Abdominal wall hernia and/or pannus support prosthetic
Product Design Specifications

Devon Moloney (Leader), Cody Williams (BSAC), Matt Jensen (Communicator), Jeff Wu (BWIG),
Hannah Frank (Procurement)
December 12th, 2012

Function:

Morbidly obese patients as well as patients with abdominal hernias often have abdominal and back pain due to the effect of gravity on either the stomach or hernia sac. Current commercially available devices such as abdominal binders do not offer any lifting support for large abdominal hernia sacs, and only provide slight pressure on the hernia sac against the body. The goal of this project is to create a device that will help support hernia sacs and/or the pannus of morbidly obese patients both before and after surgery.

Client requirements:

- Lift the hernia sac/ pannus upward, providing 5 – 100 lb. (2 – 45 kg) support
- Durable for daily use
- Distributes weight evenly
- Washable, breathable material that doesn't irritate skin
- Prototype that can be adapted to market
- Within budget: $1000 grant
- Aesthetically pleasing

Design requirements:

1. Physical and Operational Characteristics

a. *Performance requirements*: Device must support hernia sac/ pannus through lifting force, distributing weight and alleviating pain. Should be durable and comfortable for daily use.

b. *Safety*: Device must be made such that it does not irritate sensitive skin or possibly puncture or harm the hernia sac/ pannus. Device should also distribute the weight evenly to avoid patient strain or discomfort.

c. *Accuracy and Reliability*: Device must remain securely fastened and provide continuous lifting support throughout daily use. Should also maintain constant, reliable support throughout life of service.

d. *Life in Service*: Device should remain functional for 6 – 12 months, the typical waiting period for corrective surgery. Device must be capable of being repeatedly washed without losing durability.

e. *Shelf Life*: Device must be comparable to current commercially available abdominal binders.

f. *Operating Environment*: The device should withstand everyday conditions experienced by the average person. Device will be worn close to body and must withstand all bodily secretions and temperature changes. Device must be able to support up to 100 lbs. throughout constant use.

g. *Ergonomics*: Device must distribute weight equally in a comfortable fashion and not irritate sensitive skin. Must not restrict motion of patient. Should be easily fastened and removable.

h. *Size*: The patient had a maximum ccircumference of 170 cm, and a circumference around the waist of 150 cm. To encompass shelf of the device is 80 cm wide and 30 cm tall. The fabric above the shelf intended to contain excess is 60 cm wide and 30 cm tall.

i. *Weight*: Device should not be cumbersome, and ideally minimal is best.

j. *Materials*: Materials should be breathable, washable, durable, and non-irritating.

k. *Aesthetics*, *Appearance, and Finish*: Should be inconspicuous, as it will be worn underneath everyday clothing.

2. Production Characteristics

a. *Quantity*: Only one functional prototype is required. Design should be conscious of possible mass production and altercations for different body types.

b. *Target Product Cost*: Design should be cost conscious.

3. Miscellaneous

a. *Standards and Specifications*: FDA approval is not required.

b. *Customer*: Design should be adaptable and comfortable for various body types.

c. *Patient-related concerns*: Design needs to provide lifting support.

d. *Competition*: Current devices do not provide adequate lifting support and lack sizing abilities. ACE wraps, maternity braces, abdominal binders.