The following pages are excerpts from the handouts and Handling Skills Manual included in this course.

THE NDT (BOBATH) APPROACH TO THE MANAGEMENT OF ADULT HEMIPLEGIA

HANDLING SKILLS

HANDLING SKILLS

OBSERVATION

- 1. Use your eyes to scan the whole ... in terms of alignment.
- 2. Every place you are positioned in relation to your patient changes or limits how much you as a handler can see.
- 3. Any other area of the patient's body and his/her movements are what you need to feel with your hands.
- 4. Your eyes will also help you to communicate with the patient, so you need to arrange yourself as a handler to give and take feedback visually

FEELING

- 1. Your hands are focused and specific.
- 2. They are directly over muscles, skin and bones to give input and feel responses.

COMBINE

YOUR EYES NEVER NEED TO BE WHERE YOUR HANDS ARE.

STARTING POSTURES

- 1. These are critical for defining the readiness state for movement and for determining the more desirable movement outcome or strategy.
- 2. Usually these are symmetrical alignments since you are more on the midline and more balanced over the BOS both mechanically and in terms of skeletal muscle activity.
- 3. Inter-relationship between Alignment and Movement:
 - 1. Beginning Posture
 - 2. Sequential unfolding of the movement
 - 3. End posture defines the end of one movement and puts you in the readiness posture for the next movement or function.

FACILITATION:

INFORMATION PROVIDED FROM THE ENVIRONMENT THAT GIVES/BIAS THE CNS TO INITIATE MOVEMENT AND/OR TO ELECT A SPECIFIC MOVEMENT STRATEGY. THIS IS AN ONGOING PROCESS FOR INITIATING AS WELL AS FOR GUIDING AND REGULATING MOVEMENT. THE CLIENT IS A CO-PARTICIPANT. YOU ARE TEACHING THE CLIENT TO MOVE HIM/HERSELF.

Choices for hand placements.

Dependent on desired movement outcome.

Offers patient feedback and element of control.

Handler will want to control:

- 1. Skeletal ms. in correct synergies.
- 2. The skeleton to maintain better alignment or disallow movements extraneous to the desired movement outcome.

The choices you make here are directly related to your patient's problems, tendencies in movement as based on those problems.

The key points that you choose should make movement easier!

OPEN HANDED APPROACH

This allows you to cover a greater amount of body surface and provide a more uniform input.

There is no grasping - grasping usually elicits a counter resistance (pull in the opposite direction).

SOFT HANDS

Gives a less noxious input.

Allows the handler to build input or pressure gradually.

Gives a smoother more graded input and therefore gets an output that is more similar in nature.

Skin receptors are the way you are getting into the system with your contact ... facilitation.

The pressure you are giving with your hands is a surface pressure - when the movement begins to occur you begin to access joints and muscle receptors through change in position and change in length.

- 1. Skin receptors: accessed through contact with body surface. This initiates a process of tension change in skeletal muscle through spinal cord, brainstem, and cerebellar processing ...
- 2. Joint and Muscle Receptors: Activated when movement begins to occur and as long as movement is occurring these receptors remain activated ...

MOVE SLOWLY

Gives time for processing and responding to input-gives time for CNS to set up control. The handler also then has time to recognize what is occurring and make adjustments within the movement.

Gives both patient and handler time to set up internal reference for correctness (Gives time to recognize errors and try to make changes in response to those errors).

Speed of movement will increase as the components are learned, errors are recognized and corrections can be made ... in every session some components or movement patterns will be learned, more control is achieved and then should be speeded up.

PREPARATION

Mobilization--gives access to ROM in order to allow movement to occur and therefore achieving the components of the desired functional outcome.

You as handler identify the easier components in the activity as opposed to the more difficult.

You select the areas or components to work on first and second, and then how to combine them in order to work gradually to the functional outcome.

You select the appropriate setup (i.e.--surfaces) and alignment for the movement strategy.

SEQUENCING

How you sequence your treatment so the handling builds on one another.

- 1. In your handling, you will overlap preparation, into movement and into function.
- 2. Weight bearing with control precedes non-weight bearing movement without control. Based on developmental concepts; sets up the patterns necessary for the functional outcome to be done in non-weight bearing in weight bearing to gain control and strength that will be necessary with even more demand on the system in non-weight bearing.
- 3. Isometric-eccentric-concentric. Progression of activity in skeletal muscle that moves from easier to more difficult. Try to handle or build skill in this

order, but ultimately they overlap in every different function ... switching back and forth between types of contractions requires more control, so initially you separate them somewhat. (Ex. Wt. shifting in standing over stance leg prior to working in stance phase in gait).

- 4. Proximal to distal key points. This is a way to withdraw your feedback or control over the movements in a gradual way ... giving more control back to patient, which is the ultimate aim. There are 3 situations with all key points--all proximal, a combination of proximal and distal, or all distal.
- 5. Small ROM to larger ROM of movement with control; there is a gradual increase in increments of movement WITH CONTROL. Movement occurs in gradual or graded way away from and around midline.
- 6. Slow to fast movement--Slow offers the ability to establish control. Fast is more reasonable in time frames necessary for function. Goal--both types of movement velocity need to be in every handling session; handler needs to select which components are ready for increased velocity.

TASK ANALYSIS

Breaking down tasks into components Identify the ease of movement in each component (wt. bearing or non, type of muscle activity ...). Looking at how to bring patient through the components with your handling; which order of components build on each other to gradually increase difficulty or ease of performance. In what posture do the components need to be done to be established and then done in the function? (This might be the same or two different postures.)

GIVING THE PATIENT A FEEL FOR THE MOVEMENT

Taking a patient through a movement so they know what the movement is like, how it feels; so they know what the initiation feels like, how it proceeds and what it feels like in the end. The feeling of the movement will allow the patient to begin to know how to be dynamic in the process.

COMMUNICATION

Establish communication with the patient ... rapport. Eye contact. Verbalizations. Messages that your hands give. This is an art and also influences patients; motivation or desire to move. Information is transferred between yourself and the patient on numerous levels.

ACHIEVING SUCCESS AND CARRYOVER

See your notes on motor learning. Repetition with variety, learning vs. performance, etc

THE NDT (BOBATH) APPROACH TO THE MANAGEMENT OF ADULT HEMIPLEGIA

MOBILIZATION TECHNIQUES

NEUROLOGIC TRUNK MOBILIZATION

INDICATIONS:

Decreased ROM due to structural limitations and/or changes in muscle tone that prevents the patient from assuming certain positions.

PURPOSE:

Increase R0M to improve structural alignment, so that the patient can select a more normal movement strategy when performing functional tasks.

ASSESSMENT:

Always done prior to mobilization.

- 1) Observe how the patient moves.
- 2) Attempt to facilitate the patient in a certain direction of movement.
- 3) Determine if there is resistance to movement in that direction.

INTERVENTION OPTIONS:

- 1) If the patient can initiate movement through part of the range of motion, but there is resistance at the end of the range: The therapist can use the same hand placement used for facilitating movement in that direction, but uses firmer pressures at the end of the range.
- 2) If there is a great deal of resistance to movement in a certain direction: The therapist may need to assume a different position to more effectively stabilize the patient while applying even firmer pressures.

* In both cases the mobilization is not a passive procedure. Inhibition and facilitation are overlapped by having the patient initiate movement through the available range before applying the firmer pressures.

GUIDELINES:

- 1) Only do those mobilizations indicated for your patient on the basis of your assessment and knowledge of the patient's past and present medical history.
- 2) Start the mobilizations in the lumbar region first and always reassess alignment and mobility in the trunk after each type of mobilization to determine if "apparent" stiffness in other areas of the trunk have resolved secondarily to increased mobility in the area you just mobilized.

- 3) Perform general mobilizations over several segments vs. specific segmental mobilizations.
- 4) Achieve small increases in ROM during a treatment session vs. full ROM all at once to avoid too many repetitions that may cause soreness.
- 5) Visually attend to the patient's overall alignment.
- 6.) Stabilize above and below the part being mobilized.

Move slowly, gradually increasing pressure to overcome resistance and then gradually decreasing pressure.

8) Teach the patient how to use the newly acquired range by facilitating movement through the range and also in the opposite direction.

Incorporate movement through newly acquired range into functional activities to maintain range between treatment sessions.

TRUNK MOBILIZATIONS

The purpose of this handout is to briefly outline the key points discussed and demonstrated in the trunk mobilization labs. This is <u>not</u> intended to be a comprehensive, step by step guide on how to perform the mobilization techniques. Space has been provided for your notations that will help "jog" your memory as you think through the process and problem solve with each of your patients.

LUMBAR MOBILIZATIONS:

- Segments T 11,12 and L 1-5
- Stabilize the thoracic spine and pelvis
- First mobilize to achieve range into lumbar extension with anterior pelvic tilt, then to achieve range into lumbar flexion with posterior pelvic tilt OR into lateral lumbar flexion.

1. ANTERIOR PELVIC TILT

Dorsal Hand

- Placement: Open and flat, contacting the lumbar area between the lower thoracic spine and the ilium.
- Purpose: Apply pressure in a forward and upward direction.

Ventral Hand

Placement:	1)	Forearm across chest, under sterno- clavicular joints with hand
		resting lightly on the patient's shoulder. <u>OR</u>
	2)	Hand flat on sternum, under sterno- clavicular joint with fingers
		pointing straight across.
Purpose:	1)	Apply increasing tension (not counter pressure) to maintain
		alignment of shoulders over hips and maintain patient on midline.
	2)	Stabilize the upper trunk while still allowing thoracic extension to
		occur as the lumbar-spine extends.
	3)	Facilitate thoracic extension with increasing tension in upward
		direction at end of lumbar extension range.
	4)	Facilitate abdominal muscles if necessary to prevent excessive
		lumbar extension.

Notes :

2. POSTERIOR PELVIC TILT

Therapist's		Behind patient on knees with head resting lightly against patient's lower
Position:		thoracic spine. Therapist should position self so that his/her back and
		neck are comfortably extended towards neutral.
		Each hand with thenar eminence on iliac crest. Fingers pointing
		forward and down in light contact with pelvis. Elbows held in, not out.
Purpose:	1)	Head: Limit amount of thoracic flexion as patient moves into post.
		pelvic tilt. Do <u>not</u> completely block thoracic flexion, since this
		movement normally occurs with a post pelvic tilt.
	2)	Hands: Apply pressure with thenar eminences straight back to activate
		the abdominals. Sustain this pressure and gradually apply pressure in an
		arc, down toward the mat to move the pelvis toward post pelvic tilt.
		This pressure is applied by pulling back and down with your arms. At
		the end of the range the therapist moves his/her body toward lumbar
		extension to achieve more range.

Notes:

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TRUNK MOBILIZATION

If the patient needs mobilization in the low trunk area, the ranges should be checked in the order in which they are listed. Then, if mobilization is necessary, it should be done in this same order. Remember only mobilize in those areas required. If the patient only needs "thoracic extension" or "pectoral stretch," he/she still needs at least a neutral low trunk before doing any stretching to the upper trunk. Also, the better extended the thoracic area is, the better the mobility and alignment one will achieve in the scapulae. It is always necessary to think about how the alignment of one area relates to and effects another part.







CLINICAL IMPLICATIONS FOR MOBILIZATION OF THE LUMBAR SPINE ANTERIORLY

Lack of lumbar extension and the inability to achieve a neutral or slight anterior pelvic tilt limits the ability to extend the thoracic spine while keeping the shoulders over the hips. It also limits lateral mobility of the lumbar spine. Both of these factors interfere with efficient use of the trunk and arms (see thoracic extension page 9) and especially with trunk adjustments for balance and function in sitting.

MOBILIZATION OF THE LUMBAR SPINE ANTERIORLY

Posterior View - The hand of the therapist is pointing down with the palm over the erector spinae muscles in the lumbar area. Wrist is straight and elbow should remain slightly bent with the thigh against the forearm. The patient is facilitated with a forward and up pressure thru the available range and then the therapist's thigh grades on more pressure to move the lumbar spine anterior. The elbow should remain bent to maintain an upward pressure.





Anterior View - The therapists forearm is placed across the upper chest (below the clavicles) in contact with the upper sternum more than the shoulders. This arm stabilizes the upper trunk to keep the shoulders over the pelvis as the lumbar spine moves toward extension.

CLINICAL IMPLICATIONS FOR MOBILIZATION OF LUMBAR SPINE POSTERIORLY

Few patients need this as most compensate with thoracic flexion to make up for the lost lumbar range, but occasionally this mobilization is necessary to enable the patient to reach his feet to don shoes and socks, particularly if the patient has limited hip mobility.



MOBILIZATION OF LUMBAR SPINE POSTERIORLY

Therapist's position - The therapist kneels behind the patient and places her head in the lower thoracic area to stabilize the upper trunk. Her knees should not be too close to the patient. The hands are placed with the thenar eminence over the iliac crest and the fingers pointing down and forward. The elbows are bent and in line with the hands and shoulders. The therapist facilitates the posterior tilt with the fingers over the abdominals and then rolls the iliac crest back and downward with her arms. The therapist must not shift her body back. More force can be obtained by "hanging" her upper body weight on her arms.

CLINICAL IMPLICATIONS FOR MOBILIZATION OF LUMBAR LATERAL SHIFT

Lack of lateral mobility in the lumbar spine is common and is often assymmetrical. Patients compensate by leaning with the upper trunk which compromises balance reactions and postural adjustments for function in sitting. By increasing range and control the patient will have ability to scoot forward with alternate hips and have increased reaching range plus have overall better trunk control. Patients who have weakness on one side of the trunk may get tight on the opposite side over time which in turn limits their ability to weight shift with control toward the better side. Assessing both sides of the trunk is essential.

MOBILIZATION OF LUMBAR LATERAL SHIFT

Anterior View - The therapist stands facing the patient's sitting surface with outside leg parallel to the patient's side. The near foot is pointing toward the patient. The therapist's near hand is placed on the far side of the trunk (arm diagonally across upper chest but not in contact). Fingers are pointing downward with the little finger over the abdominals, thenar eminence horizontal over the lateral ribs and the rest of the fingers over the posterolateral surface of the low thoracic area. This hand position provides for the ability to facilitate lumbar extension, abdominals and prevent the ribs from moving laterally.



MOBILIZATION OF LUMBAR LATERAL SHIFT

Posterior View - Finger pads kept together and pointing down towards the opposite hip are placed along the lateral aspect of the paravertebral muscles and between the pelvis and ribs. The thumb is horizontal over the low scapula area and the forearm is resting against the therapist's thigh. The therapist facilitates lateral weight shift with a medial and up pressure and the thigh grades on more pressure to add stretch. This is then followed by a slight lateral weight shift of both therapist and patient to get a little more stretch.



Posterior View (alternate method)-Therapist must flex her body more in order to place the ulnar border of the hand along the lateral aspect of the paravertebral muscles between the pelvis and ribs. The elbow is level with the hand so the thigh is against the posterior aspect of the humerus. Lateral weight shift is facilitated first and then the thigh grades on pressure to get a stretch. A weight shift of therapist and patient can also be added for more stretch.



CLINICAL IMPLICATIONS FOR MOBILIZATION OF THE THORACIC AREA

Thoracic Extension – Thoracic kyphosis is very common in older adults and this can compromise respiration and arm function. (With the upper trunk flexed the scapulae are positioned in a more elevated and abducted position which results in more difficult proximal stabilization and thus less efficient arm function and more limited arm elevation.) Any increase in thoracic extension range can be very beneficial to the patient's vital function, but it must be done with extreme care as many patients over 40 years old tend to have some degree of osteoporosis.

MOBILIZATION OF THE THORACIC AREA

Posterior View - **1.** Therapist's hand is placed over the paravertebral muscles at the lower end of the stiffness of the thoracic curve. Cup the hand so that the contact is on the muscles with the thenar and hypothenar eminences and the spinous processes are located between those two surfaces but not being contacted. Fingers and arm are pointing straight down so the therapist may need to kneel on something to get herself high enough. Lumbar extension is facilitated with the finger pads.



MOBILIZATION OF THE THORACIC AREA



Anterior View - The front hand which is spread is placed below the ribs and then slid up to make contact on the inferior edge of the costal cartilages with the thumb and little finger. (No contact on the xiphoid process.) As the lumbar spine achieves neutral the abdominals are activated with the three middle fingers to prevent lumber hyper-extension. Then the ribs are moved forward and up (as in taking a deep breath) as the thoracic spine is extended.

2. Once the lumbar spine is extended to neutral, a straight downward pressure is applied with the arm to extend the thoracic spine. Following that a forward and up pressure is applied with the front hand. (See anterior view). Therapist's hand always stays below the apex of the thoracic curve. The therapist's thigh does not push forward but just stabilizes the arm so it does not slip down.



CLINICAL IMPLICATIONS FOR PECTORAL STRETCH

Pectoral Stretch – Sometimes the pectoral muscles are very tight which pulls the shoulders forward and the scapula into abduction. This frequently accompanies thoracic kyphosis but may occur separately so one must assess which needs to be done or both. With less pectoral muscle tightness the patient can position the scapulae in a more stable position for better arm function. The patient will need to learn how to stabilize in the new position for this to become efficient. Also, with better trunk extension and scapulae position, the head can align itself better over the spine instead of being in a more forward position. This allows for better respiration and oral-motor function.

PECTORAL STRETCH

Therapist kneels behind the patient with her knees outside the patient's pelvis. Place a rolled sheet or towel in the patient's lower thoracic area so that as the therapist extends her hips the patient is facilitated into extension. The therapist must bring the patient into neutral extension only. The therapist's hands are open with the first two fingers along the clavicles, thumb over the shoulder and ring and middle finger over the upper ribs to be able to facilitate abdominals as necessary. Therapists elbows are directed anteriorly (i.e. medial rotation of shoulders) as much as possible. After the low trunk is extended, the therapist facilitates the abdominals and then abducts her arms, keeping her elbows forward, to spread the clavicles, thus stretching the pectoral muscles and extending the thoracic area. The therapist must not lean forward as the patient's head must be allowed to come back as the thoracic area extends.



SCAPULA MOBILIZATION

Assessment of the position and alignment of both scapulae in relation to the spine is very important. The scapulae work very closely with the trunk, therefore, the therapist must know appropriate alignment and how the scapulae move as the trunk moves in a various directions. This assessment is essential to determining the direction(s) that need to be mobilize, and the degree of stiffness present. Occasionally the scapula needs to be mobilized in all directions, however only two directions are usually required. The therapist determines the tightness by first assessing the position of the scapula on the trunk, and then by moving the scapula. One should mobilize <u>only</u> when the scapula does not move easily. Once some mobility is gained in any direction, additional range can be gained by combining the passive stretch with appropriate trunk movement (flexion, extension, lateral weight shift or rotation) which the patient does actively while the therapist "holds" or moves the scapula.

Once mobility has been gained, the therapist must work on achieving scapular stability through a great deal of upper extremity weight bearing activity, with the arm in different positions around the body. All patients with proximal upper extremity weakness tend to elevate the scapula during arm function. This will soon become a habit and thus must be stopped if the therapist wishes to help the patient achieve the best possible arm and hand function.





CLINICAL IMPLICATIONS FOR INHIBITION OF THE HAND

Inhibition of the Hand - This handling skill is performed to enable the patient's hand to be open on a surface in weight bearing. Once this is achieved it should be maintained throughout the session. The patient should also be taught to inhibit his own hand and place it on a surface. If the hand is in a weight bearing position appropriate for the function on which the patient is working, then he might use it automatically. So the hand position should always be considered for whatever function the patient is preparing to perform. It is very normal for one hand to be in weight bearing while the other is involved in the task more directly.

INHIBITION OF THE HAND

The patient should be sitting in midline and in as good a posture as possible during this process. Usually this sequence is preceded by increasing trunk and shoulder girdle mobility when necessary.

1. The therapist sits in line with the patient's elbow and hand. The patient's arm should be away from the body with as much lateral rotation as is comfortable for the patient. Keeping one's hands off the flexor surfaces of the arm and hand, correct the wrist deviation but keep it slightly flexed.





2. The therapist, using her right hand on the patient's left hand (or vice versa), places her finger pads on the shaft and head of the first metacarpal and the heel of her hand on the dorsum of the patient's hand. The thumb can be placed on the lateral aspect of the distal phalanx if it is accessible, but very little pressure should be applied at that point as it is possible to sublux the MP joint. The therapist's other hand is contacting the palmar surface of the head of the 5th metacarpal to apply a lateral pressure to spread the metacarpals. Note: Keep the wrist in neutral deviation with slight flexion.

3.Maintain the above position and spread the metacarpals; radially abduct the patient's 1st metacarpal and thumb by applying a lateral pressure on the shaft of the metacarpal and rolling the thumb out (thereby increasing the distance between the heads of the 1st and 5th metacarpals). This is done by the therapist extending her MP joints with a slight counter pressure on the heel of her hand.





4. While maintaining the metacarpal spread, the therapist pivots her left hand on the head of the 5th metacarpal so that her index finger lies under the heads of all the metacarpals (2 - 5) and the rest of her fingers are inside the patient's fingers. This is most easily done if the wrist and MP joints are kept flexed.

5. Maintaining the wrist and MP flexion and the metacarpal spread, the therapist uses her thumb and fingers to extend the PIP and DIP joints of the patient's fingers. She spreads her fingers while applying a counter pressure with her thumb on the dorsum of the fingers. This may need to be done one or two fingers at a time.





6. Once the fingers are extended the therapist maintains a "shelf" with her fingers to maintain them, while the wrist and MP joints stay flexed.

7. Keeping the wrist bent and the PIP's and DIP's extended, the therapist maintains her index finger under the patient's MP joints and slowly extends those joints with her fingers raising the patient's fingers on the palm. The therapist keeps her index finger under the heads of the metacarpals to prevent hyper-extension.





8. While maintaining the previous position, therapist applies an upward pressure on each head of the patient's metacarpals while stabilizing the wrist with the ulnar border of her other hand. Do not push down on the wrist. **Note:** The therapist may get better releases by alternating back and forth between #5, #6, #7, and #8. It is very important for the therapist to "feel" what movement(s) help release the hand most.



9. Once the hand is open the therapist maintains this position and finds an appropriate surface on which to place the hand for weight bearing - ie. flat preferably but it may need to be curved if the hand cannot be fully opened. The therapist places the hand down contacting the ulnar border first and then rolling the palm and thumb down. The therapist slides her hand distally out from under the patient's fingers and lastly takes her hand off the thumb which is maintained in radial abduction.



10. If contact is necessary to maintain the hand on the surface the therapist uses two fingers to maintain weight bearing over the wrist with a distal pressure into the surface (not too heavy). The rest of her hand can rest lightly over the patient's hand to monitor the finger position and also to maintain thumb abduction.

4. Anterior view - The therapist's front hand is open with index and thumb pads under the clavicles to stabilize the upper trunk and facilitate the abdominals as previously described.

OR

5. Front hand could be positioned over the patient's near shoulder with therapist's finger pads below the clavicles and thumb on the scapula. This hand position may enable the therapist to control shoulder movement better and still be able to facilitate the abdominal muscles.



FACILITATION FOR SCOOTING FORWARD WITH THE LEFT HIP

1. The Therapist's front hand keeps the patient's shoulders over the pelvis and the abdominals active. The thumb of the therapist's right hand moves down to the lateral paravertebral and quadratus muscles to maintain the hip lift. The finger pads move down onto the back of the pelvis to cue it forward.

ALTERNATE WAY TO SCOOT HIPS FORWARD

2. The therapist's right hand stays in position as shown(on page 39, #3), to facilitate the hip lift. Once the hip is lifted the therapist's left hand moves from the upper trunk or shoulder onto the distal thigh of the patient's involved leg. A downward and forward pressure is given into the patient's heel to assist the patient in pulling the left side of the pelvis forward with his leg. (Note: This is easier when the patient's heel is under the knee and not behind it.)



TRUNK FLEXION AND LIFT-OFF WITH TRUNK ERECT

1. The therapist facilitates an erect trunk with her right hand, followed by the abdominals. Using her left hand to achieve a co-contraction. Then the patient bends forward at the hips while therapist maintains an active trunk (i.e. thoracic extension and active abdominal muscles).





2. Lateral View (Intermediate position) - As the patient bends forward so his shoulders come over his distal thighs, the therapist slides her back hand up over the thoracic area so she can get her elbow over the posterior aspect of the pelvis, while maintaining active extensors and abdominals.

3. As the patient's shoulders move forward over his distal thighs, the therapist gives a forward and up cue with her arm (in the direction of the inclination of the trunk) while maintaining the patient's abdominals and thoracic extensor muscles active. The therapist also bends forward herself to assist the lift-off. If the toes come up (as seen in this picture), the patient's weight is too far back. This could be resolved by bringing the shoulders more forward or the feet further back.



SEQUENCE OF SCOOT BACK (from side)



Posterior View -1. Therapist sits beside and facing patient with the near leg extended under the patient's thighs (to get it out of the way). Therapist facilitates an erect co-contracted trunk.

2. The patient bends forward at the hips and the therapist slides her hand up and places her elbow on the patient's pelvis, near the sacrum, as his trunk inclines forward. When the shoulders get over the distal thighs, the therapist gives a forward and up cue with her arm to help the patient lift his hips. Therapist may also need to lean laterally (left) to keep from blocking the patient's movement.





Anterior View - The therapist's far leg is placed so as to contact the patient's lower leg just below the patella and on the antero-lateral aspect. As the patient lifts off the therapist allows the leg to come forward slightly (so patient can get weight over feet). The therapist applies a slight back pressure with her leg to help patient move the hips back on the surface. The shoulders should be kept forward until the hips are down on the surface.

FACILITATE LIFT OFF & SCOOT BACK (leg assisted)

1. The therapist sits beside the patient and brings her near arm around the patient so that her forearm can facilitate low back extension. Her fingers can facilitate the abdominals (with a light back and up pressure). The hand of the other arm is placed over the distal thigh of the affected leg.





2. The patient and therapist bend forward at the hips. As they lift-off, the therapist exerts a down and forward pressure into the patient's foot to facilitate lift off. The therapist must move with the patient and do what the patient needs to do. As soon as the hips are unweighted the therapist gives a backward cue on the thigh to assist the hips in moving back. Both therapist and patient stay flexed at the hips thus keeping the shoulders forward and the weight over the feet.

CLINICAL IMPLICATIONS FOR FACILITATING WEIGHT BEARING OF THE ARM

It is important to get the arm in weight bearing as soon as possible in treatment. The arm and trunk work together normally and doing activities which combine them will increase muscle activity in the trunk, as well as begin getting some activity in the extensor muscles of the arm. Proprioceptive input from weight bearing and movement helps the patient become aware of the limb. Weight bearing on the arm can be combined with sitting activities such as lateral weight shift, scooting forward and back, lift-off and reaching, as well as standing activities.

In sitting, the placement of the hand in relation to the trunk also determines how much one tends to push with the arm. When the hands are beside the hips, the arms are more active than when the hands are placed on the thighs. Where the patient's hands are placed in the beginning may be partially determined by the range and/or the presence of pain in the shoulder and/or wrist. One must always stay below the threshold of pain.

It is important that hip movement be initiated in the low trunk without allowing the shoulders to lean away. (Leaning the shoulders causes the hand to come out of weight bearing and may also cause pain.) Facilitating approximation of the scapula against the rib cage also enhances the response. **Note:** Maintaining an active and erect trunk is also critical to achieving a positive response.

FACILITATING WEIGHT BEARING OF THE ARM WITH WEIGHT SHIFT



Anterior View -1. The therapist sits beside the patient with one leg behind the patient and the other leg positioned in front to prevent leg abduction and maintain the left (involved) hand in weight bearing. The therapist's foot can be placed over the patient's antero-lateral tarsal bones to maintain the foot in weight bearing. The therapist's front hand is placed over the patient's near shoulder with the finger pads below the clavicle to facilitate abdominals and the thumb on the scapula to approximate the scapula against the rib cage.

FACILITATING WEIGHT BEARING OF THE ARM WITH WEIGHT SHIFT

Posterior View -2. The therapist's right hand is placed with the pads of the fingers in the lumbar region and against the lateral paravertebral muscles just above the iliac crest to facilitate lateral shift using a medial and up pressure.





3. The therapist's right thumb pad is on the back of the humerus to give a down and slightly forward pressure into the heel of the hand to facilitate arm weight bearing to assist the patient's pelvic lift and lateral shift.

4. Same as above, except that the patient's hand is on a table and is not maintained in weight bearing by the therapist's leg.



FACILITATING WEIGHT BEARING OF THE ARM WITH REACHING

Posterior view

The patient is sitting with left (involved) upper extremity in weight bearing and reaches up with the opposite arm. The therapist is sitting beside the patient with her foot on top of the tarsals of the involved foot and the thigh over the involved hand which is on the surface. The patient is sitting erect and the therapist facilitates lateral weight shift with the finger pads of her right hand by giving a cue in and up toward the opposite shoulder. The involved UE weight bearing is facilitated by giving a downward pressure into the humerus with her right thumb pad while maintaining an erect trunk and scapula approximation with her left hand. The weight bearing pressures into both left extremities are given while the patient is reaching up with the right arm.



Anterior View

The therapist asks the patient to reach up as high as possible while facilitating the UE weight bearing and hip lift on the involved side. The therapist's left finger pads apply a slight downward pressure under the clavicle to maintain the abdominals through out this activity



CLINICAL IMPLICATIONS FOR FACILITATION OF THE TRUNK WITH THERAPIST STANDING

When the therapist no longer needs to assist a lot with the involved leg, and/or needs to increase the speed of gait, she needs to stand to allow her to move faster with the patient. Recognize that the therapist cannot walk very fast when she is moving backwards, but sometimes it is helpful to be there, as the patient may be less fearful of coming forward. No matter where the therapist places her body or hands, the result must be that the trunk stays aligned in all planes and moves as a unit over the patient's base of support.

FACILITATION OF TRUNK WITH HANDS ON SHOULDER & OPPOSITE HIP

Antero-lateral View - 1. The therapist may be in front with one hand on the lateral pelvis activating the abdominals with the thumb, and tucking the pelvis with her finger pads. The little finger can also facilitate the hip abductors. The other hand is on the opposite shoulder to approximate the scapula and facilitate extension with the finger pads and to assist abdominal activation with the thumb. Additional pressures can be given, as necessary, to keep the shoulders and pelvis aligned over the feet in standing, or each foot as in walking.



FACILITATION OF TRUNK WITH HANDS ON SHOULDER & OPPOSITE HIP

Posterio-lateral View - **2.** Therapist can be behind the patient with one hand on the lateral low trunk so that the index and middle fingers facilitate the abdominals, the ring finger facilitates the hip abductors and the little finger cues the pelvic tuck. The thumb extends up the thoracic area to keep the rib cage forward if necessary. The other hand is on the opposite shoulder to cue the abdominals with the finger pads below the clavicle and to approximate the scapula with the thumb. Pressures may also need to be applied between the two hands to keep the shoulders over the hips in good alignment.



HANDS ON MIDDLE OF TRUNK FROM THE BACK



Alternative Hand Position - 3. Both hands can be spread so the thumbs are extended up the posterio-lateral rib cage to keep the upper trunk aligned over the pelvis. The index and middle fingers are over the abdominals, just under the rib cage, to apply a slight back pressure to activate the abdominals. The ring and little finger are over the posterio-lateral pelvis to active the hip abductors and tuck the pelvis. **Note:** Patient's arms are raised for purposes of this photograph only, to allow for a view of the therapist's hand.

FACILITATING STRIDE WEIGHT SHIFT FORWARD AND STEP WITH INVOLVED LEG FROM THE FRONT

Side View - 1. The therapist has her hands placed as in the previous example on page 89, to keep the trunk aligned and extensors and abdominals active. After the patient takes a step with the less involved leg, the therapist keeps the trunk stable and guides the body as a unit to shift forward over the forward foot.





FACILITATING STRIDE WEIGHT SHIFT FORWARD AND STEP WITH THE INVOLVED LEG



Posterio-lateral View - **2.** Once the weight is on the forward right leg, the patient releases the back left leg. The therapist can assist by giving a slight downward cue on the pelvis.

Note: The therapist is maintaining the patient's less involved leg so that it will not bend when the patient bends/releases the involved leg.

3. After the weight is forward over the right leg and the "trailing" left leg has released, the therapist can assist the leg to advance by hooking her toes under the lateral aspect of the patient's foot and sliding it forward. Once the leg is forward the therapist may need to again facilitate weight bearing by guiding the patient's body over the forward foot while preventing knee hyper-extension.



CLINICAL IMPLICATIONS FOR FACILITATING TRANSFERS

Transfers - Squat transfers can be accomplished quite early in the patient's recovery process with adequate preparation of the trunk and legs, primarily in sitting. Keeping the patient low during the transfer is safer as he can use the arm(s) more effectively and needs only to lift the body high enough to clear the surfaces he is leaving or approaching. The patient also needs to learn to transfer to both sides eventually in order to be totally safe and functional. He needs to learn to adjust his base of support so that he can keep his center of mass over it as he moves. The use of a second person in the transfer is to add facilitation of hip and leg extension and give the patient a "feel" of the appropriate movement. That person should not lift the patient at the hips but is there for safety reasons.

TRANSFER FROM BENCH TO CHAIR

1. The therapist positions herself to be able to facilitate trunk extension, control the involved leg and if possible incorporate the involved arm in weight bearing at the side. Before facilitating lift off, the patient's feet should be turned slightly to assist the turn. The therapist can then facilitate a lift off and then cue a lateral shift with the leg. **Note:** If shifting toward the involved side, the involved leg should be allowed to advance forward over the foot slightly to enable the body to turn.



TRANSFER FROM BENCH TO CHAIR

2. & 3. If the arm cannot be controlled in weight bearing at the side, it should be placed more medially on the patient's thigh. The therapist facilitates the trunk, leans back so the patient can bend forward and lift off, and then shifts the patient to the side with her leg. If the therapist slumps as the patient bends forward, this allows the knees to advance so the patient can get his weight over his feet.)



Note: The therapist does not lift with her arms but merely leans back so that her shoulders are behind her hips. This helps guide the patient forward over his feet. To assist the patient in turning, the therapist's left leg cues the patient's right leg back slightly, and her right leg moves away to allow the patient's left leg to advance over the foot slightly. This is accomplished by the therapist rotating her pelvis; not pulling with her arms.

TRANSFER FROM BENCH TO CHAIR

4. & 5. This process is repeated making sure to adjust the patient's feet prior to each lift off and turn. When the therapist is ready to have the patient scoot back, she remains leaning back after lift - off and lifts her heels (by plantar flexing her feet) which applies a back pressure against the patient's legs and moves the hips backward. Once the hips are down on the surface the therapist comes forward which allows the patient's shoulders to realign over the hips (i.e. sit up).



FOOT POSITION FOR TRANSFERS

When the patient is being transferred, it is helpful to offset the feet slightly, with the forward foot being the one in the direction toward which the patient is going. Thus, in this picture the patient is turning toward the right so the right foot is slightly ahead of the left. Both heels must still be slightly behind the knees. Also, if the foot is turned slightly, it is easier to turn the patient.



TWO-MAN TRANSFER

Position and Function of the Back Person:

The therapist in front does exactly what she would do in a one-man transfer as shown on pages 95-97. The person behind positions herself with a wide base of support and slightly in the direction toward which the patient will be moving. (**Note:** She could be kneeling with one leg on the surface toward which the patient is going, or standing, as demonstrated in this photo.) The hands are placed over the greater trochanters of the patient with the fingers spread and pointing toward the patient's knees. As the patient bends forward the therapist approximates the trochanters into the hips and with her thumbs gives a pressure forward toward the knees and into the feet to facilitate the push of the patient's legs. The therapist then moves with the pelvis as the front therapist cues the turn with her legs.



Note: The therapist must not go under the buttocks and lift the hips as the patient will then let the therapist lift him.

CLINICAL IMPLICATIONS FOR FACILITATING GAIT ACTIVITIES

Gait Activities - Walking slowly enables the therapist to work on control of specific components, however, the speed must be increased to make it functional. This must happen at the end of every session to get carry-over so the therapist must position her/ himself either beside or behind the patient to be able to increase the speed and keep it smooth while giving cues if necessary. The therapist must make his/her own walking smooth and step with the same foot as the patient to help with the rhythm. If walking behind the patient, the therapist should also step directly behind the patient's feet, otherwise there is too much lateral movement. During walking the therapist should be facilitating and encouraging more equal step length and timing as well as progression of the body forward over each foot to increase efficiency.

Functional walking incorporates many aspects some of which have been included in this section, such as walking backwards, turning or pivoting, stepping up and/or down, bending down to pick something up, etc. These are just the beginning and the therapist must listen to his/her patient as he describes what is difficult and then work on those specific problems. Moving the body over the base of support in many different ways and positions, while one performs tasks with the arms, is what function is all about. Usually the patient has a limited variety of movements which severely interferes with his ability to function safely, independently and efficiently. The more creative the therapist can be in his/her choice of activities to present to the patient, the more the patient will improve, if the quality of movements is maintained relatively well. Remember your choice of activity often will be crucial to your success.

Each activity should be:

- 1. Performed at the appropriate level of challange to the patient.
- 2. Meaningful to the patient.
- 3. Of interest to the patient.
- 4. Successful within a reasonable time frame.
- 5. Lead to other challanging activities.
- 6. Performed in actual functional situations if at all possible.

FACILITATING THE TRUNK WHILE WALKING FROM THE SIDE

Note: In all trunk facilitation the therapist **must** be able to influence both the upper trunk and lower trunk at all times to keep the trunk aligned.

Anterio-lateral View - 1. The therapist's right hand is over the abdominals cueing the upper abdominals to bring the rib cage down and/or the lower abdominals to keep the pelvis neutral.





Posterio-lateral View - **2.** The therapist's left hand uses the thumb to cue the rib cage forward and the fingers cue the back of the pelvis down into a "tuck". There should be no contact over the low back as the patient is usually already over-extended there, due to frequent leaning of the upper trunk back or tilting the pelvis forward.

ALTERNATIVE WAYS TO FACILITATE BRIDGING

- 1. The therapist places her hand and forearm across the patient's distal thighs, and her opposite forearm over her hand to reinforce weight bearing. The therapist facilitates weight bearing into the patient's feet by pulling her arms toward her. She then facilitates abdominals and asks patient to lift as she shifts back slightly to assist lift.
- 2. Use the same hand and forearm position as above except the free hand is on the lateral pelvis instead of the abdominals. The therapist facilitates weight bearing into the feet by pulling her arms toward her and then assists hip lift on affected side while shifting back slightly.



BRIDGING (cont.)

If the patient needs more help, use a draw sheet under the pelvis <u>at hip level</u>. The therapist's forearms are on the patient's femurs. Hold sheet taut. Give pressure into the feet with your forearms; then by leaning back slightly with your body guide the patient's femurs forward over the feet while simultaneously cueing the pelvic lift with the draw sheet. Always give a verbal directive at the appropriate time.



SCOOTING PELVIS TO SIDE (Bridging with rotation)

Pressure is applied into the feet from the distal femurs to activate the hip muscles. Then cue for bridging.

While maintaining the bridging cues, add a lateral pressure on the patient's left femur and a forward pressure on the right femur, and the hips will shift slightly to the right in bed.

Cues must be applied slowly and released slowly.

Reverse the cues to shift hips in opposite direction.

This can also be done with the draw sheet. Once the patient has bridged, then give a lateral cue with the sheet on the left, and a forward cue with the forearm on the right femur, to move the hips to the right.



SCOOTING PELVIS TO THE SIDE STANDING BESIDE BED (Bridging with rotation)

The therapist stands at the side of bed next to patient's hips. She places her upper rib cage on the patient's distal thigh of his near leg and her upper arm across distal thigh of his far leg. Placing her hands on the lateral pelvis, the therapist shifts backward against the patient's distal thigh to apply pressure into the patient's feet and then assists hip lift and/ or scoot as needed.



SCOOTING UPPER BODY

The therapist's body is positioned near the patient's hips. Feet are in a stride position with outside leg forward. The therapist's hands are over the patient's shoulders so thumbs are in front and fingers are spread on patient's scapula.

Roll the shoulders forward and diagonally across to opposite hips. Slight pressure with the thumbs under the clavicle facilitates the head lift. Shift your body weight back to bring the patient's shoulders closer to hips. Must clear scapula to move trunk easily. To facilitate lateral translation of upper trunk to the left: apply a lateral pressure on axillary border of the right scapula and maintain elongation of the left side of trunk while shifting the upper trunk to the left.



ALTERNATIVE METHOD FOR SITTING TO LYING



Place feet on stool or chair so knees and hips are the same height. The therapist assists patient down to a lying position as previously described, but leaves the involved foot on the chair. (The patient will probably automatically bring the less involved leg up.)

Once the patient is down, the therapist can assist the patient in bringing the involved leg up using the same facilitation as described with placing the leg. (see page 123)

