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**Topic of Research:** Analysis of QoS Parameters of Wireless Body Area Networks (WBANs)

### **FINDINGS**

One of the most important applications of WBAN is a smart health care system. QoS is amongst one of the several challenges in implementation and performance of WBANs. The QoS paradigm spans to both quantitative and qualitative aspects. This work analyzes QoS in a qualitative manner as it holds from the consumer's perspective. In this research, an analysis of QoS parameters of the most fundamental component of WBAN- the antenna sensor has been presented. Three antenna sensors have been proposed in the current work. The first proposed structure is that of a high efficiency AMC enabled compact microstrip patch antenna operating in ISM band. It has a CPW feed and is suitable for WBAN wearable applications. The second proposed structure is a versatile UWB radio sensor for early stage breast cancer detection. It is designed using RDRA technique. Third proposed structure is an UWB compact elliptical-patch antenna used as a sensor for early stage detection of breast cancer in women with high mammographic density. All three proposed sensors are shown to be adherent to QoS parameters considered for analysis.

Energy efficiency is an important QoS metric and is achievable by either by a low-power consuming hardware mechanism in WBAN or by protocol designed to enhance energy efficiency. This work presents an extensive survey of the state-of-the-art QoS based routing protocols which can be used by researchers for designing protocols suited for remote healthcare application.

Lastly, a Fuzzy Inference System is proposed for studying the intracranial pressure under hydrocephalus condition of the human brain. The proposed fuzzy model successfully provides an innovative solution of estimation of QoS parameters of CSF, ICP and blood flow dynamics in human brain exposed to electromagnetic radiations emitted by microwave towers.