

# POLARYS

[www.ibramed.com.br/polaritys](http://www.ibramed.com.br/polaritys)



- **4 modalidades de tratamento**

- Convencional
- Preparo
- Reperfusão
- Contraste

- Vácuo -550 mmHg (~80kPa)
- 2 aplicadores independentes
- Segurança redundante
- Temperatura : - 8 °C
- Reservatório de água
- Clean Mode
- Steps Mode
- Tutorial
- Acessórios



# MODALIDADES DE CRIOLIPÓLISE



# ACESSÓRIOS



Aplicadores: P, M e G  
2 conexões independentes



Resfriamento



Aquecimento



Réguas  
e  
posicionadores



# CRIOLIPÓLISE

- **Conceito**

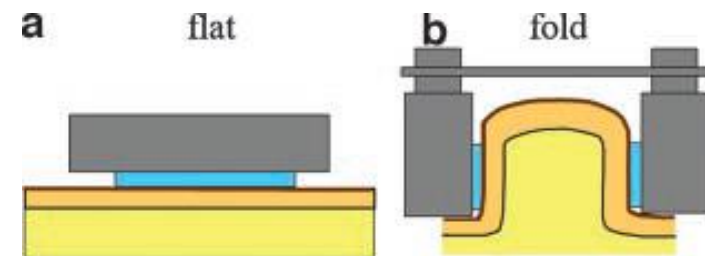
- Técnica não invasiva para tratamento da gordura localizada por extração de temperatura.

- **Objetivo**

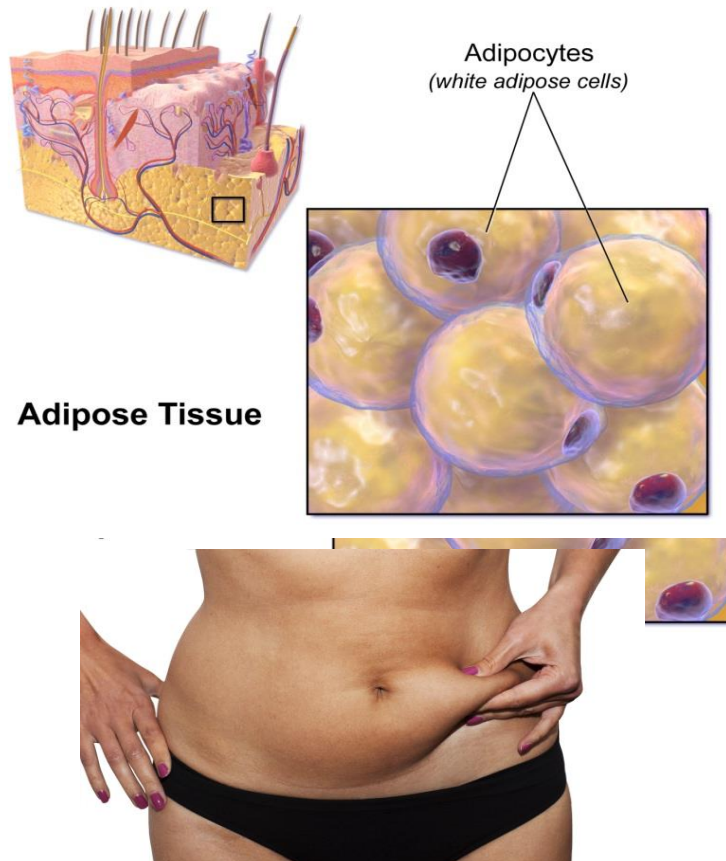
- atrofia terapêutica no tecido adiposo subcutâneo

- **Indicações**

- Tratamento da gordura localizada.
- Modelagem não-invasiva do contorno corporal.



# PARTICULARIDADES DO TECIDO ADIPOSITO SUBCUTÂNEO



- Gordura:  
Saturada X Insaturada
- Maior sensibilidade ao frio
- Cristalização seletiva
- Inflamação dispara apoptose

# HISTÓRICO

- Reabilitação
  - Bolsas de gelo/compressas
- Medicina
  - Nitrogênio líquido -196°C

**2007-2008<sup>1</sup> Criolipólise**

**1902<sup>2</sup> sensibilidade ao frio**

**1941 Adiponecrose e frigori**

**1940-1970 nódulos paniculite induzida pelo frio**

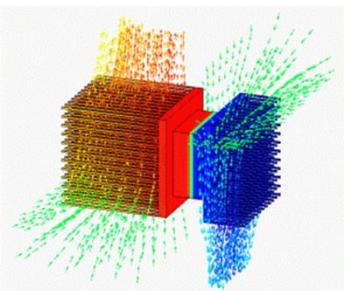
**1970<sup>3</sup> paniculite do picolé**

<sup>1</sup> Manstein D, Laubach H, Watanabe K, et al. Selective cryolysis: A novel method of non-invasive fat removal. *Lasers Surg Med.* 2008;40:595-604.

<sup>2</sup>3. Hochsinger C. Über eine akute kongelative Zellgewebsverhärtung in der Submentalregion bei Kindern. *Mschr Kinderheilk.* 1902;1:323-327.

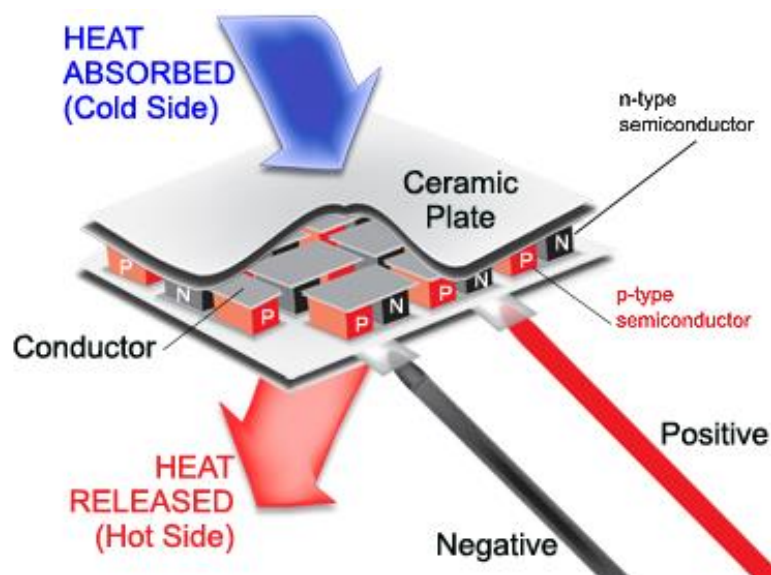
<sup>3</sup>Epstein EH Jr, Oren ME. Popsicle panniculitis. *N Engl J Med.* 1970;82:966-967.

# Painel de resfriamento/aquecimento



## Pastilha Peltier

- Pastilha semicondutora
- Termostato
- Excitação elétrica
- Extração de temperatura do tecido
- Troca de calor / interface com a água
- Inversão para produção de calor



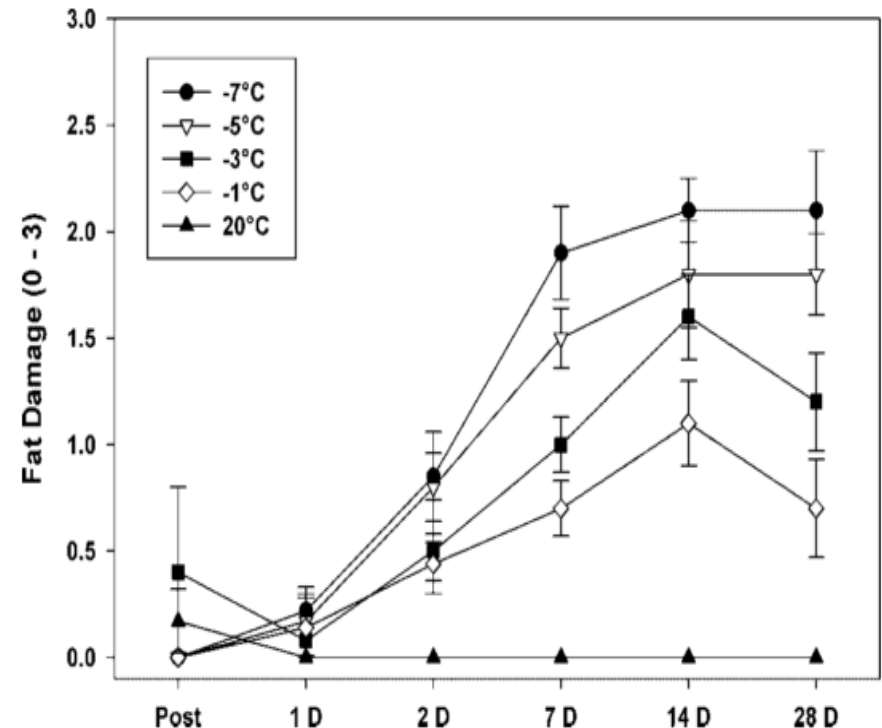


# DESENVOLVIMENTO



- Ensaio pré-clínico (2008)

- 6 porcas
- 15 diferentes locais (flancos, abdômen e glúteos dos animais)
- +20, -1, -3, -5, e -7°C
- Loção anticongelante
- 10 min (tratamento)
- 1 min (vibromassageador comercial)
- Avaliação: pós-tratamento, 1D, 2D, 7D, 14D e 28D.

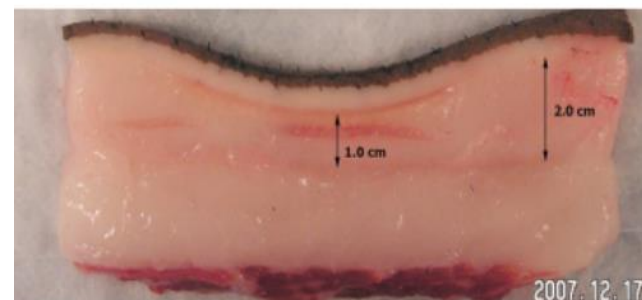
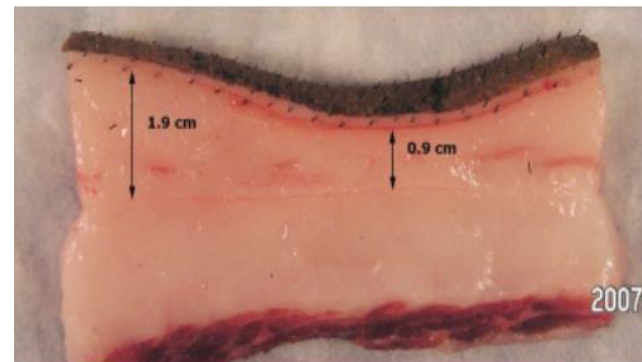


**Selective Cryolysis: A Novel Method of Non-Invasive Fat Removal**

Dieter **Manstein**,\* Hans Laubach, Kanna Watanabe, William Farinelli, David Zurakowski, and R. Rox Anderson

# DESENVOLVIMENTO

- Ensaio pré-clínico (2009)
  - 3 porcos
  - 15 diferentes locais
  - Temperatura transcrita para taxa de extração de calor ( $\text{mW}/\text{cm}^2$ )
  - Fator de intensidade de resfriamento (CIF = *cooling intensity factor*)
  - 45 min (tratamento)
  - 5 min (vibromassageador comercial)
  - avaliação aos 28 dias, 14 dias, 7 dias, 2 dias 1 dia e imediatamente ao tratamento
  - Amostras de sangue



Redução da gordura subcutânea superficial 90 dias após o tratamento.

**Cryolipolysis for Noninvasive Fat Cell Destruction:  
Initial Results from a Pig Model**

BRIAN ZELICKSON, MD,\* BARBARA M. EGBERT, MD,<sup>†</sup> JESSICA PRECIADO, PhD,<sup>‡</sup> JOHN ALLISON, PhD,<sup>‡</sup> KEVIN SPRINGER, AS (ELECTRONICS TECHNOLOGY),<sup>‡</sup> ROBERT W. RHOADES, PhD,<sup>§</sup> AND DIETER MANSTEIN, MD\*<sup>¶</sup>

# DESENVOLVIMENTO



- Ensaio clínico (2009)
  - Primeiros relatos: compilado de resultados apresentados na *Annual Meeting of the American Society for Laser Medicine and Surgery*



Seminars in  
Cutaneous  
Medicine  
and Surgery

## Cryolipolysis for Reduction of Excess Adipose Tissue

Andrew A. Nelson, MD,\* Daniel Wasserman, MD,† and Mathew M. Avram, MD, JD‡



**Figure 1** A representative example of clinical improvement following 1 treatment with cryolipolysis for fat layer reduction of the flanks (ie, love handles). The patient's left side was treated, while the right side served as an untreated control. The top pictures show the baseline, while the bottom pictures demonstrate the clinical improvement 4 months after treatment. The patient's weight on the baseline and 4 month follow-up day remained unchanged. This figure is obtained and used with permission of Flor Mayoral, MD.<sup>15</sup>

Artigo Fisioterapia SER  
Profa. Dra. Estela Sant'Ana

# EFEITOS FISIOLÓGICOS ESPERADOS



Tecido adiposo: maior sensibilidade ao frio.

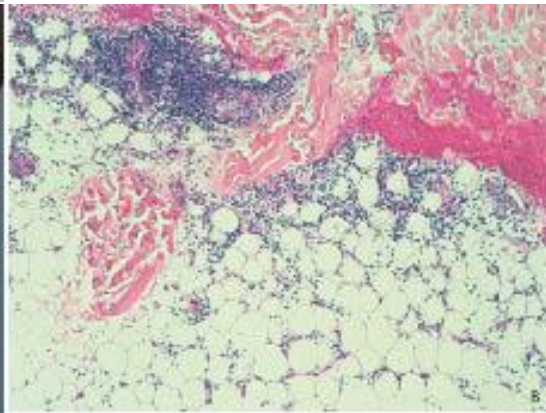
1. Cristalização dos lipídeos: extração de temperatura.
2. Paniculite lobular: inflamação do panículo adiposo causada pelo frio.
3. Apoptose: morte celular.
4. Reperusão: liberação da vasoconstrição pós-crio.

# PANICULITE POR FRIO

- Paniculite lobular



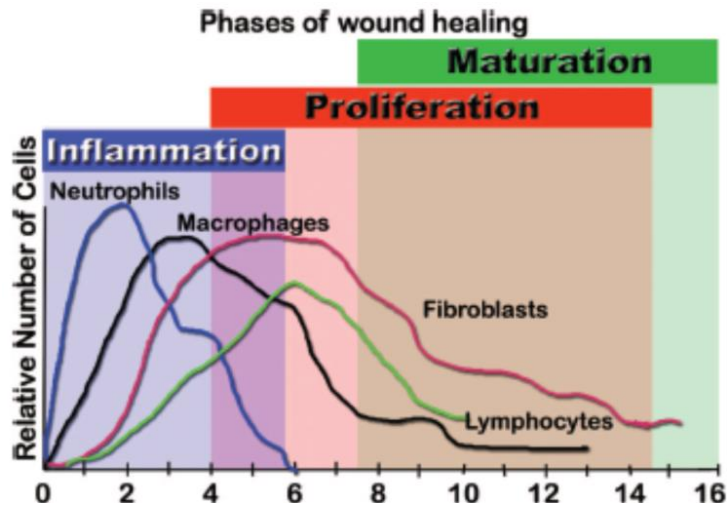
*Popsicle Panniculitis*



- Paniculite controlada
- Proteção da pele por membrana anticongelante.
- Extração de temperatura gradual.
- Peltier com termostato.
- Tempo dependente.

<http://emedicalhub.com/panniculitis/>

# PANICULITE POR FRIO



Broughton II et al., 2006

## Cryolipolysis™ for Subcutaneous Fat Layer Reduction

Mathew M. Avram, MD, JD<sup>1\*</sup> and Rosemary S. Harry, MSME<sup>2</sup>

<sup>1</sup>Dermatology Laser & Cosmetic Center, Massachusetts General Hospital, Boston, Massachusetts 02114

<sup>2</sup>RHarry Consulting, Killingworth, Connecticut 06419

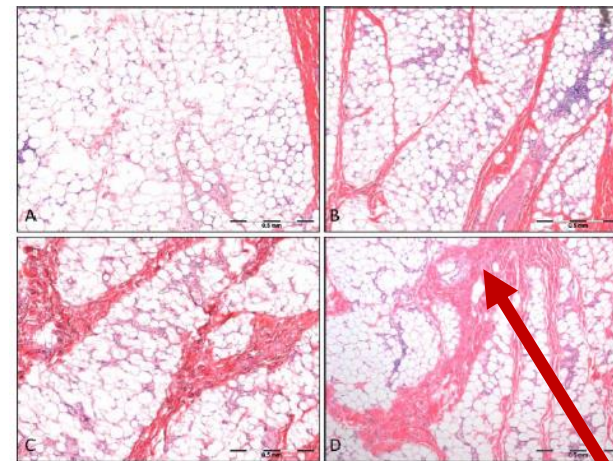


Fig. 2. Histological sequence of inflammatory response following treatment at 3 days (A), 14 days (B), 30 days (C), and 60 days (D) after treatment [5].

**Figura 2.** **2A.** 3 dias: evidências do início do processo inflamatório; **2B.** 14 dias: pico do processo inflamatório presença de macrófagos e neutrófilos /fagocitose; **2C.** 30 dias: resposta inflamatória diminuída e **2D.** 60 dias: diminuição evidente da densidade e volume dos adipócitos. **Espessamento evidente dos septos (pelo infiltrado edematoso)**

# REPERFUSÃO



## Massagem

### Noninvasive Selective Cryolipolysis and Reperfusion Recovery for Localized Natural Fat Reduction and Contouring

Gordon H. Sasaki, MD, FACS; Natalie Abelev, RN; and Ana Tevez-Ortiz, RN

112 pacientes  
Termopar sobre a pele.  
86 follow up

6 pacientes  
Termopar subdérmico

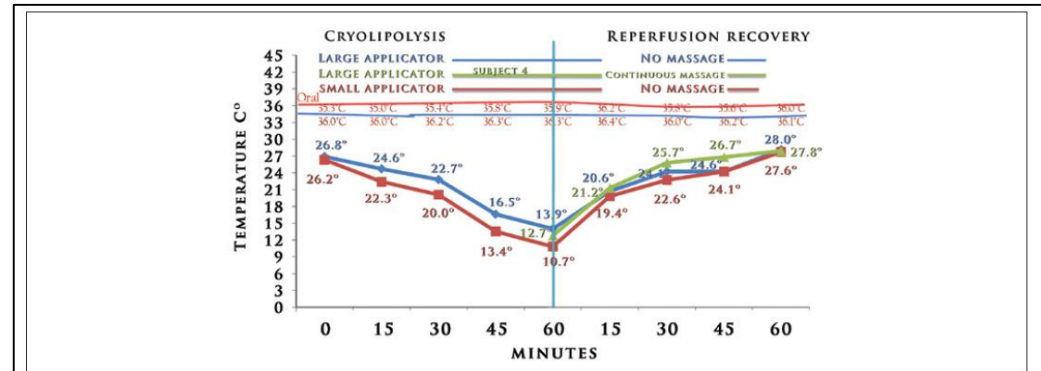


Figure 1. Average oral and skin temperature profiles during cryolipolysis and reperfusion-recovery phases for the abdomens of subjects 1 through 5.

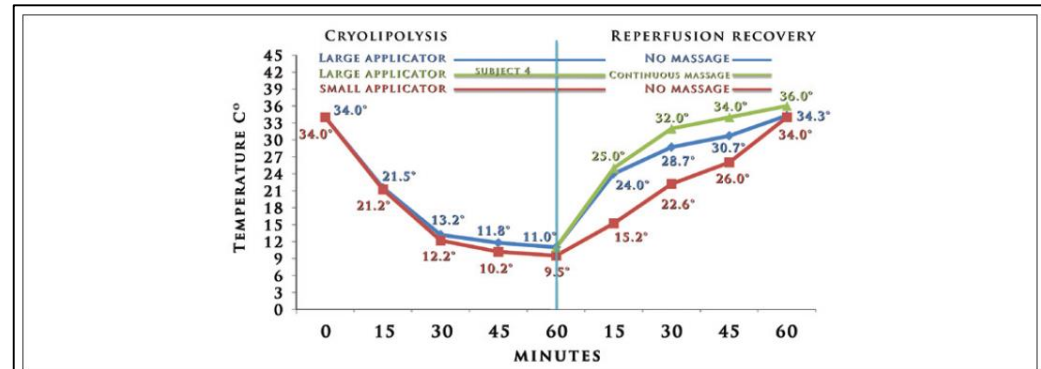


Figure 2. Average subdermal temperature profiles during cryolipolysis and reperfusion-recovery phases for the abdomens of subjects 1 through 5.

# CONTRASTE



Cryoletters 2014; 35 (2:154-60)

## PRE AND POST LIPOCRYOLYSIS THERMIC CONDITIONING ENHANCES RAT ADIPOCYTE DESTRUCTION.

Hernán Pinto \*<sup>1</sup>, David Ricart-Jané<sup>2</sup>, Eva Pardina <sup>2</sup>

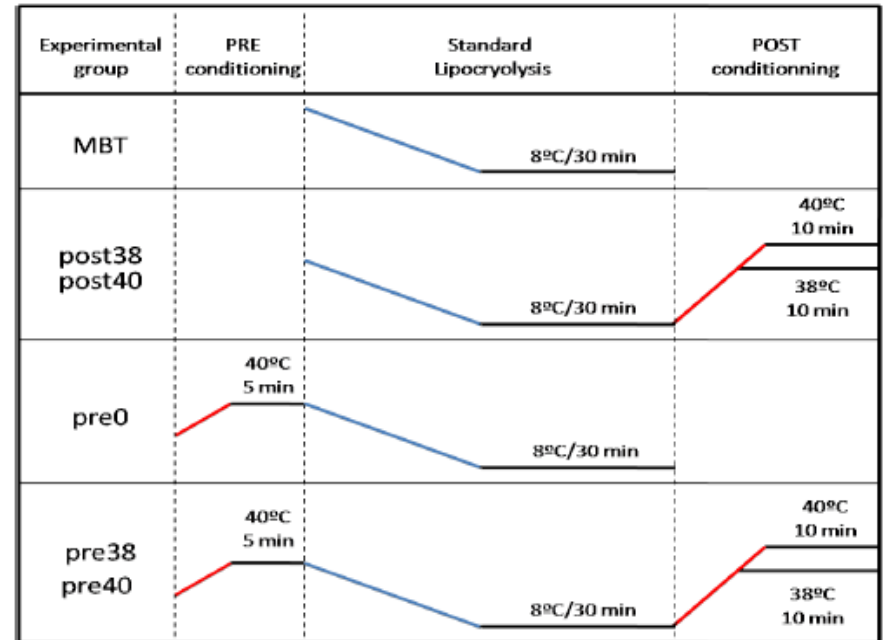
7 ratos Sprague-Dawley

**Vermelho:** aquecimento

**Azul:** resfriamento

**Preto:** estabilização da temperatura

Reperfusão significativa  
 Maior % de morte celular  
 Minimizou equimoses



**Fig 1. Temperature treatment patterns (TTPs).** Heating (red line), cooling (blue line) and stabilized temperature (black line). 40°C during pre-conditioning, 8°C during standard lipocryolysis, 38°C or 40°C during post-conditioning. Control groups (constant room temperature) are not shown. MBT: modified basal treatment. Min: minutes.



# CONTRASTE

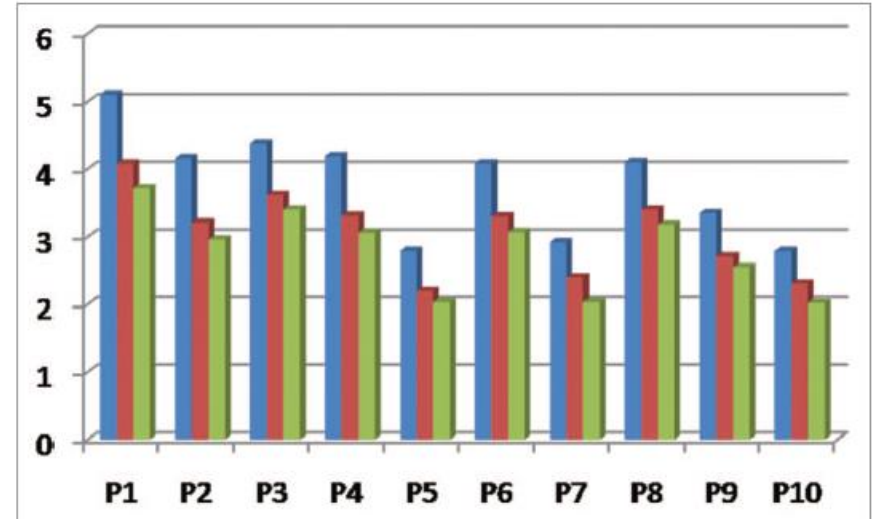
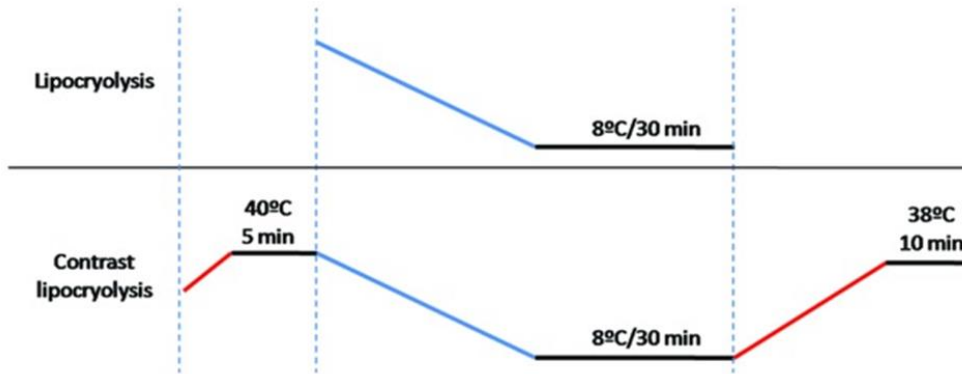


BRIEF REPORT

Adipocyte 3:3, 212–214; July/August/September 2014; © 2014 Landes Bioscience

## Contrast lipocryolysis

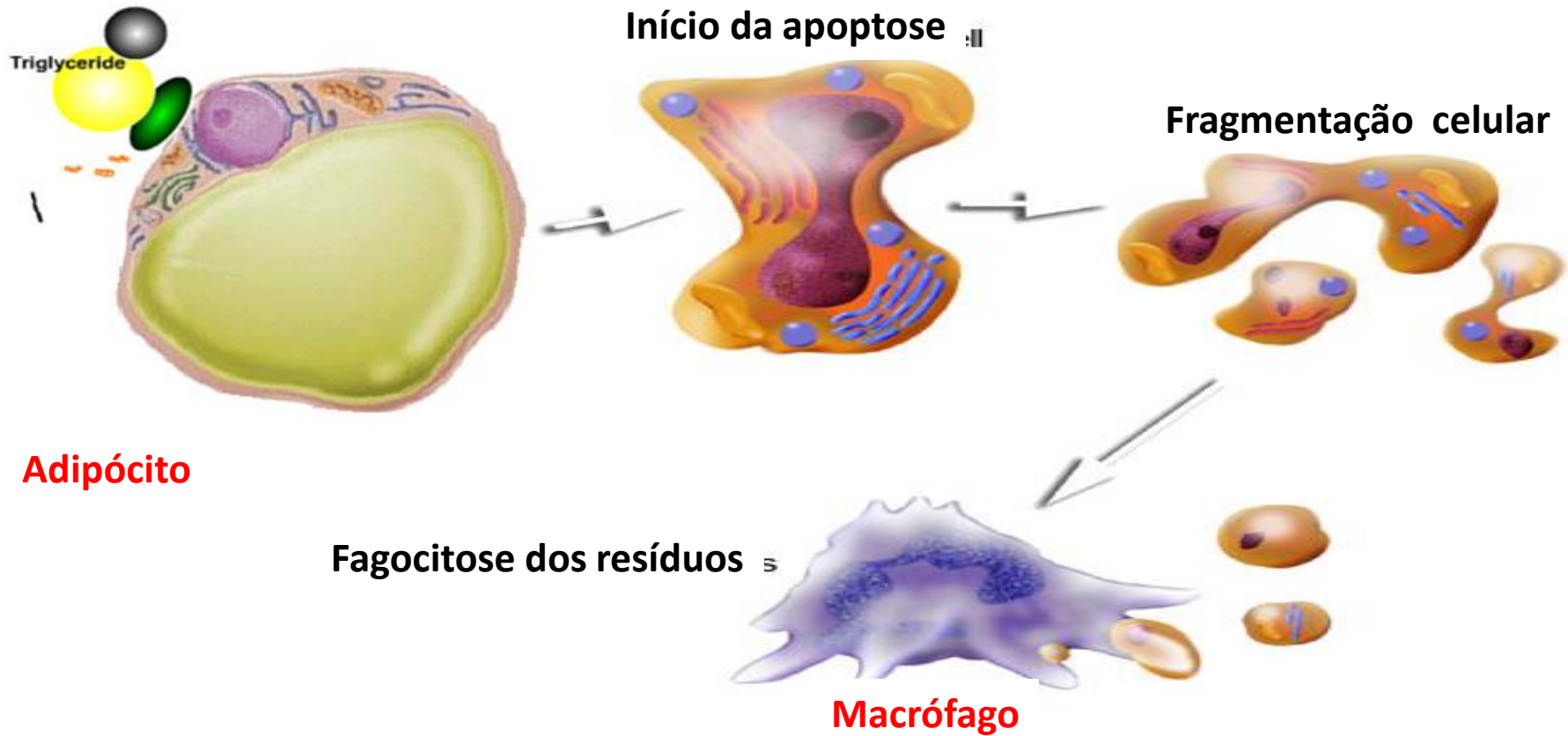
Pre- and post-session tempering improves clinical results



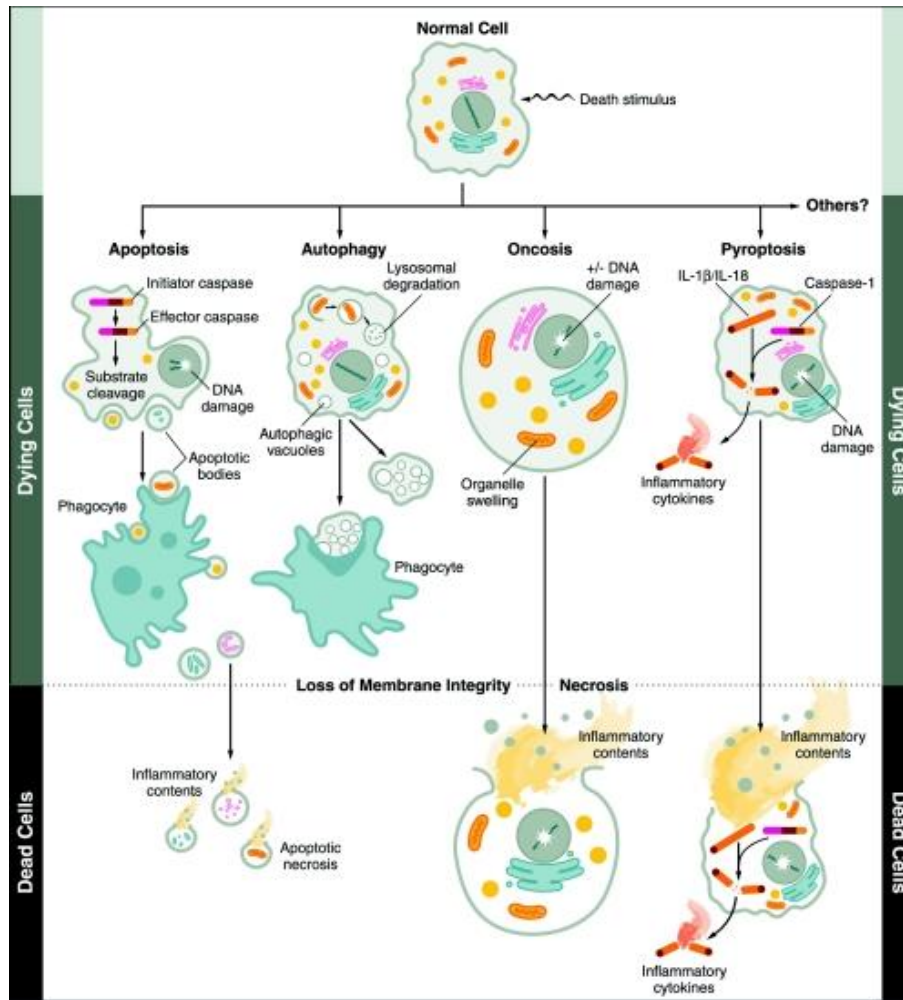
- 10 mulheres, 48,1±9,7 anos
- Criolipólise convencional: média de redução **22,5%**
- Criolipólise de contraste: média de redução **42,45%**

- **Azul:** antes
- **Vermelho:** 15 dias pós tratamento
- **Verde:** 30 dias pós tratamento

# MORTE CELULAR



# MORTE CELULAR



INFECTION AND IMMUNITY, Apr. 2005, p. 1907–1916  
 0019-9567/05/\$08.00+0 doi:10.1128/IAI.73.4.1907–1916.2005  
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Vol. 73, No. 4

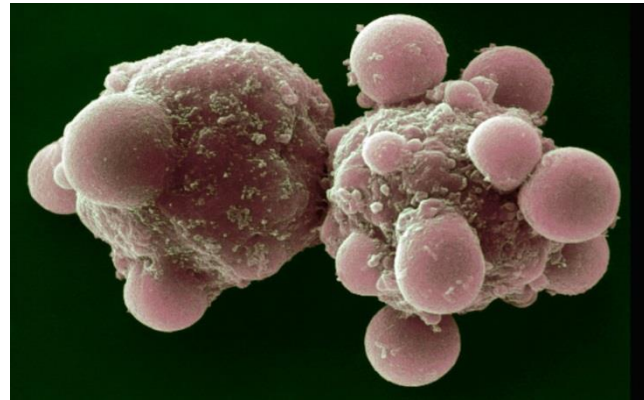
## MINIREVIEW

### Apoptosis, Pyroptosis, and Necrosis: Mechanistic Description of Dead and Dying Eukaryotic Cells

Susan L. Fink<sup>1</sup> and Brad T. Cookson<sup>2\*</sup>

*Molecular and Cellular Biology Program<sup>1</sup> and Departments of Laboratory Medicine and Microbiology,<sup>2</sup> University of Washington, Seattle, Washington*

# MORTE CELULAR



Hepatócito

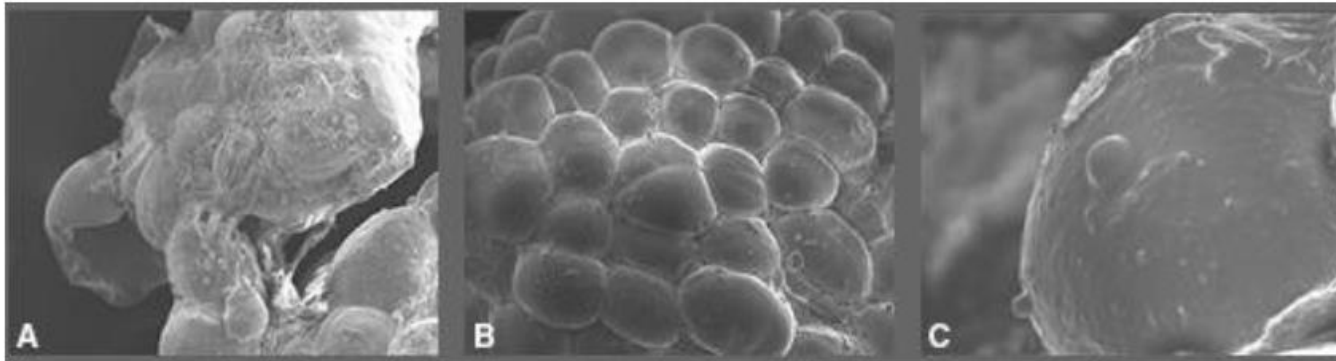


Fig. 1 **A**, SEM of a necrosis response in adipose tissue. The cell membrane has ruptured, and few viable adipocytes remain. **B**, Normal fat is injected with saline as a control. **C**, Close-up of an adipocyte undergoing apoptosis. Blebbing is present in the intact cell membrane.

# MORTE CELULAR



## **Apoptose**

- Mediada por caspases: 3, 6, 9, 10...
- Ausência de inflamação prévia
- Fragmentação celular por estímulo endógeno ou exógeno
- Fagocitose por Macrófagos

## **Piroptose ou Poroptose**

- Mediada por caspases 1 e 11
- Poração da membrana
- Citocinas inflamatórias
- Fagocitose por Macrófagos



# Pyroptosis of fat

DR DIANE DUNCAN discusses the BodyFX treatment and how cell death mechanisms affect clinical results

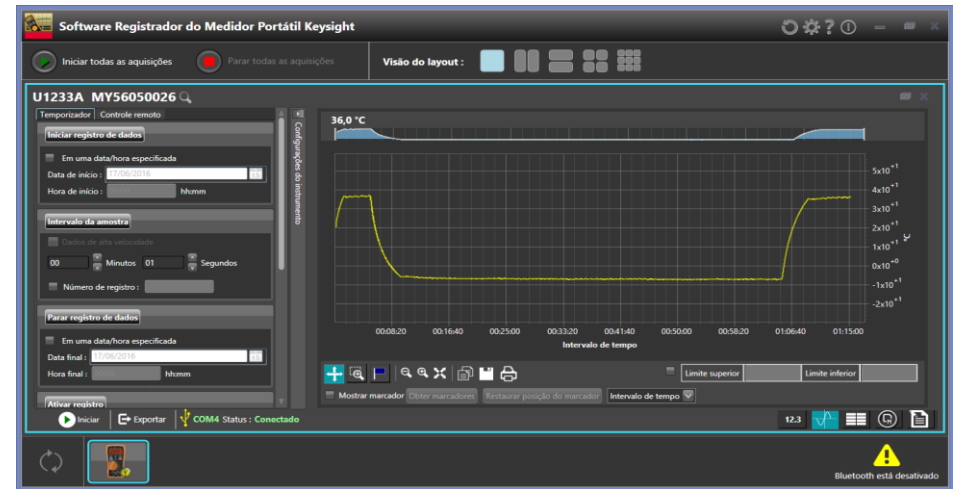
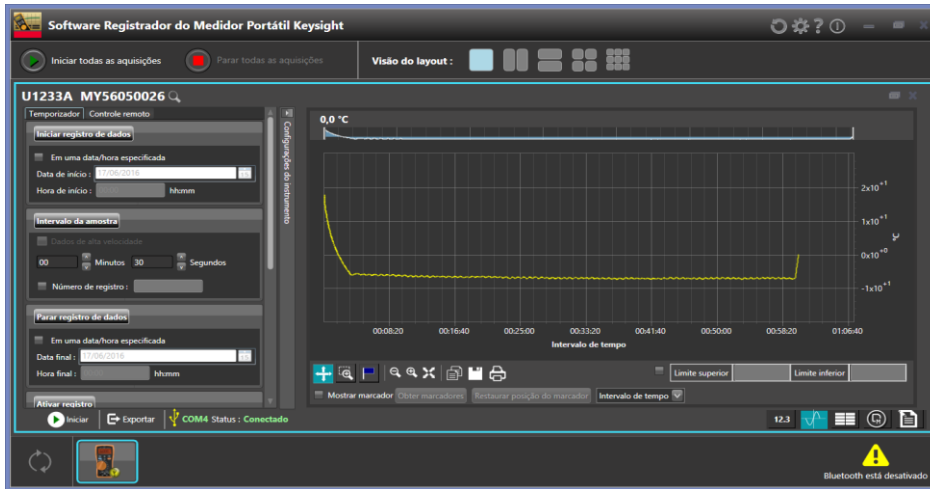
# TEMPERATURA



Convencional



Contraste





# Non-Invasive Cryolipolysis™ for Subcutaneous Fat Reduction Does Not Affect Serum Lipid Levels or Liver Function Tests

Kenneth B. Klein, MD,<sup>1</sup> Brian Zelickson, MD,<sup>2</sup> Jeffrey G. Riopelle, MD,<sup>3</sup> Eric Okamoto, MD,<sup>4</sup> Eric P. Bachelor, MD,<sup>5</sup> Rosemary S. Harry, MSBME,<sup>6</sup> and Jessica A. Preciado, PhD<sup>7\*</sup>

<sup>1</sup>Endpoint LLC, Bainbridge Island, Washington 98110

<sup>2</sup>Department of Dermatology, University of Minnesota Medical School, Minneapolis, Minnesota 55455

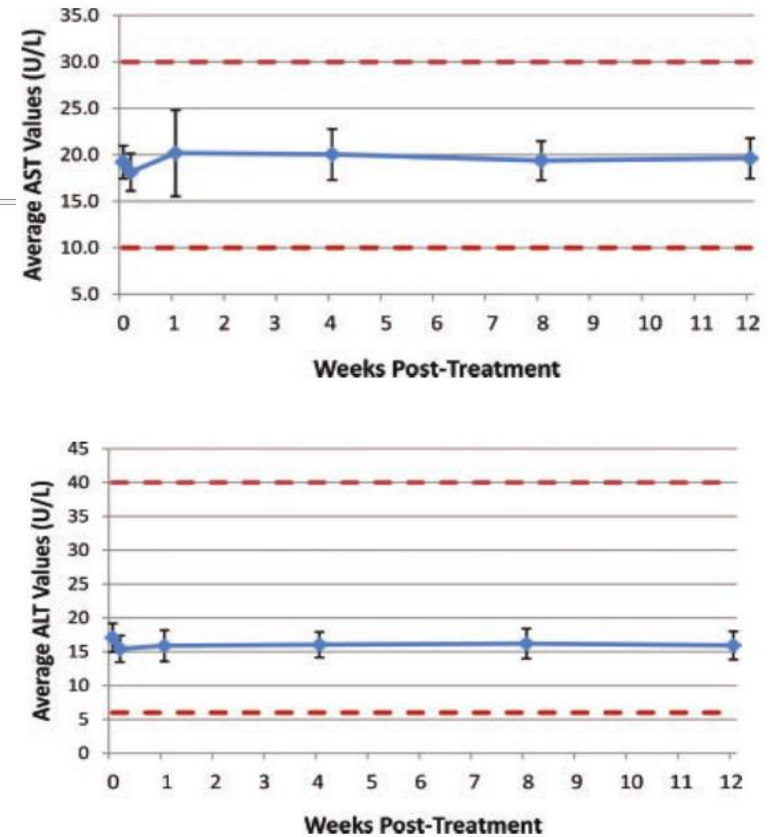
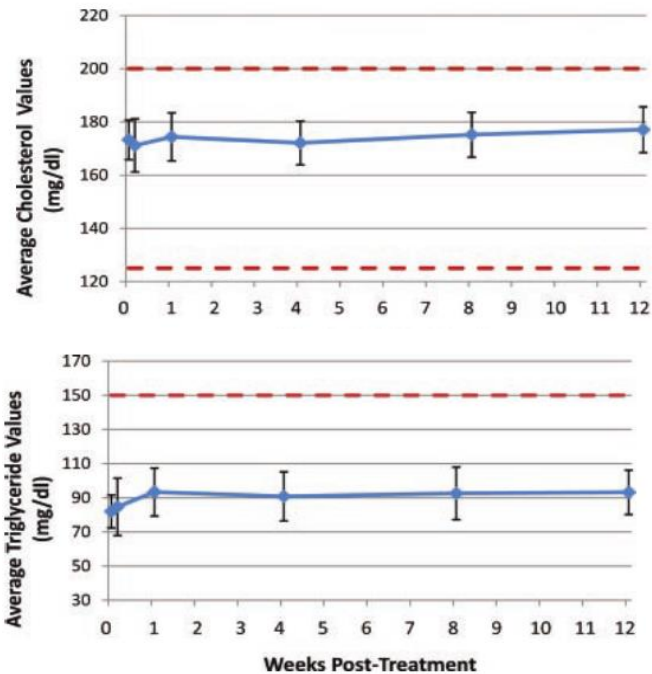
<sup>3</sup>Laser Advantage Medi-Spa of San Ramon, San Ramon, California 94583

<sup>4</sup>Fremont Plastic Surgery, Fremont, California 94538

<sup>5</sup>The Plastic Surgery Center, Pleasanton, California 94566

<sup>6</sup>RHarry Consulting, Killingworth, Connecticut 06419

<sup>7</sup>Zeltiq Aesthetics, Pleasanton, California 94588



# FLACIDEZ DE PELE



## Does Cryolipolysis Lead to Skin Tightening? A First Report of Cryodermadstringo

W. Grant Stevens, MD, FACS

Aesthetic Surgery Journal  
1-3  
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DOI:10.1177/1090820X14539699  
[www.aestheticsurgeryjournal.com](http://www.aestheticsurgeryjournal.com)  
SAGE

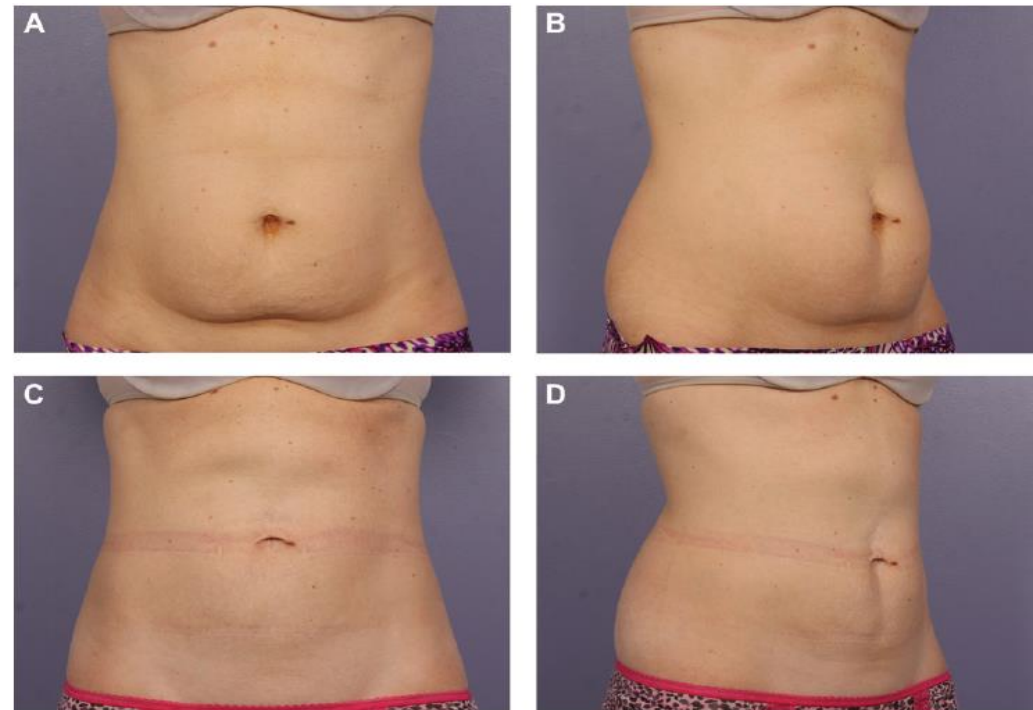
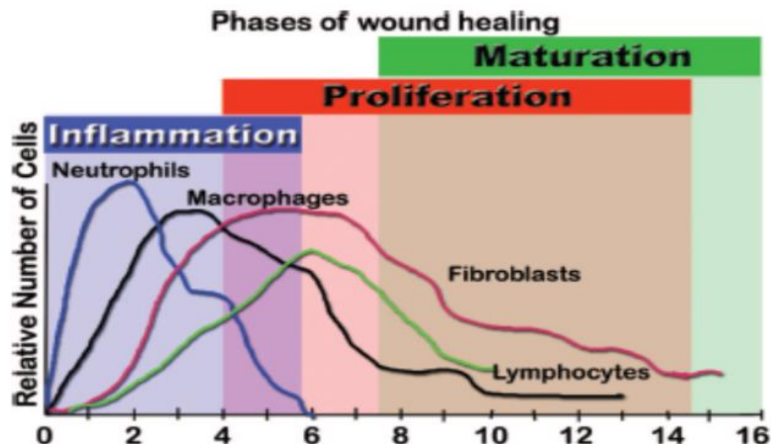


Figure 1. This 38-year-old woman sought treatment for excess fat and received 2 cycles to the lower abdomen and 2 cycles to the upper abdomen: pretreatment (A, B) and 4 months posttreatment (C, D). Cryolipolysis nonsurgically reduced undesirable fat deposits, and the patient attained skin tightening. Weight change since baseline, -4 lb. Procedure by Dr Grant Stevens.



Broughton II et al., 2006



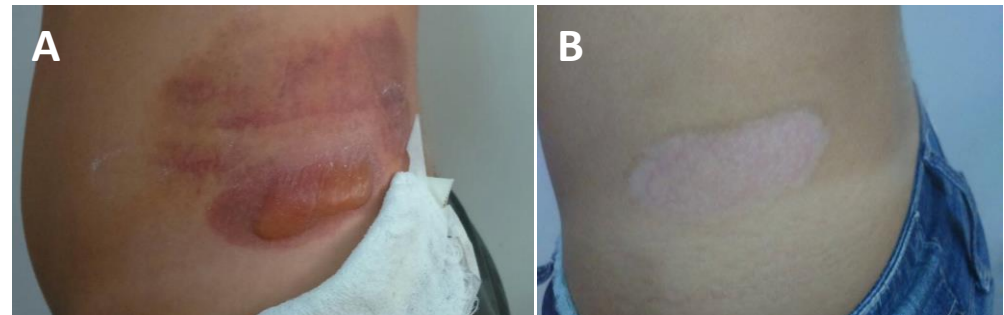
# REAÇÕES ADVERSAS

Pós sessão



Esperadas

## Queimaduras



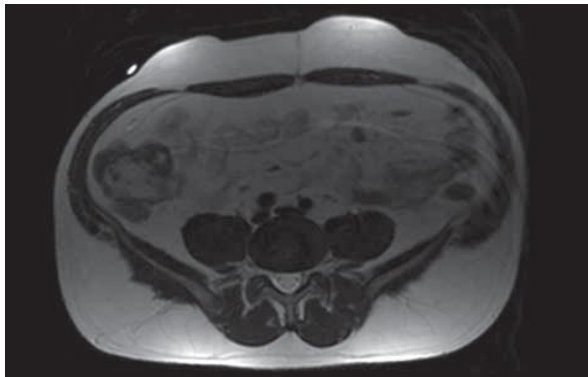
24h pós sessão

15d pós sessão

# REAÇÕES ADVERSAS



Ressonância magnética

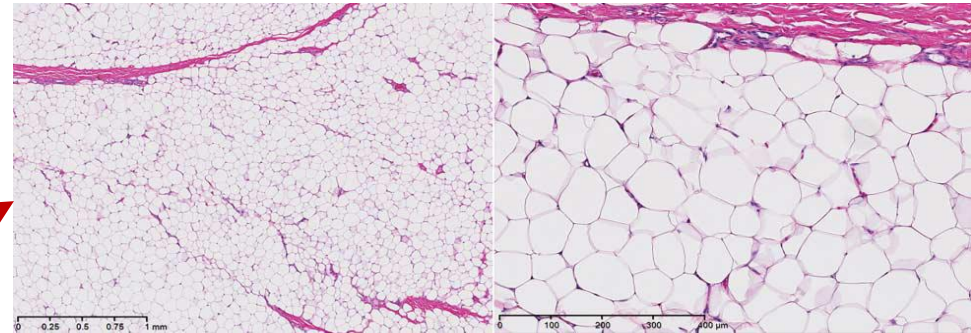


## Hiperplasia paradoxal

Case Report/Case Series

### Paradoxical Adipose Hyperplasia After Cryolipolysis

H. Ray Jallan, MD; Mathew M. Avram, MD, JD; Lilit Garibyan, MD, PhD; Martin C. Mihm, MD; R. Rox Anderson, MD

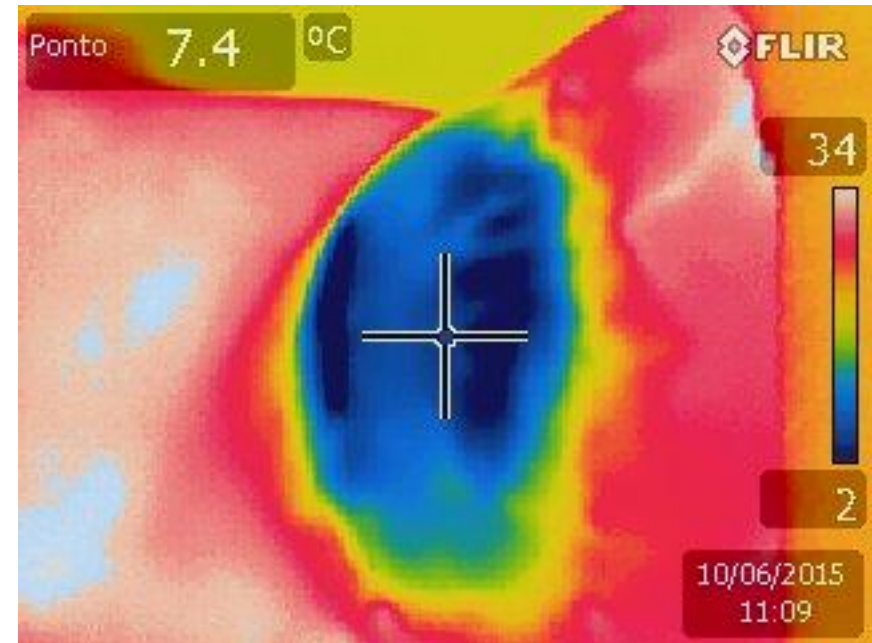


**A e B**, imagem histológica de tecido adiposo com hiperplasia paradoxal (A: x2,5) e (B: x10).

- Hiperplasia do tecido adiposo
- Espessamento de septos fibrosos
- Rede vascular aumentada
- Pode ter relação com a paniculite?

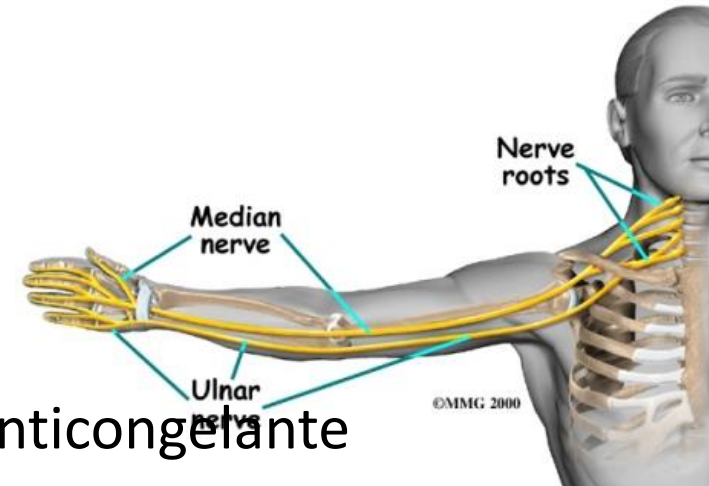
Homem, 40 anos: Eritema e desconforto moderado; 1-2 meses (diminuição da gordura); 3 meses (aumento gradual); 5 meses (estabilização).

# PÓS-SESSÃO



# POSICIONAMENTO ESPECIAL

- Paciente ideal
- Paciente deve ser avaliado de pé
- Braço a 90°/pernas separadas
- Observe a zona de acúmulo de gordura
- Cuidado com a inervação!
- Demarque a área e posicione a membrana anticongelante
- Posicione o aplicador com o paciente de pé
- Não aplicar se excesso de flacidez de pele
- Sintomas de parestesia podem ocorrer (suspenda o tratamento se sensação pioram).



Lasers Med Sci (2015) 30:2165–2169  
DOI 10.1007/s10103-015-1781-y



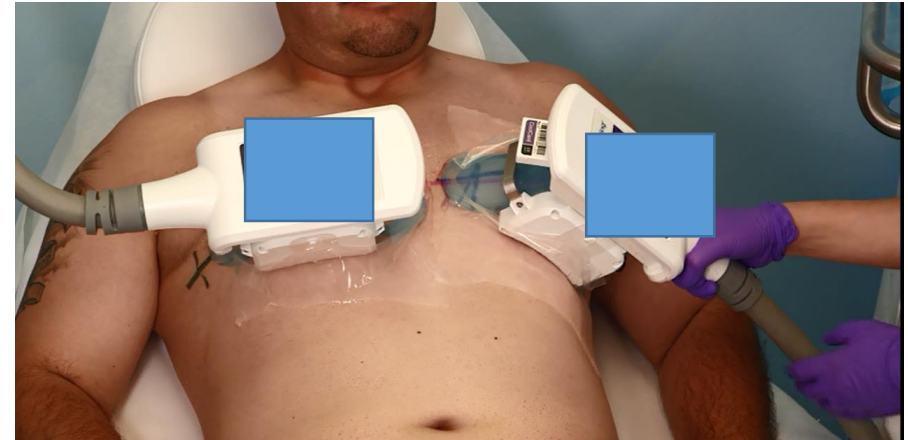
ORIGINAL ARTICLE

The efficacy of cryolipolysis treatment on arms and inner thighs

Rungsima Waniphakdeecha<sup>1</sup> · Angkana Sathaworawong<sup>1</sup> ·  
Woraphong Manuskiatti<sup>1</sup>

# POSICIONAMENTO ESPECIAL

- Paciente ideal
- Paciente deve ser avaliado de pé
- Observe a zona de acúmulo de gordura
- Demarque a área e recoste o paciente
- Posicione a membrana anticongelante
- Posicione o aplicador



## Broad Overview of a Clinical and Commercial Experience With CoolSculpting

W. Grant Stevens, MD, FACS; Laura K. Pietrzak, MSHS, PA-C;  
and Michelle A. Spring, MD

Aesthetic Surgery Journal  
33(6) 835-846  
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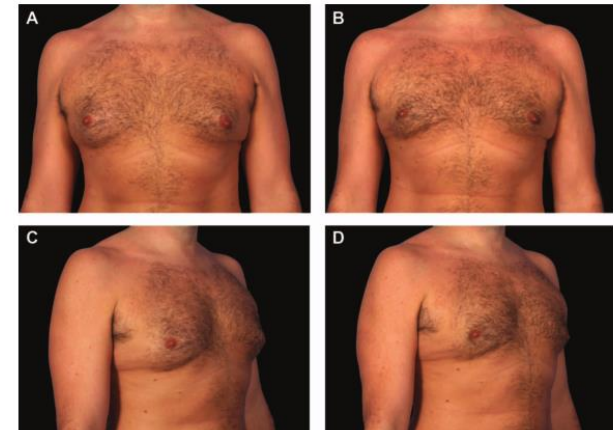



Figure 12. (A, C) This 37-year-old man presented for nonsurgical treatment of gynecomastia. (B, D) Two months after a single treatment cycle to each side of the chest, the patient is shown with no weight change since baseline.

# PÓS-CRIO

## REFORÇO DA TÉCNICA (Imediato, 15-21 após)

- Ondas de choque
- Ultrassom focalizado
- Carboxiterapia
- Eletrolipólise
- Terapia combinada
- Radiofrequência
- Tecaterapia
- Terapia vibro-oscilatória
- Endermoterapia
- Massagem manual
- Drenagem linfática

## Recuperação do adipócito

- LLLT
- LED



Fototerapia

# CONTRAINDICAÇÕES



## Absolutas

- Gestantes ou sobre o útero potencialmente grávido.
- Dispositivo eletrônico implantado (ex: marcapasso).
- Áreas neoplásicas ou sobre áreas onde o tumor foi removido.
- Alta sensibilidade ao frio (crioglobulinemia).
- Intolerância a crioterapia.
- Síndrome de Raynaud.
- Sobre áreas isquêmicas (onde o suprimento sanguíneo pode ser incapaz de suprir a demanda metabólica resultando em necrose).
- Sobre pele irritada ou com presença de dermatites.

## Relativas

- Sobre hérnia abdominal.
- Diabetes Mellitus ou outros casos de déficit de cicatrização.
- Indivíduos com doenças metabólicas e hepáticas que comprometam o metabolismo das gorduras.
- Sobre áreas com alteração de sensibilidade.
- Cirurgias recentes no local do tratamento.
- uso regular de medicamentos anti-inflamatórios.
- Quelóides ou propensão a quelóides na região a ser tratada.

# CRIO-LIPÓLISE POLARYS





## ESPECIFICAÇÕES DAS MODALIDADES TERAPÊUTICAS



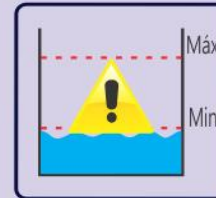
<b>Temperatura de resfriamento:</b>	De + 8°C até - 8 °C ± 10% com incrementos de 2°C
<b>Temperatura de aquecimento:</b>	Fixa em + 40°C ± 10%
<b>*Intensidade do vácuo:</b>	0 até - 550 mmHg ± 10%
<b>Modos de vácuo:</b>	<b>Contínuo</b> e Pulsados: <b>P1</b> (10 pulsos/min) <b>P2</b> (20 pulsos/min) <b>P3</b> (35 pulsos/min)
<b>Modos de temperatura:</b>	<b>1-</b> Resfriamento; <b>2-</b> Aquecimento inicial + Resfriamento; <b>3-</b> Resfriamento + Aquecimento final; <b>4-</b> Aquecimento inicial + Resfriamento + Aquecimento final.
<b>Tempo de resfriamento:</b>	1-60 minutos ± 10%
<b>Tempo de aquecimento inicial:</b>	1-10 minutos ± 10%
<b>Tempo de aquecimento final:</b>	1-10 minutos ± 10%
<b>Tempo máximo de tratamento:</b>	Até 80 minutos ± 10%

\* Valores de intensidade de vácuo estarão expressos de 0 a 100% no visor do equipamento, com incrementos de 10%

Password



POLARYS





## Reservatório de água

- Capacidade ~10 litros
- Água desmineralizada
- Drenar mensalmente

## POLARYS

Remova os dois plugues dos conectores de abastecimento.

Conecte as mangueiras à entrada de água (Water Supply) e à saída de água (Water Vent).



Abasteça lentamente o reservatório com água (~10 litros de água) até o extravasamento pela mangueira de saída (Water Vent), em seguida desconecte as mangueiras e tampe os conectores.



# SELEÇÃO MANUAL



Cryo 1      Cryo 2

Mode

min

Initial Heat

Heat Time min

Vacuum Mode

Cnt P1 P2 P3

Vacuum Intensity

%

Work Temperature

Cryo 1      Cryo 2

°C      °C

IBRAMED

# STEPS MODE



The screenshot displays the control interface for two cryo units, Cryo 1 and Cryo 2, in STEPS MODE. Each unit has a set of three cooling time steps (S1, S2, S3) with up/down arrows and a 'P3' button. Below these is a 'Mode' button with a circular arrow icon. A 'Heat Time' section includes an 'Initial Heat' button, a 'Heat Time' input field with up/down arrows, and a 'min' label. A 'Vacuum Intensity' section features a horizontal slider bar, a '%' symbol, and up/down arrows. At the bottom, there is a home button, a green arrow button, a 'User' icon with up/down arrows, and a 'Save' button. A central snowflake icon separates the two units.

# Clean Mode

Ativar modo de limpeza ?



POLARYS



Realize o procedimento de limpeza após cada sessão de tratamento.

O equipamento será bloqueado para limpeza após 15 sessões.



# PASSO A PASSO

- 1) Avaliação adequada do paciente.
- 2) Preparo do equipamento - T° C e vácuo
- 3) Higienização do local.
- 4) Demarcação da área a ser tratada (Ex. de pé).
- 5) Posicionamento do paciente (Ex: inclinação de tronco).
- 6) Colocação adequada da membrana anticongelante sobre a pele.



(Nunca reutilizar a membrana)

# PASSO A PASSO

- 7) Colocação do aplicador sobre a pele (Cuidado com superfícies ósseas).
- 9) Iniciar a sucção.
- 9) Utilize rolo de toalha, faixas ou posicionadores como suporte para sustentação do aplicador e maior conforto do paciente.
- 10) Pulsado (máximo 5 min).





# POLARYS

A TEMPERATURA NA MEDIDA CERTA

O **MODO PULSADO (P1, P2 e P3)** é indicado para massagear o tecido tratado a qualquer momento durante o tratamento.

Recomenda-se a não utilização do **MODO PULSADO** por um tempo de aplicação superior a 5 minutos.

Tempos prolongados de uso do **MODO PULSADO** podem causar lesões na pele por atrito com o aplicador.

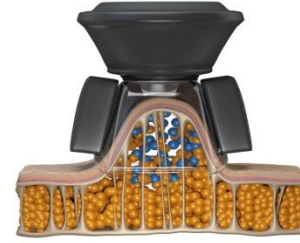
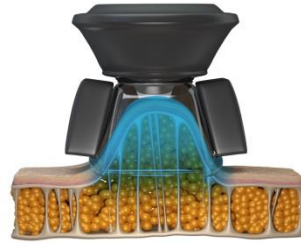


QUESTÃO DE RESPEITO



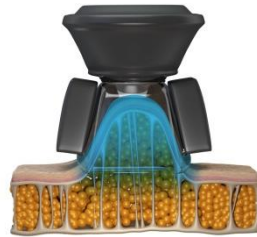
CONVENCIONAL

60 min



REPERFUSÃO

70 min



CONTRASTE

80 min



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Dúvidas

[duvidas@ibramed.com.br](mailto:duvidas@ibramed.com.br)



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