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Future of ultrasound wound therapy: Technologies, devices, science and clinical outcomes

Nowadays, ultrasonic wound and skin treatments, especially those which aid in infection control, have been gaining the interest of hospitals, clinics, wound care centers and doctors' offices worldwide. The purpose of this presentation is to introduce upcoming advances in ultrasonic wound therapy, as well as to share, review and evaluate the expected efficacy of ultrasound therapies in treating all types of acute and chronic wounds. This includes battlefield wound treatment and the topical oxygenation of wounds and body parts with ultrasound. For wound treatment purposes, both low and high frequency ultrasound devices will be used in the near future. For example, Arobella Medical has designed:

1. (Patented and FDA approved) The Qoustic Panacea® AS -1000 is the next wound care product based on the use of ultrasonic energy to mix oxygen and saline in real-time. This allows for ultrasound delivery to the wound bed and topical oxygenation of various parts of the body. Slides and videos will be demonstrated during presentation.
2. Portable Wound Therapy System AF 1000 series to provide a portable ultrasound device for the treatment of wounds. This system is suitable for military use in the battlefield for immediate treatment of wounded soldiers. Additionally, the device's small size, portability, and low weight enable its use in field surgery, where equipment is often limited. The device cauterizes the wound, stops bleeding, greatly reduces pain, and prevents infection. The Portable Wound therapy system has several therapeutic effects and can remove bullets or shrapnel from a wound, making it useful in battlefields, terrorist attacks and other disaster areas, such as crashes, etc. This device can be used by a variety of emergency personnel whether in an ambulance or an antiterrorism operation. Slides and videos will be demonstrated during presentation.
3. BA-1000 Skin Care Device and Method: The BA-1000 is an ultrasound assisted, cryogenic ablation device that enables tissue to be frozen and ablated at zero degrees Celsius. Generally, tissue ablation is performed at negative fifty degrees Celsius. This device is going to be used for warts, skin disorders (scars), Human papillomavirus and later for tumor removal with reduced discoloration, less scarring, minimal regrowth, faster

healing and less pain in comparison with existing technologies such as a laser, cryo, etc. Ablating tissue at a warmer temperature, the exact freezing point of water, limits damage to surrounding tissue and provides a safer procedure.

4. Osteomyelitis Treatment: Osteomyelitis is an infection of bone marrow. Standard treatment involves surgically opening the bone and scraping away infected marrow. Arobella Medical has developed a technology that enables a significantly less invasive treatment of the disease. This device is protected by issued US patents.

5. Arobella Medical has developed ultrasound technology for use in combination with varying degrees of pressure and/or suction (Negative Pressure Wound Therapy + ultrasound and Positive Pressure Wound Therapy + ultrasound) as an all-in-one device for accelerating tissue healing in patients. The use of ultrasound by medical personnel for wound treatment provides benefits of improved efficiency, faster healing, selective debridement and less pain during and after the procedure.

6. Different companies including Arobella Medical are working on high frequency ultrasound devices for wound therapy.

7. Ultrasonic Infection Control: A patented hand washing or sterilization device for use before surgery in operating rooms. Other applications include kitchens, stores, toilets, and public areas.

During the presentation many other expected future ultrasound technologies and devices will be discussed.

Speaker Biography

Eliaz Babaev, co-founded Arobella Medical, LLC in 2006 and serves as its chief executive officer and President. He co-founded Celleration Inc. and served as its chief technical officer until July 2009. He worked as an ultrasound system design engineer and research scientist for DiaSorin, Inc., SpectRx, and AeroPag-USA, Inc. He served as the head of Biomedical Engineering Laboratory and a professor for State Technical University, Baku, USSR for 25 years. He has more than 40+ years expertise in non-Imaging medical ultrasound and particularly in ultrasound wound management, live tissue repair and in all the areas of advances in skin, wound care, nursing, tissue science, drug delivery systems, wound treatment technologies, tissue engineering, and body architectonics research and cancer research including apoptosis. 50 + US and 100 + worldwide patents are issued, numerous are pending, 50+ scientific articles, abstracts are published.

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