Wirral University Teaching Hospital
NHS Foundation Trust

Wirral Children's Occupational Therapy Service

Motor skills Information Folder

Secondary Age

Cherry Tree House, Clatterbridge Hospital

Children's OT department on 0151 482 7732

This booklet has been designed for children who have been assessed via the OT motor skills pathway. It contains activity ideas for parents/ guardians/ schools to complete with the child to develop motor coordination skills.

INDEX

Motor skills

Motor skills are part of your child's everyday life and are the basic movement skills that allow us to do the things we want and need to do throughout the day. They can be separated into gross motor skills, and fine motor skills.

Gross motor skills use the large muscle groups, which work together to produce actions such as walking, running, jumping, catching, and throwing. They need a good deal of strength, control, and whole-body co-ordination.

Fine motor skills use only the smaller body parts, such as the hands, and they make different demands on the body. These include skills such as eating, writing, using scissors, fastening buttons, and manipulating toys.

In young children, gross movements develop first, and these relate to the early developmental milestones of sitting, rolling, crawling, and walking. As fine motor skills develop later, children will have had less practice in fine motor activities, and this explains why some children are, for example, able to run and jump well, but cannot control a pencil. This also explains why problems may not always be evident in the early years.

However, sometimes children find fine motor activities easier, because when the main part of the body is fixed, as in sitting, it does not need to be controlled as much, which then allows more concentration to be given to the moving parts.

Children need to experience movement in order to learn about themselves, and how they relate to the environment around them. In order to move well, a child must be able to:

- Know where all the parts of their body are.
- Control the body as it moves.
- Co-ordinate the different parts of their body so that movement is smooth.
- Judge the amount of force, strength, and speed needed.
- Understand directionality – up/ down, back/ front, left/ right, top/ bottom etc.
- Appreciate the rhythm and timing of movements.
- Make safety decisions about when to move, and where to.
- Be able to stay still.

What if there is a motor skill problem?

Children with co-ordination difficulties generally have difficulty completing or performing motor tasks that they want to do, in a smooth and successful manner. As a result, they may appear clumsy and uncoordinated and the quality of their movements and the speed at which they can learn new skills tend to differ from most children of their age. These difficulties are not related to intelligence.

However, no two children are the same, and there are many different sorts of motor and learning difficulties.

By the time a child is five, six or seven, they have usually made a great deal of progress in their motor development. They can run, jump, balance, climb and swing. Many also like to challenge themselves further, by adding bicycles, skateboards, or roller skates. But children with co-ordination difficulties may not have developed all of the movement skills that allow us to do these things. For these children, just coping with everyday activities, such as getting dressed, can be challenging enough, and for some, can be an overwhelming difficulty.

Why do they have these difficulties?

Moving well (smoothly and efficiently) in different environments depends on the following skills:

- Perception – the ability to recognize process and make sense of information coming into the senses, from the environment.
- Planning – the ability to build a mental picture or plan of how to do something.
- Organising – the ability to actually carry out the movement.

In normal movement, information comes into the brain through the senses - sight, hearing, touch, smell, vestibular(balance), and proprioception (body position). The brain makes sense of this information and decides what is a sensible way to respond to this. It then sends messages back to the muscles and joints, telling the body how to move. For example, if you put your hand too near a fire, the sensation of heat travels along the nerves, to the brain. These signals are interpreted as being hot, and the brain figures out the potential safety hazard that we might burn. This then sends a message to the arm muscles and joints, to pull the hand away from danger.

To be able to move well, without fumbling and stumbling, the information coming in from senses must be clear, and the processing system must work correctly. If the messages getting to the brain from the senses are not accurate, then this will affect how it is interpreted.

At the interpretation, or processing stage, there are two kinds of problem. Some children may not be able to plan what kinds of actions are appropriate, but for others, the organization is the problem. They know intellectually what they want to do, but lack the memory of previous movement patterns, to help them organize their movement in a sensible order.
At the execution stage, children might not have the body awareness, strength, stamina, balance, or co-ordination skills to do what the brain is trying to tell the body to do.

Feedback is an important part of the process. Experiences of movements are stored in our memories, and we use them to figure out the best way of doing

things, or to figure out how to do something new, that is similar to something we have done before, but may be a little more challenging.

However, if the movement patterns used in the original memory were faulty, then attempts at repeating the action, or expanding on it will also be faulty, as the 'recipe' is incorrect. This explains why practice alone will not necessarily improve performance, because unless the movements are correct in the first place, the child will just get faster at doing the wrong thing!!

With the right type of practice though, children with co-ordination difficulties should be able to gain any skill they choose, so long as they are motivated. It may take longer than other children.

Is it a disorder or a disease?
Neither – children with Developmental Co-ordination Disorder (DCD) are healthy. They are of normal intelligence, and they do not have any known brain disorder. The cause is not known, but it has been shown to run in families, and more boys than girls have it, in a ration of 4:1. Research has shown that 5-10% of the population has motor co-ordination difficulties, and 2% of these are severely affected. This means there are 2-3 children with a co-ordination difficulty, in every classroom.

DCD is diagnosed by a collection of symptoms. We look at what the child can and can't do and see where they fit in the spectrum (or range) of the 'normal' population. However, DCD is sometimes seen alongside other conditions, such as ADHD/ ADD, Autism, and Dyslexia. This means it can be difficult to pinpoint exactly which aspect is causing the main problem for a child in their daily activities.

What is the difference between Dyspraxia and DCD?
Developmental Co-ordination Disorder (DCD) is a general term, which covers all types of co-ordination difficulties. Dyspraxia is a specific type of co-ordination problem, within that general 'umbrella' term.
The child with dyspraxia has difficulty planning actions. They do not know what to do, or how to do it very well. The child with DCD is more likely to be aware what they need to do but are not able to do it very well.
There is some confusion over the terminology used in the UK, because the term Dyspraxia, is often used by the media, teachers, and many medical and health professionals to mean all children with co-ordination difficulties.

Gross motor skills

Gross motor skills use the large muscle groups, which work together to produce actions such as walking, running, jumping, catching, and throwing. In order to achieve efficient gross motor co-ordination, you must have developed and integrated the following component skills: body awareness, postural stability, balance, bilateral integration, sensory processing, motor planning, eye-hand coordination.

Possible difficulties:

- **Falls, trips, and bump into things**
- **Poor coordination when walking, running, skipping, swimming, ball games, and school PE activities.**
- **Reluctant to participate in active sports and school PE activities.**
- **Tires easily.**
- **Poor balance, poor posture.**
- **Poor sitting posture.**
- **Difficulty in planning and carrying out a sequence of movements, difficulty changing direction or stopping and starting actions.**
- **Difficulty completing activities requiring coordination of both sides of the body (bilateral integration) e.g., bike riding.**

Body awareness: Body awareness is how conscious and connected you are to your own body. It helps us to be aware of the position and movement of body parts in relation to muscles and joints. Young people with body awareness challenges may rely heavily on their vision to tell them where their body is in space. The types of challenges you may see are difficulties with tooth brushing, fastening top buttons and bottom wiping because the child cannot see their hand position and movements. They may also struggle with concepts of left and right and knowing how to move one part of their body while keeping other parts still to produce co-ordinated movements.

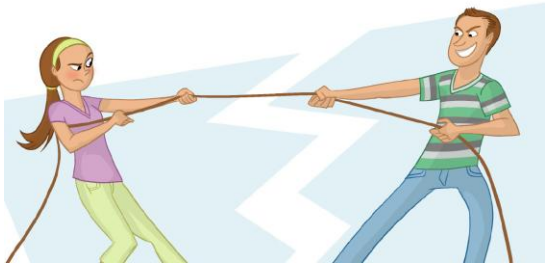
Activities that provide additional input to muscles and joints can be helpful to develop body awareness as the extra sensory input informs the brain about body position in space.

The following activities will help your child to develop body awareness:

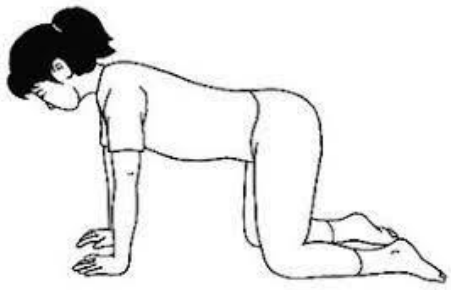
- **Twister/ twister air game**
- **Yoga**
- **Pilates**
- **Meditation**
- **Tai chi**
- **Massage**
- **Heavy work activities** that involve the muscles working against resistance such as: pushing/ pulling activities, moving heavier objects, using gym equipment, gardening, climbing activities.
- **Jumping jacks:** Stand upright with your legs together, arms at your sides. Bend your knees slightly and jump into the air. As you jump, spread your legs to be about shoulder-width apart. Stretch your arms out and over your head. Jump back to starting position. Repeat. Choose a length of time or number of repetitions that will allow your child to maintain good technique.

Postural stability: The following activities will help your child improve their hip and shoulder stability. Hip stability is related to the muscle strength around the hips, and it is important for good control in standing, and balancing.
Good shoulder stability enables a child to reach, grasp and weight bear through the arms. It is an important factor for control in handwriting, and general hand function

- **Arm wrestle:** Sit opposite the child with elbows on the table. Hold each other's hand and encourage the child to push against resistance.



- **Tug of war:** Can be done either sitting, kneeling or standing, using a rope, a twisted bathroom towel, scarf etc.



- **Push ups:** Kneel on all fours and bend the arms at the elbows so that you just touch the floor with the nose. Straighten the arms slowly and come back to all fours position. To encourage this, you could try placing a ball slightly in front of the hands to touch with the forehead – decrease the size of the ball as it gets easier.

- **Bridge:** Lie on your back with your knees bent and feet flat on the ground. Keep your arms at your side with your palms down. Lift your bottom off the ground. Hold your bridged position for 10 seconds and increase time as skills improve. To increase challenge cross arms over chest. It is important to get your child to hug their knees into their chest after holding the bridge position.

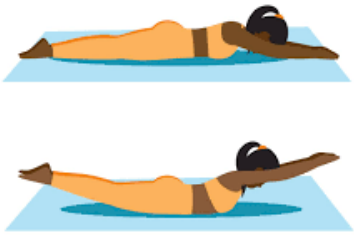
- **Wall press ups:** Stand an arm distance away from the wall. Lean on the wall, with the hands flat on it. Keeping the arms straight, push away from the wall using the fingers to get an upright position. As it gets easier, move the feet backwards so that there is a greater angle of lean against the wall.

- **Superman:** Kneel on all fours and stretch one arm straight out in front and the **opposite** leg straight out behind. Hold the superman for up to 30 seconds. It is very important that your child does not twist or arch their back.
  If this is challenging for your child build up to full superman pose. Do holding arms and legs straight individually and work on improving strength in each limb until not twisting and/ or collapsing. Make sure they count out loud to ensure they are breathing normally and not holding their breath.

- **Plank:** Place the forearms on the ground with elbows bent, aligned below the shoulders, and arms parallel to the body at about shoulder-width distance. Lift your knees and tummy off the floor. Back and hips should be straight – no bottoms raised in the air. Build up to a maximum hold for up to 20 seconds.

- **Dipping toes:** Stand on a sturdy step/ bottom stair and pretend you're standing on the side of a pool – trying to dip your toe in "water" to check the temperature! Do not put the whole foot onto floor, instead gently place the ball of your foot onto the floor. Do not allow your child to twist at the hips or be in a sideways position. Build up to 20 repetitions on each foot.

- **Ball rolling under foot:** Place your foot on a football and roll it back and forward. If this is too easy, roll it round in circles gradually making circles larger. Try on each leg.



- **Ball rolling on tummy:** Lying on your front, keeping your legs straight, raise the legs, head, chest, and arms off the floor at the same time, and hold position. Build on time your child can hold position. You can roll a ball on the floor back and forth between you and a partner whilst remaining in this position. Make sure that your arms and shoulders are lifted off the floor. Ensure the child does not hold for long period of time – up to 30 seconds is sufficient. Do not overdo this position - you should not feel pain in your body. They should rest down flat onto the floor at regular intervals.

- **Static wheelbarrow:** Support the lower part of your child's body on a small sturdy stool/ step/ block/ gym ball. Child supports their own weight through their arms whilst always keeping head up, fingers pointed forwards, and palms flat on floor. Start at your child's current level of ability building up to a maximum of 3 minutes. As their tolerance/ strength improves get your child to support self with one arm and carry out an activity with the other hand. Change arms to strengthen both sides.

Leisure activities are very important for young people to improve their postural stability. Here are some ideas you may wish to try:

- **Yoga**
- **Pilates**
- **Martial arts**
- **Dance classes**
- **Indoor climbing walls**
- **Swimming**
- **Bike riding**
- **Hiking**
- **Horse riding lessons**

Balance: Balance is concerned with maintaining good control of the posture, either whilst moving (dynamic balance) or when still (static balance). To improve balance you need to move and experience different activities to challenge your balance.

Activities to challenge and develop balance skills include:

- **Martial arts**
- **Gymnastics**
- **Yoga**
- **Pilates**
- **Aerobics**
- **Running/ jogging**
- **Dance classes**
- **Trampolining**
- **Bike riding**
- **Hiking over different surfaces**
- **Horse riding lessons**
- **Skateboarding**
- **Skating**

Aiming and catching: The following activities are aimed at improving ball skills, which involves the ability of the hands and eyes to work together. Children need to learn how to grade the force of their throw, keep their eyes on the ball and time / co-ordinate their body and hand movements to catch successfully.

- **Bounce and catch:** Bounce a large ball off the floor and catch with two hands. Encourage the child to hold the ball at waist height, bounce it once, and look at the ball to help them with judging speed and return of the bounce. Reduce the size of ball until the child can catch a tennis ball. Build up to bouncing and catching with one hand.

- **Bounce a ball repeatedly on the floor:** Encourage your child using the palm of their hand to bounce a ball repeatedly up and down from the floor. Try with one hand and then the other. Progress to trying alternate hands.

- **Throw and catch in the air:** Get the child to stand still and throw a bean bag or large ball up in the air (to eye level) and catch it. As skills develop the height thrown can be increased. Different types of balls can be tried (shapes, sizes, textures). Try throwing/ catching with one hand. Start with throwing up in air and then progress onto throwing and catching with another person.

- **Ball bounce to another person:** Encourage the child to throw the ball, with a single bounce to another person. The ball is then returned back to the child in the same way. Starting with a single ball bounce slows down the speed that the ball travels, giving the child more time to plan and organise their movements to catch successfully. Once this is achieved progress onto a smaller ball. Increase the distance between each other. Encourage catching between two hands not against the chest or tummy.

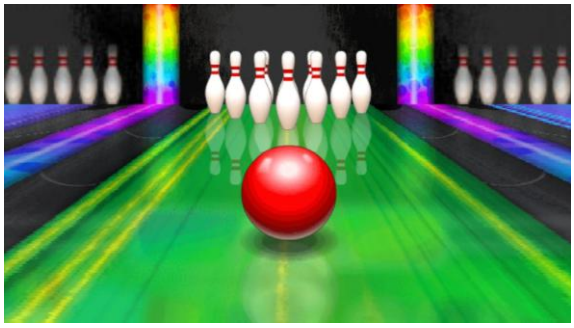
- **Throw and catch in pairs:** Throw and catch without the ball bouncing. Remember to try different size balls and gradually increase the distance between the participants. Encourage catching between two hands not against the chest or tummy.

- **Throwing and catching against the wall**: Practice with a large soft ball and throw underarm against the wall, allowing the ball to bounce once on the ground before catching with 2 hands. Encourage the child to catch using just 2 hands, not trapping the ball against the chest or tummy. As skills progress try catching without allowing the ball to bounce. Try reducing the size of the ball as skills develop. Finally, try catching the ball using just one hand.

- **Target skills:** Make some balls from rolled up socks or use bean bags. Throw them into a hoop/ bin/box. Vary target size and distance away from target. Skittle style games rolling a ball to hit a target are also helpful.

Leisure activities are very important for young people to improve their aiming and catching skills. Here are some ideas you may wish to try:

- **Target sports**
- **Hockey**
- **Football**
- **Tennis/ badminton**
- **Archery**



Fine motor skills

Fine motor skill is the ability to perform small precise hand movements with fluency and accuracy. It is based on efficient development of a variety of skills, including body awareness, processing touch sensations, postural stability and strength in the shoulder, wrist, and hand muscles.

Possible difficulties children with fine motor challenges experience:

- Aches in hand, arm or shoulder following fine motor tasks
- Difficulty using cutlery appropriately
- Difficulty with dressing skills e.g. fastening buttons, tying shoelaces etc.
- Manipulating or using tools – ruler, scissors, maths / science equipment, tools used in design technology / food preparation
- Poor handwriting – formation of letters, neatness, fluency and speed
- Difficulty with graphics and drawing
- Poor or variable presentation of written work due to muscle fatigue
- Poor accuracy with copying skills
- Difficulty manipulating small objects / dropping objects

Here are some activity ideas that can help to strengthen the muscles in the hands and develop manipulation skills:

- Art activities games - Hama beads, aqua beads, collages with scraps of paper (torn and cut) or material, hole punch “patterns” onto paper – folded paper or card provides more resistance so the hand muscles need to work harder.

- Drawing, colouring – using different media e.g. chalk, crayon, charcoal, felt tip. Try using crayon/ chalk snapped in half which the child holds with the thumb, index and middle finger. This helps to strengthen finger and thumb muscles.
- Sewing activities
- Using scissors

- Commercially available games such as Connect 4, Kerplunk, Operation, Jenga, jigsaw puzzles etc.

- Travel games with very small pegs.
- Construction games (multi-link games, Lego, brick building, Meccano, etc).
- Board games involving dice and counters. Dice games encourage the hands to be placed into a cupped position to shake the dice, which is good for developing hand arches.
- Playing card games.

- Origami/ paper folding i.e. fortune teller
- Mazes, word searches, word puzzles can be helpful for developing pen control skills
- Theraputty / Therapy Putty to manipulate, squeeze, roll and manipulate into different shapes. These are available in different resistances – generally medium resistance strength is the most appropriate strength for teenagers
- Stress balls

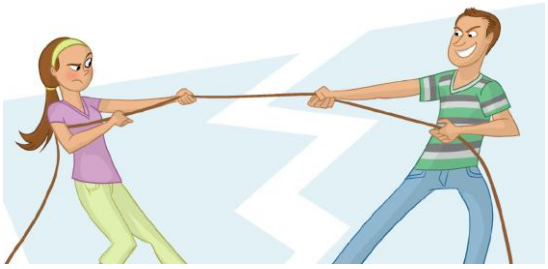
- Chinese baoding balls

- Finger fidget toys
- Rubiks cubes
- Wringing out cloth/ sponge - activities such as car washing, cleaning windows.
- Squeezing sponges – fill a container with water and see how quickly the child can empty it by putting the sponge in and squeezing into another container.
- Can also encourage polishing furniture, cleaning glass/ mirrors with adult supervision
- Pouring activities – pouring liquid from one vessel to another. Increase the size of vessel or amount of liquid being used to increase hand and shoulder strength
- Squeeze toys/ water blowers/ basters.
- Use of spray bottles to water plants, clean windows etc.
- Organising and pegging out clothes on a line/ rack etc.
- Baking – whisking/ mixing ingredients by hand
- Tweezer games e.g. using tweezers to move small beads / pasta / rice grains from one container to another

Shoulder and wrist strength: The following activities are aimed at improving shoulder and wrist strength. We need strength in these areas of our body to control our movements to complete all fine motor activities.

- **Arm wrestle**
- **Tug of war**
- **Push ups**
- **Wall press ups**
- **Superman**
- **Static wheelbarrow**
- **Palm pushing**

See pages 8 – 11 for further details on how to do these activities if you are unsure.



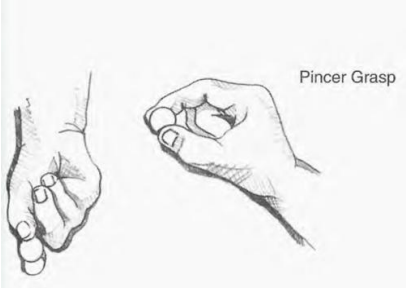
Developing pincer grip: The pincer grip involves the co-ordinated use of the thumb and index finger to close together to hold a small object steady. The pincer grip is important for precision movements of small items. When practicing developing pincer grip skills, it is important is important to encourage the child to hold objects using the pads of their finger and thumb.

The following activities are helpful to support the development of pincer grip skills:-

- **Penny collecting – palm to finger translation:**
  Picking up a coin using a pincer grip, ask the child to slide the coin using their thumb up the back of their index finger and push into their closed palm – hide in palm. Do not let them turn their hand – keep palm facing the table. Repeat until 5 coins are held in closed palm. Then retrieve each coin individually using thumb to slide it back down the back of their index finger onto the table - without turning hand and dropping coin out of palm.

- **Finger isolation:** With palm facing up to ceiling. Place a coin on each fingertip. Then individually, starting with thumb, move each finger to put the coin into palm of the hand.

- **Dropping small items into a container from in between fingers:** Place marbles, small piece of rolled up paper, or similar small object in the web space between each finger. Get them to drop one at a time in a controlled manner into a container. Ensure you try with both hands.



- **Transferring small objects:** Grasp objects between pads of thumb and index finger, pick up 50 small items such as grains of rice, frozen peas, or small beads. Record how long it takes to pick them all up and put them into another container. Using a container with a small opening such as an empty plastic bottle improves control of movement.

- **Threading skills**
  Thread beads onto string. Make sure the bead is picked up between the pads of the thumb and index fingers. Build up to making jewellery and friendship bracelets.

Hobbies to develop out of school

The activities outlined in this section are general ideas for extracurricular activities that provide children who have coordination difficulties with the opportunity to practice developing their skills. Any hobby that a young person pursues should be one that they have chosen, so that it provides enhanced motivation, enjoyment and will boost their self-esteem and confidence.







Some ideas:

Horse riding

This activity promotes postural stability. It also helps the child to balance and feel rhythm. It is a good idea to choose riding schools that understand the needs of your child and allow them more time to gain the necessary skills.

Swimming

This activity allows the child to strengthen both upper and lower body. It also helps two-sided coordination skills.

Cookery

Preparing food, baking, stirring - can help improve both fine and gross motor skills, whilst organization skills are practiced in the preparation and following of instruction from recipes with adult supervision.

Trampolining

Trampolining can help with posture and balance. It can also make the pelvic girdle more stable, promote increased postural stability and improve motor planning.

Army or Air or sea cadets / sea scouts/ guide/ scouts
With an understanding facilitator a child will benefit from group activities incorporated in these clubs, and at the same time improve their social skills. It is recommended to advise the facilitator that your son/ daughter may find certain activities hard to do, to ensure they achieve success and improve their self-esteem.

Martial arts/ Yoga/ Pilates
This requires self control and discipline. It also provides opportunities to follow a sequence of commands. The benefit of these activities is in gross motor skills, self-esteem, and body awareness. A young person can go at their own pace and success can be gradually achieved. Yoga and Pilates help relaxation and body awareness.

Badminton
This would be a first choice of racquet sports because the racquet is light and the shuttlecock moves relatively slowly. To start with make it easier by using a large shuttlecock.

Rock climbing
Indoors or outdoors. Good for improving motor planning and organisational skills. Helps with strengthening muscles both upper and lower body. This is a good form of exercise to improve overall aerobic fitness.

Photography
An enjoyable way of being creative and showing others what can you do. It may be more successful than painting or drawing for the child with poor fine motor skills. Digital cameras allow the scenes to be viewed instantly and then transferred and formatted on a computer.

Drama classes
Acting may help to develop confidence. It is good for improving social skills and gives the young person an opportunity to express frustration and other emotions in a controlled way.

Rambling and orienteering
People of all ages like walking. This activity can be done with others if you join a rambling group. It allows the young person opportunity to meet others, and exercise at their own pace.

Computers
Students with coordination difficulties are often advised to utilize computers for an alternative method of recording written work. This can be turned into an advantage and they may become highly skilled in this area.

Non-competitive hobbies
Singing, craft activities etc. can all be fun. The child is not seen to fail or pass at these when compared to his peer group therefore building self-esteem and confidence.

Gym
Attending a gym facility, where the child can find lots of equipment to improve postural stability, strength, and stamina. The child can work at their own pace and success can be gradually achieved.

Useful local resources

SENDLO – Wirral local offer websites which sets out what services, support, and advice are available for children in Wirral who have additional needs. Website – https://www.sendlowirral.co.uk

BRANCH is an online mental wellbeing hub for children and young people in Wirral, for children and young people aged 0 to 18 (and up to 25 with additional needs). It does not deliver services directly but offers a guide to help people find the best tools and support available locally. Website – https://branch-wirral.co.uk

ADDVANCED SOLUTIONS - provide open access, community-based, solution-focused learning, coaching and mentoring programmes, featuring health, wellbeing and enrichment activities to support the special educational needs, specific learning difficulties and associated mental health needs of neurodivergent children and young people. Website – www.addvancedsolutions.co.uk