Pressure cooker autoclave

Country of origin | United States of America

Health problem addressed
Healthcare associated infections are the most frequent threat to patient safety worldwide, and Surgical Site Infections (SSIs) are the most common type of infection. The effects of SSIs on patients and health-systems are both severe and underestimated, and the burden of infections falls on the patient population with the highest level of need.

Product description
The pressure cooker autoclave is an affordable, easy to use autoclave. An electronic sterilization monitor connects to a pressure cooker via an integrated thermal sensor. The monitor provides verbal instructions to health post employees in their native language. It notifies them when their attention is required and guarantees whether or not instruments were fully sterilized at the end of each cycle. Information regarding frequency, features used, and rates of successful sterilization cycles is sent via cellular networks to an online database where location and usage information can be viewed and analyzed.

Developer's claims of products benefits
Medical instrument boilers and autoclaves are available in some regions. Boilers are the most common sterilization method used, but are ineffective and can leave instruments contaminated. The low-cost autoclaves that are currently available require electricity, which is often intermittent at best, and therefore they often go unused.

The principal benefits of the pressure cooker autoclave are convenience and efficacy. Pressure cookers can completely sterilize medical instruments whereas boilers cannot. Spoken instructions in the local language facilitate use for health post employees, enhance staff efficiency, reduce training costs, and ensure that the sterilization protocol is followed correctly. Remote monitoring helps health administrators to measure the impact of the devices and know they are used regularly.

Suitability for low-resource settings
The pressure cooker autoclave is intended for use in remote and resource-constrained clinics in lower and middle-income countries. By removing the dependency on electricity and featuring a built-in instructor, it is suitable for areas without regular electricity and addresses education and training challenges faced by normal autoclaves.

Operating steps
Users select how the medical instruments are packaged (wrapped in linen or not) on the cycle monitor. Verbal instructions then help users complete a successful sterilization cycle. At the end of the cycle, the monitor notifies users whether sterilization was successful, and how to maintain the instruments clean until use.

Regulatory status

Future work and challenges
Remote clinics typically do not have the funds necessary to purchase their own equipment. In order to reach the intended users, governments or other health administration bodies will first purchase the autoclaves to distribute to intended consumers. Governments often have little incentive to be early adopters of new technology. Finding the correct strategy to move the product to the intended users is the primary challenge facing the pressure cooker autoclave.

User and environment
User: Nurse, health post employee
Training: None
Maintenance: None

Environment of use
Settings: Rural, urban settings, primary (health post, health center), secondary (general hospital), tertiary (specialized hospital)
Requirements: Almost no infrastructure requirements are necessary to operate this autoclave. Fresh water should be used each time new instruments are sterilized. A heat source capable of boiling water must be employed. Whatever is typically used to cook food can be used, including gas, coal, electric or solar.

Product specifications

<table>
<thead>
<tr>
<th>Dimensions (mm)</th>
<th>300 x 300 x 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>3</td>
</tr>
<tr>
<td>Consumables</td>
<td>None</td>
</tr>
<tr>
<td>Life time</td>
<td>10 years</td>
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<tr>
<td>Shelf life</td>
<td>15 years</td>
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<tr>
<td>Retail Price (USD)</td>
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<tr>
<td>List price (USD)</td>
<td>-</td>
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<tr>
<td>Other features</td>
<td>Software use, mobile, capital equipment</td>
</tr>
<tr>
<td>Year of commercialization</td>
<td>Awaiting CE mark</td>
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</tbody>
</table>

Contact details
Mark Maples
Email suecho87@gmail.com
Telephone +1 415 952 5458
http://www.who.int/medical_devices
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