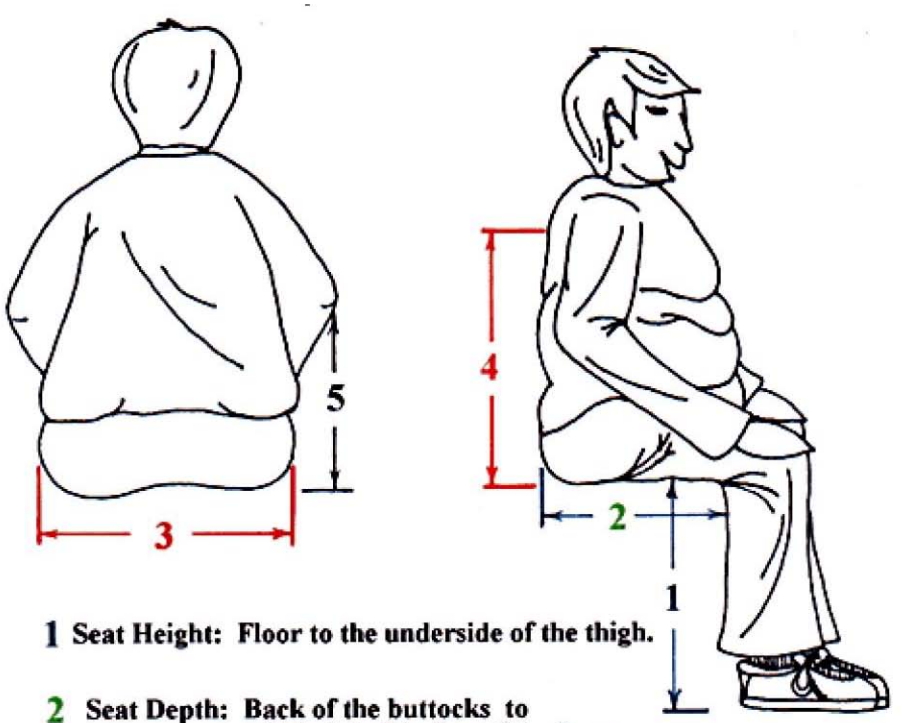
Wheelchair Prescription



1 **Seat Height: Floor to the underside of the thigh.**

2 **Seat Depth: Back of the buttocks to within 1 to 2 inches of the knee.**

3 **Seat Width: Measure the widest aspect of the seated client.**

4 **Backrest Height: Measure from seat surface to mid shoulder blade.**

5 **Armrest Height: Sitting surface to the bent elbow.**

Supine wheelchair measurement:

Supine measurement is possible, however, tends to result in excessive seat depth and insufficient seat width. For this reason, supine measurement should be performed when all other means are deemed impractical.

Michael Dionne B.S.,P.T.
www.BariatricRehab.com

A special note regarding the difference between Bariatric and standard wheelchairs. The center of body mass is located somewhere about 1 inch forward of the second sacral vertebrae in the average person. Wheelchair manufactures know that having ~ 80% of body weight over the rear axle maximizes ease of wheelchair propulsion by unweighting the front caster wheels. In the Baratric client this center of body mass may be several inches forward when compared to the client of average weight. For this reason, the specialized bariatric wheelchair has a rear axle displaced further forward relative to the standard wheelchair just to achieve the same ~ 80% body weight over the rear axle. Orthopedically this forward axle also allows mechanical advantage for the bariatric client to propel by means of a full arm push and not wrist extension seen in wheelchair prescription where the axle is too far behind the patient's shoulder.

Wheelchair Prescription:

Actual body weight. If clients body type is "pear like" consider potential of stable weight and stable w/c width indication over time. If client body type is "apple like" consider potential for fluctuating weight. If deciding between two sizes consider opting for the larger size and potentially wider w/c. The final wheelchair design selected should, of course, meet the dynamic load potential of the intended client.

Measuring:

When measuring this client population, if possible have the client sit on a hard surface such as a therapy mat, original wheelchair, or on a square of firm plywood. The client's thighs should be level and not upward or downward sloping relative to the hip joint. The lower leg should be in a comfortable vertically oriented posture. This posture allows for easy access to measure the client from a true postural set, otherwise not possible from a soft surface. Once the overall height is determined, the next consideration in W/C prescription is measurement of the pelvic region. This is the client's primary weight bearing surface. W/C measurement is possible while the client is lying in bed, however, very subject to error as adipose tissue sags posteriorly rather then inferiorly as observed in sitting postures. The supine measurement therefore contributes to undersized width and excessive depth as the clients legs do not abduct as in the sitting posture where abdominal contents drift inferiorly between the clients legs.

1. Seat Height:

With feet flat on the floor and the shin in vertical posture, measure from the back of the heel to underside of knee. The client should wear typical footwear and again the thighs should be level relative to the hip joint prior to measurement. This will allow for proper foot rest length and overall W/C height which is so vital in W/C propulsion for those who tend to achieve propulsion by combination of hand and foot use. W/C floor to seat height is also critical for sit to stand activities. For individuals who are primarily exercise ambulators, a lower seat height may be indicated allowing community propulsion while for individuals who ambulate (functional ambulators) to vital rooms or bathrooms, a higher seat height may be indicated. Recall that W/C cushions will add to the height of the finished sitting surface. Extra low or bariatric hemi-wheelchairs are also available providing sufficient mechanical advantage for those who rely upon one sided (unilateral) W/C propulsion or bipedal W/C propulsion.

2. Seat Depth:

Measure from the back of the buttocks to within ~ 1 to 2 inches of the back of knee. The completed W/C should allow for approximately 1 to 2 inches of space between the back of the clients knee and the front of the W/C seat, thereby preserving circulation to the lower leg while maximizing the clients weight bearing surface and leg mobility during foot assisted propulsion. The seat surface should support the entire gluteal region. If a client has a posteriorly bulbous gluteal region, then a contoured cushion or strap backrest may help provide sufficient trunk support.

3. Seat Width:

Measure widest part of client in the seated posture. Again consider apple versus pear. A pear shaped individual having greater gluteal femoral weight distribution may be widest near the front edge of the seat. Excessive W/C width will restrict mobility about environmental barriers, increase difficulty of both turning and forward propulsion while decreasing armrest support with resulting potential for back pain. The completed W/C will allow for approximately 1 to 2 inches of width on either side of the client for winter clothing, client weight shifting during pressure relief, and if necessary room for possible lift devices such as slings. On occasion clients may opt to remove W/C push rims to accommodate narrow doorways or environmental barriers.

4. Backrest Height:

Measure from the seat surface to mid shoulder blade height. The back rest generally should reach to mid shoulder blade level in height and support the apex of the client's back to diminish potential for postural back pain thus providing for adequate pressure relief while allowing maximal shoulder blade mobility. If the client is in a reclining chair then additional upper thoracic support may be indicated. More agile clients may prefer a backrest that is positioned vertically just ~ 1 inch below the shoulder blade allowing for maximal upper body mobility over their lower trunk. in sitting postures. If a the client should have localized excessive tissue bulk causing partial contact to their backrest. A strap or laced back backrest may be indicated to provide sufficient support for that unique body type.

5. Armrest Height:

Measure directly from the sitting surface to the bent elbow having the forearm parallel to the seat. Recall that a seat cushion may add the height of the seat and equally add to the height of the armrest. Appropriate armrest height is determined from this measurement and is important for decreasing neck and thoracic back pain by providing adequate support for the shoulder girdle. Remember that respiratory impaired individuals derive increased respiratory support by leaning upon their forearms and thereby increase depth of breathing by reverse action of upper body muscles. This is common in the obese client with respiratory compromise or congestive heart failure. Pressure relief, weight shifting and sit to stand activities may also be augmented by arm rest height in some individuals.

Hard Seat Applications:

Solid hard seat applications provide superior weight bearing distribution and overall superior orthopedic alignment. To the client, this is experienced in decreased muscular pain related to prolonged poor postures. The hard seat application tends to be more durable making them ideal for clients who rely upon their W/C as a primary source of mobility. The difficulty in providing hard seat applications are financial and client familiarity with side folding W/C's.

Specific medical indications which require hard seat applications include:

- presence of neurologic disease with spasticity,
- post stroke or other forms of paralysis and

- severe orthopedic deformity.

Tires:

Consider that hard solid tires have increased durability especially in turning. Pneumatic tires provide a smoother ride and return greater energy to the user, but have a tendency to roll off the rim during turning and may experience premature sidewall tire fatigue over time. Further, pneumatic tires and spoked rims require continued maintenance not necessary in the mag wheel solid tire application. Pneumatic tires also can sustain leaks resulting in flats, therefore tend to be used for the client who requires performance.

Adjustable Backrest Indications:

In the past, Velcro strapping within W/C back rest has been used to accommodate client orthopedic and neurologic deformity, creating a custom fit pressure-relief surface. For the bariatric client, strapped or laced backrest have evolved independently, allowing posterior translation of seat depth, thereby placing the client's center of gravity over the rear axle for effective propulsion. Such adjustable backrest also allow adjustment to accommodate excessive posteriorly displaced tissue bulk often seen in the client with a bulbous gluteal region.

Reclining W/C Applications:

Clients unable to sit vertically because of excessive abdominal tissue bulk limiting hip flexion range of motion, or excessive tissue contributing to respiratory resistance in upright sitting postures may require a reclined backrest application. Other medical conditions restricting individuals from upright postures include orthostatic hypo tension, psychological influences and fear often more apparent during initial phases of rehabilitation.

Power W/C Applications:

Recommendations include: Order designed heavy duty wheelchairs rather then attempting to upgrade standard power w/c applications.

Lesser applications are susceptible to metal fatigue upon impact and shear forces often at caster mounts, caster wheel axles, foot plate mounts, and general frame integrity. Motor durability issues should also be obvious. Many individuals require power applications due to cardiac insufficiency. Some third party payers will reimburse for power W/C's if prescription will dramatically increase client participation in community activities such as employment while decreasing the clients dependency upon medical services.