Elastic Bandage Stabilizer (PDS)

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Function: The client, Michael Bentz, has requested a device to replace the current elastic bandage used to hold dressings in place on post operative patients. Current methods for maintaining the dressing's position are ineffective since the current bandage typically slides out of place. The primary location of use for the device is around the upper leg. Additional areas of applications can include the lower leg, the upper arm, and the lower arm.

Client requirements:

- Must hold dressings in place even with normal patient movement.
- Must be easily applied by the patient without external help.
- Cannot create a tourniquet effect on the outer extremities.
- Cannot cause excessive chaffing or rubbing.
- Tension and size should be adjustable for use by various sized patients.

Design requirements:

1. **Physical and Operational Characteristics**
    a. *Performance requirements:*
        i. The device must hold the dressings in initial position.
    b. *Safety:*
        i. The device must be made out of non allergenic, and should not contain materials such as latex.
        ii. The device must not limit blood flow or lymphatic circulation.
        iii. The device must be washable or disposable to prevent infection of the exposed wound.
    c. *Accuracy and Reliability*
        i. The client wants a device that will be effective in 99 percent of the cases.
    d. *Life in Service:*
        i. The device must be usable for 4 to 6 weeks.
    e. *Shelf Life:*
        i. Sterile before use.
        ii. Easily storable.
    f. *Operating Environment:*
        i. Attached to a human limb.

ii. Must be able to accommodate locomotion and be contained under clothing.

g. *Ergonomics:*
    i. Comfortable for patient.
    ii. Must be easy for patient to apply without help.
    iii. Must maintain its position with normal patient movement.

h. *Size:*
    i. Must be able to anchor a dressing in range from 2-15 mm in thickness.
    ii. Must be big enough to cover a 3x4 inch graft, or an incision.

i. Weight:
    i. Light enough to not fall off from shear weight.

j. *Materials:*
    i. Cotton or nylon is preferable.

k. *Aesthetics, appearance, and finish:*
    i. Function over aesthetics.
    ii. Possibility for future customization (i.e. colorful or themed).

2. Production Characteristics

a. *Quantity:*
    i. At least one proof of concept prototype.
    ii. Eventual varying sizes and lengths for different sized patients.

b. *Target Product Cost:*
    i. Flexible.

3. Miscellaneous

a. *Standards and Specifications:*
    i. Must be non allergenic.
    ii. Must be durable.

b. *Customer:*
    i. Customer wants the ability to easily create a themed and/or colored product to be more appealing towards children.

c. Patient-related concerns:
    i. Must take into account patient allergies.
    ii. Must not create tourniquet effect.

d. *Competition:*
    i. The current protocol for stabilizing dressing is wrapping the wound with Ace bandage tape.