may not always align with the treatment goals of the MDT team. This may be the case, for example, when treating in line with best interests and risk management in order to keep the patient safe and minimise harm from their eating disorder and managing medical risk and weight restoration is the priority. Therefore, being part of open and transparent MDT discussions between the team and patient are key at this stage.

6. Physiotherapy management/interventions:

6a. Physical activity and exercise

It is widely evidenced that there are many physical and psychological health benefits of physical activity and exercise, including improved heart and lung function, improved muscular and skeletal strength, improved sleep patterns and positive effect on self-esteem, confidence and mood. As a result, exercise plays an important part in what is considered to be a healthy balanced lifestyle, physically, socially and psychologically.

Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure. Exercise is a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness (Caspersan *et al.*, 1985). Physical activity in daily life can be categorised into different forms, as presented in the diagram below.



Physical activity and exercise can therefore encompass a wide range of activities such as running, dancing, gardening or housework. These activities can be broken down further into those that are planned and structured exercise, or those which are neither planned nor structured but still involve activity and body movement, such as hoovering, washing the car, walking to and from the shops, and these types of activity are often classed as incidental exercise and activity. In the context of an individual with an eating disorder it is vital to be considering all forms of physical activity and exercise, both structured and incidental.

The Department of Health and Chief Medical Officer provides national guidance on the recommended type and amount of exercise and activity engagement, for health and disease prevention, from childhood and through the lifespan.

The most up to date guidance and infographics can be found on the government websites

<https://www.gov.uk/government/publications/physical-activity-guidelines-uk-chief-medical-officers-report>

<https://www.gov.uk/government/collections/physical-activity-guidelines>

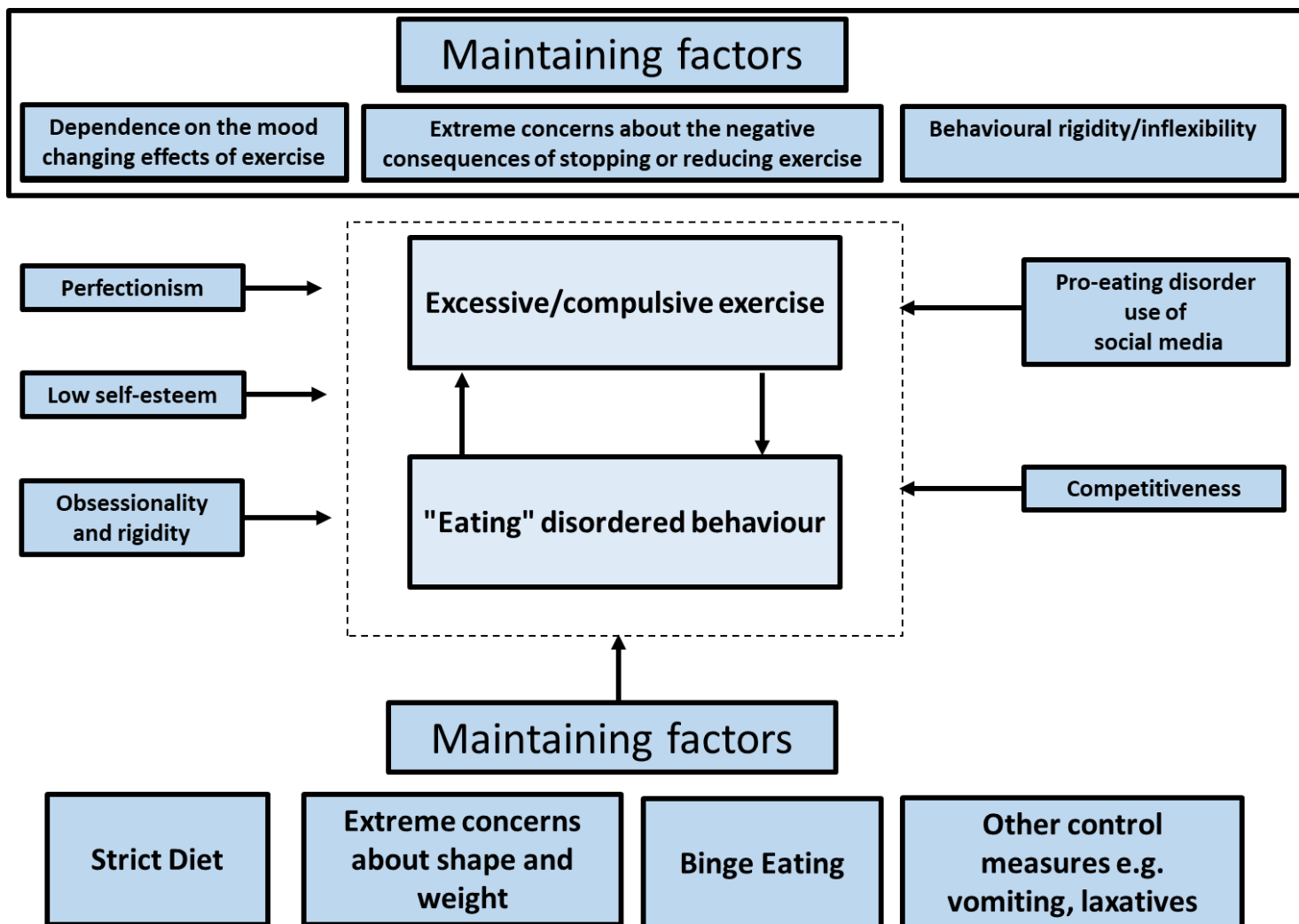
However, it is important to acknowledge that these recommendations are directed at the majority of the wider child, adult and older adult populations, and are not appropriate for every individual. It is important to consider an individual's physical and mental health and it is vital to understand that this amount of activity can be detrimental to someone who has an eating disorder and/or is underweight. Physiotherapists have holistic health skills that can support the adaptation of generalised guidance and advice to an individual's needs, abilities and goals.

6ai. Dysfunctional Exercise

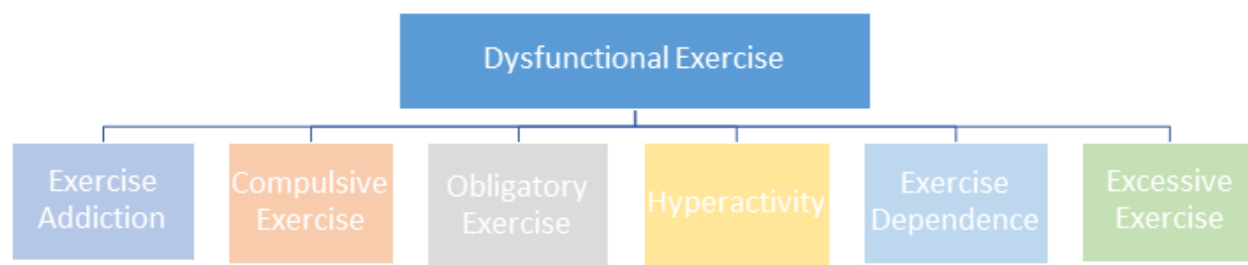
When exercise becomes associated with an eating disorder it can often become driven, rigid and compulsive, with exercise levels increasing beyond that of nutritional intake. When this happens the health benefits of exercise are lost, and exercise becomes more harmful to the body than helpful.

In general, individuals start exercising for a variety of different reasons, often for general health and fitness, or to support overall improvements in mental wellbeing. In addition, engagement in this exercise is usually healthy, balanced and does not bring any negative experience or lack of enjoyment. However, this relationship can change in the presence of an eating disorder and the relationship between an eating disorder and exercise levels can vary between individuals. This can be dependent on the reasons for first starting exercise, for example, whether it be to control weight and shape or whether it started out healthily prior to the eating disorder thoughts and behaviours taking over. Whatever the reason, exercise can become a very powerful tool in maintaining an eating disorder and can develop into a strong compensatory behaviour and coping strategy for the eating disorder. This can subsequently result in an increased exercise dependence and increased negative emotions if exercise opportunities are reduced or not available, due to the strong influence that it can have on weight control or in managing challenging emotions.

The following diagram shows the multi-factorial influencing and maintaining factors of an eating disorder and how exercise can be a closely linked component of this.



Exercise associated with an eating disorder has been classified with many different titles, however the current term 'dysfunctional exercise' reflects the wide range of reasons and ways exercise can be part of an eating disorder. There is growing evidence and consensus that unhealthy exercise and related behaviours are best defined based on the qualitative relationship with exercise, as opposed to solely on the quantitative amount of exercise, as what would be classed as 'excessive' will differ for each individual and be dependent on health status, age and fitness (Martenstyn *et al.*, 2021). Quesnel *et al.*, (2023) defined dysfunctional exercise as "a pathological relationship with exercise resulting in negative physical and/or psychological health impairment." Dysfunctional exercise is used as an umbrella term encompassing a variety of differing terms previously used to describe eating disorder related exercise, as shown in the diagram below:



Dysfunctional exercise can also take on many different forms when linked as part of an eating disorder, and can be both covert and overt in nature, or a combination of both. Dysfunctional exercise can also consist of structured and planned exercise opportunities, often high intensity and for energy expenditure, or in the form of incidental activity and persistent restlessness. Individuals driven by dysfunctional exercise beliefs and behaviours often find it difficult to be restful or engage in more sedentary activities, due to experiencing feelings of guilt or laziness, or fear of excessive weight gain.

The following table breaks down different types of dysfunctional exercising behaviour:

Vigorous movement	Marked increase in daily movement	Movement restlessness
Strenuous, highly intensive sport or exercise <ul style="list-style-type: none"> • Can be highly repetitive • Increasing duration and high expectations of achievement or exercise goals • With intention of increased energy expenditure or building muscle mass 	Increase in incidental physical activity and daily movement <ul style="list-style-type: none"> • Often covert • Making excuses for 'additional trips' • Choosing tasks that are more active • Avoiding social or occupational activities that are more sedentary • Offering to help others with active tasks • Conscious movements - foot and finger tapping, rocking, holding muscle contracts and static postures • Habitual movements 	Influenced by neurobiological factors <ul style="list-style-type: none"> • Persistent restless • Tics • Chorea • Habitual movements • Sensory seeking movement • Anxiety driven behaviours – foot and/or finger tapping, rocking, limb shaking, repeated sitting-standing Can be influenced by biochemical changes in hormone Leptin levels

A great disparity can develop between a healthy and safe approach to physical activity and exercise and what develops as part of dysfunctional eating disorder driven exercise. And subsequently, with the latter potentially resulting in a substantial impact on health and lifestyle, as presented in the following table.

Healthy exercise approaches	Dysfunctional exercise approaches
<ul style="list-style-type: none"> • Flexible in routine and engagement • Fun • Enjoyable • Social • Varied • Nourished with nutrition and hydration • Balanced with rest and recovery • Primarily for health benefits • Realistic exercise goals and routines • Positive reinforcement – enjoyable and improves mood • No negative effect of being unable to exercise • Appropriate to own abilities and fitness levels 	<ul style="list-style-type: none"> • Rigid – inflexible routines and can interfere with social and vocational/occupational tasks • Fixed routines – repetitive with no variation • Strict exercise rules • Withdrawal symptoms – anger, irritability, guilt, anxiety • Fear of negative consequences of not exercising – physical or emotional • Solitary • Secretive • Unbalanced nutrition and hydration • Unable to rest until completed exercise • Used as an avoidant coping strategy • Change in motivation e.g., no longer related to performance or health • Change in exercise type e.g., drive for higher intensity exercise • Loss of awareness of behaviours/routine • Little or no pleasure or enjoyment • Obsessive attitudes with often false beliefs about weight, health and fitness • Following unhelpful rules about exercise, e.g., ‘no pain no gain, ‘more is better’ • Dependence for mood improvement • Feels of compulsion – have to, feeling like a chore • Exercising in the presence of illness or injury • Compensation for missed sessions • Exercising as a form of self-punishment • Increase preoccupation with exercise • Detailed measurement of exercise results, e.g., intensity, steps, distance • Used as a means to eat, or to compensate for food eaten • Influenced by comparisons with others, including through the use of social media and, for e.g., fitness magazines • Unhelpful and obsessive use of fitness apps and exercise trackers.

Exercise Scenario 1

Adam is 17 and in his final year at high school. He doesn't enjoy sports and feels self-conscious participating in PE. He has become extremely concerned that his friends are all slimmer than him and has become fixed on following fitness influencers on social media. As a result of this he feels guilty when he eats food and has taken up doing exercise after eating to compensate for this. He has a set routine of doing 100 sit ups, 100 star jumps and going for a brisk walk for an hour, tracking his steps on his fitness app. Adam feels he must exercise even if he feels tired or he is meant to be doing something else.

Adam has an unhealthy attitude to exercise – he doesn't enjoy exercising; it has become compulsive, with a 'debting' approach to eating/exercise.

Exercise Scenario 2

Raminder is 22 and has just finished her university degree, and secured her first full time job in a legal firm. Her job is office based and mostly sedentary. She isn't somebody that normally participated in exercise but became aware that she had put on weight with being inactive at university. She started attending a circuit-based class at the gym on the recommendation of friends. She didn't enjoy the sessions and so decided to join a local tennis club, playing 3 times a week. She also incorporated walking into her routine by going for long walks at the weekend in the country with friends. She has lost weight with the exercise, is pleased with her progress, and generally feels fitter. As well as the changes to her body, she really enjoys the social aspect of these activities. However, if the weather is bad or she has something else on she is not upset about missing out.

Raminder has a healthy attitude to exercise – even though weight loss was her original motivator, she engages in varied exercise which she enjoys, and it is sociable. She is also not dependent on it.

Exercise scenario 3

Jo is a 19-year-old college student who has always enjoyed fitness. They attend the gym five nights a week incorporating an hour of cardiovascular work and an hour of weights. They also swim lengths of the pool for one hour every day before going to college. They feel better after exercise and their mood is elevated. They believe that they need to exercise in order that they stay slim and healthy. In each session they continually set targets such as increasing the amount of weight they lift or increasing the resistance and incline on the cross trainer. When they don't manage to achieve this, they feel a lack of achievement. They also try to eat healthily in order to maintain their weight. They are struggling with their college work and haven't made many friends.

Jo has an unhealthy attitude to exercise. It appears rigid and solitary, interfering with studies and personal relationships, and they are dependent on exercise for mood. However, the mood improvement is short term due to negative emotions associated with not achieving their exercise targets, and they also have false beliefs about what constitutes health and fitness.

Exercise scenario 4

Ella is 24 and works as an accountant. She is planning to run a half marathon. She used to run for her county when at school. Ella sets high standards for herself and is extremely competitive. She is using a training app for her running sessions which incorporates a progressive training regime and weekly goal setting. She has two rest days a week. She is also monitoring her weight and diet. If required, she will eat more to match her energy expenditure. Through the training she has had some muscular aches and pains. As a result, she does have rest periods and although she misses it, she knows the importance of the rest for her body.

Ella has a healthy attitude to exercise – her goals are realistic, not set rules. Ella she enjoys running and gains a sense of achievement from it, she looks after her health including stopping if injured and ensures that her energy intake is sufficient for the activity

Exercise scenario 5

Maria is 63. She has been overweight for much of her life and tried lots of different diets, none of which she found successful. About a year ago she found a lump in one of her breasts. It turned out to be benign, but this scared her and she decided to change her lifestyle. Maria changed her diet and started to go to the gym. She was delighted when she started to lose weight and friends and family noticed how healthy she was looking. Maria increased her gym sessions and now goes for a couple of hours each day. If she misses a day, she goes for an extra hour to compensate the next day, or takes a long walk and skips lunch. She has left the book club which she used to enjoy. Friends and family have told her they are worried about her, but she thinks they are just jealous of her weight loss. She has continued to lose weight and is often tired when she gets back from the gym. She often feels guilty about resting and spends a lot of her time cleaning the house, which she likes to look perfect. Whilst cleaning out her cupboard Maria experienced sudden onset of back pain and an x-ray subsequently confirmed a spinal wedge fracture. Maria is now concerned about gaining weight as a result of not being able to attend the gym whilst her fracture heals.

Maria has an unhealthy attitude to exercise. She increased her gym sessions which began affecting her social life and her engagement in hobbies. She feels guilty if she rests or misses a day and feels that she needs to skip a meal or do something else to compensate. She is ignoring the concerns of those close to her and her behaviours have resulted in a likely fragility fracture.

Exercise scenario 6

Gwen is a 13-year gymnast, they train at their local club and are in 'squad' training. Gwen trains for 2 hours on a Monday, Tuesday and Thursday and 4 hours on a Saturday. They hate missing training and worry that they will not be as fit as their teammates and will lose their skills even if they only miss one training session, they also worry about their place on the squad. Gwen will often miss out on activities with their friends as they don't want to miss training, especially on a weekend. Gwen often feels like their homework is not good enough as they rush to fit it in around training. They are not enjoying gymnastics as much as they used to but don't feel they can tell their parents or coach as they keep telling them how they have to work hard to make it. Gwen also worries about how they look in their leotard and will often do extra exercises to make sure they have a flat stomach. They also don't like the thought of having big legs, this makes them cut out any food they think is unhealthy and train even harder if they think they have eaten too much.

Gwen has an unhealthy attitude to exercise – They have strict exercise routines, influenced by the pressure of achieving set goals and ability to perform. They are not enjoying their exercise and prioritising exercise over social and academic activities. Gwen is also influenced by body image pressures, alongside debting behaviour, exercising to compensate for what they have eaten.

Exercise scenario 7

Jack is 15 and attends a local boxing club, he trains 3 times a week with his coach but worries this is not enough, so has started doing extra at home. He will do press ups for 30 mins before bed every evening and every time he walks through his door, he does 10 pull ups on his pull up bar. Jack feels that he is not 'cut' enough as you can't see much muscle definition in his trunk, arms and legs. Jack listens to the other boxers talking about how much weight they can lift and worries that he can't lift as much. Before a fight Jack has to fit into a weight category, he worries all week that he is not going to make it, so he cuts out snacks and lunch at school. He also heard that cutting out fat makes his muscles look bigger, so he tries to avoid food he thinks is high in fat. Jack enjoys being at training and talking to the other fighters but is always comparing himself to the others in the club. He thinks that if he works harder, he will get 'bigger and better'.

Jack has an unhealthy attitude with exercise – although Jack is enjoying his training and boxing, he is influenced by the nature of the sport in relation to weight and shape expectations and compares himself with others. Jack has an inaccurate understanding of nutritional requirements for his training and body physique. Jack also has a rigid training routine.

As previously mentioned, individuals who engage in dysfunctional exercise as part of their eating disorder are often influenced by set rules or beliefs that drive exercise routines and behaviours. Rules and beliefs may have initially been appropriate, safe and healthy, and led by fact, however, as part of eating disorder psychology and cognitions, these rules and beliefs can change and often develop in a way that benefits and maintains the eating disorder. For example, to benefit perceived weight and shape ideals, fear of weight gain, or drive for improved 'fitness' and 'health', and after often influenced by rigid thinking styles and unachievable goals. Examples of these exercise beliefs and rules can be seen below:

Examples of patient's exercise beliefs and rules that can maintain exercising behaviours

"I've done nothing all day except sit. I haven't earned food or rest"

"People who don't exercise are lazy. People will see me as lazy if I don't exercise"

"If I don't exercise my metabolism will drop"

"If I sit down all day I will get fat, be lazy and will get a fat tummy"

"If I don't exercise, I won't be able to cope with my day or my anxieties"

"Without exercise I can't trust my meal plan"

"I can't do anything else in a day unless I have done some exercise"

"I must achieve 20,000. They say 10,000 but I must do more in order to have the best achievement."

"I must exercise everyday as this will make me stronger"

"Everyone should exercise every day"

"People will judge me for eating if I do not exercise enough"

"If I'm not a runner then I have no identify. It is who I am".

"I feel pretty gross, alone and trapped. Exercise gets me away from feeling that"

"If I start the day off with exercise, I feel productive and like I have achieved something"

"I feel tired – exercise will wake me up"

6a. Supporting a safe return to physical activity and exercise

Exercise abstinence versus inclusion of exercise in eating disorder treatment

There is growing evidence that supports the inclusion of exercise as part of eating disorder treatment. Historically, the subject of exercise and eating disorders has been poorly understood and its inclusion as part of treatment has been reported as controversial and considered detrimental, due to the medical and psychological risks, resulting in many patients being told just to stop exercising, without any support or guidance.

It is important to consider that dysfunctional exercise and activity can be a key component of an eating disorder and therefore, if left untreated, can increase the risk of relapse and chronicity (Monell *et al.*, 2018).

Dysfunctional exercise is present in 22-80% of individuals diagnosed with an eating disorder (Dalle *et al.*, 2007) where individuals may experience increased eating disorder psychopathology with poorer health-related quality of life, and in chronic eating disorders result in increased depression, greater risk of relapse and experience an enduring course of their illness (Carter *et al.*, 2004; Hallward *et al.*, 2021; Hausenblas *et al.*, 2008; Mathisen *et al.*, 2018; Meyer *et al.*, 2011 and, Strober *et al.*, 1997).

Supporting exercise management, and the inclusion of exercise interventions as part of eating disorder treatment has remained a key area of work for Physiotherapists in eating disorders, and there is now growing evidence that supports both (a) the inclusion of exercise and (b) the treatment of dysfunctional exercise and activity. Exercise management is also now being included within national guidance documents on eating disorders.

Although there are more promising outcomes of exercise inclusion during eating disorder treatment, serious co-morbidities associated with eating disorders contra-indicate certain exercise types, modalities, intensities and quantity (Quesnel *et al.*, 2023). It is essential therefore that all exercise interventions are fully assessed, prescribed, and supervised by a specialist Physiotherapist and must be in collaboration with the multidisciplinary team. The patient must be medically and psychologically well enough to engage. The following section outlines key evidence in support of exercise interventions, considerations of inclusion of exercise and the role of physiotherapy.

Examples of evidence to support (a) the inclusion of exercise (b) the treatment of dysfunctional exercise and activity	
Ng, LWC., Ng, DP., and Wong WP., (2013) Is Supervised exercise training safe in patients with Anorexia Nervosa? A meta-analysis Physiotherapy 1-11	This systematic review concluded that including supervised exercise training in the management of adult patients with AN is safe, as it did not result in additional weight loss and may have benefits in the areas of strength and psychological wellbeing. Exercise training was reported to improve strength and cardiovascular endurance despite no change in lean body mass. No significant impact on quality of life was reported, although negative feelings for food and exercise were reduced. There was a reduction in anxiety and depression, improved body image, improved social behaviour, and a reduction in requirement for secret exercise

Hay P., Touyz S., Arcelus J., Pike K., Attia E., Crosby, R.D., <i>et al.</i> , (2018). A randomised controlled trial of the compulsive exercise and activity therapy programme programme (LEAP). A new approach to compulsive exercise in anorexia nervosa. International Journal of Eating Disorders, 51 pp. 999-1004.	Showed that the inclusion of cognitive behavioural therapy and the Loughborough Eating Disorders Activity Programme (LEAP) resulted in improved attitudes and beliefs towards exercise. In addition, there were general improvements in BMI and eating disorder psychopathology in people with AN.
Ditmer N., Voderholzer U., Monch C., Cuntz U., Jacobi C., and Schlegl S., (2020) Efficacy of a Specialised Group Intervention for Compulsive Exercise for Inpatients with Anorexia Nervosa. Psychotherapy and Psychosomatics	A randomised controlled trial. 207 adolescent and adult females with AN and atypical AN were randomly allocated to treatment as usual (TAU) or to additional participation in Healthy exercise behaviour (HEB), HEB integrated elements of exercise-based therapy into a CBT approach. Findings were that HEB resulted in significantly stronger reductions in the severity of compulsive exercise compared to the TUA group.
Cook B.J., Wonderlich S.A., Mitchell J.E., Thompson R., Shema R., and McCallum K., (2016) Exercise in eating disorders treatment. Systematic review and proposal of guidelines. Medicine and Science in Sports and Exercise 48 pp.1406-1414.	This review identifies specific guidelines that may enhance eating disorder treatment outcomes. It provides a practical set of guidelines for the clinical management and therapeutic use of exercise in eating disorder treatment by focusing on empowering individuals with exercise as a tool for healthy living. Evidence includes the recommendation for inclusion of a psychoeducational component. It is important to address the issues of dysfunctional exercise/activity and body image as part of eating disorder treatment. Both of these are maintaining factors of each other and of an eating disorder. If these components are left untreated, there is greater risk of relapse and chronicity of an eating disorder.

Exercise resources to guide practice:

A range of resources are available that guide practice in relation to exercise management and eating disorders, adopting principles of risk management and psychoeducation approaches.

- Loughborough Eating Disorder Activity Programme (LEAP). The LEAP is a CBT (cognitive behavioural therapy) based programme developed by the University of Loughborough and is used to assess and treat compulsive exercise as part of an eating disorder treatment programme. The programme manual provides detailed guidance and session plans that support the delivery of a psycho-educational programme, with expected 'homework' by patients in between sessions. Patients complete an exercise profile at the start of the programme in order for the individual to understand how they exercise and why. The components of the programme explore exercise myths and beliefs, rules and rigid exercise

behaviour, healthy and unhealthy exercise, as well as exercise for emotional regulation and initiating and maintaining factors for exercise. The programme is most effectively run in conjunction with a Clinical Psychologist and requires a level of CBT knowledge and training.

<https://www.lboro.ac.uk/enterprise/case-studies/cet-leap/>

- Safe Exercise at Every Stage (SEES) (Dobinson *et al.*, 2019). The SEES guidance provides clinical guidelines managing and incorporating exercise into eating disorder treatment. The guidelines adopt the approach that inclusion of exercise alongside thorough physical and psychological risk assessment and review is an effective approach to management of dysfunctional exercise. The guidelines emphasise the key principles: non-abstinence, safe and healthful exercise engagement, a holistic approach, mindful and intuitive movement and ensuring a collaborative approach with the patient and MDT. The recommendations within the guideline are intended to provide an evidence-based framework for clinicians to inform clinical decision making in relation to exercise prescription for individuals with an eating disorder and dysfunctional exercising behaviour. The guidance does not replace a Physiotherapist's clinical reasoning following physiotherapy assessment and individual treatment planning.
- In 2021, Quesnel *et al.*, published Safe Exercise at Every Stage: Athlete Version (SEES-A) a guideline in managing exercise and return to sport in athletes with an eating disorder. The SEES-A is intended to be used in conjunction with the SEES guideline <https://www.safeexerciseateverystage.com/>

Bed rest versus early mobilisation

Within acute health care settings, such as acute medical or gastroenterology wards, a patient who is in the early stages of refeeding, or who is medically unstable may be placed on time limited bed rest, with the priority for energy conservation and medical stabilisation. In addition, these energy conservation approaches may be used in the early stages of weight restoration or medical stabilisation on specialist eating disorder units, where activity may be limited or restricted, often referred to as 'unit rest'. This may be through the use of bed rest or wheelchair use. However, practice varies between eating disorder units, and there is currently no clear evidence that prolonged bed rest must be a standardised practice for all patients in the early stages of treatment, including consideration of bed or 'unit' rest in relation to BMI range. Inbrahim *et al.*, (2019) concluded that in most cases enforced bed rest is unhelpful and should be avoided due to the potential associated physical and psychological risks of bed rest. This is also cited within the MEED guidelines (2022) with risks including psychological distress and physical complications such as pressure sores, infections, deep vein thrombosis, muscular atrophy and increased bone absorption. A Physiotherapist may be asked to advise on a patient's level of mobility and activity, however it is clear that any consideration for mobility and activity, particularly in the context of limiting activity and energy conservation, must be made with MDT multi-factorial assessment and take into account factors including medical stability, physical observations, strength, balance and functional abilities, whilst balancing risks of physical and psychological complications with the aims of reduced activity levels. This assessment must continue to be dynamic and reviewed in light of deterioration in the patient's health status and clinical frailty. Section 9 – Considerations for Physiotherapists in other clinical settings - provides further information on balancing rehabilitation considerations and medical risk.

Including physiotherapy led exercise interventions as part of eating disorder treatment

As a result of the high medical risk and mortality rate associated with eating disorders, the inclusion of exercise interventions as part of treatment must be prescribed in line with medical, psychological and functional risk assessment (see section 4 – risk assessment). In addition, exercise prescription must take into account the patient's engagement and progress with treatment and weight restoration. As with the importance of developing healthy eating behaviours and cognitions during treatment, restoring a healthy relationship with movement, activity and exercise is also a vital part of treatment, whether this be in the form of structured exercise, incidental exercise or a combination of both (Quesnel *et al.*, 2023). Taking a graded approach to exercise prescription supports opportunity for interventions to be tailored specifically to the patient's health status and risk, short- and long-term exercise goals, as well as exercise preferences and fitness levels. This approach also supports the opportunity for close monitoring of medical and physical health and regular review of the therapeutic prescription of activity and exercise alongside changes in health status (Calgerty & Pedrotty, 2004; Calogero *et al.*, 2010; Cook *et al.*, 2016).

The role of physiotherapy, and considerations for exercise interventions, will be dependent on key clinical reasoning factors, risk management and stage of treatment. Consideration is also needed for the aims of exercise interventions, whether this links directly with physiotherapy input or a collaborative approach linking with physical activity that results from other therapeutic activities as part of wider treatment pathways, as follows.



Physical activity and exercise prescription as part of management of dysfunctional exercise behaviour

This includes the safe and appropriate re-introduction of activity and exercise alongside challenging a dysfunctional exercise relationship



Physical activity and exercise prescription as part of balanced lifestyle choices

This includes the safe and appropriate re-introduction of activity and exercise, alongside weight restoration, in the absence of dysfunctional exercise behaviours



Physical activity and exercise prescription of physical or functional conditions

This includes prescription of specific exercise programmes for targeted treatment, such as musculoskeletal, neurological or orthopaedic conditions



Indirect and incidental physical activity and exercise prescription resulting from other therapeutic treatment interventions

This includes activity and exercise that results from meal pathway activity, leave, community visits, leisure and recreational activities

Developing a healthy relationship with exercise

Key components of supporting an individual to return to a healthy balanced approach to exercise must include:

- Assessment and interventions related to the **relationship the individual has with exercise and how this links with their eating disorder**
- Consideration of **body awareness approaches** with the aim of enhancing the ability to recognise physical, as well as psychological cues, for healthy intuitive exercise and movement. This work is considered more effective if commenced prior to, or at the early stages of exercise re-introduction, and alongside exercise and body awareness psycho-education.
- Exploration, review and progression of a **graded and supervised** return to practical movement, physical activity and exercise opportunities, including both individual and group sessions.

AIMS of physiotherapy led psycho-education sessions in the management of dysfunctional exercise

- To increase an understanding of what is meant by physical activity and exercise, and how these can link to an eating disorder
- To understand initiating and maintaining factors of dysfunctional exercise as part of an eating disorder
- To understand what is meant by physical activity and exercise, including a structured versus functional approach to exercise
- To explore an individual's relationship with exercise and how this links with their eating disorder and exercise behaviours, including exercise styles, patterns, and intensities.
- To share information on the physical, psychological, and social risks of dysfunctional exercise, and risks associated with exercising at a low body weight or with unbalanced rest, nutrition, and hydration.
- To work through the cost versus benefits of exercise engagement, linking with pros and cons of change.
- To identify specific short- and long-term goals, linking with the stages of change model.
- To discuss healthy versus unhealthy exercising approaches, linking with dysfunctional exercise, and share examples of different exercise scenarios.
- To understand common myths and misleading information in relation to exercise and exercise rules, beliefs and thinking styles, that can develop as part of an eating disorder.
- To understand how social media, fitness apps/trackers and exercise environments, as well as perceived motivational exercise messages, can impact on dysfunctional exercising beliefs and behaviours, and consider approaches that can help lessen these potential triggers.
- To explore and challenge an individual's exercise rules and beliefs with the aim of developing a counter-response for behavioural change.
- To guide discussions and reflections on the stages of change model and pros and cons of challenging dysfunctional exercise
- To understand exercise approaches which support and maintain recovery; from both a physical and psychological health perspective, including the importance of an individualised approach, and of nutrition, rest and recovery.
- To expand on the longer-term physical and medical risks of a low body weight, specifically bone health and osteoporosis and links with safe exercise management
- To share the principles of body awareness, intuitive movement and exercise
- To explore and understand helpful strategies, approaches and techniques to challenge dysfunctional exercise

- To guide reflections and action planning regarding engagement in supervised and community led exercise sessions as part of treatment programme
- To provide support, education and advice to family, friends and carers, as appropriate, as part of the patient's treatment and relapse prevention.
- To guide reflections and action planning in relation to relapse prevention and relapse planning; to include awareness of exercise triggers, warning signs of exercise challenges and strategies to stay on track longer term.

Physiotherapy sessions with the above aims can be delivered through group and/or individual psycho-educational sessions, group or individual exercises sessions, or a combination of these. Not all the above goals will be appropriate for all patients at all stages. Selection of appropriate psycho-education sessions will be dependent on the acuteness of the patient's eating disorder, the willingness and readiness to work on dysfunctional behaviours, as well as whether the patient is both physically and mentally well enough to engage in these sessions. Sessions will also be dependent on the patients' stage of recovery, goals, context (inpatient, outpatients or community) and MDT treatment pathway. It is essential that the above interventions are delivered as part of an MDT approach. Sessions might also be delivered jointly with another member of the MDT, for example a Clinical Psychologist or Dietitian, if there are specific topics to discuss or beliefs to challenge. Feeding back to the MDT on sessions patients have engaged in and the outcome of these sessions is also vital as part of a collaborative approach to the patient's treatment programme.

Practical application of exercise opportunities alongside psycho-educational interventions.

Alongside the inclusion of treatment that addresses the psycho-social aspects of dysfunctional exercise, evidence also supports the inclusion of the practical application and participation in exercise as part of eating disorder treatment and recovery (Cook *et al.*, 2016; SEES, 2020, SIGN 2022).

The Safe Exercise at Every Stage Guidance document (Dobinson *et al.*, 2019) provides detailed evidence-based guidelines, in conjunction with risk management, and can be used to support clinical reasoning relating to exercise prescription for those with dysfunctional exercising behaviours. Exercise prescription must always be individualised and in line with assessment of physical, medical and psychological risk. These guidelines do not include detailed consideration of co-morbidities or functional difficulties and therefore are not to be used as a sole guide for prescription of physiotherapy treatment approaches.

As well as core physiotherapy assessment of functional abilities and physical health conditions, selection and prescription of exercise interventions must also consider the following:

- Medical, physical and psychological risk factors
- Underlying physical health conditions, co-morbidities, as well as musculoskeletal, osteoporosis or rheumatological conditions resultant from, or exacerbated by, an eating disorder
- The stage of treatment, engagement with treatment and progress with weight restoration.
- Identification of appropriate intensity, frequency, and duration of physical activity and exercise, to ensure that it does not compromise clinical frailty, weight restoration, medical status or psychological exercise dependency. This must also take into account incidental accumulative physical activity and exercise resulting from other aspects of lifestyle or treatment interventions.
- There is no consensus within research, however, expert opinion recommends not engaging patients in physical activity or exercise interventions or opportunities <BMI 13.0, due to the medical, physical and psychological risks of severe low body, and risk of compromising energy availability and the

vulnerability of the body at severely low body weight. Dobinson *et al.*, (2019) further supports this recommendation in the Safe Exercise at Every Stage with recommendations of increased risks of exercise <BMI 13.5. The SEES guidance also contra-indicates high impact exercise at <BMI 16.0.

- Whilst further bodyweight/BMI set points or ranges are not seen as being an evidence-based marker for exercise prescription, it is important to include body weight as part of clinical reasoning and risk assessment due to the medical, physical and psychological risks associated with low body weight. In addition, it is vital to be aware of risks of clinical frailty and vulnerability of the body at low body weight. Any prescription of movement must take this into account and consider low intensity, duration, and frequency accordingly, with a gradual progression only when deemed appropriate. Exercise prescription needs to ensure that it does not compromise or limit weight restoration, energy stores, or places undue stress on the body.
- The individual's relationship with exercise and how this links with their eating disorder – this will include past exercising behaviours and triggering factors, such as environment, comparisons with others, and body image.
- Work to short-, medium- and long-term goals – begin with an initial reintroduction, at appropriate intensity and duration, and progress, pause or regress appropriately during recovery. Longer term goals can be developed when secure in recovery and maintaining a healthy relationship with exercise and their body.
- Must be appropriately supervised and graded. Gradual monitored changes are recommended to avoid sudden shifts in activity levels which may impact physically and/or psychologically. Any changes in frequency, duration and/or intensity should be regularly reviewed, and progressed/regressed accordingly dependent on progress and risk.
- Must include consideration of lifestyle choices, exercise preferences, recreational and leisure interests, as well as consideration of accumulative activity that may result from occupational or vocational activity. It is vital to consider accumulative levels that will arise from both structured and incidental activities, as well as accumulative activity levels that may arise through other the patient's engagement in other activities that form part of a treatment pathway. For example, home leave or activities associated with other professional input such as meal pathway activities, or social integration. Consider also accumulative activity that will arise if the individual is also returning to work or school at the same time. Focus on achieving a balance and focus on what the priorities for the individual are at that time, such as focusing on balancing incidental activity that arises from returning to school, before reintroducing exercise clubs or additional recreational activities.

Identification of appropriate exercise interventions

When returning to a healthy, balanced, approach to exercise it is important to identify helpful strategies that will enhance a positive, intuitive, and mindful approach to exercise. This will support the patient in developing lived experiences and strategies that will help with sustaining longer-term management of exercise and activity.

The following factors are helpful approaches to encourage and facilitate when reintroducing exercise and physical activity. Where appropriate, aim for sessions to be:

Fun and enjoyable. Dysfunctional exercising behaviour, for example for weight and shape or emotional regulation, can often become rigid, unenjoyable and feel like a chore. It is essential to be able to reframe exercise with the patient and reintroduce an element of fun and enjoyment, shifting the experience and reinforcing the positive aspects of exercise.

Social. Where possible, groups, with family and friends, team sports, can all enhance a more positive experience, and reduce the risks of exercise becoming solitary and rigid. Exercising with others can also help reduce the risks of the patient inappropriately increasing duration, intensity, or frequency of their exercise, and reduces the risk of exercise becoming secretive in nature.

Time Limited. Dysfunctional exercising behaviour can include ever increasing exercise goals or targets, e.g., “the more I run the better I will feel”, “I did 20 minutes yesterday therefore I must do 30 minutes today”, Patients often find it hard to listen to their body’s physical cues and recognise when they have engaged in an appropriate level of exercise/‘enough’. Having sessions time limited, supports the patient to engage in an appropriate level of exercise with a set end point, reducing risk of being led by eating disorder related rules or beliefs.

Facilitated by others. e.g., group instructor or coach, exercise class setting. This approach can support a time limited and social approach but can also ensure that safe and appropriate guidance and supervision is offered, and limits the sessions being led by the patient’s dysfunctional exercise rules and beliefs.

Encourage exercise classes and sessions that are supportive, non-competitive, and appropriate to participants abilities and health status. Guide individuals to avoid sessions which may be triggering for their relationship with exercise, for example, that strive for competitiveness, set routines, or results driven goals, contain unsolicited advice, or are focused on weight and shape targets.

As previously discussed, re-introduction and management of physical activity and exercise must be dependent on thorough risk assessment, and consideration for additional risks that arise if an individual is exercising in a malnourished and/or unhealthy weight state. If physical activity or exercise is not adapted or prescribed appropriately to medical, physical and psychological status then there will be increased risk and will further compromise the individual, as follows.

- **Psychological** – increased risk of dysfunctional exercise behaviour and exercise dependence
- **Musculoskeletal and bone health** - Increased risk of musculoskeletal injury such as repetitive strain, muscle catabolism, longer term impact on bone health
- **Cardiac** – reduced cardiac output and cardiac function during exercise, syncope and arrhythmias
- **Electrolytes and metabolic** – increased sweating/dehydration and metabolic demand e.g., diabetes, hyponatremia, hypokalaemia and hypoglycaemia
- **Increased risk of exacerbation of co-morbidities**
- **Falls**
- **Reduced energy availability, fatigue, weight loss and further compromise of medical and psychological risk** (Dobinson *et al.*, 2019; Royal College of Psychiatry, 2022; Quesnel *et al.*, 2023)

Quesnel *et al.*, (2023) states that there is limited evidence regarding specific exercise prescription, including duration, type, intensity, and frequency, in relation to medical and physiological risk. In addition, this lack of evidence also extends to differentiating between the risks of mechanical versus metabolic loading of exercise and how these are likely to influence safety with prescribing. They provide the example that if prescribing on ‘intensity’ alone, this may be misleading or increase risks, due to the fact it does not take into account high mechanical and high metabolic loading. These factors are therefore vital to consider for Physiotherapists to

consider when prescribing, ensuring detailed risk assessment and treatment planning, and increased evidence that exercise prescription must be delivered by a Specialist Physiotherapist as part of eating disorder treatment.

Format

The environment in which an individual engages in activity or exercise can be an important factor. For example, clear consideration is needed if a patient wishes to return to an exercise environment, such as the gym, where they had previously engaged in high levels of solitary dysfunctional exercise. Would returning to this environment be triggering and a high risk of relapse for dysfunctional exercise, or would the individual be in a place where they could learn a new approach to gym exercise. This will depend greatly on the individual and their motivation, as well as their ability and readiness to recover. In many cases, it will be appropriate and more compassionate to identify new and alternative physical activity and exercise options, which enhance the opportunity for the individual to succeed in challenging their exercise behaviours and bring a greater sense of enjoyment.

With the increased use of home and virtual exercise opportunities in more recent years patients may also be keen to reintroduce this format, often due to greater accessibility and affordability compared with exercise memberships. If this is a consideration then it is important to discuss risks associated with the content, the nature of the solitary style exercise, and increasing association of home as a place of exercise, as well as virtual and pre-recorded exercise not providing the level of support and supervision that a face-to-face physiotherapy/exercise instructor led class will provide. It would be appropriate to make a safety plan if this format of exercise is being considered e.g., away from bedroom, include family/friends, adhering to planned and recommended amount of activity.

Support and facilitation

Depending on the clinical setting, consideration is needed to the level of supervision provided during exercise interventions. A graded approach is recommended, beginning with supervised sessions and working towards independent management of activity as appropriate and adapted accordingly, dependent on risk. A graded exposure approach may be indicated for individuals to ensure that the re-introduction is paced appropriately and supportive to those who may lack confidence or experience increased anxiety as part of exercise re-introduction.

Exercise sessions must initially be delivered and supervised by a Physiotherapist, and/or physiotherapy support roles with physiotherapy supervision and review. As risks of exercise engagement reduce and patients' ability to manage activity safely increases, it is possible for other members of the team to support physical activity and exercise opportunities, with guidance, for example attending community led exercise classes, or leisure and recreational activities. Family and carer support can also bring great value to patient experience and longer-term support. This can also provide patients with enhanced support when transitioning from inpatient to community and home settings.

Where this additional support is provided, whether this be by other team members, family or carers, joint education and guidance sessions from the Physiotherapist are vital. These sessions can ensure open discussions about risk and discuss appropriate support strategies.

Motivation and readiness for change

Meyer *et al.*, (2011) highlights that there may be resistance to changing exercise behaviours that link closely with eating disorder psychopathology. Individuals may be at different stages of readiness to change, and therefore willingness and preparedness for challenging dysfunctional exercising behaviours may vary. A collaborative approach with the individual and their clinical team is therefore encouraged and may help to support enhanced motivation for change and openness about their relationship with exercise (SEES, 2020).

The following diagram presents the Stages of Change Model (Prochaska & DiClemente, 1983) and considers how physiotherapy input will vary depending on the individual's motivation for change. Physiotherapy input changes as the patient transitions through the stages of a patient's journey to recovery. Engagement may vary dependent on different clinical settings as well as when transitioning through services, however continuity of support is key for developing a healthier relationship with exercise longer term.

Recommended interventions related to motivation and stages of change

Relapse phase

Address immediate physical or function risks associated with relapse

Support in maintaining safe activity levels in line with presenting mental and physical health.

Identify relapse triggers relating to body image and exercise and consider revisiting psycho-educational aspects of exercise management.

Maintenance phase

Transition of exercise interventions from inpatient to community inclusion (if in acute services). Enhance self-management and self-monitoring in relation to exercise engagement, including implementing self-directed body awareness and intuitive movement principles

Development of longer-term management plan that includes identification of exercise triggers, warning signs of dysfunctional exercise and strategies to apply if exercise becomes more challenging, including changes to make to exercise in order to maintain health and prevent relapse

precontemplation

Precontemplation and contemplation phase

Interventions to maintain functional safety if severe low body weight and compromised function. Support to consider exercise relationship and how this links with their eating disorder. Education and advise on the multi-factorial risks of exercise behaviour, low body weight, and exploration of pros and cons of change.

contemplation

Preparation phase

Identification of strategies and plans to implement to challenge exercise engagement, alongside medical, physical, and psychological risk assessment.

Identification of short- and longer-term goals for practical exercise engagement

Psychoeducation on healthy exercise approaches, challenging exercise rules and beliefs

Introduction of body awareness interventions and intuitive movement principles

MDT input into identifying alternative coping strategies and psychological interventions to support alongside reducing dysfunctional exercise and reintroducing a healthier approach

Action phase

Implementation of exercise and activity plan, alongside continued exploration of exercise and body image rules, beliefs and behaviours

Continued review and reflection of exercise engagement during practical sessions, including body awareness and intuitive movement, and adapt and enhance exercise management plan as indicated

action

maintenance

relapse

Adapted from **Stages of Change Model**, Prochaska & DiClemente, 1983

Exercise risk factors and triggers/risks of exercise prescription

When providing support to challenge dysfunctional exercising behaviour, additional input is important to address the psychological impact that challenge exercise may have in relation to emotional regulation or resultant reduction in coping strategies. If a patient uses exercise as a coping strategy for their eating disorder, e.g., to manage weight restoration or for emotional regulation, then risks arise when reducing their exercise. The patient may turn to alternative harmful coping strategies such as reducing nutritional intake, self-harm or purging. Working with the patient and MDT to identify these risks and provide preventative support through identifying alternative ways to cope or address emotions and/or weight restoration is vital.

Caution is needed when discussing or considering the use of exercise targets that use exercise trackers, such as fitness apps and tracking devices and exercise readings on gym equipment. Whilst these measures may be helpful for some individuals, within the context of dysfunctional exercising tendencies there is a high risk that these tools exacerbate rigid rules, routines and goals and further develop an unhealthy approach to exercise. The use of trackers and apps also reduces opportunities to learn and engage in intuitive movement and listen to physical and psychological cues that guide exercise. It is important that these risks are discussed with patients. In addition, open discussions about the use of media messages and national physical activity guidelines can support individuals to contextualise information and consider an individualised approach to their own exercise and how these messages are not applicable, and often inappropriate, for individuals with an eating disorder, underweight and/or dysfunctional exercise.

Activity diaries and exercise plans can also exacerbate dysfunctional exercise behaviour or eating disorder thoughts. Whilst the aim is to identify the level of exercise that an individual may be engaging in, including initially undisclosed exercise, and can have the benefit of the individual acknowledging greater levels of exercise than the patient acknowledges, they also risk the patient over-analysing activity levels, interpreting these as not high enough, or resulting in inflexibility and rigid rules about exercise recorded.

Be vigilant of any emerging dysfunctional exercise presentation during exercise sessions even in patients for whom exercise is not a presenting component of their eating disorder, as this may be a new behaviour arising or a past behaviour becoming more challenging.

Consider the risks of prescribing exercise programmes for those with physical or functional difficulties, in the presence of dysfunctional exercise behaviour. Be aware of the reasons an individual is requesting exercise prescription, for example for a musculoskeletal complaint, that there might potentially be another underlying reason for seeking permission to exercise.

Continued monitoring of medical, physical and psychological risk factors

Prescription and engagement in physical activity, movement and exercise sessions **must** be reviewed regularly, and include review of physical, medical and psychological risks, as well as progress with weight restoration or stabilisation. It may be appropriate to review physical observations prior to and post exercise sessions, depending on the clinical setting.

Consider use of physical markers, such as those identified through the NEWS2 score (Royal College of Physicians, 2017) – cardiovascular function, respiratory rate, temperature, pain, cognition and blood glucose; as well as changes in weight, emotional regulation and review of blood results, including CK levels and plasma blood glucose.

Regular review and collaboration with the MDT to consider the multifactorial risks of exercise prescription are essential to ensure appropriate monitoring, progression or regression of physical activity and exercise interventions as health status changes.

Additional outcome measures/monitoring symptoms can further support the review and monitoring of exercise engagement to ensure it remains safe and appropriate. These include measures such as the SEES intuitive movement checklist prompt (appendix iii), green/red flags (appendix iv), Borg Rate of Perceived Exertion scale, review of the Compulsive Exercise Test. These tools can further guide discussions and re-education on intuitive movement principles and safe and appropriate exercise engagement.

As with all exercise prescriptions, including the type of exercise, it is essential to consider the presence of other health conditions which may influence clinical decision making and risk management. For example, for individuals with diabetes/T1DE, advice and guidance can be sought from the patient's dietitian, medical team and diabetes team. For individuals with T1DE, and who use insulin as a way to control weight, and who are likely to run blood glucose levels high, this must be taken into account when reviewing physical observations and blood test results. If the individual is working on reducing the use of insulin as a weight control strategy, then they may switch to another coping strategy, such as exercise. Vigilance is therefore needed to ensure that new dysfunctional exercising behaviours do not emerge, and support is available accordingly.

Blood glucose levels can also be a useful marker for identifying individual's exercise levels, particularly undisclosed and secretive exercise. Reviewing blood glucose results prior to, and post sessions, when indicated, can ensure continued risk assessment for safe and appropriate engagement of exercise interventions.

Inclusion of body awareness and intuitive movement principles

Often an effective initial stage to reintroduction of exercise or challenging dysfunctional exercise is to work on body awareness. To support the individual to reduce any mind and body dissociation or disconnect, and to re-educate on aspects of interoception and interpretation of internal cues, to be able to support the individual to reconnect with the body when at rest, during and through movement.

Encourage the patient to then further develop self-monitoring skills, to develop greater interoceptive skills and ability to listen to physical and psychological cues pre, during and post exercise. These may include subjective monitoring of thoughts around exercise, acknowledging exercise urges and how these may link with eating disorder related beliefs and behaviours; or objective monitoring including tiredness, muscular pain or discomfort.

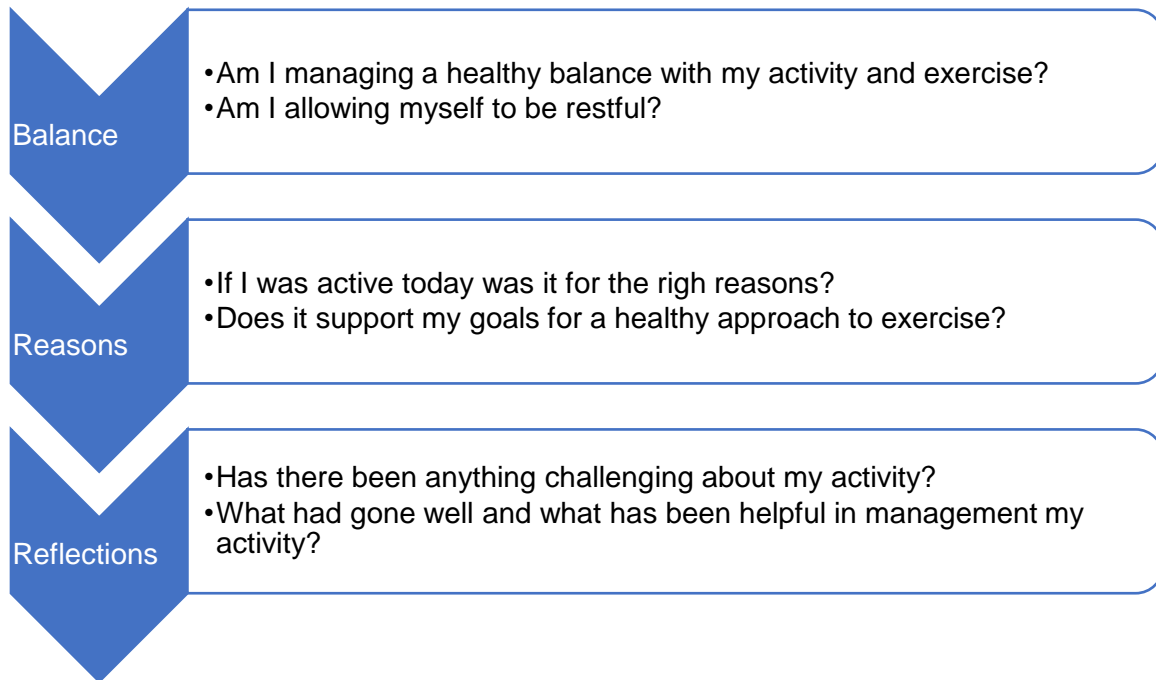
Support the individual to be able to understand when and why it would not be appropriate to exercise, such as when injured, undernourished or restricting fluids, vomiting, or when unwell.

Expert consensus is such that including intuitive movement principles and approaches throughout the reintroduction and inclusion of practical exercise opportunities, and working on these simultaneously as treatment progresses, leads to improved outcomes for challenging dysfunctional exercising behaviour and enhancing a healthy approach to exercise during treatment and longer term.

With kind permission of the authors, Dobinson *et al.*, (2019), appendices III and IV contains useful checklists and tools, developed for patients to use pre, during and post exercise. They consider the principles of intuitive movement and encourage the patient to listen to physical, psychological and behavioural cues.

It is important to guide a patient to consider the overall impact that their engagement in exercise may have, and how this supports or challenges their progress towards a healthier exercise relationship. Patients can be encouraged to complete self-directed reflective work that can review progress and guide next steps with exercise management.

Example of prompt questions that could support a patient to reflect on their exercise engagement



Delivering physiotherapy led groups

It is thought that delivering interventions in a group setting can have many therapeutic benefits:

- Patients often value peer support and sharing similar experiences can help them feel they are not alone
- Group sessions can lead to enhanced social interaction and support interpersonal understanding and relations
- Activity-based group sessions can improve patient's confidence with moving and exercising in front of others, as well as have potential to enhance engagement with physiotherapy
- Group sessions provide an opportunity for further understanding and exploration of the patient's presentation which can further guide and enhance treatment planning

Physiotherapists have skills and expertise in delivering treatment within a group setting. In the context of eating disorders these sessions may include psycho-educational sessions, practical exercise sessions, or a combination of both. For example:

- Educational groups – exploring, for example, exercise, bone health or postural health
- Body awareness and body image
- Relaxation and anxiety management
- Practical re-introduction of exercise engagement, e.g., Mindful movement, Pilates, Yoga
- Sports, leisure and recreational opportunities, e.g., nature walking group, badminton, team sports

Ahead of starting any physiotherapy led group it is important to set up rules and expectations of the group to ensure that it remains inclusive and supportive and does not facilitate or exacerbate comparisons or competitiveness.

Considerations for group format and delivery:

- Closed versus open group format. It can be helpful to identify the topic for planned educational sessions, or the content of practical exercise sessions, and then consider whether these will be more effective, and enhance patient engagement, if the group is closed (where the same cohort of individuals attend for the set number of sessions and do not join part way through the programme) or open (where attendance is on a more flexible basis and not set with a start and end point to the programme). Closed groups can often provide opportunity for patients to build better support relationships with their peers where they remain together for the duration of the sessions, or for groups where the exercise sessions have a structure of progressive exercise interventions. A closed format may also feel less disruptive than if the peer group is changing, particularly for sessions which deliver a set programme or carry-over of themes. For other groups, such as more active community sports related groups, open attendance can often work well to provide that social variability and flexible engagement.
- Prior to any movement or exercise-based group session individual physiotherapy assessment and/or screening is essential. This will ensure engagement in group sessions for the individual is safe and appropriate, depending on stage and progress with treatment, and where they are physically and medically appropriate to attend.
- Group session effectiveness can also be enhanced by additional 1:1 time outside of the group to support the individual to reflect on the group experience, discuss challenges and what went well, and identify any individual aspects for the patient to work on, or modifications needed. A patient may find it difficult to openly share challenges during a group setting, and therefore additional 1:1 time can be supportive of this.
- Group attendance can also be paused or stopped if the patient is not engaging and an open dialogue about this is extremely valuable in considering next steps or additional support needed.
- Physiotherapy led exercise groups can also be a helpful re-introduction to community-run exercise classes, providing a supportive graded exposure to group exercise sessions to then transition into sessions led by community exercise instructors with the general public. Part of physiotherapy group work can also include planning and preparation for attending the community-led exercise classes, including guidance on adaptations needed for individual exercise practice, communication with the class facilitator if required, type and style of sessions to attend and level of support needed.
- As with all physiotherapy led groups, the Physiotherapist, or staff member in a physiotherapy support role, must be trained appropriately and be competent to deliver the intended content of the session, within an eating disorder setting, and appropriate supervision processes be in place

Additional considerations for supporting safe return to activity

- Take a holistic approach to exercise re-introduction and management, where it is important to consider other aspects of an individual's eating disorder and any potential interplay with effectiveness of exercise sessions and the patient's experience. For example, it will be vital to provide consideration and support with practical body image concerns, such as in relation to clothing selection, mirrors within activity and exercise areas, swimming costumes and changing areas.

- As part of the weight restoration process, individuals may feel challenged as their weight and shape changes, particularly in relation to central weight distribution – it is therefore important to educate away from toning one specific area of the body, for example the stomach area/abdominal muscles, as twofold, this weight distribution is essential to the body for recovery, and also focuses on exercise for body shape, as opposed to wider health benefits.
- Exercise equipment, particularly gym equipment, often contains screens which can detail calorie expenditure or have recommended exercise routines. It is vital to discuss this with the patient, avoid and/or educate the patient on how to manage any potential triggers.
- Take into account psychological risk factors, including self-harm and ligature risk, when considering exercise equipment selection, particularly if the individual will be using this unsupervised.
- Use of terminology is important when exploring a healthy relationship with exercise, avoid trigger words or sharing own exercise beliefs.
- Consider exploring understanding of specific exercise styles – linking with potential stigma and expectations attached to specific exercise, for example “going to the gym is only for fit people” and consider expectations on clothing and exercise outfits, where some individuals can feel challenged by feeling they can only engage in exercise if they “look the part” or “have my own equipment”. This can increase expectations and pressure placed on these exercise opportunities, and it is important to reframe these.
- Consider the potential impact that challenging or stopping dysfunctional exercise can have on an individual’s sense of identity, as well as the challenges that arise if they are advised not to return to past exercise engagement. For example, “who would I be if I am not returning to running - I’m a runner” and the sense of loss that this individual may experience.
- As part of educational sessions, it is important to treat rest as something important in its own right, not just what happens in response to exercise engagement. Intentionally seeking restful and fulfilling activities, putting rest/ creative activities into activity plans, and not just exercise and physical activities, can be a valuable step towards a healthy balanced lifestyle.
- Ensure that myths around “motivational exercise” messages that are seen online or are seen in community exercise settings are explored e.g., “no pain, no gain”, “go hard or go home”, “push past exhaustion” as these may act as triggers in some cases.
- Whilst the focus during physiotherapy will be on safe return to exercise and activity, maintenance of appropriate nutrition and hydration to support an active lifestyle is very important and should be acknowledged. The key will be to not encourage a detailed focus on energy expenditure versus nutritional intake. An important health message is that exercise should not be a compensatory/debting behaviour to eating/food. This will help an individual to learn that they can maintain weight through a consistent approach to their meal plan and nutritional intake, whilst engaging in a varied and flexible approach to exercise and activity that includes rest days. This also guides the individual not to feel that they must reduce what they eat on days they are less active.

Involvement of family and carers

Depending on clinical setting, it can be extremely effective and collaborative to work with the individual’s family and/or carers if appropriate. This will be dependent on relationships and dynamics, as well as the individual’s willingness to openly discuss exercise as part of their family sessions. It will not be the responsibility of the family member, carer or friend to stop the individual from exercising, but they may be able to highlight risks or signpost for support. Family, carers and friends often know the individual the best and so can be a great support and guide when developing treatment strategies and plans. The level and type of support that family or carers can provide will be different for each individual and will be dependent on their openness and readiness

for change. Encouraging an opportunity to be open and honest with a listening and non-judgmental approach can be valuable, as well as understanding how and why exercise can link with an eating disorder and what the links might be for those they are caring for.

It may be possible to contribute to family/couples work with the Clinical Psychologist and discuss exercise management, or it may be appropriate to meet with the family or carers without the patient present if there are particularly concerns or need for advice and guidance. This may include compassionate discussions about exercise myths and facts, healthy versus unhealthy exercise approaches, own family exercise routines and behaviours, and any potential impact on the individual's exercise, as well as collaborative approaches to considering new family exercising routines, or strategies for the individual to manage the impact family exercise may have.

Written resources, and educational sessions, in relation to healthy approaches to exercise, appropriate levels of exercise, and understanding links between exercise and eating disorders can be hugely valuable for the family/carer. This can also bring huge value within a school or club setting and providing educational opportunities to, for example, PE teachers and coaches.

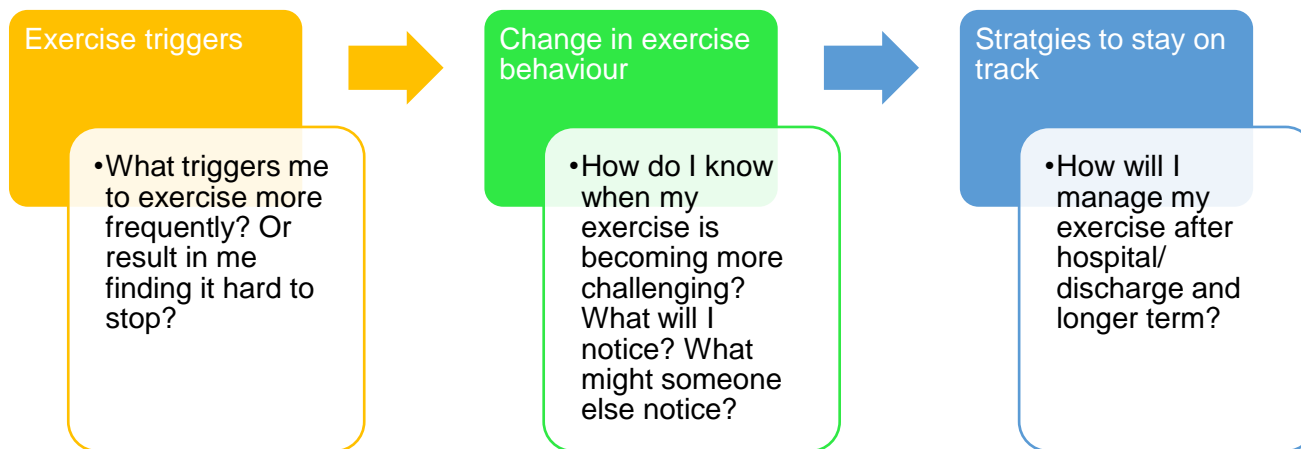
As well as supporting the individual, for example in identifying warning signs, or being aware of triggers for increased dysfunctional exercise, it is also important to guide the carer or family member on how to avoid colluding with the eating disorder behaviours.

Working with family members/carers can be hugely valuable in listening to their feedback and experience with how the individual engages in exercise at home, or within the community, and can be a valuable guide when developing a longer-term management plan for exercise.

Relapse prevention and wellness recovery planning

Addressing dysfunctional exercise as part of eating disorder treatment will support in reducing longer term relapse risk and chronicity of the illness. The outcome, and opportunity for longer term behavioural change, when working with the patient to develop a healthier relationship with exercise as part of treatment will be enhanced by the inclusion of relapse prevention work. Consideration of longer-term management of exercise is also likely to increase a patient's confidence in being able to integrate back into a balanced lifestyle, of which exercise and activity can for a part. This will include knowing how to continue to balance activity and rest alongside the transition to further life activities when returning to work, school or college, and when reintroducing wider leisure and recreational opportunities.

As part of a patient's relapse prevention, or crisis management, plan, the exercise component could include information as follows:



Encouraging the patient to discuss this plan with their family, carers and/or community team, where appropriate, will further enhance the effectiveness of plan and the support that the patient receives.

Treatment approaches in inpatient and community settings, and service transition.

Application of the information and guidance within this section will also be dependent on the clinical setting, e.g., inpatient or community, as well as the level of support the patient is receiving. Within an inpatient setting there is likely greater opportunity for more frequent supervision and support in relation to exercise, risk management and exercise application, due to the acuteness of the individual's illness. It can sometimes be difficult for the individual to then transition to a community setting where there may be less frequent supervision and monitoring, and where the individual needs to work on taking greater responsibility and independent monitoring of their exercise.

Services in any healthcare setting should work together to ensure that transitions between services are achieved as smoothly as possible. Some service level transitions that can happen in a patient's treatment journey include; transition from child and adolescent to adult services, from adult to older adult services, from inpatient to day or outpatient treatment and vice versa, ending of treatment and discharge back to GP care or a change of locality due to employment changes or a move to start University and new service referral being made. Other transitions that can happen are; a change of therapist or modality or a move to another service for another associated co-morbidity e.g., referral to substance misuse service

Transitions can be difficult for anyone but for those with an eating disorder there can be increased challenges in terms of the impact on their illness. Individuals can often struggle to make more flexible decisions, in particular due to the rigidity of the illness and so it can be especially hard for them to find ways to adapt to change. As a result, they may use their illness as a way to provide certainty and security during times of change or challenge. Transitions are inevitable and can even sometimes be of value, but this patient group can be vulnerable to change and can sometimes mean that they have increased anxiety and increased eating disorder symptoms, restriction, more reliance on coping strategies such as dysfunctional exercise, and resultant weight loss. It is really important that there is prompt and robust care planning that is tailored to an individual's needs, in preparation for, and during, the transition process

NHS Quality Improvement Scotland. Eating disorders in Scotland: recommendations for management and treatment. Edinburgh: NHS Quality Improvement Scotland; 2006. Available at:

https://www.healthcareimprovementscotland.org/previous_resources/best_practice_statement/eating_disorders_in_scotland.aspx

Transition from inpatient care to discharge

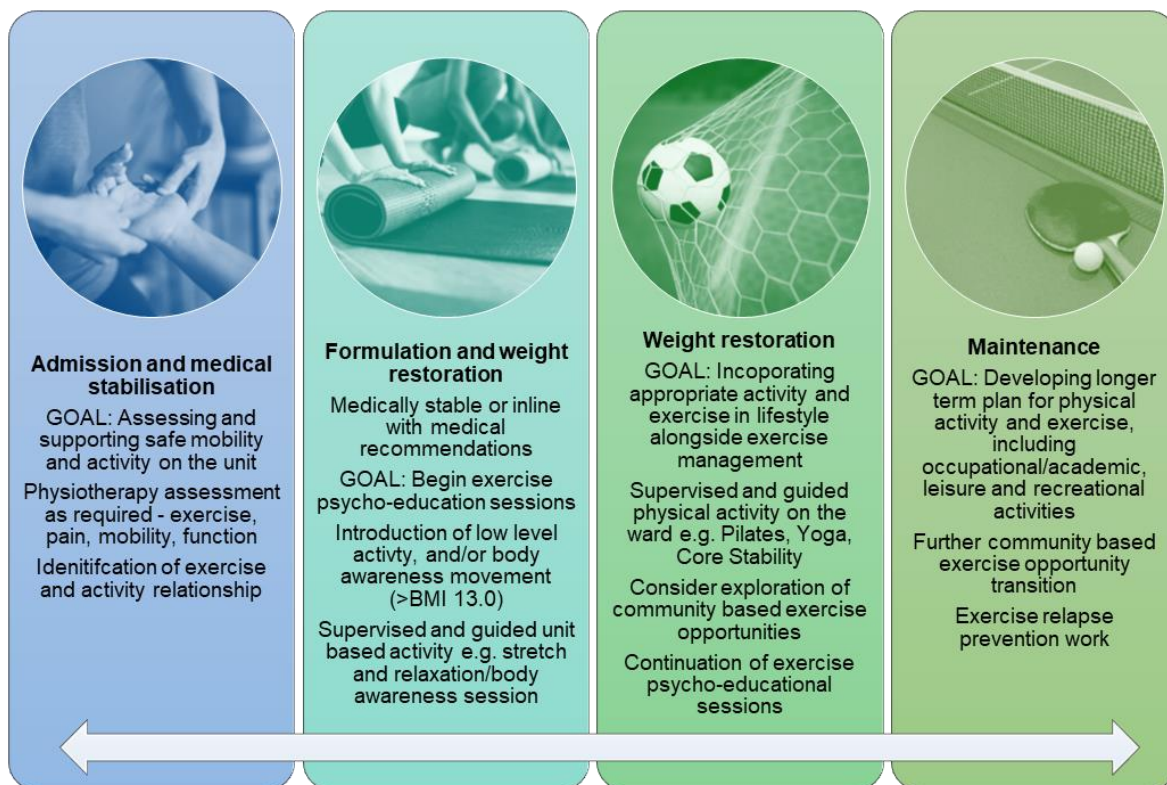
As part of inpatient treatment there may be the opportunity for patients to have periods of home leave, for a gradual reintegration into home life and activities of daily living, whilst working towards discharge. Home leave may also provide opportunities to engage in community-based exercise opportunities, whether this be with friends or family, or trialing attendance at a community exercise group. This can be a very valuable stage of physiotherapy treatment in setting up successful exercise management longer term and opportunity for the individual to identify if they can successfully manage their activity and exercise relationship whilst at home. These opportunities provide exposure to community activity and exercise, with time to reflect, identify triggers or aspects that went well, and further build on strategies as part of relapse prevention planning. It will be important to support the individual to find a safe and appropriate balance of activity that results from daily life such as school, college or work, as well as gradually building in leisure, recreational and/or structured exercise activities. Individuals may find it difficult to acknowledge incidental activity levels and so it is vital to be discussing accumulative activity, the importance of rest, recovery, and balancing with more restful activities, all to enhance a healthy approach to exercise. Providing these opportunities will support the individual to work on the transition from an in-patient to a community setting, and to take greater ownership and responsibility for managing their exercise and activity. Day service attendance may also be available, depending on service structure, which again provides valuable opportunity to support patients whilst transitioning from an inpatient setting, and preparing for independence.

Exercise opportunities, engagement and experience can all contribute to exercise management approaches on leave, but also in developing a longer-term management plan for exercise post discharge. Physiotherapy involvement alongside the MDT is vital to ensure exercise management is included as part of relapse prevention and recovery plans. Where indicated, onward referral to a Physiotherapist based within the community eating disorder service is ideal to support with transition work and fully embedding and reviewing physical activity and exercise engagement following discharge, and for the plan to be progressed as the individual becomes more settled into home life, or for enhanced support if the transition to the community and daily life has resulted in exercise becoming more challenging again. That ongoing support can provide greater opportunity for longer term maintenance and or/recovery with a healthy balanced approach to exercise. It can often be helpful for the patient to share their exercise management plan with their community team and family, alongside working towards self-management. Where a Physiotherapist is not present in the community team, this poses risks of reduced support for exercise management and physical health co-morbidities associated with their eating disorder.

Community based treatment

Physiotherapists are also best placed to be able to provide thorough assessment and treatment planning for individuals whose treatment is community based. This may again be in the form of 1:1 physiotherapy input, as part of group exercise or psycho-education sessions, or a combination of both. Physiotherapy input can be extremely valuable in supporting the individual to challenge dysfunctional exercising behaviour. Support can guide on a reduction in activity and exercise engagement, where indicated, and a safe reintroduction of exercise and activity, whilst acknowledging and balancing incidental activity levels, and identifying lifestyle factors which may be influencing an individual's relationship with exercise. These include, for example, activities that result from aspects of school, clubs or work, and plan to build a healthier relationship with exercise within their own environment. Further considerations include the potential scope to provide education and support to family, carers and teachers, as well as increase collaborative working with community exercise providers. Individuals may also be under the care of Physiotherapists in other disciplines such as pelvic health and musculoskeletal outpatient services, highlighting the importance of good communication between clinicians and sharing expertise to ensure appropriate overall management in relation to eating disorders.

An example of a physiotherapy pathway in an inpatient setting



An example of a physiotherapy pathway in community settings



The following provides an example of how physiotherapy treatment can progress as part of someone's eating disorder recovery journey. It can often be extremely beneficial to define the aims and stages of returning to

exercise, particularly for individuals whose aim is to return to sport. This helps to ensure clarity about expectations of re-introducing exercise, the stage at which the individual is at, and support a realistic progression of treatment where individuals may have a tendency to want to progress quicker than is appropriate.

Clinical Rehabilitation Phase

- **Initial:** EXAMPLE: longer walks possibly with a family member
- **Physical activity build up:** EXAMPLE: add in one of the following - visit to the gym or exercise class, core strengthening on the ward (clearly defined repetitions and exercises and supervised), alternative physical activities (e.g swimming, badminton), may vary activities from week to week.
- **Other activities:** incidental activity, leisure and recreational activities
- **Monitoring:** specified length of time and use HR combined with rate of perceived exertion scale as appropriate. The aim is to learn how to regulate activity using your own interoceptive feedback not external targets.
- **Supervision:** By a physiotherapist or delegated to another member of staff following a clearly documented plan including how to monitor, length of time etc and discussed and closely monitored by physio. This is to manage the risk of exercise becoming dysfunctional again, causing physical recovery to plateau or decline, and to maximise the chances of successfully supporting you to return to a healthy relationship with exercise.
- **Progression determined by:** continuing on an agreed trajectory of weight restoration, able to manage appropriate diet in consultation with dietitian, reduced/ no engagement in dysfunctional exercise behaviours, reflective work about dysfunctional thought patterns during physical activities and engagement in challenging these.

Period of stability in the community

- Once in a healthy BMI range this will need to be maintained for a length of time before more intense training is contemplated if undertaken in a sustainable way.
- EXAMPLE "If running is something you would like to re-engage in, a realistic aim for this point in your recovery would be something like the following:
- EXAMPLE: Park run once a week, pilates or similar strengthening activity, one other social run possibly with a friend/ relative etc. Alternatively a running club may be something to consider.
- **Monitoring:** Rate of perceived exertion, physical health monitoring, stable weight, using tools for monitoring healthy versus dysfunctional thoughts and beliefs, considering the opinions of others and allowing them to support.
- **This stage is about experience rather than performance"**

Return to sport/ training at a competitive level

- If the exercise is to be undertaken in a sustainable way (ie training) with healthy approaches, this should be done only after a period of stability in the community as above. This will provide opportunity to build the skills to monitor exercise relationship prior to working on performance. Guide on recommendation to find a coach with experience in eating disorders and/or specialist support from dietitian, physiotherapist etc who specialise in working with athletes recovering from eating disorders.

Relative Energy Deficiency in Sport (REDs)

REDs (previously named RED-S) is a reported syndrome encompassing disordered eating, amenorrhea/oligomenorrhea (in females) and decreased bone mineral density. It results from low energy availability in relation to the energy demand expended by the athlete, from a combination of training demand and activities of daily living. The resultant low energy availability can be either intentional or unintentional, but in either case energy availability is too low to support biological functioning.

REDs has been developed from the previously known 'Female Athlete Triad', and due to the non-menstrual components also being observed in males the name was changed to REDs. "REDs was introduced in 2014 by the International Olympic Committee's expert writing panel, identifying a syndrome of deleterious health and performance outcomes experienced by female and male athletes exposed to low energy availability (LEA; inadequate energy intake in relation to exercise energy expenditure)" (cited in Mountjoy *et al.*, 2023).

Athletes with REDs are often influenced by the perception that thinness and leanness can enhance athlete performance. However, this is not the case and can lead to long-term complications. The components of REDs are known to influence physiological functioning, including metabolic rate, bone health, protein synthesis and cardiac health, and subsequent detrimental effect on health and athletic performance (Mountjoy *et al.*, 2015).

In 2023, Mountjoy *et al.*, published the International Olympic Committee's (IOC) consensus statement on Relative Energy Deficiency in Sport (REDs) which includes a health and performance conceptual models, as well as a newly developed physiological model that demonstrates the complexity of either problematic or adaptable low energy availability exposure and resultant impact on health and performance. The consensus also presents prevention and treatment principles of REDs to encourage best practices for sports organisations and clinicians.

The interplay of REDs, eating disorders, disordered eating and/or exercise compulsion can be complex and therefore further reading is encouraged for Physiotherapists who may be working with individuals within sport. Physiotherapy input may also vary across sporting settings as well as between sporting styles.

Safe Exercise at Every Stage: Athlete (2020) provides a guideline for managing exercise and return to sports in athletes with eating disorders. www.safeexerciseateverystage.com

Other useful resource links include www.RED-S.com and <https://health4performance.basem.co.uk>. The Association of Chartered Physiotherapists in Sports & Exercise Medicine (SEM) provide opportunities to develop knowledge and skills, and provide a network of Sports Physiotherapists to promote experiential learning opportunities <https://www.physiosinsport.org/>

Some competitive sports lead individuals to manage their weight through extreme dieting and training behaviours (for example, use of diuretics, laxatives, dietary restriction and excessive exercise). These behaviours may increase around competition times, which can sometimes have serious implications to physical and mental health, including disordered eating, negative body image experience, and can increase the risk of developing eating disorders.

Despite being of a healthy weight, individuals may engage in extreme behaviours to achieve an expected or ideal weight target. This includes sports where individuals have to achieve a precise weight to compete in certain categories, such as boxing, weightlifting and martial arts. In striving for an ideal body weight and/or

increased muscle bulk and definition, individuals may experience symptoms of REDs when preparing for competition, by significantly reducing body fat levels, despite having a relatively high body weight.

Murray *et al.*, (2018) presented a case study of a male who was experiencing muscularity orientated disordered eating, and whilst not of low body weight, had low levels of fat tissue, and symptoms of bradycardia.

In other areas such as ballet and gymnastics, the focus is often on aesthetic performance, and an increased focus on a lean and lighter physique to fit with the aesthetic appearance commonly associated with these activities, and perceived improvements in performance. Increased focus may therefore be placed on body weight and shape, and increased risks of developing disordered eating, and/or diagnosed eating disorders, and associated health consequences because of striving for these body ideals, such as osteoporosis.

Exercise scenario:

Dan is a 22-year-old and cycles for a local club and is in the competitive road race team. He trains with the club 2 nights a week and will often go for a long ride on a weekend. Dan feels the pressure to stay at a low weight and be as lean as possible because this results in a favourable power to weight ratio that means he can cycle up hills faster. Dan often feels self-conscious about his appearance, he struggles to sleep and feels low in energy and depleted. Dan believes that a low body weight will improve his racing performance. Lots of the other cyclists in the club talk about diet, food intake and their weight, which makes Dan feel like he is not professional or committed enough if he eats what he should.

Cyclists are particularly at risk of REDs +/- disordered eating due to the pressures of having a low body weight which gives you a higher power to weight ratio, this enables cyclists to be less affected by gravity when cycling up hills and therefore have a higher performance in races. The effects of low energy availability (LEA) cause a disruption of hormones, this has an impact on bone health. As cycling is a low weight bearing activity, sport cyclists are already at higher risk of poor bone health, this combined with LEA increases the risk of fractures if they fall. Chris Boardman (highly decorated Olympian) retired from professional cycling due to receiving a diagnosis of osteoporosis.

Further reading:

[Eating Disorders and Disordered Eating in Competitive Cycling: A Scoping Review - PMC \(nih.gov\)](https://www.ncbi.nlm.nih.gov/pmc/articles/pmc9774887)

Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/pmc9774887> Eating Disorders and Disordered Eating in Competitive Cycling: A Scoping Review - PMC (nih.gov)

6b. Exercise, activity & osteoporosis with an eating disorder

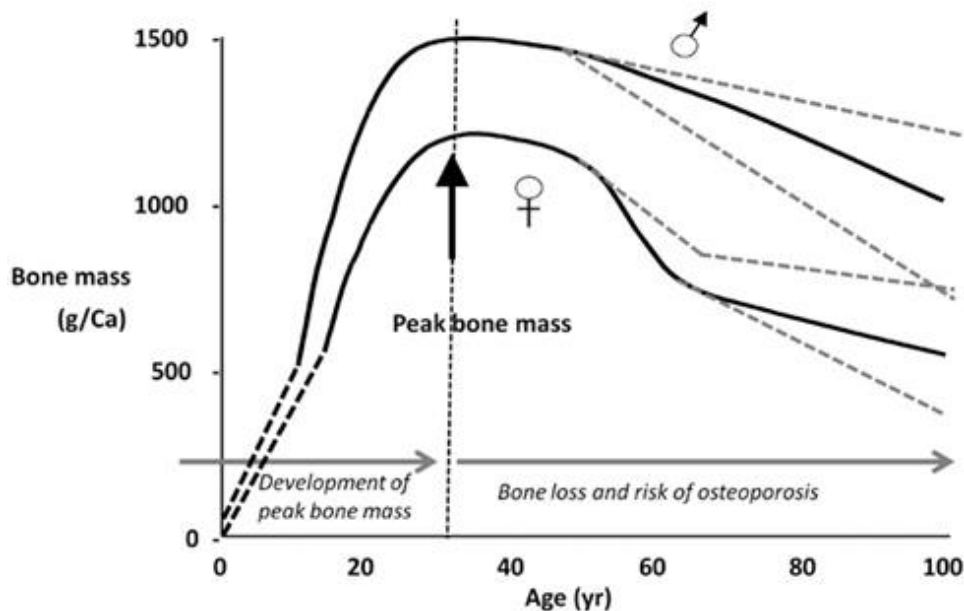
Osteoporosis is a condition of low bone mineral density (BMD), deterioration of the inner structure of the bones and reduced bone strength. This leads to an increased fracture risk. These type of fractures are known as fragility fractures or low impact fractures, and occur commonly in the spine, wrists and hips. Stress fractures in the feet also commonly occur in those with eating disorders (Steinman *et al.*, 2019).

Unfortunately, fractures in the spine, referred to as: compression, crush, biconcave or wedge fractures, cause permanent changes, such as a loss of height and spinal curvature which can consequently lead to persistent pain and disability. Preventing these changes becomes really important for long term health.

There are many factors that are thought to contribute to the lowering of bone mineral density for individuals with eating disorders, and include:

- Unhealthy body weight
- Reduced oestrogen levels and amenorrhea in females, and reduced testosterone in males
- Hormonal disturbances such as altered cortisol levels, low IGF-1 and low leptin
- Loss of muscle mass for bone loading and low body weight to load weight bearing
- Prolonged malnutrition with reduced calcium and vitamin D intake.

Bone health across the lifespan



(Harvey *et al.*, 2014)

Throughout childhood, adolescence and young adulthood, bones increase in density and strength until around the age of 30 when we reach what is known as 'Peak Bone Mass' (PBM). In women, bone turnover stays fairly stable until the age of 35 after which a little bone loss begins to occur until menopause is reached. After menopause it declines steeply for 5-7 years. Men, however, reach a higher peak bone mass than women and their bone loss declines more steadily after the age of 50 years, meaning that they are less likely to suffer with

osteoporosis than women. Bone loss; where the inner structure within bones begins to thin and break down, continues with advancing older age which is why osteoporosis and broken bones are more common in old age. Bone becomes less flexible and more brittle as we age.

The onset of Anorexia Nervosa in adolescence or young adulthood interrupts the building of bone density and strength. The outer cortex of the bone thins and becomes less dense and the inner trabecular density lowers. Peak bone mass ends up being lower than expected especially when there has been significant weight loss and amenorrhea over a long duration, during these important years. Many young females and males with Anorexia Nervosa and to a lesser extent Bulimia Nervosa develop bone density significantly lower than expected for their age, considerably increasing their risk of fractures from minor impact and leaving them more vulnerable to fractures with advancing age.

The best treatment for improving bone health in an individual with an eating disorder is weight restoration, good nutrition and for females, restarting regular menstruation. The younger the individual is and with less delay in weight restoration results in the best outcome for long term physical health. Being under the age of 30 provides the best chance of restoring some of the bone losses and rebuilding bone strength and density, though improvements can be made at all stages of life.

A DEXA bone scan is used for diagnosis of osteoporosis, osteopenia or 'low bone mineral density for age, gender and ethnicity'. It measures quantity rather than quality of bone. Low bone mineral density is considered a risk factor for fractures but is not a perfect measure of bone strength. Fracture risk is multifactorial and is associated with age, sex, and age at time of diagnosis. Including fracture risk assessment (FRAX) provides a more complete picture of an individual's bone health and risk of fracture in the next 10 years.

frax.shef.ac.uk/FRAX/tool.aspx?country=9

Bone scan results (Z-scores and T-scores) including bone strength and fracture risk can be discussed with patients. The T-score compares an individual's bone mineral density (BMD) with the optimal BMD of a 30-year-old adult of the same sex. The Z-score compares an individual's BMD with that of someone the same age, gender and ethnicity. If the Z-score is below -2, then BMD is lower than it should be for that age. Z-score is used in children, teens and adult women up to menopause and younger men. It is more appropriate to use the Z-score instead of the T-score in younger eating disorder patients under the age of 30 as they have not yet reached peak bone mass (t-score). Comments such as "low BMD for age, gender and ethnicity" may be seen on the bone scan reports in reference to Z-scores.

Physiotherapists have a vital role in educating individuals about the risks associated with eating disorders and bone health, and subsequent longer-term consequences and impact on future activity, physical health and exercise, if action is not taken to restore overall health.

The information within the section is best used in conjunction with **The Royal Osteoporosis Society (ROS): Exercise and physical activity for osteoporosis and bone health**. This provides comprehensive information and resources, developed by leading clinical experts, with fact sheets and videos to accompany the information (Royal Osteoporosis Society, 2019 a,b,c,d,e,). These resources adopt the following principles of exercise prescription for bone health:

Strong

- Details type and amounts of exercise and activities to promote bone strength. These include weight-bearing/impact exercises and muscle strengthening exercises

Steady

- Details exercises and information to improve balance and reduce falls, especially for the less steady and over 65s

Straight

- Details exercises to strengthen the back muscles, manage pain from vertebral fractures, postural exercises and a positive approach to bending, moving and lifting

For individuals with Anorexia Nervosa and dysfunctional exercise behaviour, it is vital to have an individualised exercise programme drawn up by healthcare professionals involved in their care. This is because excessive amounts of exercise and activity associated with the eating disorder could potentially add to bone strength problems and delay recovery from the eating disorder.

Advice on the amount and type of exercise and activity therefore needs careful consideration so that it does not interfere with weight restoration or, in females, the restoration of menstruation. As outlined in other sections of this guidance document, exercise may in fact be harmful if it results in plateau or further weight loss, placing bone health at further risk. An appropriate bone building programme will therefore depend upon the individual's ability to reach and maintain a healthy weight.

The most up to date evidence and expert consensus The Royal Osteoporosis Society, (2019b) suggests that for those with osteoporosis at healthy weight, physical activity and exercise are not significantly associated with severe harm, including spinal fragility fractures, and in general the benefits of physical activity and exercise outweigh the potential risks. Exercise has an important role in promoting bone strength, reducing falls risk and managing symptoms and when safely and appropriately prescribed can be an important part of treatment. Individuals with osteoporosis should be encouraged to do more than less, focusing on 'how to' rather than 'don't do'. However, the expert group recommends more caution for people with a history of, or existing, vertebral fractures or multiple low trauma fractures, who will have greater general bone fragility and a higher risk of further fracture.

Prescription of exercise and activity:

The amount of exercise and activity an individual engages in should be prescribed in conjunction with a positive progression towards reaching a healthy weight and restoring menstruation (if female) and subsequently maintaining a healthy weight. The evidence demonstrates that longer illness duration and amenorrhoea are associated with lower bone mineral density in Anorexia Nervosa. Given that those with Anorexia Nervosa can have consistently reduced bone mineral density across all skeletal sites, significantly increased chance of osteoporosis and a 1.8-fold increase in fractures compared with healthy controls (Solmi *et al.*, 2016) it would suggest therefore that the dysfunctional and excessive exercise undertaken in many with AN is not protective to bone health and indeed more likely to be harmful.

A Meta-analysis by Solmi *et al.*, (2016) has shown that for Bulimia Nervosa, there were no significant differences in bone mineral density versus healthy controls, except a trend level significance for reduced lumbar spine bone mineral density. This might further demonstrate the significance of amenorrhoea in lowering bone mineral density (as those with Bulimia Nervosa do not necessarily experience amenorrhoea) and support the exercise prescription in this document. It is also important to understand the different implications for bone health between an individual with a diagnosis of Anorexia Nervosa, from that of a healthy individual, in that the underlying cause of the secondary osteoporosis remains if weight remains unhealthy and the bones remain subject to further deterioration. This leads to the possibility of fractures or further fractures, if already having fractures. The age of the person with Anorexia Nervosa, the severity and length of the illness and notably amenorrhea are all important factors in gaging the individual levels of caution.

Soeby *et al.*, (2023) suggest that the fracture risk is markedly lower in those diagnosed at a young age, namely 6-14 years (HR [hazard ratio] 1.1) and 15-24 years (HR 1.29), rising and almost doubling at 25-34 years (HR 2.01) and again 35-44 years (HR 2.56) and above the age of 45 (HR 2.8) in their study fracture risk with patients over a 40-year period. A period of disturbed eating and weight loss may precede diagnosis and a time lag between clinical onset and diagnosis might partly explain the increasing fracture risk with increasing age at diagnosis. Earlier detection and intervention in more recent years might translate to a lower fracture risk. They also noted that in the studies of bone strength and BMD in AN, which show that cortical and trabecular bone are affected, might plausibly be the physiological reason that the risk of major osteoporotic fractures is higher than controls.

Haines *et al.*, (2023) reminds us that in women with atypical AN, bone formation is lower and bone resorption is higher than controls, resulting in mean loss of BMD. In adolescent girls, reduced bone turnover often results in failure to reach peak bone mass and is associated with both lower bone formation and resorption in controls. Women with atypical AN who resume menses result in an annual mean increase of 3.1% BMD in the spine, whereas those who do not recover normal menstrual function, even if their weight has restored, have an annual mean decline in the spine of 2.4%. Again, highlighting the importance of menstruation rather than BMI. Much less is understood about endocrine complications in men with AN, other than the fracture risk is increased after age 40 years.

In addition, current opinion suggests that one of the main factors for improving BMD is the restoration of optimal body fat to support hormone function.

Individuals can be encouraged to maintain normal functional movements and day to day physical activity and leisure activities, in order to maintain strength and flexibility. Education is important to ensure individuals are guided by pain and comfort levels and use good moving and handling techniques, including for everyday tasks such as housework and shopping.

Physiotherapists have a key role to play in the educational component of bone health management. It is important to provide education to support a patient's understanding of their bone health risk factors, diagnosis, and management. In addition, recommendations for safe and effective exercise need to be provided alongside any orthopaedic management plan for individuals who have sustained acute fractures or, where indicated, the longer-term management of any functional or musculoskeletal effects of osteoporotic fractures.

Some individuals with low bone density never sustain a fracture (Royal Osteoporosis Society, 2019c) however, for those individuals with spinal fragility fractures or multiple low trauma fractures, irrespective of bone scan results, it is essential that they be guided with safe exercise and activity prescription.

The following section provides recommendations for effective and safe exercise for bone health.

Strong

Both impact (weight bearing) and muscle strengthening (progressive resistance) exercise stimulate bones and promote bone strength.

a. Weight bearing/impact exercise

Variety in exercise with different movements, directions, and speeds, is more effective in bone stimulation and growth than long durations of repetitive exercise.

Bone and fracture status	Recommendation level of weight bearing
Diagnosis of Osteoporosis + Spinal fractures or stress fractures of the feet	Low impact exercise and activity
Diagnosis of Osteoporosis without fragility fractures	Moderate impact exercise and activity
Diagnosis of Osteoporosis + History of spinal fractures or multiple low trauma fractures – now healed and pain free + Healthy weight + Regular menstruation (females)	Moderate impact exercise and activity

Impact exercise levels

Lower impact activity or exercise is a broad term that includes activity in which there is a small amount of impact through the bones, such as walking, side steps, and gentle heel drops. Usually, at least one foot remains on the ground.

Moderate impact activity or exercise is when a moderate force is created by pushing off and returning to the ground, usually both feet leave the ground but with less height and force than high impact activity. Examples: running, jogging, stride jumps, jump rope, highland dancing, jumps and hops. Some exercise, such as stamping, and heel drops with sufficient force can create moderate impact even though one foot remains on the ground. Sports such as racquet sports, track events, most ball games and martial arts. **NOTE: moderate impact exercise and activities may be suitable for some individuals but will be dependent on the number and type of fragility fractures, pain, fitness, previous exercise experience and health status.**

High impact activity and exercise is when a large force is created on returning to the ground, usually from a greater height (e.g. from a higher jump or from a higher jump to lower level). This includes landings from exertional jumps such as high vertical jumps, star jumps, tuck jumps and drop landing. Sports such as volleyball, basketball, and gymnastics may include high-impact activity.

Swimming, cycling and water aerobics have many health benefits, but are not weight-bearing exercises. If they sufficiently strengthening muscles at target sites, then they may promote bone strength.

b. Muscle strengthening/progressive resistance exercises

Exercises should target the most vulnerable sites affected by osteoporosis (spine, hip and wrists), and progress in the intensity of resistance.

When strengthening using weight, resistance bands, and gym equipment, provide specialist advice on safe technique and gradual progression of intensity, tailoring to individual fitness and ability.

Back strengthening exercises, including those in a prone position, are recommended as part of an exercise programme, to support improved bone density and an upright posture.

Strengthening core muscles to improve spinal stability and support of the spine and everyday activities will have a positive influence on posture and balance. Pelvic floor strengthening exercises can help improve stress incontinence.

Steady

Include balance exercises if balance is compromised and/or for individuals over 65 years as part of falls prevention and management.

Straight

Strengthening the back muscles has been shown to increase bone mineral density in the spine, and to reduce the risk of vertebral fractures. However, there is no clear evidence as to whether exercise can promote bone strengthen in those who are not menstruating or not fully weight restored. However, back strengthening exercises can help towards maintaining, or regaining, a healthy posture.

Posture exercises are also important to maintain joint range and soft tissue flexibility and promote good neutral upright posture, which can reduce risk of developing an increased kyphotic spinal curve and vertebral fractures.

These exercises include upper back extension, shoulder girdle retraction and depression, cervical spine retraction and stretches of the pectoral and hip flexor muscles.

EXERCISE AND PHYSICAL ACTIVITY PRESCRIPTION PRE-CAUTIONS:

Forward flexion exercises place the spine in the kyphotic posture, compressing the front of the spine which might increase the risk of wedge fractures. These general recommendations are to support exercise prescription with caution:

With a diagnosis of Osteoporosis:

- Modify or find alternatives to exercises that involve sustained, repeated or end range, excessive forward flexion.
- Modify or avoid any exercise that causes the back to bend excessively into a c-shape, particularly with added load.

But individuals who are experienced/have very good core muscle strength and control/demonstrate flexibility in the spine and manage the movements comfortably and smoothly can continue as long as they are fit enough to manage them with ease.

Bone health and fracture status	Exercise and activity pre-cautions
<p>(1) Diagnosis of Osteoporosis, low BMD or unknown bone health status and History of spinal fragility fractures or multiple low trauma fractures and Unhealthy weight range and Amenorrhea/Dysmenorrhea (female)</p>	<p>Further to the information above:</p> <ul style="list-style-type: none"> • Avoid flexion exercises in standing, such as touching the toes/Pilates roll-down, because it is loaded by gravity and weight of the arms. • Avoid sit ups, abdominal crunches, and oblique crunch/sit up, 'abdominal and oblique prep' and exercises in this flexed spinal position that are excessive, repeated or sustained and loaded with force or weight. • Avoid exercises that flex the spine excessively in the Pilates C-curve especially with added load such as 'teaser' 'rollup'. • During Yoga and Pilates exercise modifications can be made to achieve the same goal whilst reducing the risk, such as the 'Cat', 'hip hinge' or 'one leg stretch' with the head on the mat. • Avoid rolling into a ball and rolling around on the spine in a fully flexed position. • Be gentle with articulation into a high shoulder bridge.
<p>(2) Diagnosis of osteoporosis without fragility fractures and Unhealthy weight range and Amenorrhea/Dysmenorrhea (female)</p>	<p>Further to the information in (1), a thorough assessment and individual plan is indicated.</p> <p>Remaining at an unhealthy weight, with amenorrhea/dysmenorrhea is likely to be further reducing bone health and increasing fracture risk. Also, it is more likely that patients may not have adequate muscle strength or control or be fit enough to manage the exercises with ease.</p>
<p>(3) Diagnosis of osteoporosis without fragility fractures (or past fractures that have now healed and are pain free) and Healthy weight and Regular menstruation (female)</p>	<p>Further to information in (1) and (2), caution is appropriate to individual circumstances such as age, chronicity of their eating disorder, DXA and FRAX scores.</p> <p>At this point bone health may be improving with reversal of bone loss. A bone building programme may be advised. Caution <i>'to be on the safe side'</i> needs to be appropriate to individual circumstances. Individuals who are experienced/have very good core muscle strength and control/demonstrate flexibility in the spine and manage the movements comfortably and smoothly, can continue as long as they are fit enough to manage them with ease.</p> <p>Balance risks versus benefits. Use exercise appropriately to promote bone strength.</p>
<p>(4) As part of recovery from an eating disorder, improvements in bone health may be seen at a healthy weight range, and with healthy hormonal balance. At this stage – if an individual is no longer in the osteoporotic range, is healthy, and has fully healed from any fractures sustained – then caution may no longer be necessary.</p>	

Consideration of leisure and recreational activities:

Some sports and leisure activities involve an inherent risk of injurious impact, falling and fracture, such as contact sports, horse riding and skiing. However, for those who practice these activities regularly, the benefits, including enjoyment and benefits to muscle and bone strength are likely to outweigh the risks, **unless at an unhealthy weight and a history of multiple fragility fractures or painful spinal fractures**. Consider benefits versus risks.

Pilates exercises are often recommended. The strength training and weight bearing aspects of Pilates are thought to promote bone strength. Classes incorporate a wide range of exercises which can be carefully considered and modified for people with osteoporosis. Pilates exercises also focus on alignment, posture, balance, flexibility, breathing, mindful movement and retraining the core stabilisers, to support the spine during everyday activities. The energy expenditure with Pilates exercises is relatively low, whilst still producing the desired outcome. This type of exercise is therefore more appropriate and favourable for someone recovering from an eating disorder.

When patients are engaging in strengthening exercise programmes, such as those within a **gym environment**, particular attention needs to be given to teaching correct posture and technique to ensure that exercises are effective but minimise risk.

As part of weight restoration, the amount of exercise that an individual can safely be able to engage in will increase. It is important to work with the patient to identify an appropriate type and amount of exercise that provides benefits to bone health but does not prevent the individual reaching a healthy weight or maintaining a healthy balance between activity and nutritional intake.

Patients may wish to attend community-based exercise classes, such as Yoga or Pilates, and therefore providing them with the information and guidance within this section can support them to make an informed decision about the exercises that they engage in, and what adaptations need to be made to ensure their Pilates exercises remain safe and effective (Royal Osteoporosis Society, 2019d).

Encourage exercise and activities that are fun, social and enjoyable. Aim to avoid solitary, rigid or repetitive exercise as these may exacerbate dysfunctional exercising behaviour as part of the eating disorder. Engaging in exercise groups or exercising with others, i.e., time limited sessions and social sessions, will therefore be supportive in guiding the patient through healthier exercising behaviours whilst supporting bone health management. Discourage the use of fitness trackers and exercise apps, wearables and machine-based computers that focus on stats to encourage increasing exercise parameters. Advise against the use of social media and internet sites related to exercise (except reliable information related to bone health) and encourage a personalised programme that is safe and effective for the individual.

Remember that restoration of weight, menstruation and a balanced diet are the most effective treatments for restoring some bone mass lost during amenorrhoea, improving bone strength or preventing further bone loss. Discussing this with individuals is a vital component of a holistic treatment programme, with the aims of returning to a healthy active lifestyle and getting back to activities or sports longer term.

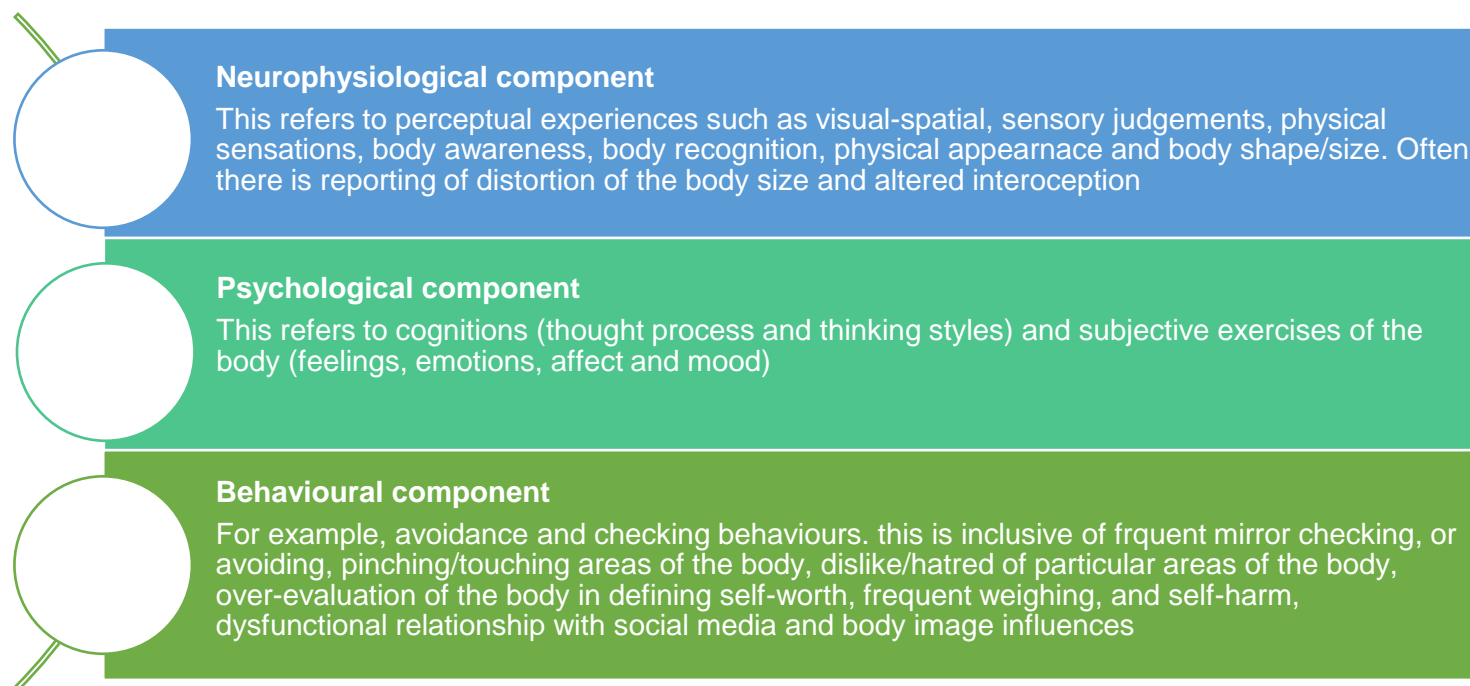
Pharmacological treatments, where appropriate, are part of the broader picture in promoting bone strength.

6c. Body Image and Body Awareness

Body Image (Body Experience)

Body image (body experience) is a multidimensional, subjective, and dynamic concept that encompasses a person's perceptions, thoughts and feelings about their body. As a result, this may also be defined as body experience, rather than body image, as it relates to more than just an image that one sees.

Multi-dimensional components of body experience:



Body image is not solely limited to the aesthetic characteristics of an individual, it also takes into consideration health, skills, ethnicity, gender and sexuality. Societal and cultural influences can also play a powerful role in the development and persistence of a negative body image. Within the Western world there is a strong value based on physical appearance with a strong emphasis on ideal weight and shape. Social ideals of beauty are conceptualised through a variety of sociocultural channels, with media being the most powerful transmitter of these ideals.

These can impact on how an individual evaluates their own physical appearance and can change thoughts regarding acceptance of their own body in comparison to the prevailing social norms of physical beauty and appearance. Consideration of the underlying role played by the body shape an individual aspires to, including the methods that an individual uses to reach their appearance related goals can lead to a better understanding of the body change related consequences of negative experience of body.

There is great variation within, and between, different gender groups, in relation to perceived body ideals. Throughout the course of time the standards of beauty have changed for both males and females. A desire for thinness has increased over time for females as the "ideal figure". Through the 1990s into the early 21st century female fashion models have stereotypically appeared to be below a healthy weight range. More recently digital modification techniques have been commonly used to slim down waists, hips and thighs, leading to exposure of unattainable figures for the majority of the population. The desire to be thin has continued into the 21st century but with the addition of having a fuller bust and more recently there has been increased pressure on social media promoting females to be strong and muscular, but at the same time to

remain thin. These ideals are almost impossible for most women to achieve by healthy means. Judgement of an individual's body shape in comparison to these ideals can lead to body dissatisfaction. This can then encourage a range of body change-related behaviours such as dieting, high levels of exercise and other weight loss measures such as self-induced vomiting and laxative misuse that could in some instances be behind the development of someone developing an eating disorder.

In terms of the male ideal there is often a desire for more muscularity, with a V shaped frame i.e., structured broad shoulders, tapering to a thin waist with defined abdominal muscles. Media often promotes the mesomorphic body type, muscular with a low body fat. Muscularity and body fat are the two primary body image concerns in the development of Anorexia Nervosa in males, characterised by a fear of being fat and muscle dysmorphia, characterised by the fear of the loss of muscularity. It is important to highlight that the existence of these two body ideals in Western society does not by definition mean that there will be negative psychological consequences for individuals who don't meet these body ideals (Dakanalis, 2017)

There is no single cause for body image dissatisfaction and the causes often differ depending on the characteristics and/or circumstances of the individual. Some persistent causes of body image dissatisfaction are thought to be; colourism—discrimination affecting people of colour where lighter coloured skin is viewed as more desirable, weight stigma—those with a higher body and lower body weight than the average can be subject to prejudice and discrimination, exposure to media depicting unrealistic and narrowly defined appearance ideals, appearance-related bullying and/or sexual harassment and the emphasis on the importance of image/beauty in society (Women and Equalities Committee, 2021).

Some groups have been identified as being more vulnerable to suffering from body image dissatisfaction including; adolescents, underweight and overweight individuals, LGBTQ+ individuals and people with disabilities or living with a visible difference (House of Commons Health and Social Committee, 2022).

It has been shown that individuals who identify as lesbian, gay, bisexual and transgender have similar body image concerns to individuals who identify as heterosexual. For example, research has shown that sexual minority men are more likely to internalise the ideal appearance of that of an athletic physique (Mental Health Foundation, 2020). Downs and Mycock (2022) highlighted how societal pressure can encourage and reward muscularity within men, and attempting to achieve these masculine ideals can result in increased risks of dysfunctional exercise, steroid abuse and restrictive and/or imbalanced nutrition, and increase the perceived link between self-worth and body image. It is also of note that women and girls (Mitchison, 2022; Edwards *et al.*, 2021) and non-binary people (Nagata *et al.*, 2021) have also reportedly experienced issues surrounding high drive for muscle and preoccupations surrounding muscularity, so this is not limited to one gender.

Body image issues do not only affect young people. Body dissatisfaction can persist into mid- and later-life and may even be exacerbated by age-related physiological changes. With evidence highlighting that poor body image tends to remain stable from adolescence through midlife, potential consequences from poor body image in childhood and adolescence may have longer lasting impacts than previously thought (Wang *et al.*, 2019)

Negative body image can be one of the initiating and maintaining factors of dysfunctional exercise and activity and components of an eating disorder. If both are left untreated, there is greater risk of relapse and chronicity of an eating disorder.

Despite being relatively constant over time, body image and body experience does change in certain contexts (for example, specific age vulnerabilities and variations of media exposure or health status). Body image does not simply reflect the biological endowment of the individual or the feedback received from others. While these factors might influence the level of body satisfaction, what is decisive is the way the body is experienced and evaluated by the individual themselves. The final result depends on personal factors (personality, self-esteem,

interpersonal factors such as family, peers and media messages) and biological factors such as genetic traits, weight and shape, and cultural factors.

Consideration is also needed in relation to the complexity of an eating disorder and interplay with other coping strategies such as self-harm. Patients may have visible scars that likely influence body experience and may increase challenges for them within certain aspects of physiotherapy treatment – for example a patient may find it challenging to wear a swimming costume to go swimming not only due to the body image difficulties related to weight and shape, but also due to feelings of vulnerability around visible self-harm scars. In addition, musculoskeletal conditions that result in an individual feeling more critical of their weight and shape, or influence interpretation of body anatomy, can interplay with body image experience. For example, vertebral fragility fractures resulting in an increased thoracic kyphosis, or post-natal diastasis recti, both of which may result in increased abdominal protrusion, have potential to affect body image, and feelings of ‘fatness’.

Physiotherapists working in eating disorders will have different levels of experience in relation to body image. As this is not a core physiotherapy skill, there is no expectation to carry out specific body image treatment sessions unless trained to do so. However, understanding an individual’s relationship with their body will inform aspects of physiotherapy treatment, and many physiotherapy interventions input can directly and indirectly benefit body image.

For Physiotherapists to carry out specialist body image work they require specialised training. Some interventions used include Basic Body Awareness Therapy (BBAT) and mirror therapy, both of which require additional training to apply these to an eating disorder setting. The principles of BBAT are to enhance the patient’s contact with the “self” through focusing on basic movement principles during everyday movements such as lying, sitting, standing and walking, where mental awareness, postural balance and free breathing are considered key elements (Skjaevern *et al.*, 2020).

That said, Physiotherapists are trained in the principles of body awareness and normal movement and have in-depth knowledge of anatomy and physiology, all of which can be applied during physiotherapy sessions to improve body image experience. Some of these principles and techniques are discussed later within this section. These interventions can also link into an MDT approach to body image work, connecting closely with the cognitive and behavioural aspects of eating disorder treatment.

Body Awareness

Body awareness is the term used to describe the ability to pay attention to oneself and feel body sensations and movements in the present moment, without the influence of judgmental thoughts. It also relates to the awareness of position and movement of body parts in relation to muscles and joints, within the surrounding environment. It considers aspects of proprioception, interoception and exteroception, within an individual’s conscious awareness, and can be modified by psychological influencers, such as attention, interpretation, perception and beliefs, experiences and expectations (Caddy, 2012; Calogero, 2010). Individuals with eating disorders have been shown to have reduced body awareness and self-awareness (Caddy, 2012) and present with an increased disconnect between the mind and body, as outlined in the neurophysiological component of body experience above.

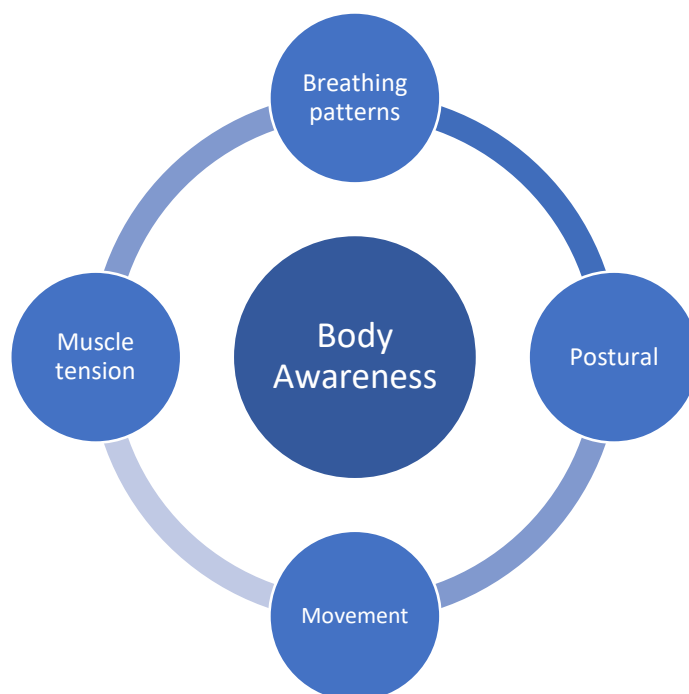
This alteration in body awareness may manifest in a rejection and disconnect of the physical self through self-hate and distorted body image perceptions, as well as through a more learnt ability to ignore body signals and cues in order to allow eating disorder behaviours to take priority.

An individual’s body awareness can vary depending on mental state, such as mood or anxiety, environmental factors, body weight and nutritional intake. For example, body awareness may be heightened post meal, and both the physical sensation of fullness and the psychological impact of eating, can result in a negative body

image experience of feeling 'fat'. In this example, body awareness is challenged as the individual is unable to feel body sensations without misinterpreting the feelings of fullness.

Some core physiotherapy skills and interventions enable clinicians to observe the impact of negative body image and reduced body awareness on movement, posture, muscle tension, and breathing. This guidance section identifies a selection of principles and techniques that can be applied during physiotherapy sessions to promote better body awareness.

It is important to acknowledge the interplay and connection between each of these components during treatment sessions, and how focusing on one area will also have potential to have beneficial effects in other areas.



Muscle Tension

Muscle tension within the body can increase when the individual is in a stressed or anxious state, or through the effects of negative body experience. This muscle tension may be released when psychological symptoms resolve in the short term or can become more set with more chronic anxiety or stress experiences. Muscle tension can also be generalised or localised areas of tension within the body, for example tension may be held in the neck, jaw or chest, or reported as generalised, transitioning, muscle tension throughout the whole body.

Muscle tension can also be held more specifically to areas of the body when influenced by negative body experience. For example, patients may be observed to hold increased tension in their thighs when sitting on a chair, or may sit with legs crossed, to avoid the “spreading effect” of muscle relaxing and interpreting their legs to be bigger than they are. Patients may also sit on the edge of a chair in order to avoid feeling the full contact that their bodies will be making with chair surfaces. Conscious muscle tension can also be observed within other areas of the body such as the abdominal muscles, where patients will hold static contractions of these muscles to achieve a flattening or concave effect.

It is important to be aware of the effect low body weight or severe weight loss can have on muscle mass, with muscle mass being reduced, and muscle tissue often being undernourished. Reduced muscle mass may mean the body has reduced ability to withstand the physical demand of movement, particularly in individuals whose

activity levels are high. Muscle imbalance can therefore develop, and therefore contribute to muscle tension and tightness in some areas of the body.

Breathing

As a result of the above muscle tension, and additional negative body experience, there can be an alteration in normal breathing patterns. Breathing can then become more apical rather than diaphragmatic/abdominal in nature or result in breath holding. These changes can result in increased tension within the chest and shoulders, risk of hyperventilation, and digestive complaints, for example nausea.

Increased breathing rates or apical breathing are also likely in individuals who are in a state of psychological arousal. For example, an individual may feel increased anxiety prior to eating a meal, or being weighted, and this results in alterations in breathing patterns, and increase tension in the body.

Movement

Movement can become more rigid, with alterations in coordination, balance and normal movement patterns, again due to psychological components and symptoms, as well as through reduced muscle mass and function. Movement patterns can also change due to increased muscle tension, holding the body fixed (freeze and body disconnection) and negative cognitions about their body, for example, comparisons with others, and beliefs and perceptions of being negatively judged by others. An individual may therefore move in a more 'guarded' way.

Posture

Posture can be altered due to mood, negative body experience or changes due to reduced musculature and core strength and stability resulting from a low body weight.

A negative body image may result in a closed, flexed, and protected posture.

Individuals may also adopt fixed and static postures, for example sitting in a fully upright posture on the edge of a chair in order to expend more energy through muscle contract, through the inability to allow the body to relax, or to avoid negative body experience associated with feeling full body contact when sitting back on a chair.

Treatment approaches to enhance body awareness

Individuals may not be aware of the influence that psychological or physical factors have on body experience, and how this experience can affect their muscle tension, breathing, posture and movement, and the impact on their body. Observation, education and advice are therefore key.

The aims of physiotherapy body awareness interventions are:

- To improve communication between mind and body
- To understand types of body awareness – interoceptive, proprioceptive and spatial awareness – and how these are experienced.
- To challenge the way in which the body is experienced, and physical sensations interpreted
- Provide education and experience on normal movement patterns, postures and physical sensations
- Introduce and teach techniques that can support improved body awareness
- To teach and promote self-management and self-led sessions
- How to apply these techniques into daily activity, for example to manage the urges to be active or pre or post meal.

The following techniques can be explored with individuals and have been shown to have a positive effect on body experience and improvements in the mind body connection. Techniques can be delivered as part of a physiotherapy treatment programme specific to body awareness, or as part of other targeted work, such as exercise management or pain management (Thornborg & Mattsson, 2010).

Body scanning

Body scanning involves paying attention to parts of the body and bodily sensations in a gradual sequence from feet to head, or head to feet. It is about bringing awareness to every single part of the body in a non-judgmental, accepting, and compassionate way.

Many patients are unaware of the increased tension they are holding in their body and the resulting impact this can have. In order to change this, regular practice of body scanning can be very helpful before change can occur.

Body scanning can be carried out in a group or on an individual basis and can be useful, for example, before or after eating. It is important to stress that with practice, patients should be encouraged to apply the techniques not only during guided /individual formal practice but also throughout the day in all situations and activities of daily living. Body scanning can be carried out in lying, sitting, standing, walking and movement. The aim is to develop conscious awareness, being mindful of breathing, comfort, mind and body connection, and muscle tension. Individuals are then encouraged and guided to move into a position of greater comfort and less tension. This of course can be challenging to patients with eating disorders as there can be disconnection from the body and body sensations. Also, with regards to negative body experience, some patients might be very critical and judgmental of themselves and their bodies and use the opportunity to overcheck. Individuals should be encouraged to bring their attention back to the aim of the scanning and separate this from body checking (an unhelpful behavioural strategy linked with negative body image).

With regular practice, patients should progress to self-management and practice but may also attend guided sessions if appropriate and available. Body scanning can also form a helpful part of relaxation sessions.

Psycho-education

Advice and educational sessions are helpful to support individuals to reconnect with a healthy body experience. The aims of these sessions support the individual to:

- Understand the psychological response of stress and anxiety, including the fight or flight responses, and understand what is happening in the body and why, and its impact on body awareness.
- To understand how and when to apply techniques such as body scanning, relaxation or breathing exercises to support periods of emotional arousal, for example to manage urges to be active.
- Understanding the physiological and psychological factors that can lead to altered body image/experience.
- Identify areas in the body where a. tension is held, b. there are changes in breathing pattern and c. changes in posture/postural awareness.
- To understand the benefits of recovery physically and psychologically in relation to body awareness/body experience.
- Understand normal structure and function of the body, including anatomy and physiology.
- Understand normal anatomical and physiological changes that occur with weight restoration, for example laying down on abdominal adipose tissue at early stages or improvements in bowel function alongside weight restoration and improved nutrition.

Relaxation

Relaxation techniques are known to have a beneficial effect on stress and anxiety and stress related conditions. Relaxation as a treatment can also have a beneficial effect on enhancing the awareness of the body and interpretation of physical sensations.

Physiotherapists are able to apply a range of relaxation techniques, for example, progressive muscle relaxation, mindfulness or guided imagery. Identifying which relaxation technique is most effective for an individual can be dependent on a number of factors, and when selecting appropriate techniques for body awareness it is important to ensure that the techniques used have the aim of keeping alertness in the moment, and a focus on body sensations and awareness. For example, imagery is a very beneficial relaxation technique, however it does not specifically focus on the body. In addition, consideration is needed to ensure that relaxation scripts or sequences avoid language or communication which may be triggering for someone with a negative body experience. For example, “feel the support that the floor is providing your body as you lay on your front on the mat” instead of “feel the weight of your tummy on the mat”.

Correctly tailored relaxation sequences can be a very effective way of enhancing a positive body connection, which can support reduction in muscle tension and improve breathing control, as part of a body awareness intervention.

Breathing exercises

Breathing exercises have many benefits to both physical and mental health, for example they can help reduce areas of tension, stress and anxiety. Incorporating breathing exercises into body awareness sessions can enhance diaphragmatic breathing, which can help reduce tension held within the abdominal area, as well as overall benefits of breathing control and normalising breathing patterns.

Massage

Massage therapy is a well-known physiotherapy treatment technique and may be indicated, for example, as part of musculoskeletal treatment. However, massage also has been shown to have a positive therapeutic effect in improving psychological well-being as well as enhancing body awareness and normalising physical sensations and responses through the use of touch. Touch and massage have also been shown to improve body image through improvements in the connection with the body and reduction in body image distortion (Probst, 2017).

Massage with an individual with an eating disorder at low body weight must be preceded by a thorough risk assessment and discussion of the therapeutic benefits versus risk. It is important to ascertain a patient's history and risk, with consideration for past trauma, the individual's experience and beliefs regarding touch as well as sensory needs and difficulties. In addition to psychological risk factors for massage, physical and medical risk factors must be considered. This should include patient's body weight and subsequent potential impact of massage on vulnerable soft tissue and prominent bony parts, as well as understanding of medical stability and the potential impact massage can have on physical parameters such as reducing heart rate and blood pressure. Understanding appropriateness of massage, as well as selection of massage technique and level of pressure, must take all the above factors into account to ensure therapeutic benefit and safety.

Movement and exercise

Engaging an individual in physiotherapy sessions that explore movement and exercise can be an effective way of raising body awareness and the mind body connection. In addition, enhancing body awareness can help an individual to develop a healthier relationship with exercise. For individuals with dysfunctional exercising behaviours the connection between the mind and body can be further separated, with the individual losing the

ability or willingness to listen and respond to physical cues and sensations. Individuals may push themselves to exercise at higher intensities or frequencies, despite signals of pain or fatigue. There may also be a loss of control of movement patterns or exercise techniques where the individual is striving for perceived improvements in performance or exercise goals, and a loss of body awareness can risk the safety of movement and enhance injury risk. Working with an individual on enhancing body awareness and body connection, for example working on body posture and slow controlled movement patterns, can not only be grounding for the body but also support to challenge dysfunctional exercise and activity if the individual can listen more to body sensations and body cues.

Enhancing body awareness, interoceptive skills and the body-mind connection through movement is an important part of treatment. Individuals need the opportunity to be able to relearn their own physical and psychological cues, acknowledging these prior to, during and following exercise engagement. In addition, to then be able to use these cues to adjust their exercise and movement engagement accordingly (Calogero *et al.*, 2010). In doing so, this supports the individual to be able to listen to their body's needs and experiences and lessen exercise drive based on eating disorder related thoughts and rules or exercise outcomes. Further consideration of the application of these intuitive movement principles is explored further in section 6 of this document.

Pilates exercises provide an opportunity to explore core strengthening and postural exercises, but also require the individual to work on body awareness, positioning, and control. They work on the recovery of muscle strength and flexibility but also have a focus on breathing control, body awareness, positioning, and neuromuscular co-ordination, and encourage a greater understanding of body functioning (Mehling *et al.*, 2011). Pilates exercises also have a beneficial effect for some in slowing down movement and being more present in the body, when they often engage in high impact, fast paced, repetitive exercise routines or have a great mind body disconnect.

Other interventions such as restorative Yoga, Tai Chi and Qi Gong, all support an enhancement of the mind and body connection; promote diaphragmatic breathing, promote relaxation and anxiety reduction, and provide an opportunity for increased body awareness through the introduction of safe and supervised exercise and movement. Incorporating elements of balance exercise can work on the proprioceptive and vestibular system and subsequent body awareness.

These interventions and therapeutic activities can be a helpful part of physiotherapy treatment, when appropriate as identified through risk assessment alongside the individuals exercise management plan.

Body image and body awareness work can be complex and challenging for the individual, and it is vital that it is delivered as part of an MDT approach, with potential for joint working therapeutic sessions to enhance the approach. For example, working alongside an Occupational Therapist who is delivering Sensory Integration approaches.

6d. Physical and mental health co-morbidities

An individual with an eating disorder can often present with other co-morbidities. These may or may not be associated with their eating disorder however they can have an impact on their eating disorder pathology and the management of it. The conditions described below are not exhaustive but from clinical experience are relevant to Physiotherapists in eating disorders. Depending on your clinical expertise you may have a direct role in the assessment and treatment of these or indirectly by liaising with the most appropriate specialist.

Continence

Incontinence, bladder prolapse, and other problems related to pelvic floor muscle dysfunction may be experienced by an individual with an eating disorder. These may be related to, for example, chronic constipation associated with restrictive type anorexia nervosa; structural damage and atrophy of pelvic floor muscles resulting from low body weight, or muscle wasting/metabolism; over-exertion of damage to pelvic floor muscles through excessive exercise, particularly high impact and explosive exercises; inadequate nutrition and endocrine changes - low oestrogen levels, hyperprolactinemia and increased cortisol levels. Cortes *et al.*, (2003) presented a case study that highlighted the presence of anal incontinence in a patient with an eating disorder due to a combination of metabolic changes and physical damage to pelvic floor muscles through over-exertion.

In addition, bingeing and purging behaviours can place an increased stress on the structures of the body. During the act of vomiting, the abdominal muscles, the diaphragm and pelvic floor muscles must increase intra-abdominal pressure in order for the stomach to forcefully expel its contents. To do this, the pelvic floor and abdominals contract up and in to increase pressure for an up and out movement. Repeated high intra-abdominal pressure and over exertion of pelvic floor muscles during this time can lead to muscular strain and stress.

Physiotherapists therefore play a vital role in supporting the assessment and management of pelvic floor dysfunction and incontinence. Physiotherapy assessment can support consideration of the impact of causal factors for the patient's pelvic floor dysfunction, including the influence of coping strategies, and education on the physical demand placed on the body as a result of these. Supporting the patient to understand the impact of these behaviours on their pelvic floor can help the patient work towards improving pelvic floor function as part of their treatment.

Alongside weight restoration and normalisation of endocrine changes, pelvic floor muscle function may improve, and many patients report, for example, urinary incontinence improves as their body reaches a healthy weight range. However, there may be a place for core and pelvic floor muscle strengthening exercises alongside weight restoration or providing support and guidance as part of an MDT approach to manage structural or more permanent change and/or if surgical intervention is indicated. Prescription of any pelvic floor exercises must be planned alongside an understanding of the patient's relationship with exercise so as not to trigger exercising behaviours and there is benefit in incorporating these exercises into a wider body awareness approach. Where surgical repair is indicated, the results are likely to only be short term if not addressing the causal factors (Cortes *et al.*, 2003). Education and guidance are therefore key to ensure longer term recovery.

Additional resources: NHS 'Squeezy' Pelvic Floor App – a clinically reviewed and approved app containing pre-set and individual formulated pelvic floor exercise programmes. The app can be used alongside physiotherapy treatment and guidance.

Further guidance and support are available through the Pelvic Obstetric and Gynecological Physiotherapy specialist interest group (POGP). www.pogp.csp.org.uk

Joint hypermobility and autistic spectrum disorder

Joint hypermobility (JHM) is linked to neuro psychiatric conditions especially anxiety disorders and neurodevelopmental disorders such as autistic spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD). Some studies have shown a link between joint hypermobility and eating disorders (Baeza-Velasco *et al.*, 2022)

Joint hypermobility is more common in females and in younger and adolescent patients. Many joint hypermobility conditions are linked to congenital inheritance and connective tissue disorders. The most severe examples are Ehlers-Danlos syndrome (EDS) and Marfan syndrome.

Many patients who present with joint hypermobility and have an Ehlers-Danlos syndrome hypermobility type also complain of multisystemic presentations of tissue fragility, gastrointestinal problems, fragility of oral mucosa, chemo-sensorial abnormalities, temporomandibular joint dysfunction, proprioception problems and smell and taste abnormalities which all may impact the body schema and image and constitute a favourable environment for developing eating disorders. These combinations of difficulties have in some cases contributed to developing and maintaining disordered eating behaviours and significant weight loss.

There is increasing evidence of a higher incidents of patients with joint hypermobility in patients with eating disorders and they can present as a specific profile that is characterised by less cognitive rigidity and restrictive behaviour in Anorexia Nervosa than patients without joint hypermobility (Can *et al.*, 2022).

A study was completed on a group of children with Avoidant-Restrictive Food Intake Disorder, a significant proportion of these children presented with joint hypermobility (Baeza-Velasco *et al.*, 2022). Another study also reports that patients with Ehlers-Danlos syndrome showed an increase in prevalence of an eating disorder history, higher risk of occurrence of an eating disorder and a lower BMI (Baeza-Velasco *et al.*, 2021).

It is important to remember however that joint hypermobility does not always indicate a more serious connective tissue disorder and may be benign in nature, it is important not to over medicalise this especially in the younger patients.

Adults and young people who have ASD can often present with eating difficulties that can be attributed to either an eating disorder or Avoidant-Restrictive Food Intake Disorder. ASD difficulties due to rigid thinking and sensory difficulties often mimic some of the symptoms of a restrictive eating disorder but can be differentiated from Avoidant Restrictive Food Intake Disorder by the presence of the desire to be a low body weight and often linked to body image. Patients with ASD and an eating disorder may still, however, have sensory difficulties linked to texture, colour or size that will impact on their ability to follow a meal plan and may need increased support. Altered sensory experience can also affect a patient's interoceptive skills and abilities to interpret internal cues and signals. This is important when considering body awareness approaches and the re-introduction of movement and exercise.

When supporting patients with ASD and an eating disorder it can be difficult to ascertain if the rigid thinking is due to the ASD or the low body weight. As the patient restores weight their thinking can become more flexible however the ASD traits will not change with weight restoration and will need to be addressed through education and alternative coping strategies. This is an important consideration when working to develop an

effective treatment programme and working towards set routines, for example returning to exercise, can be more beneficial than trying to aim for an increased flexible approach as is encouraged with general healthy exercise approaches. Routines can provide a calming and self-regulating approach as well as support in managing anxiety which can enhance a more positive experience with movement and exercise.

Individuals with autism may also present with certain emotional behavioural responses to challenging or triggering situations or environments, that can also be interpreted as eating disorder driven dysfunctional exercising behaviours. For example, tapping, rocking and pacing are often utilised as self-regulating strategies and it is therefore important to differentiate between dysfunctional exercising behaviours and strategies that the individual may actually find soothing, calming and self-regulating.

In addition, as part of assessment of the individual's relationship with exercise explore together whether exercise experiences and behaviours started at the same time as their eating disorder or whether these were present earlier in life.

When planning treatment location also consider environmental factors, such as lighting, noise and crowded space, which can often result in an over-stimulating environment. As part of treatment consider individual preferences for lighting levels, noise and location of treatment if possible.

Section 6a explores factors to consider when supporting patients as part of transition across service, for example inpatient to community on discharge or from children and adolescent services through to adult services. Transitions can be more challenging for individuals with autism and therefore identifying additional support that might be helpful for the individual may help make that transition a more positive experience.

Case Scenario

India, 22, had been an inpatient on an eating disorder unit for the last 6 months and had been working hard towards recovery and challenging her relationship with food. India was diagnosed with autism at the age of 12 years and prior to her eating disorder developing she had enjoyed swimming, and the sense of calmness that she experienced when feeling the water around her. India also found the rhythmical sequencing of swimming self-regulating and this was something that she wanted to get back to. As part of her admission India had been working with the Physiotherapist to develop a healthier relationship with exercise, where exercising behaviours had become dysfunctional as her eating disorder progressed, particularly in relation to walking and exercising in order to compensate for what she had eaten. As part of physiotherapy treatment India was keen to be supported to trial a re-introduction to swimming. She engaged well in the planning stages and used a graded exposure approach to ensure that potential triggers were identified, in relation to the pool environment and strategies put in place to manage these. She visited the local swimming pool to orientate herself to the environment and sessions were planned for times when the pool would be quieter. India also felt more challenged when the environment around her was noisy and therefore India chose to wear noise cancelling headphones to reduce the surrounding noise and echo within the pool environment. India also found these helped focus more on the sensory feedback she received from the feel of the water. India had a negative body image and at times felt unsure if she would be able to work on this enough to allow herself to go swimming. India was also aware of the risks that returning to swimming may have in terms of feeding into dysfunctional exercise beliefs, however, she was motivated to work on both body image and dysfunctional exercise and develop an effective recovery plan so that she could experience the positive experience that swimming brought her. India developed a routine with her swimming sessions, and she found this helpful in enhancing her swimming experience.

For further information PEACE is a pathway for eating disorders and Autism developed from clinical experience and provides valuable resources for patients, carers and professionals. www.peacepathway.org

Co-morbid psychiatric conditions

Research demonstrates that in individuals diagnosed with an eating disorder there is also a high prevalence of one or more psychiatric co-morbidities (Blinder *et al.*, 2006; Sansome *et al.*, 2007). The most common psychiatric disorders which co-exist with an eating disorder include mood disorders (e.g., depression), anxiety disorders (e.g., obsessive compulsive disorder), personality disorders (e.g., borderline personality disorder, obsessive compulsive personality disorder), post-traumatic stress disorder and trauma, substance use disorders, self-harm and suicide ideation.

It is vital to understand the presence and presentation of additional psychiatric diagnoses for individuals with an eating disorder due to the potential impact of symptoms on eating disorder presentation and behaviours, level of engagement, associated risk and therefore suitability of certain treatment interventions. MDT working and thorough risk assessment and care planning remains essential.

Further information, links and guidance on physiotherapy approaches within mental healthcare can be found on the website for the Chartered Physiotherapists in Mental Health <http://cpmh.csp.org.uk>

7. Considerations for children and adolescents

It is a well-documented fact that eating disorders are increasing so it is difficult to get an accurate figure for how many children and young people are diagnosed with eating disorders in the UK.

The BBC news reported that in 2018/19 25% of admissions to UK hospitals for eating disorders were children under 18, over 50% of the admissions were for AN and 16 of these were children under the age of 9.

NICE 2019 included the fact that the highest incidence of AN is in young people aged 15-19.

Childhood and adolescence are times of life that have lots of transformation and change, these are physical, emotional, and biological changes that often happen rapidly and can cause a feeling of loss of control. All these changes can impact the relationships between mind, body, and food for young people.

Children and young people become more independent, friendships change, and their bodies develop. There is also a huge amount of change physiologically with hormone levels being one of the most significant. Puberty can cause many emotions in young people and can be stressful, confusing and frightening. All these thoughts and feelings can cause children and young people to try to gain some control over what is happening to them, and they can use food to do so and unintentionally reinforce disordered eating habits. There are also personality traits like perfectionism, rigidity, impulsivity and obsessive thoughts that will increase a young person's risk of developing an eating disorder.

Due to the rapid physical growth in children and young people, eating disorders can be the result of an imbalance of nutrition and growth, this is especially true when they are active. Adolescence is often when sports involvement increases as does the pressure to perform. Training becomes more frequent, and this combined with rapid growth makes meeting the basic nutritional requirements difficult, this can then lead to an energy deficiency and again increase the risk of an eating disorder developing.

It is not as simple as just being affected by the internal changes of childhood and adolescence, they also have to deal with external factors such as social interactions and environmental factors.

The changes that happen to an adolescent's socio-emotional system during development lead to their brains seeking reward for being popular among their peers and behaviours to influence this can be strong. They tend to follow what friends are doing, which may include dieting or trying to look a certain way. They may also struggle with feeling different and their sexuality. There are higher rates of eating disorders in sexual minority adolescence groups, with a significantly increased rate of disordered/unhealthy weight control in lesbian, gay and transgender young people than their peers.

Environmental factors such as poverty, social media, school pressures and public health messages also play an important part in children and adolescence behaviours and beliefs around food, health and nutrition which can impact the development of an eating disorder.

Adolescents with health conditions that require dietary control such as cystic fibrosis, diabetes and coeliac disease may also have an increased risk of developing an eating disorder.

Although it is more common for older adolescents to develop eating disorders they have been diagnosed in children as young as 7. The younger children are more likely to have pre-morbid psychopathology such as anxiety, depression and OCD and less likely to have purging or binge behaviours present. Younger children are also more likely to have atypical presentations and instead of presenting with weight loss they may present with failure to meet expected growth markers in weight or height (Garner 1997). There is less of a split between sexes in the younger age group and they are more likely to have rapid weight loss. (Peebles *et al.*, 2006)

Children and young people are not just small adults, as the information above suggests they can be complex in their development and there are often many factors to the development of an eating disorder. The physical signs and symptoms can be the same as the adult cohort but due to the lower body fat stores and the rapid growth and development that happens in childhood, the weight loss is often more significant and therefore often requires more urgent intervention and medical management. The risks are also higher due to the impact on physiological processes and development that can lead to permanent changes. This includes fertility, bone health, growth and brain development as well as the social implications.

When assessing the risk of weight loss in children and young people the main difference is the use of weight for height over BMI and the parameters of the physical observations.

Weight for height (WFH) is used in children and young people as BMI does not take into account sex or age variances. Children develop at different ages and weight/height will vary greatly. WFH measures the child's BMI relative to a population of the same age and sex and takes into account the range, i.e., if a BMI was exactly the mean value of that population, then the WFH would be 100%. As in adults it is important to not base risk just on WFH alone. A child or young person who has high muscle mass might have a higher WFH value than expected but still be at significant risk, this can often be seen in children and young people that compete at sport on a frequent basis.

The MEED risk assessment includes parameters for children and young people as well as adults and should be used to assess the risk of all children and young people.

Treatment

NICE guidelines name family therapy for the treatment of eating disorders in children and young people as the most effective treatment. It can be delivered as single-family work or combined with single and multi-family therapy.

The Maudsley family-based therapy approach (FBT) regards parents and carers as the experts in their family and it empowers them to challenge the eating disorder and take charge until recovery is seen to begin.

It is important for children and adolescents to have a multi-disciplinary team around them that are all using a FBT approach. This is supported by current evidence (Mairs & Nicholls, 2016)

Children and young people generally have higher recovery rates than adults with Anorexia Nervosa. Mairs and Nicholls state that 50-70% of children and young people who receive a FBT treatment approach reach a healthy weight and at follow up 60-90% will have recovered or partially recovered and relapse rates are low. There is however a portion of younger patients who do not do so well and relapse or who are treatment resistant. There is a suggestion that childhood onset AN will have a poorer outcome than adolescent onset and around 50% of childhood onset sufferers will have an increased risk of psychiatric illness and co-morbidities in adulthood.

If FBT is not appropriate, then Cognitive behavioural therapy and adolescent focused psychotherapy are both also named in the NICE guidelines as effective treatment for eating disorders in children and young people.

Considerations

• Family beliefs and influences

Whilst we know that FBT is recommended and often has positive results we need to consider that a family belief system can also have a negative effect on occasions. They may be an active family and are not willing to reduce the amount of activity they do for fear of being unhealthy, or the parents or carers may have experienced eating difficulties themselves which makes them less able to be a positive influence. Wider family

members often have a strong influence and again this can be both positive and negative. A person's appearance may be held in high regard in a family and therefore they are proud of the child or young person being slim/thin and not fully understand the risks. Sporting performance can be of high value so they support excessive participation thinking it will improve performance.

- **School**

School can provide a supportive environment for children and young people and often it is beneficial for children and young people to remain in an education setting wherever appropriate, they can experience positive modelling from peers and teachers can often be another source of support. There are times, however, when it will be appropriate for children not to attend and this needs to be considered on an individual basis based on not only the risk to physical health but also the emotional distress that may be caused. Bullying is often a factor in a child or young person's eating disorder and often this has occurred in a school setting, exam and academic stress can also be a factor in maintaining or triggering difficulties and it can be helpful to remove this if appropriate.

School can often be physically challenging and increase the energy requirement needed by a child or young person, in some situations it may be appropriate for an individualised timetable to be considered e.g., shorter days, lessons in one location.

School is a really important part of a young person's development both socially and cognitively, a child or young person will gain a lot of knowledge during their time in school from many sources, some of which will be more powerful than others. Schools are often providing lots of information across a number of subjects that could impact an eating disorder and it is easy for a message to be misinterpreted or not considered on an individual basis. This can be seen in food technology and nutrition information in regard to healthy eating, PE and body typing, exercise guidelines and sports nutrition. Science lessons that talk about nutrition, weight, and health. It is very easy for a child or young person to take the wrong message from this information and either trigger an eating disorder or maintain one. A session that is often done is to work out the calorific value of a meal and then how much exercise it would take to use the energy consumed. There are also messages from public health bodies about unhealthy food which leads to thoughts of good and bad food rather than unhealthy habits. This can be seen in school canteens where there is a 'healthy food' bar for example. Children and young people can then develop very strong ideas about food they should or shouldn't eat, which can have a big impact on developing or maintaining an eating disorder or disordered eating.

- **Sport**

Sport plays a crucial part in many children and young people's lives and can again be both a positive and negative factor in terms of an eating disorder. We know that some sports that involve endurance, weight requirements or idealised body shape can increase the risk for children and young people to develop an eating disorder or REDs and it maybe symptoms that are linked to their sporting involvement that alert people to the issue such as amenorrhea, poor performance, stress fractures or collapse.

Sport can also be a positive factor as it can be a social opportunity, provide peer support and act as a motivator for recovery.

Before stopping sport or physical activities the risks should be assessed of the exercise on the physical health as well as the psychological health of young people. The perceived negative consequences of stopping exercise by the child or young person needs to be considered. There are many children and young people that will resort to purging behaviours in lieu of being able to exercise such as self-harm, secret exercising and vomiting and these may pose a higher risk to their health than the exercise they were doing. It may be appropriate to reduce the amount by tailoring club sessions, doing a shorter time or less often or swapping one

form of exercise for a safer alternative. You would use the same considerations in children and young people than for adults but need to be mindful that a child and young person's energy requirements are higher than that of an adult due to the growth and development of the bodies and brains.

It is important to consider the sporting environment for children and young people as again it can have a positive or negative effect.

Some sports present a higher risk because of the weight requirements such as boxing, martial arts, rowing and weightlifting. These involve children and young people adopting behaviours to meet a weight requirement and often encourage judgements to be made on a person's weight. Sports that have more focus on aesthetics such as dance, ballet and gymnastics are also a risky environment as the costumes and kit are often clingy and revealing and again judgements are often made about how a person looks rather than performs or their performance is linked to body shape.

Gym culture has become a big influence on children and young people in recent years. Many gyms are now offering a children's membership which allows children and young people to train alongside peers or adults, many will adopt poor technique, compete against peers, compare their body shape to adults or older peers and again the focus in many gyms is to look a certain way. They can be made to feel that to fit in they need to look and behave in a certain way. Many marketing techniques for supplements, clothes, sessions are used that are aimed at adults, but the children and young people are exposed to this which can influence their beliefs and behaviours.

It is especially a risk for young boys who are often feeling under pressure from society to look a certain way about their muscularity and perceived 'manliness'. This is emphasised by some contact sports such as rugby where they may be told they are too small or need to 'bulk'. Size is often the measurement for perceived performance benefit rather than speed, strength, skill, agility. As children and young people are still developing their thoughts, knowledge and beliefs they may not consider that genetics plays a big part in this, also they may not have developed yet and need more time, so they adopt risky behaviour to achieve their goal.

Early elite pathways in sports can also play a part in eating disorders. Young children are being pushed into early specialisation with often high expectations for performance. This can lead to over training, poor training variety, misleading information about ability and future potential. A child who is dropped from an academy at a young age can be negatively impacted by the experience and can lead to self-esteem issues, falling out of love with sport or thinking they need to do more training to be better.

All children and young people should have a wide experience of all sports. Their bodies develop at different ages, and it is impossible to tell what sport will suit their fully developed body at a young age. A child who is told they look like a runner at age 11 may alter their behaviours to try to influence their body shape to continue to look like a runner at age 14 when they have been through puberty and have a different body shape/type to previously.

Sport should be about fun and enjoyment and variety throughout childhood and if they develop all the fundamental skills of physical activity such as balance, co-ordination and agility they can apply these skills to any sport and therefore specialise when they have the physical and cognitive maturity to deal manage it and the pressures that occur. It is extremely risky for children and young people to be allowed to believe that performance is linked to body size or shape from both an eating disorder perspective but also unhealthy exercise behaviours.

- **Social media**

Children and young people face a significant amount of pressure for many different reasons. Social media plays a huge part in this pressure and is easily accessible even by a young child. Children and young people have not yet developed skills to critically appraise the information they are accessing online. They may view everyone as experts, and this can lead to lots of misinformation about health, fitness and nutrition being believed to be true.

It can also impact body image and how a young person views themselves. There are many posts and pictures showing people's bodies, poses and postures. Many of the pictures and images have been altered with filters, photo-shopped or distorted to make an individual look a certain way that is perceived to be perfection. Children and young people are then putting pressure on themselves to look like the images that they are viewing. This is risky as firstly many of the images are of adults or older people and is not a fair comparison also as the images are not realistic, they may be simply not achievable. It is not just looking a certain way that can cause risk but also sporting or fitness performance that is portrayed to be appropriate or expected. Lifting heavy weights that have been put on a loop so it looks they are sustaining that weight over a number of repetitions, the settings on a treadmill being shown to be higher than they are during use, or an elite sports person's performance being portrayed as the normal can all lead to unrealistic expectations and therefore unsafe exercise practices.

The algorithms used in social media can also increase the risk to children and young people as they recognise a theme and then increase the exposure to similar images or content, but this is then often more extreme. They also log a search that may have been made and provide other links to similar content. So, a young person could search for information on healthy exercise and then their feed be filled with all exercise images and content regardless of if it is appropriate or healthy. It also causes increased exposure which leads to a less balanced social media feed. Certain fitness forums or 'fitspiration' posts on social media or the internet can normalise disordered behaviours and beliefs around food and exercise.

Safeguarding

When working with children and young people safeguarding should always be a consideration. Parents often collude with an eating disorder as they do not like to see their children distressed or cannot cope with the challenging behaviour that often accompanies the difficulties. This is not done with malicious intent and often improves with increased support and confidence and interventions such as Non-violent resistance (NVR) training, however a duty to report should be completed if the parent or carers fail to follow advice and comply with treatment programme. It can also be seen in the form of not attending appointments or not engaging with professionals, missing filling prescriptions and not supplying appropriate food as recommended on the meal plan.

Children and young people can also disclose abuse during sessions and these need to be acted upon appropriately in line with safeguarding guidelines.

Safeguarding concerns should immediately be escalated and discussed with the appropriate professionals.

Consent

It is important that the difference between children and young people and adults with related to consent is considered. The following information is from www.nhs.uk.

People aged 16 or over are entitled to consent to their own treatment. This can only be overruled in exceptional circumstances.

Like adults, young people (aged 16 or 17) are presumed to have sufficient capacity to decide on their own medical treatment, unless there's significant evidence to suggest otherwise.

Children under the age of 16 can consent to their own treatment if they're believed to have enough intelligence, competence and understanding to fully appreciate what's involved in their treatment. This is known as being 'Gillick' competent.

Otherwise, someone with parental responsibility can consent for them.

This could be:

- the child's mother or father
- the child's legally appointed guardian
- a person with a residence order concerning the child
- a local authority designated to care for the child
- a local authority or person with an emergency protection order for the child

Parental responsibility

A person with parental responsibility must have the capacity to give consent.

If a parent refuses to give consent to a particular treatment, this decision can be overruled by the courts if treatment is thought to be in the best interests of the child.

By law, healthcare professionals only need one person with parental responsibility to give consent for them to provide treatment.

In cases where one parent disagrees with the treatment, doctors are often unwilling to go against their wishes and will try to gain agreement.

If agreement about a particular treatment or what's in the child's best interests cannot be reached, the courts can make a decision.

In an emergency, where treatment is vital and waiting for parental consent would place the child at risk, treatment can proceed without consent.

When consent can be overruled

If a young person refuses treatment, which may lead to their death or a severe permanent injury, their decision can be overruled by the Court of Protection.

This is the legal body that oversees the operation of the Mental Capacity Act. (Information on www.nhs.uk)

8. Considerations for older adults and frailty

Background

Weight loss in the older adult is often multifactorial and has been considered synonymous with aging (Morley, 1997; Bulat EA, 2019). The 'anorexia of ageing' is a term that refers to a reduction in food intake and loss of appetite in older adults caused by decreased chemosensory functions and altered metabolism (Di Francesco *et al.*, 2007). It is distinct from Anorexia Nervosa which is defined as a mental health disorder (The Diagnostic and Statistical Manual for Mental Disorders - 5 DSM -5, 2013).

Eating disorders, however, are not only confined to younger people. Older adults can and do present with symptoms which meet the criteria for a diagnosis. An eating disorder diagnosis is differentiated from the physiological Anorexia of aging by the presence of body image distortion, weight pre-occupation and fear of fatness (Midlarsky E, 2018).

Luca *et al.*, (2015) reported that prevalence in later life ranges from 1.8% to 3.8%, with binge eating disorder being most typical amongst this cohort. Eating disorders may be seen as either late onset, (i.e., developing for the first time in later life), or as a continuation or re- occurrence of a pre-existing condition in older age. Exact prevalence rates are difficult to establish. A systematic review in 2017 by Le, Long *et al.*, found that Anorexia Nervosa accounted for 8% of cases, avoidant-restrictive food intake disorder (ARFID) 5% Binge Eating Disorder 22% Bulimia Nervosa 19% and other specified feeding or eating disorder (OSFED) 47%.

Though medical complications of later life eating disorders are similar to early onset, the risk of co-morbidity for cardiovascular, metabolic gastric and bone disorders are far greater (Luca *et al.*, 2015). Other data (Landi F, 2013) acknowledges a direct association between Anorexia Nervosa and sarcopenia, which is one of a number of markers for frailty syndrome. Poor nutrition in older adults can accelerate the effects of the aging process (Amarya *et al.*, 2015) with significant weight loss (greater than 5% body weight in 3-month period), severely limited food intake, or a trigger on a nutritional screening tool (e.g., Malnutrition Universal Screening Tool, MUST) warranting referral to a Dietitian.

There may be many reasons for weight loss in an older adult and identifying the cause is important to prompt the correct treatment. If an eating disorder is causing or complicating the presentation it is important to address this to ensure that the person is able to engage with nutritional advice and supplementation, should this be appropriate.

Sources of further information:

<https://www.gov.uk/government/publications/helping-older-people-maintain-a-healthy-diet-a-review-of-what-works/helping-older-people-maintain-a-healthy-diet-a-review-of-what-works>

<https://ukcareguide.co.uk/nutrition-for-the-elderly/>

Specific pressures associated with mid and later life

There may be many stressors in mid and later life which may lead to a relapse of a previous eating disorder, exacerbation of an existing eating disorder or a new presentation of eating disorder. Depression may predispose to weight loss in older adults but may also co-exist (Midlarsky E, 2018). An internet survey of older women aged 60-90, identified depression as a driver for eating disorder pathology, along with perfectionism, and sociocultural pressure to be thin. These paralleled the concerns in younger and middle-aged women.

Forgarty, (2019) also acknowledged that factors such as divorce, death of a parent, 'empty nest syndrome', managing signs of aging and pressure to stay young, can all precipitate disordered eating behaviours. Physiological changes associated with mid-life cause some natural weight gain and slowing of metabolism.

Consequently, eating behaviours may become disordered despite a BMI within normal range. Such instances may be classified as an Other Specified Feeding or eating disorder i.e., not meeting the criteria for Anorexia Nervosa, Bulimia Nervosa and binge eating disorder (ICD-11, 2021).

Unsurprisingly, a growing body of research suggest changes in oestrogen levels both at puberty and perimenopause, increase one's vulnerability to the development or re development of an eating disorder (Mangweth- Matzek *et al.*, 2013; K. Klump 2013; Baker and Runfola 2016). Women's bodies in particular go through many changes throughout the lifespan requiring an acceptance and adaptation to changes in shape and size. This may be especially challenging for those who struggle with body image. A systematic review by Cameron *et al.*, (2019) concluded that older women can feel a disconnect from their bodies as they age, as their aging exterior did not reflect their inner perceptions of themselves, i.e., they did not feel old but were viewed by others as being so. Research has also shown that older women with poor body image are less likely to be socially active, and thereby more likely to report depressive symptoms. (Sabik, 2017).

Men are not immune from some of these life changes and the relative proportion of men to women with eating disorders may be slightly higher in later life than for earlier onset (Newton, 2013). While men do not experience the sudden change in hormones that women do in menopause, they do have a steady slow decline in testosterone levels from age 30-40 of approximately 1% per year (NHS 2022). This does not usually cause problems in itself. However, social and lifestyle pressures, along with changes in the male body due to normal aging processes, may combine to negatively affect self-esteem and body image (Matsumoto *et al.*, 2020). Some men may find that as they reach their 40s and 50s, they experience depression, loss of libido, erectile dysfunction, mood swings and irritability. In addition to muscle atrophy, a reduced ability to exercise, fat redistribution (around abdomen and chest), reduced enthusiasm, difficulty sleeping and tiredness, poor concentration, and short-term memory loss. <https://www.nhs.uk/conditions/male-menopause/> .

Lapid (2010) highlights the lack of control which may be perceived by an older adult. This coupled with personal losses and life changes, may lead to disordered eating as a way of regaining some control. There may be a sense of failure of achievement in a career, loss of morale, loss of sexuality and development of health problems. Newton (2013) also describes how role transitions in middle and later life may mirror those of adolescence, leading to an increased vulnerability to a new onset or an exacerbation of an existing eating disorder. It is widely recognised that disordered eating is often witnessed as a compensatory behaviour to chronic stress Luca *et al.*, (2015).

Presentation

The diagnosis of an eating disorder in later life may be missed due to a low index of suspicion, BMI within normal range, and feelings of shame preventing people seeking help. Some women in mid-life have been prompted to seek help by seeing their adolescent offspring having treatment, after keeping disordered eating behaviours secret for years (Fogarty, 2019).

Eating disorders may be even less likely to be suspected in older men, and presentation may also vary. A questionnaire survey of Austrian men between 40-75 years old (Mangweth Matzek B, 2016) asked about eating behaviour, sports activity and quality of life. Although there may be some self-selection effects on their findings, 6.8% of respondents had current eating disorder symptoms. Exercise was prominent as a potential 'purging' strategy with 4 of the 7 men reporting binge eating using excessive exercise to compensate for this. Men with eating disorder symptoms also had generally higher scores on the Exercise Addiction Inventory.

In addition to the assessment information within section 4 of this document, the following additional assessment tools and outcome measures may be indicated for use within this population group.

Frailty measures	Gait Speed >5s to walk 4m Timed up and go >10s The Program on Research for Integrating Services for the Maintenance of Autonomy PRISMA 7 - score of 3 or above (Turner & Clegg, 2014) Elderly mobility scale Rockwood Clinical Frailty Scale (Rockwood, 2005) Frailty Phenotype (Fried, 2001) Frailty Index Edmonton Frailty Scale (Rolfson, 2006)
Function	Sit to stand Transfers Stairs Gait assessment and need for walking aids Balance (Berg, Tinetti, Functional Reach etc.) Personal activities of daily living (PADL)/ Daily-home based activities of daily living (DADL)
Sarcopenia	Hand grip <27kg men, <16kg women (Cruz-Jentoff AJ <i>et al.</i> , 2019) Sit to stand >15sec for 5 rises (Cruz-Jentoff, 2019) Sarc F (Malmstrom T. Morley J. 2013) Mini Sarcopenia Risk Assessment (Rossi A 2017)

Management

Physiotherapists may meet older adults with eating disorders in many different contexts. They may have presented with physical health issues e.g., falls and frailty, mental health issues e.g., anxiety, depression, or sometimes on a specialist eating disorders unit. The environment and the treatment pathway will affect the physiotherapy management.

A review of case studies by (Lapid M.I., 2010) concluded that eating disorders do occur in older adults but are more often overlooked. Furthermore, older adults are at increased risk of harm and have poorer outcomes than younger patients. Of the cases covered by the review 20% died due to the eating disorder and its complications. We know that weight loss is one of the markers of frailty. In order to successfully treat a frail older adult whose presentation is complicated by an eating disorder, specific interventions for the eating disorder are likely to be needed. For an older adult who has been admitted to an eating disorder or adult mental health unit it may be the case that their increased physical needs are difficult to manage in an adult mental health environment. There may be a need to work with the MDT in safely adapting the environment, providing equipment or advising on a more appropriate place for them to access the treatment they need for their eating disorder.

Priorities of treatment will need to be discussed and agreed by the MDT. The physiotherapy role within this process is vital to support clinical reasoning in balancing energy conservation with nutritional needs for weight restoration, whilst still maintaining mobility and function, and minimising the effects of deconditioning in the

management of sarcopenia and frailty. The MDT must work closely together during weight restoration, and for measures of physical health to be closely monitored throughout the process.

Case scenario 1:

Wendy is 59. She has been admitted to the ward for management of her eating disorder. She had treatment for Anorexia Nervosa in her early 20s and has been physically well since. Due to her current physical state, the MDT have recommended that she is on unit rest. Just prior to admission she sustained 3 osteoporotic wedge fractures in her spine after a fall. The resulting kyphosis is causing discomfort in sitting, and pressure on her digestive system. In the acute hospital she found that she was spending large amounts of time in a slumped long sitting position on the bed.

The MDT will need to decide how to balance the competing risks of rest and activity for Wendy. The physiotherapist may need to give advice on posture and suggest suitable seating options if none are available on the ward. She may need a daily plan which allows for changes of positions to rest in. She may struggle with eating due to the pressure on her abdomen and this will need to be addressed by the team to facilitate the promotion of weight restoration. physiotherapy advice will be required to prevent further physical dysfunction via appropriate treatment goals and intervention. An individualised plan will be required to optimise recovery, manage her osteoporosis, and reduce her risk of further falls. Following discharge, if referred to falls prevention services, the importance of ongoing weight restoration may need to be conveyed.

Case scenario 2:

Sally is 73. She has had an eating disorder for most of her adult life but has managed to maintain a BMI at the lower end of healthy. She is very active and walks at least 6 miles a day. At home she reports that she rarely sits down and if she watches TV, she sits on an exercise bike to do so. She has a diagnosis of osteoporosis. She was admitted to a medical ward after a short viral illness which made managing at home difficult and caused her to relapse. She has lost weight and admits that she has been restricting food to make up for not being able to get out and walk. She has been very fatigued on the ward and ward staff are concerned about deconditioning and have referred for physiotherapy to 'build her strength up'.

There will be a need for education around managing this lady's eating disorder and exercise behaviour. She is likely to need rehabilitation but at the appropriate time once she is better nourished and is restoring weight. A daily plan with appropriate changes of position may be helpful for the nursing team to refer to and ensures consistency, as well as a mobility plan and falls risk assessment. Staff and patient may need reassurance that Sally's fatigue and weakness are likely to improve as their nutrition improves and that further rehabilitation will be available at the appropriate time.

An older adult may have co-morbidities which make eating more difficult. For example, difficulties swallowing; poor dental health and/or false teeth; long term conditions; cognitive issues; functional difficulties; lack of taste, smell enjoyment etc. which may affect eating disorder treatment. Mental health issues such as depression may also lead to a loss of appetite.

Refeeding syndrome is an important consideration for elderly patients admitted with malnourishment, whether this is due to an eating disorder, self-neglect, feeding difficulties or difficulties managing at home.

Physiotherapists managing these patients need to be aware of the risks of complications from electrolyte imbalance and plan their treatment accordingly.

Falls

Malnutrition, and dehydration, regardless of cause, can be contributing factors to frailty in an older adult. A person who is not adequately nourished or hydrated may be at increased risk of recurrent falls due to sarcopenia, postural hypotension, cardiac effects, fatigue etc. Patients who have had longstanding eating disorders may show signs of frailty at an earlier age, and this coupled with an increased risk of osteoporosis/osteopenia, means that the threshold for triggering a multi factorial falls assessment may be a lot lower than a general screening tool may suggest. Older adults requiring in-patient treatment on a mental health inpatient unit, may also have additional needs for environmental adaptations and equipment to reduce the risk of falling, particularly in an environment that is not built for those with functional needs, or where there is anti-ligature equipment. Thought should be given to the environment of the eating disorder unit and how it may need to be adapted with falls prevention in mind.

Physiotherapists are essential members of the MDT to support the management of the complex needs of this patient group, due to their extensive knowledge and skills in physical health and wellbeing.

Principles for treatment planning:

- Consider priorities - rest vs mobility
- Prescription and management of appropriate physical activity and exercise levels
- Consider eating disorders and associated behaviours in frail malnourished older adults
- Consider co-morbidities and risk factors, and their impact on eating disorder treatment
- Support to prevent isolation in community
- Multi factorial falls risk assessment and preventative measures
- Effect of refeeding
- Supporting and educating families, carers and the wider MDT

9. Considerations for Physiotherapists in Other Clinical Settings

Due to the complexities of eating disorders and associated co-morbidities, Physiotherapists may encounter individuals within other clinical settings and may be asked to see an individual who has an underlying or undiagnosed eating disorder.

Physiotherapy interventions are delivered across a wide breadth of clinical specialties, and as a standard of practice, take a holistic approach to assessment and treatment. Understanding of an individual's eating disorder presentation, as well as associated psychological and medical risks, is important when identifying appropriate assessment methods and treatment interventions relating to the condition for which they have been referred to physiotherapy. Both physical and psychological components of an eating disorder may alter the way in which a patient presents and engages in treatment, and being able to understand these aspects, as well as understanding the sometimes-secretive nature of an eating disorder, will support a more effective therapeutic approach.

The Management of Medical Emergencies in Eating Disorders (MEED): Guidance on Recognition and Management, published in 2022 by the Royal College of Psychiatry, highlights the importance of understanding the roles different healthcare professionals, including physiotherapy, have in acute eating disorder management. <https://www.rcpsych.ac.uk/improving-care/campaigning-for-better-mental-health-policy/college-reports/2022-college-reports/cr233>

Case Study One

Janet, a 53-year-old female, with 10-year history of restrictive type Anorexia Nervosa, is admitted to an acute medical ward due to recent onset of chest pain, syncope, reduced mobility and falls. Janet has recently been severely restricting her diet and increasing her activity levels at home. Her BMI is 11.7. The ward team are concerned about how frail Janet has become, and her risk of falling, and therefore referred her to physiotherapy for assessment of transfers and potential for strength and balance exercises.

Consideration for physiotherapy input:

- Section 4 of this guidance document, as well as information contained within the MEED Guidelines, highlight the importance of understanding physical and psychological risks associated with an eating disorder and subsequent precautions needed for physiotherapy assessment and input.
- The prescription of physiotherapy interventions must be such that they do not further compromise energy stores, do not limit weight restoration, or cause weight loss, do not compromise medical stability, or place stress on an undernourished frail body.
- In Janet's case, assessment of functional abilities is important due to her frailty, and risk of falls, and to ensure that recommendations identify a safe level of supervision or assistance, including whether use of a walking aid is indicated, for transfers and mobility. However, medical stability and weight restoration are the priority for Janet and exercise and mobility practice may compromise energy stores and medical stability. Engaging Janet in targeted muscle strengthening exercises will have limited benefit as she may still be in a catabolic state, and may lead to rhabdomyolysis.
- Janet may also be finding it hard to be restful on the ward. For example, she may be exercising in secret or refusing to spend time on her bed, and therefore it is important to provide support to manage exercise and activity urges – this could include distraction with other more restful activities and anxiety management with support of the team, as well as spending time with Janet to support her to understand the risks of her activity in her current medical state, and the need to remain restful. Advice and guidance to the ward team on managing incidental activity levels will be helpful in managing the

impact of accumulative activity, for example to walk back and forth to the bathroom throughout the day, to collect medication, to meet visitors, will all impact on available energy stores.

- Liaison and discussions with the ward team on maintaining safe function and falls prevention, monitoring skin integrity, and the need to prioritise energy conservation over strength and balance exercises, will all be important as part of Janet's treatment approach.
- It is important to review Janet regularly and discuss with the team any recommended changes to her mobility care plan and activity levels, in accordance with medical stability and improving nutritional status and body weight.

Whilst it is acknowledged that additional considerations are needed for patients who have additional functional needs, for example those which may have resulted from severe rapid weight loss, or intensive care treatment, the priority remains weight restoration and being able to have adequate nutritional intake to support function. Again, the effectiveness of physiotherapy interventions will be limited if not supported by adequate nutritional intake, energy stores, if the body remains in a catabolic state, or the body has insufficient muscle mass to withstand demand/work with during treatment.

Physiotherapy input within eating disorders, including on a non-eating disorder unit, is not a standalone input and must be delivered in conjunction with the MDT, in order to manage medical, psychological and physical risks.

Any interventions which involve exercise, whether active or passive, must be risk assessed and delivered by a Physiotherapist, due to the vulnerability of the body at significantly low BMI.

Once weight restoration has been consistent and the patient is medically stable, gradual and graded introduction of functional tasks, such as sitting on the edge of the bed, transferring to a chair, and mobility can be introduced, however again must not compromise weight restoration or medical stability. Interventions at this stage will need consideration for the level of support and assistance needed as well as acknowledgement of overall accumulative activity levels and subsequent impact of energy stores/weight restoration.

Any intervention must be preceded by full awareness of nutritional status, weight trajectory, blood results/medical stability and physical observations (including BP, HR, postural drop and blood glucose) and a decision made as to the suitability of interventions at that time.

Providing advice to the patient, as well as relatives and carers considerations for engaging in physiotherapy when at a significantly low body weight, the impact of low body weight on function, as well as the improvements in function that will arise from weight restoration, can often be helpful. Discussions about the priority for weight restoration and medical stability can often be helpful when their goal is to be able to return to exercise and physical activity longer term. Reassurance that the goal can be to work towards these as part of recovery, but the priority when at high risk remains medical stability, energy conservation, and weight restoration.

Case Study Two

Ade was referred to an outpatient MSK clinic due to a reported right ankle strain following a fall whilst running. Ade was seen in A&E and X-ray showed no fracture, and he was discharged with elbow crutches and advised to rest. Ade is 10 weeks post injury and reports only marginal improvement in ankle pain and swelling, therefore his GP referred him for physiotherapy following an additional x-ray and CT scan, both ruling out underlying fracture. Ade arrived in the outpatient clinic using his elbow crutches, non-weight bearing on his right leg. Ade appears underweight, with clear muscle definition in his arms and legs, he shares openly about his diagnosis of an eating disorder, as well as his love of running and strength training in the gym. Ade shares frustration that his injury has not been healing

and comments on the impact not being able to run is having on his weight and reported loss of muscle definition, as well as how exercise helps with improving his mood. As a result, Ade reports feeling increasingly anxious. Ade is also keen to be prescribed upper limb strengthening exercises as he feels his arms are not strong enough to be using the crutches.

Considerations for physiotherapy input:

- Understanding the interplay between an eating disorder and exercise, and how this may be affected in the presence of an injury, is important when assessing Ade, as well as obtaining thorough and holistic history.
- It is important to understand Ade's relationship with exercise and current exercising levels. His concerns about weight gain as well as frustration and fears about not being able to run may mean he is not adhering to advice to rest. Ade may be unable to acknowledge the impact that incidental and accumulative activity are having on his rate of healing, or he may be engaging in alternative exercise to maintain muscle mass or manage weight.
- Ade may be open to discussions regarding healing processes, and longer-term risks of limiting the healing process. As well as understanding the importance of rest and recovery as part of this healing process.
- Ade may be limiting his nutritional intake if he is anxious about not being as active and the impact this has on his weight, and therefore discussions about the benefit of nutrition and hydration for the phases of healing may be helpful.
- Ade may also benefit from reassurance that supporting adequate healing can lead to being able to reintroduce exercise and activity longer term, providing that it is appropriate for him to do so at the time.
- Ade may be seeking additional strengthening exercises so support with his fears of loss of muscle definition, or increased body weight, if not running, and therefore discussing with Ade about healthy approaches to exercise and exercise goals may be helpful, and avoiding prescribing exercises when not indicated, as this may be colluding with his eating disorder beliefs and behaviours. This is also the case when considering prescription of home exercises for his ankle, and being able to identify appropriate ankle exercises which support improved functional rehabilitation, and do not feed into rigid repetitive exercise routines for weight/shape or muscle definition.

In case study two, the patient was open about his eating disorder, and his relationship with exercise. However, this might not always be the case and individuals may not feel able to disclose an eating disorder history or may not have had an eating disorder diagnosis.

If concerns are identified about a patient's presentation, then it is important to ensure additional support is obtained, as appropriate. For example, concerns may include assessment findings not correlating as expected with reported history, MSK injuries not improving in line with treatment and advice given, or there are concerns about body weight/weight loss over the course of treatment session. If concerns are identified then they should be escalated using local escalation processes with a clinical supervisor, and/or feedback to a mental health team, or the patients GP.

Additional information on considerations for Physiotherapists when supporting a patient with a mental health condition, in a non-mental health setting, can be found via this link

https://www.csp.org.uk/system/files/publication_files/Guide%20to%20treating%20patients%20with%20a%20mental%20health%20condition.pdf

10. Considerations for governance, workforce planning and future development

The role of physiotherapy can bring great value to eating disorder treatment approaches, however, as mentioned throughout this document, it is vital that physiotherapy input is delivered as part of an MDT approach. This not only supports complex risk management and treatment delivery but also results in enhanced care and potentially improved patient compliance, engagement and outcomes.



“We find eating disorder physiotherapy an essential resource in our inpatient treatment programme, in particular their role in addressing compulsive exercise. The success of these interventions for this patient group suggests that specialised targeted physiotherapeutic interventions would also benefit those patients treated in the community. As more comprehensive services are being developed to support patients with Anorexia Nervosa, specialised physiotherapy should be considered a valuable asset to multidisciplinary teams”

Dr. Jaco Serfontein, Consultant Psychiatrist, S3, Cambridge and Peterborough NHS Foundation

Inclusion within an MDT approach, whether this be embedded within an acute service, or within a community team, also provides greater support for the Physiotherapist. This can be in the form of inclusion within clinical case discussions, clinical supervision and training opportunities. In order to ensure best practice and enhance skill development, Physiotherapists must be provided with opportunities for professional development, including low level psychological interventions, such as motivational interviewing and CBT approaches.

In line with clinical governance and CSP requirements, Physiotherapists must receive clinical supervision. Given the currently limited number of Physiotherapists working within eating disorders clinical supervision opportunities specific to this clinical area may be limited, and consideration is needed for alternative

opportunities, such as a combination of physiotherapy and clinical psychology supervision or seeking external clinical supervision from a Physiotherapist working within eating disorders out with their organisation.

Physiotherapists may be commissioned to work within NHS acute or community settings or may work within the private sector. Irrespective of clinical setting or organisation, the need for an MDT approach remains vital, and links must be established where possible. A further consideration when working privately and separate to a specialist eating disorder team, is to ensure access is gained to accurate and open information from the patient regarding their health status, eating disorders behaviours and risk management. Due to the nature of an eating disorder, some patients may be intentionally secretive and withhold information, or find it difficult to speak openly with a clinician, all of which will impact on risk management and ensuring safe and appropriate treatment planning. In addition, it is essential to obtain consent to share information and link with the patient's GP and eating disorder team, if they are providing care, to be able to feedback on physiotherapy assessment and treatment. Ensure local procedures are followed in any Safeguarding/Adult Support and Protection cases.

Supporting the role of physiotherapy in eating disorders

As the role of physiotherapy in eating disorders continues to widen in recognition in the UK, and evidence base develops, eating disorder services will be considering how the role can be embedded within their provision. It is hoped that this guidance document will be a valuable resource to guide discussions with service providers and commissioners and demonstrate the vital role physiotherapy can have as part of eating disorder treatment.

Appendix II provides an example of physiotherapy competencies specific to working in eating disorders and can be used as a guide framework for both professional development and well as service commissioning.

Consideration is also needed of the risks to patient care and service delivery if physiotherapy is not part of eating disorder treatment:

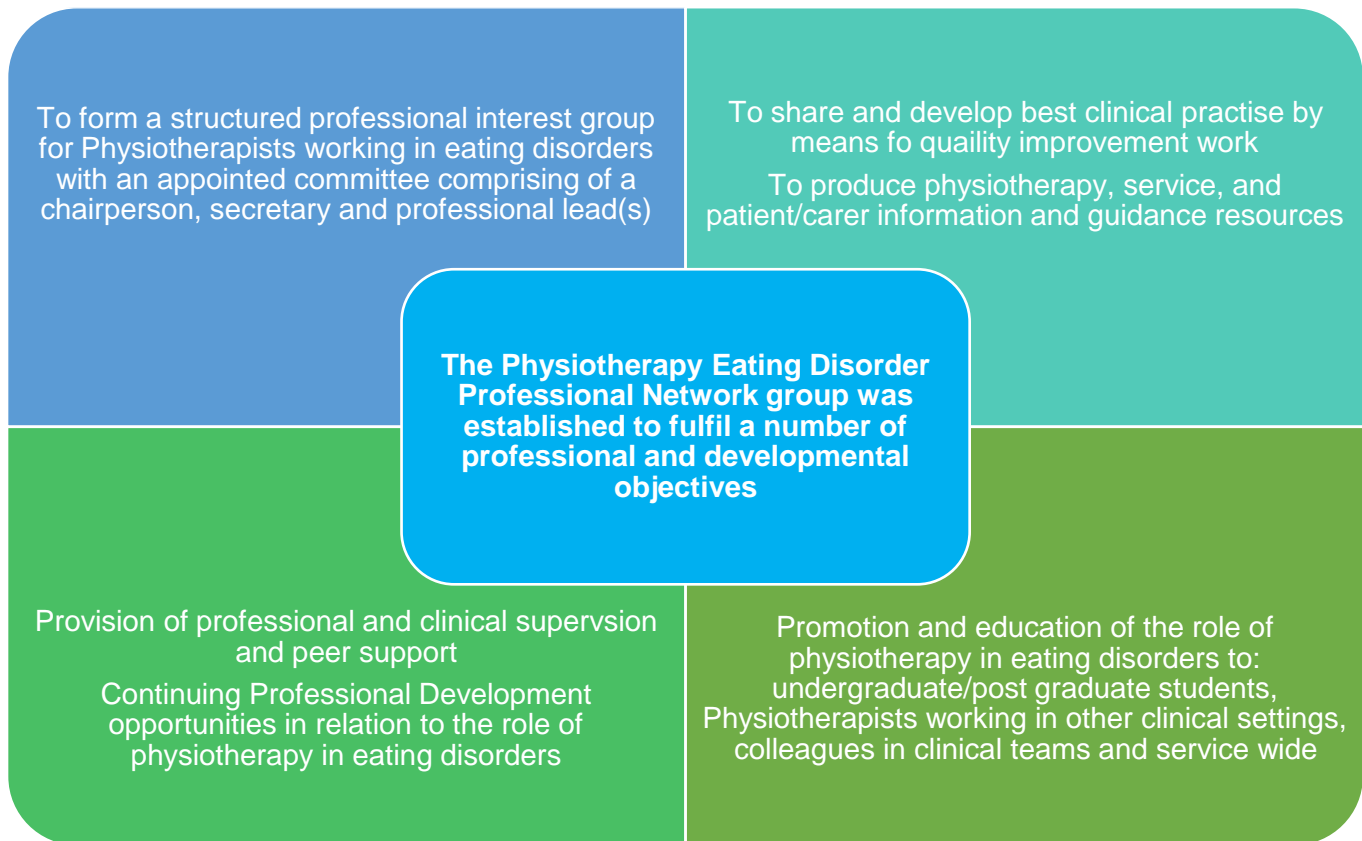
- Gaps in physical health and functional needs being met.
- Limitations in assessment and treatment of reduced mobility and prevention and management of falls
- Functional and transfer assessment and rehabilitation needs not being met, leading to limitations in quality of life and poor longer-term functional outcomes, as well as reductions in independence and functional tolerance with activities of daily living
- Limited support with posture care and skin integrity through pressure care
- Not being able to provide nursing staff with guidance on moving and handling and safe transfers/ways to manage poor functional abilities and falls risk
- Limitations in advice on adapting a mental health environment to support individuals with physical health and functional needs.
- Having no dedicated professional to prescribe safe exercise throughout the patient's pathway – needing to prescribe exercise that is safe, and adapted to the patient's physical, medical and psychological needs and risks.
- No educational opportunity for management of dysfunctional exercise, understanding their relationship with exercise and how to challenge exercise beliefs and approaches in order to develop a healthier relationship with exercise and prepare for re-starting exercise during admission, in preparation for discharge and then longer term. There is evidence that if patients don't address this there is a greater risk of relapse and lengthier admissions.
- No physiotherapy input for patients with co-morbidities, for example neurology, or cardio-respiratory which have required specific physiotherapy intervention and rehabilitation needs
- Gap in the provision of education and lifestyle advice, and prescription of exercise, in relation to bone health, or the orthopaedic management of osteoporosis and resultant osteoporosis injury longer term.

- Gap in provision of support for musculoskeletal and orthopaedic conditions associated with low body weight, reduced bone health or the effects of dysfunctional exercise.
- Increased risk of chronicity and relapse from limitations in assessment and treatment of negative body image experience and compulsive exercise.
- Lack of a full holistic approach to treatment with physiotherapy not forming part of the multi-professional team.

Furthermore, the inclusion of physiotherapy into eating disorder treatment provides the following opportunities:

- Physiotherapists working in mental healthcare have specialist skills in understanding and adapting treatment to support the combination of pathophysiology and psychopathology of eating disorders and have enhanced skills in communication, educational and motivational techniques.
- Embedding physiotherapy skill set into the MDT treatment pathways for eating disorder services, therefore widening treatment opportunities, and improving patient experience
- Potential reduction in relapse rates for individuals where dysfunctional exercise is a component of their eating disorder
- Potential for service continuity regarding physiotherapy input and so enhancing transition from acute to community and from children's services to adult's services as required.
- Improved outcomes around quality of life. As demonstrated in reducing risks above.
- Potential income generation through educational and supervisory roles of physiotherapy in eating disorders out-with the organisation.
- Increased opportunity to support the development of future workforce by offering specialist eating disorder pre and post registration physiotherapy education, through specialist placements across both adults and children's services.
- To develop research pathways in an area of physiotherapy where research base is limited. Having dedicated physiotherapy roles within eating disorder services will allow for the development of research opportunities in relation to eating disorders and physiotherapy.

Physiotherapy Eating Disorder UK Professional Network



The Physiotherapy Eating Disorder UK Professional Network is a subgroup of the Chartered Physiotherapists in Mental Health who provide training and develop opportunities for Physiotherapists working within mental health settings. <https://cpmh.csp.org.uk> www.csp.org.uk

Whilst this document is aimed at Physiotherapists working within the UK, linking with international physiotherapy colleagues brings greater opportunity for professional development and peer support. Physiotherapists working within eating disorders within countries such as Belgium, Germany and Scandinavia, have pioneered the role, have extensive knowledge and expertise, and have developed valuable research and resources, particularly in relation to body image and body awareness. <https://www.iopthm.org>.

Further workforce development and research

It remains a key priority for the Physiotherapy Eating Disorder UK Professional Network to develop learning opportunities for current and future physiotherapy workforces, as well as linking with training opportunities for the wider MDT, which will support wider recognition of the physiotherapy role in eating disorders. Undergraduate physiotherapy training provides an excellent opportunity to consider how physiotherapy can support eating disorder treatment within specialist eating disorder services, as well as in other clinical settings where patients may be referred with an eating disorder or eating disorder history. New and emerging specialist eating disorder clinical placements, and practice-based learning opportunities within wider mental health placements, have begun to raise awareness in learning institutions, and a greater number of final year students are exploring the eating disorder role as part of their search thesis. However, this remains limited to specific areas of the UK, and linked to services who currently have Physiotherapists as part of eating disorder

services. The overarching goal of increasing the physiotherapy workforce within eating disorders will therefore also support the development of greater placement and learning opportunities.

Development of high-level research will continue to support consideration of the inclusion of physiotherapy within national guidance and commissioning documents, such as NICE guidance. In 2022, The SIGN 164: Eating Disorder Guidelines was published and included physiotherapy due to its role in the management of dysfunctional exercise and activity <https://www.sign.ac.uk/our-guidelines/eating-disorders>

Physiotherapy clinicians working within eating disorder have key roles in developing evidence base, providing education opportunities to develop the future physiotherapy workforce, and widening understanding of the role with other members of the MDT, training providers and commissioning bodies. In addition, key areas for research development include evidence to support the inclusion of physiotherapy interventions as part of dysfunctional exercise management, prevention and management of osteoporosis and body awareness and body experience.

Appendix i - Glossary of Abbreviations and Terms

Abbreviations

ADHD	Attention Deficit Hyperactivity Disorder
ADL	Activities of Daily Living
AN	Anorexia Nervosa
ARFID	Avoidant-Restrictive Food Intake Disorder
ASD	Autism Spectrum Disorder
BAI	Becks Anxiety Inventory
BAT	Body Attitude Test
BCAQ	Body Checking and Avoidance Questionnaire
BED	Binge Eating Disorder
BMD	Bone Mineral Density
BMI	Body Mass Index
BN	Bulimia Nervosa
BP	Blood Pressure
BPD	Borderline Personality Disorder
bpm	beats per minute
CAMHS	Children and Adolescent Mental Health Services
CK	Creatine Kinase
CBT	Cognitive Behavioural Therapy
CPMH	Chartered Physiotherapists in Mental Health
CSP	Chartered Society of Physiotherapists
DMS-5	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
DXA	Dual Energy X-ray Absorptiometry
ECG	Electrocardiogram
EDS	Ehler's Danlos Syndrome
EUPD	Emotionally Unstable (borderline) Personality Disorder
FRAX	Fracture Risk Assessment
GP	General Practitioner
HGS	Hand Grip Strength
HR	Heart Rate

ICD-11	Eleventh Revision of the International Classification of Diseases
JHM	Joint Hypermobility
LEAP	Loughborough Eating Disorder Activity Programme
MDT	Multi-disciplinary Team
MEED	Medical Emergencies in Eating Disorders
MSK	Musculoskeletal
NICE	National Institute for Clinical Excellence
PBM	Peak Bone Mass
OCD	Obsessive compulsive disorder
OSFED	Other Specific Feeding and Eating Disorders
QTc	Corrected QT (start of the Q wave to end of the T wave) interval
REDs	Relative Energy Deficiency in Sport
RCP	Royal College of Psychiatrists
ROS	The Royal Osteoporosis Society
SEED	Severe and Enduring Eating Disorder
SEES	Safe Exercise at Every Stage
SIGN	Scottish Intercollegiate Guidelines Network
SUSS	Test Sit-Up– Squat Stand Test
T1DE	Type 1 Diabetes and Eating Disorders
WHO	World Health Organization

Terms

Activities of Daily Living (ADL): Activities of daily living are essential and routine tasks that most healthy individuals can perform without assistance. These can include skills required to manage one's basic physical needs, including personal hygiene, dressing, toileting, transferring or mobilising, and eating. The Instrumental Activities of Daily Living include more complex activities related to the ability to live independently in the community. These include activities such as e.g., managing finances and medications, food preparation, housekeeping, laundry (Edemekong *et al.*, 2022)

Anorexia Nervosa (AN): Is a psychiatric disorder characterized by significantly low body weight for the individual's height, age, developmental stage or weight history that is not due to another health condition or to the unavailability of food. Low body weight is accompanied by a persistent pattern of behaviours to prevent restoration of normal weight, which may include behaviours aimed at reducing energy intake (restricted eating), purging behaviours (e.g., self-induced vomiting, misuse of laxatives), and behaviours aimed at increasing energy expenditure (e.g., excessive exercise), typically associated with a fear of weight gain. Low body weight or shape is central to the person's self-evaluation or is inaccurately perceived to be normal or even excessive (ICD-11, 2019/2021).

Binge Eating Disorder (BED): Binge eating disorder is characterized by frequent recurrent episodes of eating significantly more food in a short period of time (e.g., once a week or more over a period of several months) than most people would eat under similar circumstances, during which the individual experiences a subjective loss of control overeating. Someone with binge eating disorder may eat too quickly, even when he or she is not hungry. The person may have feelings of guilt, embarrassment, or disgust and may binge eat alone to hide the behaviours. There is a substantial difference between binge eating disorder and the common phenomenon of overeating. Recurrent binge eating, although less common than overeating, is far more severe, and is associated with significant physical and psychological problems (ICD-11, 2019/2021).

Body Image/Body Experience: Body image/Body Experience is a multidimensional, subjective and dynamic concept that encompasses a person's perceptions, thoughts and feelings about his or her body (Prnjak *et al.*, 2022). Disordered body image arises when cognitions and emotions associated with an individual's body image perception and satisfaction begin to detrimentally affect their self-worth or body esteem or result in clinical distress and dysfunctional behaviours.

Body Mass Index (BMI): BMI is a statistical measure of an adult's weight to height to broadly place them into the following categories; underweight, normal weight, overweight and obese. An individual's BMI is important in the determination of potential future health issues and has been widely used as a factor in the determination of various public health policies. BMI can be calculated metrically: weight (kilograms) divided by height squared (meters) - $BMI = \text{kg/m}^2$ (Zierle-Ghosh *et al.*, 2022)

Bulimia Nervosa (BN): Bulimia Nervosa is a psychiatric disorder characterised by frequent, recurrent episodes of binge eating. A binge eating episode is a distinct period of time during which the individual experiences a subjective loss of control overeating, eating notably more or differently than usual, and feels unable to stop eating or limit the type or amount of food eaten. Binge eating is accompanied by repeated inappropriate compensatory behaviours aimed at preventing weight gain (e.g., self-induced vomiting, misuse of laxatives or enemas, strenuous exercise). The individual is preoccupied with body shape or weight, which strongly influences self-evaluation. There is marked distress about the pattern of binge eating and inappropriate compensatory behaviour or significant impairment in personal, family, social, educational, occupational or other important areas of functioning (ICD-11, 2019/2021)

Dysfunctional Exercise: Exercise associated with an eating disorder has been given many different titles in the literature including, exercise addiction, exercise abuse, excessive exercise, exercise anorexia and

obligatory exercise. However, the term 'dysfunctional exercise' may be more appropriate as it reflects the wide range of reasons and ways exercise when this is part of an eating disorder. Individuals driven by dysfunctional exercise beliefs and behaviours often find it difficult to be restful or engage in more sedentary activities, due to experiencing feelings of guilt or laziness, or fear of excessive weight gain. Exercise can be a very powerful tool in maintaining an eating disorder because of the strong influence that exercise can have on weight control and/or in managing challenging emotions in particular negative experiences of the body. It can develop into a strong compensatory behaviour and coping strategy for the eating disorder and can lead to exercise dependence and increased negative emotions if exercise opportunities are reduced or not available

Exercise: Exercise is a subset of physical activity that is planned, structured, and repetitive and has a final or an intermediate objective, the improvement or maintenance of physical fitness (Caspersan *et al.*, 1985).

Exercise Prescription: Exercise prescription commonly refers to the specific exercise plan of fitness-related activities that are designed for a specified purpose, which is developed by a Physiotherapist for the patient. Due to the specific and unique needs and interests of the patient, the goal of exercise prescription should be successful integration of exercise principles and techniques that motivates the patient to be compliant, thus achieving their goals of safely returning to exercise. Ensuring that this shouldn't increase the risk of injury and/or risk of relapse. Components should include; the type of exercise or physical activity plan that compliments your treatment goals with an understanding of current mental and physical health and the precautions around this, how intense, how long and the frequency of the activity or exercise, understanding of the persons current level of fitness, strength, balance and general conditioning.

Health Professional: For the purpose of this guideline, this broad range category will encompass clinicians and researchers who hold a minimum of a bachelor's degree recognising certification in health service provision. This may include but is not limited to, General Practitioners, Specialist Doctors, Psychiatrists, Nurses, Psychologists, Physiotherapists, Dietitians or Occupational Therapists.

Frailty: Frailty is theoretically defined as a clinically recognizable state of increased vulnerability resulting from aging-associated decline in reserve and function across multiple physiologic systems such that the ability to cope with every day or acute stressors is comprised. In the absence of a gold standard, frailty has been operationally defined as meeting three out of five phenotypic criteria indicating compromised energetics: low grip strength, low energy, slowed waking speed, low physical activity, and/or unintentional weight loss (Fried *et al.*, 2001).

Genogram: The genogram is a visual representation of multiple generations of a family, structured like a family tree. Genograms can include the symbolic depiction of relatively objective 'factual' information, such as family structure, sociodemographic, deaths, disease and illness, as well as subjective information including relational dynamics, stressful life events, behaviours and culture (Mackay, 2015)

Goal Setting: Goal setting between Physiotherapists and their patients is a complex and fundamental part of rehabilitation. It is "the formal process whereby a professional or the MDT, together with the patient and/or their family, negotiate goals". Goal setting is used to direct interventions towards a specific outcome(s) and can result in greater patient satisfaction and improved recovery. Shared goal setting can also co-ordinate members of the MDT and ensure they are working together towards a common goal. Goals can also be used to evaluate the success of rehabilitation interventions (Wade, 2009). One common method of goal setting is SMART goals. There are some variations, but it is generally accepted that the acronym stands for Specific, Measurable, Attainable, Realistic and Timely.

Healthy/Healthful Exercise: Exercise that is undertaken safely and in a manner that promotes the best outcome from both a physical and psychosocial perspective

Inpatient Treatment: Inpatient treatment will always be necessary for the most severe and urgent cases of eating disorders. Inpatient hospitalisation is provided to individuals who are physiologically and/or psychologically compromised and require intensive medical and/or psychological stabilisation (Geller *et al.*, 2012)

Intuitive Movement: “Movement that is done with attention, purpose, self-compassion, acceptance, awareness, and joy... focused on the process of becoming more connected, healthier, and stronger” (Calodergo and Pedrotty-Stump, 2010)

Likert Scale: A Likert scale is a rating scale used to measure opinions, attitudes, or behaviors. It consists of a statement or a question, followed by a series of five or seven answer statements. Respondents choose the option that best corresponds with how they feel about the statement or question.

Lived Experience: In phenomenological research, lived experience is a person’s perspective of a situation that was acquired through their first-hand account of a situation (Creswell, 2007)

Multiagency Working: This refers to the joint planning and delivery of co-ordinated services.

Multidisciplinary Team: This refers to a group of professionals from a range of disciplines who are working collaboratively in support of an individual. While this may include any health professional, clinical guidelines for eating disorders recommend that this team should minimally include professionals administering medical, psychological and dietetic interventions

Other Specified Feeding and Eating Disorder (OSFED): Other specified feeding or eating disorder is applicable to individuals who are experiencing significant distress due to symptoms that are similar to disorders such as anorexia, bulimia, and binge-eating disorder, but who do not meet the full criteria for a diagnosis of one of these disorders (ICD-11, 2019/2021).

Outpatient Treatment: The NICE Eating Disorder guidelines recommends that most patients with eating disorders who are medically stable should be treated on an outpatient basis with evidence-based therapies such as eating-disorder-focused cognitive behavioural therapy (CBT-ED) and family-based treatments. Outpatient treatment can be undertaken in specialist day services or specialist outpatient services

Physical Activity: Any bodily movement produced by skeletal muscles that results in energy expenditure (McArdle *et al.*, 2010)

Psychoeducation: Psychoeducation refers to the process of providing education and information to those seeking or receiving mental health services, such as people diagnosed with mental health conditions (or life-threatening/terminal illnesses) and their family members. Psychoeducation, the goal of which is to help people better understand (and become accustomed to living with) mental health conditions. It is generally known that those who have a thorough understanding of the challenges they are facing as well as knowledge of personal coping ability, internal and external resources, and their own areas of strength are often better able to address difficulties, feel more in control of the condition(s), and have a greater internal capacity to work toward mental and emotional well-being.

Quality of Life: WHO defines quality of life as “an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” (WHO, 2023)

Readiness to Change: Readiness is associated with change. To succeed, you need to understand the three most important elements in changing a behavior are readiness to change, barriers to change and likelihood of relapse

Risk Assessment: Risk assessment in healthcare refers to the process of calculating and evaluating a person's current health status and identifying health risk factors. Health risk assessment takes many factors into consideration including physical, psychiatric and psychosocial risks.

Social Media: Social media are interactive technologies that facilitate the creation and sharing of information, ideas, interests and other forms of expression through virtual communities and networks.

Transitions: Transitions are inevitable in treatment and in life. However, eating disorder patients and their families/carers during transitions of care and in life can face specific risks in terms of the impact on the illness. With any transition there is a need for thorough and prompt care planning which is tailored to the individual's needs this include transition through different services e.g., CAMHS to adult outpatient services or in life e.g., moving away from home to go to university.

Appendix ii

Example of a competency framework for physiotherapy in eating disorders

Mental Health Competency Framework: Eating Disorders

Learning outcomes:

1. To understand the classification of eating disorders including;
 - Anorexia Nervosa (AN) subtypes – restrictive or binge/purge
 - Bulimia Nervosa (BN)
 - Binge Eating Disorder (BED)
 - Other Specified Feeding and Eating Disorders (OSFED)
 - Type 1 diabetes and eating disorders (T1DE)
2. To be able to identify the physical and psychological effects of eating disorders
3. To have an understanding of the physiology of starvation
4. To have an understanding of re-feeding syndrome
5. To have an understanding of the impact of low body weight on pre-existing co-morbidities
6. To gain an understanding of evidence based behavioural and psychological interventions and approaches used in eating disorders treatment
7. To gain knowledge of medication used in the treatment of eating disorders
8. To understand the specialist role that the Physiotherapist plays within a multidisciplinary eating disorders team
9. To understand dysfunctional exercise
10. To have an understanding of the concept of body image
11. To have an understanding of relaxation and the effects of stress on the body
12. Demonstrate ability to complete a subjective physiotherapy assessment including:
 - Assessing for initiating and maintaining factors
 - Assessing for dysfunctional exercise and their relationship with exercise
 - Assessing for negative experience of body or body image dissatisfaction
13. Be able to carry out a functional objective assessment of an eating disorder patient (including those at a really low weight/high medical risk)
14. Be able to identify risk factors
 - Refeeding risks
 - Electrolyte imbalances
 - Vomiting/laxative use
 - Temperature
 - Postural Hypotension
 - Syncope/Fainting
 - Tachycardia/Bradycardia
 - Over drinking
 - Falls
 - Osteoporosis and bone health
 - Self-harm and suicide risks

15. Identify Outcome Measures used by Physiotherapists in eating disorders
 - Body Attitude Test
 - Compulsive Exercise Test
 - Additional Exercise and Physical Activity Outcome Measure
 - Body Checking and Avoidance Questionnaire
 - Body Image Continuum Scale
 - Body Image satisfaction/dissatisfaction
 - 4 Lens Drawings
 - Patient Specific Functional Tool
 - Tragus to Wall Test
 - Hand Grip Strength
 - Squat test and sit up test
 - Timed Loaded Standing Test
 - Beck's Anxiety Inventory Index
16. Be able to devise physiotherapy patient specific goals in line with patients' overall treatment plan
17. Be able to deliver effective one to one psychoeducation in the management of dysfunctional exercise
18. Be able to recommend a safe amount of physical activity and structured exercise to the MDT and patient taking into account stage of recovery and any physical or psychological risks
19. Be able to deliver an effective group programme for the management of dysfunctional exercise
20. Be able to deliver effective one to one treatment for negative experience of body/body image dissatisfaction including:
 - Psychoeducation
 - Basic Body Awareness Therapy
 - Mirror Therapy
21. Be able to deliver effective group programmes for negative experience of body
 - Psychoeducation
 - CBT approach
 - Basic Body Awareness Therapy
22. Be able to deliver effective relaxation sessions to patients either individually or as part of a group

Learning Outcome	2-3-4 Support staff	5 Rotational	6 Specialist	7 Highly Specialist / Advanced Specialist	8+ Advanced Practitioner	Date competency achieved / demonstrated *	Initials (mentor and mentee)	Comments / methods used to demonstrate knowledge
1 To understand the classification of eating disorders	Essential	Essential	Essential	Essential	Essential			
2. To be able to identify the Physical and Psychological effects of eating disorders	2-3 Desirable 4 Essential	Essential	Essential	Essential	Essential			
3. To have an understanding of the physiology of starvation	2-3 Desirable 4 Essential	Essential	Essential	Essential	Essential			
4. To have an understanding of re-feeding syndrome	2-3 Desirable 4 Essential	Essential	Essential	Essential	Essential			
5. To have an understanding of the impact of low body	2-3 Desirable	Essential	Essential	Essential	Essential			

weight on pre-existing co-morbidities	4 Essential							
6. To gain an understanding of evidence based behavioural and psychological interventions and approaches	Desirable	Desirable	Essential	Essential	Essential			
7. To gain knowledge of medication used in the treatment of eating disorders	Desirable	Desirable	Essential	Essential	Essential			
8. To understand the specialist role that the Physiotherapist plays within a multidisciplinary eating disorders teams	Desirable	Essential	Essential	Essential	Essential			
9. To understand dysfunctional exercise	Desirable	Essential	Essential	Essential	Essential			
10. To have an understanding of the concept of body image	Desirable	Essential	Essential	Essential	Essential			
11. To have an understanding of relaxation and the effects of stress on the body	Desirable	Essential	Essential	Essential	Essential			
12. Demonstrate ability to complete a subjective	N/A	Desirable	Essential	Essential	Essential			

Physiotherapy assessment								
13. Be able to carry out a functional objective assessment of an eating disorder patient	N/A	Desirable	Essential	Essential	Essential			
14. Be able to identify risk factors	N/A	Desirable	Essential	Essential	Essential			
15. Identify Outcome Measures used by Physiotherapist in eating disorders	N/A	Desirable	Essential	Essential	Essential			
16. Be able to devise physiotherapy patient specific goals in line with patient's overall treatment plan	N/A	Desirable	Essential	Essential	Essential			
17. Be able to deliver effective one to one psychoeducation in the management of dysfunctional exercise	N/A	Desirable	Essential	Essential	Essential			
18. Be able to recommend a safe amount of physical activity and structured exercise to the MDT and patient taking into account stage of recovery and any	N/A	Desirable	Essential	Essential	Essential			

physical or psychological risks								
19. Be able to deliver effective group programmes for the management of dysfunctional exercise	N/A	Desirable	Desirable	Essential	Essential			
20. Be able to deliver effective one to one treatment for negative experience of body/body image dissatisfaction	N/A	Desirable	Desirable	Essential	Essential			
21. Be able to deliver effective group programmes for negative experience of body	N/A	Desirable	Desirable	Essential	Essential			
22. Be able to deliver effective relaxation sessions to patients either individually or as part of a group	2 - N/A 3-4 Desirable	Essential	Essential	Essential	Essential			

Future action plan (if required)

- .
- .
- .

Learning Methods <ul style="list-style-type: none"> • Independent study • Engagement with patients • Attending in-service training • Physiotherapy Professional network training days • Supervision with colleagues • Reflection • Peer review 	Reading List <ul style="list-style-type: none"> • Physiotherapy in Eating Disorders Professional Network (CPMH web page) • SEES Document SEES (safeexerciseateverystage.com) • NICE guidelines Overview Eating disorders: recognition and treatment Guidance NICE • SIGN guidelines SIGN 164 Eating disorders Revised August 2022 • Minnesota starvation study • ICD-11 • DSM • MEED Medical Emergencies in Eating Disorders Medical emergencies in eating disorders (MEED): Guidance on recognition and management (CR233) (rcpsych.ac.uk)
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Intuitive Movement Exercise Prompts

Physical

- Do I have any injuries or illnesses?
- How has my sleep been?
- Am I tired/run down?
- Am I adequately nourished and hydrated for this movement?

Emotional:

- What is the reason for exercising right now?
- Is there another coping mechanism I could use? e.g. talk to someone

Behavioural:

- Have I eaten sufficiently to nourish my body yesterday, today and do I plan on continuing tomorrow?
- What exercise did I do yesterday, today and do I plan on exercising tomorrow?
- Am I sacrificing anything to exercise right now?

Intuitive movement principles

Will this exercise:

- Rejuvenate my mind and body, not exhaust or deplete them?
- Enhance mind-body connection, not allow or induce disconnection?
- Alleviate mental and physical stress, not produce more?
- Provide a genuine enjoyment, not pain or dread?

GREEN FLAGS OF HEALTHY MOVEMENT

(USE DURING MOVEMENT)

- | | |
|---|---|
| <input type="checkbox"/> Safe | <input type="checkbox"/> Pain-free |
| <input type="checkbox"/> Fun | <input type="checkbox"/> Notice mind and body cues |
| <input type="checkbox"/> Symptom-free | <input type="checkbox"/> Able to adjust exercise |
| <input type="checkbox"/> Rejuvenating | <input type="checkbox"/> Good form |
| <input type="checkbox"/> Energy-enhancing | <input type="checkbox"/> Variety |
| <input type="checkbox"/> Focussed/present | <input type="checkbox"/> Can handle unexpected change |
| <input type="checkbox"/> Healthy intentions | |

RED FLAGS OF DYSFUNCTIONAL MOVEMENT

(USE DURING MOVEMENT)

- | | |
|--|---|
| <input type="checkbox"/> Unnourished/dehydrated | <input type="checkbox"/> Guilt |
| <input type="checkbox"/> Symptoms presenting or worsening (e.g. dizziness) | <input type="checkbox"/> Need to go harder/longer |
| <input type="checkbox"/> Injury/illness worsening | <input type="checkbox"/> Can't rest even if needing to |
| <input type="checkbox"/> Pain worsening | <input type="checkbox"/> Strong drive to control weight |
| <input type="checkbox"/> Exhaustion | <input type="checkbox"/> Rigid rules |
| <input type="checkbox"/> Punishment | <input type="checkbox"/> Only way to feel better/cope |
| <input type="checkbox"/> Numb out | <input type="checkbox"/> Dread |
| | <input type="checkbox"/> Interrupting other commitments |

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