PORTABLE DEVICES ADOPTED BY THE RUSSIAN MINISTRY OF HEALTH FOR HOME MEDICAL CARE

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Improvement of the primary medical care is a direction of top priority in the development of health service. Home medical care is an important component of primary medical care.

Presently, new portable physiotherapeutic medical devices appropriate for medical care at home are commercially available from various manufacturers including former defense industry facilities.

The range of diseases that can be successfully treated with physiotherapeutic devices at home is also significantly extended, particularly for elderly patients. In Russia, the development and use of devices for home medical care is under the control of the Committee for New Medical Technologies, Russian Ministry of Health (Head, Prof. T. I. Noskova), the Commission for Physiotherapeutic Devices of the Committee (Head, Prof. O. I. Efanov), and the Russian Association of Physiotherapists (Head, Prof. O. I. Efanov).

The goal of this work was to let the readers of Biomedical Engineering know of some new models of portable medical devices adopted for medical use at home and available from domestic manufacturers. The devices described were developed at the Ryazan State Medical University and Scientific-Research Institute of Radioengineering (Moscow). The devices are manufactured at the Joint-Stock Company Elatomiiskii Pribornyi Zavod, a former defense industry facility. The number of items produced varies from 40 to 100,000 per year. The devices were tested, certified, provide stable and satisfactory performance, and they are easy to use. No special training is required, and all the devices can be easily used by any patient, including children, without risk to the patient's health.

Portable Medical Devices for Local Heating

Hyperthermia is an effective therapeutic agent in many diseases, including otorhinolaryngological and proctological diseases. However, some technical and organization factors place limitations on its use.

For example, otorhinolaryngological diseases are prescribed to be treated either under outpatient settings or at home. The devices available for outpatient UHF-treatment are difficult to adapt to individual patients or to patient movement during therapy. The efficacy of treatment is significantly reduced (even up to complete failure) as a result of post-procedure exposure of the patient to unfavorable weather during his (her) return from the polyclinic to home. Routine home thermal therapy of maxillary sinus, throat, etc., is usually performed using available materials (salt, sand, etc.). Such therapy inevitably involves adjacent organs, and it does not include any control of temperature, duration, etc.

Proctological procedures are uncomfortable, and they are psychologically inconvenient.

Thus, the devices described in this work were designed to meet the following requirements:

- local heating of given surfaces (cavities); continuous (variable) heating with temperature and exposure control;
- ability to be used at home (electrical safety, safe and easy use by untrained personnel); moderate cost.

These requirements are met by the devices developed at the Ryazan State Medical University. The PGG-01 Pra and PPK-01 Pra local heating devices were developed for treating otorhinolaryngological and proctological diseases, respectively (Figs. 1 and 2).

The devices consist of a heater and a power source. The heater is made of PME-80 medical purpose plastic by compression molding technology.
In the rhinolaryngological local heating device PGG-01 Pra, the heater shape can be adapted to the patient's facial surface. It is equipped with a soft holder and is attached to the patient's face skin above the maxillary sinus. It can also be attached to the forehead to treat the frontal sinus area or to the throat to treat the tonsils. When the device should be used for treating the next patient, the surface of the heater is subjected to common cold disinfection.

Medicinal therapy proved to be significantly more efficacious when applied against a background of thermal treatment with the PGG-01 Pra device. To date, it is the only physiotherapeutic device which is able to provide a sufficiently deep and unlimited in time heating under home settings.

This device is particularly suitable for treating children. If applied daily 30-40 rain before sleeping, it significantly reduces the incidence of flu even during epidemics. Therefore, the PGG-01 Pra is an effective prophylactic device.

Specifications of the PGG-01 Pra Device

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater temperature (controllable), °C</td>
<td>Up to 55</td>
</tr>
<tr>
<td>Heater voltage, V</td>
<td>7.5</td>
</tr>
<tr>
<td>Power line</td>
<td>220 (110) V, 50 (60) Hz</td>
</tr>
<tr>
<td>Consumed power, VA</td>
<td>No more than 10</td>
</tr>
<tr>
<td>Class of safety</td>
<td>II type BF</td>
</tr>
<tr>
<td>Dimensions, mm</td>
<td>No more than 78 x 150 x 216</td>
</tr>
<tr>
<td>Mass, g</td>
<td>No more than 500</td>
</tr>
</tbody>
</table>

The device has been adopted by the Scientific Research Council, Russian Ministry of Health (protocol No. 3, June 16, 1989).

The device is indicated for treating the following diseases:
- acute rhinitis;
- chronic rhinitis at the stage of exacerbation, compensation, and remission;
- chronic rhinosinusitis at the stage of compensation and remission;
- acute and chronic rhinosinusitis at the stage of exacerbation, compensation, and remission;
- acute and chronic tonsillitis at the stage of compensation;
- acute and chronic maxillary sinusitis at the stage of compensation;
- acute and chronic frontitis at the stage of compensation.

The correspondence certificate of the device is No. GOST P. RU AE 01.1.2.0625.

The device was tested at the Moscow Scientific-Research Institute of Pediatrics and Pediatric Surgery; Moscow Scientific-Research Institute of Ear, Throat, and Nose; Otorhinolaryngological Clinics, Russian State Medical University (Moscow).

No analogous device is presently available worldwide.

The heater of the PPK-01 Pra device (Fig. 2) is made as a clyster tip, and it can be inserted into the colon by the patient himself (herself). The outer surface of the tip withstands common cold disinfection.