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SYMPOSIUM

Biomechanics of the Sensor–Tissue Interface—Effects of Motion, Pressure, and Design on Sensor Performance and Foreign Body Response—Part II: Examples and Application

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Abstract

This article is the second part of a two-part review in which we explore the biomechanics of the sensor–tissue interface as an important aspect of continuous glucose sensor biocompatibility. Part I, featured in this issue of *Journal of Diabetes Science and Technology*, describes a theoretical framework of how biomechanical factors such as motion and pressure (typically micromotion and micropressure) affect tissue physiology around a sensor and in turn, impact sensor performance. Here in Part II, a literature review is presented that summarizes examples of motion or pressure affecting sensor performance. Data are presented that show how both acute and chronic forces can impact continuous glucose monitor signals. Also presented are potential strategies for countering the ill effects of motion and pressure on glucose sensors. Improved engineering and optimized chemical biocompatibility have advanced sensor design and function, but we believe that mechanical biocompatibility, a rarely considered factor, must also be optimized in order to achieve an accurate, long-term, implantable sensor.

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Abbreviations: (CGM) continuous glucose monitor, (FBR) foreign body response, (ISF) interstitial fluid, (PerQ) percutaneous, (PLLA) poly-L-lactic acid, (SubQ) subcutaneous

Keywords: biocompatibility, biomechanics, foreign body response, glucose sensor, micromotion, pressure

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