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Scar Management for Therapists

Synthesizing and Utilizing Best Evidence

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Objectives

• At the end of this presentation, the learner will be able to:
  o describe recommendations for identifying and managing hypertrophic scars in a wide variety of clients.
  o outline methods for finding and synthesizing best available evidence into practical recommendations at the point of care in a variety of areas of practice.
  o explain the importance of evidence based practice in all areas of occupational therapy.
Patricia A. Sharp, OTD, MS, OTR/L

- 9 years in pediatric burns, Shriners Hospital for Children
- 2010 - Move to Cincinnati Children’s
- 2011-2012 Returned to school to attain OTD
- 2014 - Publication of BEST
- 2015 – Publication of BEST as manuscript

Initial state of care

http://themasqueradestore.com/
Scars are a problem?

- Hospitals see many patients with conditions that can result in scarring
- Hospitals see a lot of patients who undergo treatments, procedures, surgeries, or traumas that can result in scarring
- This warrants some formal way of addressing and managing scars

What is a scar?

- Develops any time the dermal layer of the skin is damaged
- The collagen fibers in hypertrophic scarring are orientated in a “whorl-like” pattern, as compared to normal skin in which collagen aligns in a parallel pattern
What causes a scar?

• Intentional
  o Surgical incision
  o Skin grafting
    • Sheet grafting
    • Meshed grafting
  o Cosmetic
    • Piercings
    • Tattoos
    • Branding

• Accidental
  o Trauma
  o Burns
  o Scalds
  o Chemicals
  o Friction
  o Infection

Picket fence analogy

withinonesmemory.blogspot.com
diaryofanewmom.net
Who develops scars?

Many factors contribute to how a person heals and develops scars

- **Wound healing is the best predictor**
  - If a wound heals within 2 weeks (closed, not wet), it will scar minimally
  - 14-21 days of wound healing time poses a risk for scarring – 30% incidence of scarring
  - 21+ days of healing will likely lead to hypertrophic scarring, with length of healing time directly related to the extent of hypertrophy – 78% incidence

(Gauglitz, 2011; Davoodi, 2008; Deitch, 1983; Staley, 1997)
Who develops scars?

- Scar outcome is highly dependent on genetics and race

- Worst scars:
  - Those with a history or with relatives with a history of hypertrophic scarring
    - Incidence in general population is 1.5-4.5%
  - Those with increased pigment – African Americans, Hispanics, Asians
    - Incidence in these groups is 4.5-16%
  - Following surgery, incidence is 40-70%

(A blister, 2003; Bombaro 2003; Deitch, 1983; Esselman, 2006; Gauglitz, 2011)

Skin Grafting

- Generally performed when an otherwise healthy (non-infected) wound would take longer than 3 weeks to heal on its own
- The only biologically acceptable permanent coverage for a wound of this magnitude is a patient’s OWN skin
Sheet Grafting

Meshed Grafting

Graft taken from patient's healthy skin

Skin is meshed to cover a large wound
Active Hypertrophic Scarring

- Identified by changes in four characteristics of the skin:
  - Vascularity (increases; may be red, pink, purple)
  - Height (increases; thick)
  - Pliability (decreases; firm)
  - Pigmentation (can either decrease or increase; may be hypo or hyper)

Hypertrophic Scarring

[Images of scarring]
Keloid scarring

- Although hypertrophic scars are often referred to as Keloids, this is incorrect
- Keloids are scars that grow beyond the border of the initial wound boundary
- It is a genetic condition with generally poor outcomes and minimal treatment options

So, why does this matter?

- Uncontrolled hypertrophic scarring has both physical and affective repercussions on a child.
- The scar will contract until it meets an equal and opposite force.
- Scar tissue is estimated to have 12 times the contractile strength of normal skin, which is clearly strong enough to pull features and joints out of place.
Functional problems

- If a scar crosses a joint, it can limit range of motion and cause functional deficits.

Contractures due to uncontrolled scar

Shriners Hospital, 2000
Psychosocial problems

• There are several psychosocial repercussions associated with visible, abnormal scarring (Spuibroek et al., 2011)

• The importance of developing a healthy body image for successful participation in childhood occupations of cannot be underestimated (Fauerbach et al., 2000)

Hidden scars

• Scars impact social and emotional functioning even if they are not visible to others
Treatment

• Best available evidence at this time supports use of the combination of manual massage, early and aggressive range of motion, positioning during periods of non-activity, and pressure via conformed wrappings or custom garments and inserts

(Berman, 1998; Berman 2008; Bloemen, 2009; Davoodi, 2008; Esselman, 2006; Gauglitz, 2011; Latenser, 2002; Mustoe, 2002; Niessen, 1999; Ogawa, 2009; Robson, 1992; Staley, 1997; Sharp, 2014)

In other words…

• Best treatment for hypertrophic scarring at this time comes from
  o Prophylaxis: Preventing scars from becoming severe with early conservative treatment (versus later surgical revision)
  o Manual pressure from massage and pressure therapy
  o Maintenance of range of motion through stretch and activity
Massage

• The scar is constantly trying to contract → massage physically counteracts the contractile forces
• Pressure is applied with fingers, lubricated by alcohol-free massage cream
• Frequency: 2-3x/day, 5-10 minutes per area
• Duration: Until the scar matures; defined by being pale, soft, pliable or stops responding to treatment
  (Field, 1998; Roh, 2007; Roques, 2002)

Stretching and activity

• Generally acceptable to resume normal activity 5-10 days after a wound is sustained or a graft is placed → **defer to the physician for full orders**
• Monitor for range of motion deficits and consult with scar specialist, if range is not regained with normal activity within 1-2 weeks

(Berman, 1998; Berman 2008; Bloemen, 2009; Davoodi, 2008; Esselman, 2006; Gauglitz, 2011; Latenser, 2002; Mustoe, 2002; Niessen, 1999; Ogawa, 2009; Robson, 1992; Staley, 1997)
Range of Motion

- Passive range of motion should be completed starting 5-7 days following injury to full range (unless underlying structures are damaged)
- Frequency: 2-3x/day
- Duration: Hold terminal range 1-2 minutes; perform until full active range is easily achieved daily
- Amount of force needed for stretch is significantly more than most diagnoses (Flowers & LaStayo, 2012)

Treatment: Splinting

- For scars crossing a joint
- If active range is limited and passive range cannot be achieved within 1-2 minutes, night splinting should be initiated
- The joint should be splinted in opposition to the scar contracture
- Progress to 24-hour splinting if night splinting does not work
- Advanced scar contractures should be treated with serial casting
Treatment: Therapeutic Activity

- Follow all passive stretches with
  - Active range of motion
    - Repetitions
    - Track maximal range over time with landmarks (reaching a sticker on a wall and moving it higher)
  - Functional skills
    - For example, passive fisting should be followed with activities which require power grasp, like carrying a basket or holding on to the monkey bars
    - Elbow extension should be followed with activities that require extended reaching, like for a ball

Pressure Therapy

[Images of children and medical supplies]
Effect of pressure on a cellular level

Krötzsch-Gómez, et al., 1998; Nature.com

Why does therapy work?
The Biomechanics of Skin

(Dewey, Richard, & Parry, 2011)
Stress-Strain/Yield/Break

Hysteresis Loop

For collagen
Stress-Strain... Hysteresis...
ELONGATION over TIME!

(successive increase in tissue elongation with repeated stretching to the same amount of terminal force)

(Dewey, Richard, & Parry, 2011)

• Shoulder graft

Post-op 3 months
Post-op 3 weeks
Post-op 1 year

Shriners Hospital, 2000
Neck graft post-op 3 weeks, 3 months, 1 year

Thigh donor site, post-op 5 days, 1 month, 1 year
Pressure Garments

• Bioconcepts: http://www.bio-con.com/
• Jobst: http://www.jobst-usa.com/
• Juzo: http://www.juzousa.com/
• Medi: http://mediusa.com/compression-products/
• Torbot: http://www.jobskingarments.com/

• Face masks:
  o http://www.hangerclinic.com/bracing-support/burn-masks/Pages/default.aspx
  o http://www.totalcontact.com/

Treatment: Pressure therapy

• Start simple and progress as needed
• If scars don’t respond, that’s an indication that increased pressure is needed
• Coban
• Ace
• Tubigrip
• Custom garment or appliance
Treatment: Inserts

- To increase pressure when scars are hard to reach or are not responding, add inserts under the wrapping
- Start with the simplest and change as needed
- Inserts should be cut to slightly larger than the size of the scar

- Velfoam
- Hydrogel (Elastogel)
- Silicone gel sheet
- 50/50 putty or silicone elastomer

Assessment/Outcome Measures

- Most easily completed with the Vancouver Scar Scale (VSS), which measures changes in the 4 main scar characteristics over time - pigmentation, vascularity, pliability, and height. (Baryza & Baryza, 1995).
- This scale has been shown to be a reliable and useful for objective assessment of hypertrophic scars and is recommended in a systematic review (Brusselaers et al., 2010; Forbes-Duchart et al., 2007; Powers et al., 1999; Tyack, et al., 2012).
Assessment: POSAS

- The Patient and Observer Scar Assessment Scale is a reliable and valid tool for measuring patient/family perception of the scar over time [Draaijers, et al., 2004].
- The POSAS is recommended for this type of use in a systematic review [Fyack, et al., 2012].
Assessment: POSAS

<table>
<thead>
<tr>
<th>Observation</th>
<th>Score</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion</td>
<td>1-10</td>
<td>10</td>
</tr>
<tr>
<td>Inflammation</td>
<td>1-10</td>
<td>10</td>
</tr>
<tr>
<td>Pigmentation</td>
<td>1-5</td>
<td>5</td>
</tr>
<tr>
<td>Thickness</td>
<td>1-10</td>
<td>10</td>
</tr>
<tr>
<td>Relief</td>
<td>1-5</td>
<td>5</td>
</tr>
<tr>
<td>Pliability</td>
<td>1-5</td>
<td>5</td>
</tr>
</tbody>
</table>

Total score: Observer Scar Scale:

Assessment: Serial photographs

- Photographs taken at every visit are also helpful in helping patients/families and clinicians become aware of change over time.
- To facilitate consistency and control, take the photos with the same camera in the same location with the same lighting, every time.
  - (Staley, 1997; Tyack, et al., 2012)
LEGEND

• Using the “LEGEND” (let evidence guide every new decision) tools...

<table>
<thead>
<tr>
<th>P (population)</th>
<th>Among individuals with or at risk for developing active hypertrophic scars</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (intervention)</td>
<td>Does treatment with pressure therapy</td>
</tr>
<tr>
<td>C (comparison)</td>
<td></td>
</tr>
<tr>
<td>O (outcome)</td>
<td>Improve aesthetic and functional outcomes?</td>
</tr>
</tbody>
</table>

• cincinnatichildrens.org/evidence

Literature Search

• **Dates:** January 1950-February 2014

• **Databases:** MEDLINE, CINAHL, Cochrane Database for Systematic Reviews (CDSR), Burntherapist.com, Cochrane Libraries, Ebsco, Google Scholar, OT Seeker, Ovid, MedLine, PEDro.org, Pubmed.gov, Pubmed Clinical Queries, and hand search of relevant articles through use of reference lists.

• **Search terms:** scar, hypertroph*, pressure therapy, compression therapy, pressure garment, burn, scald, trauma as well as MeSH terms cicatrix and hypertrophic.
Results

- 45 articles found
- 28 pertinent to the PICO
  - Level 1: 1
  - Level 2: 7
  - Level 3: 3
  - Level 4: 2
  - Level 5: 15

Levels of Evidence
Scar Characteristics

- Vascularity (redness)
- Pigmentation (brown hues)
- Thickness (height above normal skin)
- Pliability (flexibility = range of motion = function)
- Best measured by the Vancouver Scar Scale (Baryza & Baryza, 1995)

<table>
<thead>
<tr>
<th>Pliability</th>
<th>0</th>
<th>Normal</th>
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<tr>
<td></td>
<td>1</td>
<td>Supple</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Yielding</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Firms</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Adherent</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Height</th>
<th>0</th>
<th>Normal</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1-2 mm</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3-4 mm</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>5-6 mm</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>&gt;6 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vascularity</th>
<th>0</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Pink</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Purple</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pigmentation</th>
<th>0</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Slightly</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Moderately</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Severely</td>
</tr>
</tbody>
</table>

woundmaster.blogspot.com


**Highlights from literature**

**Table:**

<table>
<thead>
<tr>
<th>Study, Year</th>
<th>Description of Results</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latenser, 2002</td>
<td>No difference in arterial pulsations or skin vascularity, pigmentation and pliability. Subjects were satisfied with the intervention.</td>
<td>Optimal pressure to apply skin traction is ~30 mmHg. Skilled persons should perform application only.</td>
</tr>
<tr>
<td>Berman, 1998</td>
<td>Early application of pressure leads to faster scar regression and decreased wear time required.</td>
<td>Pressure leads to improved function in terms of ROM.</td>
</tr>
<tr>
<td>Kinser, 2010</td>
<td>Pressure group resulted in significantly larger decreases in thickness as compared to control, no significant difference for vascularity, pigmentation and pliability. Subjects were satisfied with the intervention.</td>
<td>PGT decreases scar thickness.</td>
</tr>
<tr>
<td>van den Kerkhof, 2005</td>
<td>Normal compression garments (20 mmHg) provided significantly improved thickness as compared to the low pressure garments.</td>
<td>Pressure therapy &gt;30mmHg significantly decreases scar thickness and accelerates scar maturation.*</td>
</tr>
<tr>
<td>Seltzer, 1998</td>
<td>Compression resulted in no significant difference in arterial pulsations or skin temperature. Optimal pressure resulted with skilled application.</td>
<td>Optimal pressure to apply skin traction is ~30 mmHg. Skilled persons should perform application only.</td>
</tr>
<tr>
<td>Skelton, 1995</td>
<td>No difference in arterial pulsations or skin vascularity, pigmentation and pliability.</td>
<td>Significant decrease in arterial pulsations or skin vascularity, pigmentation and pliability.</td>
</tr>
</tbody>
</table>
**Highlights from literature**

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>N/A</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauglitz, 2011</td>
<td>[5a]</td>
<td>N/A</td>
<td>Excessive scars form as a result of aberrations of physiologic wound healing and may develop following any injury to the deep dermis including burn, lacerations, abrasions, surgery, piercings, and vaccinations. Good differential diagnosis for HSc vs. Keloid. Recommends pressure at 15-40mmHg Q23 &gt;/=6 months of scar healing for prophylaxis. Prophylaxis is more effective than tx for HSc. “Both clinicians and patients are highly concerned with minimizing scar appearance and value as clinically meaningful even small improvements in scarring.” It’s a difficult issue – we know little about the pathology of scar formation and remediation, other than studies re: extensive use, but not well-designed clinical studies.</td>
</tr>
<tr>
<td>Mustoe, 2002</td>
<td>[5a]</td>
<td>N/A</td>
<td>p. 561 “the most successful treatment of a HSc is achieved when the scar is immature but the overlying epithelium is intact” – somewhere between prevention and tx! A treatment algorithm is proposed with pressure therapy utilized as both initial and secondary management tools</td>
</tr>
<tr>
<td>Niessen, 1999</td>
<td>[5a]</td>
<td>N/A</td>
<td>Garments need to be worn until scars are mature. Early release of the garments tends to be followed by rebound hypertrophy</td>
</tr>
<tr>
<td>Ogawa, 2010</td>
<td>[5a]</td>
<td>N/A</td>
<td>Proposed treatment algorithm recommends pressure as part of non-surgical multimodal therapy. Pressure therapy is recommended following surgical revision</td>
</tr>
<tr>
<td>Robson, 1992</td>
<td>[5b]</td>
<td>N/A</td>
<td>Pressure is an effective adjunct in the control of scar maturation, important in prevention of deformity, also states importance of pressure following each surgical reconstruction. “PGT should be applied to prevent further shortening of collagen”</td>
</tr>
<tr>
<td>Staley, 1997</td>
<td>[5b]</td>
<td>N/A</td>
<td>Supports general algorithm for pressure recommendations and dosage at 24-25 mmHg. Recommends applying garments as soon as skin can tolerate shear force of garment.</td>
</tr>
</tbody>
</table>

**Recommendations**

- 1. It is strongly recommended that pressure therapy is utilized to decrease hypertrophic scar height. (Anzarut 2009 [1b], Candy 2010 [2a], Engrav 2010 [2a], Van den Kerckhove 2005 [2a], Li-Tsang 2010 [2b], Garcia, Velasco 1978 [2b], Chang 2001 [4a], Basser 2009 [5a], German 1998 [5c], German 2008 [5c]).
Recommendations

2. It is recommended that pressure therapy is utilized:
   - As soon as the healing skin can tolerate the pressure and/or shear force generated by the intervention, in order to promote optimal scar outcome (Kloti 1982 [3a], Kloti 1979 [3b], Gauglitz 2011 [5a], Ogawa 2010 [5a], Esselman 2006 [5a], Latenser 2002 [5a], Mustoe 2002 [5a], Davoodi 2008 [5b], Staley 1997 [5a], Robson 1992 [5b]).
   - As a prophylactic measure for wounds that take longer than 14-21 days to heal, as well as all skin grafts, as these wounds are more likely to develop hypertrophic scars than those which heal more quickly (Deitch 1983 [4a], Bloemen 2009 [5a], Davoodi 2008 [5b], Staley 1997 [5a]).
   - To decrease hypertrophic scar erythema (Candy 2010 [2a], Garcia-Velasco 1978 [2b], Cheng 2001 [4a]).
   - For 23 hours per day for approximately 12 months, or until scar maturation is achieved (Haq 1990 [3b], Bloemen 2009 [5a], Davoodi 2008 [5b], Niessen 1999 [5a], Berman 2008 [5b], Davoodi 2008 [5b]).

Recommendations

3. It is recommended that pressure therapy appliances are:
   - Fit to achieve compression force near capillary pressure (20-30mmHg) to promote optimal scar outcome (Candy 2010 [2a], Engrav 2010 [2a], Van der Kerkhove 2005 [2a], Yamaguchi 1986 [2a], Garcia-Velasco 1978 [2b], Bloemen 2009 [5a], Latenser 2002 [5a], Berman 1998 [5a], Davoodi 2008 [5b], Staley 1997 [5a]).
   - Replaced every 2-3 months in order to maintain the pressure needed to achieve optimal outcome (Candy 2010 [2a], Garcia-Velasco 1978 [2b], Esselman 2006 [5a]). Alternatively, pressure appliances can be modified by re-sewing or inserts can be added to assure pressure of 20-30mmHg (Candy 2010 [2a], Davoodi 2008 [5b]).
Recommendations

4. It is recommended that pressure wrappings or appliances are applied or fit by skilled individuals in order to assure optimal pressure and prevent tissue damage (Yamaguchi 1986 [2a]).

5. It is recommended that pressure therapy is not utilized:
   - For decreasing abnormal scar pigmentation (Anzarut 2009 [1b], Candy 2010 [2a], Engrav 2010 [2a], Van den Kerckhove 2005 [2a]).
   - To hasten the rate or time to scar maturation (Chang 1995 [2b]).
Recommendations

- 6. There is insufficient evidence and a lack of consensus to make a recommendation for the use of pressure therapy to increase scar pliability or resulting joint range of motion (Engrav 2010 [2a], Li-Tsong 2010 [2b], Garcia-Velasco 1978 [2c], Kolod 1983 [3a], Uang 1990 [3a], Gauglitz 2011 [5a], Bloemen 2009 [5a], Berman 2008 [5b]).

Knowledge dissemination

- Education must be provided to
  - OT/PT staff
  - Patients and caregivers
  - Referral sources

- Education must be “palatable”
- Information must be applicable and useful
Scar Risk Assessment

Who to treat?

- **Prophylactic Management**
  - **Low Risk**
    - Wound healing < 10 days
    - No joint involvement
    - Not bothersome to patient/family

- **Increased Monitoring**
  - Wound healing 10-21 days
  - No joint involvement
  - Aesthetic concerns in < 3 categories (thickness, redness, pliability, pigmentation)
  - Minimally bothersome to patient/family

- **Conservative Treatment**
  - Skin graft or donor site
  - Wound healing 21+ days
  - Joint involvement
  - Aesthetic concerns in 3+ categories
  - Bothersome to patient/family

Treatment algorithms

**Algorithm for the Treatment of Hypertrophic Scar - Note:**

1. Is the patient a candidate for a minimally invasive procedure?
2. Is the scar high risk or evident scar?
3. Is the scar low risk or not evident?
4. Is the scar not bothersome to patient/family?
5. Is the scar not bothersome to patient/family?
6. Is the scar not bothersome to patient/family?
7. Is the scar not bothersome to patient/family?
8. Is the scar not bothersome to patient/family?
9. Is the scar not bothersome to patient/family?
10. Is the scar not bothersome to patient/family?
**Recommendations Simplified**

Recommendations for use of pressure therapy

<table>
<thead>
<tr>
<th>Desired Outcome</th>
<th>Strongly Recommended</th>
<th>Recommended</th>
<th>Insufficient evidence and lack of consensus</th>
<th>Not Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased height</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased erythema</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased pliability</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased range of motion</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased pigmentation</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Decreased time to maturation</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Recommendations Simplified**

Recommendations for Pressure Therapy Implementation

<table>
<thead>
<tr>
<th>Target scars</th>
<th>Skin grafts, wounds requiring 14-21+ days to heal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation</td>
<td>As soon as healing wound can tolerate pressure and shear</td>
</tr>
<tr>
<td>Frequency</td>
<td>23 hours/day</td>
</tr>
<tr>
<td>Duration</td>
<td>Approximately 12 months with garment replacement every 2-3 months</td>
</tr>
<tr>
<td>Dosage</td>
<td>20-30 mmHg, ensured by skilled fitting and regular monitoring</td>
</tr>
</tbody>
</table>
Treatment algorithms

Treatment algorithms
OT/PT

• Presentation at “Blitz Day”
  
  **See scars early**

  **Conservatively treat**

  **Assess regularly**

  **Refer to Patti as needed**

• Formation of Scar Management Team for difficult cases

---

**Knowing Note – “Scar Prevention”**

---

**Scar Prevention**

- See scars early
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- Assess regularly
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**Growing Through Knowing**

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**Growing Through Knowing**

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**Scar Prevention**

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- Assess regularly
- Refer to Patti as needed
- Formation of Scar Management Team for difficult cases

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**Knowing Note – “Scar Prevention”**

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Knowing Note – “Pressure Therapy”

Referral sources

• The 4 P's
  o Presenting
  o Publishing
  o Pleading
  o Prodding

Continued
Clinical Scenario

• A patient is seen in sports-ortho PT 4 months following surgical intervention to the leg, including compartment syndrome release with grafting.
• All surgical precautions have been lifted and PT intervention is focused on strengthening and return to sport at this time.
• Small linear scars are noted along graft sites, but the thigh donor site is scarring heavily.

Clinical Scenario

• Donor site with hypertrophic scarring
Clinical Scenario

• Assessment: The scar is within 3-6 months post injury, so it is treatable.
• Evaluation VSS:
  o Pigmentation: 0=Normal
  o Vascularity: 2=Red, significant increase
  o Pliability: 3=Firm
  o Height: 2=Between 2-5mm
  o Total score: 7
• Evaluation POSAS:
  o Has the scar been painful in the past few weeks?  9
  o Has the scar been itching in the past few weeks?  8
  o Is the scar color different from the color of your normal skin at present?  10
  o Is the stiffness of the scar different from your normal skin at present?  10
  o Is the thickness of the scar different from your normal skin at present?  10
  o Is the scar more irregular than your normal skin at present?  10
  o What is your overall opinion of the scar compared to normal skin?  10
  o Average: 9.6
  o “I hate it. It’s gross. I don’t even want to look at it. I never want to touch it.”

Clinical Scenario

• Treatment:
  o Scar massage (used Knowing Note)
  o Custom pressure shorts, 20-30mmHg (used Knowing Note)
  o Silicone insert to increase pressure due to minimal change in scar thickness
  o Garments replaced every 2 months, requiring 2 sets
  o Scar intervention was discontinued after 7 months, or 11 months post-injury
Clinical Scenario

• Outcome VSS:
  o Pigmentation: 0=Normal
  o Vascularity: 0=Normal
  o Pliability: 1=Supple
  o Height: 2=Between 2-5mm
  o Total score: 3 (down from 7 at initial visit)

• Outcome POSAS:
  o Has the scar been painful in the past few weeks? 1
  o Has the scar been itching in the past few weeks? 5
  o Is the scar color different from the color of your normal skin at present? 2
  o Is the stiffness of the scar different from your normal skin at present? 3
  o Is the thickness of the scar different from your normal skin at present? 3
  o Is the scar more irregular than your normal skin at present? 3
  o What is your overall opinion of the scar compared to normal skin? 2
  o Average: 2.7 (down from 9.6)
  o “It doesn’t bother me much. I can’t believe it was such a big deal!”

Results 😊

12/5/2011

1/28/2013

CONTINUED
New Referrals

Emerging practice

Emerging Practice

INPATIENT
CLINIC, MD &
NURSING,
sometimes
OT/PT

OUTPATIENT
NURSING &
OT/PT

ABNORMAL
SCARRING

DERMATOLOGY
PLASTIC SURGERY

MD

TRAUMA

SURGERY

INPATIENT

OUTPATIENT

MD

SCAR
SPECIALIST
OR TEAM

Emerging Practice
- Simple written educational materials provided to patient or family
“THE ART AND SCIENCE OF ASKING QUESTIONS IS THE SOURCE OF ALL KNOWLEDGE.”

THOMAS BERGER

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Thank You