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↑ steady
SWASH®

↶ go
SWASH®



MANUAL

Fitting and Customization

Sitting Walking And Standing Hip orthosis

TABLE OF CONTENTS

SWASH® components	4-5
Product selection	6-7
Product size & upright selection	8
Assembly	9
Initial application	10
Initial adjustments	11
Initial fitting	12
Check the fit	13
Initial function, evaluation & customization	14-15
The professional finish	15

- Prescription Required
- Single Patient Use Only.
- The product must be fitted by or under the supervision of a Certified Orthotist Prosthetist, Certified Orthotist or equivalent medical professional.

Prerequisite reading:

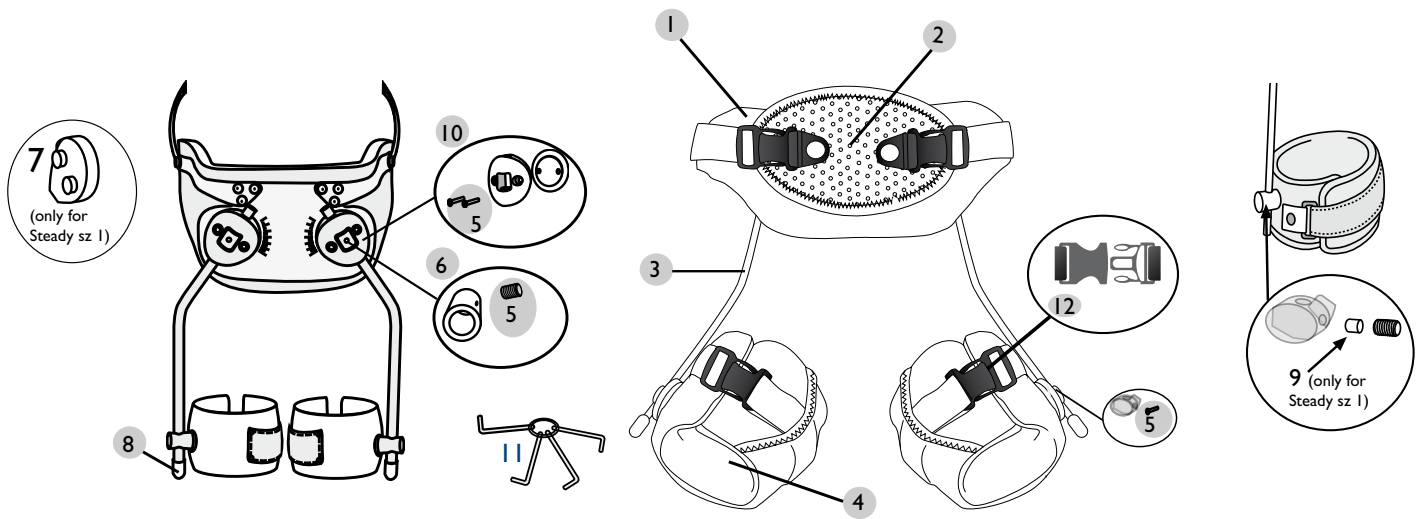
For a successful fitting, read the following sections included in the SWASH® Clinical Manual (available separately):

- Biomechanics of SWASH®
- Indications & Contraindications
- Candidate Selection
- Pre and Post Fitting Functional Evaluation
- Protocols and Proper Fit Guidelines

Primary development goals of the SWASH®

1. Overcome excessive hip adduction to better align the femoral head in the acetabulum to help prevent hip displacement and facilitate more normal development.
2. Prevent excessive adduction during sitting and walking
3. Optimize sitting and standing posture
4. Achieve the above goals with an automatic transition from neutral (walking, standing) to abduction (sitting)

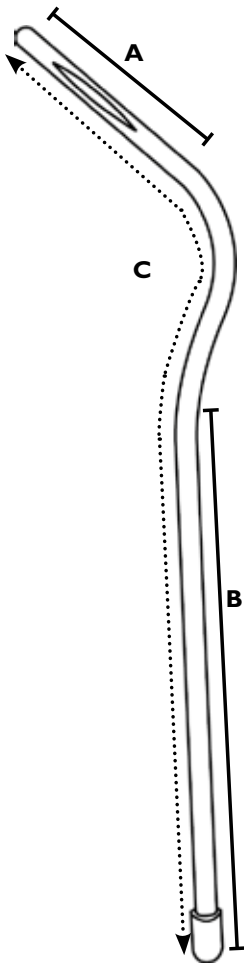
SWASH® COMPONENTS



No.	Description	Unit	STEADY	GO
1	Pelvic Padding with Abdominal Pad	1 set	28857	28858
2	Abdominal Pad	1 pcs	28860	28860
3	Upright 6 mm 15°, size 1 only	Pair	28855-06	
3	Upright 8 mm 15°	Pair	28855-08	28855-08
3	Upright 6 mm 23°, size 1 only	Pair	28856-06	
3	Upright 8 mm 23°	Pair	28856-08	28856-08
4	Thigh Cuffs Padding	Pair	28859	28859
5	Screw Kit, size 1		28861-06	
5	Screw Kit, size 2 - 6		28861-08	28861-08
6	Clamp Ring Set, size 1	2 pcs	28862-06	
6	Clamp Ring Set, size 2 - 6	2 pcs	28862-08	28862-08
7	Boss Cover, size 1	2 pcs	28863-06	
8	Upright End Cover, size 1	2 pcs	28864-06	
8	Upright End Cover, size 2 - 6	10 pcs	28864-08	28864-08
9	Brass Bushing, size 1	10 pcs	28865	
10	Hip Joint Set, size 1	2 pcs	28866-06	
10	Hip Joint Set, size 2 - 6	2 pcs	28866-08	28867-08
11	Allen Wrench Key Set	1 set	28868	28868
12	Buckles 25 mm, for size 1 - 3	2 pcs	28869-25	28869-25
12	Buckles 38 mm, for size 4 - 6	2 pcs	28869-38	28869-38

This product should only be fitted by a certified professional.

SWASH® COMPONENTS

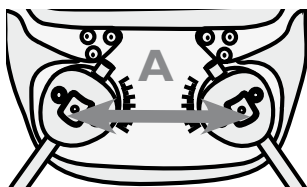
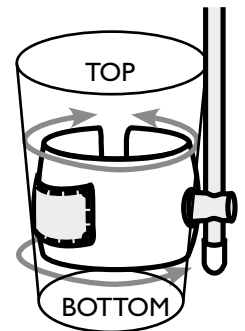


Upright lengths

Size	Proximal Length A		Distal Length B		Total Length C	
1	63mm	2 ½in	175mm	7in	310mm	12 ¼in
2	80mm	3 ¼in	215mm	8 ½in	375mm	14 ¾in
3	80mm	3 ¼in	280mm	11in	440mm	17 ¼in
4	80mm	3 ¼in	320mm	12 ½in	480mm	19in
5	90mm	3 ½in	370mm	14 ½in	540mm	21 ¼in
6	100mm	4in	420mm	16 ½in	600mm	23 ½in

Plastic circumference

Size	Top		Bottom	
1	230mm	9in	210mm	8 ¼in
2	270mm	10 ¾in	250mm	9 ¾in
3	310mm	12 ¼in	290mm	11 ½in
4	360mm	14in	340mm	13 ½in
5	390mm	15 ¼in	370mm	14 ½in
6	460mm	18in	420mm	16 ½in



Pelvic Section - Distance Between Joint Centers

Size	STEADY A		GO A	
1	82mm	3 ¼in	82mm	3 ¼in
2	90mm	3 ½in	90mm	3 ½in
3	105mm	4 ¼in	105mm	4 ¼in
4	120mm	4 ¾in	120mm	4 ¾in
5	N/A		130mm	5in
6	N/A		150mm	6in

Measurements are taken on flat plate before bending.

PRODUCT SELECTION

Before you begin

If at all possible, meet with the physician, physical therapist and caregiver to determine the primary and secondary goals for using a SWASH. If this is not possible, try calling them to make sure their expectations are understood. This will affect whether you select SWASH® STEADY or SWASH® GO, 115 or 123 degree upright, plus the abduction adjustment you make to the orthosis. The Pre-Fitting Evaluation (see SWASH® Clinical Manual) is key to success and, combined with the Post-Fitting Evaluation (see SWASH® Clinical Manual) serves as a means for you to document outcomes.



SWASH® STEADY

SWASH® STEADY Pelvic Section is available in sizes 1-4. SWASH® STEADY size 1 is designed for infants or very small children. The STEADY size 1 uprights are 6mm diameter. The smaller diameter uprights on size 1 allow more “spring”, permitting less restriction of movement. This is often desirable for the developing infant. To accommodate these smaller diameter uprights the retaining rings in the pelvic section and cuffs are also 6mm diameter. The STEADY size 1 pelvic section, cuffs, and uprights are not interchangeable with other sizes.

Sizes 2-6 uprights are 8mm diameter and retaining rings in the pelvic section (sizes 2-4) and cuffs (sizes 2-6) are also 8mm diameter so they are interchangeable.

SWASH® GO

SWASH® GO uses a padded iliac extension that can be positioned in one of two places: It can be fit immediately above the iliac crest between the crest and the inferior angle of the costal margin, or it can be fit at the level of the ASIS between the iliac crest and the greater trochanter. The latter is used to minimize any influence towards lumbar flexion when sitting.

SWASH® GO Pelvic Sections, Cuffs, and Uprights are available in sizes 1-6. The uprights for all sizes are 8mm diameter. This increase in diameter offers added strength to manage very high tone, plus it allows cuffs to be completely interchangeable between all sizes.

Guidelines for Product Selection

The following are offered as general guidelines only. When possible, it is recommended to try each style on the patient to best assess which offers optimum function.

SWASH® STEADY

- When maximum trunk control is required, i.e., for the candidate who lacks muscle strength or upper body control to sit upright.
- When patient is primarily non-ambulatory (GMFCS IV-V).
- When a smaller diameter (6mm) uprights on the size 1 are desired to permit less restriction of movement.*
- When the greater pelvic coverage area triggers more desirable neuro-sensory motor response.

SWASH® GO

- When the primary goal is to control scissoring gait.
- When wearer has limited space between the iliac crest and the rib cage.
- When the lower profile height is better anatomically tolerated by the patient.
- When the lower profile design is cosmetically more acceptable for the patient or caregiver.

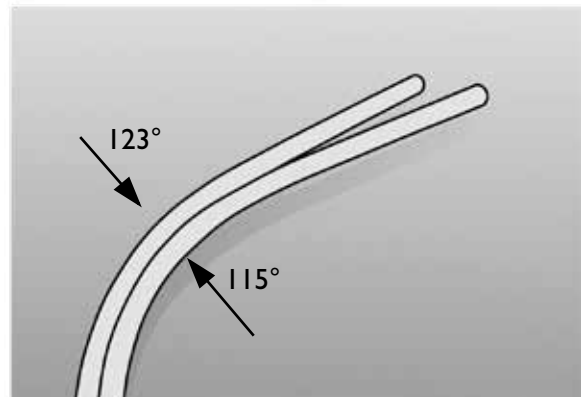
*All uprights are 8mm diameter except Steady size 1.

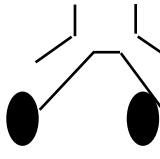
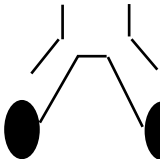
PRODUCT SELECTION

115 or 123 Degree Uprights?

SWASH® is available with either 115° or 123° uprights. This refers only to the fixed angle of the most proximal visible curve in the uprights – it does NOT refer to the exact degree of abduction obtained while wearing the orthosis.

Standing and walking functions of both uprights are very similar. Generally the difference between the two are related to abduction in sitting, with the 123° uprights creating greater amount of abduction.

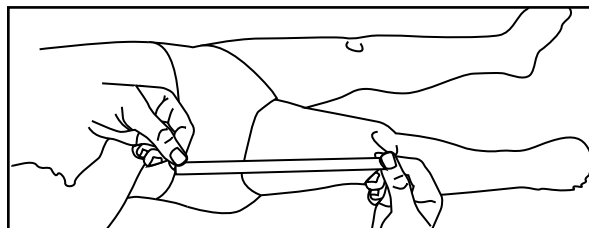


 <p>123 Degree - Wide Sitting Base When the greatest amount of adductor muscle lengthening in the sitting position is desired. When more trunk lumbar flexion influence is desired when sitting. When more lumbar extension is desired during gait.</p>	 <p>115 Degree - Narrow Sitting Base The wearer is primarily chair mobile and the 123° uprights would be too wide in the sitting position for the child to fit in chair or car seat, and a new chair or car seat is not an option. Adductors are too tight and the amount of abduction when sitting in the 123° uprights would be impossible or painful. When less trunk flexion influence is desired when sitting.</p>
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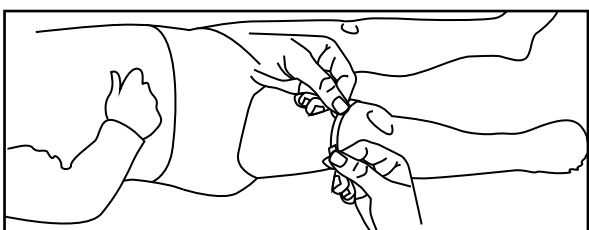
PRODUCT SIZE & UPRIGHT SELECTION



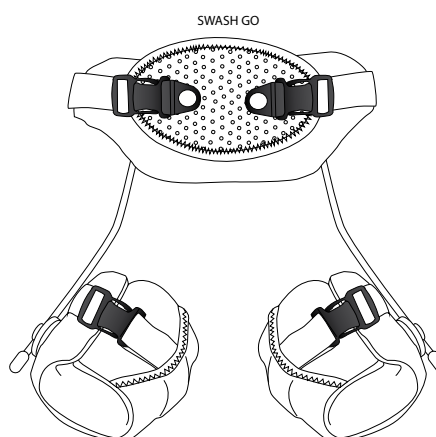
PELVIC SECTION CIRCUMFERENCE



UPRIGHT LENGTH



THIGH CIRCUMFERENCE



Upright length

Measure waist to mid-patella. At final fitting, should be shortened to level of distal thigh cuff padding.

I15 = narrow sitting base

I23 = wide sitting base

Upright diameter

All uprights are 8mm diameter except SWASH STEADY size I which are 6mm diameter.

Pelvic section circumference

Measure

SWASH® STEADY - At level of the natural waist for maximum trunk stability. SWASH® GO – At the level of the ASIS. Ideal is to fit the orthosis at mid-pelvic girdle to obtain good pelvic stability.

Thigh circumference

Measure at distal thigh, just proximal to the condyles. Ideal is to fit the cuffs as distal as possible without creating pressure or interference in the popliteal area. However, pressure on the thorax, excessive spinal flexion, or discomfort due to hamstring tightness, may be relieved by moving the cuffs up 1 - 3 inches.

Sizing guide

Use the table below to select the largest size that will fit the child, based on the measurements, to allow optimum room for growth. Keep the following in mind:

- The plastic on the cuffs and the pelvic band may be trimmed if necessary.
- The waist band on SWASH® GO may be shaped to fit slightly larger or smaller waist circumferences.

Interchangeability of Components

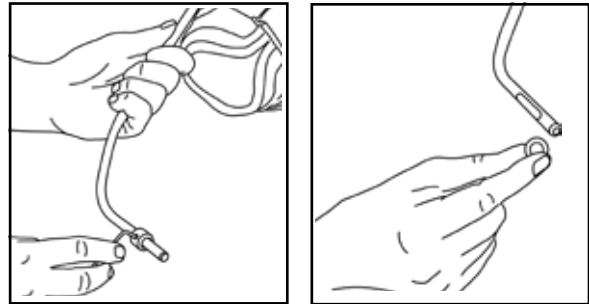
- The sizes for all Pelvic Sections, Uprights, and Cuffs are interchangeable EXCEPT SWASH® STEADY Size I.
- The uprights almost always require trimming (after final fitting approval) so that the distal tips are level with the bottom of the cuff padding.

SWASH® SIZING CHART

Dimensions in mm and inches.	Pelvic section Circumference		Thigh cuffs Circumference		UPRIGHTS						
					Diameter	Overall Length		Proximal Width		Distal Length	
Size 1	400 - 465	15 ¾ - 18 ¼	210 - 250	8 ¼ - 9 ¾	STEADY = 6 GO = 8	310	12 ¼	63	2 ½	175	7
Size 2	460 - 550	18 - 21 ¾	250 - 290	9 ¾ - 11 ½	8	375	14 ¾	80	3 ¼	215	8 ½
Size 3	540 - 630	21 ¼ - 24 ¾	290 - 330	11 ½ - 13	8	440	17 ¼	80	3 ¼	280	11
Size 4	620 - 720	24 ½ - 28 ¼	330 - 380	13 - 15	8	480	19	80	3 ¼	320	12 ½
Size 5	710 - 810	28 - 32	380 - 440	15 - 17 ¼	8	540	21 ¼	90	3 ½	370	14 ½
Size 6	800 - 900	31 ½ - 35 ½	440 - 500	17 ¼ - 19 ½	8	600	23 ½	100	4	420	16 ½

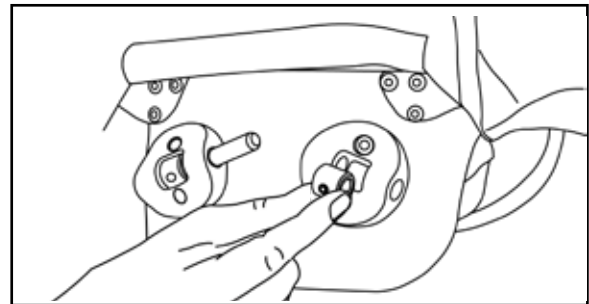
1. Remove retainer rings from the uprights

The uprights are labeled "R (right)" and "L (left)" to correspond to the extremity on which they are fit. To assemble the uprights to the pelvic band: Use the Allen Key to loosen the set screw and slide the retainer ring off from the upright.



2. Insert retainer rings into joint assemblies

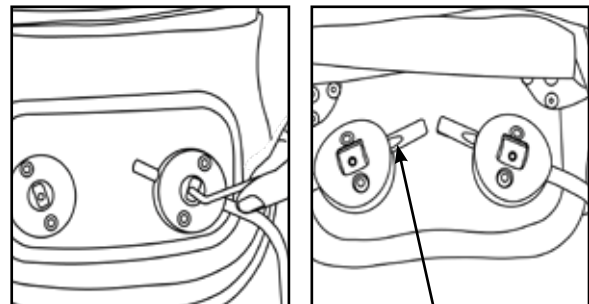
Insert the retainer rings into the center of the hip joint with the hex-screw pointing up.



3. Insert and secure uprights into joint assemblies

Insert the uprights into the hip joint assembly and through the retainer ring.

Make certain the groove in the upright faces up and is aligned with the set screw in the retaining ring. Tighten the set screw until it is securely seated into the groove in the upright.



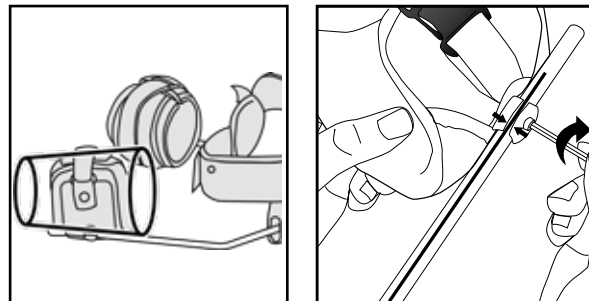
Groove must face up.

4. Symmetrical uprights

Repeat with the opposite side, making certain that both uprights are **inserted equal distance** through the joint assembly so they are symmetrical.

5. Apply thigh cuffs

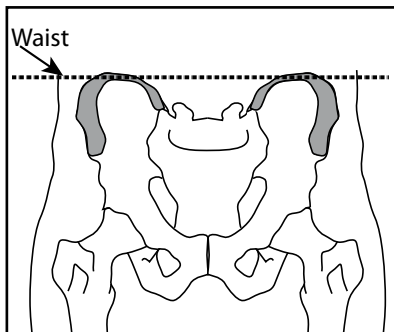
Remove rubber tips from bottom of uprights. Slide the thigh cuffs onto the uprights, making sure right cuff is on right upright and left cuff is on left upright (cuffs are cone shaped - greater circumference should be at the top and straps should close to lateral side). For initial placement, the vertical line on the upright should be visible in the closure opening in the retaining ring. Use Allen key to secure in position. Replace rubber tips to ends of uprights.



INITIAL APPLICATION

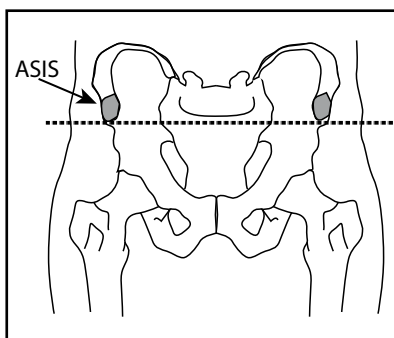
I. Position the orthosis on the patient in supine position

SWASH® STEADY



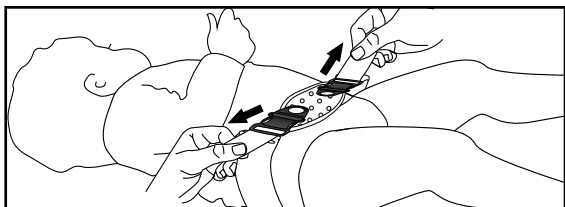
For maximum trunk stability, the indentations on the lateral sides of the pelvic section should be at the level of the waist line so that the bottom half of the pelvic section covers the iliac crest. Check that pelvic section is at same height on both sides and not rotated on the patient.

SWASH® GO



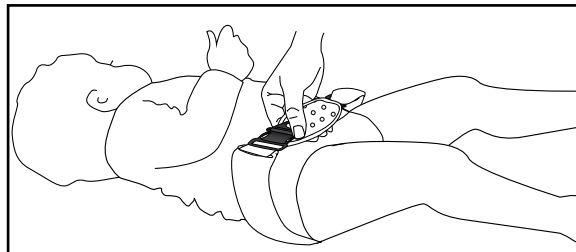
For maximum pelvic stability, position at level of the ASIS between the crest of ilium and the greater trochanter. Ideal is to fit the orthosis at mid-pelvic girdle to provide comfortable control of the pelvis.

Check the ASIS relative to the posterior section of pelvic band on both sides to ensure symmetry in pelvic height and that the orthosis is not rotated on the patient.



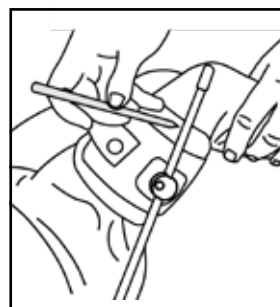
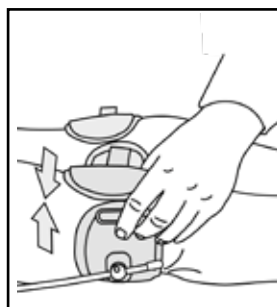
2. Size the orthosis to fit the patient:

Center the abdominal pad on the abdomen. Feed the straps on the pelvic section through the D-Rings on the buckles and symmetrically pull the straps until the abdominal pad is comfortably snug. Feed the loose end of the straps into the opening in the pelvic section padding and secure by pressing into the Velcro.



3. Check the fit of the abdominal pad:

With hips alternately flexed and extended, slide the fingers of one hand between the abdominal pad and the abdomen to ensure a snug yet comfortable fit.



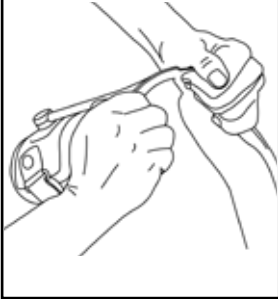
4. Thigh cuffs

Initially, position the thigh cuffs as distal as possible without creating pressure in the popliteal area and without interfering with flexion. However, pressure on the thorax, excessive spinal flexion, or discomfort due to hamstring tightness, may be relieved by moving the cuffs up 1-3 inches. When making cuff height adjustments, check that the vertical line on the upright is visible through the opening on the retaining ring. Mark on the uprights where the cuff should be secured. If the cuffs are too large, mark on the cuff where it should be trimmed for recommended fit (do not trim until after initial fitting as it is possible you will find it necessary to move the cuffs up higher on the thigh to resolve posture or comfort issues).

INITIAL ADJUSTMENTS

Remove the orthosis from the patient. Make all necessary changes to the orthosis while it is off the patient.

Pelvic band adjustments

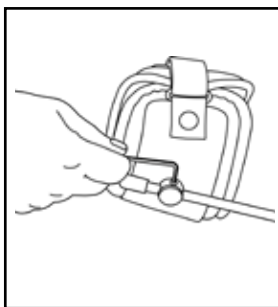


SWASH® GO: If based on your observations you need a closer fit of the metal frame, remove the cloth cover and hand shape the frame that forms the iliac extension. Be sure to maintain symmetry.

Adjust uprights for hip clearance

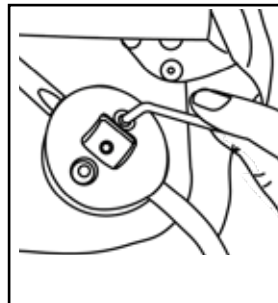


Adjust equally the distance that the upright passes through the hip joint assembly and tighten. This setting may need to be changed after the orthosis is tested on the patient.

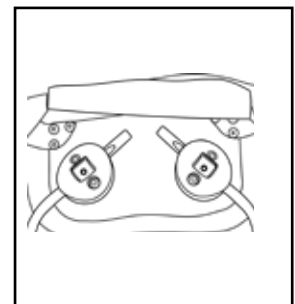
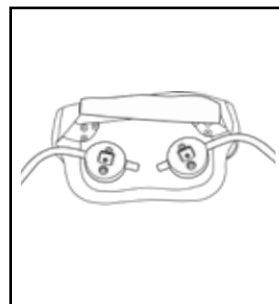


Move thigh cuff to the marked position on uprights, rotate slightly laterally and tighten. Move other thigh cuff to the same height and rotation.

Abduction settings



Loosen the large screws in the outer ring of the hip joint assemblies. Rotate the joints to set amount of abduction needed to improve sitting and standing posture, and/or prevent scissoring during standing and walking, or to meet post-operative protocols, and then tighten.



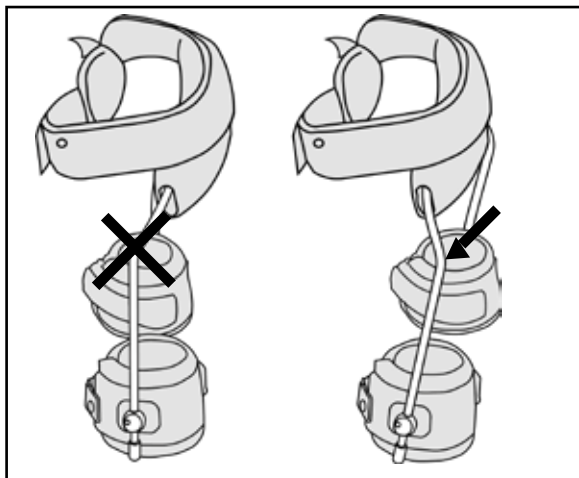
More (left photo) or less (right photo) abduction may be needed depending on the child's hip alignment and functional performance.

Note: Loctite® or other adhesives are not generally necessary to maintain secure settings on the SWASH®.

Maintain symmetry: The orthosis should be set up to be symmetrical in every aspect. Most patients with cerebral palsy present with both postural and functional asymmetries. The SWASH® should be set up and used symmetrically for two to four weeks in an attempt to help the child become more symmetrical.

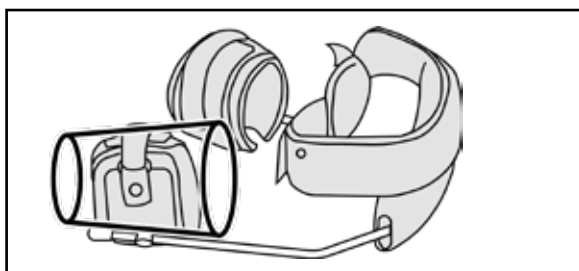
INITIAL FITTING

Final product check before fitting



Are the uprights in correct RIGHT and LEFT positions?

There is an engraving or black label on the upright that identifies left and right. Another way to check is to be certain the long horizontal groove in the proximal end of the upright that slides through the joint assembly should always be facing up.



Are the cuffs on appropriate upright?

The cuffs are a cone shape and the large circumference should be on top and the **straps should close to the lateral side**. If this is not the case, remove the cuffs and switch to opposite uprights.

Are the thigh cuffs rotated to appropriate angle?

The retaining ring that connects the thigh cuff to the upright must not touch the sitting surface when the patient is sitting. Generally, rotating the cuff approximately 10° posterior from mid-line is sufficient.

Does the abduction angle prevent the cuffs from touching?

A good starting point is 1 to 2 inch (2.5 - 5 cm) gap between the cuffs when you glide the uprights to the standing position. This angle will generally need to be re-adjusted after the function fitting, depending on the primary goals of the orthotic intervention and the amount of tone during function. If the patient is ambulatory, one goal for final fitting is to have the cuffs barely touch each other as the patient walks.

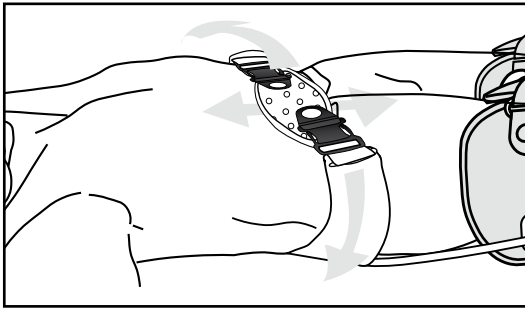
Are all settings symmetrical?

When at all possible, start with all settings symmetrical. Give the wearer a chance (2-4 weeks) to see if SWASH® will help the wearer adjust to more symmetrical posture.

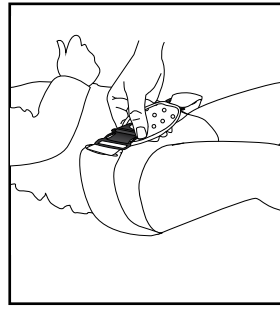
Do the uprights move freely and easily?

The uprights should always move freely and easily in a full ellipse. If they don't, check that the Allen screw in the retaining ring in the joint center is properly seated into the groove in the upright.

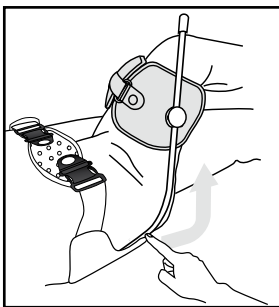
CHECKING THE FIT



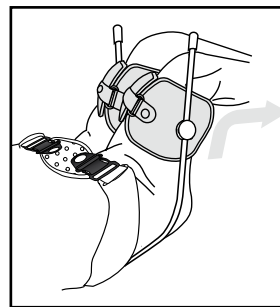
1. Check the height and rotation of the orthosis on the patient, making certain everything is symmetrical.



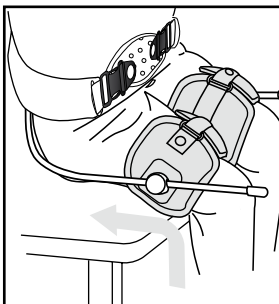
2. Slide the fingers of one hand between the abdominal pad and the abdomen to assure a comfortably snug fit and the patient's comfort.



3. Flex the hips to 90° to check the position of the uprights relative to the greater trochanters. The uprights should be as close as possible to the greater trochanters without impinging on them with the hips flexed. If there is impingement or if the distance is too great, remove the orthosis and adjust the distance of the uprights through the hip joint assemblies. Check to be certain that the desired abduction setting has not been altered. Re-apply the orthosis.



4. Check both limbs with the knees at 90° that there is no impingement on the popliteus or the gastrocnemius. If the thigh cuffs are too high or if they are too low and causing impingement on the popliteus or the gastroc, mark a more appropriate height on the upright, remove the orthosis, and adjust the cuffs to the new position.



5. Have the patient sit on a bench. Check that the location of the retaining rings are symmetrical and are not hitting the sitting surface. Check abdominal band tightness and comfort while sitting.

INITIAL FUNCTION EVALUATION & CUSTOMIZATION



Sitting

Stability during sitting is usually a fairly immediate improvement with the SWASH[®]. Sometimes a few minutes of fun activities may be required to learn that now they do not have to touch balance to sit comfortably. More time will allow them the opportunity to improve reaching and other upper extremity functional capacities and a more erect posture.

Standing

Many children will demonstrate a more erect and stable standing posture. It may take some time to become acclimated to their new posture and elevation. Cervical hyperextension and spinal rotation should diminish as pelvic stability increases. Improvements in standing balance and stability may be demonstrated after a few hours or days.

Walker, Standing Frame, and/or Crutch Height

Evaluate the height of any external walking aids with the patient wearing the SWASH[®]. They will often need to be raised to accommodate to the new stance height.

Walking

In initially setting up the orthosis, it is difficult to judge the amount of abduction required to eliminate scissoring during gait. The goal is for the thigh cuffs to come as close together as possible, yet offer sufficient abduction to improve hip alignment, posture and gait control, and prevent scissoring.

Toeing out

Suggest the patient be evaluated for external tibial or femoral torsion. Sometimes internal hip rotation can disguise tibial torsion, so even though the patient's feet don't toe-out without SWASH[®], with SWASH[®] on and internal rotation minimized, the tibial torsion becomes more apparent.

Does abduction angle offer optimum function?

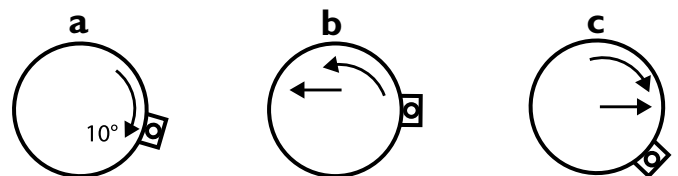
Significant Abduction Angle Adjustments

If scissoring continues to hinder gait, remove the orthosis and increase the amount of abduction angle by rotating the hip joint assemblies. (see page 9 of this manual).

Fine Tuning Abduction Adjustments

To "tweak" the abduction angle to offer a tiny bit more abduction or adduction to (1) optimize gait or (2) prevent the retaining ring on the cuff from touching the sitting surface of the chair:

Note: all below illustrations are left side lateral view.



a) Start with 10° external rotation. This is considered the neutral position

b) To reduce Abduction (increase ADduction), internally rotate cuffs on uprights

c) To increase ABduction, externally rotate cuffs on uprights

Residual Internal Rotation

Even with the SWASH[®] in use, there may be residual internal rotation of the lower extremities. Very often, unless there are internal tibial torsion or metatarsus adductus issues, the medial hamstrings have been seen to exert this internal rotary influence. A walking program along with specific medial hamstring stretching has been seen to minimize this residual internal rotation.

INITIAL FUNCTION EVALUATION & CUSTOMIZATION

Too much trunk flexion

When sitting in SWASH[®], ADduction of the legs along with tight hamstrings may produce a posterior rotary influence on the pelvis, creating a flexion influence on the trunk. This is more pronounced with the use of 123 degree uprights and less pronounced with the 115 degree uprights.

If the condition persists, try one or a combination of the following:

- a) Change position of thigh cuffs from distal femur to distal 2/3 femur.
- b) Set the hip joints for less abduction.
- c) Rotate the thigh cuffs laterally, increasing the 10° lateral rotation that is generally recommended.
- d) Depending on the patient, additional anterior or posterior padding may stimulate a proprioceptive response to shift into more trunk extension:
 1. Add a longer foam pad to the posterior aspect of the pelvic band or add a sitting wedge (thicker part under seat, narrow part under legs).
 2. Insert a thin pillow or foam pad (slightly larger than the abdominal pad) between the abdominal pad and the abdomen.

Too much trunk extension:

- a) Check the style (115 or 123 degree) of the uprights (find this engraved or on a blue label on the upright). The 123 degree will influence more flexion.
- b) Recommend the child always sit in a chair with a back rest; if needed include a hip strap to avoid sliding forward.
- c) Set the hip joints for slightly more ABduction. This will increase the flexion influence of the orthosis on the trunk.

Interference with Baclofen Pump or Feeding Tubes

Move to next smaller size abdominal pad.

Pressure on the rib cage

This is usually due to thigh cuffs being fit too distally on the thigh. Move the cuffs up to approximately 2/3 distal on the thigh.

Cuffs are too large

There are two options: (1) Verify it is correct size. If size is correct, cuffs can be trimmed and straps adjusted accordingly. (2) Go to next smaller size cuff. Cuffs are interchangeable for all SWASH[®] STEADY and GO components EXCEPT SWASH[®] STEADY size 1 Pelvic Section, Uprights, and Cuffs. SWASH[®] GO size 1 Cuffs will fit on SWASH[®] STEADY size 2 Pelvic Section and Uprights.

Cuffs are too small

Go to the next larger size cuff. All cuffs are interchangeable EXCEPT SWASH[®] STEADY size 1.

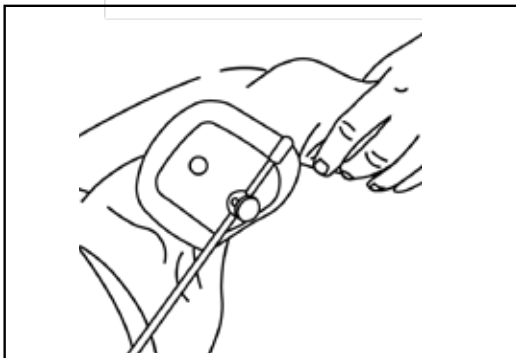
Posterior section of SWASH[®] STEADY is too long

If size is correct, remove cover and trim posterior section with heavy duty shears.

THE PROFESSIONAL FINISH

Post-Fitting Evaluation

Congratulations! You are now ready for the Post-Fitting Evaluation (Refer to Clinical Manual). Be sure to document the Post-Fitting Evaluation so you have a record of functional improvement when compared to the Pre-Fitting Evaluation.



Cut the uprights to proper length

Once the team has approved the orthosis, the uprights should be trimmed so that the distal tips are at the same level as the bottom of the padding on the thigh cuffs. Ensure the ends are rounded and polished smooth. Push on the protective rubber tips.

Teach caregiver to apply

Demonstrate and then ask the caregiver to apply and remove the orthosis to help assure appropriate caregiver compliance.

Protocols and proper fit guidelines

You will find this in the Clinical Manual.

Benefits and outcomes

This is in the Clinical Manual and may help in the preparation of documents for submission for insurance.

Frequently asked questions

Also in the clinical manual, this contains many of the questions asked by both referral sources, therapists, patients, and caregivers.

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