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Issues in Cerebral Palsy
Part 2: Physical Handling Treatment

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Learning Outcomes

The Participant Will be able to:

1. Describe the importance of a physical handling treatment.
2. List the major considerations of a physical handling treatment session.

Disclaimer

The information in this article is not a substitution for qualified professional training, it is for educational awareness only. Physical handling requires experience and training. Numerous training courses and seminars are available for therapists interested in physical handling techniques.Treatment requires the consultation and prescription of the child's physician or primary care provider.

Preface

Physical handling is a therapeutic approach that essentially matches the clinician's nervous system to that of the client. Through various key points of control the clinician is able to feel and observe the quality of the child's movement and how the child reacts to subtle changes to shifts in the center of gravity. Additionally, the clinician can feel and observe how the child's posture relates to movement. What compensations the child uses to move and most importantly how the child initiates those compensations. Through various handling techniques it is possible to determine what cues and levels of intermittent support are most successful in achieving a more efficient activation of movement that allows the child to actively initiate improved quality and control of his posture and movement.

Part 2 deals with with specific treatment techniqiues to achieve identified goals. Part 3 deals with promoting functional skills.

Physical handling is a process of restoring dynamic balance to posture and movement. The first and most important step is to establish alignment and promote efficient kinesiological selection of muscle groups to achieve dynamic postural maintenance that supports more normal movement components.

Issues in Cerebral Palsy
Part 2: Physical Handling Treatment Strategies

Physical handling treatment for children with neuromotor dysfunction strives to provide active intervention to improve control of posture, sensory tolerance of movement, organization of body sides and therefore improved functional efficiency. The therapeutic principle of physical handling treatment is to provide the least amount of control needed to achieve a more efficient response and then gradually turn over more and more active control to the child.

Within this treatment principle, various techniques are required to prepare the child for an active response. These techniques include activating muscle contraction through direct tapping, use of intermittent support to activate stability and sustained postural control, oscillation to increase or decrease tone, deep pressure tapping to reduce tightness, mobilization of the body over the limbs to normalize sensory tolerance in various ranges of movement and improve dissociation of body segments, and changes in degree and intensity of input, and key points of control to advance the child's potential for activating more organized movement patterns.

Physical Handling Treatment Tools

Treatment must be directed to a specific goal for each therapy session, as well as the larger goals for cumulative treatment. Although the goals of independent sitting, walking, feeding, hand manipulation and other functional goals are always underlying objectives, they are too general to lend direction to the direct treatment process. Foundational underpinnings of postural control and alignment are critical before any efficient skill can develop in functional areas. Practicing functions on an abnormal or compensatory postural base will result in embedding the dysfunction and strengthening abnormal compensatory patterns.

Direct physical handling requires an organized sequence that leads to specific outcomes within each session of treatment. Both general and specific preparatory techniques are utilized to transmit to the child new sensations of potential movement and develop the components control of underlying postural stability and freedom of movement. All functional skills require an organized base of support and a graded interplay of stability-mobility.

Effective direct physical handling requires experience and training to understand the normal and dynamic interaction of functional components. The therapist needs to have an image of the normal components of posture and movement, what those components look like and feel like, and be able to clearly identify essential components of abnormal or compensatory movement.

In the beginning of a session the child is briefly placed in a challenging functional position to observe the child's reactions and attempts to maintain the position and more clearly understand the emerging problems.

Maintaining alignment in standing requires control of the body over the base of support of the feet, with the knees and hips extended and the pelvis in stable neutral or slightly anterior to allow the trunk to extend for core stability. On this example the child is unable to activate sufficient knee and hip extension, this the pelvis is in too much anterior tilt. the trunk cannot extend and the shoulders and neck compensate with elevation and hyperextension. Without proper alignment any weight shifts will result in more abnormal compensations in posture.

After some preparation and treatment, returning to the same or similar posture or position requiring the same components of control, will offer some immediate feedback as to whether the child is responding positively or whether the therapist needs to modify her handling. Each therapy session must be a discovery of how best to vary handling techniques to effect positive change. Treatment should never be a set protocol. The therapist gauges their effectiveness through the child's reactions to treatment.

Lateral shifting from a seated position while maintaining control of the arm and leg allows the therapist to mobilize the pelvis and dissociate the movement of the pelvis from the trunk and leg. With more pelvic adaptability placing the child in straddle standing while controlling the knees in extension allows the possibility for active hip extension and therefore more active trunk control in standing.

Once there is more dissociation of the pelvic girdle with the trunk, and more active hip extension, the therapist places the child in a more functional position in standing in order to integrate the new movement potential into more functional control. With more mobility of the pelvis and active hip extension, experience in supported standing allows integrating these changes into more active trunk elongation and lateral flexion.

Physical Handling Considerations During Treatment

Without analysis of individual problems there is a tendency to fall back to general treatment techniques and protocols that are not specific to the individual's unique set of difficulties. The risk of using general protocols is that they may activate compensatory patterns and further embed the child's limited functional adaptation. Compensatory patterns interfere and inhibit new motor learning because they do not allow for adaptation or establishment of postural foundations that support efficient activation of movement.

Treatment should strive to introduce new motor learning experiences, not only as functional responses but preparatory in terms of sensory tolerance for ranges of movement and degrees of freedom of dissociation of movement, displacement of the body weight, adequate adaptation of respiration in new positions of posture and movement that are introduced, and the ability of the child to accept and control changes in movement in terms of velocity and direction without resorting to compensatory patterns.

Specific sensory experiences are associated with postural change and movement. The more clearly the clinician can identify these changes through physical handling, the better the therapist will be able to analyze specific compensatory components present and therefore more specific objectives for the treatment session.

Effective treatment supports new sensorimotor learning. Variety in posture and movement combinations is crucial to for new sensorimotor learning to occur. It is useful to remember that "feeling" the body weight over the feet results in proprioceptive activation of standing when the weight of the body is brought over the feet. The normal system aligns the body over the base of support in the new posture. Being able to activate and adjust to vertical postures aligns the sensory systems to their optimal orientation to integrate sensorimotor processes.

In the dysfunctional system the trunk needs special help in experiencing adaptation to various alignments in upright while the center of mass is controlled over the base of support.

Bringing the body weight slowly over the feet helps to activate and grade extension of the legs and hips with extension of the trunk. The therapist guides the forward flexion of weight over the base of support and once upright, assists with stabilizing the posture and adjusting the distribution of weight.

Use of a roll increases the base of support and allows the therapist more opportunity to guide the child over the supporting legs and activate hip and trunk extension.

Movement, especially new or lesser used movement by the child, requires the acceptance of the sensation of movement, not only in proprioceptive weight distribution, but also in musculoskeletal tolerance of sensation and joint and muscle ranges of compression, mobility and length.

When a child lacks postural control necessary to sustain a movement, the therapist manages part of the body weight and assist appropriate trunk and limb reactions to movement. When the limbs are placed or initiate movement the trunk must follow and be able to shift over the supporting limb in order to grade and activate transitional movement.

Assisted and facilitated transitions of the trunk over limb placement helps to increase stabilization of the trunk and activation of core stability and graded mobility. The completion of postural transitions provides multisensory experience and fosters sensorimotor learning.

Practice of particular skills can result in some motor learning and is appropriate for children who can activate transitional movements but needs some assistance in postural control and stability to organize the movements more efficiently. However, it is important for the therapist to guide and allow the child to use his motor skills in a variety of ways in dynamic postural alignments in order for the new or refining skills to be fully integrated for eventual independent activation.

The simple task of reaching for an object can be used to help integrate rotation with flexion and extension while maintaining control of the trunk over the base of support in shifting alignments. Establishing graded dynamic alignment control in various combinations of flexion, extension, and rotation is critical for refining and organizing efficient transitional movements.

Assisting the weight shift with input to the trunk helps the child complete a more fill rotation while sustaining his weight on the side of the rotation. This input to help stabilize and guide the trunk allows for dynamic postural alignment to assist the movement potential.

Combining flexion with rotation as well as extension with rotation provides experience in controlling dynamic alignment in a variety of movement sequences. Changing the key point of support to the weight bearing arm, allows the trunk to be more active in stabilizing as the trunk rotates over the weight bearing arm, thus allowing another level of graded rotational control on a different dynamic alignment. Reaching activities like these should be undertaken in various positions of sitting, standing, prone and supine to fully

activate and integrate dynamic postural control and adaptability of efficient movement sequences.

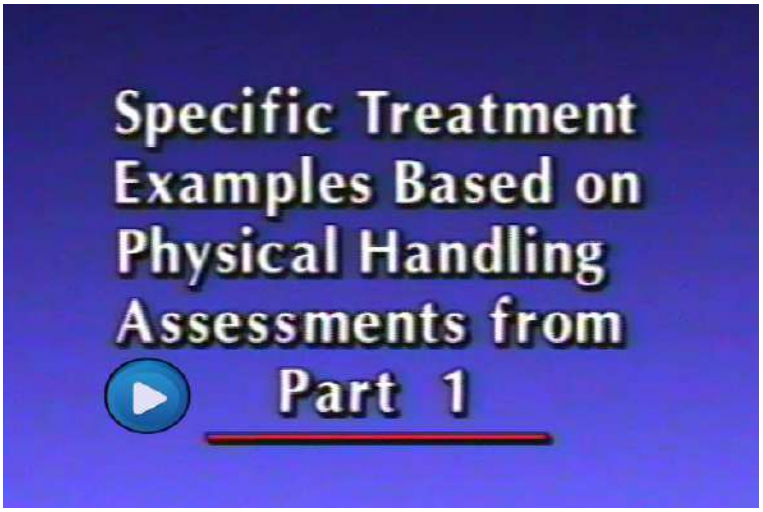
A major consideration in treatment is the degree and efficiency of dissociation of body parts, not only passively but more importantly while the child is moving. Dissociated movement follows dynamic postural adjustments and transitional movement patterns, while lack of dissociation will result in recurring habit patterns or compensations.

For example, when one hand is supporting the other limb should be free to move and there should be ease of rotational trunk movement and reaching across midline without shoulder elevation or tightness or collapse of the trunk. When there is movement of the pelvis the legs should not compensatorily follow that movement but be free to place or adapt to weight shifts without tightness or lack of independent movement. Dissociation leads to greater control and efficiency of functional movement patterns.

During treatment special consideration is given to how the respiratory system adapts and adjusts to movement patterns during higher and higher levels of postural control against gravity as the base of support narrows. Grading various movement patterns and allowing respiration to adjust is an important component of treatment.

Dissociation and Respiration Considerations

Treatment Discussion from Children Highlighted in Part 1



Summary Comments

There are many aspects to cerebral palsy. Cerebral palsy is a stubborn adversary. The challenge to the treating clinician, is the need to clearly analyze the individual characteristics that interfere with the child's efficient use of his body, both posturally and in movement, therefore providing clues and strategies for the most effective intervention possible. Physical handling assessment and treatment requires continuous analysis of the child's compensations. Understanding the various limitations and compensations the child presents allows the therapist to intervene to inhibit unwanted responses to postural shifts and movement activation, while facilitating more efficient movement and organization of posture. Constant modification in handling is determined by the child's responses to handling and the therapist is continually guided in refining treatment techniques within and throughout each treatment session.

Organized movement and efficiency of function cannot be activated from a dysfunctional alignment, or through practice utilizing the child's abnormal compensations. Skilled physical handling is critical for leading the child toward more efficient use of his body and therefore more success in attaining higher levels of functional skill.

Appendix A

Physical Handling Preparatory Techniques

PROCEDURE	*TYPE*	*TONAL EFFECTS*	*INDICATIONS*
Quick Tapping	Fast & repetitive	Increases & builds tone	Flaccidity & underlying low tone. Fluctuating and high tone after initial tone reduction
Alternating Tapping	Successive & rhythmic	Stabilizes & activates contraction in small ranges	Fluctuating and high tone after reduction & low tone after preparation
Oscillation	Fast with periodic slowing or stop/ Slow & rhythmic	Reduces tone	High tone & tension areas in fluctuating tone
	Fast & repetitive	Increases tone	Flaccidity or underlying low tone in high or fluctuating tone conditions
Intermittent Support	Hold & release in fast intervals	Stabilizes & activates co-contraction	Fluctuating and low tone after reduction
Compression	Sustained Intermittent & rapid	Reduces tone Increases tone	High tone Low tone
		Activates joint control	Fluctuating tone
	Deep Sustained over muscle belly	Reduces tone	High tone
Sweep Tapping	Fast in direction of desired movement	Increases active extensor tone/decreases flexor tone	High tone
	Slow with pressure	Decreases tone	High tone
Placing & Holding	Position in desired posture	Increases joint stability/activates co-contraction	High tone after reduction of tone Low tone/Fluctuating tone

PHYSICAL HANDLING PREPARATORY TECHNIQUES

Preparatory techniques are designed to influence the general state of postural tone and are used to prepare the somatic system for movement. Postural tone is influenced by various factors of sensory input, such as speed, frequency, duration and intensity of specific sensory cues. in general, fast input tends to increase tone while slow input tends to decrease tone. Input can be long in duration and intensity, such as compression into a joint or short and alternating such as approximation of a joint. The actual response to the presentation of sensory input depends on the child's individual nervous system and the degree of sensitivity of the handler to monitor and modify the input.

Tapping is a technique which is used as a means to apply repetitive sensory input to the surface of a muscle. Quick tapping, or fast tapping increases tone. This type of tapping is used to increase the muscular activity of low tone children or to balance agonist and antagonist muscle groups in children with high tone and fluctuating tone.. Alternating tapping is used to control a small range of movement to increase graded control. It can be used to inhibit low tone collapse into gravity, overshooting in athetosis and to maintain relaxed tone in spasticity.

Oscillation is a term which is used to describe a repetitive swinging or swaying of a limb. As with all sensory techniques, the speed of application determines the sensory-motor response. Fast oscillation tends to decrease tightness in the shoulder or hip, when applied distally to a limb. However, this fast oscillation must be interspersed with times of no oscillation or slow oscillation, to avoid any rebound or musculature tightening. Prolonged oscillation, applied bilaterally to the arms, has a tendency to increase trunk tone in a low tone child as it stimulates arm motion for the joint receptors. Slow oscillation, particularly with slight traction of the limb can result in decreasing tightness, while repetitive quick traction has the tendency to increase tone around a joint. Extreme care must be exercised during these techniques to protect the joints from subluxation or dislocation.

Intermittent support is a term used to describe active stabilization within a range of movement. It is essentially a hold and release technique which supports body weight and releases it with various frequency and duration as needed to enhance active stability and equilibrium. It can be performed with the body weight slightly off center to activate automatic responses or in a stable midline condition to enhance stability. It is a good technique for stabilizing fluctuating tone in midline postures and activating low tone responses to a shift in the center of gravity.

Compression is a sustained pressure into a joint in alignment. Sustained pressure into a joint has the effect of reducing tone or spasticity around the joint. Intermittent compression into a joint, or approximation can increase joint stability and tone if repeated rapidly or decrease tone if performed in a slow and rhythmic manner. Deep sustained pressure over a muscle belly has an inhibitory influence and is effective in reducing spasticity.

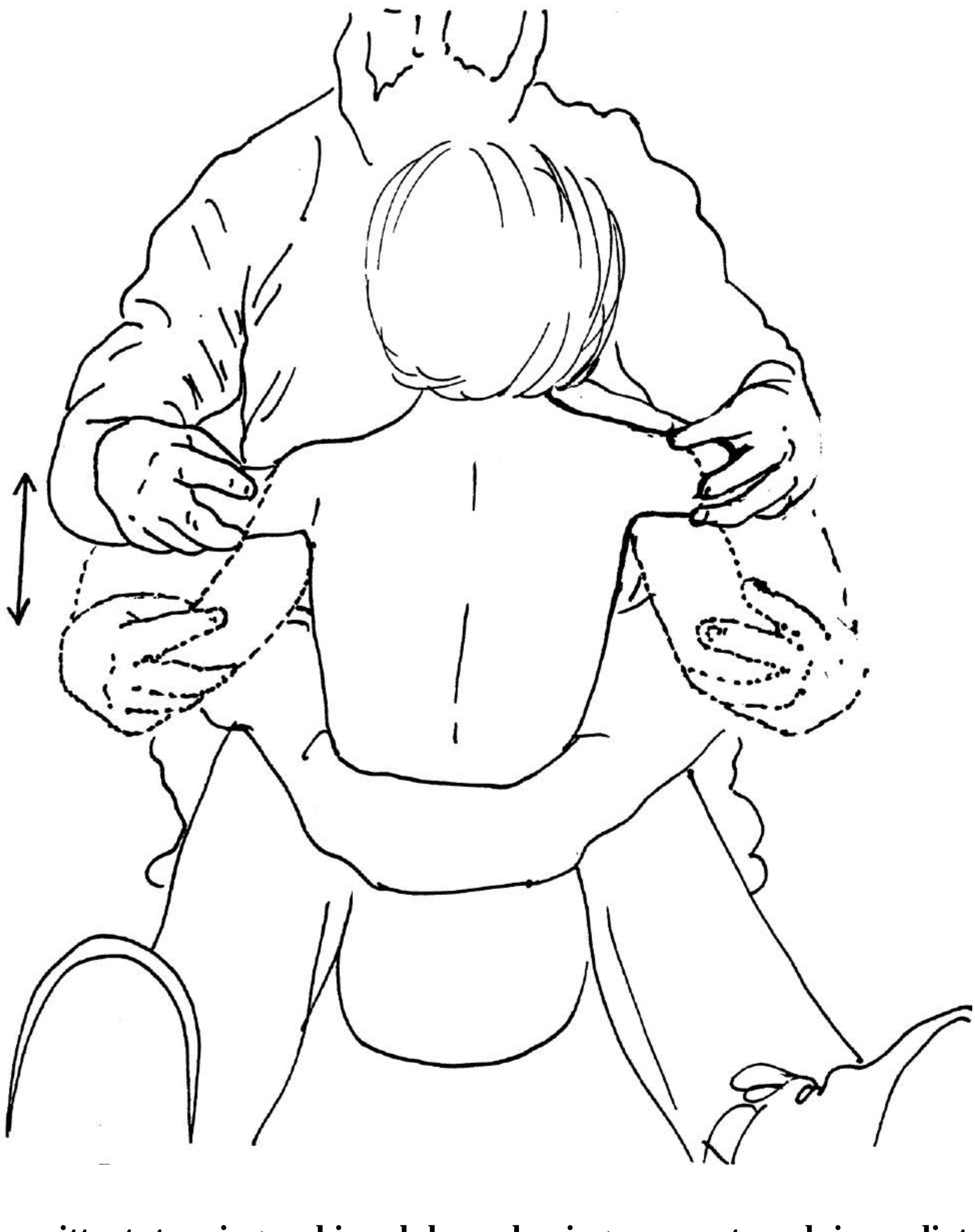
Sweep tapping is another form of stimulation to facilitate motor patterns of muscle groups. Sweep tapping is a technique which provides a facilitatory input in the direction of a desired movement, such as sweeping the triceps and extensors of the arm in the direction of extension to inhibit flexor tightness in the biceps. Slow sweeping can also be used with deep pressure to tight muscle groups in the direction of the desired response, such as slow deep pressure sweeping of the biceps to reduce tone and facilitate an extensor response of the arm.

Placing and holding is another technique which places a limb in a desired position. Holding the limb in place, perhaps with slight intermittent support, allow the proximal joints to gradually increase tone for stability, and activate holding power. If done slowly however, this can result in a sustained release in proximal tightness and rebound phenomena.

Preparatory techniques are a means to prepare the somatic musculature and sensory systems to tolerate facilitatory handling. They can be employed prior to movement as in the notion of the word preparatory, but more likely they are employed simultaneously with facilitatory handling to maintain the readiness of the sensory-motor systems for somatic adaptation.

Alternating Tapping to Maintain Active Control of Posture

Oscillation of Limbs up and down to affect tonal changes in proximal joints and limbs



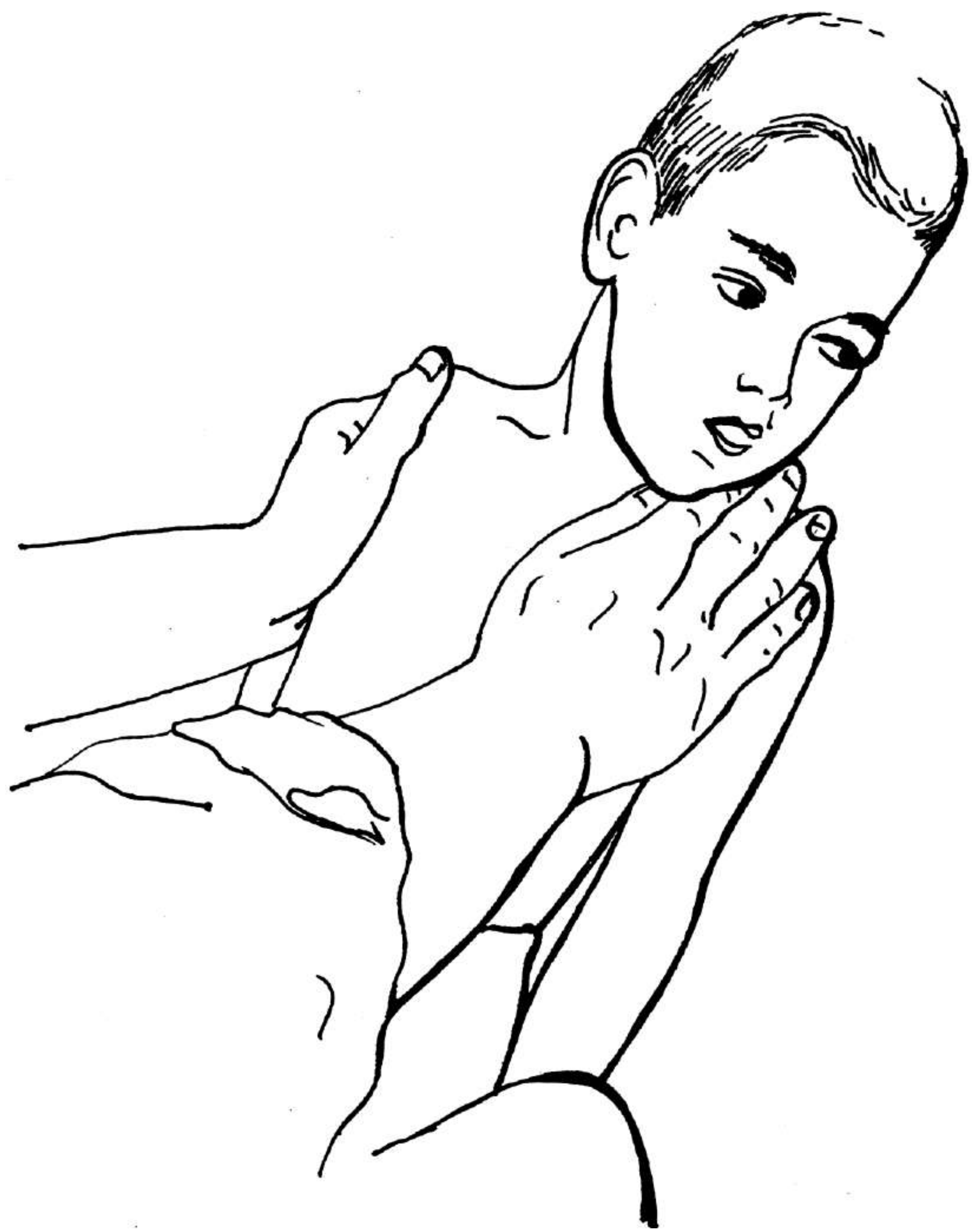
Intermittent tapping achieved by releasing support and immediately regaining control of shoulders.

Intermittent support for stability in prone with quick release and hold to maintain active control & stability

Sustained compression into a joint to reduce spasticity around the joint

Repetitive approximation into a joint to influence tonal changes

Sustained deep pressure over a specific area to reduce tone



Repetitive placing and holding to establish release and control of movement

Changing postural tone in preparation for, or simultaneously with, facilitatory handling requires constant monitoring of the child's tonal state. Postural tone is never constant even in cases of spasticity. There are usually various layers of postural tone. For example, after tightness in an area is reduced, there exists another or new level of postural tone. This tone is often referred to as the underlying tone. In some cases the underlying tone may be close to normal, low, fluctuating or ataxic. Many children have mixed tone with predominant tightness. When attempting to change postural tone it is often necessary to alternate various preparatory techniques to reach a balance of reciprocal innervation. Additionally, some children require different techniques in different body areas depending on the distribution of their postural tone.

The distribution of tone refers to the specific tensions of muscle groups in various areas of the body. Muscle groups which are tight have a higher distribution of tone than muscle groups which are flaccid or low tone. Tone may be distributed with great fluctuation between high and low, as seen in children with athetoid cerebral palsy. The distribution of tone affects and is influenced by the distribution of body weight. Weight and tone are two sides of the same coin. If there is an imbalance of postural tone due to neurological damage there will be a resultant imbalance in weight distribution. For example, if a child is placed in prone and experiences predominating flexor tightness, the distribution of that tightness on the alignment of the joints and body parts will cause an unequal or improper distribution of weight into the surface, thus compounding the problem. When the distribution of tone, weight and alignment are pathologically influenced, there is little if any possibility for the child to shift his weight for a transitional movement, alter his body alignment in a position sufficient to allow freedom of movement or modify his postural tone independently. Conversely, if the child is placed in a position in an inappropriate alignment or without regard for the distribution of weight through his body, the result is often an exacerbation of abnormal postural tone.

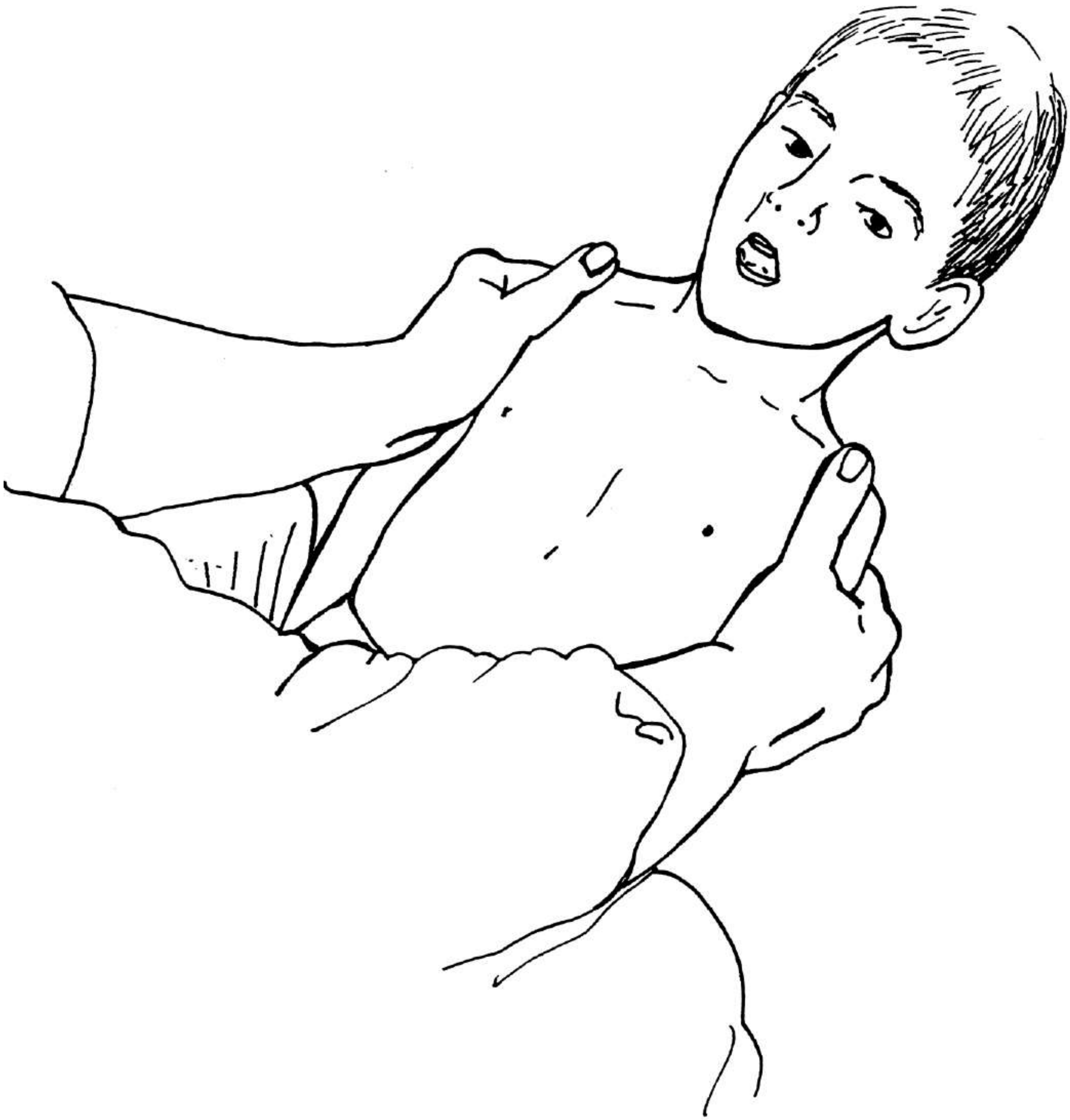
Effective physical handling of a child with cerebral palsy requires, therefore, attention to the distribution of tone, the distribution of weight, and body and joint alignment. Because children with cerebral palsy have habitual abnormalities in the areas of weight, tone and alignment, they also suffer from sensory deprivation in somatic adaptation. Before certain movements can be accepted by their nervous system, there must be a normalization of the sensations required for those movements.

The sensory aspects of movement and posture include postural tone, body weight, joint alignment and somatic proprioception. It is unlikely that a joint movement which rarely or never takes place will be initially accepted by a damaged nervous system. When tightness around a joint has been reduced, for example, and the joint has been placed in a new and unfamiliar alignment or excursion, there often results an initial rebound because there is little if any sensory threshold tolerance for the new position. Before dynamic facilitatory treatment of varied movement patterns can be introduced, it may be important to establish a sensory threshold for the movements desired.

By providing preparatory techniques to manage postural tone, gradually increasing the tolerance of joint movement and placing the child in altered alignment positions with appropriate weight-bearing, it may be possible to normalize the somatic proprioceptive threshold required for body movement. In so doing it is important to prepare the musculoskeletal system to accept a greater degree of sensory-motor challenge than basic movements require. This of course is to insure that there will be sensory tolerance throughout the range of the desired movement, position, or transition, without surpassing the sensory threshold of the child causing collapse or rebound into abnormal patterns.

APPENDIX B
BASIC TREATMENT STRATEGIES FOR FACILITATING MORE EFFICIENT MOVEMENT AND POSTURE

Reducing postural tone through deep and sustained pressure to the lateral trunk in preparation for lateral flexion response or dissociation of the trunk from the pelvis through manually rolling the trunk. This position also effects some relaxation on the weight bearing side. For low tone children, this positioning can be used with gentle quick tapping to stimulate more lateral trunk tone, or to stabilize fluctuations in trunk tone seen in children with fluctuating tone.



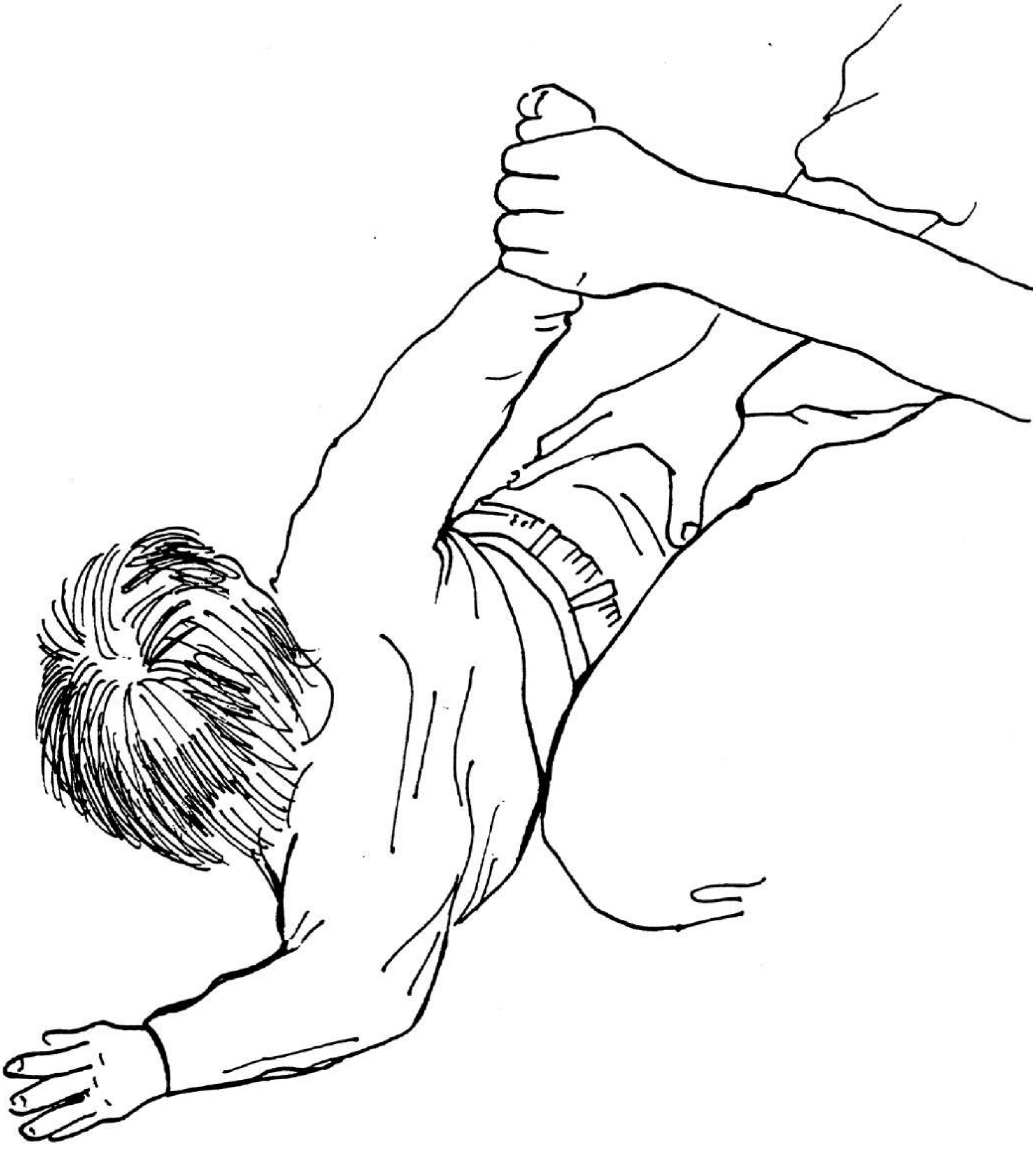
Sustained compression of the shoulders toward the pelvis with the head in alignment can be effective in reducing high tone or spastic elevation of the shoulders, as well as to establish some firm stability in children with fluctuating tone. The child actively controls the head. Low tone children require a roll to elevate the head and more rapid approximation into the shoulder area to increase tone.

Maintaining the shoulders down and in alignment, the head can be elevated and flexed forward to inhibit hyperextension or collapse, and to provide sensory awareness of midline. Adding gentle approximation can facilitate increased cervical tone in low tone children, while adding slight traction may" help maintain a decrease in tightness and lengthen the posterior cervical musculature.

Slowly lifting the head away from the surface while controlling the shoulders allows the child to experience dissociation of the head from the body. In spastic child sustaining the elevation with slight traction helps to maintain tone reduction and establish better sensory tolerance. Children with low tone require gentle intermittent support to help build neck tone and stability, while children with fluctuating tone benefit from sustained holding to increase sensory tolerance for stability and to inhibit fluctuations.

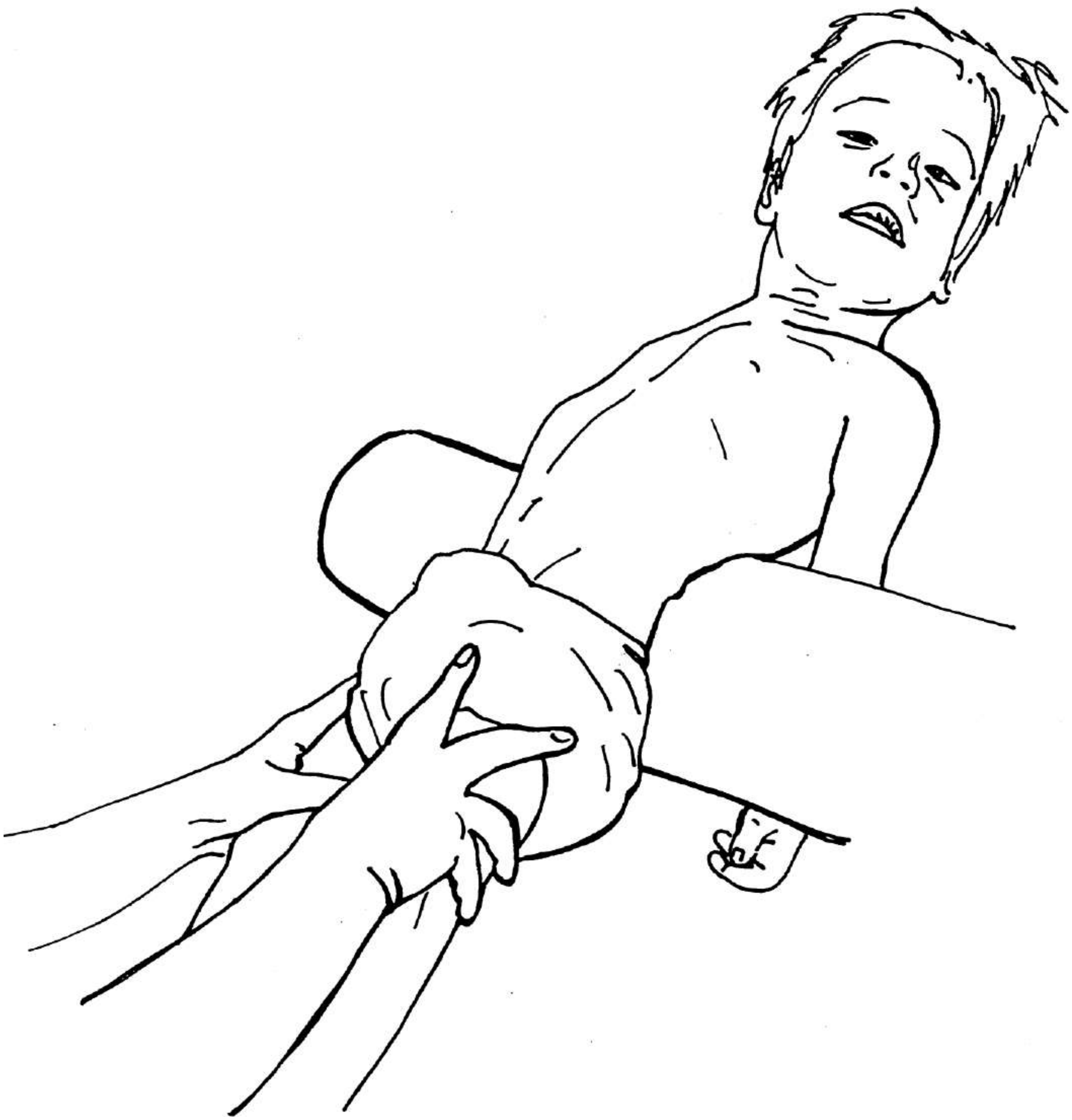
Maintaining shoulder alignment and control while moving the shoulders through retraction and protraction is helpful for sustaining inhibition of tightness during movement. Slower, more deliberate excursions with pressure can assist the child with fluctuating tone to experience graded movement while inhibiting fluctuation. Tone can be increased in children with low tone by adding firm approximation toward the midline.

Using a ball between the scapulae and supporting the head with a roll facilitates scapular adduction and inhibits shoulder protraction, allowing more thoracic excursion. Movement of the trunk laterally back and forth adds an element of dissociation of the head to trunk and the gentle movement helps to maintain inhibition of tightness. Using this position with children with low tone with the weight distributed forward can be helpful in increasing tone in the shoulders, neck and trunk. Children with fluctuating tone need to have their arms controlled with slight traction to inhibit tonal fluctuations.



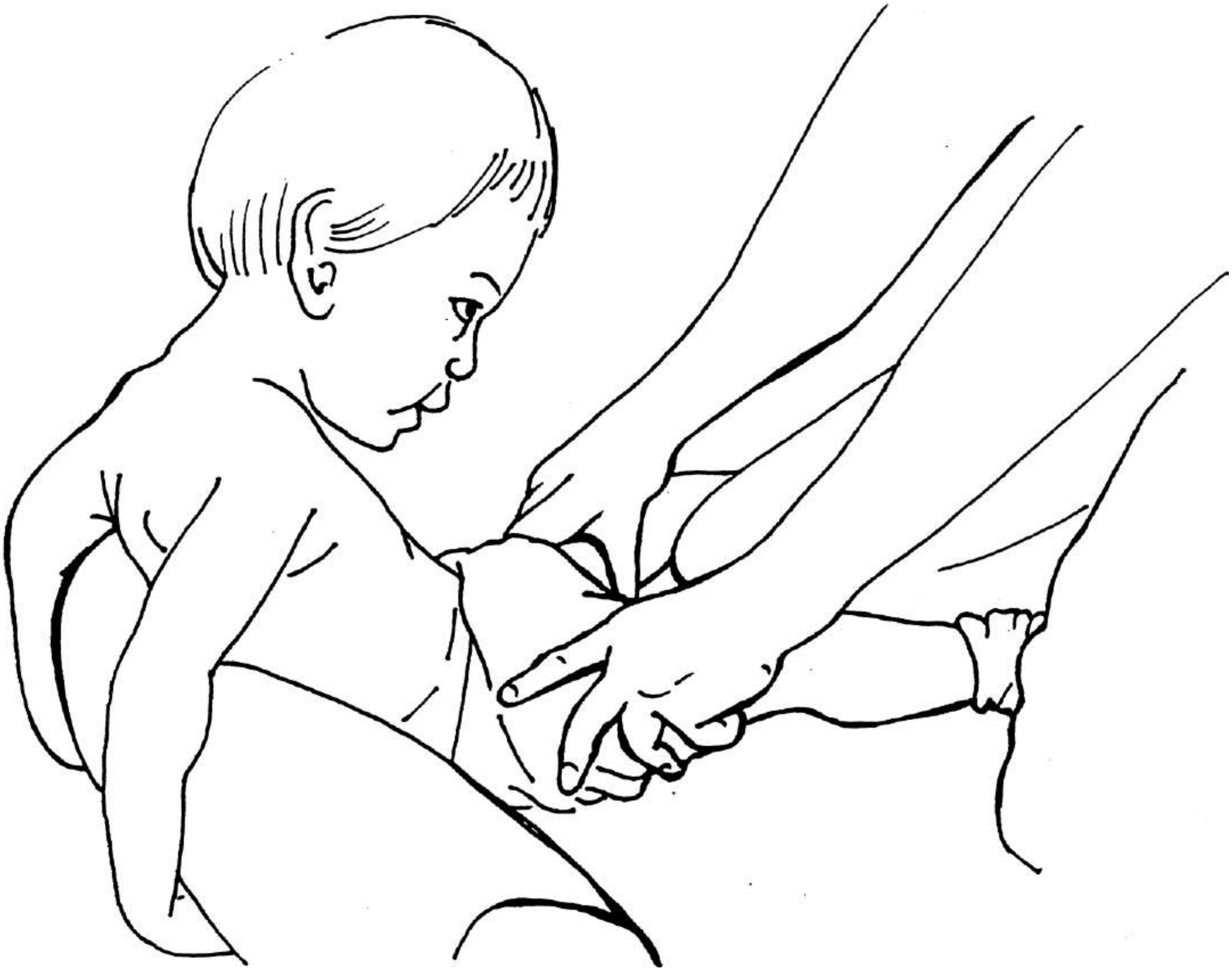
Elongation of one body side while maintaining pelvic stability and adding slight traction of the opposite arm, helps promote the experience of lateral flexion, while dissociating the upper extremities. Weight bearing on the elongated side also inhibits tightness. Children with fluctuating tone benefit from graded control of the response to inhibit tone fluctuations. This position is not good for Children with low tone because the distal control puts too much stress on their poor joint stability.

Figure 34



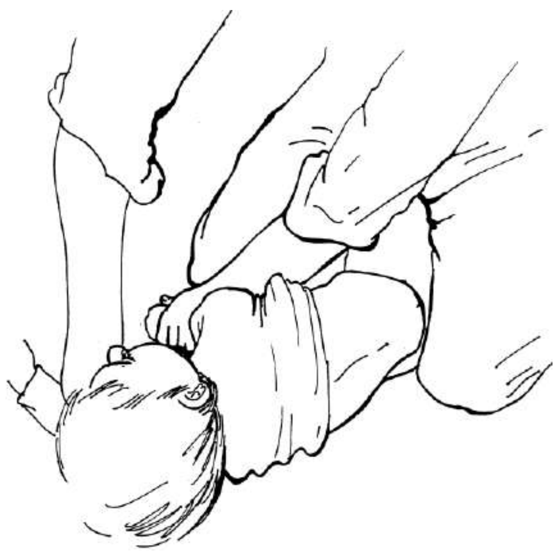
Controlling trunk and shoulder alignment through the use of a roll, allows the handler to mobilize the pelvis and dissociate the pelvis and lower trunk from the upper trunk The pelvis can be moved laterally or into posterior tilt, while the legs are separated through sustained pressure. With gradual reduction in tone the legs can be flexed to allow posterior pelvic tilts. Maintaining this position for children with fluctuating tone can inhibit tone fluctuation and establish sensory organization in midline. Children with low tone benefit from sustained forward weight bearing on the shoulder and neck areas.

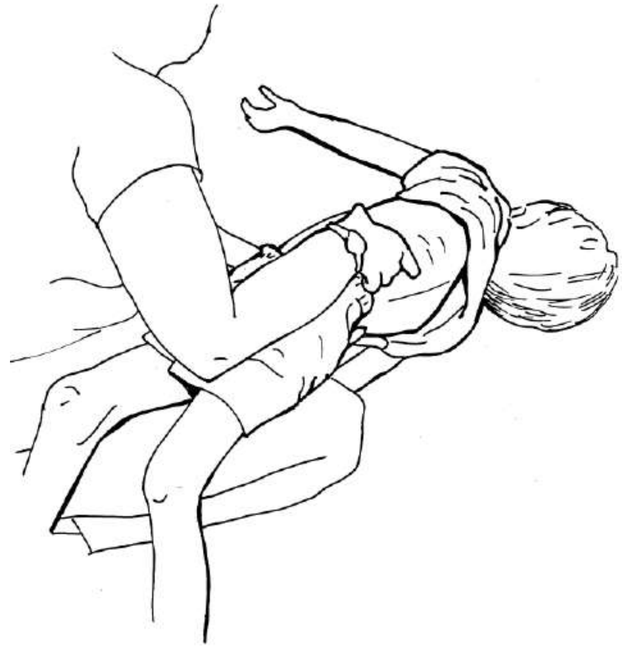
Figure 35



Once tone reduction has been accomplished, the arms can be helped to bear weight through maintaining hand placement under a roll. The pelvis is controlled and facilitated in various tilts, increasing and decreasing the amount of weight on each upper extremity. This position is only effective if sufficient tone reduction of tightness has been accomplished. If the child can easily be positioned without rebound or tightness, then the activity can be beneficial. Children with fluctuating tone or low tone require handling control and support at the shoulders and the head and neck. Without this control, this position should not be used.

Using a roll to support the head and controlling the legs in flexion and pelvic stability, the child can be facilitated in lateral trunk movements with dissociation of the head from the trunk. Sustaining the weight on each shoulder temporarily allows for graded and continual reduction of tightness in the shoulder girdle area. Maintaining flexion of the legs also inhibits the tendency for extensor tightness or posturing of the lower extremities. Children with low tone benefit from proximal compression in both pelvic and shoulder regions, while children with fluctuating tone can expedience graded movement while fluctuations are inhibited.

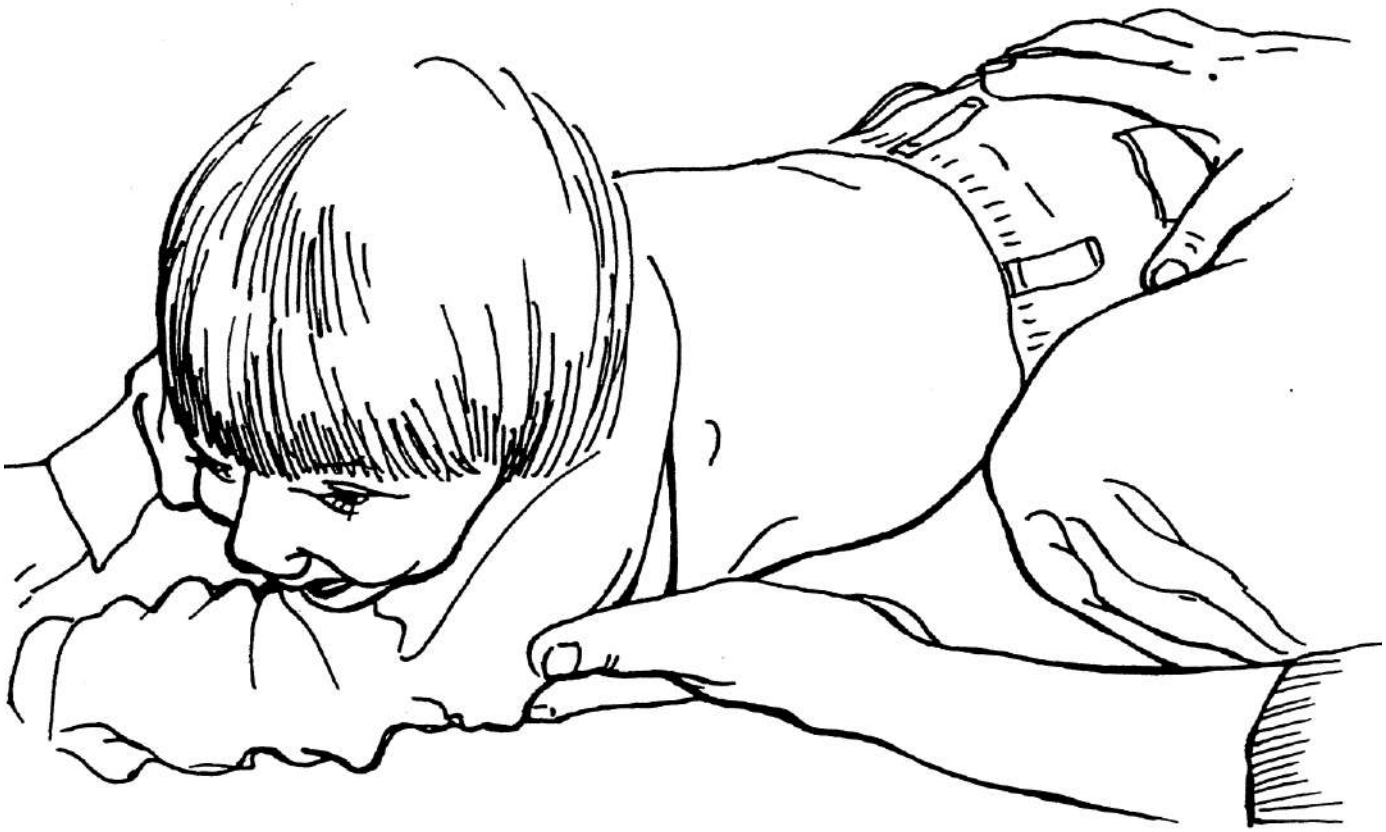




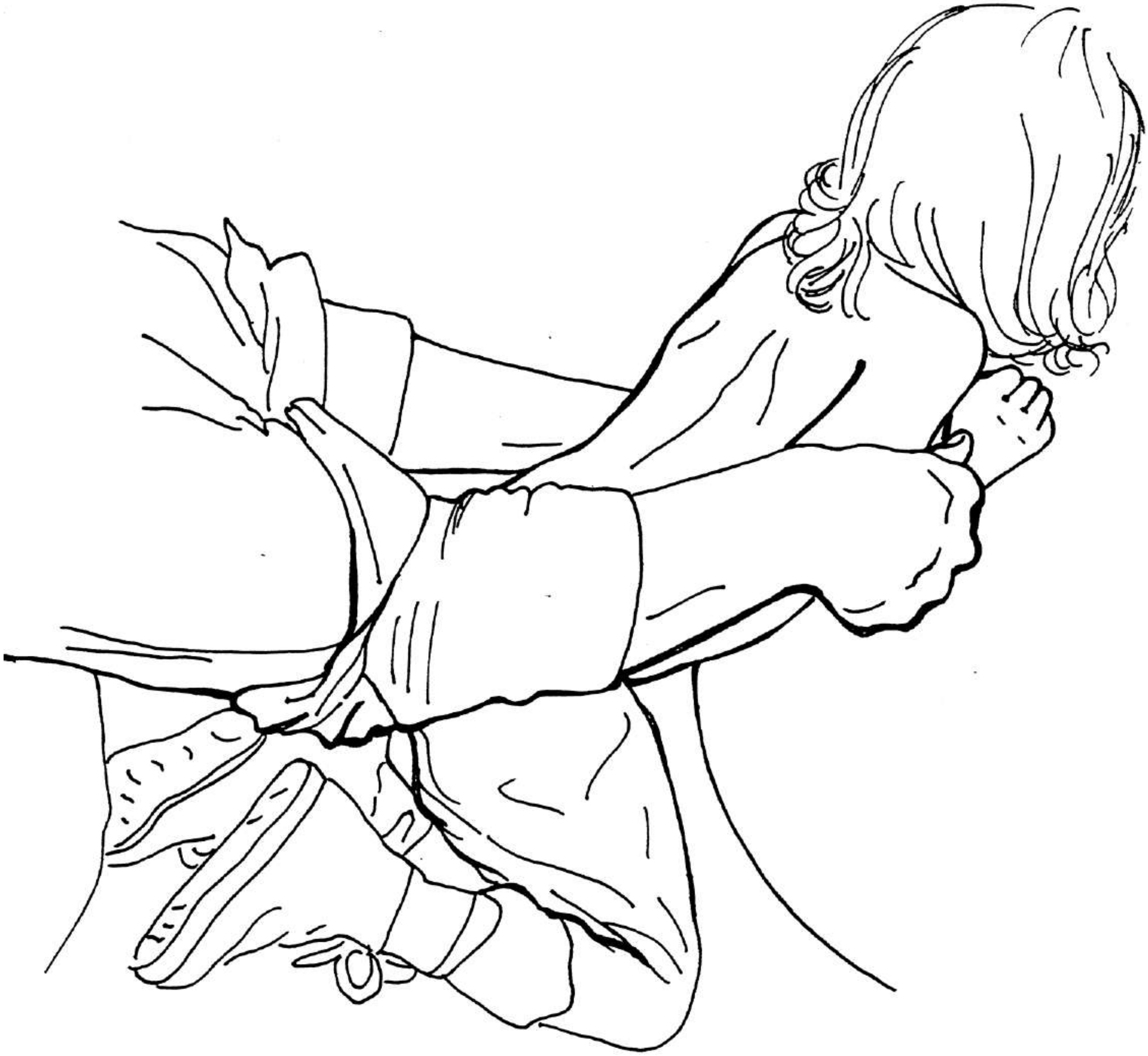
Placing the child in side-lying, while elongating the weight bearing side, allows the handler to bring the opposing arm forward and back in ranges of shoulder protraction and retraction, thus dissociating the upper extremities while inhibiting tightness. The trunk often follows in small ranges of rotation and contributes to maintaining decreased tone during movement. The pelvis is stabilized and results in the additional advantage of separating the trunk from the pelvis. Rhythmic shoulder excursions help to decrease tone while slower excursion facilitate graded sensory tolerance. This position is also effective for children with fluctuating tone, since the position is stable and the movement can be managed to grade the response while inhibiting fluctuations. For children with low tone, adding approximation to the weight bearing shoulder and proximal tapping to the upward shoulder may help to build tone. Lifting the upward arm and giving intermittent support may also help increase shoulder stability and control. Respiratory responses should be carefully observed and considered in direct handling.

Specific techniques can be applied to discrete muscle bellies to reduce tightness. Deep pressure into and along the length of the muscle belly combined with soft tissue mobilization over the surface of the muscle can affect specific localized changes in tightness. This procedure can also be used for localized areas of tightness or for children with fluctuating tone. The head is gently kept in alignment while the specific work is done.

Ranges of trunk elongation and lateral flexion are important. Repeated sustained traction between the pelvis and shoulder girdle, followed by slow release gradually lengthens the lateral excursion of the trunk. Once the trunk is lengthened through reduction of lateral flexor tightness, a more active lateral flexion response can be anticipated. Lifting the pelvis in lateral tilt toward the shoulder and guiding the shoulder to depress toward the pelvis initiates more active lateral flexion. The pelvis can be lifted and held with intermittent support to encourage more active normalized lateral flexion responses in the anti-gravity alignment. The pelvis can also be mobilized into posterior tilt to lengthen the lumbar area and reduce is tightness or lumbar stress evidenced by lordosis and anterior pelvic posturing.

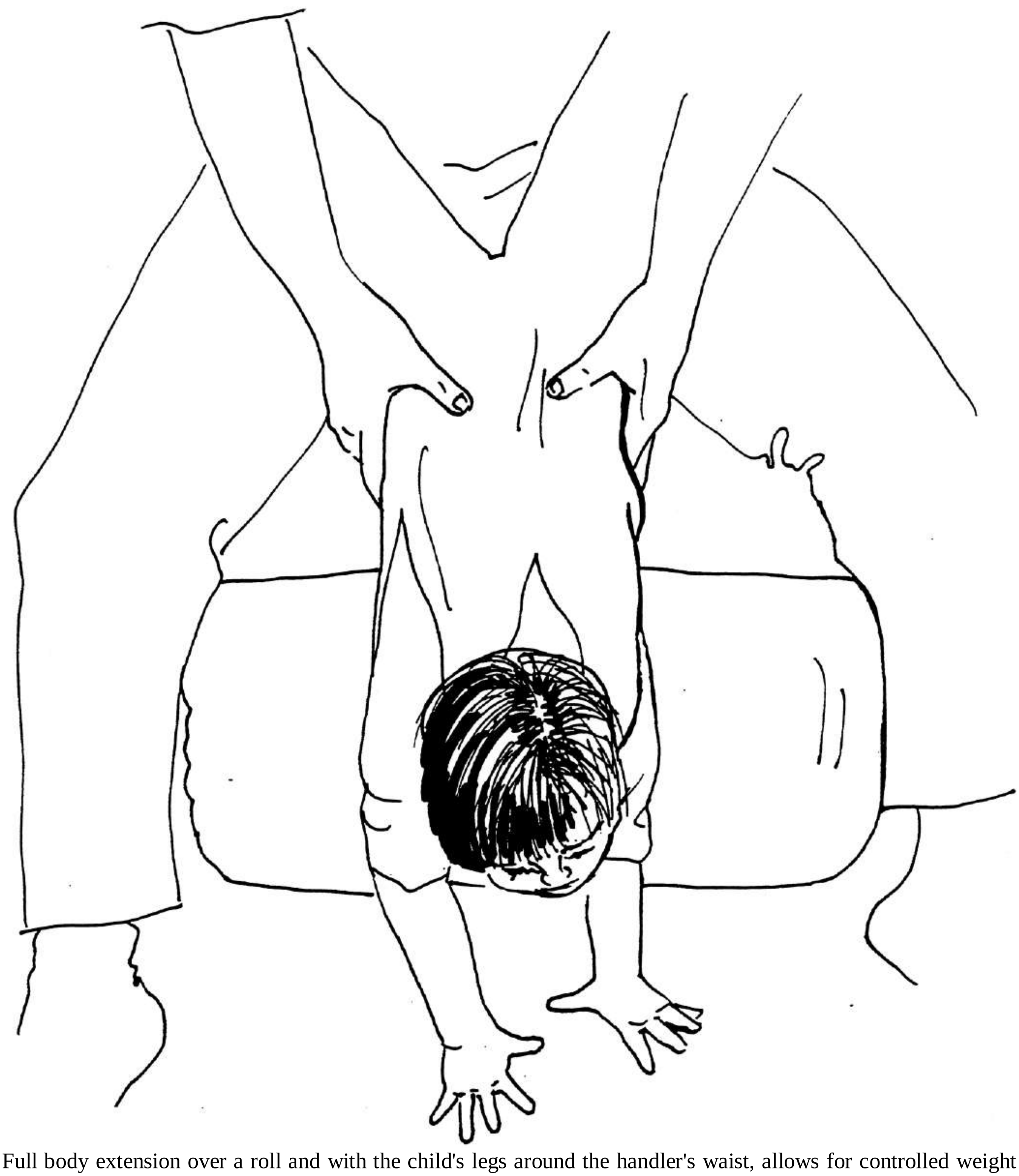


Increasing shoulder mobility can be accomplished through gently placing the arm in full extension in prone. Slight traction can be applied toward the distal extremity. The arm is then lifted gently to the. point of restriction and gently moved back to the surface and up to the restriction and held briefly. As tone reduces the excursion is increased further into the restricted range. The same procedure can be used in ranges of abduction. The scapula must be stabilized to prevent winging with firm tapping toward midline to encourage more actives scapular adduction. Simultaneously the pelvis is rocked gently laterally to provide a sensory background of inhibition to retard the tendency for spastic rebound. The child with low tone in this position requires both arms to be supported under him, so that the handler can lift both arms together and at the same time give support to the head. The upper body is raised into a small range of extension and bobbed with intermittent support to encourage increased extensor tone. When the tone begins to increase the arms can be firm placed on the surface to facilitate independent head raising if possible.



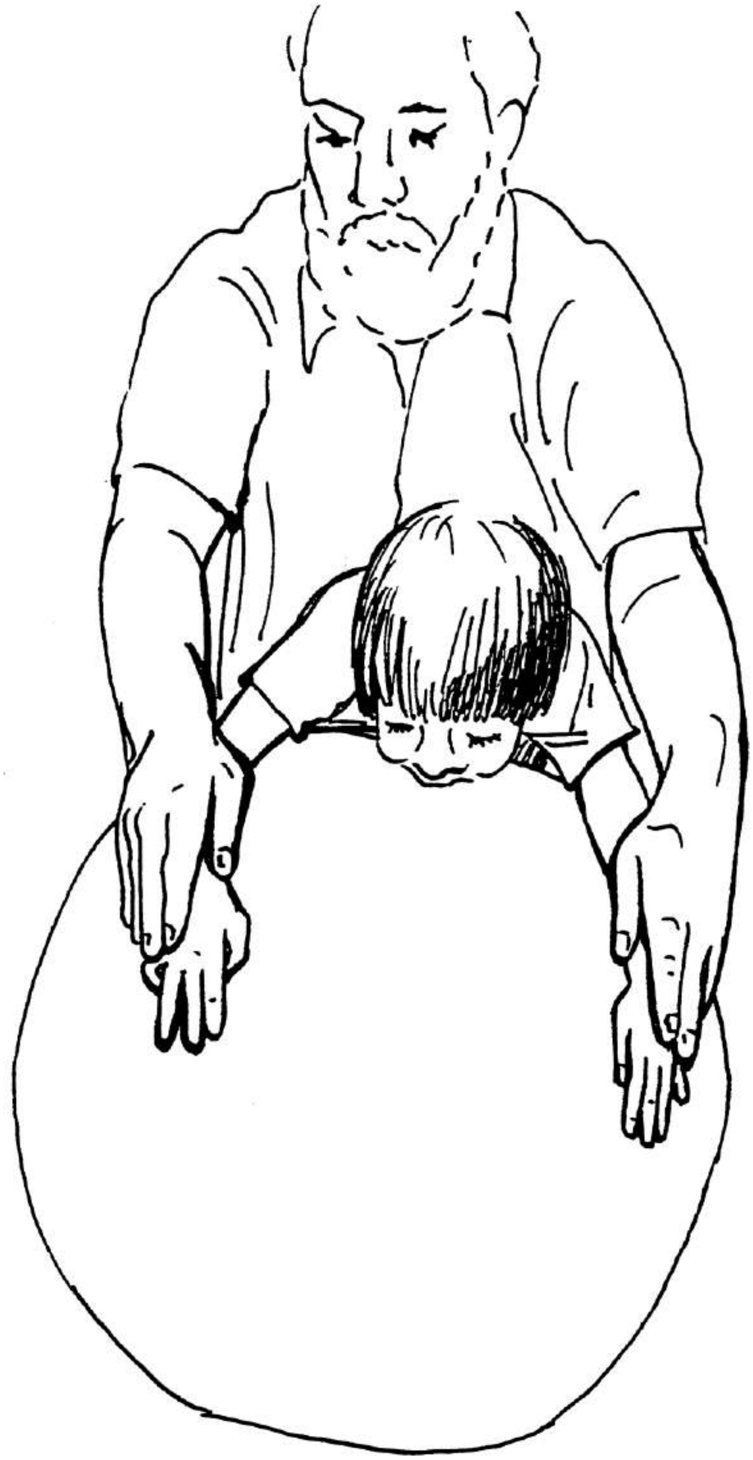
Placing a child against a ball in kneeling with the hands directly under the shoulders, encourages scapular adduction, neck extension and forearm support for propping. This is a position which can help activate muscle control for support in children with tightness after some general tone reduction is achieved, and if the child can be easily placed in the position. The springy quality of the ball allows constant background movement to maintain reduced postural tone and also facilitates the tendency for the child to push up. Children with fluctuating tone are given more compression into the proximal areas and toward the midline of the spine to encourage more joint awareness and a basis of stability to push up against. Children with low tone will need more complete trunk support, and lifting and gently dropping the trunk on the ball to encourage an increase in extensor tone.

Using an elbow air splint or a small gaiter splint allows the handler to maintain arm extension and maintain shoulder control while working bilaterally for upper body extension and elongation of the trunk. Such supports can also be used for children with fluctuating tone to limit the range of fluctuation of a joint and for low tone children to stabilize a limb for weight bearing. The emphasis is on giving the child a successful experience.

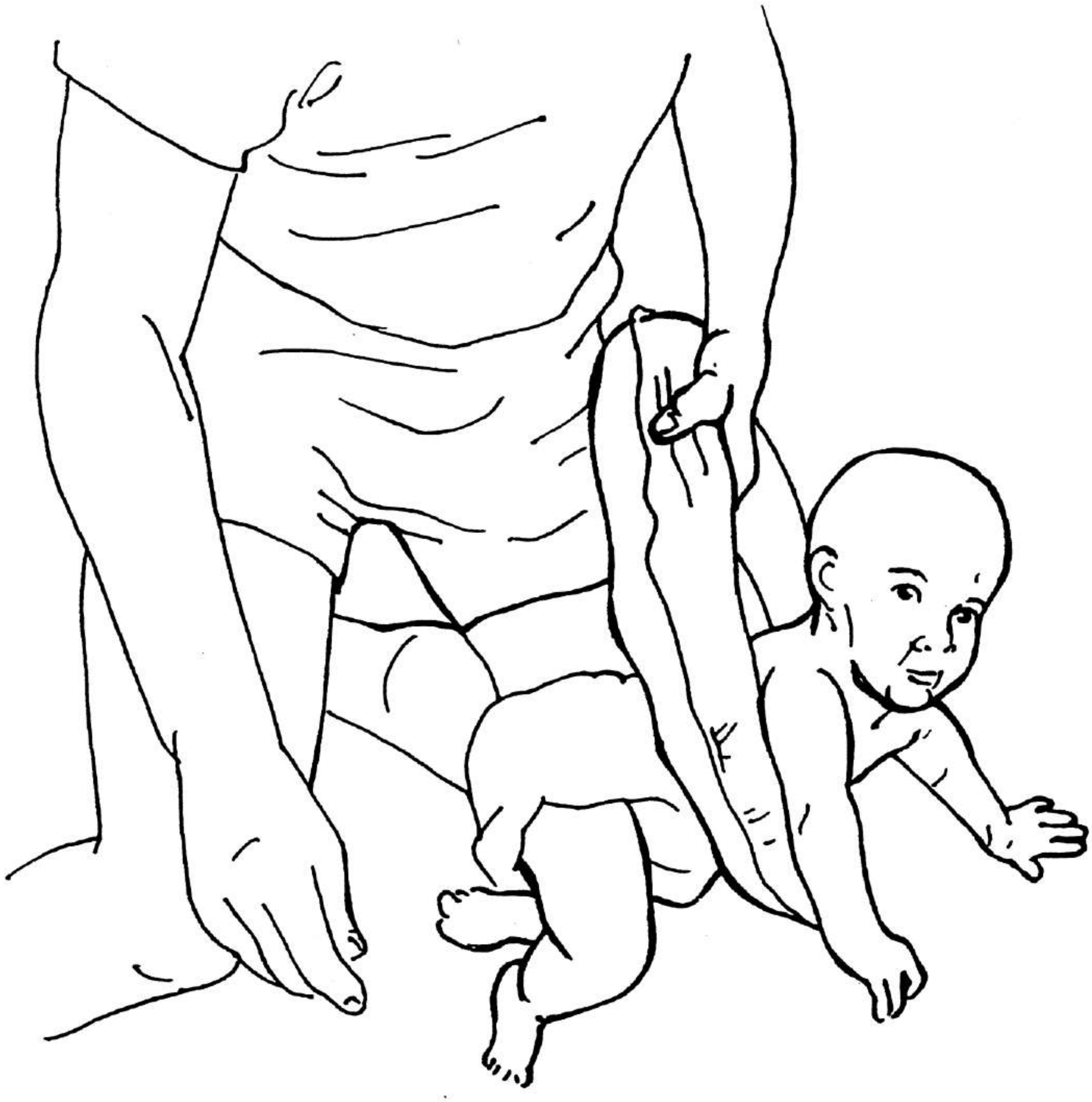


Full body extension over a roll and with the child's legs around the handler's waist, allows for controlled weight bearing on the hands and through the upper extremities. children with high tone may need generalized reduction of tone before weight can be tolerated, and may also require splints on the arms to inhibit flexor rebound affects or collapse with tone changes. Children with fluctuating tone gain stabilization through deep pressure weight bearing and children with low tone need more proximal support and control so that only partial weight is applied to the extremities.

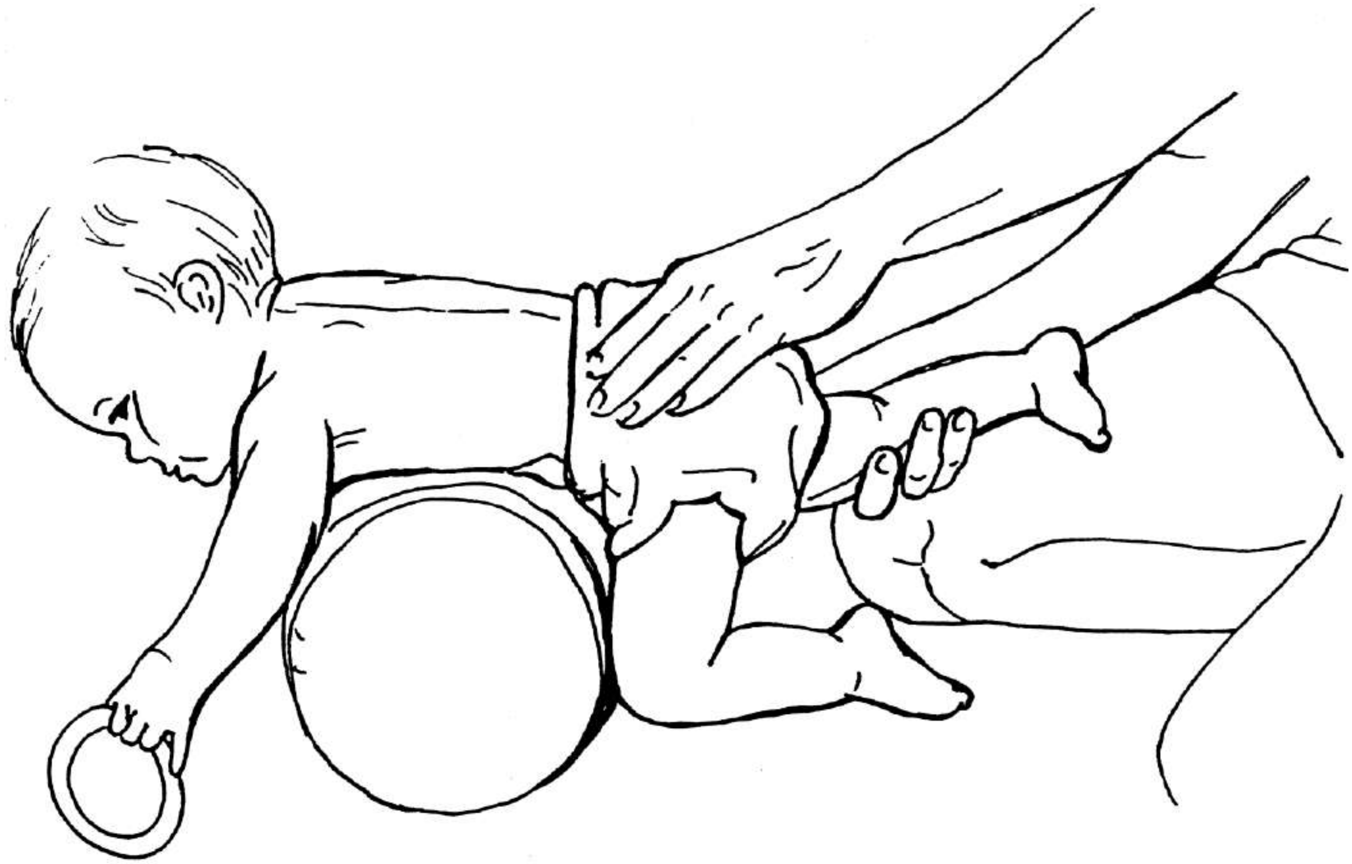
Maintaining the child's arms along the trunk or underneath the trunk allows better isolation of head and shoulders. Alternating the weight from one shoulder to another rotates the trunk slightly and facilitates head mining and separation of head and shoulders with inhibition of tonic influences. This can be effective in spastic children as a tone reduction activity and an active dissociation process that is the basis of the righting reactions. Children with low tone may need some additional facilitation for head turning to activate neck contraction. Children with fluctuating tone need monitoring for speed of turning so fluctuations of tone can be inhibited and graded movement responses introduced.



Routine placement of the child over a ball with surface contact to the upper body can be effective in reducing spasticity around the thorax and shoulder girdle while controlling the arms in extension. Gentle vestibular rocking laterally helps maintain inhibition of tone. From this position isolated head lifting can be dissociated from the shoulders and trunk while the forearms give support to the effort. Children with fluctuating tone can gain midline orientation and control in small ranges of head lifting without overflow. Children with low tone require more proximal support and assistance in head lifting for gradual increases in tone and strength.



Use of a small swim ring for mid-trunk support allows more active responses of the young child to supporting body weight. The swim ring can be tilted laterally for unilateral body supporting responses as well as forward and back for bilateral upper and lower extremity supporting reactions. A bath towel may be used in a similar way for dynamic trunk support.

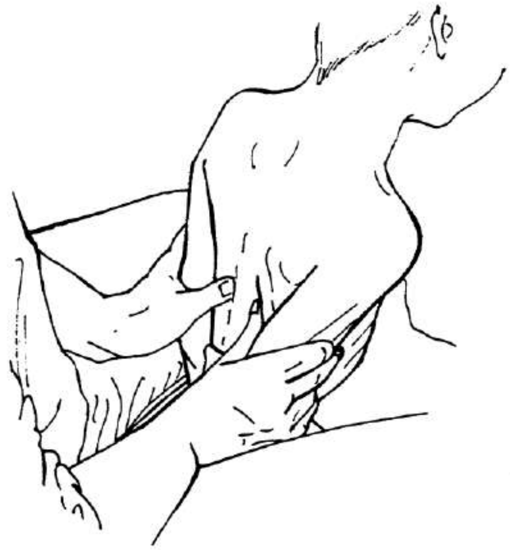


Separation of the lower extremities can be accomplished by placing the child over a bolster and maintaining pelvic control while extending one leg and allowing the opposite leg to maintain weight. The pelvis can be gently rotated laterally to increase inhibition of spasticity and facilitate dissociation of the pelvis and legs. Upper extremity weight bearing can be graded by tilting the child's weight forward and back if there is not significant upper extremity spasticity present.

Controlling the child through the trunk with legs stabilized around the handler's waist allows isolation of weight bearing to each arm independently. Control must be given to the upper arm and shoulder and hand placement may need to be provided for children with significant spastic tendencies for flexor withdrawal. This position also encourages head righting, but low tone children will require head support and then intermittent support for fighting reactions to occur.

Facilitation of transitional movements, for example, from side sitting to four point can be accomplished by stabilizing the pelvis and supporting the weight bearing side while facilitating weight transfer to a four point position. Oscillation or gentle background movement can help inhibit tightness during the movement transition. Resistance with trunk compression can be applied to grade transitional components and inhibit fluctuating tone. Children with low tone will require more firm input and support along with intermittent support to facilitate active muscle participation.

Controlling the child's legs with the handler's legs and supporting the mid-trunk with a soft ball or small bolster, allows the handler to control both upper extremities proximally and alternate weight bearing on each arm. Gentle dropping of the limbs increases proprioceptive feedback for children with fluctuating tone and low tone. Sustained weight bearing helps inhibit tightness and increase sensory tolerance for joint proprioception.



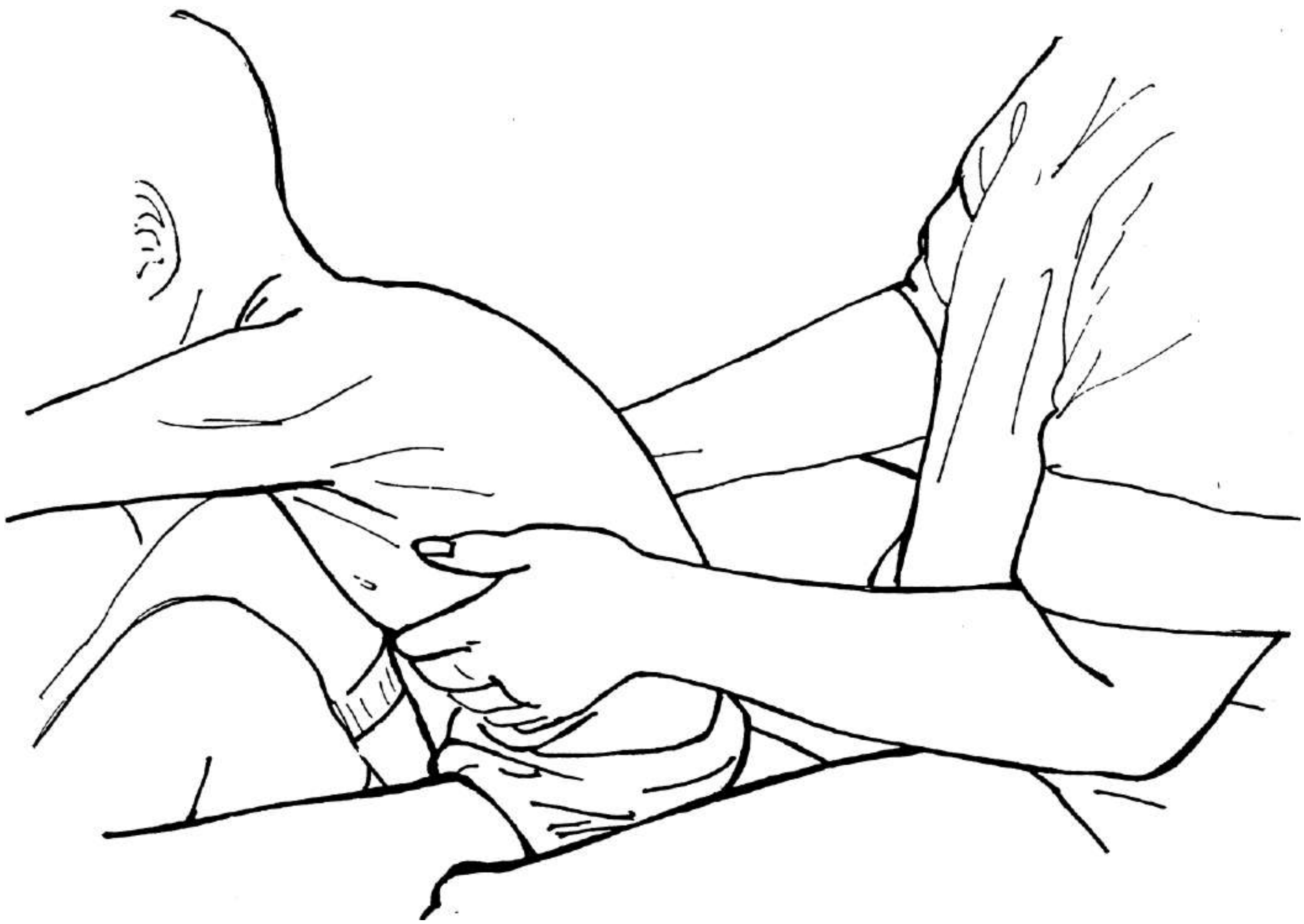
Placing the child in straddle sitting around the handler's waist and lowering the child to a small ball placed between his scapula, permit the possibility of reducing tightness in the mid-trunk and bringing the shoulders out of protraction. The ball provides contact for body areas that never touch the surface due to the effects of spasticity. The child can be controlled at the pelvis and mobilized to decrease lumbar lordosis if present. Pressure can be applied to the chest and the soft tissue spread laterally to reduce thoracic tightness. Attention must be given to fatigue due to the head control.

The shoulders can also be mobilized to decrease protraction and facilitate depression into normal alignment. Low tone children can benefit from this position with added head support to assist lifting the body away from the ball and giving intermittent support to facilitate increased postural tone. Children with fluctuating tone benefit from the midline organization of this activity, and with firm control of the shoulders, graded movement away from and back to midline can be experienced. Rotational adjustments can be graded.

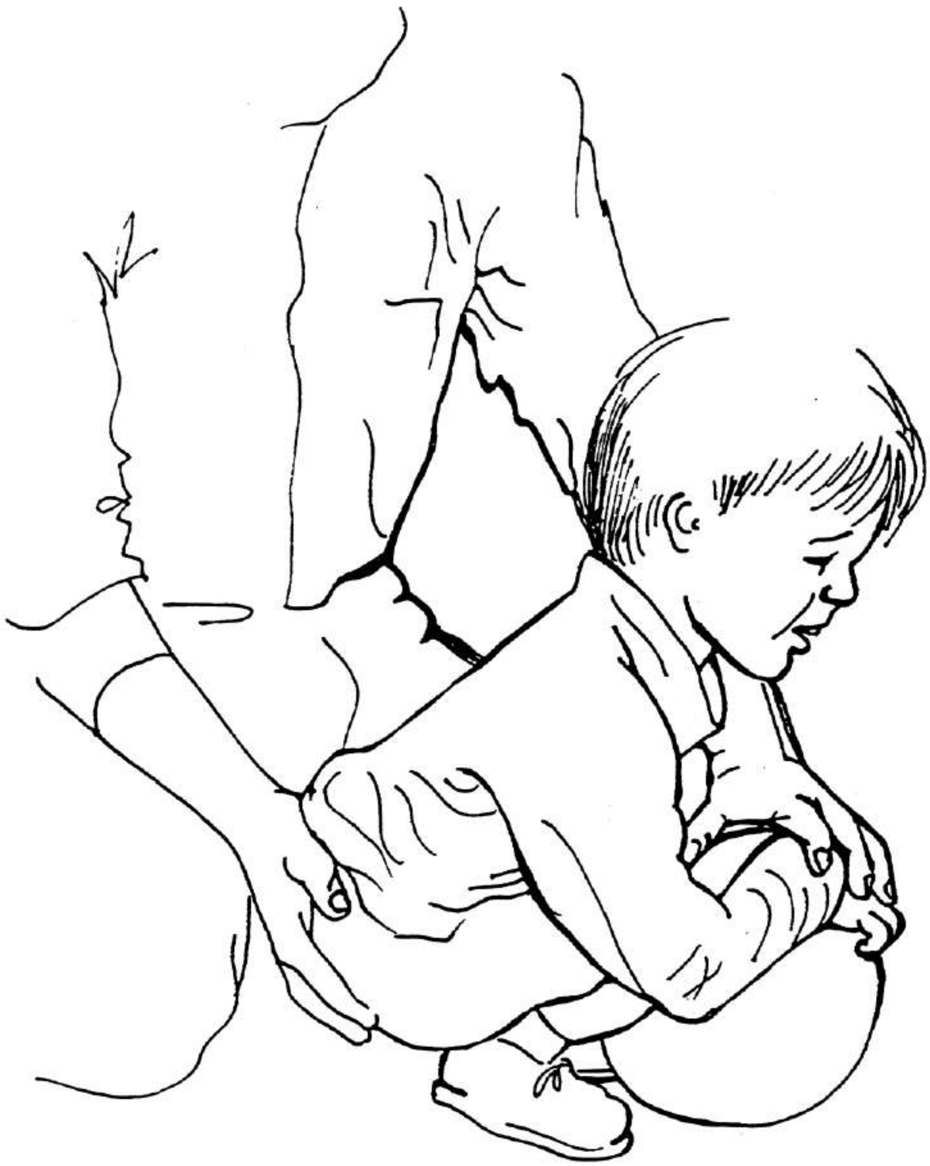
Once tone is prepared the child can be placed more upright, shoulders back and arms in external rotation to facilitate active scapular adduction. A bench permits the adult to sit behind or face the child. Additional input can be provided to the trunk extensors to facilitate more normalized trunk support for the shoulders to react with. Body weight may be shifted over the hands and arms.

Lateral weight shifts to facilitate righting and equilibrium responses can be achieved with gradual shifts from the center of gravity. The child can be prepared to feel the change in weight distribution through slow deliberate shifts and manual assistance with elongation of the trunk and lateral flexion of the opposite side of the trunk. This movement can be accompanied by firm approximation to reinforce the proprioceptive input, and slight bouncing or oscillation to more consistently inhibit spasticity. Low tone children require more firm bouncing and exaggerated approximation, always with alignment maintained to reinforce proprioceptive input and intermittent support to maintain increased postural tone. Children with fluctuating tone require firm compression into the proximal joints to increase awareness of joint proprioception and slow graded shifts of lateral excursion away from the midline to control fluctuation in postural tone.

As postural tone is more normalized larger excursions can be facilitated with more distal control. Slight traction can be applied to inhibit spastic rebound and short periods of rapid oscillation can also be used to break up any tendencies toward flexor withdrawal. Head righting can be facilitated by increasing traction of the elongated side or by supporting the head with the raised arm. The hand can be manually placed on the surface for proprioceptive placement responses and sustained weight bearing to further normalize tone and allow isolated head righting. Low tone children should not be given traction to the elongated side, because of joint laxity, but can be elongated with intermittent support to encourage an increase in tone. Gentle dropping of one limb to the surface from a height of several inches with immediate control of the distal extremity may help. sustain increased tone in the extremity, while the handler simultaneously supports the child's head with his upper arm. Children with fluctuating tone may require alternating points of control from proximal to distal to control fluctuating tone. Lateral excursions should be applied slowly with firmness to grade lateral reactions and avoid patterns of fluctuation and disorganization of movement components. Use of a foam neck support can be helpful in maintaining head control in children with fluctuating or low tone children with problematic fluctuating tone.



Placing the child on the handler's lap and promoting forward flexion allows the lumbar spine to elongate and decrease tension in tile low back through natural traction from the positioning of the upper trunk in flexion. Movement of the tissues over the rib cage frees the respiration. Controlling the trunk on the surface with firm pressure also assists in decreasing flexor spasticity below the ribs. At the same time displacing the trunk laterally assists in dissociating the lower trunk from the pelvis, shifts the body weight laterally and mobilizes the pelvis in lateral tilts. Children with high tone with tendency for flexor tightness of the arms may need additional control of arm splints to help maintain arm extension and encourage free arm movement during lateral shifting of the trunk.



Weight bearing can be added to a total body flexor pattern by placing the child in a squat position in front of a small ball. Supporting the pelvis and the arms allows the handler to shift the child's weight forward and back over the feet. This compressed posture is advantageous for children with fluctuating or low tone. Children with high tone with strong flexor tightness benefit only if the tightness has been reduced and good postural tone can be maintained.

Kneel standing with proprioceptive upper extremity weight bearing may be accomplished by maintaining leg alignment with the handler's knees and supporting the trunk and hand placement on a roll. The child's weight can be shifted forward and back to influence sustained holding and postural support of the upper extremities. Children with high tone may need continual gentle shifting to inhibit tightness reactions, while children with fluctuating tone can tolerate more movement with care to control fluctuating tone. Children with low tone may need more upper trunk support, occasional tapping of the abdominals and intermittent placing or dropping of the arms to maintain increased tone in the upper extremities and trunk.

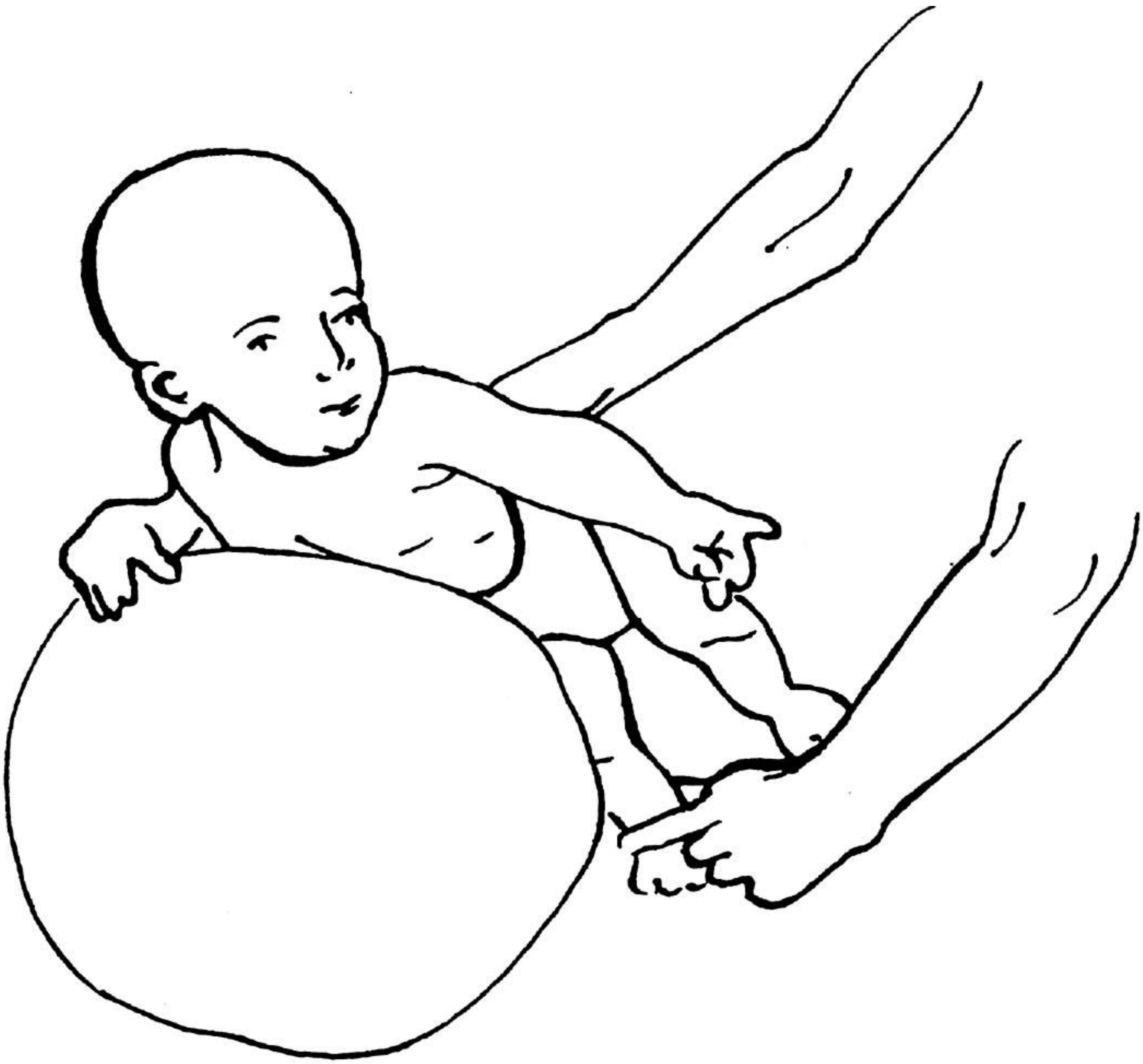
Straddling a roll and controlling the shoulders while maintaining hand contact with the surface allows for upper extremity proprioceptive weight bearing. Gentle elevation and depression of the shoulders can be effective in reducing shoulder spasticity. Compression into the shoulders increases joint awareness and stability for children with fluctuating tone or low tone and allows the handler to maintain midline control while shifting the child's weight over the hands to increase proprioceptive upper extremity support.

Children can experience more independent control in sitting when placed inside a large circular tube with additional support where needed. This type of circular support may allow the child to initiate and experiment with isolated head control.

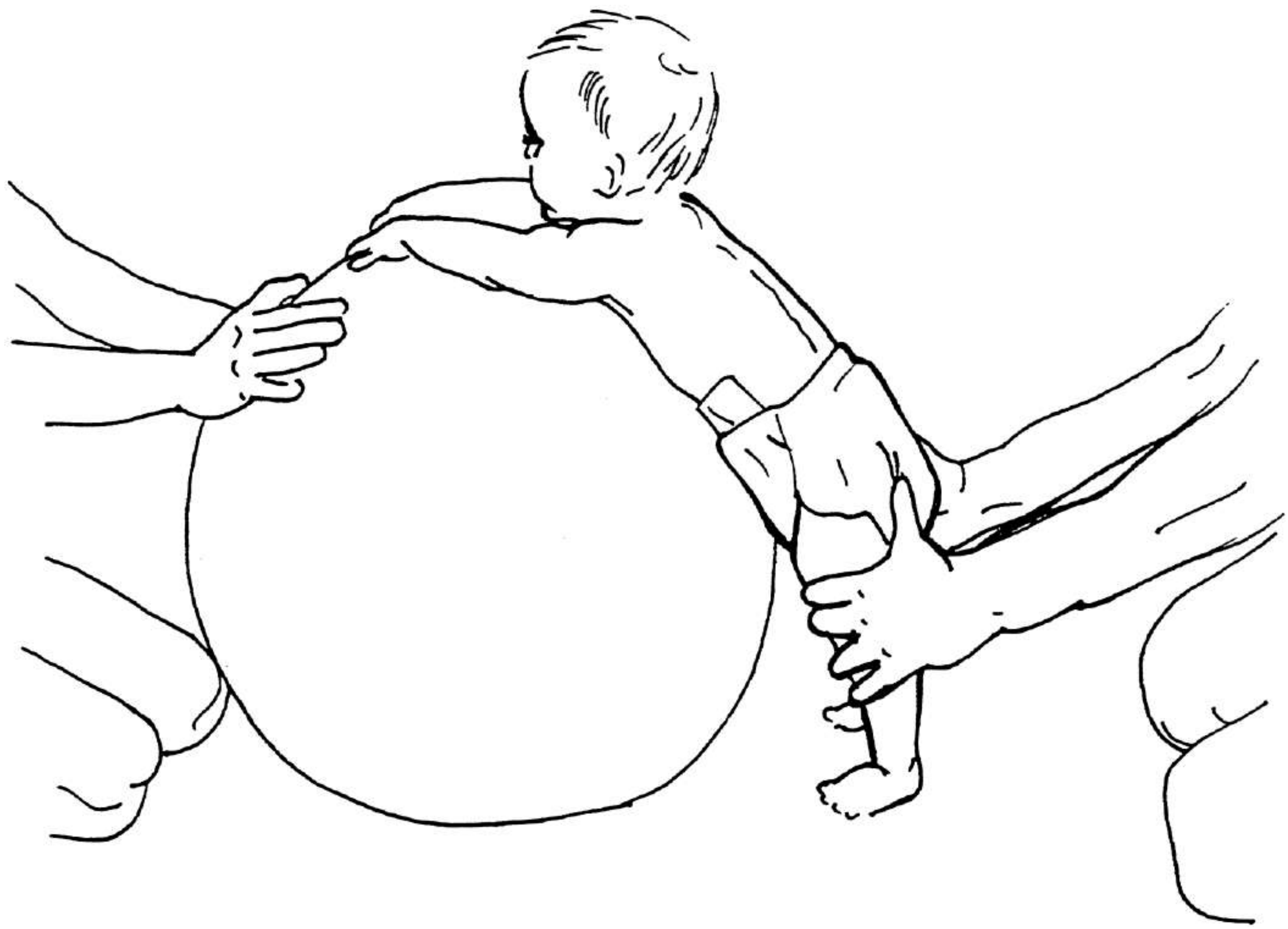
Plantar-grade weight bearing can be facilitated by controlling the child's pelvis and placing a small ball between the child's knees to maintain separation of the legs. The upper extremities are free to place for support and forward and back weight shifts can enhance the proprioceptive input to the extremities. With good proprioceptive support in weight bearing, the child may be able to initiate head lifting and activate trunk extension. Children with high tone may need additional arm support through the use of gaiter splints to maintain elbow extension.

Kneel-standing allows for the facilitation of initial upright equilibrium responses with a low center of gravity through controlled weight shifts away from midline in all directions. Forward weight shifting with inhibition of anterior pelvic tilt and neck hyperextension can result in a graded transition to four-point control supported by upper extremity proprioceptive placement. Lateral weight shifting can facilitate separation Of lower extremity positioning. The handler supports the elongated trunk while shifting the weight toward that side and assists the opposite leg to come forward in a half-kneel transitional posture. Speed of movement and specific points of control and support will vary depending on the type of the child's tone.

More complete upright control can be experienced by the child in standing over a large ball. The child is supported throughout his trunk and weight is gradually brought to bear through the legs. Each leg can be alternately separated to prepare sensory tolerance for dissociation of lower extremity patterns. Weight may be shifted forward and back and sustained to build tolerance for weight over the feet. Children with fluctuating tone benefit from firm pressure and approximation through the weight bearing extremity. Children with low tone may require more rapid approximation and bouncing of the weight bearing limb on the surface to increase and maintain tone. Spastic children may pull into flexion in this position, and if tone cannot be controlled, alternate weight bearing positions should be employed, such as supine standing.

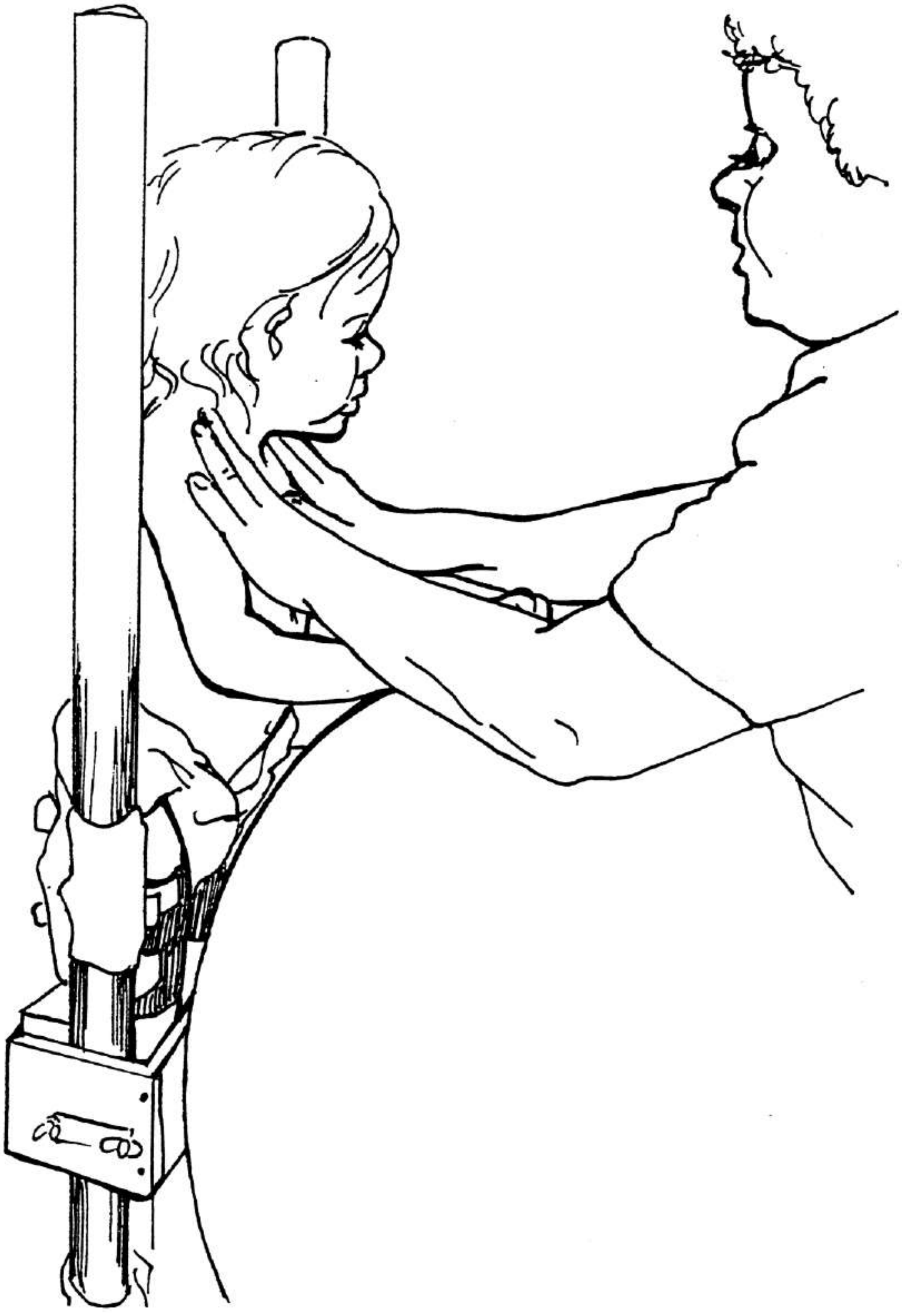


Weight bearing on the lateral surface of the foot can be accomplished from a side lying position over a ball. From this position the child can be shifted over the foot more easily than in a straight forward position. The child, can be elevated off the surface occasionally to inhibit sensory buildup or intolerance to proprioceptive contact to the foot. The opposite leg may be facilitated to separate through guided swinging or placement in stride positioning. As in all other cases, the type of tone will dictate the exact handling requirements.



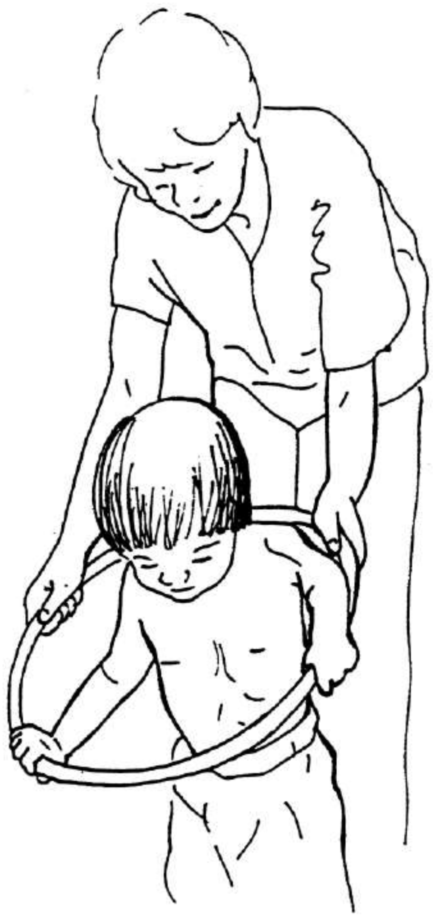
Standing with both feet firmly on the surface and in a more upright position allows the child to feel more of his complete body weight over the feet. The child can be brought gradually to a complete upright position for maximum effect and then lowered to allow recovery from sensory buildup. Children with fluctuating tone can be given firmer and sustained approximation. Low tone children will require a more rhythmic contact and release in a quick tapping type of technique to increase tone. Children with high tone will require a combination of hold and release from the posture with anticipation by the handler to inhibit spastic rebound.

Supine standing allows the. child to experience weight distribution on the lower extremities which enhances weight bearing on the heel of the foot, with more complete extension of the trunk than is usually accomplished in prone standing. The handler can place the child's arms behind with external rotation and shoulder retraction to activate scapular adduction and further contribute to overall trunk extension. Various supports may need to be used such as leg splints or a neck support depending on the needs of the particular child.



The more involved child may need more total support to experience the benefits of standing, such as a flexi-stander or standing flame device. Standing devices like other, types of adaptive equipment should not be used to contain a child or free staff to do something else. Adaptive equipment need continual monitoring and the child requires adjustments to the rigid position as well as some movement and weight shifting to prevent unopposed flexor tightness rebound or low tone collapse.

The less involved child may be given more challenging experiences in standing. Firm control of the weight bearing side in elongation and placement on a surface of challenge allow the handler to provide various degrees of support to facilitate graded equilibrium and righting responses.



Facilitation of walking can be accomplished in many ways when the child's tone and postural control are prepared for the experience. Standard walkers are useful for independent walking, however they require careful observation. Forward rolling walkers tend to encourage tightness in hip flexors for spastic children, and the child's weight most often remains forward in toe walking. Posture control walkers facilitate more trunk extension and weight bearing on the heel of the foot, however children may not be able to make the transition into forward flexion of the trunk to distribute weight over the feet. In this case the child becomes just as reliant on using too much extension as the child who relies on too much flexion. Children may need to experience the use of both forms of walking devices to manage the transition of forward and backward weight shifting necessary for independent walking.

These are the verification exam questions to be answered when you click on Take Exam. For ease of completion select your answers prior to clicking on Take Exam.

Issues in Cerebral Palsy Part 2: Physical Handling Treatment

CEU Verification Exam

1. The therapeutic principle of physical handling treatment is to provide the least amount of control needed to facilitate a more efficient response.
a. True
b. False

2. Preparatory techniques are not required to prepare the child's postural tone for an active response.
a, True
b. False

3. Foundational underpinnings of postural control and alignment are critical before any efficient skill can develop in functional areas.
a. True
b. False

4. All functional skills require an organized base of support and a graded interplay of stability-mobility.
a. True
b. False

5. The risk of using general protocols is that they may activate compensatory patterns and further embed the child's limited functional adaptation.
a. True
b. False

6. Treatment should strive to introduce new motor learning experiences, not only as functional responses but preparatory in terms of sensory tolerance.
a. True
b. False

7. Degree and efficiency of dissociation of body parts, is only required in passive movement.
a. True
b. False

8. Respiration corrects itself and no direct intervention is required for respiratory support to movement.
a. True
b. False

9. In the dysfunctional system the trunk needs special help in experiencing adaptation to various alignments in upright while the center of mass is controlled over the base of support.
a. True
b. False

10. Organized movement and efficiency of function cannot be activated from a dysfunctional alignment, or through practice utilizing the child's abnormal compensations.
a. True
b. False