ESPEN Congress Krakow 2019

Nutrition In Wounds And Tissue Regeneration

MULTIFACETED APPROACH IN WOUND CARE

S. Smet (BE)
Multifaceted approach in wound care

Steven Smet – Clinical nurse specialist wound care
Wound Care Center, Ghent University Hospital, Belgium
Ghent University Hospital

- 3000 patients/day
- 6000 employees
- > 1000 beds
- University based institution
  - Intensive collaboration with the faculties of medicine, health sciences and the university center of nursery and midwifery
Phases of wound healing

• Inflammatory phase
  – 1. Vascular response
  – 2. Blood coagulation
  – 3. Inflammation

• Proliferative phase
  – 4. Formation of new tissue
  – 5. Epithelisation

• Remodelling phase
  – 6. Contraction
Physiology of wound healing

- Interaction between cells and matrix components are initiated and maintained by:
  - Growth factors
  - Cytokines
  - Proteases
  - Cell adhesion molecules
Wound observation

• Influencing factors on wound healing
  – Some local factors:
    • Type, depth and size of the wound
    • Bacterial load
    • Vascularization
    • Location of the wound
    • …
  – Systemic factors
    • Underlying diseases (diabetes, tumoral process, vascular problems, …)
    • Medication (corticoïds)
    • Aging process
    • Nutritional status
    • …

• To prevent an acute wound to become chronic!
Chronic wound: definition

- Wound existing for 6 weeks or longer
- Wound in a patient with a chronic underlying pathology that can cause delayed wound healing
Wound observation

- Patient on the ambulatory nephrology consultation with smelling and wet bandages around the legs…
Wound observation

- Patient on the oncologic policlinic related to a breast carcinoma
- When we ask if wounds are present regarding the start of chemotherapy…
Wound observation

• Why is a structured approach in wound observation important?
  – Many wound products and innovative treatments available
  – A correct use is only possible after a structured approach in wound assessment

• -> Development of wound assessment instruments
Wound observation instruments

• TIME classification (2004)
  – Structured approach of the wound by evaluation of 4 characteristics
  – Principle of *wound bed preparation* for optimal wound healing
  – Mostly used worldwide classification tool in wound care nowadays
## Wound observation instruments

<table>
<thead>
<tr>
<th>Disturbing factor</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Necrotic Tissue</td>
<td>Removal of the necrosis</td>
</tr>
<tr>
<td>Infection / inflammation</td>
<td>Reduce the bacterial load</td>
</tr>
<tr>
<td>Moisture imbalance</td>
<td>Correct the moisture imbalance</td>
</tr>
<tr>
<td>Non-migrating wound edges</td>
<td>Stimulate the healing process</td>
</tr>
</tbody>
</table>
TIME principle

• Whatever TIME suggests, cleansing is the essence when conducting wound care!
  – Removal of loose necrosis and fibrin tissue
  – Lowering the bacterial load
  – Wound bed preparation for an optimal efficacy of the applied wound dressing

• NaCl 0,9% / saline or clean tap water (Fernandez R et al, 2012)
TIME: Tissue

Presence of necrotic or fibrin tissue
- Dry, moist or wet

Aim:
- Removal of necrotic tissue
  - Physical barrier that will prevent wound healing
  - Ideal source for bacterial proliferation

Debridement
1. Autolytical
2. Osmotic
3. Mechanical
4. Surgical
5. Bedside sharp
6. Biological
7. Enzymatic
TIME: Tissue

- Debride not if:
  - Risk of bone exposition
  - (Possible) limited arterial blood flow

<-> unless infection: DO debride

→ Multidisciplinary collaboration!
TIME: Tissue

Debridement: autolytic
   – All forms of natural physiological debridement, based on moist wound healing
     • e.g. hydrogel

Debridement: osmotic
   – Stimulate debridement by creation of an osmotic pressure difference
     • E.g. honey products
TIME: Tissue

Debridement: mechanical
- Wet-to-dry, monofilament fiber pad (e.g. Debrisoft®)
- Bedside sharp debridement

Debridement: surgical
- (Too) extensive and complete debridement of the necrotic tissue
- Fast and effective but need for sedation
TIME: Tissue

Debridement: Biological
- Larvae therapy
- Very selective and effective wound debridement
- Importance of reimbursement

Debridement: Enzymatic
- Products with collagenase and proteases to dissolve the necrosis
TIME: Infection

- All wounds, especially chronic wounds, contain bacteria
- There is only a problem when there is an imbalance between the host and the bacterial virulence and/or numbers
Don’t treat the lab result but treat the patient!
Wound infection continuum

Local infection

• With or without clinical symptoms
TIME: Infection

- Supplementary treatment with (risk of) infection:
  - Local antiseptics
    - Polyvidon-iodine aqueous solution
    - Chloorhexidin aqueous solution
    - Chloramin, hexamidin, …
  - The use of topical antibiotics should be restricted!
TIME: Infection

• When do we use systemic antibiotics?
  – Only when a clinical infection with:
    • Local signs of infection with a high risk patient
    • Regional signs of infection
    • Systemic signs of infection
TIME: infection

Possible additional treatments with (risk of) infection:

- Silver dressings
  - Antimicrobial, no resistance, no allergic reactions
  - Long term effects not researched yet

- Honey and/or sugar bandages
  - Antimicrobial effect by osmotic pressure difference and low pH

- Wet wrappings with saline, kaliumpermanganate, acetic acid, …

- …
TIME: Moisture

• An optimal wound healing is possible in a moist wound environment
TIME: Epithelialisation, Edge of Wound

- Is epithelialization present?
- Are the wound edges vital? Is there undermining?
- Is hypergranulation present?

Aim:
- Growth and migration of cells which leads to wound closure
- Contraction of the wound edges
TIME: Epithelisation, Edge of Wound

• More innovative treatment strategies necessary?
  • Reconstructive surgery?
  • Biotechnological wound dressings
    • Collagen
    • Hyaluronic acid
    • ...
  • Cell cultures, e.g. amnion membrane, keratinocytes
  • Topical negative pressure therapy
  • Elektrical stimulation
  • Shockwave therapy
  • ...
Treatment

• What are the treatment options after a thorough wound assessment?
• Is there any scientific evidence to facilitate the choice of the correct treatment option?
Local treatment?

• One global conclusion:

Consider using!

• Most recommendations are evidence level C
  – Recommendation is supported by indirect evidence and/or expert opinion
To choose the correct wound bandage, take TIME for it!

- The TIME algorythm can help to detect the disturbing factors that delay wound healing, which facilitates a correct dressing choice.
In TIME wounds will heal?

• “Wound bed preparation should not be seen in isolation from holistic wound assessment, which encompasses the patient’s psychosocial needs as well as underlying and associated aetiologies”

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**TIME- D**

- Immediate considerations (e.g., surgical debridement)
- Preliminary diagnosis (e.g., treat underlying cause)
- Patient/wound assessment
- Basic wound management
- Ongoing assessment
- Non-healed wound
- Healed uncomplicated wound

**TIME- H**

- Follow-up assessment
- Time management
- Epithelial (edge) advancement
- Moisture balance
- Inflammation & infection control
- Tissue management

- Implement advanced therapies
- Continue present therapy
- Re-evaluate time
Case 1

- **Anamnesis:**
  - Woman of 65 years old
  - Wounds at the lower leg, present for more than a year
  - Multiple bandages and dressings are already used (Hydrogel, polyvidon iodine gel, enzym algigel)
  - Heals and deteriorates
  - Earlier consultation and follow up by the community doctor, a specialized wound care nurse and a vascular surgeon

- **First consultation on the wound clinic**
  - Some complaints of an itchy feeling
Case 1

• Diagnosis:
  – Irritative contact dermatitis / eczema, based on dry skin and allergic reaction on the used ointments

• Treatment
  – Corticoïd around the wound and hydration of the skin
  – Decusorb dextranomer ointment (neutral ointment based on principle of osmotic debridement) on the wound
  – Non woven compresses and soft fixation

Result after 2 weeks treatment
Case 2

• Anamnesis
  – Woman of 65 years old
  – 1991: diabetes type 2
  – 12/10/2018: Total hip prosthesis
  – 18/10/2018: Blister at the heel, suspicion of pressure ulcer development
  – 25/11/2018: Deterioration of the wound
Case 2

- Treatment since October 2018
  - Follow-up by community doctor and nurse
  - Conservative wound treatment
  - Compression therapy

- Referral to a multidisciplinary wound clinic in December 2018

- TIME?
  - T: adherent necrosis
  - I: No signs of infection
  - M: No exudate
  - E: No specific remarks
Case 2

• Vascular assessment
  – Multiple arterial occlusions, no venous problems
  – No pressure ulcer!

• Treatment
  – STOP compression therapy
  – Arterial dilatation (27/12), till then keep necrotic crust in situ
Case 2

- Treatment after 27/12 (arterial dilatation)
  - Multidisciplinary approach: nurse wound care team, dermatology, vascular surgeon
  - Diabetes educator and endocrinology for optimizing diabetes control
Case 2

- Treatment after 27/12 (arterial dilatation)
  - Multidisciplinary approach: wound care team, dermatology, vascular surgeon, orthopedics for supporting pressure relief
  - Orthopedics for additional pressure relief
  - Wound closed after 3 months
Case 3

• Anamnesis
  – Man of 48 years old
  – 7/2014: Fall from the roof with fractures C5 till T7. Paraplegic
  – 12/2014: First wound debridements at the sacrum and buttocks
  – 03/11/2014 – 08/06/2015: admission to the hospital
    • 10/11/2014: creation colostomy
    • Observation 26/11/2014
Case 3

• Follow-up
  • Observations after surgical debridement 05/12/2014
  • 16/12: Acute respiratory failure related to sepsis, admission ICU
Case 3

- Multifaceted approach
  - Plastic surgery
  - Dermatology
  - Wound Care team
  - Abdominal surgery and stoma team
  - Dietician since 04/12/2015
    - 60kg; BMI 17.3; NRS=3
    - Probe feeding once on ICU
    - Probe feeding prolonged till 21/5/2015 because of insufficient oral intake
Case 3

- Multifaceted approach
  - Reconstructive surgery only performed when blood samples are acceptable:
    - General blood analysis
    - Extra blood analysis of:
      - Total serum protein (albumin – globulin)
      - Pre-albumin
      - Ferritin and iron
      - Zinc
  - Despite bad samples, patient got operated and they closed all the wounds…
  - Discharge at 08/06/2015 with additional protein and energy drinks
Case 3

- Anamnesis
  - 16/11/2015 – 18/11/2016: readmission in the hospital
    - Again 3X reconstructive flap surgery necessary
    - Depressive mindset
    - Patient not reliable in expressing his food intake
    - Patient prefers his oral nutritional supplements and neglects his regular eating pattern
    - Low albumin blood levels
    - Weight of patiënt not defined. Very limited mobility and a lot of pain
      - Estimation of less then 50kg’s.
    - Additional probe feeding for 3 months
    - 4/10: Patient hardly eats his daily portions. Tired of the hospital food…
  
- Observation 29/02/2016
Case 3

- **Anamnesis**
  - 17/11/2016: static wounds at hip and groin, recurrent wounds at sacrum
Case 3

- **Anamnesis**
  - 18/11/2016: discharge out of the hospital
  - 14/12/2016: ambulatory consultation on plastic surgery department
    - spectacular healing of all wounds!
    - Patient is in a rehabilitation center and already gained 8kg’s
Importance of a multifaceted and multidisciplinary approach

- Development of a MD wound care center in Ghent University Hospital since 2006
  - Wound Care Committee
    - MD decision-making
  - Wound Care Team
    - Bedside consultations
    - Bedside MD wound tours
    - MD ambulatory wound clinic
    - MD diabetic foot clinic

- Wound Care Coordinator / nurse specialist wound care
- Prof. Dr. Hilde Beele
  - Director Wound Care Center / dermatologist
- Els Rutten
  - Wound Care Consultant / diabetology educator
- Tine Gille
  - Wound Care Consultant
- Iltsa Kelless
  - Wound Care Consultant
- Stefie van Wassenhove
  - Wound Care Consultant
- Wouter De Moor
  - Wound Care Consultant
- Steven Smet
  - Wound Care specialist
- Chantal Tijemans
  - Wound care consultant / head nurse ambulatory clinic
- Neels Jassens / Sofie Creeye
  - Farmacist
- Wouter De Moor
  - Representative orthopedic departments
- Jos Verbeeten / Henk Hoeksema
  - Burn Care Center
- Simone Schillemans
  - Microbiology plastics and vascular surgery
- Rais Alisho
  - Hospital infection control
- Martine Muller
  - Representative ambulatory clinic plastic surgery

- Consulten aan bed
- Ambulante wondkliniek / diabetische voetkliniek

- Wound Care Committee
- Public services
- Scientific research
- Development and follow up of the hospital wound care protocol
Importance of a multifaceted and multidisciplinary approach

- Hospital-wide protocols and guidelines
  - Wound care protocol:
    - From posters to a digital flowchart
  - Care bundles of acute and chronic care
    - MD approach with medical disciplines, nursing staff, paramedics (podiatrists, physiotherapists, …)
  - Care bundle of pressure ulcer prevention and control
    - Implementation of dietician included, not in other wound care protocols
Conclusion

• A correct diagnosis and a thorough assessment of the wound bed is essential to reach sufficient wound healing

• Multiple problems need a multifaceted approach which asks for a multidisciplinary collaboration, also with a nutritional team!

• The development of MD teams or the creation of a new medical domain ‘clinical wound healing’ (e.g. Denmark) can / will lower the amount of people who suffer from chronic wounds (2-3% of the population)
STEVEN SMET
Clinical nurse specialist wound care
Wound Care Center
steven.smet@uzgent.be

Universitair Ziekenhuis Gent
C. Heymanslaan 10  |  B 9000 Gent
T +32 (0)9 332 21 11
E info@uzgent.be

www.uzgent.be
Volg ons op