Cervical cryoablation equipment

Country of origin  United States of America

Health problem addressed
Cervical cancer is the third most common cancer in the world where 80% of all cases occur in the developing world. Current costs and reliability of equipment limit the amount of patients that can be treated. There is a demand for a low-cost and robust treatment solution that will reduce the burden of cervical cancer in developing countries.

Product description
This device is a low-cost, simple, and highly portable technology for the treatment of cervical pre-cancerous lesions for women in the developing world. It consists of a novel mold and probe design that facilitates the formation and application of a dry-ice tip that functions as the element of cooling during cryotherapy.

Product functionality
The device freezes the cervix without the complexities of the current cryotherapy equipment. The probe is inserted into the mold which is attached to a carbon dioxide tank, and the dry-ice tip forms within the removable probe. The probe incorporates aids for monitoring ablation time and quality of ablation.

Developer's claims of product benefits
Currently, the developing world utilizes out-dated cryo-guns in order to ablate pre-cancerous cervical lesions. This design suffers from several flaws including: malfunctions, low number of patients treated per tank, and expensive tips susceptible to corrosion. In contrast, this new design is made of simple plastic, which has a cost-effective manufacturing process that reduces the upfront capital cost by over 90% and reduces recurring costs by 500% in regards to carbon dioxide tank efficiency. In addition, simply designed parts which do not corrode when sterilized provide for easy maintenance. The device also achieves technical superiority by reaching temperatures colder than that of current carbon dioxide guns, which reduces treatment time.

Operating steps
Connect mold on carbon dioxide tank through snap-fit. The probe is placed in mold and secured. The ‘on’ switch is located on the mold, and when pressed automatically forms dry-ice tip in the required time and pressure. The probe is used to ablate cervical lesions through existing protocols. When done, the parts are sterilized parts and can be used on the next patient.

Development stage
Device has undergone successful bench testing based on published methods for evaluating cryotherapy effectiveness. It achieved a lower freezing temperature and in a faster time compared to current methods. By the end of February 2012, the initial round of in vivo studies will be completed yielding additional efficacy and safety data.

Future work and challenges
The strategy to provide affordability and sustainability of the technology is to enable manufacturing of the device in the target regions, which may be possible in countries with semi-developed infrastructures. The ability of NGOs to provide screen/treat camps will ultimately be the limiting step to providing treatment with the technology.

User and environment
User: Technician, nurse, midwife
Training: Local physicians in association with NGO’s
Maintenance: None

Environment of use
Settings: Rural, urban, primary (health post, health center), secondary (general hospital), tertiary (specialists hospital)
Requirements: Medical or food and beverage grade carbon dioxide gas tanks are required for the use of the technology. CO2 tanks are readily available because of the food and beverage industries in the target countries. There will be no infrastructure changes when incorporating the device over existing treatment methods.

Product specifications
Dimensions (mm): 300 x 100 x 90
Weight (kg): 0.23
Consumables: None
Life time: 1 year
Shelf life: 5 years
Retail Price (USD): 100
List price (USD): 100
Other features: Mobile
Year of commercialization: N/A
Currently sold in: N/A

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