Two Real-Time Methods for Bladder Volume Measurement

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Technology description

Two methods are proposed in order to continuously monitor the bladder volume.

Description

The sensations that alert a normal person that his bladder is full, are either significantly reduced or completely absent for patients suffering from bladder dysfunctions. Thus, the risk of bladder overfilling is high for such patient and that can lead to severe consequences such as a high infection rate and stone formation. Current methods, such as intermittent catheterization based on carrying out on a time basis with precise time intervals, are not optimum. Monitoring the bladder volume and pressure while detecting specific thresholds would be useful in preventing bladder overfilling or urinary incontinence. Two methods are proposed in order to continuously monitor the bladder volume:
1. By using a stretch sensor inside the bladder wall. This method estimates the bladder volume and/or pressure by means of stretch sensors coupled to the bladder wall. This method may be used in a stand-alone implanted device to send monitored information wirelessly outside the body, or implemented within an implanted bladder stimulation device to provide a continuous or intermittent feedback.
2. By monitoring the activity related to the bladder afferent nerves. In this second method, an electronic circuit estimates, in real-time, the bladder volume from the afferent nerve activities.

Application area

Two methods address multiple cases: The degree of bladder dysfunctions shall determine the appropriate method. The first method targets patients with high bladder dysfunction. The sensor is mechanical and can be attached in different configurations. It may replace current wired sensors. The second method targets patients with bladder afferent nerve troubles and would add value to implantable simulators. Improved life's quality: For patients suffering from bladder dysfunctions, monitoring the bladder volume and pressure and detecting specific thresholds is an essential step to the autonomy. Future developments: Using afferent nerve to monitor the function of organ may lead to new developments in terms of medical treatment and re-education.

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联系我们

叶先生

电 话：021-65679356
手 机：13414935137
邮 箱：yeyingsheng@zf-ym.com