Dr Herman van Kradenburg

CELL REGENERATIVE THERAPY FOR WOUNDS, ULCERS AND BURNS

Disclosures

I have in the past received monetary recognition for services rendered, research grants or other tangible reward including cost of transport and accommodation for lecturing/patient education/CME and attending CME from the following companies and organisations who may have influence in the field of health:

Pfizer, Glaxo-Smithkline, Aventis, Lundbeck, MSD, Access Healthcare, Parke-Davies, Hoechst-Marrion-Roussell, The NZ Department of Labour Workplace Health and Safety, The NZ Civil Aviation Authority, The NZ Association of Safety Managers, Alzheimers New Zealand, Probis, Eli Lilly, Novartis and Roche. This may be incomplete - I may have left some out.

Background

GP in private practice since 1993, background in General Surgery, Vascular Surgery and Paediatric surgery, Occupational medicine, A and E work.

Practice on Kapiti Coast since 2001, still keep my hand in with minor surgery

Previously ran trauma centre for 90 factories, GP practice next to one of Cape Town's largest Industrial areas.

Have seen a multitude of burns, wounds and ulcers in my career.

Most heal without problem, but some do not.

- All have pain.
- Many have infection.
- Many have complications
- Many carry the scars and disfigurement
- Many have ongoing chronic ulceration a
- Risk of malignant transformation

Burns and Wound experience

SA Trained, Pretoria Academic complex, Tembisa Hospital,
Groote Schuur Hospital: General and Vascular Surgery, Orthopaedics.
Red Cross War Memorial Children's Hospital: Paediatric Surgery
Kwandebele Industrialist's Assn. Clinic and Trauma Centre
Epping Industria, Cape Town, Centres for Diabetes and Endocrinology.
Waikanae Health Centre, Kapiti.

Recent experience and training

• Guangzhou, China – Visited 9 hospitals, training in using a treatment option for burns and ulcers harnessing the human body's own regenerative potential to treat burns and ulcers of all magnitudes

•1st International Burns and Ulcer Conference (12th Chinese conference) Nantong, China, with delegates and speakers from 27 countries that use this modality of treatment

• Key-note address was by Prof Ali Al Numairy, Vice President of the Arab Medical Union, World Vice president of the International College of Surgeons, President ICS UAE Section, President of Plastic Surgery Society – Emirates Medical Association. Director General and Head of Plastic & Aesthetic Surgery Dept. Gulf Specialty Hospital – Dubai

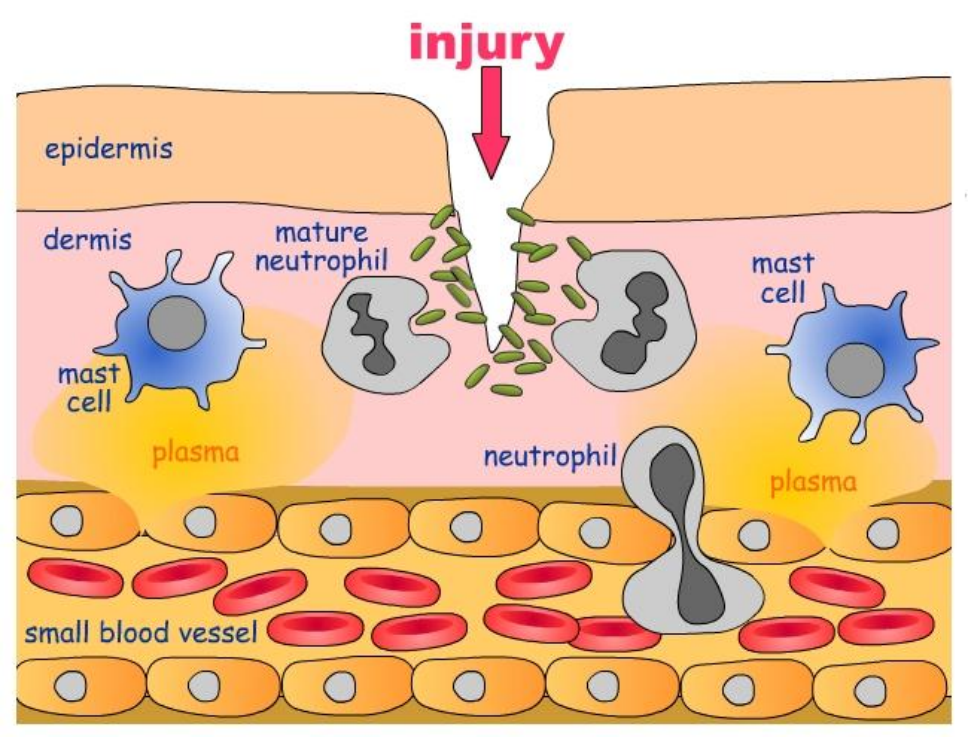

广州市中西医结合医院

Guanzhou Hospital for Integration of Traditional Chinese and Western Medicine and Huangpu Hospital, Zhongshan

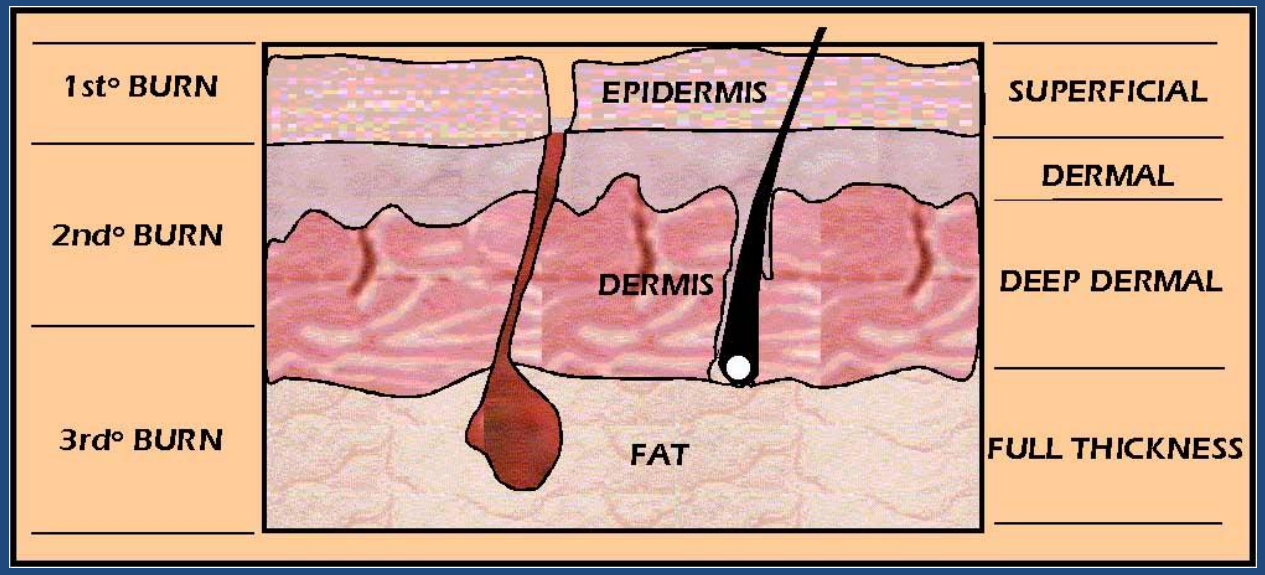
Tungwah Hospital


第十二届全国烧伤创疡学术会议暨首届国际烧伤创疡学术会议代表合影
Twelfth Chinese & First International Congress of Burns, Wounds and Ulcers Regenerative Medicine Congress of Burns, Wounds and Ulcers Regenerative Medicine Group Photo of Delegates
中国·南通 NanTong.China 2012.5.25
摄影：南通久久摄影设计有限公司 85510998

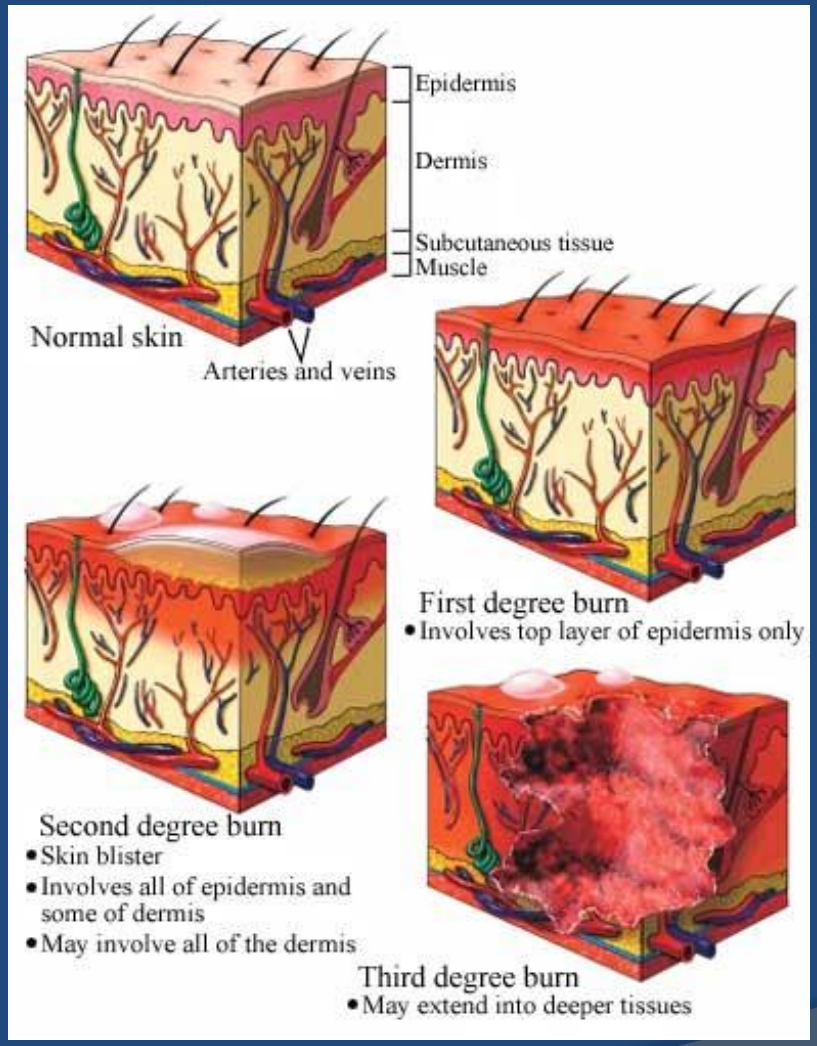
Burns and Wounds: Physiology



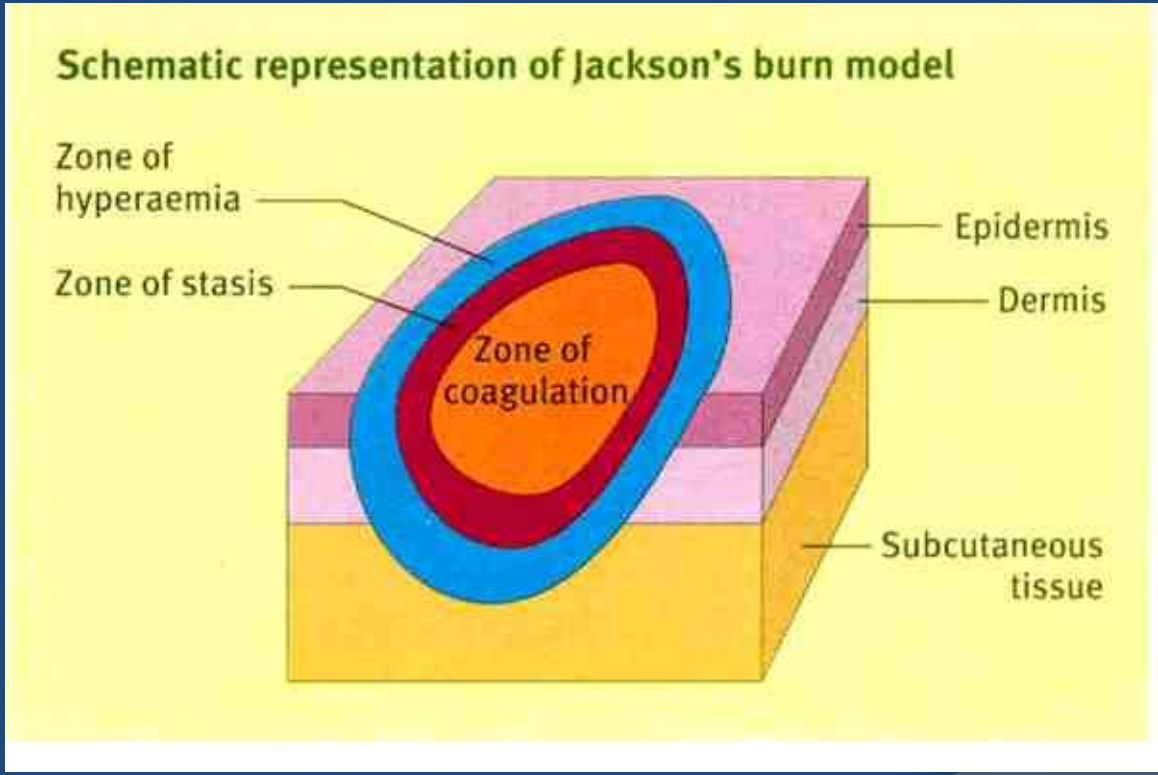
Thermal damage



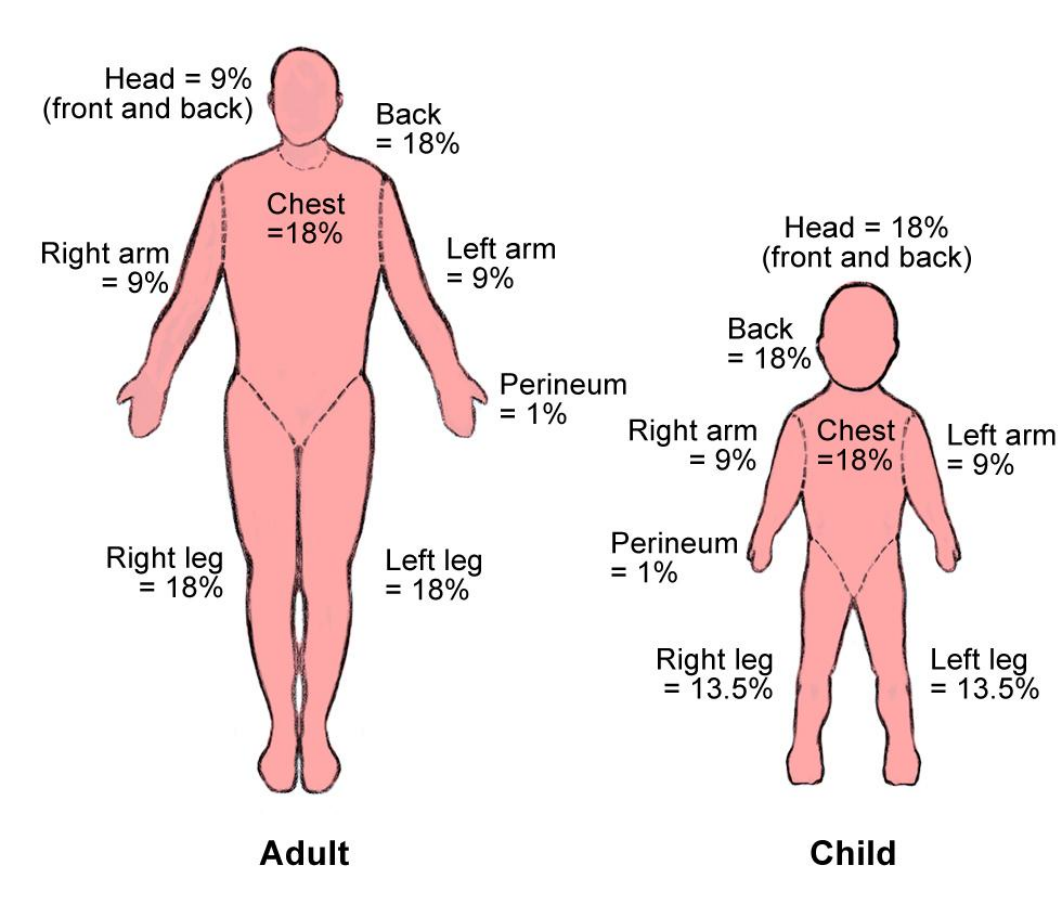
Burns


Epidermis
Dermis
Subcutaneous tissue
Muscle
Normal skin
Arteries and veins
First degree burn
• Involves top layer of epidermis only
Second degree burn
• Skin blister
• Involves all of epidermis and some of dermis
• May involve all of the dermis
Third degree burn
• May extend into deeper tissues

Thermal injury: Jackson's Zones



Thermal Damage: TBS - Rule of 9s

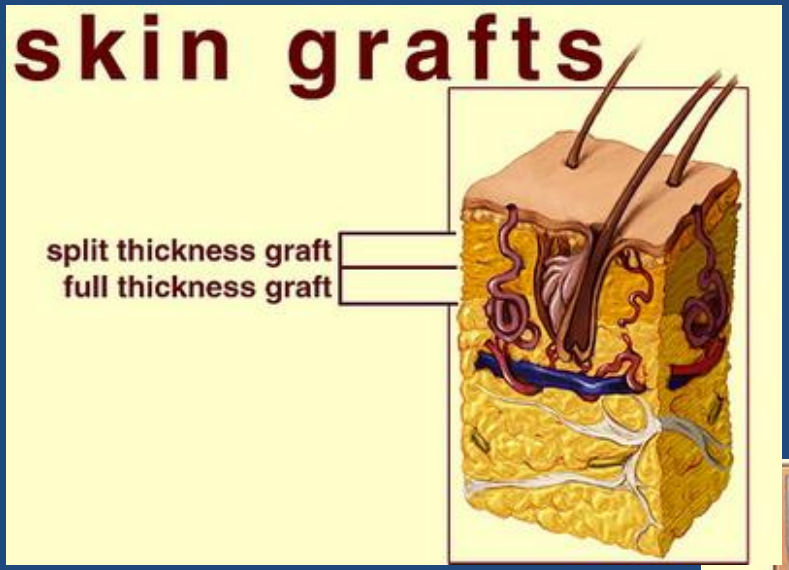


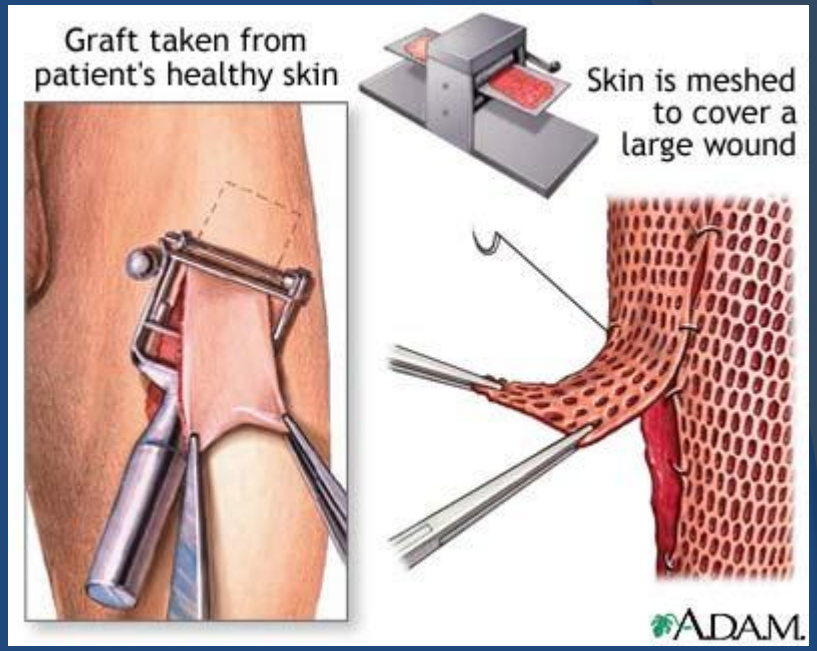
Wound and Burn Treatment Options

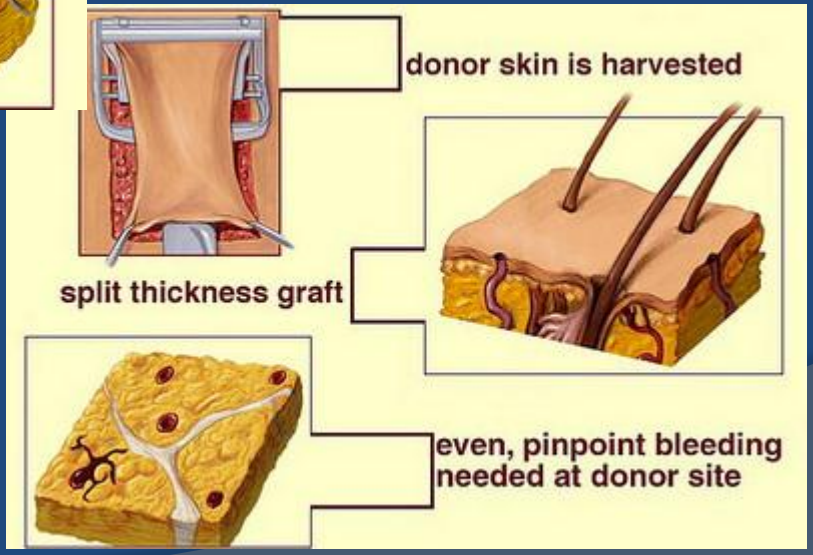
1. Surgery: Primary repair or secondary repair:

2. Skin grafts : Auto – Full thickness, partial thickness, meshed or Meek grafts
   Allo – Cadaver skin, donor skin, animal skin, placenta, various other biologicals

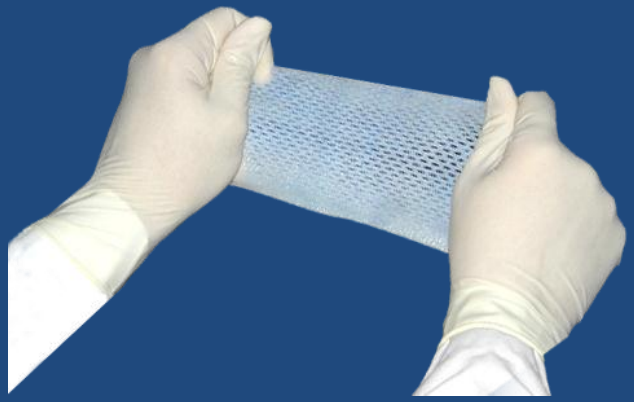
3. Facilitate physiological healing to take place:
   - Cover defect –
   - Dressings and coverings,:
     Allows secondary healing by primary intent, complicating factors, intrinsic and extrinsic:
     Slow, poor and non-healing wounds may result, though most actually heal well.

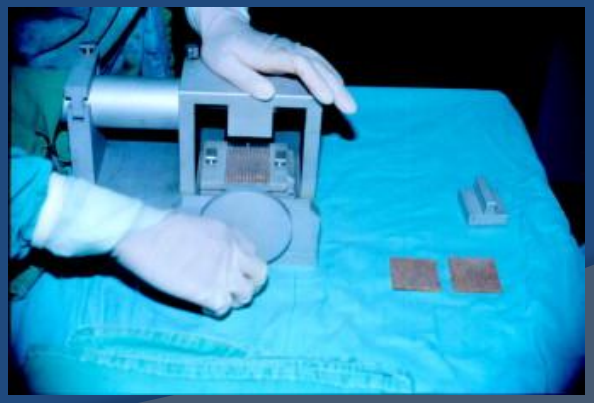

skin grafts
split thickness graft
full thickness graft


Graft taken from patient's healthy skin
Skin is meshed to cover a large wound
A.D.A.M.


donor skin is harvested
split thickness graft
even, pinpoint bleeding needed at donor site

Skin Grafts: Meek





Wound and Burn Treatment Options

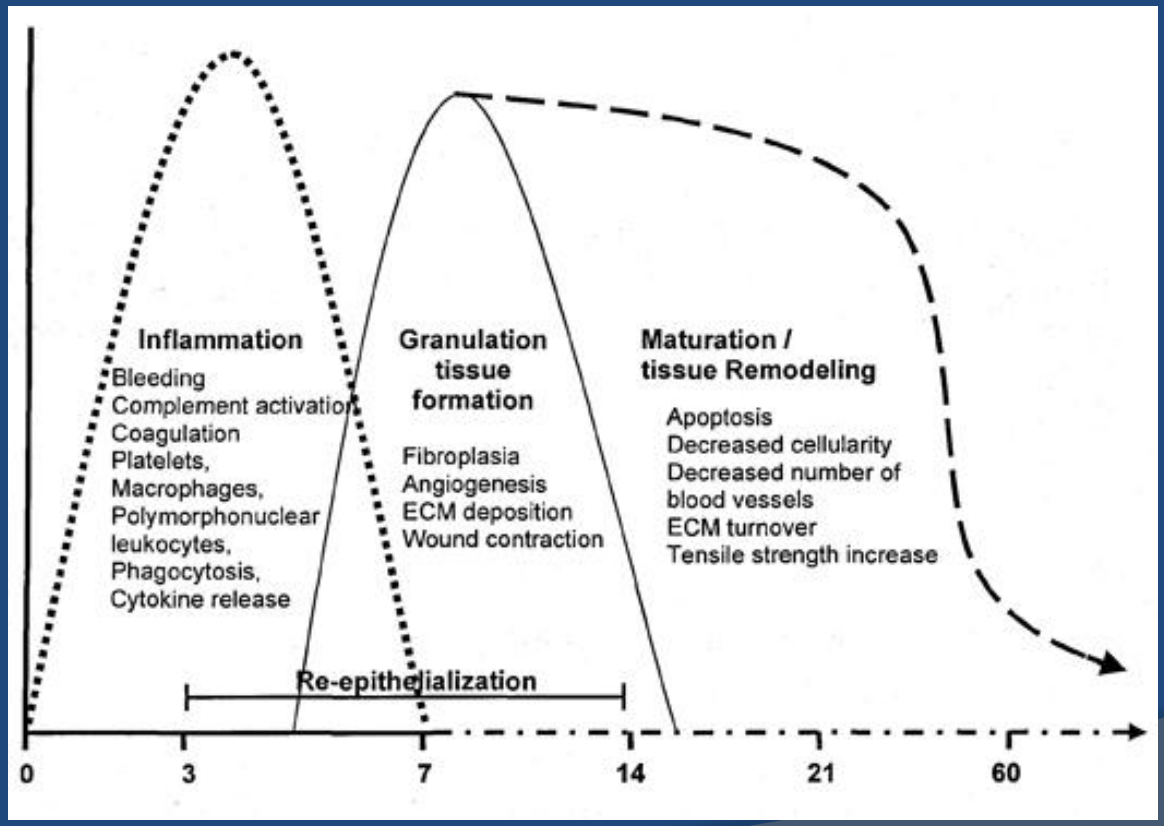
- **Stem Cell therapies**

1. Seed or cover defect with stem cells (auto or allo) – problem is survival of donated cells
2. Stimulation of own stem cells to regenerate (subject of today's talk)

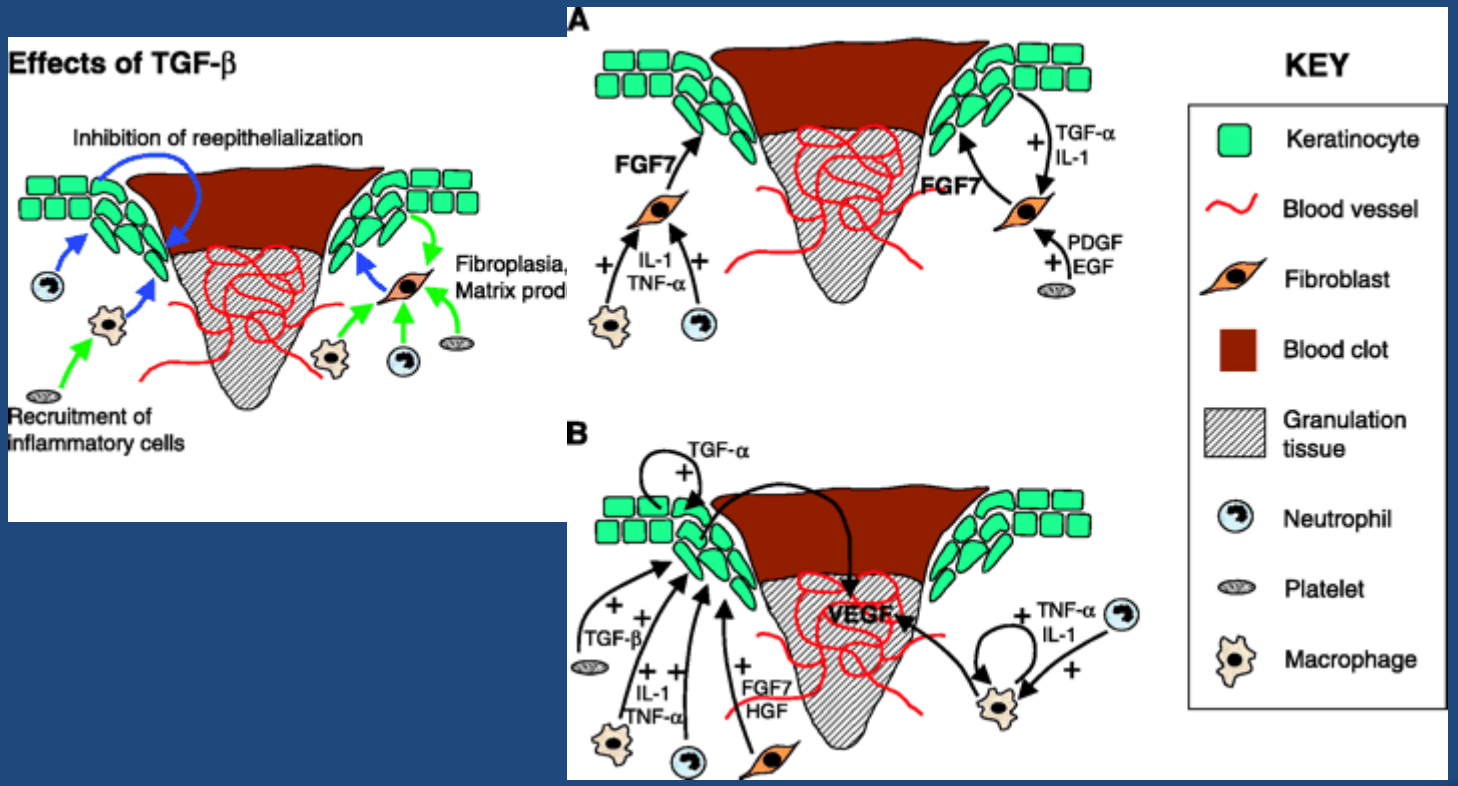
3. Combinations of therapies: Surgical and physical/physiological

4. Regeneration of tissue with use of novel surgical techniques and stem cell stimulation
    1. Saw-plough or sharp tension relieving technique
    2. Micro-implantation seeding graft technique

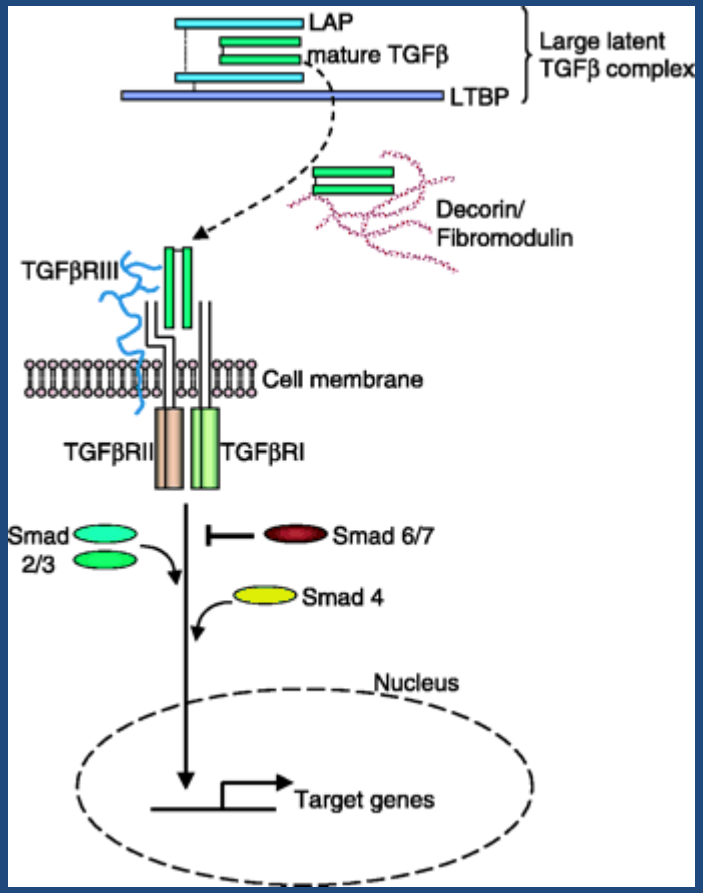
Burns and Wounds normal vs. delayed healing

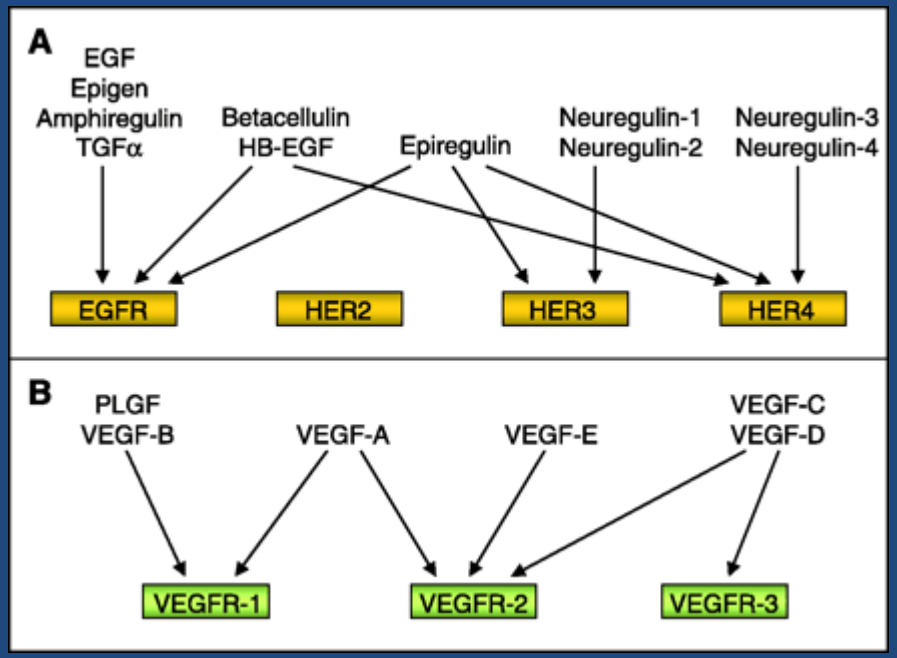


Burns and Wounds Natural Regeneration

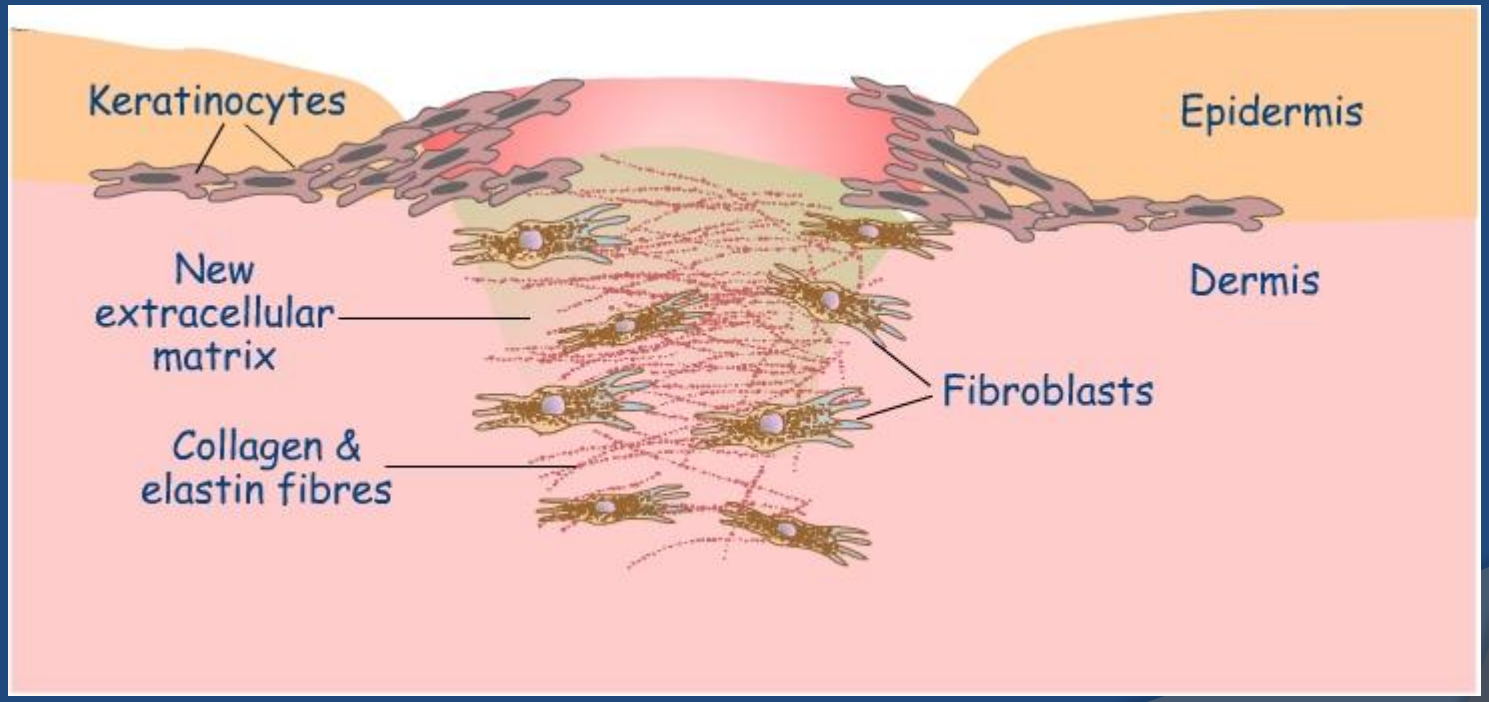


Burns and Wounds Natural Regeneration

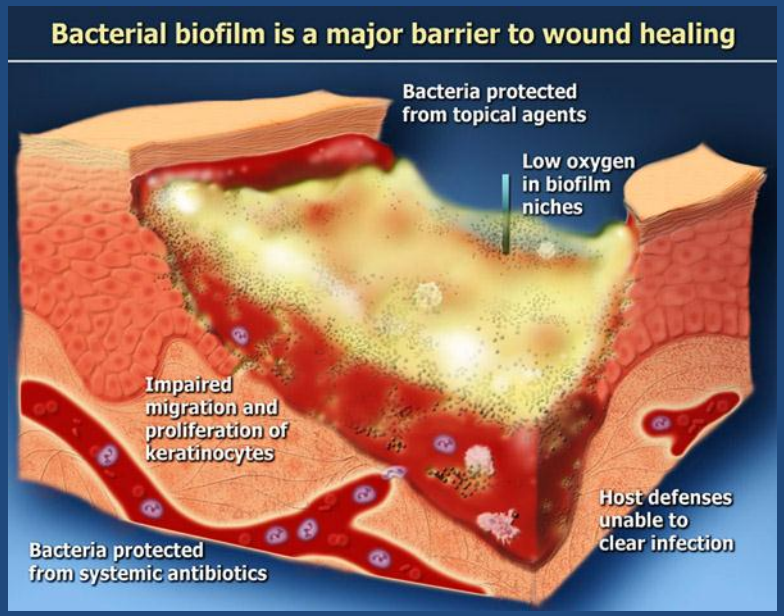


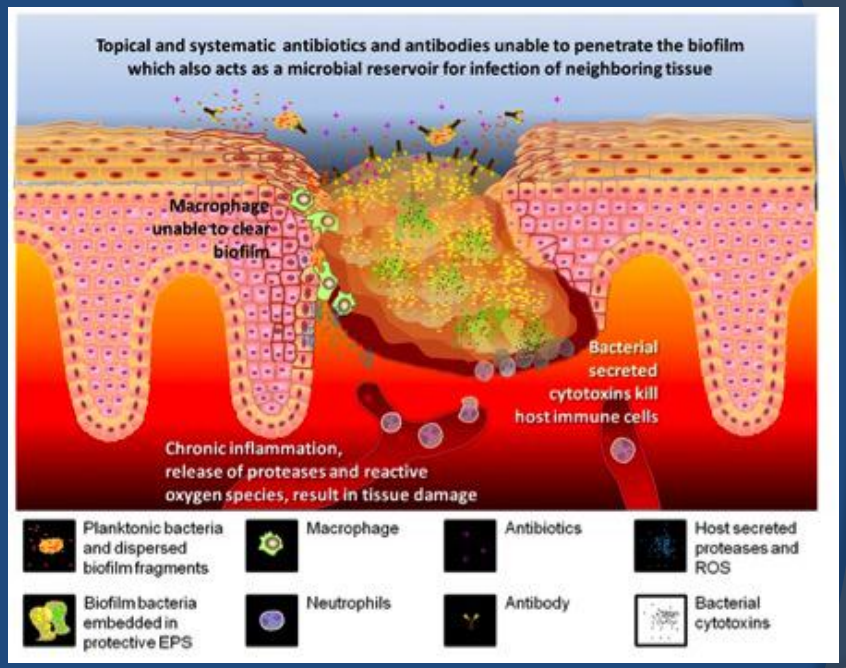


Burns and Wounds Natural Repair



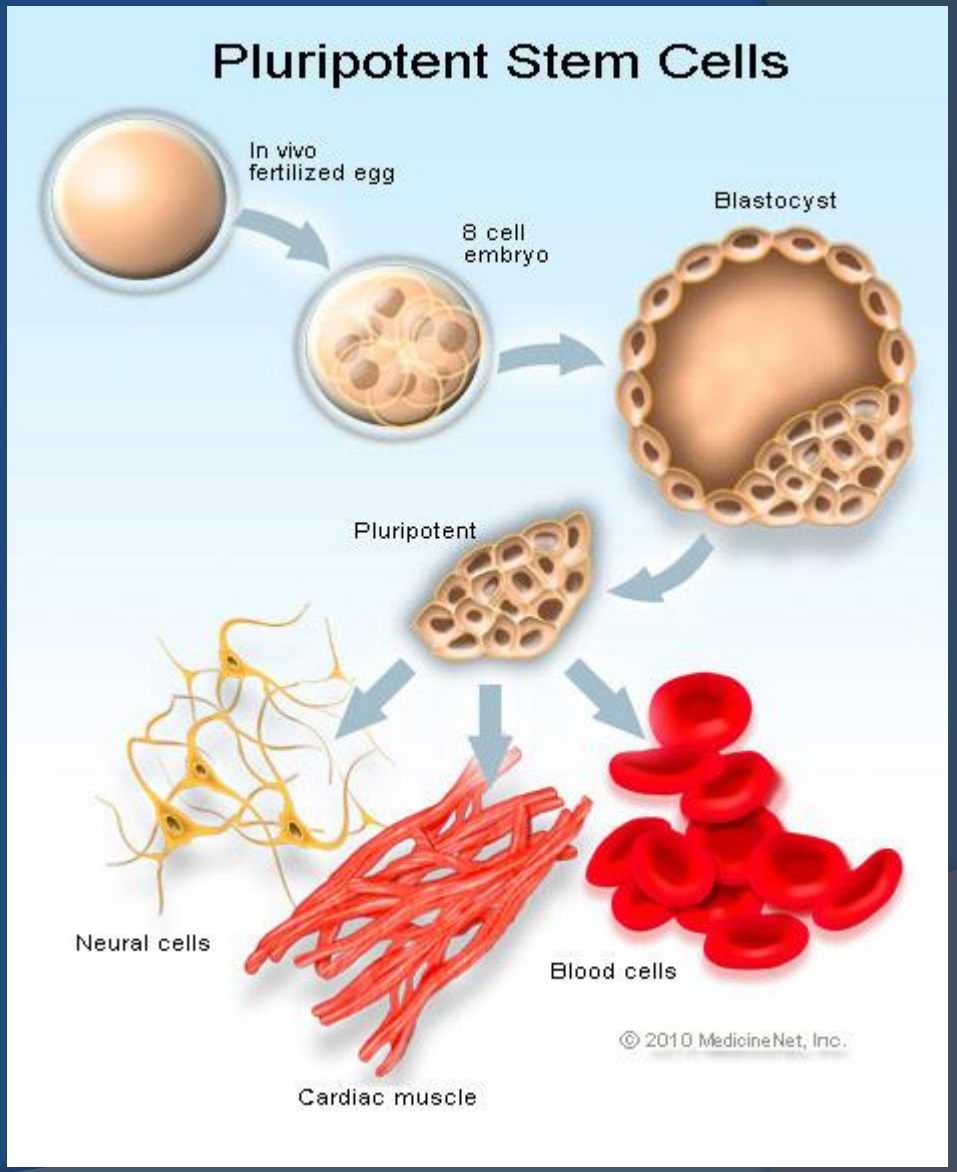
Burns and Wounds normal vs. delayed healing



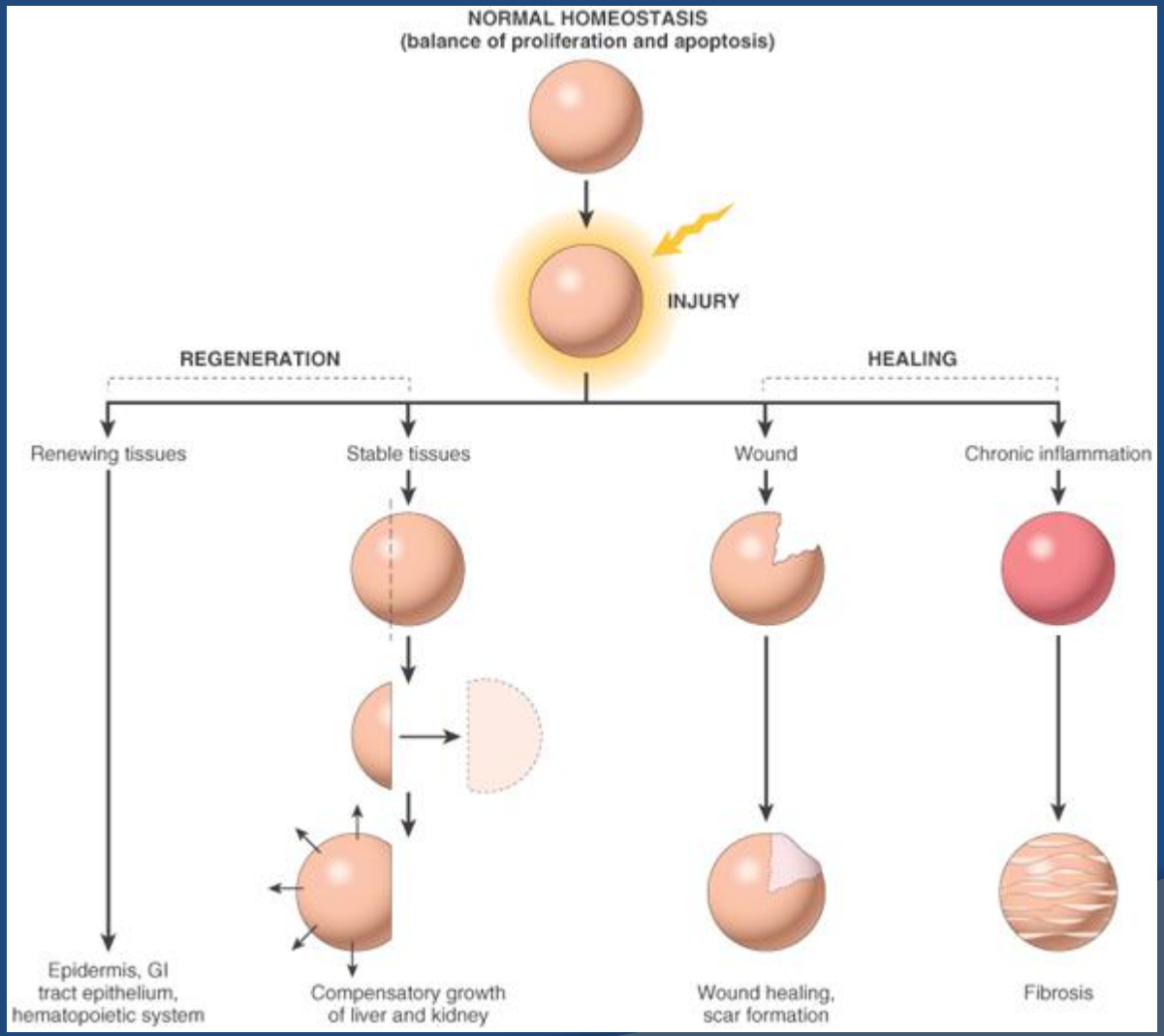


Early re-epithlialisation prevents early and later complications

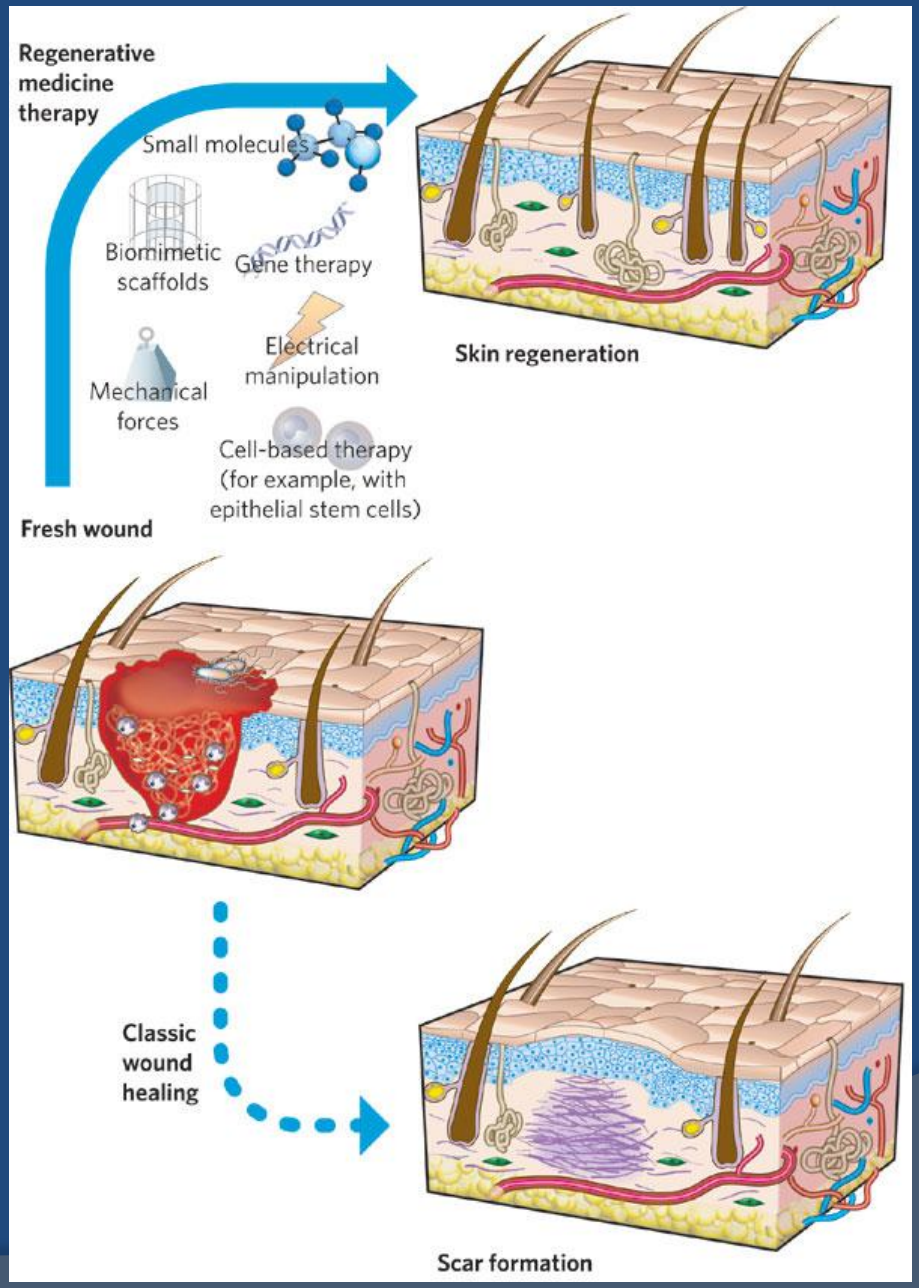
Stem Cell Basics



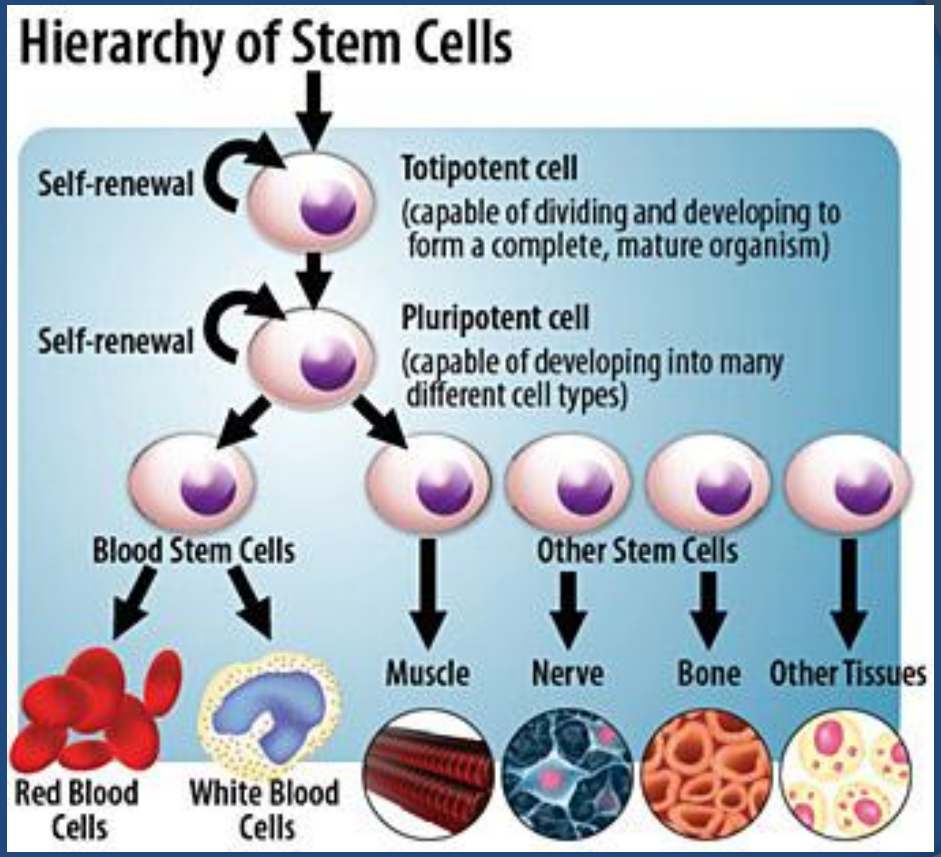
Stem Cell Basics



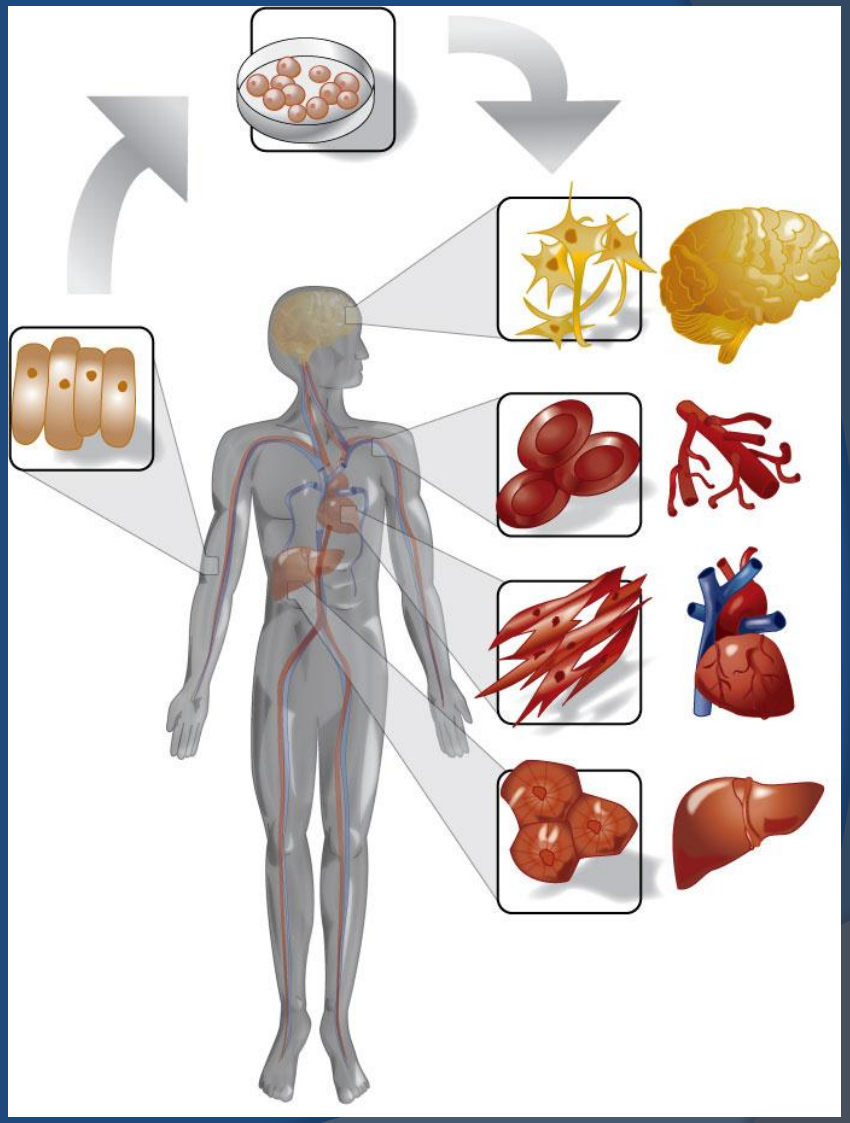
Stem Cell Basics



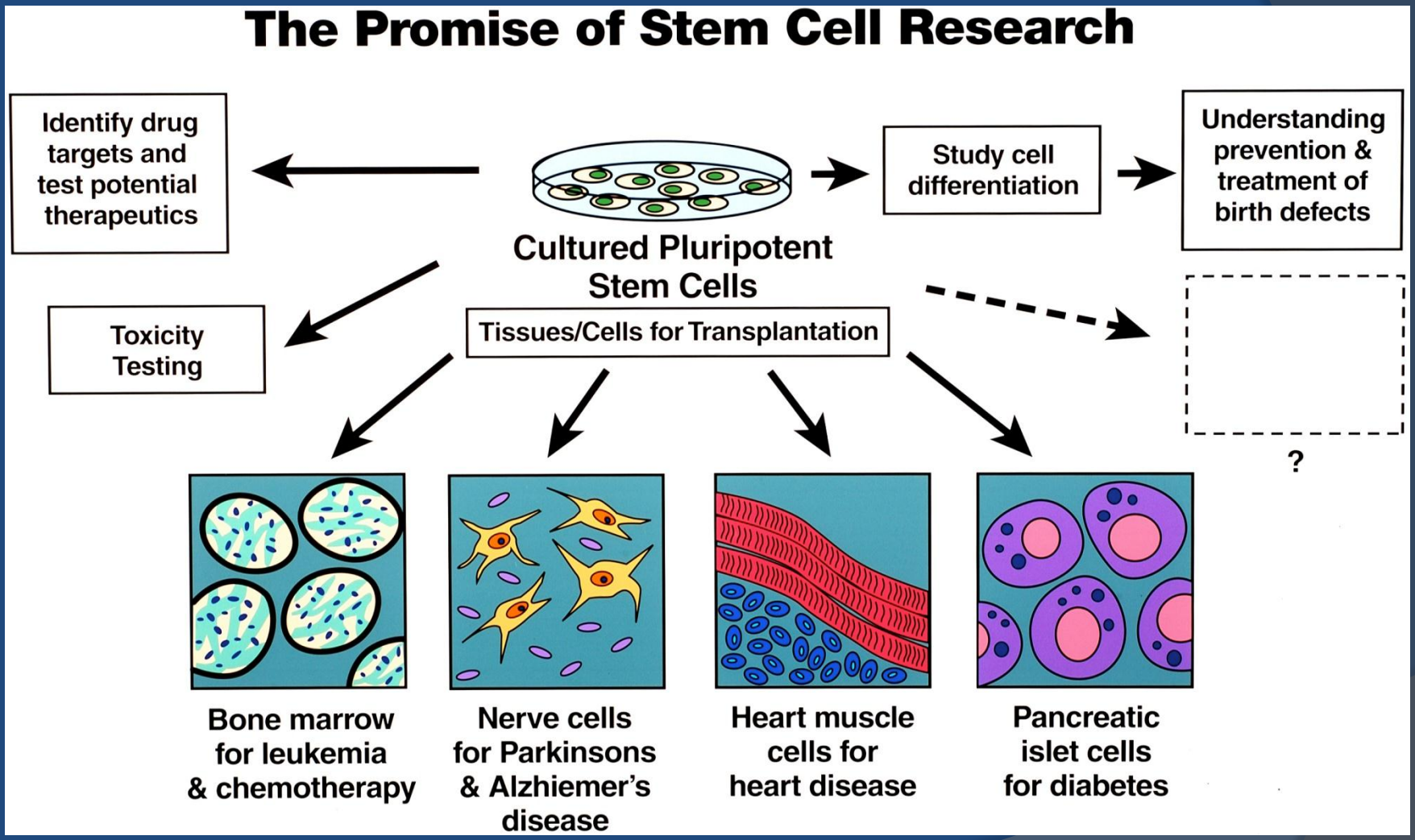
Stem Cell Basics



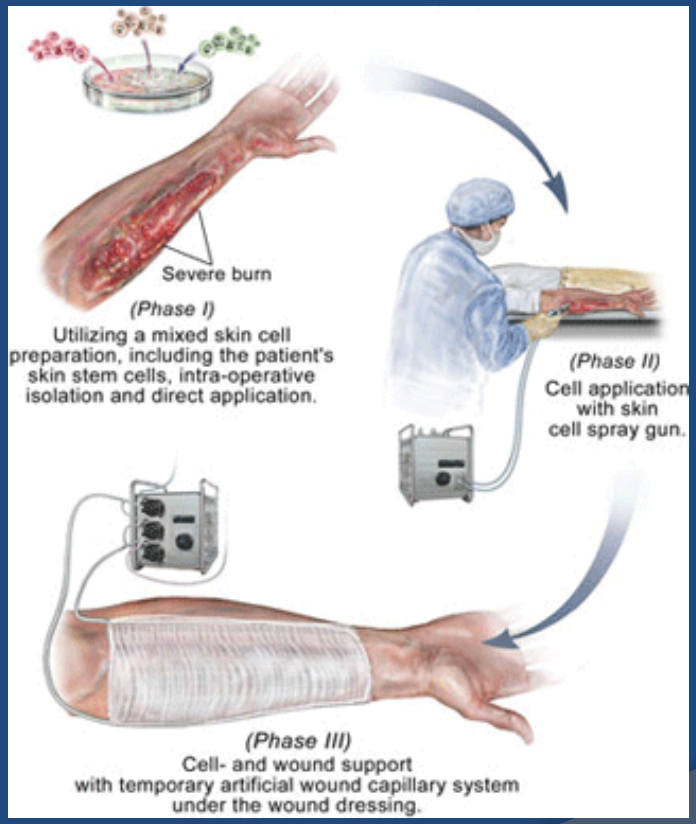
The “Holy Grail”



The Promise of Stem Cell Research

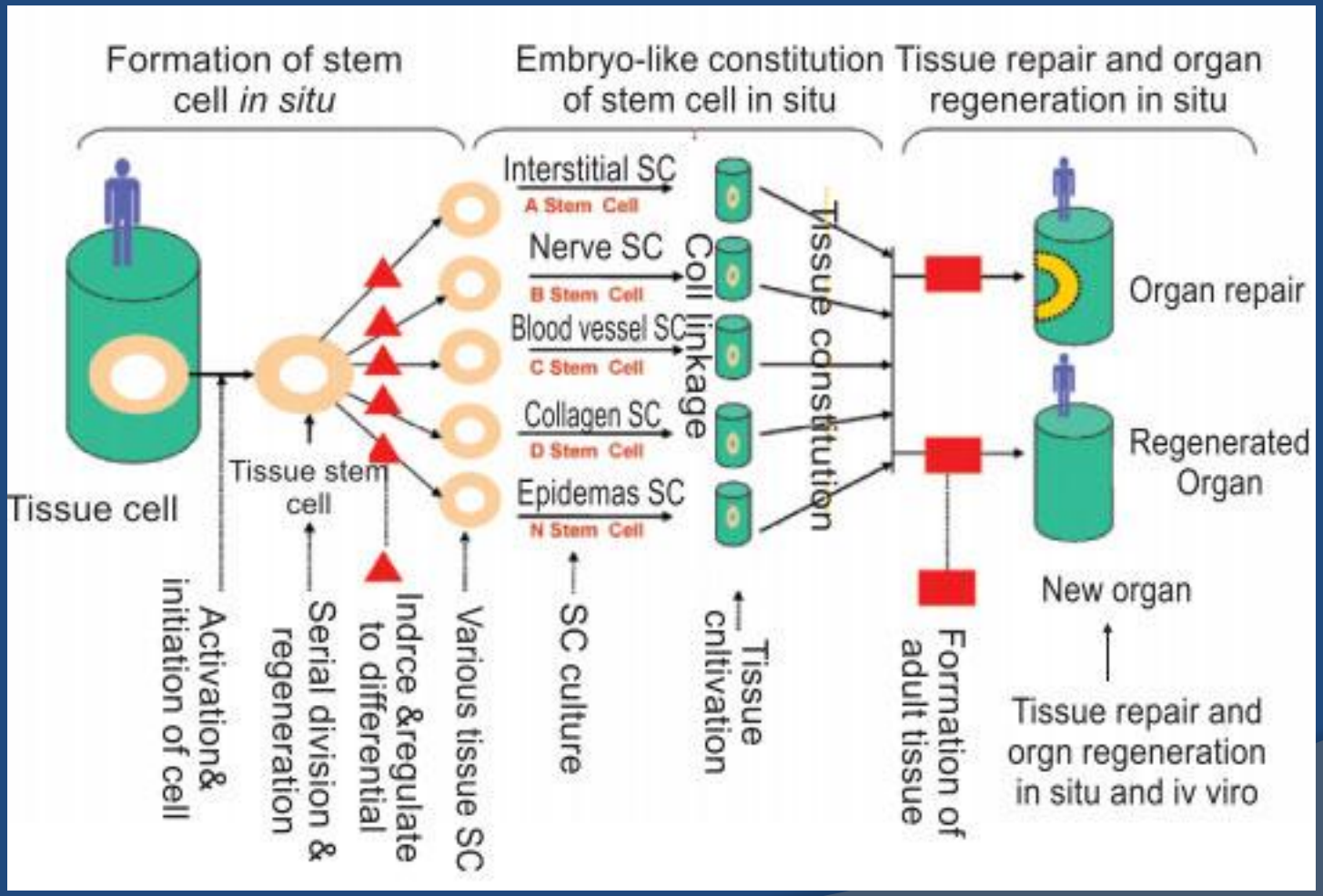


What is already available?



Auto cells, sprayed on.
Survivability, growth medium in vivo a problem

Activation of what we have



In Situ Skin Organ Regeneration

Fig. 1-1. Schematic illustrations of burn regenerative therapy.

Stem cell activation and initiation

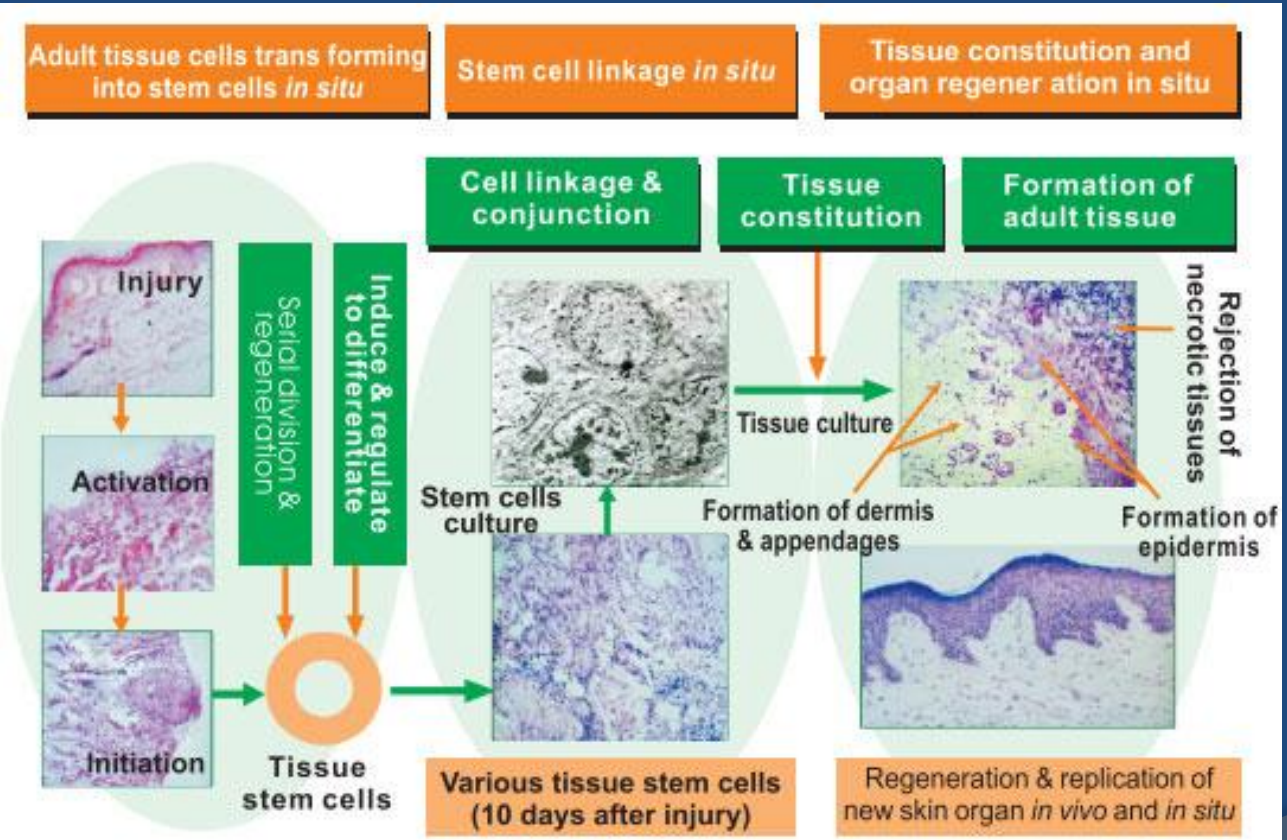
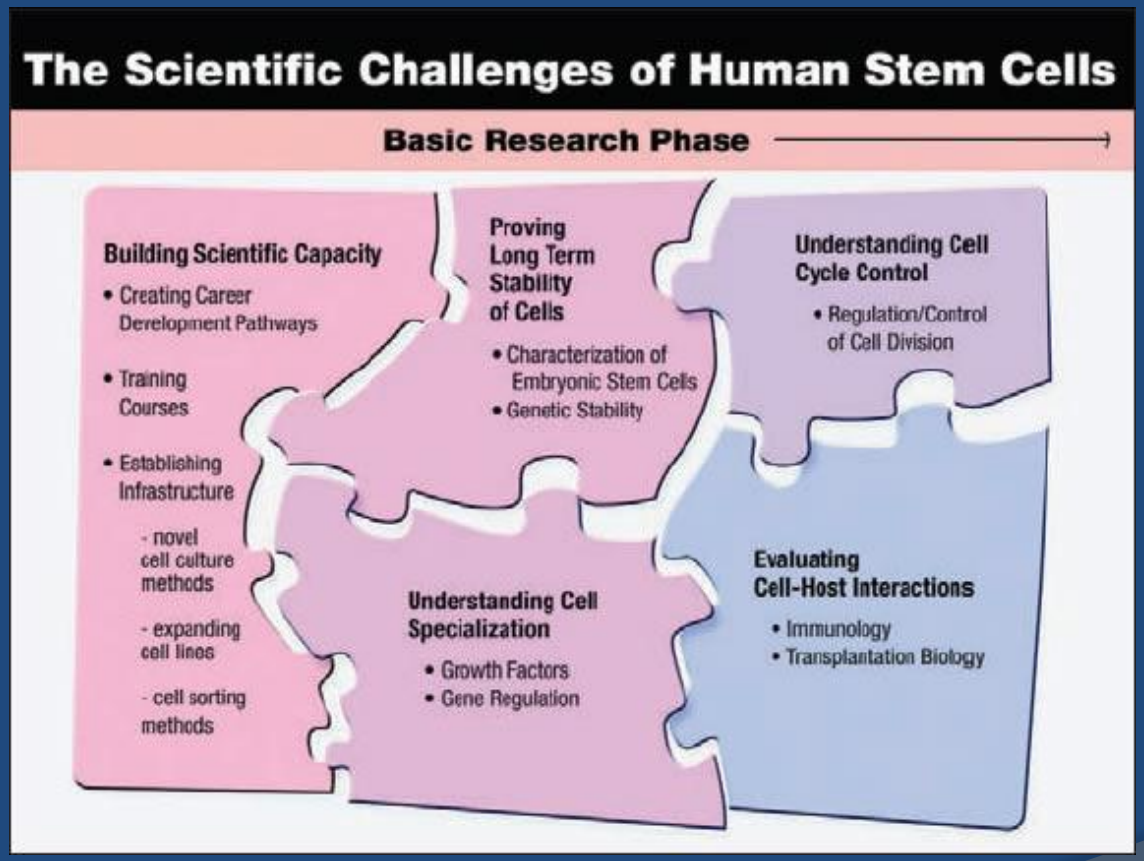


Fig.1-2.Histological Expression Process of Regeneration and Replication of Human Tissues and Organ*in situ* by PRCs and Stem Cells (Skin)

Challenges with extra-corporeal Stem-Cell therapies



Wound and Burn Dressings and Treatment Modalities

The sheer number of dressings available makes choosing the correct dressing difficult.

Wide variety of commercial products to choose from, which can lead to confusion and, sometimes, the wrong type of dressing for a particular wound.

Knowing the types of dressings available, their uses and when not to use a particular dressing may be one of the most difficult decisions in wound care management.

Although there are hundreds of dressings to choose from, all dressings fall into a few select categories.

The “ Ideal Dressing”

The 'Ideal Wound and Burns Dressing or treatment' should:

- Maintain a moist environment at wound interface (prevents dessication)
- Remove excess exudate without allowing 'strike through’ to surface of dressing (drainage)
- Provide thermal insulation and mechanical protection (barrier)
- Act as a barrier to micro-organisms/ bateriocidal / bacteriostatic
- Allow gaseous exchange and oxygenation of tissues
- Be no adherent and easily removed without trauma
- Leave no foreign particles in wound
- Be non-toxic, non-allergenic and non-sensitising
- Be cost effective and simple to use and choose
- Provides analgesia
- Promotes cell differentiation

Dressings

Gauze Dressings (Impregnated or plain)

Made of woven or non-woven materials and come in a wide variety of shapes and sizes.

Pros: Readily available; may be cheaper than other dressing types; can be used on virtually any type of wound.

Cons: Frequently change, which may add to overall cost; may adhere to the wound bed; must often be combined with another dressing type; often not effective for moist wound healing.

Dressings

Transparent Films

allow oxygen to penetrate through the dressing to the wound, while allowing moisture vapor to be released. Generally composed of a polyurethane material.

Pros: conforms to the wound well, can stay in place for up to one week; aids in autolytic debridement; prevents friction against the wound bed; does not need to be removed to visualize the wound; keeps the wound bed dry and prevents bacterial contamination of the wound.

Cons: may stick to some wounds, not suitable for heavily draining wounds, may promote wound maceration due to its occlusive nature, glue allergies.

Dressings

Hydrocolloids
- Matrix of cellulose and other gel forming agents - gelatin and pectin
- Occlusive dressing
- Should be avoided if infection particularly with anaerobic organisms
- Promotes autolysis and aids granulation
- Can remain in place for up to a week
- Over-granulation can occur

Alginates e.g. Kaltostat
- Calcium and sodium salts of alginic acid obtained from seaweed
- Highly absorbent
- Useful in medium to heavily exudating wounds
- Secondary covering is required
- Forms a gel in contact with wound exudate

Dressings

Foam dressings

- Useful for moderately exudating wounds
- Prevents 'strike through' of exudate to wound surface
- Desloughs wounds by maintaining a moist environment

Hydrogels e.g. Intrasite Gel

- High water content creates a moist wound surface
- Debrides wounds by hydration and promotion of autolysis
- Will absorb a light exudate
- Not appropriate for heavily exudating wounds

Dressings

Foams
are less apt to stick to delicate wound beds, are non-occlusive and are composed of a film coated gel or a polyurethane material which is hydrophilic in nature. Use on: pressure ulcers, minor burns, skin grafts, diabetic ulcers, donor sites, venous ulcers.

Pros: comfortable, won't adhere to the wound bed, and highly absorbent; allow for less frequent dressing changes, depending on the amount of wound exudate; come in many shapes and sizes.

Cons: may require a secondary dressing to hold the foam in place; if not changed often enough may promote peri-wound maceration; cannot be used on wounds with eschar or wounds that are not draining; some foams may not be suitable for certain wounds, such as those that are infected or are tunneling.

Dressings

Hydrocolloids
Very absorbent and contain colloidal particles such as methylcellulose, gelatin or pectin that swell into a gel-like mass when they come in contact with exudate. They have a strong adhesive backing.

Pros: encourage autolytic debridement; provide insulation to the wound bed; waterproof and impermeable to bacteria, urine or stool; provide moderate absorption of exudate

Cons: leave a residue present in the wound bed which may be mistaken for infection; may roll over certain body areas that are prone to friction; cannot be used in the presence of infection.

Dressings

Alginates
contain salts derived from certain species of brown seaweed. May be woven or nonwoven and form a hydrophilic gel when they come in contact with exudate from the wound. Use on: venous ulcers, wounds with tunneling, wounds with heavy exudate.

Pros: highly absorbent; may be used on wounds that have infection present; are non-adherent; encourage autolytic debridement.

Cons: always require a secondary dressing, may cause desiccation of the wound bed, as well as drying exposed tendon, capsule or bone (should not be used in these cases).

Dressings

Debriding agents and local antiseptics

- Remove escar and necrotic tissue
- Do not maintain moist environment
- Need frequent changes
- Varidase = streptokinase
- Acerbine = malic, benzoic and salicylic acids in a cream base
- Damages granulation tissue and delays healing
- Detrimental to all stages of burn and wound repair (Ischaemia, necrosis, sloughing and healing)

Dressings

Composites or combination dressings
May be used as the primary dressing or as a secondary dressing.
These dressings may be made from any combination of dressing types, but are merely a combination of a moisture retentive dressing and a gauze dressing.

Pros: widely available; simple for clinicians to use.

Cons: More expensive and difficult to store; less choice/flexibility in indications for use.

Dressings

Other dressings available on the market include:

Dressings containing silver or other anti-microbals, such as povidone iodine, charcoal dressings and biosynthetic dressings.

MEBO/MEBT

“Moist Exposed Burn Ointment and Moist Exposed Burn Treatment”

Botanical formulation consisting of multiple botanic components, nutritional ingredients suspended in a patented dosage form with net-frame structure.

What does it do ?

Action of MEBO

- Analgesia within 5-10 minutes
- Absorbs residual heat when used in burns
- Isolates the burn wound
- Liquifies and removes necrotic tissue gently
- Inhibits microbal growth
- Anti-inflammatory action
- Activates dormant stem cells in depth of wound and surrounding tissue
- Repairs and maintains damaged but potentially viable cells by direct cell nutrition
- Improves and speeds up healing
- Reduces scarring

What is It?

Topical ointment for burns, wounds and ulcers

Natural ingredients:

1. Sesame oil
2. Beeswax
3. 3 edible herbs, which provide β-sitosterol, 18 natural amino acids, 4 essential fatty acids, vitamin E, and polysaccharides, berberine, baicalin
4. Developed in the 1980s by Prof Rongxiang Xu for use in skin burns
5. Covers many (if not all) of the “Ideal wound treatment”

What is in it ?

Botanicals:

- Amur Cork Tree*(Phellodendron amurense)*
  - *Beta sitosterol* (Plant sterol: anti-inflammatory)

What is in it ?

- Golden Thread Rhizome *(Coptis chinensis)*
  Berberine (Alkaloid: Antioxidant, antimicrobal, antibacterial, vasodilator)

What is in it ?

- Blue Skullcap *(Scutellaria baicalensis)*
  - Flavinoid: Anti-thrombotic, Anti-oxidant, Anti-bacterial, Anti-inflammatory

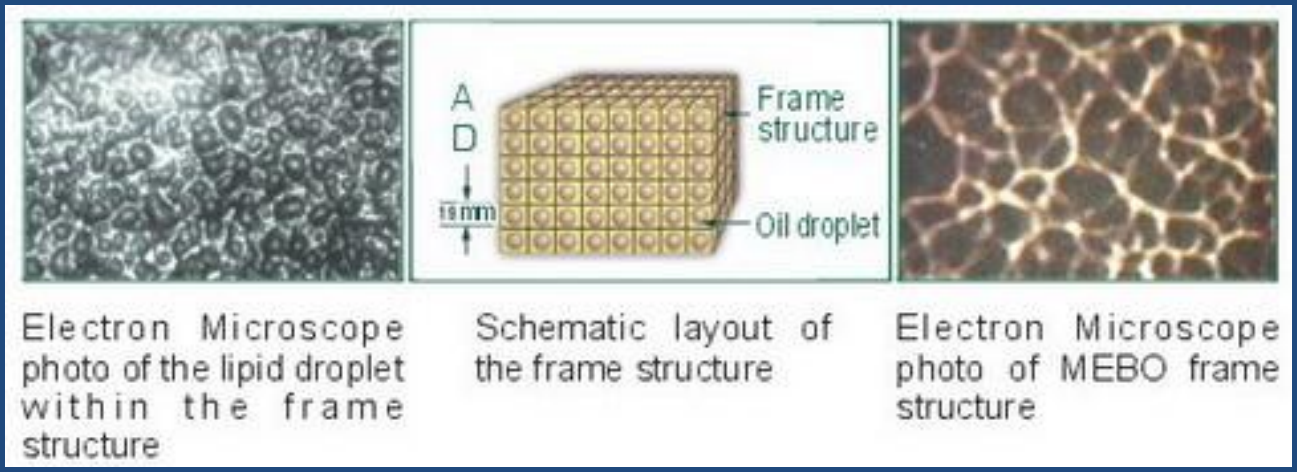
What is in it?

Beeswax:

- Provides energy, Absorbs heat,
- Allows Gaseous exchange, Preservative, suspension matrix

Sesame Oil: Emolient and carrier oil

How does it work?



Electron Microscope photo of the lipid droplet within the frame structure

Schematic layout of the frame structure

Electron Microscope photo of MEBO frame structure

Action

- Covers wound, maintains moist environment
- Does not allow serous exudate to form
- Allows liquefaction and removal of damaged and necrotic tissue
- Prevents microbal growth and colonisation
- Good analgesia

Action

- Stimulates own K-19 stem cells to regenerate, and not to degenerate into fibroblasts after 60 generations
- Carries nutrients to potentially viable cells, allowing cells in stasis zone of burn to recover
- Stimulates PRC cells and existing stem cells to regenerate skin organs in situ (Angiogenesis, epithelo- and neurogenesis)

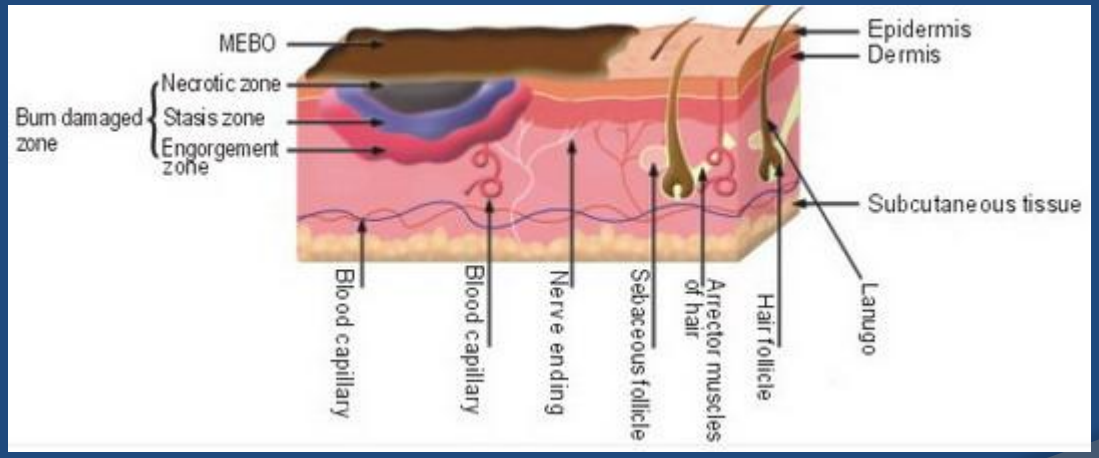
What is liquefaction?

Process of auto-debridement whereby dead and non-viable tissue is

1. Enclosed in oil
2. Hydrolysesd,
3. Epidermolysed
4. Rancidified
5. Saponified
6. Esterified
7. Liquified
8. Shed and discharged from the viable skin

How does it give pain relief

1. Relaxes the contraction of arrector muscles of the hair follicle due to nociceptor stimuli
2. Barrier function on exposed nociceptors
3. Fatty acids protect exposed and injured nerve endings
4. Pain typically relieved in 5-10 minutes



Pros: Outcomes

Early re-epithelialisation

leads to improved healing rates and less complications

reductions in

- Pain
- Disability
- Scarring
- Expense of treatment
- Patient survival
- Hospitalisation

Pros:

- Simple to apply, patients can treat small or simple wound themselves
- One ointment does all the jobs
- No difficult algorythms or multiple products
- No expensive dressing materials
- Patient satisfaction
- Easy to learn techniques
- Removes anaerobe smell
- Curtails weeping/exudate from wounds

Cons

- Allergy/sensitivity – relatively rare, a risk with any product
- Smell of carrier oil – food association for some
- Do need some training, not usual wound management procedures
- Frequency of dressing changes compared to some products
- Impregnated gauze dressing not available in NZ and Aus yet
- Middle-man profit when patient buys OTC
- Not funded as yet

MEBT/MEBO in Burns

“ Moist exposed burn treatment with MEBO”

Innovative form of burns treatment reducing the need for skin grafts, with excellent cosmetic outcomes
Extensive work and international experience in this field, also in the use in limb ulcers, especially diabetic foot ulcers(DFU)
105 Burns Centres, 4500 hospitals across China use MEBO/MEBT as first-line treatment for all degrees of burns
Extensively used in Middle-East, Singapore, Indonesia, Malaysia, Phillipines, Tunisia
Huge evidence base, lot of initial research published in Chinese, for many years a language bias in literature
Large body of work in English, French, German and Greek, multi-centre trials

About MEBO/MEBT

- Available in NZ for 10 years as topical application and wound dressing
- FDA registered, now in phase 2 trials, when passed will be the first (modern) botanical compound to be registered as a drug in US
- Patented across the globe
- The pharmacist's "little secret" for burns, wounds and ulcers
- Without any advertisement the 8th best seller OTC in pharmacies across NZ

- Well tolerated. Contra-indication: Sesame allergy, or allergy to specified botanicals
- No significant adverse reactions other than topical sensitivity documented in NZ. Local dermatitis or sensitivity only recorded adverse outcomes.
- No systemic adverse reactions documented, but in theory, like anaphylaxis due to nut or sesame allergy would be a possibility

Technique

See Slideshow separate

Superficial/Partial thickness burns

- 1st Degree: MEBO treatment: Regenerates skin in 3-5 days.
- Can cover/leave open. Quick analgesia.
- Apply 1-2mm thick. If left open change ointment 3 x per day , if simple with occlusive dressing, 1-2 x per day to daily.
- Do not use saline or antiseptics on wound.
- Simply dab away (with gauze) any excess MEBO, apply fresh dressing.

Superficial/Partial thickness burns

- 2nd Degree Superficial/Partial thickness.

- Superficial blistering of skin, peels easily.
- Maintain blistered skin as long as possible (5-7 days. Own skin is still the best cover)
- Can drain blister fluid. (Always a contentious issue, this one.)
- Maintain moist environment by ointment or dressings. Apply 1-2mm thick, change 2-3 x per day initially.
- Dab, don't press or wipe away.
- On D3-7 a yellow, fibrous isolation membrane will appear. This is NOT infection. This is NOT maceration. This is NOT an escar. Do not allow this to dry out. Keep applying ointment. This will slough off 4-6 days later.
- Continue with MEBT/MEBO for 7-10 days later, when full healing will take place.

Superficial Type (Deep 2nd Degree)

Characteristic: Thick blistering of skin, burn down to reticular layer of skin
Does not peel easily.
Apply MEBO/MEBT 1-2mm thick. Drain blister fluid, debride blisters at D5-7. Liquefaction will set in D6-15. This will produce a milky, white-yellow exudate, easily mistaken as infection. NB: Check for other systemic signs of infection.
Procedure aims: 2x sets of 3's:

1. No pain
2. No bleeding
3. No damage to regeneration or healthy tissue.

4. No necrotic tissue left on wound
5. No liquefaction left on wound
6. No excess used (spent) MEBO left on wound

Deep Second degree and Third degree burns

Deep 2nd: Burns down to dermal layer, and basement membrane: subcutaneous tissues and glands still viable.
3rd Degree: Severe injury with escar formation, full thickness burns with deep tissue destruction.

These will likely require hospital level treatment in NZ, and not be treated in the community, and do fall within the scope of my talk. Treatment with MEBO/MEBT differs substantially from that practiced in conventional western medicine.

I would be happy to discuss their management with MEBT/MEBO in the hospital setting with interested colleagues

Diabetic Foot Ulcers

Global status of DFU:

Skin ulcers account for 37 million cases per annum.

Diabetic ulcers are the largest portion (14.5 million)

Annual growth rate of 9% (International Diabetes Federation estimates)
Lifetime chance of DFU 15%

Of these 14-24% progress to amputation
5 year All-cause Mortality 80% post amputation

Burden of DFU

DFU treatment cost: U$17 500–$27 000 per case

Direct medical care of DFU in US: ~$9 billion

Major amputation: ~$50,000

Annual total cost of LEA~$1.6 billion

NZ costs and statistics not available at time of wring

Treatment of DFU

Multidisciplinary：(if PN, PAD)

- Systemic treatment：Blood sugar, hyperlipemia, smoking
- Surgical intervention: Sharp debridement, revascularisation
- Local treatment :

Infection management

Revascularization

Pressure alleviation (Unloading)

Debridement, dressing, moist environment

Compression where appropriate

Treatment options

1. Conservative:
2. Petroleum gauze, Normal Saline, Povidone Iodine, silver based dressings
3. AMWT: Alginate, hydrogels, hydrocolloids, silicone coated foam
4. Adjunctive strategies:
5. Negative pressure wound therapy (NPWT), Hyperbaric Oxygen
6. Biopharmaceutical: Growth factors and artificial skin products.
7. Surgical: skin grafting, flap coverage
8. MEBT/MEBO: Wound cleaning agent/stem cell stimulation medium

Systematic review and mixed treatment comparison: dressings to heal diabetic foot ulcers

- 15 eligible studies, evaluating 9 dressing types. (hydrogel, foam dressings, hydrocolloid-matrix, alginate, iodine)
- 10 head-to-head treatment comparisons

Conclusion:

- More expensive dressings may offer no advantages in terms of healing than cheaper basic dressings. (60%)
- Evidence in favour of 'advanced' dressing is of very low quality
- No probability of being the 'best' treatment in any sensitivity analysis.

Diabetologia
DOI 10.1007/s00125-012-2558-5

SYSTEMATIC REVIEW

Systematic review and mixed treatment comparison: dressings to heal diabetic foot ulcers

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Received: 23 December 2011 / Accepted: 19 March 2012

Abstract
Aims/hypothesis Foot ulcers in people with diabetes are a common and serious global health issue. Dressings form a key part of ulcer treatment. Existing systematic reviews are limited by the lack of head-to-head comparisons of alternative dressings in a field where there are several different dressing options. We aimed to determine the relative effects of alternative wound dressings on the healing of diabetic foot ulcers.
Methods This study was a systematic review involving Bayesian mixed treatment comparison. We included randomised controlled trials evaluating the effects on diabetic foot ulcer healing of one or more wound dressings. There were no restrictions based on language or publication status.
Results Fifteen eligible studies, evaluating nine dressing types, were included. Ten direct treatment comparisons were made. Whilst there was increased healing associated with hydrogel and foam dressings compared with basic wound contact materials, these findings were based on data from small studies at unclear or high risk of bias. The mixed treatment comparison suggested that hydrocolloid-matrix dressings were associated with higher odds of ulcer healing than all other dressing types; there was a high degree of uncertainty around these estimates, which were deemed to be of very low quality.
Conclusions/interpretation These findings summarise all available trial evidence regarding the use of dressings to heal diabetic foot ulcers. More expensive dressings may offer no advantages in terms of healing than cheaper basic dressings. In addition, evidence pointing to a difference in favour of 'advanced' dressing types over basic wound contact materials is of low or very low quality.

Keywords Diabetic foot ulcers · Dressings · GRADE · Meta-analysis · Mixed treatment comparison · Systematic review

Abbreviations

BNF	British National Formulary
CrI	Credible interval
DIC	Deviance information criterion
GRADE	Grading of Recommendations Assessment, Development and Evaluation
MTC	Mixed treatment comparison
NHS	UK National Health Service
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RCT	Randomised controlled trial
SUCRA	Surface under the cumulative ranking

Background

Foot ulcers in people with diabetes are a common, serious and costly global health issue [1]. In 2007, the mean total reimbursement cost for a US Medicare patient with a

Electronic supplementary material The online version of this article (doi:10.1007/s00125-012-2558-5) contains peer-reviewed but unedited supplementary material, which is available to authorised users.

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Published online: 29 April 2012

Springer

MEBO/MEBT in DFU

Grade I

Case 1

Female, 33y， diabetes 10 years, left forearm abraded by machine

SD-AG

6 months unhealed

Treatment with MEBT/MEBO

Healed in 25 d

Case 2:
Female, 38y, diabetes, R foot trauma during earthquake, chronic infected ulcer

Conventional dressing

3 month unhealed

MEBT/MEBO

Healed in 17d

Shifang Burn Hospital, Dr. Wang Jian-xue

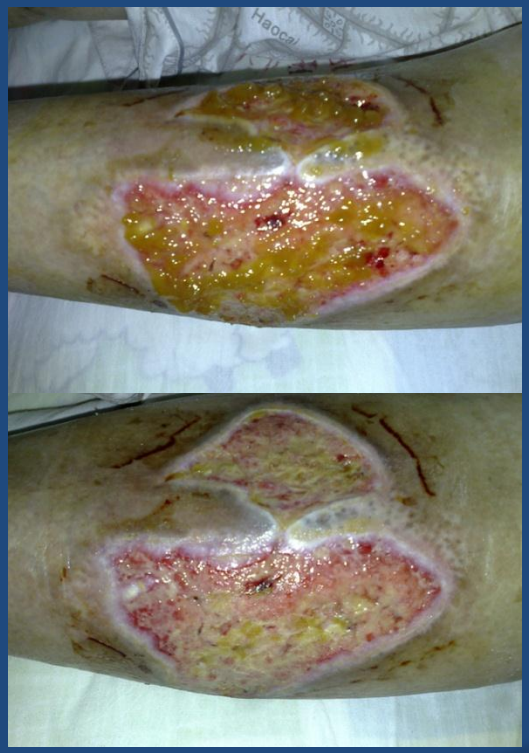
Grade II

Case 3：
Infected left lower leg ulcer

Topical AB bandage

One month, ulcer penetrating into muscle with infection

MEBO Wound and Ulcer Dressing



Healed in 40 d

Kaiping Central Hospital, Dr. Chen Zhong-jian

Case 4:
Male Age: 28Y diabetes, Road traffic accident, degloving injury on right ankle;
Full thickness skin necrosis with exposed tendon Achilles

Hydrogel and Hydrocolloid

1 **month unhealed**

MEBO treatment

Week 3

Week 5

Healed in Week 14

Dr. S Ibrahim, Sungai Buloh Hospital Selangor, MALAYSIA

Case 5：

60Y, M, DM, infected ulcer wound of right lower leg. Failed daily vasaline gauze dressing, change to MEBT/MEBO

Petroleum gauze dressing 3 months

S Ibrahim
Sungai Buloh Hospital Selangor, MALAYSIA

Treatment with MEBT/MEBO

Week 1

Week 3- skin planting (SP)

1 wk post S.P

2 wks post S.

3 wks post S.P

4 wks post S.P

5 weeks post skin planting

6 weeks post skin planting

7 weeks post skin planting

5 months follow up

Grade III

Case 6:
F, 63y, DM, ulcer on dorsum of left foot

Conventional dressing

2 month unhealed

MEBT/MEBO treatment

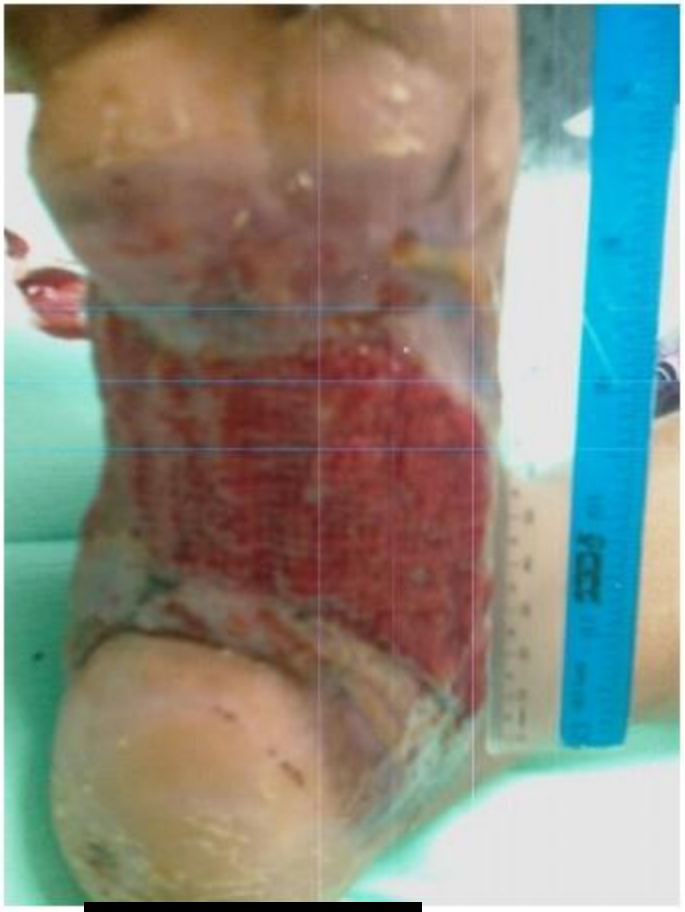
Healed in 4w

The Fifth Affiliated (Tertiary Academic) Hospital, Sun Yat-Sen University; Dr. Xin Jian

Case 7 Diabetic ulcer on right foot

NS, Hydrogel, Hydrocolloid

MEBT/MEBO treatment



2W unhealed

Week 2

Week 5

Dr. Abdullah, A.T., Kuala Terengganu Hospital, Malaysia

Healed in 12w with MEBO treatment

Week 7

Week 9

Heal in week 12

Grade IV

Case 8:
Skin ulcer, swelling, covers around 4 cm x 4cm plantar aspect, dorsum, and toe of left foot

Conventional dressing

2 months unhealed

Dr Wan Zhi-qiang, Guangzhou Hospital of Integrated Tradition and Western Medicine

MEBT/MEBO treatment

Healed in 6w

Case 9：

F,50Y, DM, post traumatic amputation of distal phalanx of second toe of left foot.

Vaseline gauze dressing

Five d unhealed

MEBT/MEBO treatment

Week 3

Week 1

Week 5

Week 7

Week 9

Week 10

V

Case 11 M, 58, DFU, injured by iron nail

Conventional dressing for 1M

Muscle necrosis; digit shed; tendon and metatarsal bone exposed

MEBT/MEBO treatment

3 month

Healed in 5M

Dr. Yu Fang, Jianhua Hospital of Qiqihaer City

Case 12
Non-healing post amputation DU wound

Conventional dressing

MEBT/MEBO treatment

Cavity and bone exposed at acetabulum

Week 6

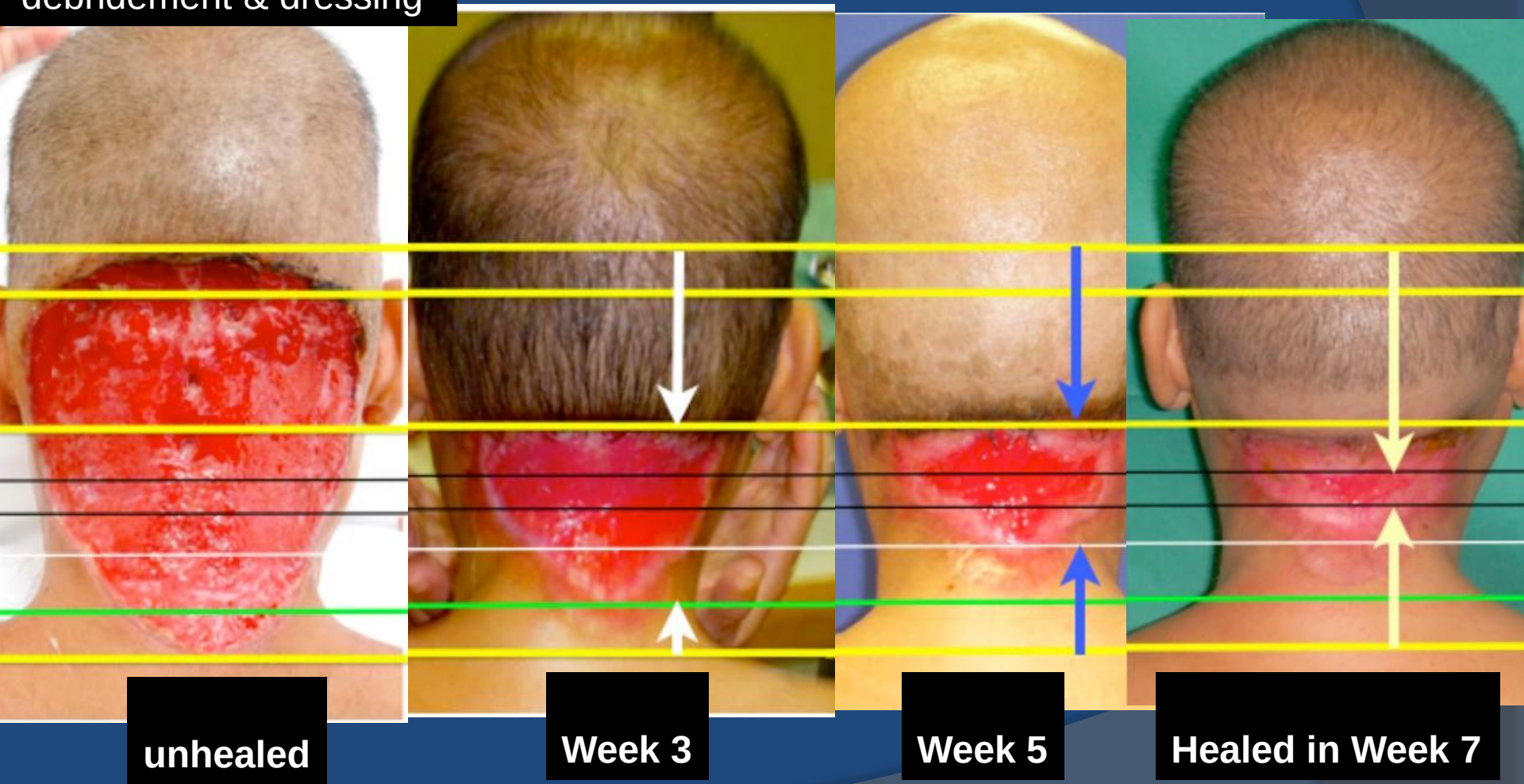
Week 16

Dr. Farrah, Affiliated Hospital of Kebangsaan, Malaysia

Case 13:
Diabetic ulcer wound infected

Conventional debridement & dressing

MEBT/MEBO treatment



unhealed

Week 3

Week 5

Healed in Week 7

Dr. Rica, Selayang Hospital, Malaysia

Data of MEBT/MEBO in DFU treatment

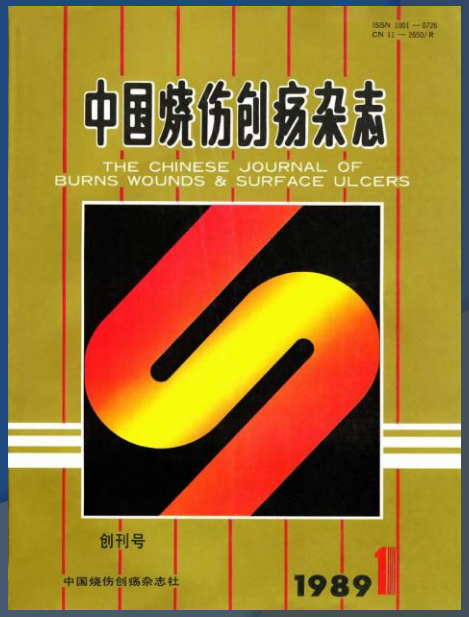
- 1989-2004
- A total of 22000 cases of ulcers reported in the journal 1989-2004

- 1999

  Success in ulcers achieved before 1999

- 2000

  Mechanism studied since 2000



Chinese National Burns Journal

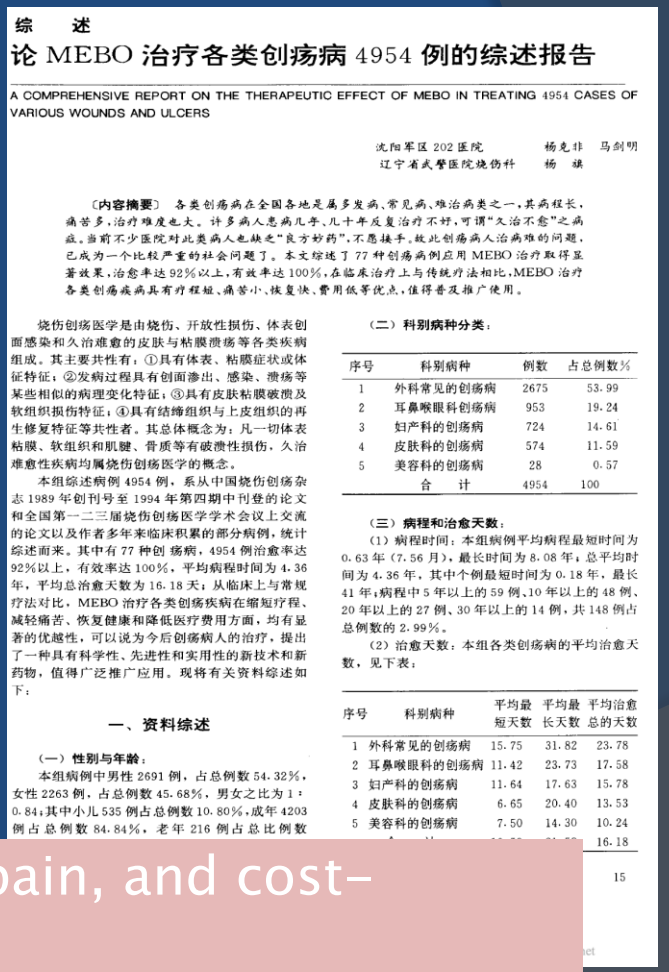
MEBO

A Comprehensive report on the therapeutic effect of MEBO in treating 4954 cases of various wounds and ulcers Yang Ke-fei, et al.

- 1989-1994
- Review of 77 ulcers (DFU) with MEBO

(4954 Cases)

Cure rate: 92%,
total effective rate: 100%,
Average Healing time: 16.18d,
course: 4.36Y



综　述

论 MEBO 治疗各类创疡病 4954 例的综述报告

A COMPREHENSIVE REPORT ON THE THERAPEUTIC EFFECT OF MEBO IN TREATING 4954 CASES OF VARIOUS WOUNDS AND ULCERS

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〔内容摘要〕 各类创疡病在全国各地是属多发病、常见病、难治病类之一，其病程长，痛苦多，治疗难度也大。许多病人患病几年、几十年反复治疗不好，可谓"久治不愈"之病症。当前不少医院对此类病人也缺乏"良方妙药"，不愿接手。故此创疡病人治病难的问题，已成为一个比较严重的社会问题了。本文综述了 77 种创疡病例应用 MEBO 治疗取得显著效果，治愈率达 92%以上，有效率达 100%，在临床治疗上与传统疗法相比，MEBO 治疗各类创疡疾病具有疗程短、痛苦小、恢复快、费用低等优点，值得普及推广使用。

烧伤创疡医学是由烧伤、开放性损伤、体表创面感染和久治难愈的皮肤与粘膜溃疡等各类疾病组成。其主要共性有：①具有体表、粘膜症状或体征特征；②发病过程具有创面渗出、感染、溃疡等某些相似的病理变化特征；③具有皮肤粘膜破损及软组织损伤特征；④具有结缔组织与上皮组织的再生修复特征等共性者。其总体概念为：凡一切体表粘膜、软组织和肌腱、骨质等有破溃性损伤，久治难愈性疾病均属烧伤创疡医学的概念。

本组综述病例 4954 例，系从中国烧伤创疡杂志 1989 年创刊号至 1994 年第四期中刊登的论文和全国第一二三届烧伤创疡医学学术会议上交流的论文以及作者多年来临床积累的部分病例，统计综述而来。其中有 77 种创疡病，4954 例治愈率达 92%以上，有效率达 100%，平均病程时间为 4.36 年，平均总治愈天数为 16.18 天；从临床上与常规疗法对比，MEBO 治疗各类创疡疾病在缩短疗程、减轻痛苦、恢复健康和降低医疗费用方面，均有显著的优越性，可以说为今后创疡病人的治疗，提出了一种具有科学性、先进性和实用性的新技术和新药物，值得广泛推广应用。现将有关资料综述如下：

一、资料综述

（一）性别与年龄：

本组病例中男性 2691 例，占总例数 54.32%，女性 2263 例，占总例数 45.68%，男女之比为 1：0.84；其中小儿 535 例占总例数 10.80%，成年 4203 例占总例数 84.84%，老年 216 例占总比例数

（二）科别病种分类：

序号	科别病种	例数	占总例数%
1	外科常见的创疡病	2675	53.99
2	耳鼻喉眼科创疡病	953	19.24
3	妇产科的创疡病	724	14.61
4	皮肤科的创疡病	574	11.59
5	美容科的创疡病	28	0.57
	合　计	4954	100

（三）病程和治愈天数：

（1）病程时间：本组病例平均病程最短时间为 0.63 年（7.56 月），最长时间为 8.08 年；总平均时间为 4.36 年，其中个例最短时间为 0.18 年，最长 41 年；病程中 5 年以上的 59 例、10 年以上的 48 例、20 年以上的 27 例、30 年以上的 14 例，共 148 例占总例数的 2.99%。

（2）治愈天数：本组各类创疡病的平均治愈天数，见下表：

序号	科别病种	平均最短天数	平均最长天数	平均治愈总的天数
1	外科常见的创疡病	15.75	31.82	23.78
2	耳鼻喉眼科的创疡病	11.42	23.73	17.58
3	妇产科的创疡病	11.64	17.63	15.78
4	皮肤科的创疡病	6.65	20.40	13.53
5	美容科的创疡病	7.50	14.30	10.24
				16.18

15

MEBO achieves good healing rate, time, pain, and cost-effective

MEBO (An innovative treatment for DFU)

- **Functions: All In One**

- **Cleaning, debriding agent & culture medium**

- Isolation and protection
- Automatic drainage and cleaning
- Physiologically moist environment
- Bacteriostatic infection control
- Nutrition and stem cell cultivation
- Pain relief
- MEBO has shown no significant impact on glycaemic control during DFU treatment.

Conclusion

- There is no single effective monotherapy for DFU wound
- management

- Types of new dressings and methods offer no improvement in heal ing rate or functions, but higher cost & risk in some cases.

- MEBT/MEBO offers a treatment option or DFU, useful
  even n chronic, deep, infected DFU wound treatment

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Evidence base

Large amount of publications in Chinese from 1980s to present. (Language bias)

Huge volume of English Language Research and Publications now available from distributor in bound and CD format.

Available from EBOS stand at conference

Micro skin implantation and tension relieving incisions

See separate presentation