PRINCIPLES OF WOUND CARE MANAGEMENT

- TOPIVAC NPWT APPLICATIONS

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This presentation is prepared to highlight wound care management, market and financial analysis of negative pressure wound and burn treatment devices and consumables considering different wound types.

TOPIVAC NPWT devices and consumables are defined and illustrated with details to tutor how to operate and treat the wounds with different wound care methods.

Data given in this presentation is gathered from reputable clinics, research centers, clinic protocols and practices in the market.
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**NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE**

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CLASSIFICATION OF WOUNDS
Wounds may be classified by several methods; their aetiology, location, type of injury or presenting symptoms, wound depth and tissue loss or clinical appearance of the wound.

General wounds are classified as being:

- **Superficial**: loss of epidermis only
- **Partial thickness**: involve the epidermis and dermis
- **Full thickness**: involve the dermis, subcutaneous fat and sometimes bone
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WOUND BED

WOUND BED
WOUND BED

- **Granulating**: Healthy red tissue which is deposited during the repair process, presents as pinkish/red colored moist tissue and comprises of newly formed collagen, elastin and capillary networks. The tissue is well vascularized and bleeds easily.

- **Epithelializing**: Process by which the wound surface is covered by new epithelium, this begins when the wound has filled with granulation tissue. The tissue is pink, almost white, and only occurs on top of healthy granulation tissue.

- **Sloughy**: The presence of devitalized yellowish tissue. Is formed by an accumulation of dead cells. Must not be confused with pus.

- **Necrotic**: Wound containing dead tissue. It may appear hard dry and black. Dead connective tissue may appear grey. The presence of dead tissue in a wound prevents healing.

- **Hypergranulating**: Granulation tissue grows above the wound margin. This occurs when the proliferative phase of healing is prolonged usually as a result of bacterial imbalance or irritant force.
FACTORS DELAYING WOUND HEALING:

- **Malnutrition** - Inadequate supply of protein, carbohydrates, fatty acids, and trace elements essential for all phases of wound healing.

- **Reduced Blood supply** - Cardiovascular disorders and Ischemia.

- **Medication** - Non-steroidal anti inflammatory drugs and Corticosteroids.

- **Chemotherapy** - Suppresses the immune system and inflammatory response.

- **Radiotherapy** - Increases production of free radical which damage cells.

- **Psychological** - Stress and lack of sleep- increase risk of infection and delayed healing.

- **Obesity** - Decreases tissue perfusion.

- **Infection** - Prolong inflammatory phase, use vital nutrients, impair epithelialisation and release toxins.
FACTORS DELAYING WOUND HEALING:

• Reduced Wound Temperature - Prolonged dressing changes or use of cold cleansing products.

• Underlying Disease - Diabetes Mellitus and Autoimmune disorders.

• Maceration - excess wound exudates or contact with bodily fluids reduces wound tensile strength.

• Inappropriate Wound Management.

• Patient Compliance.

• Unrelieved Pressure.

• Immobility.

• Substance Abuse - Including alcohol and cigarette smoke.
TYPES OF WOUNDS
TYPES OF WOUNDS

Depending on the healing time of a wound, it can be classified as **acute or chronic**.

Those classified as **acute** wounds heal uneventfully in the predicted amount of time.

Those classified as **chronic** wounds take a longer time to heal and might have some complications.
Wounds can be **open** or **closed**.

**Open** wounds are wounds with exposed underlying tissue and/or organs that are open to the outside environment.

**Closed** wounds have damage that occurs without exposing the underlying tissue and organs.
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TYPES OF WOUND

OPEN WOUND

CLOSE WOUND
Another way to classify wounds is to determine if the wound is **clean** or **contaminated**.

**Clean** wounds have no foreign materials or debris inside.

**Contaminated wounds or infected wounds** might have exudate, dirt, fragments of the causative agent, bacteria or other foreign materials.
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TYPES OF WOUND

CLEAN WOUND

INFECTED WOUND
Short-term, open wounds are often described in 5 categories, based on the mechanism and appearance of a skin injury.

- **INCISION**
  - Refers to a clean cut in the skin caused by a sharp object.
  - A surgical incision is another common example.
LACERATION - refers to an injury caused by tissue tearing. - Similar to gaped wounds.
ABRASION

- Abrasions occur when the skin is scraped off due to rubbing against a rough surface.
AVULSION - known as de-gloving, is a serious injury in which the skin is torn from the tissues beneath it.
- The mechanism of skin avulsion typically involves the skin catching on an object while the involved body part is in motion.
TYPES OF WOUND

- **PUNCTURE**
  - Refers when a sharp, slender object penetrates the skin and possibly the underlying tissues, depending on the length of the object.
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TYPES OF WOUND

ULCERS
ULCERS
- A lesion that is eroding away the skin or mucous membrane. Ulcers can have various causes, depending on their location. Ulcers on the skin are usually due to irritation, as in the case of bedsores, and may become inflamed and/or infected as they grow.

- VENOUS STASIS ULCERS
- NEUROPATHIC / DIABETIC ULCERS
- ARTERIAL ULCERS
- PRESSURE ULCERS
- TRAUMATIC ULCERS
- POST-SURGICAL ULCERS
Venous stasis ulcers are damage and skin loss on the legs due to problems with the underlying veins.

They’re usually found below the knee on the inner part of the leg. They’re shallow and red but may be covered in yellow tissue.
Also known as diabetic ulcers, neuropathic ulcers can actually affect anyone who has impaired sensation in their feet due to neurologic disorders or Hansen disease.

They usually occur on the foot, most commonly on pressure points that are prone to blisters.

**Diabetic ulcers** are typically caused by prolonged pressure or trauma to the foot.
Most people who suffer from arterial ulcers have cardiac or cerebrovascular disease.

These foot wounds are deep, sometimes exposing tendons, and usually located on bony prominences, the heel or between toes.
Pressure ulcers are most common in patients with limited mobility and occur on body parts that have prolonged pressure applied to them such as the hips, tailbone and heels.

Skin pressure limits blood flow to the area and the skin eventually dies.
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**TYPES OF WOUND**

**Trauma** or injury to the body may cause a loss of tissue layers and may result in damage to or loss of body parts or organs.

**Traumatic** injuries involving the oral cavity may typically lead to the formation of surface ulcerations.
Wound infections are a common complication of surgery.

Watch for any signs of these common wounds including redness around a surgical wound in the days following surgery.

You may also notice redness or streaking in surrounding tissues, throbbing or intense pain, pus or collection of fluids around the surgical site, a strong, unpleasant odor, and a mild to moderate fever.
Infectious wounds whether it is bacterial, fungal or viral, if the cause of the infection is not treated with the proper medication, the wound will not heal properly in the expected time.
Ischemic wounds; means that the wound area is not getting sufficient blood supply. Limiting the blood supply, and the oxygen and nutrients it carries, can delay the healing process or even prevent it.

Ischemic ulcers can occur when there is poor blood flow in your legs. Ischemic means reduced blood flow to an area of the body.

Poor blood flow causes cells to die and damages tissue. Most ischemic ulcers occur on the feet and legs. These types of wounds can be slow to heal.
INFLAMMANTORY PHASE

PROLIFERATION PHASE

MATURATION PHASE
The **inflammatory phase** is the body’s natural response to injury. After initial wounding, the blood vessels in the wound bed contract and a clot is formed.

Once haemostasis has been achieved, blood vessels then dilate to allow essential cells; antibodies, white blood cells, growth factors, enzymes and nutrients to reach the wounded area.
During proliferation, the wound is ‘rebuilt’ with new granulation tissue which is comprised of collagen and extracellular matrix and into which a new network of blood vessels develop, a process known as ‘angiogenesis’.

Healthy granulation tissue is dependent upon the fibroblast receiving sufficient levels of oxygen and nutrients supplied by the blood vessels.

Healthy granulation tissue is granular and uneven in texture; it does not bleed easily and is pink / red in colour.
Maturation is the final phase and occurs once the wound has closed.

This phase involves remodelling of collagen from type III to type I.

Cellular activity reduces and the number of blood vessels in the wounded area regress and decrease.
The definition of **wound management** is mainly;

The process of returning to health; the restoration of structure and function of injured or diseased tissues. The healing processes include blood clotting, tissue mending, scarring and bone healing.
To ensure proper healing, the wound bed needs to be well vascularized, free of devitalized tissue, clear of infection, and moist.

Wound dressings should eliminate dead space, control exudate, prevent bacterial overgrowth, ensure proper fluid balance, be cost-efficient, and be manageable for the patient and/or nursing staff.

Wounds that demonstrate progressive healing as evidenced by granulation tissue and epithelialization can undergo closure or coverage.

All wounds are colonized with microbes; however, not all wounds are infected.
WOUND MANAGEMENT

WOUND MANAGEMENT PURPOSE:
- To promote wound granulation and healing,
- To prevent undue contamination of wound,
- To decrease purulent wound drainage (dressing material absorbs the drainage),
- To provide dry environment (moist environment facilities growth and multiplication of microorganisms),
- To immobilize and support the wound,
- To apply medication to the wound,
- To provide comfort,
- To promote aesthetic sense.
WOUND MANAGEMENT

TYPES OF DRESSING:
• Transparent adhesive films,
• Hydrocolloids,
• Collagens,
• Hydrogels,
• Exudate absorbers,
• Polyurethane foams,
• Lubricating sprays of emollients,
• Enzymatic debrides,
• Non-adherent dressings,
• Gauze dressings.
FACTS AND ADVISES:
All open wounds are colonised.

Bacteriological culture is indicated only if clinical signs of infection are present or if infection control issues need to be considered.

The classic signs of infection are heat, redness, swelling, and pain.

Additional signs of wound infection include increased exudate, delayed healing, contact bleeding, odour, and abnormal granulation tissue.

Treatment with antimicrobials should be guided by microbiological results and local resistance patterns.
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INFECTION CONTROL

INFECTION CONTROL
INFECTION CONTROL

Never close infected wounds.

Systematically perform wound toilet and surgical debridement.

Continue the cycle of surgical debridement and saline irrigation until the wound is completely clean.

Do not close (e.g., grafting) contaminated wounds and clean wounds that are more than six hours old.

To prevent wound infection:
- Restore breathing and blood circulation as soon as possible after injury.
- Warm the victim and at the earliest opportunity provide high-energy nutrition and pain relief.
- Perform wound toilet and debridement as soon as possible.
- Give antibiotic prophylaxis to victims with deep wounds and other indications.
- Antibiotics do not reach the source of the wound infection.
- Use of topical antibiotics and washing wounds with antibiotic solutions are not recommended.
PATIENTS ASSESSMENTS TO UNDERTAKE:

- Life style,
- Ability to care for self,
- Mobility,
- Caregiver support,
- Reimbursement status,
- Psychosocial,
- Nutritional status,
- Blood test.
TRENDS ON WOUND MANAGEMENT

- SILVER DRESSINGS
- ADVANCED DRESSINGS
- BIO-SYNTHETICS AND TISSUE ENGINEERING
- SKIN SUBSTITUTES
- GROWTH FACTORS AND BIOLOGICAL WOUND PRODUCTS
- HYPERBARIC OXYGEN THERAPY
- OZONE GAS THERAPY
- ELECTROSTIMULATION / TENS THERAPY
- NEGATIVE PRESSURE WOUND AND BURN THERAPY
SILVER DRESSINGS:
The use of silver to prevent and treat infection is both one of the earliest forms of wound care.

Silver has a very broad spectrum of microbial coverage, including yeast, fungi, mould, and even antibiotic-resistant bacteria.

Silver concentrations lethal to bacteria can also cause damage to healthy cells. In vitro studies on silver nitrate show a negative impact on fibroblasts.

Overall silver is a very effective modality for prevention or treatment of infection over a wide variety of bacteria, viruses, fungi, and moulds, with few side effects.

Though there are some reports of developing resistance, with continued appropriate use it should remain effective against even multi-antibiotic-resistant microorganisms.
ADVANCED DRESSINGS:

Plain gauze certainly has its place as it is inexpensive, readily available, and appropriate for a large number of wounds. Impregnated gauze improves upon this by adding zinc, iodine, or petrolatum to help prevent desiccation and provide non-adherent coverage.

New wound understanding and technology have produced advanced products that help the body achieve the ideal moist, warm, protected wound healing environment.
# TRENDS ON WOUND MANAGEMENT

## ADVANCED DRESSINGS:

<table>
<thead>
<tr>
<th>Dressing Type</th>
<th>Description</th>
<th>Debridement Method</th>
<th>Additional Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauze</td>
<td>Inexpensive; readily available</td>
<td></td>
<td>Papain/urea</td>
</tr>
<tr>
<td>Impregnated gauze</td>
<td>Nonadherent; preserves moisture</td>
<td>Selective debridement</td>
<td>Collagenase</td>
</tr>
<tr>
<td>Antimicrobial dressings</td>
<td>Hydrogels</td>
<td>Hydrofibers</td>
<td>Absorbent dressings</td>
</tr>
<tr>
<td>Antibacterial ointments</td>
<td>Reapply often to maintain moisture</td>
<td>Absorbs moderate exudate</td>
<td>Foam</td>
</tr>
<tr>
<td>Iodine based</td>
<td>Absorbent; not for use with thyroid disorders</td>
<td>Absorbs minimal exudate</td>
<td>Occlusive; allows exchange of gasses</td>
</tr>
<tr>
<td>Silver based</td>
<td>Many forms; broad spectrum; low resistance</td>
<td>Absorbs heavy exudate</td>
<td>Not for exudative or infected wounds</td>
</tr>
<tr>
<td>Autolytic debridement</td>
<td>Hydrogels</td>
<td>Absorbs heavy exudate</td>
<td>Rehydrates to soften dry wounds</td>
</tr>
<tr>
<td>Films</td>
<td>Chemical debridement</td>
<td>Alginates</td>
<td>Hydrocolloids</td>
</tr>
</tbody>
</table>
IDEAL DRESSING:

- Provides moisture,
- Provides thermal insulation,
- Removes excess exudates and toxins,
- Protects from trauma and infection,
- Facilitates debridement of necrotic tissue,
- No trauma with removal.
Systems and Synthetic Biology is a relatively new field in biomedical research.

It focuses on engineering new or modified signalling proteins to create desired signalling pathways in the cell.

Every living cell is an extremely complex machine expressing thousands of different proteins.

Due to superb regulation, many cells, such as photoreceptors and other neurons in vertebrates, can live for decades.

Cells can also self-reproduce by division, where both daughter cells are perfectly viable.
TRENDS ON WOUND MANAGEMENT
TREND ON WOUND MANAGEMENT

BIO-SYNTHETICS AND TISSUE ENGINEERING:

Tissue engineering integrates biological components, such as cells and growth factors, with engineering principles and synthetic materials.

Substitute tissues can be produced by first seeding human cells onto scaffolds, which may be made from collagen or from a biodegradable polymer.

Examples of tissues that are candidates for tissue engineering include skin, cartilage, heart, and bone.
SKIN SUBSTITUTES:

Skin substitutes are used to aid in wound closure, control associated pain and replace the skin function to promote healing of the wound.

A skin substitute can be either temporary or permanent.

Synthetic substitutes, formed from synthesized materials that are made on demand with specific characteristics required in each case.

Permanent skin substitutes are used to replace the full thickness of skin layers and improve the quality of skin at the wound or burn sites permanently.
SKIN SUBSTITUTES:

SYNTHETIC SKIN SUBSTITUTES
SKIN SUBSTITUTES:

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TRENDS ON WOUND MANAGEMENT
GROWTH FACTORS AND BIOLOGICAL WOUND PRODUCTS:

Platelet derived growth factor (PDGF) plays a role in each stage of the wound healing process.

PDGF is released from de-granulating platelets upon injury and is present in wound fluid.

PDGF stimulates mitogenicity and chemotaxis of neutrophils, macrophages, fibroblasts, and smooth muscle cells to the wound site aiding the initiation of the inflammatory response.
• **Epidermal growth factor (EGF)** is secreted by the platelets and macrophages and stimulates proliferation of fibroblasts, the cells that produce collagen. EGF may reduce the healing time of wounds when applied topically.

• **Keratinocyte growth factor (KGF)** promotes the growth of cells known as keratinocytes, cells that secrete a protein called keratin.

• **Transforming growth factors (TGFs)** are a group of substances with different properties. TGF-α stimulates growth and migration of keratinocytes and fibroblasts in the affected area. TGF-b1 and TGF-b2 have been shown to promote the growth of new blood vessels (angiogenesis), ensuring adequate blood supply to the healing wound.

• **Vascular endothelial growth factor (VEGF)** is a growth factor that promotes angiogenesis.

• **Platelet-derived growth factor (PDGF)** is a growth factor secreted by the platelets, which attracts fibroblasts and macrophages to the area of injured tissue.
HYPERBARIC OXYGEN THERAPY:

Hyperbaric oxygen therapy involves breathing pure oxygen in a pressurized room or tube.

Conditions treated with hyperbaric oxygen therapy include serious infections, bubbles of air in your blood vessels, and wounds that won't heal as a result of diabetes or radiation injury.

In a hyperbaric oxygen therapy chamber, the air pressure is increased to three times higher than normal air pressure. Under these conditions, your lungs can gather more oxygen than would be possible breathing pure oxygen at normal air pressure.

Your blood carries this oxygen throughout your body.

This helps fight bacteria and stimulate the release of substances called growth factors and stem cells, which promote healing.
HYPERBARIC OXYGEN THERAPY:

TRENDS ON WOUND MANAGEMENT
OXYGEN THERAPY:

Body tissues need adequate supply of oxygen to function.

When tissue is injured, it requires even more oxygen to survive. Oxygen therapy increases the amount of oxygen on your blood can carry.

In wound healing, hypoxia is an insufficient supply of oxygen which prevents normal healing process.

When hypoxia extends beyond the local wound environment the effects of ischemia-reperfusion injury can be seen.

Soft tissue and bone infections are frequently accompanied by localized areas of tissue hypoxia caused by the inflammatory processes accompanying infection and by subsequent vascular thrombosis.
**OXYGEN THERAPY:**

**FUNCTION OF ATP (Adenosine triphosphate):**

*Mitochondrial* respiration is responsible for more than %90 of oxygen consumption in humans.

Cells utilize oxygen as the final electron acceptor in the aerobiosis metabolism of glucose to generate **ATP** which fuels most active cellular processes such as during wound healing.

Increased energy demand of the healing tissue leads to a hyper metabolic state wherein additional energy is generated from oxidative metabolism increasing the oxygen demand of the healing tissue.

**ATP** thus, generated powers tissue repair.
OXYGEN THERAPY:

Vascular complications commonly associated with problematic wounds are primarily responsible for wound ischemia.

Limitations in the ability of the vasculature of deliver oxygen rich blood to the wound tissue leads to, among other consequences, hypoxia.

Hypoxia is a reduction in oxygen delivery below tissue demand, whereas ischemia is a lack of perfusion, characterized not only by hypoxia but also by insufficient nutrient supply.
OXYGEN THERAPY:

MAJOR FACTORS OF HYPOXIA:

- Peripheral vascular diseases garroting oxygen supply,
- Increased oxygen demand of the healing tissue,
- Generation of reactive oxygen species by way of respiratory burst and for redox signaling.
- Arterial Hypoxia.
OXYGEN THERAPY IS REQUIRED FOR THE FOLLOWING CONDITIONS:

- Anemia, severe,
- Brain abscess,
- Bubbles of air in your blood vessels,
- Burn,
- Decompression sickness,
- Carbon monoxide poisoning,
- Crushing injury,
- Gangrene,
- Infection of skin or bone that causes tissue death,
- Non-healing wounds, such as diabetic foot ulcers,
- Radiation injury,
- Skin graft or skin flap at risk of tissue death.
TRENDS ON WOUND MANAGEMENT

OZONE GAS THERAPY:
OZONE GAS THERAPY:

Ozone (O3) is three molecules of oxygen combined together.

The goal of an ozone treatment is to force oxygen into the cells of the body.

Ozone enters the mitochondria of the cells, repairing it (the energy production of the cell) and helps decrease fatigue and better utilize oxygen in the cells.

This has been shown to treat a variety of chronic illnesses.
OZONE GAS THERAPY:

It has been proven that cancer and disease grow very poorly in oxygenated tissue.

Ozone triggers the white blood cells to start producing antibodies which will prevent the immune system from attacking healthy cells.

Ozone helps to reduce oxidation of the cells promoting natural antioxidant properties and decreases the level of acidity in the body.
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THERAPY DEVICE

TRENDS ON WOUND MANAGEMENT

OZONE GAS THERAPY:

METHODS OF OZONE GAS APPLICATIONS:

- IV TREATMENTS: Intravenous - Transfusion
- INSUFFLATIONS: Breathing
- LIMB BAGGING / CUPPING: Ozone Bag
- OZONATED SALINE: Debridement
- MAJOR AUTOHEMOTHERAPY: Similar to IV
- SINUS INSUFFLATION:
- EAR INSUFFLATION:
- RECTAL INSUFFLATION:
- BLADDER INSUFFLATION:
- VAGINAL INSUFFLATION:
OZONE GAS THERAPY:

Medical grade ozone is a mixture of pure O2 and O3 in the ratio of 0.1% to 5% of O3 and 95% to 99.5% O2.

The half life of O3 is 40 minutes at 20°C degree.

Ozone therapy is the non-surgical alternative form of the medical treatment in which amount of oxygen in the body is increased by administrating O3 via different routes.
Ozone therapy may help to reduce clogging of blood cells, detoxify the liver, decrease uric acid in the body, improves circulation and oxygen supply, kill viruses, fungi, bacteria and also increase the activity of ATP.

European generators give the ozone concentration in terms of microgram/ml and the range 1-100 is sufficient for medical use.
OZONE GAS THERAPY:

BENEFITS:

- **Ozone** increases availability and delivery of Oxygen, Glucose, and ATP within the Ischemic Tissue.

- **Ozone** enhances implantation of bone marrow stem cells at the site of lesion, which can provide angiogenesis, Neovascularization and Tissue Regeneration.

- **Ozone** activates neurohormonal reaction responsible for improving quality of life.

- **Ozone** induces up-regulation of expression of antioxidant enzymes and hence Oxygenize and extends preconditioning benefits.
OZONE GAS THERAPY:

BENEFITS:

Medical Ozone Gas activates the red blood cell to release the oxygen into surrounding tissue and cells;

- Improved oxygen release,
- Increased flexibility,
- Improved blood circulation,
- Increase in ATP production.
OZONE GAS THERAPY:

BENEFITS:

- **Ozone** stimulates the production of white blood cells, which are necessary to fight infection.
- **Ozone** increases oxygen and hemoglobin disassociation, thus increasing the delivery of oxygen from the blood to the cells.
- **Ozone** inhibits the growth of new tissues like tumors.
- **Ozone** increases red blood cell membranes distensibility, thus enhancing their flexibility and effectiveness.
- **Ozone** increases anti-oxidant enzyme system, which scavenges excess free radicals in the body.
OZONE GAS THERAPY:

4 PRIMARY WAYS TO APPLY MEDICAL OZONE GAS:

- Autohemotherapy, which involves removing about one half pint of blood from the patient, adding ozone and oxygen to the blood, and infusing the blood back to the patient.

- Rectal insufflation, in which ozone and oxygen are administered as a rectal enema. The ozone/oxygen mixture is then absorbed through the large intestine.

- Ozone Bagging which involves having an airtight bag placed around the area to be treated. A mixture of ozone and oxygen are pumped into the bag and absorbed through the skin.

- Ozone is also used externally in the form of ozonized olive or sunflower oil.
OZONE GAS THERAPY:

OZONE THERAPY CAN BE USED IN THE FOLLOWING MEDICAL SPECIALTIES:

- Gerontology
- Gastroenterology
- Dentistry
- Dermatology
- Cosmetology
- Cardiology
- Infectiology
- Hepatology
- Gynecology
- Intensive Therapy
- Neurology
- Oncology
- Orthopedics
- Rheumatology
- Stomatology
- Pneumology
- Urology
- Angiology
OZONE GAS THERAPY:

OZONE GAS IN PRACTICE:

Ozone therapy was found its way into medical practice in Germany. Ozone/Oxygen mixture had been used in vascular surgery, stomatology and geriatrics.

Italian ozone therapists focused their activity on medical cosmetology.

Specialized ozone therapeutic clinics are operated in Switzerland and other countries of West Europe.

Cuba is well-known for its Ozone Research Centers.
OZONE GAS THERAPY:

Ozone can destroy practically all kinds of bacteria, viruses, fungi and protozoa.

Gram-Positive bacteria and capsular viruses having a lipid bio-layer are particularly sensitive to oxidation.

The therapeutic ozone concentrations provides bactericidal effect which indirectly activates the non-specific defense system as well as components of cellular and humoral immunity.
OZONE GAS THERAPY:

Anti-inflammatory effect is revealed in ozone capacity to oxidize the compounds containing double bonds, the arachidonic acid and its derivatives – prostalandins, in particular.

These biologically active substances participate in the development and sustaining the inflammatory process. Besides, ozone regulates metabolic reactions in tissues at the place of inflammation and resolves pH.

Detoxication effect of ozone is revealed in correction and activation of metabolic processes in the hepatic and renal tissues, thus, ensuring their main function of neutralization and evacuation of the toxic compounds from the organs.
OZONE GAS THERAPY:

ACTIVATION OF OXYGEN-DEPEND PROCESSES:

Ozone gas causes the increase in the content of free and dissolved blood oxygen with rapid intensification of enzymes that catalyze aerobic oxidation of carbohydrates, lipids and proteins with formation of ATP energy substrate.

The great importance of this process is the mitochondrion activation of H-ATP-ase, responsible for conjugation of respiratory processes and oxidative phosphorylation, resulting in ATP synthesis.
OZONE AERATED BAGS:

The method has proved to be highly efficient in the treatment of trophic ulcers, purulent sluggish wounds, bed sores, painful cicartices, burns and defects caused by sequestrations of irradiated surficial and subcutaneous tumors.

Before the procedure the affected leg is damped with water or saline and then bag is put on and hermetically sealed. The bag is filled with gas mixture until the excessive pressure is reached. Then a destructor is switched on. The aerating is done for 15-20 minutes.
OZONE GAS THERAPY:

Treatment times vary depending on the wound type.

Typically range from 10-30 minutes of application time.

In this method, the ozone kills any bacteria, viruses, fungus or molds infecting the open wound, increase blood flow on the wound, and stimulates the healing process.

75 to 90 microgram/liter is undertaken as sterilizer.

20 to 30 microgram/liter is undertaken as medical grade and healing the wounds.
OZONE GAS THERAPY:

Principally, ozone is applied complementary to a corresponding basic therapy.

Diabetes, Type II diabetes, chronic inflammatory diseases such as inflammatory vascular disease, in particular diabetic angiopathia, chronic hepatitis forms, and chronic intestinal conditions belong to the classic indications within the low-dose ozone concept.
OZONE GAS THERAPY:

TOPICAL APPLICATION FORM OF OZONE GAS:

- Instillation by Ozonized water under vacuum,
- Application of Ozone gas under vacuum,
- Ozone cream,

Topical application of O3/O2 gas mixtures, from ozone-treated water or Ozone Gas or Ozone cream and beyond, a wound healing effect is produced, which is being used to an increasingly successful extent:
- External ulcers,
- Burns, superinfected wounds,
- Skin lesions,
- Local infections.
OZONE GAS THERAPY:

OZONIZED WATER:

In topical applications, the use of ozonized water is present in water in molecular form as O3, presenting a physical solution.

When using de-ionized water and a high quality ozone generator, a maximum saturation of approximate 20 microgram ozone per ml of water at room temperature can be obtained.

It reacts immediately on skin contact, has a longer influence than cream.
TRENDS ON WOUND MANAGEMENT

OZONE GAS THERAPY:

OZONIZED WATER INDICATIONS:

- Local infections,
- Ulcus cruris,
- Decubitus ulcers,
- Mycosis, mycotic infections,
- Herpes simplex and herpes zoster,
- Burns,
- Intraoperative rinsing,
- Surgery scars,
- Edemas of traumatic or bacterial origin.
OZONE GAS THERAPY:

TOPICAL TREATMENT OF OZONE BAGGING:

Transcutaneous (ozone gas immersion) is a method of deep topical infections.

After moisturizing the extremity to be treated or the area over the organ concerned, direct O3 gas immersion is applied inside a sealed ozone resistant bag, or in a slight vacuum using a special- low pressure boot or under a low pressure cup.
OZONE GAS THERAPY:

TOPICAL TREATMENT OF OZONE BAGGING INDICATORS:

- Skin lesions,
- Burns,
- Superinfected wounds,
- Diabetic foot,
- Phlegmons,
- Large-surface,
- Open and deep chronic ulcers,
- Possibly infected and decubitus ulcers.
TRENDS ON WOUND MANAGEMENT

OZONE GAS THERAPY:

TOPICAL TREATMENT OF OZONE BAGGING APPLICATION:

BURN STAGE 1 AND 2:

- Moisturizing by ozonized water / de-ionized water,
- 10-20 min of gas application.
CONTRA-INDICATIONS TO OZONE THERAPY:

- All cases with blood coagulation failure,
- Bleeding organs,
- Thrombocytopenia,
- Ozone allergy,
- Hemorrhagic or apoplectic stroke,
- Ozone intolerance.
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TRENDS ON WOUND MANAGEMENT

ELECTROSTIMULATION / TENS THERAPY:
TRENDS ON WOUND MANAGEMENT

ELECTROSTIMULATION / TENS THERAPY:

TENS stands for Transcutaneous Electrical Nerve Stimulation.

TENS is a therapy that uses low-voltage electrical current for pain relief in physiotherapy.

TENS is a method of electrical stimulation which primarily aims to provide a degree of symptomatic pain relief by exciting sensory nerves and thereby stimulating either the pain gate mechanism and/or the opioid system.

The stimulating pulses help prevent pain signals from reaching the brain. Tens devices also help stimulate your body to produce higher levels of its own natural painkillers, called "Endorphins".
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TRENDS ON WOUND MANAGEMENT

NEGATIVE PRESSURE WOUND THERAPY (VAC):

VACUUM ASSISTED CLOSURING
NEGATIVE PRESSURE WOUND THERAPY (VAC):

Negative pressure wound therapy is a medical procedure in which a vacuum dressing is used to enhance and promote wound healing in acute, chronic and burn wounds before skin grafting.

The therapy involves using a sealed wound dressing attached to a pump to create a negative pressure environment in the wound.

Applying continued vacuum helps to increase blood flow to the area and draw out excess fluid from the wound.

Depending on the wound type or location, the vacuum can either be applied continuously or intermittently.

TRENDS ON WOUND MANAGEMENT
NEGATIVE PRESSURE WOUND THERAPY (VAC):

Dealing with wounds is a matter of knowledge and experience.

Different etiologies such as trauma and infection may lead to acute and chronic wounds.

Management of these wounds differs according to the size of wound and the type of structures exposed and the **co-morbid condition** of the patients.
NEGATIVE PRESSURE WOUND THERAPY (VAC):

NPWT was developed to aid wound healing and is increasingly used prophylactically to prevent wound complications, including SSIs (Surgical Site Infections).

NPWT had been used by Wim Fleischmann and his colleagues in 1998. They proved the blood flow was increased 4 times than normal flow thanks to negative pressure application.
NEGATIVE PRESSURE WOUND THERAPY (VAC):

NPWT applications are used to treat acute & chronic wounds. The main aims of the application are;

- Keeping the wound bed clean until surgery,
- Reducing the exudate and infection on the wound bed,
- Increasing the blood flow of the wound bed,
- Increasing the granulation of the wound bed to influence success of wound closuring.
NEGATIVE PRESSURE WOUND THERAPY (VAC):

Types of wounds can benefit from negative pressure wound therapy such as:

- Diabetic ulcers,
- Venous ulcers,
- Arterial ulcers,
- Pressure ulcers,
- First and second degree burns,
- Chronic wounds,
- Wounds with large amounts of exudate,
- Surgical and acute wounds at high risk for infection.

TRENDS ON WOUND MANAGEMENT
NEGATIVE PRESSURE WOUND THERAPY (VAC):

APPLICATION PROCESS:

The dressing used for negative pressure wound therapy starts with sterile open-cell foam that is cut to size and packed into the wound.

This foam acts as a sort of filter to keep any large particles (such as blood clots or dead, sloughed off tissue) from clogging the vacuum system.

Once packed with foam, the wound is covered with an occlusive dressing, typically made of polyurethane.
NEGATIVE PRESSURE WOUND THERAPY (VAC):

APPLICATION PROCESS:

A pump is attached to the occlusive dressing and once negative pressure is applied, a vacuum environment is created.

The pump can be programmed by a health care professional for strength of suction, amount of time it is to be applied and if it is to be intermittent or continuous.

A canister on the pump collects drainage and exudate is drawn away from the wound site.
NEGATIVE PRESSURE WOUND THERAPY (VAC):

BENEFITS:

- Optimizes blood flow in wound bed,
- Helps granulations in wound bed,
- Decreases local tissue swelling,
- Removes exudate and relevant excessive fluid,
- Decreases number of bacteria,
- Increasing cell division thanks to intermittent function,
NEGATIVE PRESSURE WOUND THERAPY (VAC):

BENEFITS:

- Earlier hospital discharge,
- Fewer wound dressing changes,
- Less need for surgery,
- Savings in nursing costs,
- Enable transfer from hospital to lower-cost health care setting,
- Improved quality of life.
NEGATIVE PRESSURE WOUND THERAPY (VAC):

BENEFITS:

- Increased local blood flow via enhancement of capillary blood flow
- Increased angiogenesis with profuse granulation formation
- Increased number of active fibro blasts and macrophages
- Enhanced epithelial cell migration
- Decreased bio-burden, bacterial toxins, and subsequent cessation/delay of healing and decreased tensile strength of the wound.

TRENDS ON WOUND MANAGEMENT

VACUUM ASSISTED CLOSURING
NEGATIVE PRESSURE WOUND THERAPY (VAC):

BENEFITS:

- Decreased harmful, chronic wound fluid and by-products and subsequent senescent cells and tissue damage,
- Decompressed excess interstitial fluid with subsequent decreased per wound induration, inelasticity, and micro vascular occlusion,
- Reduced number of dressing changes and subsequent decreased damage to delicate new tissue, pain, desiccation, and exposure to nosocomial infection,
- Provision of a moist, norm thermic wound environment that allows more efficient epithelization, growth factor synthesis and availability, and overall wound healing potential.
NEGATIVE PRESSURE WOUND THERAPY (VAC):

BENEFITS:

- Provision of mechanical approximation of wound edges,
- Promotion of viscoelastic flow and distraction histogenesis due to tissue stretch and stimulation of the cytoskeleton with subsequent enhanced mitosis,
- Decreased shear forces to the graft during inosculation via uniform wound bed immobilization,
- Decreased seroma/hematoma of grafts and flaps,
- Limitation of zone of injury after acute orthopedic trauma,
- Splinting effect (sternal, abdominal).
NEGATIVE PRESSURE WOUND THERAPY (VAC):

WORKING FUNCTIONS:

Vacuum assisted closure can be applied between -70 to 150 mmHg on wound bed in terms of two working functions:

- INTERMITTENT NEGATIVE PRESSURE THERAPY
- CONTINUOUS NEGATIVE PRESSURE THERAPY
NEGATIVE PRESSURE WOUND THERAPY (VAC):

WORKING FUNCTIONS:

INTERMITTENT THERAPY:

This type of treatment refers to application of negative pressure on wound bed alternating the vacuum value at a certain period of time.

The application would last between 12 to 72 hours by applying a high level of vacuum (e.g. -125mmHg) for 2 minutes and lower level of vacuum (e.g. -70mmHg) for 2 minutes repeating until sessions are completed.

This type of treatment was proved by clinical study that the blood flow and granulation were increased at the optimum level of application.
NEGATIVE PRESSURE WOUND THERAPY (VAC):

WORKING FUNCTIONS:

CONTINUOUS THERAPY:

This type of treatment refers to application of negative pressure on wound bed at a certain set value of vacuum degree.

The application would last between 12 to 72 hours by applying a constant vacuum value (e.g. -125mmHg).
NEGATIVE PRESSURE WOUND THERAPY (VAC):

GENERAL VAC APPLICATION FACTS:

- Decreasing application cost as one in third,
- Decreasing length of stay of patient at hospital as %60,
- Decreasing the cost of hospitalization as %30.
- Decreasing amputation chances,
- Faster closing wound bed and areas,
- Wound bed readiness for grafting and flapping applications.
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT
THERAPY DEVICE

BURDEN / STATISTICAL DATA FACTS

MARKET FACTS:

STATISTICAL DATA
MARKET FACTS:

- 20 billion US $ yearly spending on wound care market,
- 422 Million diabetic patient in the world (WHO 2014)
- 1.2 Million mortality record in 2012 (WHO)
- 2.2 Million mortality due to high glucose rate (WHO)
- Conventional NPWT device rental cost 488$-623$,
- Dressing cost per application 86$-110$,
- Portable NPWT 198$
- Use of NPWT increased from %51 to %73,
- The percentage of leg ulcers that utilized compression increased from %60 to %90,
- Daily dressing changes reduced from %39 to %19,
- Healing increased from 39 weeks to 29 weeks (2009-2011)

* Data acquired from a private survey company along with WHO studies. (www.o-wm.com)
FACTS:

SOME OF THE FACTORS CONTRIBUTING TO THE GROWTH OF THE MARKET ARE:

• Increase in the aging population,
• Rise in chronic wounds and ulcers,
• Increase in diabetes population,
• Increase in the number of surgeries,
• Rise in the number of government initiatives towards prevention of injuries,
• Rapid rise in technological advancements.
FACTS:

SOME FACTORS LIMITING THE GROWTH OF THE MARKET ARE:

- Expensive procedures,
- Reluctance in acceptance of new technologies,
- Lack of proper reimbursement policies.
FACTS:

TOTAL WOUND COSTS PROPORTION:

- %20 Dressing,
- %40 Nurse,
- %40 hospitalization.

* The given proportions are general approach of cost estimations.
INNOVATION IN WOUND CARE:

PROCESS INNOVATION:
- PROTOCOLS,
- STUDIES,
- CLINICAL RESULTS,

PRODUCT INNOVATION:
- INNOVATIVE MEDICAL DEVICES AND CONSUMABLES
“As part of the 2030 Agenda for Sustainable Development, Member States have set an ambitious target to reduce premature mortality from NCDs – including Diabetes - by one third; achieve universal health coverage; and provide access to affordable essential medicines – all by 2030.’”

Dr. Margaret Chan
Director – General
WHO
Diabetes is a serious, chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces.

Diabetes is an important public health problem, one of four priority non-communicable diseases targeted for action by world leaders.
TYPE I:

- Requires insulin injections for survival.

TYPE II:

- Where the body cannot properly use the insulin it produces.
MANAGING DIABETES:

- Blood glucose control,
- Through a combination of diet,
- Physical activity,
- Medication if necessary,
- Control of blood pressure and lipids to reduce cardiovascular risk.
There are at least 12 to 20 companies available in the advanced wound care management market.

Each of the company is offering different dressing styles and application purposes to the end user.

In the following contents will include some of the main specifications of the companies and what they are offering.
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

MEDICAL DEVICES MARKET
-
COMPANIES

EXSUDEX®
GENADYNE
HARTMANN
Lohmann & Rauscher

Acelity
MÖLNLYCKE HEALTH CARE
DEVON MEDICAL PRODUCTS
medela

TALLEY MEDICAL
smith & nephew
FORYOU MEDICAL
DeRoyal

ATMOS Medical Limited
Hartmann Group is in the healthcare industry since 1818.

Origin of the company is in Germany. Offering active and passive closuring techniques.

NPWT Brand name: Vivano Tech, offering conventional negative pressure.

Canister capacity: 300 ml and 800 ml.

Medical Sponger: Polyurethane sponges.
Exsudex (HAROMED MEDICAL) is active in healthcare since 1996 located in Belgium.

The company is offering different wound care solutions and conventional vacuum therapy device.

NPWT Brand name: Exsudex

Canister capacity: 300 ml, 500 ml.

Medical Sponger: Polyurethane and silver sponges.
Genadyne is active in healthcare since 1992 located in United States of America.

The company is offering conventional negative pressure treatment.

NPWT Brand name: XLR8, XLR8 PLUS and UNO

Canister capacity: 200 ml, 400 ml, 600 ml, 800 ml, 1100 ml.

Medical Sponger: Polyurethane and silver sponges.
Lohmann and Rauscher is active in healthcare since 1998 located in Germany.

The company is offering variety of different medical products.

For advances wound care device, they are offering conventional negative pressure wound therapy.

NPWT Brand name: Suprasorb CNP P1 and Suprasorb CNP P2

Canister capacity: 250 ml. And 1000 ml.

Medical Sponger: Polyurethane sponges.
Acelity known as KCI is active in healthcare since 1976 located in United States of America.

For advance wound care device, they are offering conventional negative pressure wound therapy and instillation NPWT without negative pressure.

NPWT Brand name: Info Vac, Vac Ulta, ActiVac, Prevena.

Canister capacity: 300 ml and 500 ml.

Medical Sponger: Polyurethane and silver sponges.
Molnlycke Health Care is active in healthcare since 1849 located in Sweden.

The company is offering a negative pressure wound therapy device.

For advance wound care device, they are offering conventional negative pressure wound therapy.

NPWT Brand name: AVANCE
Canister capacity: 300 ml and 800 ml.

Medical Sponger: Polyurethane sponge.
Devon Medical Products is active in healthcare since 2005 located in United States of America.

The company is offering a negative pressure wound therapy device.

For advance wound care device, they are offering conventional negative pressure wound therapy.

NPWT Brand name: ExtriCare 2400, ExtriCare 3600

Canister capacity: 100ml and 400ml.

Medical Sponger: Polyurethane sponge.
Medela is active in healthcare since 1961 located in United States of America.

The company is offering a negative pressure wound therapy device and breast feeding products.

For advance wound care device, they are offering conventional negative pressure wound therapy.

NPWT Brand name: INVIA LIBERTY, INVIA MOTION

Canister capacity: 150 ml, 300 ml and 800 ml.

Medical Sponger: Polyurethane sponge.
Talley Medical is active in healthcare since 1953 located in United Kingdom.

The company is producing mattress and beds along with NPWT device.

The company is offering a conventional negative pressure wound therapy device.

NPWT Brand name: Venturi Avanti, Venturi Compact

Canister capacity: 300 ml and 600 ml.

Medical Sponger: Polyurethane sponge.
Smith and Nephew is active in healthcare since 1856 located in United Kingdom.

The company is producing wound care dressing and NPWT devices.

The company is offering a conventional negative pressure wound therapy device.

NPWT Brand name: Renasys, Pico, Renasys EZ Plus.

Canister capacity: 300ml, 750 ml, 800 ml.

Medical Sponger: Polyurethane and silver sponges.
ForYou Medical is active in healthcare since 1993 located in People’s Republic of China.

The company is offering a conventional and instillation negative pressure wound therapy device.

NPWT Brand name: ForYou Pro, ForYou Home.

Canister capacity: 250 ml and 800 ml.

Medical Sponger: Polyurethane sponges.
DEROYAL is active in healthcare since 1973 located in United States of America.

The company is offering a conventional and instillation negative pressure wound therapy device.

NPWT Brand name: PRO II, PRO II, CONTINUUM mobile.

Canister capacity: 250 ml and 450 ml.

Medical Sponger: Polyurethane and silver sponges.
ATMOS medical is active in healthcare since 1984 located in Germany.

The company is producing different medical products and equipments.

The company is offering a conventional and instillation negative pressure wound therapy device.

NPWT Brand name: ATMOS S 0 42

Canister capacity: 300ml and 800ml.

Medical Sponger: Polyurethane sponges.
Until now, most of the negative pressure wound therapy manufacturer are listed with their main details.

Most of the producers are offering Vacuum application and Vacuum assisted instilitation applications.

**HOWEVER, TOPIVAC NPWT IS NOT ONLY OFFERING A VACUUM APPLICATION. IT IS OFFERING COMBINATION OF TREATMENT THERAPIES.**
Teknomar Ltd was founded in 1993. The company is based in Ankara, Turkey and manufacturing the following medical devices:

- ETHYLENE OXIDE GAS STERILIZER (HOSPITAL & INDUSTRIAL)
- HYDROGEN PEROXIDE GAS PLASMA STERILIZER (H2O2)
- HYDROGEN PEROXIDE OZONE GAS PLASMA STERILIZER (H2O2 & O3)
- AIR PURIFIER AND DECONTAMINATION DEVICES
- TOPIVAC NEGATIVE PRESSURE WOUND & BURN TREATMENT DEVICES
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

MEDICAL DEVICES MARKET

- COMPANIES

TOPIVAC HAND

TOPIVAC MEDIUM

TOPIVAC PRO
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

MEDICAL DEVICES MARKET

- COMPANIES

TOPISET - CONSUMABLES
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

TOPIVAC IS FEATURING COMBINATION OF DIFFERENT TREATMENT METHODS:

1. The healthcare giver would choose to apply vacuum therapy.

2. Vacuum therapy can also be combined with moisturizing during application.

3. The debridement can be done under vacuum by the device when Vacuum and Irrigation/Instillation application chosen.

4. TOPIVAC can work as Hyperbaric Oxygen treatment by applying Oxygen/Ozone gas under vacuum.

5. By Gas Therapy, the applicator can practice the bagging method.
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

TOPIVAC IS FEATURING COMBINATION OF DIFFERENT TREATMENT METHODS:

THERAPY SELECTION MENU
HISTORY of TOPIVAC NPWT:

- TOPIVAC was developed in 2011.
- R&D studies and clinical protocols have been finalized in 2014.
- First product launch had been made in 2014 in Turkey.
- Global market launch had been made in 2016 at ARAB HEALTH SHOW (DUBAI).
TOPIVAC NPWT
PRODUCT DESCRIPTION

TOPIVAC NPWT enables to apply the following treatments:

- CONVENTIONAL VACUUM THERAPY,
- VACUUM & MOISTURIZING THERAPY (De-ionized / Oxygenated / Ozonized Water)
- VACUUM & INSTILLATION THERAPY (De-ionized / Oxygenated / Ozonized Water)
- VACUUM & GAS THERAPY (Oxygen / Ozone)
- GAS THERAPY (Oxygen / Ozone)
- ELECTROSTIMULATION / TENS THERAPY.
- VAC + MOISTURIZING + INSTILLATION + GAS + TENS THERAPY AT ONE SESSION.
IN THE FOLLOWING CONTENTS DESCRIBE THE EACH OF THE TREATMENT APPLIED BY TOPIVAC

TOPIVAC HAND

TOPIVAC MEDIUM

TOPIVAC PRO
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC HAND NPWT
PRODUCT DESCRIPTION

TOPIVAC HAND is the smallest version of TOPIVAC family.

TOPIVAC HAND performs the followings:

- Conventional Vacuum Therapy NPWT,
- Intermittent Vacuum Therapy,
- Continuous Vacuum Therapy,
- Canister (1000 ml),
- Polyurethane Sponge.
- Touch Screen Full Colored Display/ Membrane Buttons.
TOPIVAC HAND NPWT
PRODUCT DESCRIPTION

TOPIVAC HAND DASHBOARD AND STEPS OF TREATMENT
TOPIVAC HAND
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC HAND NPWT
PRODUCT DESCRIPTION

TOPIVAC HAND DASHBOARD AND STEPS OF TREATMENT

TOPIVAC HAND
TOPIVAC HAND NPWT
PRODUCT DESCRIPTION

TOPIVAC HAND DASHBOARD AND STEPS OF TREATMENT
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC HAND NPWT
PRODUCT DESCRIPTION

TOPIVAC HAND DASHBOARD AND STEPS OF TREATMENT

TOPIVAC HAND

HAND

THERAPY DURATION (HOUR)

12 24 36

48 60 72
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC HAND NPWT
PRODUCT DESCRIPTION

TOPIVAC HAND DASHBOARD AND STEPS OF TREATMENT

TOPIVAC HAND
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT
THERAPY DEVICE

TOPIVAC HAND NPWT
PRODUCT DESCRIPTION

TOPIVAC HAND DASHBOARD AND STEPS OF TREATMENT
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC HAND NPWT
PRODUCT DESCRIPTION

TOPIVAC HAND DASHBOARD AND STEPS OF TREATMENT

TOPIVAC HAND

HAND

-120 mmHg
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC HAND NPWT
PRODUCT DESCRIPTION

TOPIVAC HAND DASHBOARD AND STEPS OF TREATMENT

TOPIVAC HAND
# TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

## TOPIVAC MEDIUM NPWT
PRODUCT DESCRIPTION

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<th>MEDIUM V3</th>
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### SPECIFICATIONS

- **Conventional NPWT**
- **Moisturizing**
- **Instillation**
- **Electro / Tens**
- **O2 Instillation**

- **Conventional NPWT**
- **Moisturizing**
- **Instillation**
- **Electro / Tens**
- **O2 Instillation**

- **Conventional NPWT**
- **Moisturizing**
- **Instillation**
- **Electro / Tens**
- **O2 / O3 Instillation**

- **Conventional NPWT**
- **Moisturizing**
- **Instillation**
- **Electro / Tens**
- **O2 / O3 Instillation**
- **O2 / O3 Gas Therapy**
- *Compatible with OzonBag for burn treatment*
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC MEDIUM NPWT
PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:

TOPIVAC MEDIUM
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC MEDIUM NPWT PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:

TOPIVAC MEDIUM
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC MEDIUM NPWT
PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:

TOPIVAC MEDIUM
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TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:
TOPIVAC MEDIUM NPWT

PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT
THERAPY DEVICE

TOPIVAC MEDIUM NPWT
PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:

TOPIVAC MEDIUM
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT
THERAPY DEVICE

TOPIVAC MEDIUM NPWT
PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:

TOPIVAC MEDIUM
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT
THERAPY DEVICE

TOPIVAC MEDIUM NPWT
PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:

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TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT
THERAPY DEVICE

TOPIVAC MEDIUM NPWT
PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:

TOPIVAC MEDIUM
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC MEDIUM NPWT
PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:

TOPIVAC MEDIUM
TOPIVAC MEDIUM NPWT
PRODUCT DESCRIPTION

TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:

TOPIVAC MEDIUM
TOPIVAC MEDIUM DASHBOARD AND STEPS OF TREATMENT:
TOPIVAC PRO NPWT

PRODUCT DESCRIPTION

TOPIVAC PRO CLINIC
SPECIFICATIONS

- Conventional Negative Pressure Vacuum Therapy
- Moisturizing
- O2 / O3 Instilllation
- Electro / Tens
- O2 / O3 Gas Therapy

*Compatible with OzonBag for burn treatment.
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

TOPISET

Box set of required consumables:
✓ CANISTER
✓ MULTICASE
✓ DRESSING
✓ DE-IONIZED WATER
✓ DRESSING KIT
✓ HAZARDOUS BAG
✓ OXYGEN HOSE
✓ ELECTROTENS CABLE
✓ ELECTRODE
TOPIVAC NPWT

PRODUCT DESCRIPTION

CANISTER

✓ 1000 ML Canister – Collection Cup
✓ It is required for all of the treatment processes.
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

MULTICASE

- 1000 ml MultiCase—MultiFunctional Irrigation Cup
- It is required for instillation and Moisturizing Therapies.
- MultiCase is coming with 500 ml. De-ionized water and infusion kit.
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

DRESSINGS

✓ SINGLE TUBE VACUUM DRESSINGS,
✓ DOUBLE TUBE VACUUM & INSTILLATION DRESSINGS
✓ MULTIDRESS DRESSINGS
## TOPIVAC NPWT

**PRODUCT DESCRIPTION**

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TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

SINGLE TUBE DRESSING

✓ SINGLE TUBE VACUUM DRESSING,
✓ SPONGE
✓ DRAPE
✓ RULER
✓ INSTRUCTIONS
✓ MEDICAL CLEANING KIT
✓ TRAC PAD

SINGLE TUBE
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

SINGLE TUBE DRESSING

- SINGLE TUBE VACUUM DRESSING,
- SPONGE
- DRAPE
- RULER
- INSTRUCTIONS
- MEDICAL CLEANING KIT
- TRAC PAD

SINGLE TUBE
**TOPIVAC**
NEGATIVE PRESSURE WOUND & BURN TREATMENT
THERAPY DEVICE

**TOPIVAC NPWT**
PRODUCT DESCRIPTION

**DOUBLE TUBE DRESSING**

- DOUBLE TUBE VACUUM DRESSING
- INSTILLATION HOSE
- PINCH VALVE CONNECTOR
- SPONGE
- DRAPE
- RULER
- INSTRUCTIONS
- MEDICAL CLEANING KIT
- TRAC PAD

DOUBLE TUBE
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

DOUBLE TUBE DRESSING

✓ DOUBLE TUBE VACUUM DRESSING
✓ INSTILLATION HOSE
✓ PINCH VALVE CONNECTOR
✓ SPONGE
✓ DRAPE
✓ RULER
✓ INSTRUCTIONS
✓ MEDICAL CLEANING KIT
✓ TRAC PAD

DOUBLE TUBE
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

MULTIDRESS

✓ MULTIDRESS
✓ INSTILLATION HOSE
✓ PINCH VALVE CONNECTOR
✓ SPONGE
✓ DRAPE
✓ RULER
✓ INSTRUCTIONS
✓ MEDICAL CLEANING KIT
REQUIRED FOR THE FOLLOWINGS:

- Installation with oxygenated water,
- Installation with ozonized water,
- Vacuum + irrigation therapy,
- Vacuum + irrigation + gas therapy.
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

ELECTROTENS CABLE

Required for the following:

✓ ELECTROSTIMULATION / TENS THERAPY
TOPIVAC
NEGATIVE PRESSURE WOUND & BURN TREATMENT THERAPY DEVICE

TOPIVAC NPWT
PRODUCT DESCRIPTION

OZONE BAG

Required for the following:

✓ GAS THERAPY
✓ HAND
✓ ARM
✓ LEG
✓ FULL BODY PARTS
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NEGATIVE PRESSURE WOUND & BURN TREATMENT
THERAPY DEVICE

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THERAPY APPLICATIONS & WOUND MANAGEMENT
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PRINCIPLES OF WOUND CARE MANAGEMENT
- TOPIVAC NPWT APPLICATIONS

CONTACT:

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PRINCIPLES OF WOUND CARE MANAGEMENT
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