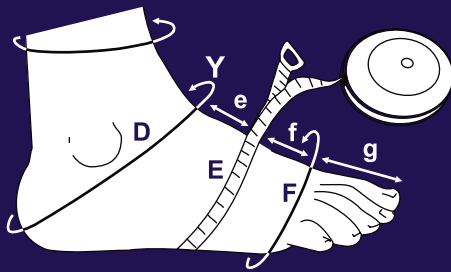


# MEASURING FOR CUSTOM-MADE PRESSURE GARMENTS

## THE HAND



Revised January 2013

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**2424 East University Drive, Phoenix, Arizona 85034**  
voice: 602-267-7854 • toll-free: 800-421-5647 • fax: 602-273-6931

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## #6 Glove to Wrist, Left & Right

See pages 25-26 for corresponding Hand Tracing Guides.

Requested features:

- color: Scarlet Red fabric with Black stitching. C17W/C26 is a shorthand method for specifying this using the color codes on the Color Guide
- thumb web insert to prevent skin breakdown in the thumb web space for the right hand
- regular lining for the dorsal left hand, palmar Silon-TEX lining with an incorporated pad on the right hand. Both features are sketched on the respective hand tracings
- ulnar zipper on the left glove, dorsal zipper offset 1" ulnarly on the right glove
- common opening for the 4th & 5th digits on the right glove as shown on the hand tracing. Circumferences C, D, E, and F are provided because otherwise we would not know how big to make the common opening

See page 24, for definition of gloves, gauntlets, and mittens.

### HAND MEASUREMENT CHART

Bio-Concepts Custom Pressure Garments are available only under Physician's Order

Patient Doe, Jane Last Name First Name

Date 06/07/2013

Garment color C17W/C26

Insert thumb web - R only

Lining regular lining dorsal left

silon lining right w/pad

Left hand zipper:  Dorsal  Palmar  Ulnar  Radial  
 With hook & loop zipper stop tab

Right hand zipper:  Dorsal  Palmar  Ulnar  Radial  
 With hook & loop zipper stop tab

*Glove and Gauntlet zippers normally open at the proximal end of the garment and extend to just proximal to the knuckles (MCPs).*

Finger/thumb tips closed  Finger/thumb tips open

Refer to the Bio-Concepts Measuring Manual for detailed procedures, additional instructions, and example measuring charts.

Additional instructions or comments:

common opening

right D4-D5

offset right glove

zipper 1" ulnar

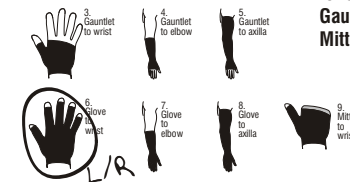
PLEASE DO NOT WRITE IN MARGINS  
Bio Concepts  
compression garments!

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#### CIRCLE ITEMS ORDERED

Bio-Concepts Use Only:

F=



HAND TRACINGS ARE REQUIRED for all Gloves, Gauntlets, & Mittens

Use the UPPER EXTREMITY CHART for adding sleeves to gloves & gauntlets.

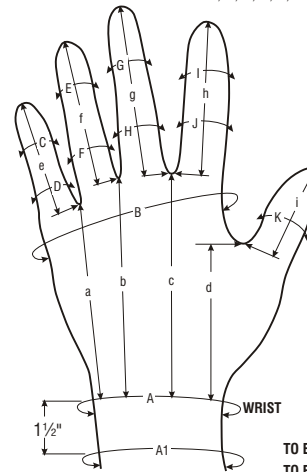
#### REQUIRED MEASUREMENTS

Gloves: All  
Mittens: All, except C thru J  
Gauntlet: A1, A, B, K, d, & i

Refer to the Bio-Concepts Measuring Manual for instructions on measuring contracted fingers.

Use the hand tracing to illustrate special features & options.

NOTE: Always take distances (a-i) from a hand tracing not from the patient



PLEASE DO NOT WRITE IN MARGINS

LEFT HAND RIGHT HAND

A1	6 <sup>2</sup>	6 <sup>4</sup>		
A	5 <sup>7+</sup>	6 <sup>0+</sup>		
B	7 <sup>5</sup>	7 <sup>4</sup>		
C	1 <sup>5</sup>	1 <sup>6</sup>		
D	2 <sup>2</sup>	2 <sup>0</sup>		
E	1 <sup>7</sup>	2 <sup>1</sup>		
F	2 <sup>2+</sup>	2 <sup>3</sup>		
G	2 <sup>1</sup>	2 <sup>2</sup>		
H	2 <sup>3</sup>	2 <sup>4+</sup>		
I	2 <sup>0</sup>	2 <sup>3</sup>		
J	2 <sup>4</sup>	2 <sup>4</sup>		
K	2 <sup>3+</sup>	2 <sup>7</sup>		
a	3 <sup>7</sup>	3 <sup>6</sup>		
b	4 <sup>3+</sup>	4 <sup>2</sup>		
c	4 <sup>4</sup>	4 <sup>1+</sup>		
d	3 <sup>2</sup>	2 <sup>6+</sup>		
e	2 <sup>3</sup>	1 <sup>4</sup>	2 <sup>7</sup>	1 <sup>7</sup>
f	2 <sup>6</sup>	1 <sup>6</sup>	2 <sup>7+</sup>	2 <sup>2</sup>
g	3 <sup>2</sup>	2 <sup>7+</sup>	3 <sup>1+</sup>	2 <sup>4</sup>
h	3 <sup>2</sup>	2 <sup>6+</sup>	3 <sup>2</sup>	2 <sup>2+</sup>
i	2 <sup>4</sup>	1 <sup>0</sup>	2 <sup>1</sup>	1 <sup>1+</sup>

TO END OF FINGER  
TO END OF GLOVE FOR OPEN TIPS

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See page 16 for an explanation of the shorthand measurement notation system.

## Hand Chart -- EXAMPLE

## MEASURING THE HAND

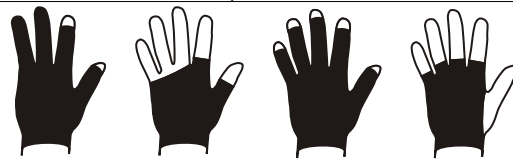
- No matter what specific hand garment is intended for the patient, always begin by tracing the hand. Use the Bio-Concepts **Hand Tracing Guide**.
- Measure the hand and finger circumferences and record them on the **Hand Measurement Chart**.
- Sketch any special features directly on the hand tracing, or on a second and clearly labeled copy of the hand tracing.

### Required Measurements

#### **GLOVES: All, A & a-i**

A **#6 Glove to Wrist** may extend 4½ inches proximal to the wrist, beyond that it is considered a **#7 Glove to Elbow** or **#8 Glove to Axilla**. A glove has openings for at least two digits, including the thumb. Any combination of the fingers and thumb may be open or closed, short, or long. Special modifications may be needed for one or more finger amputations, but the garment would still be considered a glove.

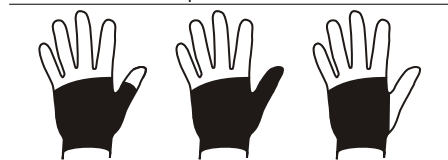
Examples of Gloves



#### **GAUNTLETS: A1, A, B, K, d, i**

A **#3 Gauntlet to Wrist** may extend 4½ inches proximal to the wrist, beyond that, it would be considered a **#4 Gauntlet to Elbow** or **#5 Gauntlet to Axilla**. A gauntlet has an opening for the thumb and a common opening for all four of the remaining digits. The thumb may be closed or open-tipped or a clearance opening.

Examples of Gauntlets



#### **MITTENS: All, except C through J**

A **#9 Mitten to Wrist** may extend 4½ inches proximal to the wrist, beyond that it is considered a **#9 Mitten to Wrist** and an attached **#1 Sleeve to Elbow** or **#9 Mitten to Wrist** and an attached **#2 Sleeve to Axilla**. A mitten is generally used for multiple digit amputations and has an open or closed thumb and a common covering for the remaining digits made of insert material.

Examples of Mittens



# Left Hand Tracing Guide -- NEW PATIENT EXAMPLE

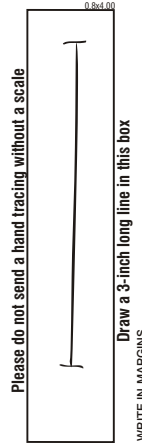
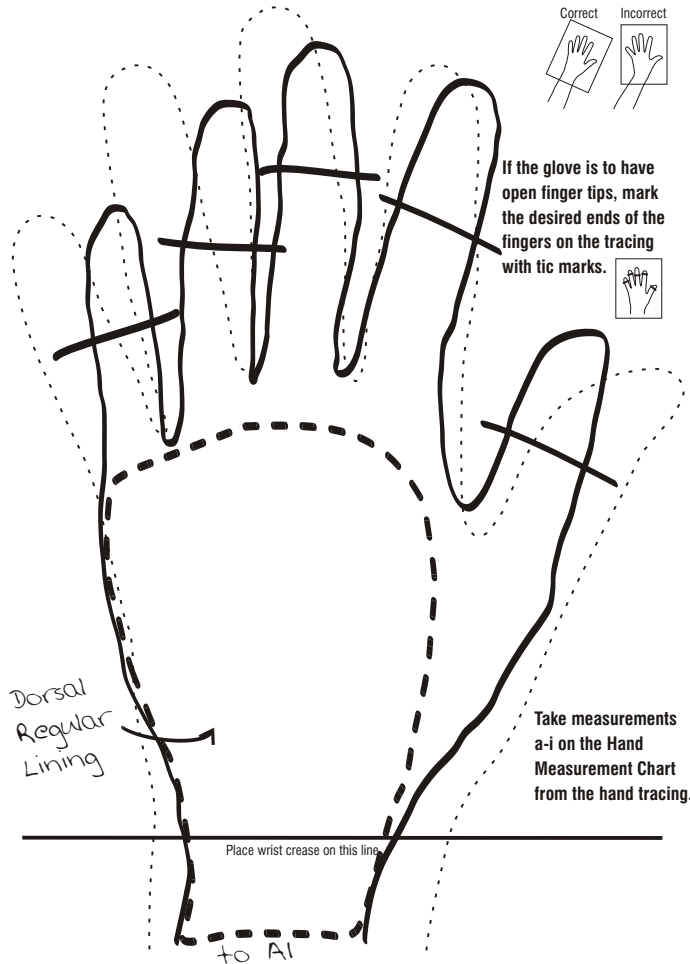
**LEFT HAND**  
TRACING GUIDE



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**REQUIRED in conjunction with HAND MEASUREMENT CHART • Position and trace patient's hand within outline**

Patient Doe, Jane Date 06/07/2013



## Left Hand Tracing

Exact location of the regular dorsal lining referred to on the *Hand Measurement Chart* (page 23) is shown on the hand tracing. Open finger tips are indicated by lines drawn across the finger.

Use the tracing to sketch extra features, but be sure to indicate whether the features are to be dorsal or palmar. If you need to illustrate both dorsal and palmar features, make a copy of the tracing and label one "palmar view" and the other "dorsal view."

Unless the patient presents with severely contracted digits or hands, measurements a-i on the *Hand Measurement Chart* must always be measured from the hand tracing not from the patient.

If the fingers are contracted, see page 29 for instructions.

# Right Hand Tracing Guide -- NEW PATIENT EXAMPLE

**RIGHT HAND**  
TRACING GUIDE



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e-mail: bio-con@bio-con.com • worldwide web: http://www.bio-con.com

**REQUIRED in conjunction with HAND MEASUREMENT CHART • Position and trace patient's hand within outline**

Patient Doe, Jane Date 06/07/2013

PLEASE DO NOT WRITE IN MARGINS  
Please do not send a hand tracing without a scale

Correct Incorrect

If the glove is to have open finger tips, mark the desired ends of all fingers on the tracing with tic marks.

Draw a 3-inch long line in this box

PLEASE DO NOT WRITE IN MARGINS

common opening D4-D5

Palmar Silon lining w/ pad

Place wrist crease on this line

Take measurements a-i on the Hand Measurement Chart from the hand tracing.

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## Right Hand Tracing

Exact location of the palmar Silon-TEX lining with velfoam pad referred to on the **Hand Measurement Chart** (page 23) is shown on the hand tracing.

Open finger tips are indicated by lines drawn across the finger.

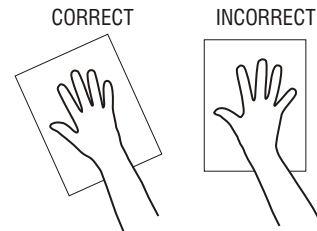
In this example a common opening is desired for D4-D5. This is indicated on the tracing and noted on the **Hand Measurement Chart** (page 23). Finger circumferences are still necessary (otherwise we will not know how big to make the opening).

Fax machines are programmed to reduce or enlarge originals to fit the output page size. Therefore, it is very important that the tracings we receive have a scale. Please draw a three inch long line in the box in the upper left.

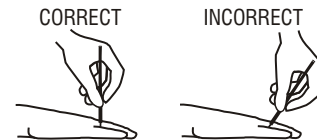
If the fingers are contracted, see page 29 for instructions.

To begin:

- Place the hand on the **Hand Tracing Guide** so the wrist is at the wrist line with fingers relaxed. The wrist should not be deviated at all. Young children often splay the fingers very widely, please try not to let them do this. We want the hand and fingers in the most neutral positions possible.
- Regular pens and pencils are too thick to accurately trace web spaces of most patients. We recommend a pen refill.
- Be sure the tracing pen is vertical. Push the pen into the web spaces.

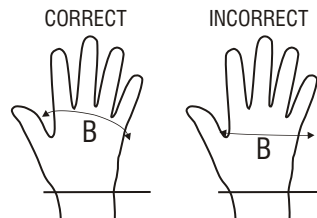


Measure the circumference of the hand at the wrist, 1½ inches above the wrist, around the knuckles, and around every finger joint (the thumb is a finger). Record all finger joint circumferences, even if the fingers on the glove are to be much shorter than the fingers on the patient.



### Circumference Measurements

Measure **A1**, **A**, and **B**, and all of the finger circumferences **C - K** using the retractable tape or the hand & finger tape. Tighten tape until lightly snug, but not snug enough to wrinkle the skin. Record all measurements on the **Hand Measurement Chart**.



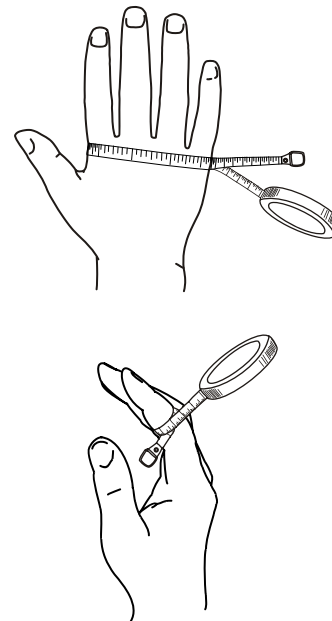
**A1** Circumference 1½ inches proximal to wrist line. Additional circumferences (**A2** and **A3**), proximal to **A1** at 1½ inch increments, can be added for longer length gloves.

**A** Circumference at the wrist line.

**B** Circumference of the hand at MCP's. This is a critical measurement for proper fit. Wrap the measuring tape around the hand across the metacarpal phalanges (the knuckles) with the curve of the palm straightened.

**C-J** The finger joint, PIP and DIP, circumference measurements. **Please take circumferences of all the joints even if you want some or all of the fingers to be shorter.** If a common opening is desired for two or more digits (see tracing on page 23), we still must have the respective digit circumferences. This is different from a gauntlet, which has a common opening for D2-D5 and only the thumb (D1) circumference (plus B, A, and A1).

**K** Circumference of thumb. Measurement should be taken around the joint.



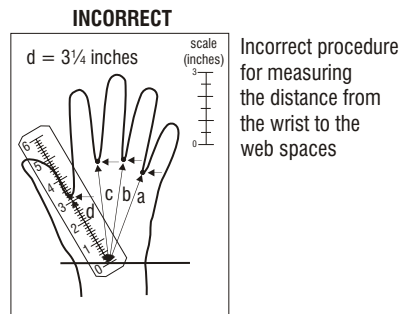
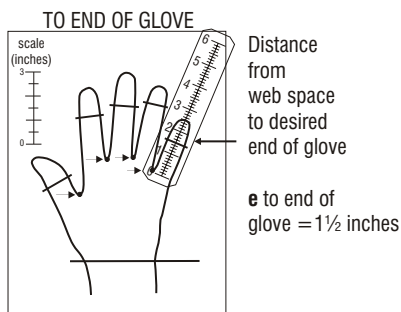
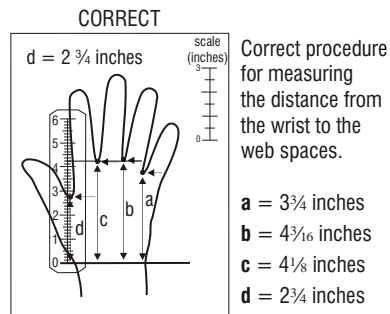
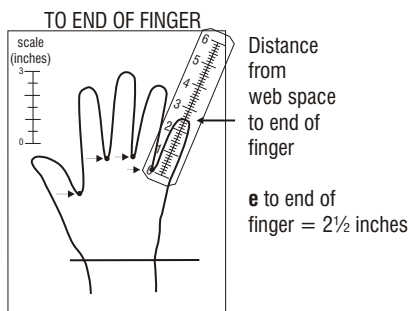
**Distance Measurements**

**a-d** Wrist to web space distances. Mark web spaces on the tracing with a dot. Draw a line (**a** through **d**) from each web space to the wrist line. These lines should be perpendicular to the wrist line. Measure the lengths of lines **a** through **d** on the tracing and then write them into the appropriate boxes on the **Hand Measurement Chart**.

**e-i** Finger lengths. Measure the length of the fingers from the base of the finger to the tip (**e** through **i**). Then write these measurements in the boxes on the **Hand Measurement Chart** indicated "TO END OF FINGER".

**e-i** Glove finger lengths. If the glove is to have open finger tips, mark the desired ends of the fingers on the tracing by drawing a line across each finger at the desired end of the glove. Then measure the distance from the base of the finger to the desired end of the glove. Write these measurements in the boxes on the **Hand Measurement Chart** indicated "TO END OF GLOVE".

**DO NOT** take measurements **a-d** and **e-i** from the patient. Unless the fingers are contracted, **ALWAYS** measure from a tracing. (see p. 29 for instructions on measuring contracted fingers).



**NEVER FAX A HAND OR FOOT TRACING WITHOUT A SCALE**

*We always check recorded hand measurements against the hand tracing, but we can only do so if the tracing we receive is the same size as your original. Please draw a three-inch long line on the hand tracing so we can check it.*

**Severely Contracted Hands**

Place the hand on the edge of a table, a rolling pin, or similar aid, and position the **Hand Tracing Guide** to follow the curvature underneath. Take the measurements **a-d** from the tracing. Then use the clear plastic ruler to measure **e-f**, the lengths of the fingers and the desired length of each finger on the glove on the dorsal and palmar surface of each contracted finger. Write both numbers in the space indicated "TO END OF FINGER" on the **Hand Measurement Chart**.

In the example below, the dorsal and palmar lengths of each finger of the left hand are recorded. The left thumb and the digits of the right hand are not contracted. The desired length of the glove for each finger is recorded in the right column by subtracting from the tip of the finger. For example, the index finger, **h**, would be open 1.25 inches from the tip of the finger.

It is not necessary to indicate which set of measurements is dorsal and which is palmar, the longer measurement is always dorsal.

How to record measurements of severely contracted fingers. The fingers of the left hand (except the thumb) are contracted, while those of the right hand are more or less normal.

	Dorsal		Palmar	
	LEFT HAND		RIGHT HAND	
d	3 2		2 <sup>6+</sup>	
e	2 <sup>6</sup>	2 <sup>1+</sup>	-10	2 <sup>3</sup>
f	3 <sup>1</sup>	2 <sup>6</sup>	-12	2 <sup>7+</sup>
g	4 <sup>0</sup>	3 <sup>5</sup>	-12	3 <sup>4</sup>
h	3 <sup>5+</sup>	3 <sup>1</sup>	-12	3 <sup>3</sup>
i	2 <sup>4</sup>	1 <sup>4</sup>	2 <sup>4+</sup>	1 <sup>4</sup>

TO END OF FINGER (indicated by arrows pointing to the top of the chart)

TO END OF GLOVE FOR OPEN TIPS (indicated by arrows pointing to the bottom of the chart)

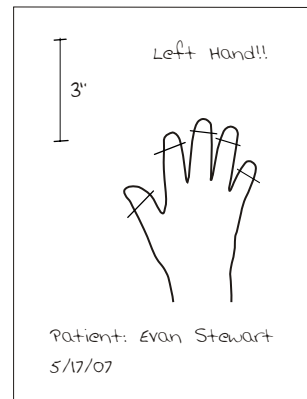
Dorsal finger lengths

Palmar finger lengths

**Active/Uncooperative Children**

Make a photocopy of the child's hand(s), but DO NOT fax the photocopy (photocopies are always rendered as indistinguishable blurs by facsimile machines). Instead, put a sheet of paper over the photocopy, hold it up to against a window or computer monitor and trace the outline of the hand on the clean sheet of paper. Before you fax the traced outline, make sure you draw a 3 inch long line on the sheet and write the date and the patient's name on the tracing.

**\*\*Important\*\* Your traced outline of the photocopy of the hand will appear to be reversed. It will appear to us to be the opposite hand. You must let us know this, otherwise we may think that you recorded the measurements in the wrong column on the Hand Measurement Chart (a very common mistake) and make a glove for the wrong hand.**





## **Common Options for Hand Garments**

### **Inserts**

Thumb web inserts made of our stretchy soft Insert Material (page 10) is the most commonly requested insert for a hand garment. This is a small wedge of insert material placed along the web between the thumb and index finger to prevent irritation and skin breakdown.

An ulnar insert, usually 1 - 2 inches wide and extending from the base of the fifth digit to the proximal end of the glove, is sometimes added to a glove or gauntlet to provide for extra flexibility in the glove or to assist the patient in donning the garment.

### **Zippers**

Zippers are common features of hand garments, however, a patient with good hand and finger strength who is not experiencing extraordinary pain or discomfort probably does not need a zipper on a glove or gauntlet. Most patients who need a zipper find that a dorsal zipper works best for them. In some cases a dorsal zipper is not indicated, as for a recent dorsal skin graft site. For these patients a palmar, ulnar, or even radial zipper might be better options.

### **Hook & Loop Closure**

Hook & loop may be used to substitute for a zipper to provide for some additional adjustability in the garment fit. Location and length should be carefully specified on the ***Hand Measurement Chart***.

### **Hook & Loop Zipper Stop Tab**

Glove and gauntlet zippers may occasionally come open on some patients. To prevent this we can install a hook and loop tab across the zipper to hold it together.

### **Hook & Loop Wrist Tab**

For some patients, getting the hand through the wrist band can be challenging, but a zipper is not needed. This difficulty is solved by installing a hook & loop tab across a break in the wrist band. A common practice is to order the first hand garment version with a zipper and the second without, or just with a wrist tab.

### **Lining**

Lining Material (page 10) linings may be indicated for a patient with a very sensitive dorsum or palm. Inserts are better for smaller areas of the hand than linings. A lining results in two layers of fabric and four sets of seams, while an insert is only one layer of fabric and two seams. The entire hand garment could be lined, but the resulting garment would be bulky and difficult to don. In this case we would recommend constructing the whole garment of soft or insert material. We also use a soft neoprene (rubber) pad sewn into the dorsal inside of a glove for lymphedema patients who tend to experience excess pooling of lymph fluid in that area.

### **Finger Tips**

Except for complete finger and thumb amputations, all hand garments have at least a thumb. This may be closed-tipped or open. **For open tips**, on the hand tracing, which is required for every hand garment, **draw a line** across the finger where you want the garment to end. **For closed-tips do not draw a line** across each finger and be sure to check the box labelled "Finger/thumb tips closed" on the ***Hand Measurement Chart***.