PHYSICAL DEVELOPMENT

GROSS MOTOR SKILLS – INCLUDES ALL LARGER MOVEMENTS OF LEGS AND ARM

FINE MOTOR SKILLS – DELICATE MOVEMENTS OF THE HANDS AND FINGERS

GROSS MOTOR SKILLS:

CHRONOLOGICAL DEVELOPMENT

The Newborn Baby

When babies are born they are totally dependent on their parents for help to survive but they do have the following reflexes, some of which are vital for their survival while others are throwbacks to our past evolution.

- Sucking and swallowing;
- Rooting for the mother's nipple;
- Grasping;
- Walking (if a newborn baby is supported in standing position on a firm surface he will make steps);
- Startle or Moro (if a baby thinks he is going to be dropped he throws his arms back with open hands and then slowly brings his arms back together with clenched fists).

Newborn babies have very little muscle control and have to be supported and held securely. However, in the first months and years of life, the brain develops its ability to control the muscles and thereby the movements of the body. With the exception of those with very tight tendons who may have problems with sitting and find it easier to stand than sit, children gain control over their bodies in the same order because their physical development is governed by two fundamental laws:

1. Development proceeds from top to bottom (cephalocandal law) – children learn to control their necks, then their backs, their hips and finally their legs. This is reflected in heads growing first and looking out of proportion to bodies.

2. Development proceeds from the inside to the outside (proximodistal law). This is reflected in hands and feet seeming small compared to the rest of a baby's body. Also children learn to support themselves on their elbows before their hands and they kneel before they can stand.

Physical development comes from active play. A child kicking his legs is developing his muscles. Similarly every time a child attempts to lift his head he is strengthening his muscles and developing his ability to control his movements.

Head control

Newborn babies are not able to support their heads. They gradually develop their neck muscles so that they can support their heads and look around while their backs are supported in a sitting position or while being drawn up by their arms from the lying to the sitting position. As the neck muscles and those at the top of the spine strengthen, babies become able to lift their heads up while lying on their tummies.

Forearm and extended arm support

While lying on their tummies, they learn to raise their chests off the ground first by supporting themselves on their forearms with arms bent and then on their hands with their arms extended straight in front of them.

Rolling over

Babies first roll from their sides to their backs and later from their backs to their tummies.

Sitting up

When newborn babies are placed in a sitting position they collapse forward in a rounded heap with a curved back. As their back muscles strengthen they need less and less support either from adults supporting them or from cushions at the base of the spine. Eventually they can sit unaided without risk of falling over backwards or sideways. When they lose balance they know how to save themselves by propping (putting their hands down to the floor by their side).
Then they learn to turn sideways to pick up toys as well as lean forwards and backwards without toppling over.

Crawling

Children strengthen their hips and legs through vigorous kicking either of alternate legs or of both legs together. They then learn to move around using one of a variety of methods. Some children crawl in the conventional way on hands and knees, some bear crawl on hands and feet, some do commando crawling on their tummies; while others use bottom shuffling instead and never crawl.

Some parents feel that crawling is rather a pointless stage on the way to walking and try to hurry children to stand up and walk. However, crawling is in fact an important skill because it makes children bear weight through their arms, thus strengthening the shoulders, arms and hands. It is this which gives children the strength and control to be able to develop fine motor skills like drawing and writing later on.

High kneeling

Children learn to kneel with their bodies straight to their knees, thus bearing weight through their hips. This is a step towards learning to stand up because the muscles around the hips only develop through taking weight.

High stride kneeling

While in the high kneeling position, children learn to place one foot flat on the ground, take their weight over this foot and then push themselves into a standing position.

Standing

In order to stand up children need to be able to stretch out their hips and knees and have the muscle power and balance to bear weight. Children first stand while holding onto furniture or people for balance and support before they are able to stand on their own.

Walking

Before walking independently children must be able to stand and bounce up and down flexing their knees. They learn to cruise i.e. walk sideways around furniture before walking forwards, holding an adult's hands or pushing a trolley or piece of furniture. Gradually as strength and confidence increase they need less support until finally they can walk alone for a few steps.

Initially, children walk with their legs far apart and their arms high for balance. They are very unsteady tripping and stumbling frequently and find it difficult to stop, change direction or look down.
As children become more agile, their feet come closer together and point forwards rather than outwards and they have a more regular stride pattern. They are able to change direction, bend down to pick up things from the floor and carry objects as they walk. They learn to push and pull toys and to walk backwards.

Climbing up and down stairs

Once they can crawl children soon start to climb up furniture and steps. They climb in the crawling position using their knees and hands. They then climb using their feet rather than their knees which they place on alternate steps. Eventually they stand up straight in an adult posture but need to hold on to a handrail or someone's hand for support. Initially they put both feet on each step before finally learning to put alternate feet on alternate steps.
Coming down stairs is more difficult than going up. Initially children either slide down on their tummies feet first or bump down on their bottoms. Eventually they take an upright posture and walk down, first holding the rail and placing two feet on each step and then putting alternate feet on alternate steps.

Balance

An improvement in balance underlies much of children's later physical development. Children learn to stand on one leg, hop, walk on a narrow beam or line and negotiate stepping stones.

Running

The transition from walking to running happens quite gradually. Children speed up their walking over time until they are able to run. They are liable to trip and fall initially but they learn to move around skillfully, turn sharp corners, carry, pull or push objects as they go, speed up and slow down.

Catching, throwing and kicking a ball

Children learn to catch large balls when thrown gently into their arms by putting their arms out rigidly. They gradually learn to bend their arms and to catch smaller balls and from a greater distance.
Children learn to let a ball drop from their arms before being able to throw it. They improve their skills in terms of both the direction and strength of their aim.
Kicking begins with children walking into a ball and kicking it accidentally; then they learn to kick standing still and later on they run, balancing on one leg. First kicks are very gently but gradually children gain strength and control.

Jumping
Children start trying to jump by bending their knees but their feet do not actually leave the ground. They first jump on the spot and then learn to jump off objects such as low steps and logs before being able to do a series of jumps without falling over.

FINE MOTOR SKILLS:

Chronological Development

The Newborn Baby

Newborn babies keep their hands closed tightly in the reflex grip.

Grasp and release

After the first few weeks they lose this reflex and have to practice until they have achieved the control to grasp objects again. Gripping something is a complex action requiring children to be able to control their arm and hand movements, turn their heads to see the object and focus their eyes on it.
Babies bring their hands in front of their eyes and examine them. They are learning the rudiments of hand-eye co-ordination. They play with their hands working out what they can do and how to get them to the right place. Initially they bat at objects dangled in front of them such as rattles strung across a pram or a baby gym.

They then learn to grasp an object with their whole hand, then to pass it from hand to hand and then to bang two objects together. Children initially grasp objects from the side and later have the co-ordination to grasp them from the top.

They learn to let go of objects later. At first, children release objects against a hard surface like a table top, the floor or an adult's hand. They later learn to release them into space. They are then able to start placing and posting objects into large containers and as their skills develop they can place them into smaller boxes and tighter holes.
Once able to release objects they learn to start throwing them, at first indiscriminately and later with force and direction.

Fine grasp

Children learn to manipulate and explore toys by handling them, bringing them and turning them in all directions.

Their grip becomes more refined as, rather than using their whole hand, they use their thumb and forefinger in the pincer grip, thus enabling them to pick up small objects such as raisins, crumbs and pieces of string. This ability to handle small objects will continue to improve over time.

Because they are using their fingers independently, they start to point and prod at things with their forefinger and to tackle posting shapes, stacking bricks and breakers, threading beads onto a string and doing puzzles (insert form boards followed by jigsaws). To begin with they need to use large equipment which is easy to handle and they will have limited success – for example, stacking only two or three large wooden bricks – but gradually they will be able to stack more and more bricks and of a smaller size.

Using two hands together

Children learn to use both hands together to carry out an activity, for example holding a bowl while scooping food out or pouring from one jug into another.

Twisting

Twisting and turning handles and bottle tops and drinking from a bottle or a cup require wrist control. Children learn to drink from a cup or twist easy knobs quite early but take time to gain the strength to turn large and stiff knobs, the precision to twist small ones and the ability to slide catches.

Undressing and dressing

To undress is easier than to dress (though children do learn fairly early to help when being dressed by putting their arms into sleeves and legs into trousers), First, a child will pull off a hat or a bib, or pull off socks and booties and then shrug off a coat or cardigan. Pulling off pants and trousers follows, then jumpers and shirts. Fastenings, particularly buttons, will be the trickiest element.

Children usually start dressing by putting on easy hats, then cardigans and shirts followed by pants, trousers and skirts. Socks, shoes and fastenings are the most difficult.

Feeding

Children learn to hold a bottle or lidded cup and drink from it. They gradually become more skilful so that they can use an open cup or beaker without spilling the contents.

Children learn to finger feed themselves with biscuits and pieces of fruit and vegetables, and then they learn to feed themselves with a spoon if it is loaded for them and placed conveniently. They then have to learn to scoop the food onto a spoon. This is much easier with foods that stick to the spoon like yoghurt, weetbix, rice pudding and semolina rather than foods like pasta which just fall off.
Having mastered a spoon, the usual progression is to learn to stab with a fork, then to use a spoon and fork together before finally using a knife and fork (but this would only be developing at school age).

Use of tools

Children learn to use all sorts of different tools which are part of everyday living for adults but require considerable manual skill and dexterity. The usual progression is scooping with spoons and spades, stabling with forks, cutting with knives, then pincer action with pegs, tongs and scissors.

Using a pencil

Children first grasp a pencil or crayon with their whole fist, and then they grip it higher up before the grip changes so that they use fewer fingers and hold it further down. This grip later becomes refined into the adult grip using the thumb and two fingers. Because drawing and writing are complex skills, requiring an intellectual understanding of the marks made, this aspect is included in further chapters.

GAMES AND ACTIVITIES:

GROSS MOTOR SKILLS

Chronological development

If your child has a physical disability or wears splints or a special soft helmet at times, check with your physiotherapist or occupational therapist before attempting these activities.

Some children with special needs find any kind of exercise distressing at first and would much rather be left alone. Try to make it fun with lots of physical contact between your and your child or make it secure and soothing with music and reassuring talking as you play.

Children who are sensation-impaired have to be watched. If they have no sensation on one side they may get into dangerous situations without being aware of it – they will not be alerted by the pain.

Positions

If you have a baby or a child who is not able to move, make sure that you place him in different positions during the day even if it is only for a short time. Don't always put him in his bouncy cradle or flat on his back in a cot or pram. Each different position encourages a child to use different muscles and see the world in different ways. Try some of the following:

- Place your child on his tummy on a mat on the floor
- Place your child on his tummy with a rolled up towel under his chest
- Lay your child on his side – a particularly good position for playing with toys using both hands together
- Place your child on his back flat on a mat on the floor
- Sit on the floor with your legs stretched out in a V shape and place your child on his tummy over your leg either so that his chest is raised off the ground
- Sit on the floor with your legs outstretched and sit your baby close to you, between your legs and supported by your body, and looking away from you
- Sit on the floor with your legs bent and soles of your feet together. Sit your child on the floor, in front of your feet and looking at your support him as necessary either with his hands or by his hips
- Kneel on the floor with your knees apart and sit your child between your legs looking away from you. You can support him by gripping him with your legs.
- Sit on the floor with your legs stretched out in a V shape and sit your child astride your thigh looking at you. This is a particularly good position if your child wants to push up to standing position.
- Lie on your back and place your child on his tummy on your chest. This is a good position for making eye contact.
- Also try carrying your child in different positions when you move round the house

Head and neck control

When your child is lying on his back, cradle shoulders and gradually draw him up into sitting position. Talk to him and make eye contact as you play.
It is also important to do this in reverse, gently getting him to lie back from sitting position.

Weight bearing on forearms

Only place your child on his tummy during the day (not to sleep) and make sure he is constantly supervised.

- Place your child on his tummy on a mat on the floor. A firm surface is best, rather than a soft one like a carrycot. Try different surfaces to make it more interesting, for example, carpet, play mats, rugs, sheepskin, wooden floor or lino.

- Lay him on his tummy and place a rolled up towel or blanket under his chest so that he lifts his head and shoulders off the ground. This will give him a wider field of vision which he may well enjoy. Alternatively, give him some toys to play with when in this position.

- Lie on the floor and place him on his tummy on your chest. Then encourage him to raise his head and look at your face.

Weight bearing on extended arms

- Place your child on his tummy with a rolled up blanket or towel under his chest so that his weight is on his elbows. Encourage him to reach for toys like a baby gym with one hand and then the other so hat he takes the weight through his arms in turn.
- Lie on the floor on your back and place your child on his tummy on your chest. Use your body to get your child to shift his weight from one arm to the other.

Rolling over

- Lay your child on his back and place one arm above his head out of the way. Gently push the other hip and leg forwards and use a toy as an enticement to get him to roll himself over onto his tummy. Do the same thing on the other side.
- Roll him halfway and encourage him to continue the roll by placing a favourite toy to one side as an incentive.
- Place him on a rug or pillow and use it to gently rock him from side to side.

Sitting

In order to help a child to sit up you need to practice the gradual pulling up and lowering described in the section on head and neck control to strengthen all the head, neck and back muscles until he is able to sit alone.

- When he is able to support himself a little in a sitting position, sit him up on your lap and support him by holding his trunk and hips firmly. He will over time need less support.
- Once a child can sit up he needs to develop his balance and strengthen the muscles in his torso. Then he will not fall over at the slightest knock or movement but can reach out to get things and prop (i.e. put his hand and arm out to touch the floor, thereby saving him from falling over).
- When your child is sitting up put tings to his front and side to encourage him to reach out and grasp them and to maintain his balance at the same time.
- When he is sitting gently rock him from side to side and from front to back so that he takes the weight on each side alternately.
- Sit your child astride your thigh, looking at your and rock him sideways to improve his balance. This is particularly good if he has right muscles around the hips.
- Sit him on a low stool or large firm cushion, hold onto his hips from behind and get him to reach forward for toys and objects.
- When in sitting position put his arms out to his sides, touching the floor and rock him so that he bears weight through his arms and stops himself falling over.