

Joint Disorder Diagnosis with 3D Image Capture

Summary

Dr. Hal Martin, an orthopedic surgeon in the Baylor Healthcare System, has developed a novel integrated system with broad applications that include patient monitoring and diagnosis in real time. Currently, diagnosis of joint conditions is based on a thorough physical examination, which is subjective and requires a steep learning curve and extensive time and training. By measuring dynamic movements in an objective, consistent and quantifiable manner, the Baylor integrated system enables the accurate diagnosis of a broad range of joint disorders.

Key Investigator

Hal Martin, D.O.

Field

Orthopedic surgery

Technology

Diagnostic
Monitoring

Key Features

Diagnostic for joint disorders

Stage of Development

Preclinical proof of concept

Status

Available for licensing
Available for research collaboration

Patent Status

Patent pending

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For more information about the Baylor Center for Hip Preservation Research visit: <http://www.hippreservecenter.com/Pages/Home.aspx>

Market

The US orthopedics market for hip replacement is large and growing. The global hip reconstruction market was valued at USD 4.8 Billion in 2014 and is expected to reach USD 5.9 Billion by 2020. The total joint replacement market is being driven by an aging global population and the growing incidence of age related diseases, especially osteoarthritis. New procedures, advanced implant designs, and more durable materials are resulting in better procedure outcomes, implants lasting longer, and faster recovery times. This is driving more young patients (45-65 year olds) to opt for surgery to maintain their active lifestyles as these baby boomers seek to remain physically active later in life. Thus, there is a need to improve longer-lasting outcomes and decrease cost.

Technology

Currently, diagnosis of joint conditions is based on a thorough physical examination, which is subjective and requires a steep learning curve and extensive time and training. By measuring dynamic movements in an objective, consistent and quantifiable manner, the Baylor integrated system enables the accurate diagnosis of a broad range of joint disorders. Furthermore, it reduces the time and training required to make a proper diagnosis. A simple graphic user interface provides the physician or healthcare provider with a visual output that is intuitive and easy to interpret. An added benefit of the integrated system is that the patient and the physician do not need to be in the same location, thereby enabling remote diagnosis, monitoring, and rehabilitation.

By fitting a patient in a body suit that comprises sensors placed around a problematic joint or limb, the patient undergoes a selected range of motions that are captured along with capturing pain data. The motion data and pain data are captured by a computer system, which compares the data set against an extensive proprietary database that is comprised of more than 10 years of patient data. Depending on the specific application, the appropriate output is generated, such as:

- (1) diagnosing a patient's disease
- (2) measuring disease progression, or
- (3) monitoring the effectiveness of a patient's treatment regimen.

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