SCARS ARE DIFFICULT TO TREAT. IS THERE ANYTHING NEW??

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SURGICAL TREATMENT OF KELOID & PAINFUL HYPERTROPHIC SCARS

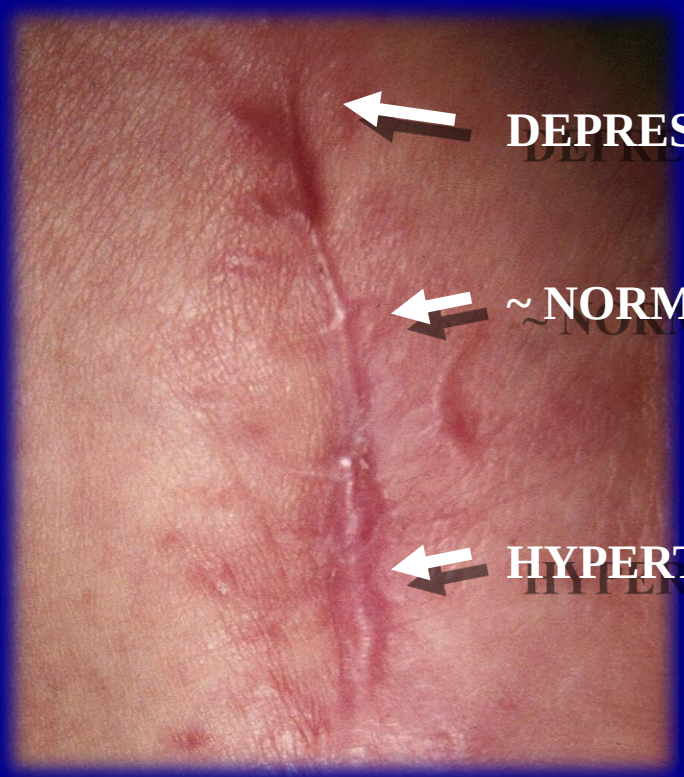
Normal Scar

Normal Scar

Hypertrophic Scar

Keloidal Scar

SHALLOW, TIGHT or SUTURES LEFT IN TOO LONG

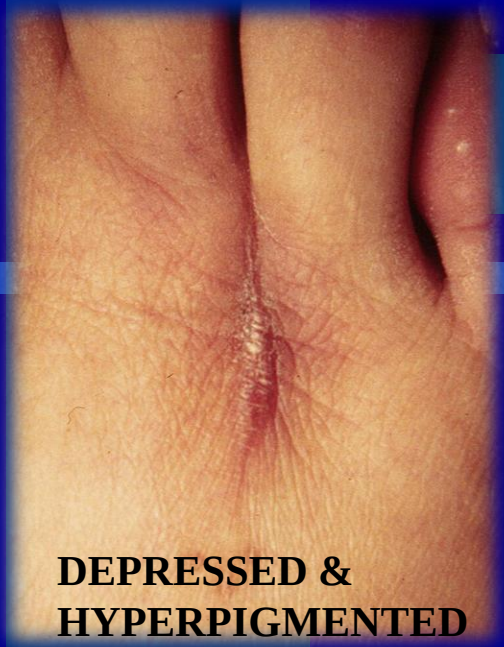


DEPRESSED

~ NORMAL

HYPERTROPHIC

- Field LM. Suture marks: factors of causation and prevention. Dermatol Surg. 32(11)425-426, 2006.
- Kudur MH, et al. Sutures and suturing techniques in skin closure. Ind J Dermatol Venereol Leprol, 75(4):425-434, 2009.
- Seki S, et al. The surgeon's technical skill in suturing: an analysis of the actual suture tracks. Surg Today. 23(9):800-806, 1993.



DEPRESSED & HYPERPIGMENTED

HYPERPIGMENTED KELOID

HYPOPIGMENTED

ELEVATED w/ INCLUSION CYST

IRREGULAR CLOSURE DEFECT

Types of Scars

OTHER DIFFICULT SCARS

Keloid, Hypertrophic, Burn

Treatment Options

- Leave the Scar Alone
- Conservative Medical Management
  - Scar manipulation and massage
  - Physical modalities
  - Cica-Care® scar treatment
  - Injections
- Surgical Treatment

SCAR MANAGEMENT

"A disgruntled patient without a surgical scar is much better off than a disgruntled patient *with* a surgical scar."

Excision Options

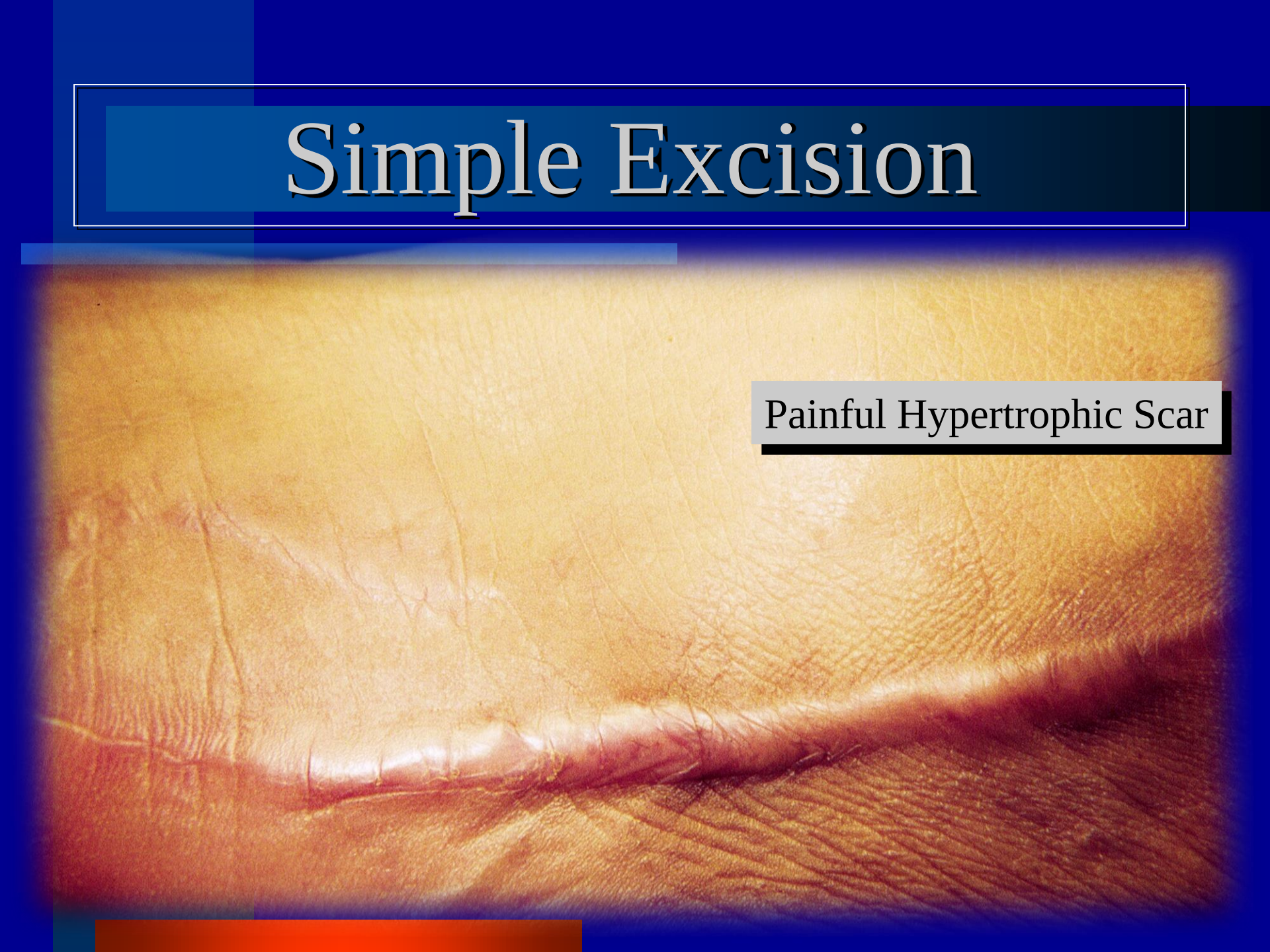
- Simple Fusiform Excision
- Simple Transfer Flap
- W-plasty Procedure
- Short Wavy Incision Method (SWIM)
- Geometric Broken Line Closure (GBLC)

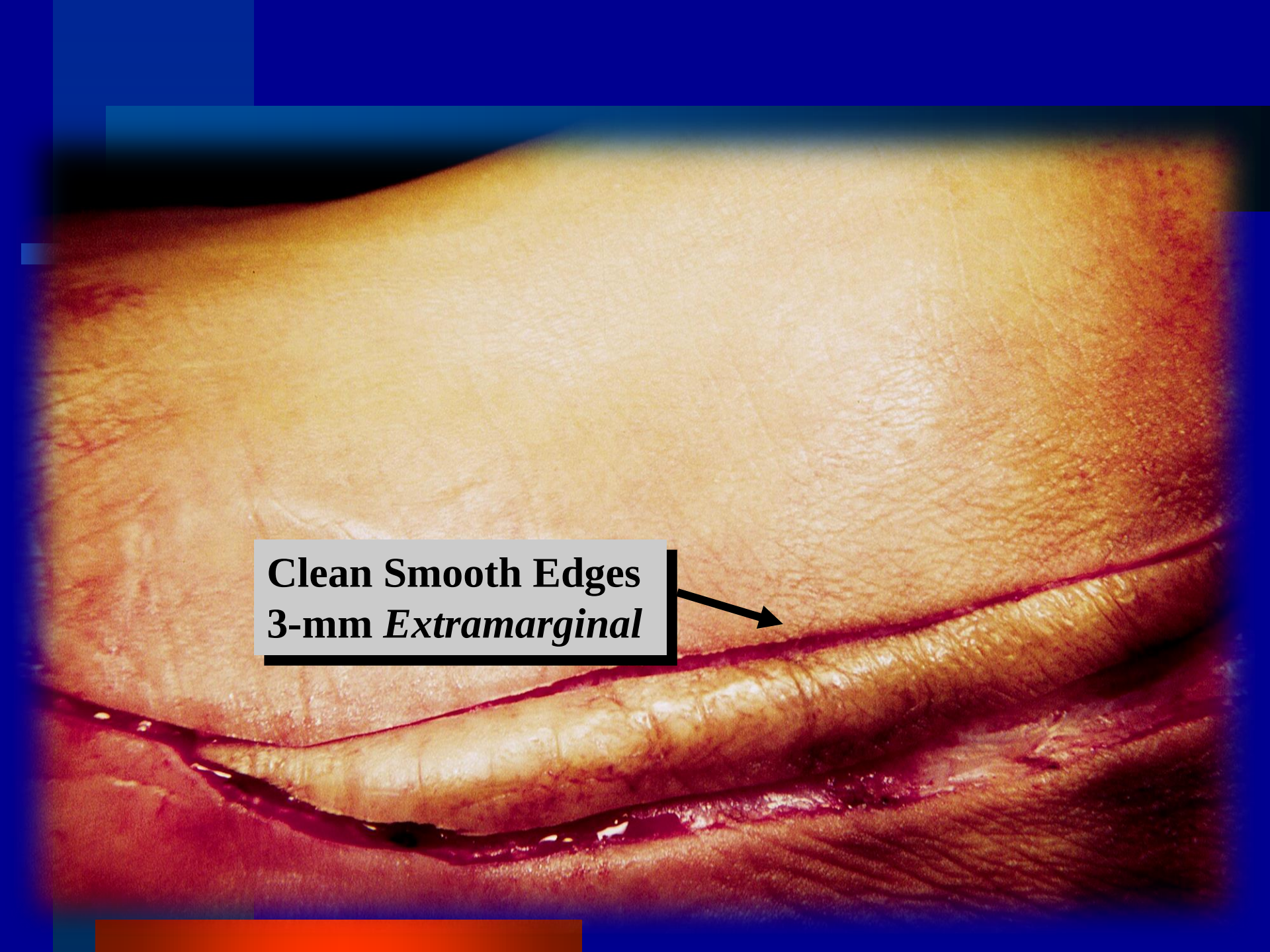
Excision Options

- **Simple Fusiform Excision CPT # 11421-6**
- Simple Transfer Flap
- W-plasty Procedure
- Short Wavy Incision Method (SWIM)
- Geometric Broken Line Closure (GBLC)

A. Excision B. SubQ Closure C. Steri - Strips D. Immediate Postoperative

Simple Excision




Clean Smooth Edges
3-mm *Extramarginal*

Suture Removal in Stages

6 weeks postoperative scar revision

Before Excision

After Excision

Dockery GL. Excisional techniques and procedures. Lower Extremity Soft Tissue & Cutaneous Plastic Surgery. Elsevier (Saunders), 2012.

HYPERTROPHIC SCARS

Shin JU, Park J, Leer JH, et al. Extramarginal excision is preferable for hypertrophic scars. Int. J. Dermatol. 53(9):1138-1144, 2014.

"3-5 mm scar margin excision (*extramarginal*) had lower recurrence rate than intramarginal or narrow excision of hypertrophic scars"

KELOID SCARS

- **Sharma BC. Keloids: a prospective study of 57 cases. Med J Zambia. 14(4):66-69, 1980.**
- **Engrav LH, et al. A comparison of intramarginal and extramarginal excision of hypertrophic burn scars. Plast Recon Surg. 81(1):40-43, 1988.**

Keloid scar removal with *intramarginal* excision followed by local hydrocortisone had lower recurrence rate than *extramarginal* excision of keloid scars alone

Topical Silicone Sheeting
May be used on new or old scars

Dockery GL, Nilson RZ: Treatment of Hypertrophic and Keloid Scars with Silicone Gel Sheeting. JFAS, 33:110-119, 1994.

Cica-Care® Scar Treatment

Apply Silicone Gel Sheeting continuously, removing for bathing or therapy. When sheet becomes worn or damaged, replace with new piece.

Cica-Care® Scar Treatment

Before Cica-Care

After Cica-Care

Cica-Care® Scar Treatment

Before Cica-Care

After Cica-Care

3 weeks of silastic gel sheeting

Cica-Care® Scar Treatment

Before Cica-Care

After Cica-Care

6 weeks of silastic gel sheeting

Cica-Care® Scar Treatment

Before Cica-Care

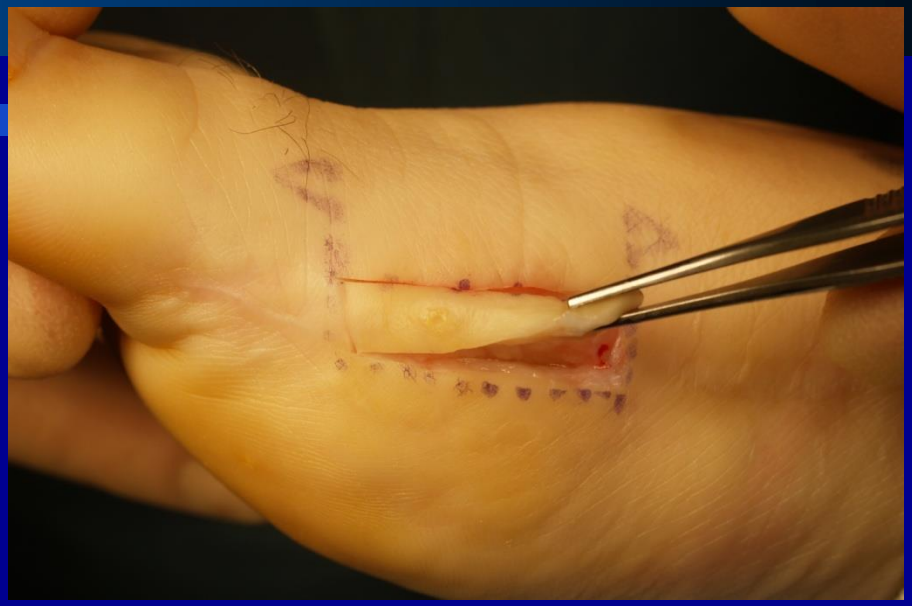
After Cica-Care

6 weeks of silastic gel sheeting

Excision Options

- ~~Simple Fusiform Excision~~
- Simple Transfer Flap
- W-plasty Procedure
- Short Wavy Incision Method (SWIM)
- Geometric Broken Line Closure (GBLC)

Simple Transfer Flap Scar Procedure: CPT #14040



3 Similar but Different Scar Excisions

- W-Plasty
- Short Wavy Incisional Method (SWIM)
- Geometric Broken Line Closure (GBLC)

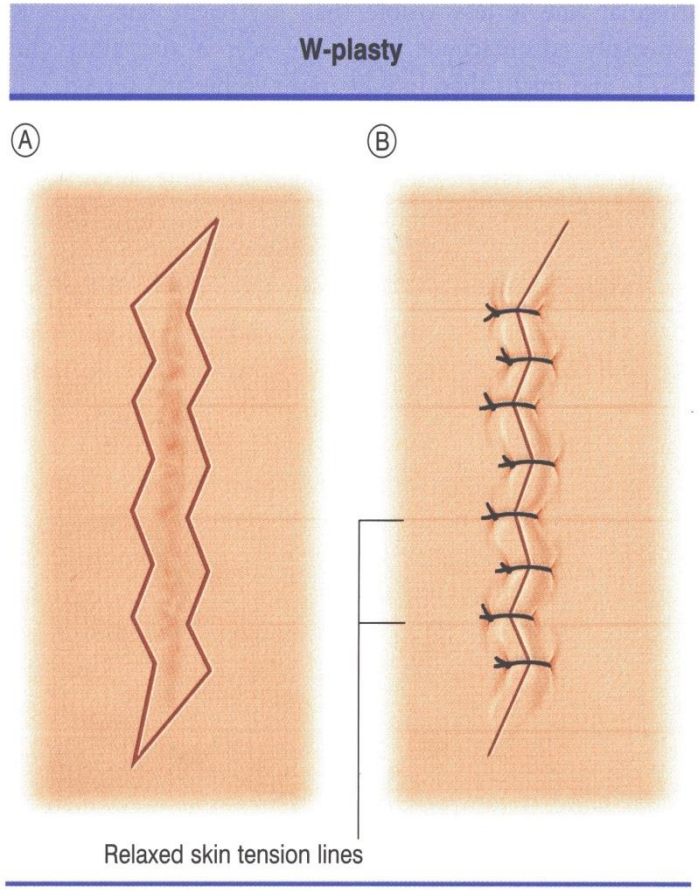
CPT #14040

Scar Revision:
Don't Leave a Straight Scar

"A Straight or Linear Scar is Much More Visible to the Eye Than a Curved or Irregular Shaped Scar"

Shockley W. Scar Revision Techniques: Z-Plasty, W-Plasty, and Geometric Broken Line Closure, Facial Plastic Surgery Clinics of North America, Volume 19, Issue 3, August 2011, Pages 455-463. https://doi.org/10.1016/j.fsc.2011.06.002

W-plasty Scar Procedure



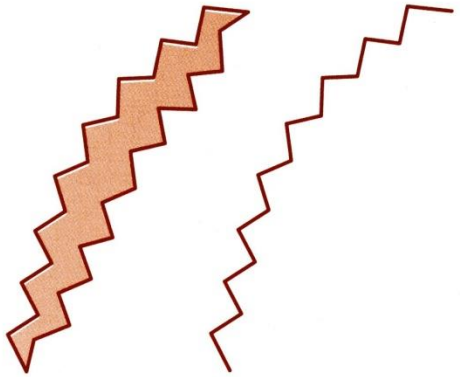


Fig. 14.32 Prevention of dog-ear deformity. At the ends of the running W-plasty the size of the triangles should be reduced to prevent dog-ear deformity.

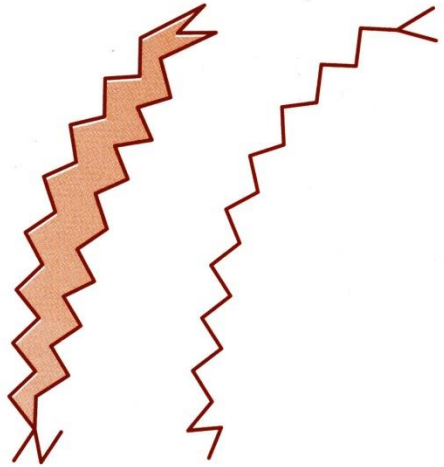


Fig. 14.33 Either an M-plasty or a Z-plasty may be performed at the end of the running W-plasty to avoid dog-ears or obtain greater extension of the closure, respectively.

Dockery GL, Crawford ME: *Lower Extremity Soft Tissue & Cutaneous Plastic Surgery*, 2nd ed, Elsevier Sciences (Saunders) 2012.

W-plasty Scar Procedure

Small Wave Incision Method (SWIM)

Hyakusoku H, et al. Small-wave incision for long keloids. Plast Reconstr Surg. 2003. 111(2):964-965.

Short Wavy Incision Method

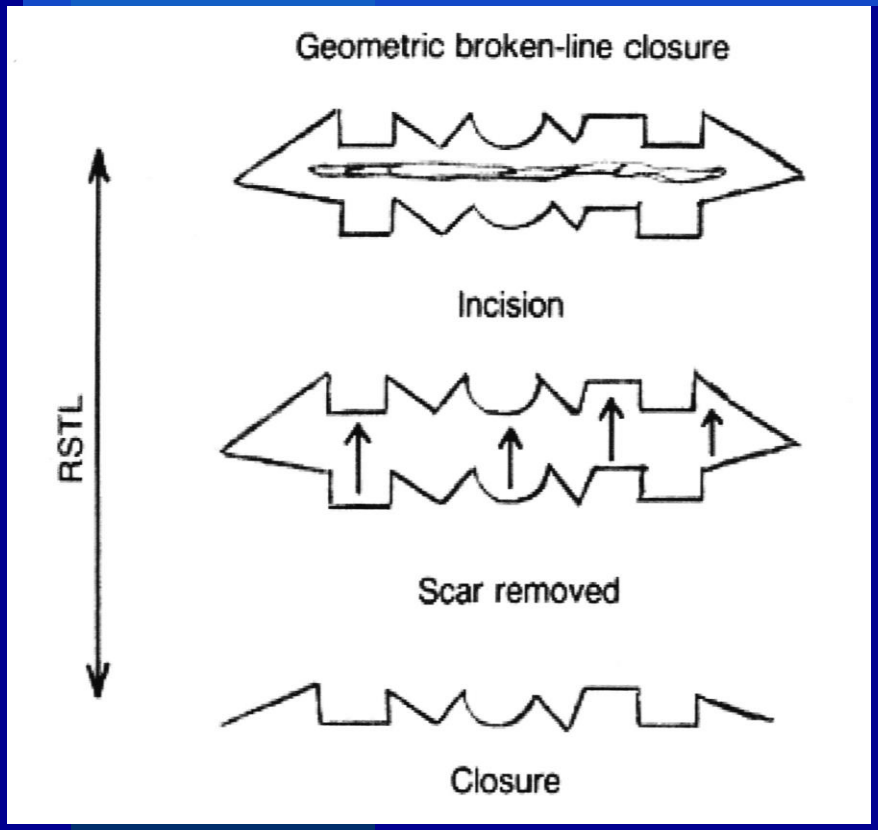
Hyakusoku H, et al. Small-wave incision for long keloids. Plast Reconstr Surg. 2003. 111(2):964-965.

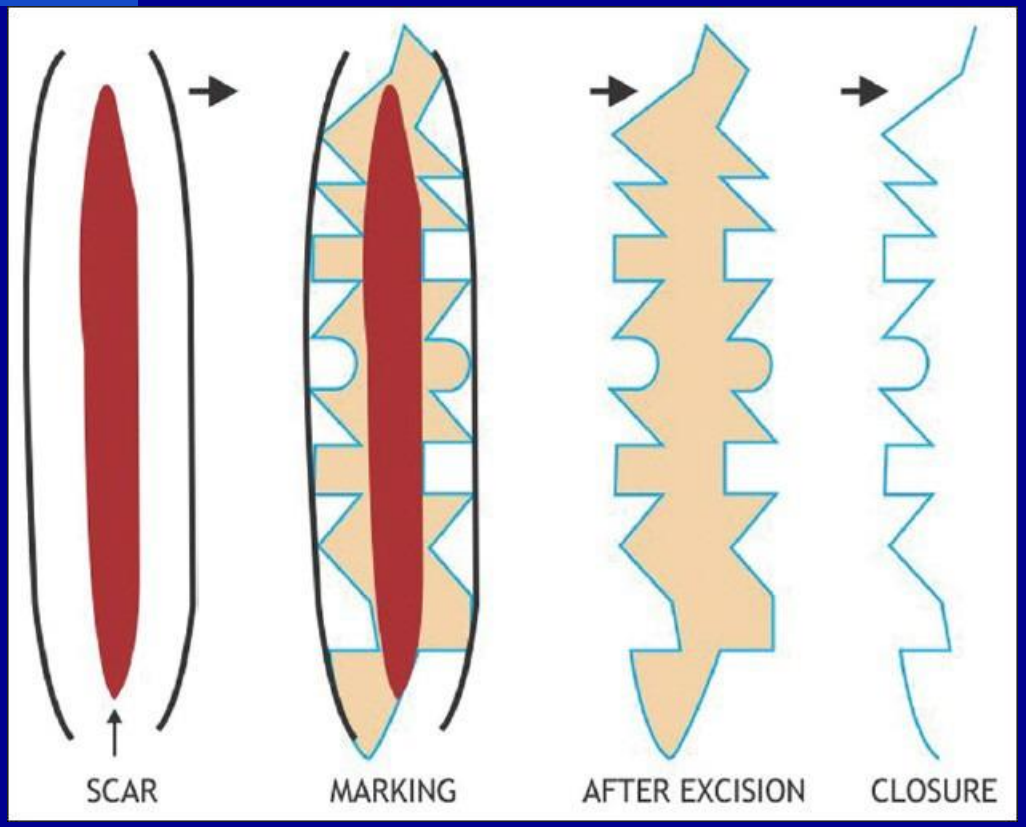
Short Wavy Incision Method

Before and After SWIM Procedure

Huang C, et al. Small-wave incision method for linear hypertrophic scar reconstruction. Aesthetic Plast Surg. 2012. 36(2):387-395.

GBLC
Geometric Broken Line Closure





Rodgers B, et al. W-plasty and geometric broken line closure. Facial Plast Surg. 2001. 17(4):239-244.

Geometric Broken Line Closure

“A Straight or Linear Scar is Much More Visible to the Eye Than a Curved or Irregular Shaped Scar”

Scar Excision with GBLC and Silastic Gel Sheeting

Linear

Irregular

Linear

Irregular

Batra RS. Surgical techniques for scar revision. Skin Therapy Lett. 2005;10:4-7.

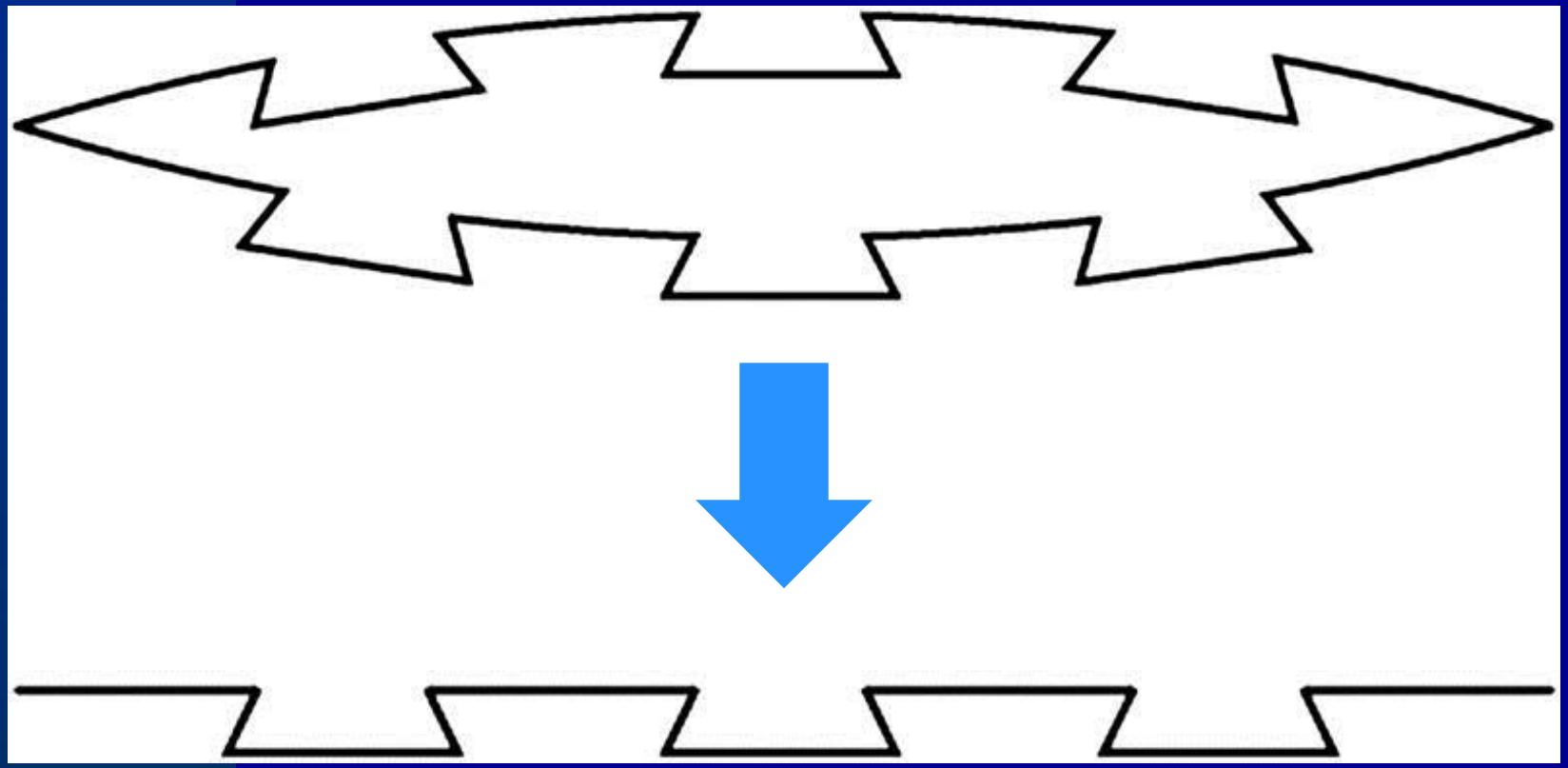
Perez-Bustillo A, et al. Surgical Principles for Achieving a Function and Cosmetically Acceptable Scar. Acta Dermosifiliogr, 104(1):17-28, 2013.

"A Straight or Linear Scar is Much More Visible to the Eye Than a Curved or Irregular Shaped Scar"

Scar Excision with GBLC and Silastic Gel Sheeting

- Dockery GL. Treatment of hypertrophic and keloid scars with Silastic Gel sheeting. J Foot Ankle Surg. 33:110–119, 1994.
- Dockery GL: Hypertrophic and Keloid Scars, J. Am. Podiatric Med. Assoc., 85:57-60, 1995.
- Puri N, Talwar A. The efficacy of Silicone Gel for treatment of hypertrophic scars and keloids. J Cutan Aesthet Surg. 2(2):104-106, 2009.

Dovetail-Plasty



Pae NS, Kim YS, Park BY. Dovetail cheiloplasty. J Korean Soc Plast Reconstr Surg. 31: 594–598, 2004.

Modified Dovetail-Plasty

Oh SJ, et al. Modified dovetail-plasty in scar revision.
J Craniofacial Surg. 25(2):485-488, 2014.

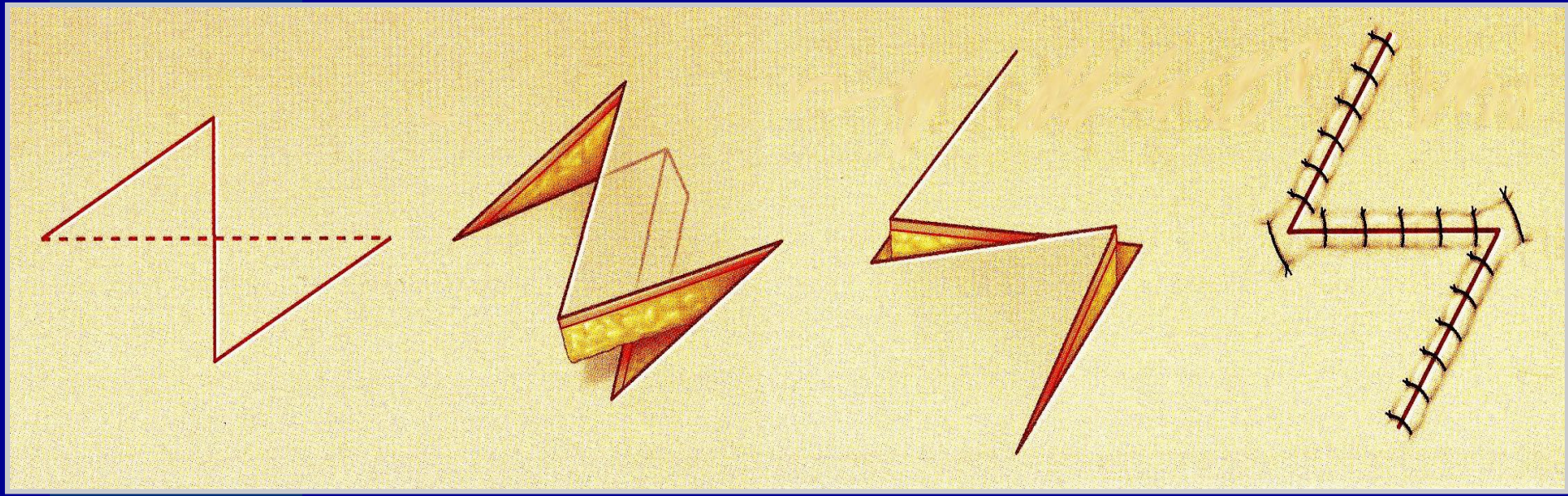
Modified Dovetail-Plasty

Oh SJ, et al. Modified dovetail-plasty in scar revision.
J Craniofacial Surg. 25(2):485-488, 2014.

Z-plasty Procedure for *Contracted* Scar

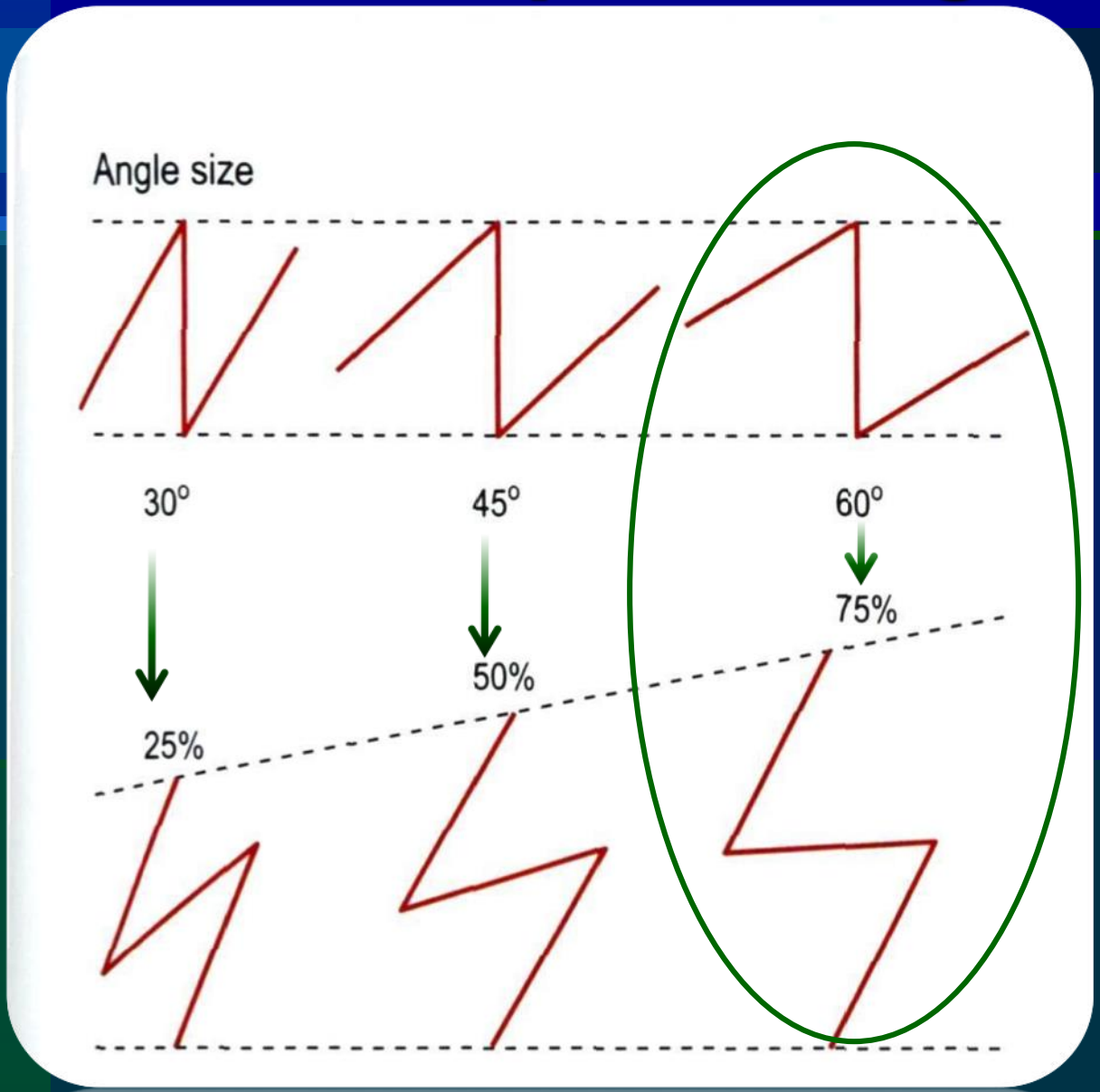
CPT #14040

Z-Plasty Flap Motion

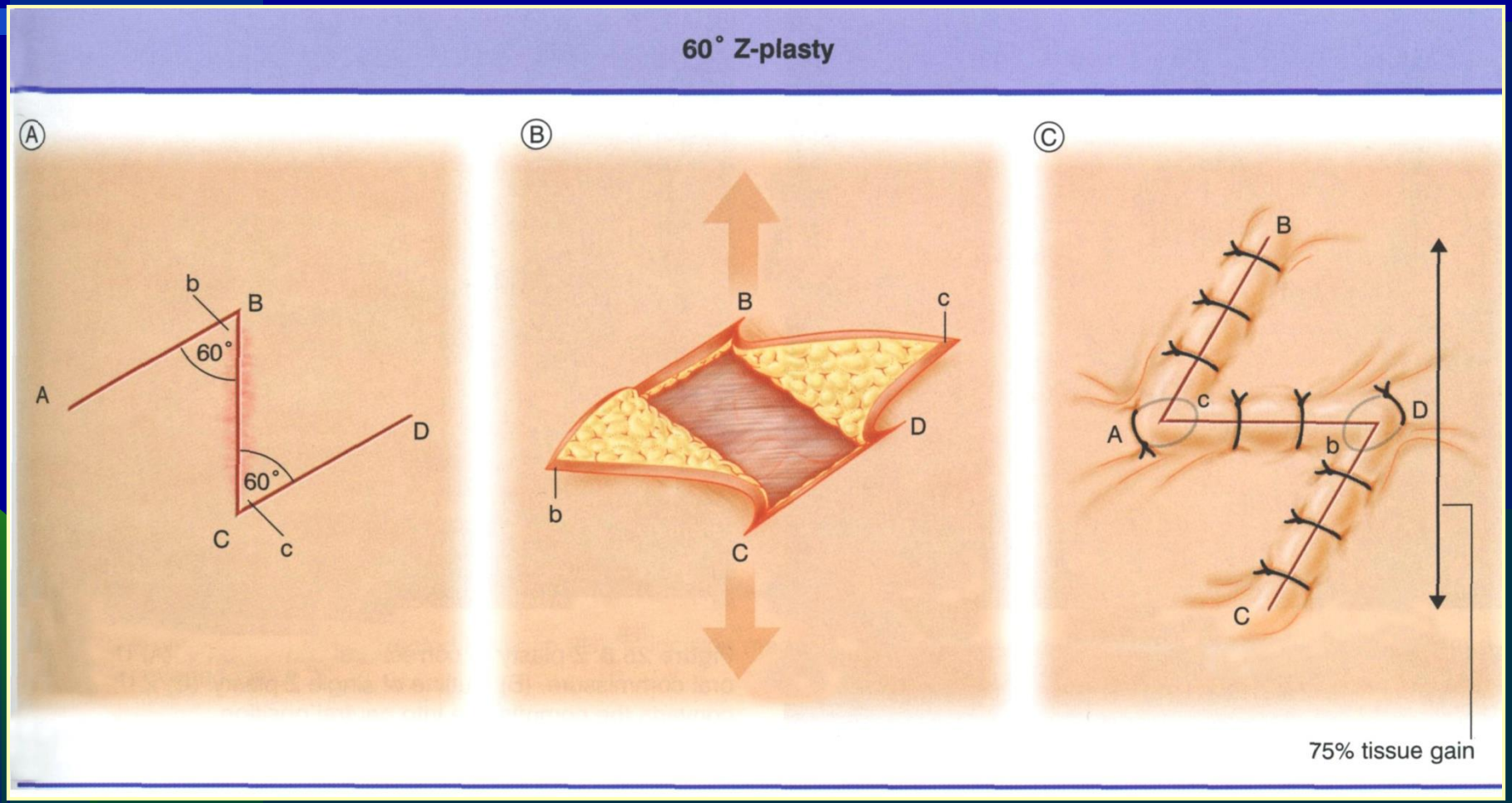


Crawford ME and Dockery GL: The Use of Z-plasty in Scar Revision and Skin Contractures of the Lower Extremity, J. Am. Podiatric Med. Assoc., 85:28-35, January, 1995.

60° is the Optimal Angle



60˚ Angle gives 75% Length



Painful contracted scar and mallet toe deformity

Postoperative scar excision with Z-plasty and toe correction

4 weeks postoperative: start scar care

Z Plasty Modification

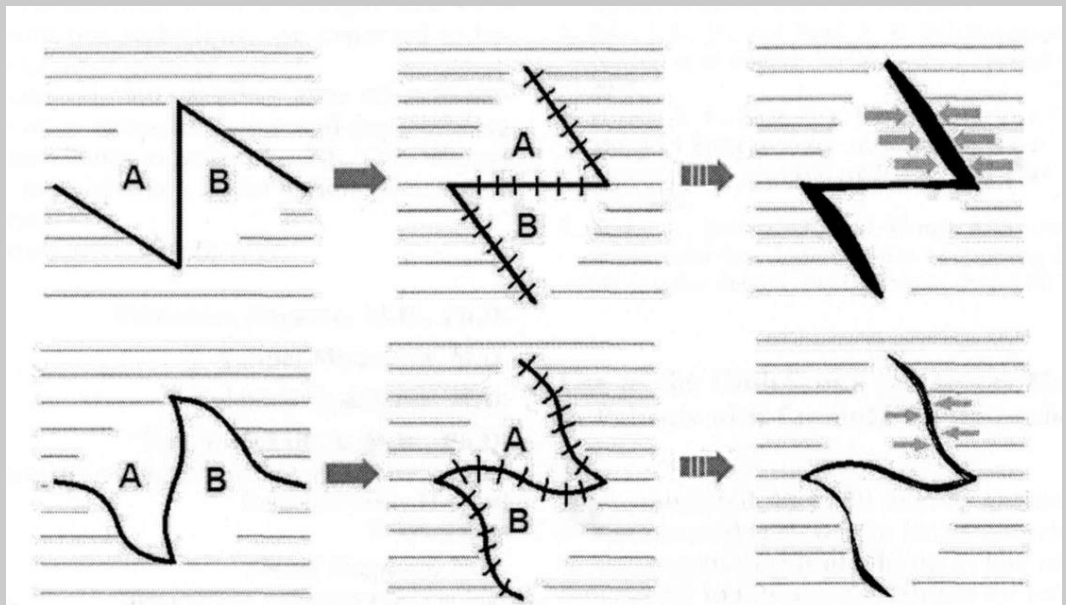


Fig. 1. (*Above*) Conventional Z-plasty and postoperative change of the scar (*above, left* and *center*). In conventional Z-plasty, a scar perpendicular to the relaxed skin tension line (*thin parallel lines*) is realigned parallel to the line. (*Above, right*) Thus, we can expect the central limb to become inconspicuous. However, since the lateral limbs form a steep angle against the relaxed skin tension line, they tend to become hypertrophic over time. (*Below*) In our technique, each limb of the flap forms a lazy S shape, so the lateral limbs are less likely to become hypertrophic postoperatively.

Nagasao T, et al. A New Modification of Z-Plasty, Plast Recon Surg . 2008;121(4):236-237.

POSTOPERATIVE SCAR CARE

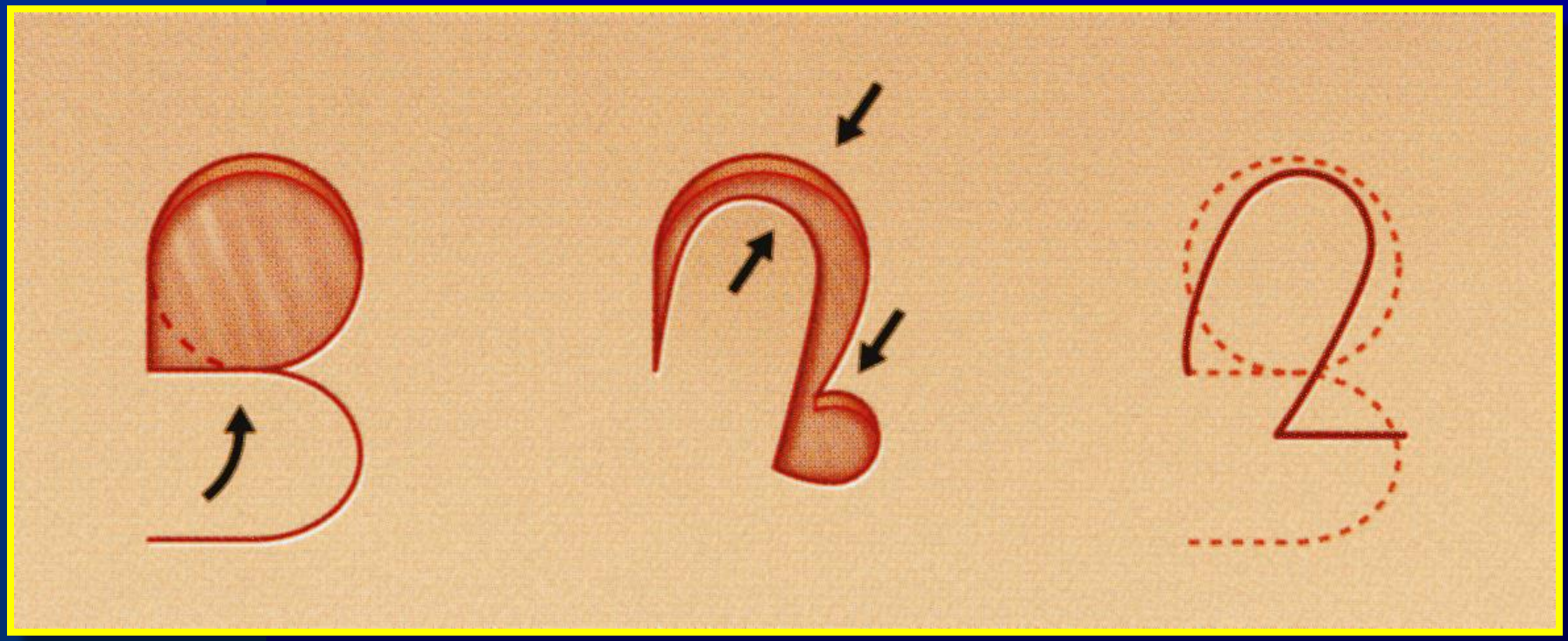
Before Scar Treatment

After Scar Treatment

Scars and Suture Tracks Can be Treated Effectively with Silicone Sheeting Gel

Dockery GL: Treatment of Hypertrophic and Keloid Scars with Silicone Gel Sheeting. JFAS, 33:110-119, 1994.

Schrudde Single Lobe Rotation Flap



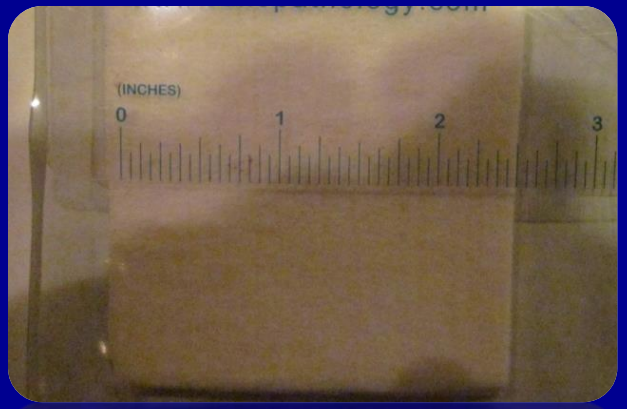
CPT #14040

Dockery, GL: Single Lobed Rotation Flaps, J. Am. Podiatric Med. Assoc., 85:36-40, 1995.

Single Lobe Rotation Flap

After Scar Revision & Plastic Correction

- Initial Non-adherent Dressing of Owen's Silk or Mepitel® Dressing
- Secondary Sterile ¼ inch Felt Pad



- Sterile Gauze and Wraps

CONCLUSIONS:

There are many options for treating all scars that are symptomatic, functionally inhibiting, or unacceptable to the patient and surgeon

Dockery G: Scar Prevention. Podiatry Management, 27(5):153-162, 2008.

Topical Vitamin E for Scars

Although there's a lot of anecdotal information about specific ingredients (such vitamin E) to reduce scars, most of it is not supported by research.

Jenkins M, et al. Failure of topical steroids and vitamin E to reduce postoperative scar formation following reconstructive surgery. J Burn Care Rehabil 1986; 7: 309-12.

The effects of topical vitamin E on patients who had undergone operation for post-burn contractures indicated that there were no appreciable effects.

Baumann LS, Spencer J. The effects of topical vitamin E on cosmetic appearance of scars. Dermatol Surg. 25(5):311-315, 1999.

This study shows that there is *no benefit* to the cosmetic outcome of scars by applying vitamin E after skin surgery and that the application of topical *vitamin E may actually be detrimental* to the cosmetic appearance of a scar.

Widgerow AW, et al. New innovations in scar management. Aesth Plast Surg; 24(3): 227-234, 2000.

Early topical application of vitamin E in scar management may cause reduction of the tensile strength of the wound leading to stretched scars and possible dehiscence from diminished wound healing.

Liu A, et al. Current methods employed in the prevention and minimization of surgical scars. Dermatol Surg, 37(12):1740-6, 2011.

Topical Vitamin E products commonly used by patients have failed to demonstrate any significant benefits in improving final scar outcomes

Rahmani N, et al. Vitamin E and its clinical challenges in cosmetic and reconstructive medicine with focus on scars. J Pak Med Assoc. 63(3):380-382, 2013.

Despite a lot of investigations and researches performed to identify and clarify the exact effects of vitamin E on hypertrophic scars, there have been no undisputed results about the clinical impact of its usage.

Tanaydin V, et al. The role of topical Vitamin E in scar management: A systematic review. Aesthet Surg J. 236(8):959-965, 2016.

There is not yet sufficient evidence that topical vitamin E has a significant beneficial effect on scar appearance….

Additional References

Dockery G: Hypertrophic and keloid scars. JAPAM, 85:57-60, 1995.

Dockery G, Nilson RZ. Treatment of hypertrophic and keloid scars with Silastic gel sheeting. JFAS, 33:110-119, 1994.

Dockery G. Excision techniques and procedures. Ch 12, pp 113-126, Lower Extremity Soft Tissue & Cutaneous Plastic Surgery, 2nd 3d. Elsevier Saunders, 2012.

Dockery G. Z and W skin plasty. Ch 16, pp 163-176, Lower Extremity Soft Tissue & Cutaneous Plastic Surgery, 2nd 3d. Elsevier Saunders, 2012.

Dockery G. Z and W skin plasty. Ch 28, pp 389-410, Lower Extremity Soft Tissue & Cutaneous Plastic Surgery, 2nd 3d. Elsevier Saunders, 2012.

Fearmonti R, et al. A review of scar scales and scar measuring devices. Eplasty, 10:e43, 2010.

Field LM. Suture marks: factors of causation and prevention. Dermatol Surg. 32(11)425-426, 2006.

Garg S, et al. Surgical scar revision: an overview. J Cutan Aesth Surg. 7(10):3-13, 2014.

Mackay-Wiggan J, Suturing techniques periprocedural care. http://emedicine.medscape.com/article/1824895

McGillis ST, Lucas AR. Scar revision. Derm Clinics. 16(1):165-180, 1998.

Mustoe TA. Scars and keloids. Brit Med J. 387(7452):1329-1330, 2004.

Nedelec B, Shankowsky A, Tredgett EE. Rating the resolving hypertrophic scar: comparison of the Vancouver Scar Scale and scar volume. J Burn Care Rehabil. 21:205–212, 2000.

Oh SJ, et al. Modified dovetail-plasty in scar revision. J Craniofacial Surg. 25(2):485-488, 2014.

Pae NS, Kim YS, Park BY. Dovetail cheiloplasty. J Korean Soc Plast Reconstr Surg. 31: 594–598, 2004.

Sharma M, Wakure A. Scar revision. Ind J Plast Surg, 46(2):408-418, 2013.

Shockley WW. Scar revision techniques: Z-plasty, w-plasty, and geometric broken line closure. Facial Plast Surg Clin North Am. 19:455–463, 2011.

Valins W, et al; Innovative therapies in the treatment of keloids and hypertrophic scars. J Clin Aesthet Dermatol. 3(5):20-26, 2010.

Vivas AC, et al. Hypertrophic scars and keloids, Part 1: Conventional treatments. Cosm Dermatol 25(7):309-316, 2011.

SURGICAL TREATMENT OF KELOID & PAINFUL SCARS

THANK YOU!

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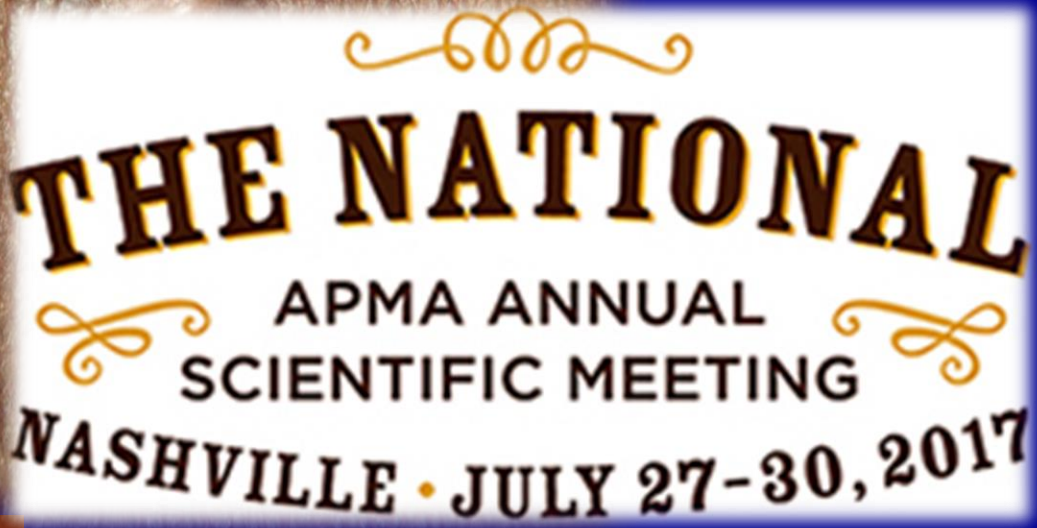
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