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Anatoly Ryzhikh

Tyche MedTech Inc., USA

First attempt to make cable less Holter based on patch monitoring concept

Patch monitors became very popular because of the portability, small sizes and absence of patient cable. But unfortunately, majority of them are single-lead or maximum two-leads ECG (Electro Cardio Graphy) registrars, which is not enough for complete Holter data acquisition. Our pilot device looks similar to the conventional patch monitoring devices but provides recording of six standard ECG leads: I, II, III, aVL, aVF and aVF. It is becoming possible because of several technical innovations. First of all, patient unit of our Holter has four input electrodes. Instead of using of patient ECG cable, we have embedded electrodes on the rear surface of the device. Electrodes are connectors same time. These connectors are closed with a snap to convenient disposal ECG sticker electrodes. Therefore, our patient unit provides possibility to register all six standard ECG leads. Connection of device's electrodes with sticker ECG electrodes provides fixation of the device on the patient chest. Of course, to make such connection reliable unit mass has to be as light as possible. Mass of our device is about 30 g. Second, we used original software algorithm which compensates small distance between unit electrodes not only for ECG signal amplification but also recalculate registered ECG signals to emulate bigger inter-electrodes spacing similar to convenient ECG registrations. Waterproof design and rechargeable battery improve utility features. Internal memory of the patient unit is enough for up to one-year period of using, therefor it can be used also as event monitor. New Holter software based on different design approaches to completely utilize all high possibilities of patient unit. We have to overcome main limitation of conventional Holter's software such as impossibility to compute huge ECG records longer than several days. To make it possible we have created new Holter software based on unique WEB engine. Also, WEB engine provides natural cross platform work of our Holter software for Windows, Mac OS and Linux.

Biography

Anatoly Ryzhikh got his PhD degree in Biomedical Electronics at Moscow Engineering Physics Institute (Technical University) in 1995 for the design of Implantable Pacemaker for Cardiomyoplasty (active auto-muscle heart circulation support), also he has his own design of abdominal auto-muscle circulation assist device, diagnostics external pacemakers, diagnostic and therapeutic electrophysiological catheters, patch holters hardware and software. He worked as an associate professor at Moscow State Engineering Physics during the period of 1994-2007. Later he assigned as a CEO of Dutch Stimulators Ltd in Russia. And now he is the CEO and President of Tyche MedTech Inc., USA. His main research area includes Circulation assist device, Diagnostics external pacemakers, Electrophysiological catheters, and Patch holters.

anatoly@tychemedtech.com