Health problem addressed
These devices provide an accepted treatment modality within the fields of dermatology, oral surgery, gynecology, urology, otolaryngology, proctology, and ophthalmology. They can be used to treat malignant and benign tumors, acne, warts, and hemorrhoids.

Product description
These devices are available as consoles or as stand-alone or handheld units. Consoles are freestanding units that typically contain cryogen gas cylinders, pressure regulators, indicators, and operating controls. They are usually battery powered and can be equipped with a probe-tip fiberoptic light source for transillumination of tissue. Stand-alone units consist of a tank, a pressure regulator, and a probe attached by tubing to the tank. Handheld units are lightweight, portable CSUs that typically use liquid nitrogen as the cryogen and are either reusable or disposable (with individual gas cartridges).

Principles of operation
CSUs apply a refrigerant (cryogen) to withdraw heat from target tissue either through direct application or indirectly through contact with a cryogen-cooled probe. There are two basic types of CSUs: those that use liquid nitrogen and those that use nitrous oxide (N2O), carbon dioxide (CO2), or other compressed gases. All CSUs employ either a closed or an open system. In a closed-system CSU, the cryogen flows through an insulated shaft in the hollow probe, cools the tip, and is exhausted back through the probe. Open-system CSUs apply cryogen directly to the target tissue. CSUs using N2O or CO2 are not usually suitable for use as open systems because cryogen “snow” would build up on the target tissue and insulate the lesion from the cryogen spray. Liquid nitrogen CSUs can be either open or closed.

Operating steps
A surgeon will use a cryosurgical unit to introduce a refrigerant to target tissue (e.g., wart, tumor) either through direct application (dabbing or spraying on) or through a cryogen-cooled probe (e.g., gun-type or pencil-shaped with either a curved or straight tip). Cryosurgically treated tissue is usually left in situ and allowed to become necrotic and slough off.

Reported problems
Few device-related problems have occurred with the use of CSUs. Of continued concern is the mechanical integrity of the units, especially the probe tips, because they are exposed to temperature and pressure extremes. Also potential damage to tissue outside of the treatment zone is a concern.

Use and maintenance
User(s): Surgeon
Maintenance: Medical staff; technician; biomedical or clinical engineer
Training: Initial training by manufacturer and manuals; supervised training with experienced surgeons

Environment of use
Settings of use: Operating room
Requirements: Stable power source

Product specifications
Approx. dimensions (mm): 690x360x660
Approx. weight (kg): 72
Consumables: Liquid nitrogen or other compressed gases
Price range (USD): 535-95000
Typical product life time (years): 10
Shelf life (consumables): Variable

Types and variations
Console; stand-alone; handheld unit

Other common names:
Cryoextractors; Cryoprobes; Cryostats; Cryo Units; CSU; Probes, Cryosurgical

Core medical equipment - Information

World Health Organization

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