## POSITIONING CHART

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PELVIS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POSTERIOR PELVIC TILT</td>
<td>• top of the pelvis is rotated posteriorly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• low abdominal/trunk tone</td>
<td>• provide support to posterior superior surface of the pelvis to block posterior rotation</td>
<td>• neutral alignment of the pelvis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• anteriorly sloped seat or drop the footrests to allow hip extension</td>
<td>• support anatomical curvatures of the spine (i.e. prevent kyphosis)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• triangular back, PSIS pad</td>
<td>• promote weight bearing on ischial tuberosities, reduce pressure risks</td>
</tr>
<tr>
<td></td>
<td>• tight hamstrings</td>
<td>• open thigh to back angle and/or decrease thigh to calf angle</td>
<td>• best alignment for biomechanical function (e.g. of trunk musculature)</td>
</tr>
<tr>
<td></td>
<td>• depth of wheelchair seat cushion or platform is too long</td>
<td>• provide appropriate seat depth to allow pelvis to be positioned correctly</td>
<td>• increase proximal stability for function</td>
</tr>
<tr>
<td></td>
<td>• limited range of motion, particularly limited hip flexion</td>
<td>• accommodate non-reducible limitation in hip flexion by opening seat to back angle to match range limitation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• contoured or molded seating system to accommodate asymmetries, as needed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• sliding forward on seat</td>
<td>• provide anti-thrust or aggressively contoured seat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• stabilize pelvis using appropriately angled pelvic belt (typically 60 degrees) or rigid anterior pelvic stabilizer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• change upholstery type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• extensor thrust</td>
<td>• provide anti-thrust or aggressively contoured seat</td>
<td>• conserve energy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• stabilize pelvis using appropriately angled pelvic belt (typically 60 degrees) or rigid pelvic stabilizer</td>
<td>• reduce shear forces</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• change position in space if caused by reflexive response</td>
<td>• maintain alignment with other components</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• increase hip and knee flexion, hip abduction and ankle dorsiflexion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• anterior knee supports</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• dynamic back</td>
<td></td>
</tr>
</tbody>
</table>

# POSITIONING CHART

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
</table>
| **ANTERIOR PELVIC TILT**  
• top of the pelvis is tipped forward | • low trunk tone  
• muscle weakness  
• lordosis | • place pelvic positioning belt across ASIS  
• circumferential support (belly binder, abdominal panel, or corset)  
• see interventions for lordosis | • reduce lordosis  
• neutral alignment of the pelvis  
• promote weight bearing on ischial tuberosities  
• best alignment for biomechanical function  
• increase proximal stability for function |

| **PELVIC OBLIQUITY**  
• one side of the pelvis is higher | • scoliosis  
• ATNR  
• surgeries  
• discomfort / pain | • change angle of pull of pelvic belt, typically at 90 degrees, 4-point belt may be required  
• wedge: under low side to correct reducible obliquity, under high side to accommodate non-reducible obliquity | • best alignment for biomechanical function (i.e. of trunk musculature)  
• level head and then pelvis, if possible  
• equalize pressure under pelvis  
• prevent subsequent trunk lateral flexion  
• reduce fixing to increase function |

| **PELVIC ROTATION**  
• one side of the pelvis is forward | ROM limitations in the hip:  
• abduction  
• adduction  
• hip flexion  
• windswept posture  
• non-reducible limitations in spine, pelvis, and/or femoral mobility (i.e. rotational scoliosis)  
• unequal femur length  
• hip dislocation | • align pelvis in neutral and accommodate asymmetrical lower extremity posture, as needed  
• pelvis may need to assume asymmetrical posture in order to keep head trunk forward facing | • neutral alignment of pelvis  
• support anatomical curvatures of the spine (prevent spinal rotation)  
• best alignment for biomechanical function (e.g. of trunk musculature)  
• prevent subsequent trunk rotation  
• increase proximal stability for distal function  
• increase pressure distribution over posterior trunk |

| | • asymmetrical surface contract over posterior buttocks and trunk  
• discomfort / pain | • create contour back surface to “fill-in”, if non-reducible | |

### POSITIONING CHART

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
</table>
| **PAINFUL OR DISLOCATED HIP**                     | • increased muscle tone pulling head of femur out of socket and influencing bony development  
• shallow socket due to lack of weight bearing  
• surgeries                                          | • use softer materials under and/or around hip  
• avoid lateral contact with hip  
• provide lateral support along distal thigh  
• determine what positions relieve discomfort / pain | • comfort / reduced pain  
• reduce excessive hip adduction and internal rotation, as tolerated  
• work with medical team if surgically reduced |
| **PELVIC AMPUTATION**                             | • Hemipelvectomy  
• Sacral Agenesis                                                                       | • Generally, an orthotic is made  
• cushion is straight forward as the orthotic is being positioned, rather than the pelvis  
• if no orthotic, then molded seating system                                                      | • neutral alignment of trunk over pelvis  
• support anatomical curvatures of the spine  
• pressure distribution  
• best alignment for biomechanical function  
• increase proximal stability                                                                      |
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRUNK</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| LATERAL TRUNK FLEXION OR SCOLIOSIS | - scoliosis may be C curve, S curve, and/or rotational | - increased tone on one side  
- decreased tone or muscle strength, causing collapse and asymmetrical posture  
- musculature imbalance  
- habitual posturing for functional activity or stability  
- non-reducible scoliosis | if reducible:  
- generic contoured back  
- lateral trunk supports (may need to be asymmetrically placed, one lower at the apex of lateral convexity)  
- anterior trunk supports to correct any rotation (see forward trunk flexion interventions below)  
if non-reducible:  
- refer to physician to explore medical or surgical procedures, x-rays  
- TLSO  
- aggressively contoured or molded back to provide for support and pressure distribution  
- horizontal tilt under seat to right head, if pressure distribution between ITs is adequate | - neutral alignment of trunk over pelvis, if reducible  
- minimize subsequent changes in pelvic and lower extremity posture  
- level head over trunk for increased vision, social interaction  
- pressure distribution |
| FORWARD TRUNK FLEXION OR KYPHOSIS | - flexion at hips  
- flexion at thoracic area  
- flexion at shoulder girdle with gravitational pull downward  
- may occur from increased or decreased tone, muscle weakness, decreased trunk control  
- increased tone (i.e. hamstrings) pulling pelvis back into posterior tilt  
- posterior pelvic tilt  
- habitual seating in an attempt to increase stability  
- non-reducible kyphosis | if reducible:  
- anterior trunk support  
- chest strap  
- shoulder straps  
- butterfly or vest style  
- shoulder retractors  
- TLSO  
- may be a rotational component posterior trunk support  
- correct posterior pelvic tilt  
- do not overcorrect limited hip flexion  
- increase trunk extension with biangular back or PSIS pad | - prevent spinal changes and subsequent pelvic changes  
- neutral alignment of trunk over pelvis  
- if reducible, anatomical alignment  
- increase head control  
- reduce neck hyperextension  
- promote trunk extension  
- pressure distribution  
- maintain good visual field  
- improve safe swallow  
- improve breathing |
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUNK EXTENSION OR LORDOSIS</td>
<td>tight hip flexors or overcorrection of tight hip flexors</td>
<td>• open seat to back angle until head is over pelvis and/or • tilt until head is over pelvis</td>
<td>neutral alignment of trunk over pelvis • pressure distribution • reduce subsequent shoulder retraction and fixing to allow function • reduce subsequent anterior pelvic tilt</td>
</tr>
<tr>
<td>• hyperextension of the lumbar area</td>
<td>increased tone pulling pelvis forward into an anterior tilt</td>
<td>if reducible: • provide lower back support, as needed • biangular back • may need to change seat to back angle • do not over correct limited hip extension • anterior trunk support (vest style or circumferential support)</td>
<td>if non-reducible: • molded back</td>
</tr>
<tr>
<td>often combined with anterior pelvic tilt</td>
<td>habitual posturing in an attempt to lean forward for functional activities</td>
<td>• “fixing” pattern to extend trunk against gravity (e.g. in conjunction with shoulder retraction)</td>
<td>• neutral alignment of trunk over pelvis • pressure distribution • reduce subsequent shoulder retraction and fixing to allow function • reduce subsequent anterior pelvic tilt</td>
</tr>
<tr>
<td>TRUNK ROTATION</td>
<td>pelvic rotation</td>
<td>if reducible: • use anterior supports on forward side • Y-strap</td>
<td>• neutral alignment of trunk over pelvis • correct pelvic rotation</td>
</tr>
<tr>
<td>• often seen in combination with lateral trunk flexion and pelvic rotation</td>
<td>see lateral trunk flexion causes above</td>
<td>if non-reducible: • consider placing pelvis asymmetrically in seating system so that trunk and head face forward • molded back to distribute pressure over posterior trunk</td>
<td>if non-reducible: • pressure distribution • forward facing posture</td>
</tr>
<tr>
<td>LOWER EXTREMITIES</td>
<td>tight hip flexors</td>
<td>if reducible: • strap feet or even thighs • padded lap tray (underside)</td>
<td>• prevent anterior pelvic tilt • prevent lordosis • prevent further loss of hip extension</td>
</tr>
<tr>
<td>HIP FLEXION</td>
<td>fixing with hip flexors due to lack of hip extension or stability</td>
<td>if non-reducible: • do not overcorrect and cause anterior pelvic tilt • asymmetric seating surface if hip angles are not symmetrical</td>
<td>• prevent anterior pelvic tilt • prevent lordosis • prevent further loss of hip extension</td>
</tr>
<tr>
<td>• poor positioning</td>
<td>• poor range of motion management</td>
<td>if non-reducible: • do not overcorrect and cause anterior pelvic tilt • asymmetric seating surface if hip angles are not symmetrical</td>
<td>• prevent anterior pelvic tilt • prevent lordosis • prevent further loss of hip extension</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
</table>
| HIP EXTENSION           | • increased extensor tone  
• tight hip extensors  
• poor positioning  
• poor range of motion management | if reducible:  
• dynamic back  
if non-reducible:  
• open seat to back angle  
• increase knee flexion, if hamstrings are tight  
• asymmetric seating surface if hip angles are not symmetrical  
• contoured or molded seat | • prevent further loss of range leading to a more reclined, and less functional, position affecting vision, feeding and breathing  
• prevent posterior pelvic tilt  
• avoid putting extensors on stretch |
| HIP ADDUCTION           | • extensor tone  
• tight hip adductors  
• sling seat  
• poor positioning  
• poor range of motion management | • contoured seat  
• leg troughs  
• medial knee support  
• anterior knee support  
• leg straps | • pressure distribution between knees  
• anatomical alignment between hips and lower extremities  
• prevent stimulation of stretch reflex or initiation of extensor tone patterns  
• limit hip internal rotation  
• ease ADLs, such as dressing and toileting |
| HIP ABDUCTION           | • tight hip abductors  
• initial low tone  
• surgeries  
• poor positioning  
• poor range of motion management | • contoured seat  
• leg troughs  
• lateral knee supports  
• lateral pelvic/thigh supports | • anatomical alignment  
• pressure distribution (prevent pressure between lower leg and footrest hanger)  
• prevent further range loss which can lead to an overly wide seating system and impact accessibility |
| WINDSWEPT POSTURE       | • pelvic rotation  
• range limitations  
• destructive sleep positions | • pelvic rotation interventions (see above)  
• hip adduction and abduction interventions (see above)  
• sleep positioning interventions | • same as for pelvic rotation (see above) |

## POSITIONING CHART

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
</table>
| **KNEE FLEXION** | • decreased range of motion of hamstrings  
• flexor tone  
• structural knee issues | if reducible:  
• refer to physician to explore medical or surgical procedures to prevent range loss  
• alternative positioning  
if non-reducible:  
• open seat to back angle  
• move footplates back  
• close thigh to lower leg angle  
• anteriorly sloped seat  
• bevel front edge of seat, as needed  | • decrease tension in the hamstrings and thus minimize pull into posterior pelvic tilt  
• comfort / reduced pain  
• clear front castors of wheelchair  
• ease transfers |
| **KNEE EXTENSION** | • extensor tone  
• decreased range in quadriceps  
• over lengthening of the hamstrings  
• structural knee changes | if reducible:  
• ankle straps  
• anterior knee supports  
• dynamic footrests  
• refer to physician to explore medical or surgical procedures  
if non-reducible:  
• move footplates forward  
• appropriately angled footrest hangers  
• elevating legrests  | • alleviate pull on pelvis and lower leg  
• accommodate in extended position, if non-reducible  
• dynamic footrests: reduce active tone, reduce client injury, reduce equipment breakage |
| **LEG LENGTH DISCREPANCY** | • pelvic rotation  
• hip subluxation / dislocation  
• surgeries  
• unequal femur length | • correct any pelvic rotation, if possible  
• asymmetrical seat depth | • to provide adequate pressure distribution for each leg  
• to correct any pelvic rotation |
# POSITIONING CHART

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
</table>
| LOWER EXTREMITY EDEMA      | • feet consistently lower than knees  
• constriction at knees  
• medical issues (i.e. blood pressure, decreased circulatory function) | • provide alternative positioning out of the chair to elevate the legs above the level of the heart  
• open the thigh to calf angle if ROM is possible and hamstrings are not put on stretch; must evaluate pull on pelvis  
• check that feet and lower leg are supported  
• raise footplates to alleviate pressure on distal thigh  
• check for pressure areas around proximal lower leg  
• compression socks (consult medical team) | • reduce edema  
• minimize potential for constriction, pressure or edema  
• comfort / reduced pain |
| ANKLE LIMITATIONS          | • tonal patterns  
• lack of weight bearing  
• surgery  
• discomfort / pain | • angle adjustable foot plates (sagittal and frontal planes)  
• padded foot boxes  
• molded foot support  
• specialized shoes (i.e. for Diabetes) | • accommodate non-reducible distortions  
• prevent pressure to foot  
• protect feet from injury  
• comfort / reduced pain |
| FOOT DISTORTIONS           | • congenital  
• acquired | Below knee  
• increase pressure distribution along thigh as much as possible  
• use calf pad or panel to support residual limb  
• avoid weight bearing on distal end of leg  
Above knee  
• ensure pelvis is level  
• increase pressure distribution for pelvis and thighs, as much as possible | • distribute pressure  
• comfort / reduced pain  
• not to interfere with transfers |

## POSITIONING CHART

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UPPER EXTREMITIES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHOULDER RETRACTION • often in conjunction with elbow flexion</td>
<td>• increased tone in scapular adductors or retractors • weakness of muscles in shoulder girdle with decreased ability to protract shoulder • “fixing” pattern to extend trunk against gravity, stabilize, or as a righting response • anxiety, startle</td>
<td>• build up posterior back support with wedges or increased foam behind scapular area • adjust tilt-in-space • strap forearms (trunk must be anteriorly supported) • provide stability elsewhere to break-up fixing pattern</td>
<td>• neutral alignment for function • reduce risk of injury (arms may get caught in doorways) • break-up fixing patterns for function • reduce neck hyperextension often seen in conjunction with scapular retraction • protect integrity of shoulder girdle</td>
</tr>
<tr>
<td>ELBOW EXTENSION • often in conjunction with shoulder horizontal abduction</td>
<td>• muscle imbalance • habitual pattern to laterally stabilize trunk • habitual pattern to extend trunk • ATNR • anxiety, startle • effort or stress</td>
<td>• pad attached to back cushion, armpad, or tray to block upper extremity laterally and/or posteriorly (limiting shoulder horizontal abduction) • strap forearms</td>
<td>• neutral alignment for function • reduce risk of injury (arms may get caught in doorways) • minimize orthopedic risks to elbow joint • break-up patterns of movement for function</td>
</tr>
<tr>
<td>UNCONTROLLED MOVEMENT OF UPPER EXTREMITIES</td>
<td>• increased tone due to effort • athetosis/dystonia • anxiety</td>
<td>• block or strapping to decrease movement • forearm weights • dynamic strapping to allow some movement but decreasing extraneous movement • distal stabilizer for independent grasp</td>
<td>• stabilization • reduce anxiety • to allow dependent tasks, such as feeding, to proceed • to protect client from injury</td>
</tr>
<tr>
<td>SELF-ABUSIVE BEHAVIOR</td>
<td>• self-abuse • self-stimulation</td>
<td>• same as uncontrolled movement interventions above • provide alternate sensory input, if appropriate</td>
<td>• to reduce risk of injury to client or others • to calm / reduce anxiety</td>
</tr>
<tr>
<td>SHOULDER SUBLUXATION OR DISLOCATION Usually in conjunction with upper extremity weakness</td>
<td>• decreased shoulder or upper extremity strength • paralysis • decreased muscle control • decreased tone • increased tone • postures that continually pull on humerus</td>
<td>• Upper Extremity Support System (tray) • widened armrests • arm trough • posterior or lateral elbow supports • forearm straps • dual shoulder straps crossing the clavicle and acromian processes • slings or mobile arm supports</td>
<td>• comfort / reduce pain • enhance functional use of arm • prevent further loss of integrity of shoulder girdle</td>
</tr>
</tbody>
</table>
# POSITIONING CHART

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SUGGESTIONS FOR INTERVENTION</th>
<th>GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HEAD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **DECREASED OR NO HEAD CONTROL** | • decreased neck strength  
• hyperextension of neck in compensation for poor trunk control  
• forward tonal pull  
• visual impairment  
• vertical midline shift  
• cortical visual impairment (CVI)  
• blindness | • posterior head support  
• providing only support at the neck may elicit increased neck extension and may not provide adequate surface area support, particularly in tilt  
• change pull of gravity against head by reclining or tilting seating system  

**solutions for little or no head control:**  
• forehead strap or pad  
• snug lateral supports  
• collars  
• chin support/orthosis  
• superior head support (Head Pod)  
• refer to behavioral optometrist, if appropriate | • visual attention to the environment, peers, etc.  
• improved swallow, feeding, breathing  
• increased function  
• elongation of neck extensors (if shortened by neck hyperextension)  
• capital flexion (e.g. “chin tuck”)  
• prevent subsequent orthopedic changes to neck and shoulder girdle  
• prevent overstretching of neck extensors and shortening of neck flexors (if head is usually hanging down) |
| **LATERAL NECK FLEXION**  
**NECK ROTATION** | • decreased neck strength  
• muscle imbalance/tone  
• ATNR  
• scoliosis  
• visual impairment, particularly a horizontal midline shift (lateral flexion)  
• Torticollis | • address scoliosis  
• lateral head support  
• posterior support with 3 point lateral control; either side of head and along jawline that is deviated laterally  
• custom molded headrest  
• horizontal tilt, if severe and if pressure over both ITs is in acceptable range  
• refer to behavioral optometrist, if appropriate | • prevent subsequent orthopedic changes to neck and shoulder girdle  
• right head for vision, feeding and respiratory status |