"Personalized Medicine": An Innovative Concept[1]

Rupa Murthy
PMed Innovations
Oak Park, Illinois, USA
dr.rupamurthy@yahoo.com

***Abstract*—"Personalized Medicine" is about empowering patients to have access to their health information at all times.[1] Empowering implies patient participation through the ongoing process of diagnosis, treatment, and rehabilitation.[1] More importantly, "Personalized Medicine" is about having insights into one's health by being able to visualize, recognize, and take timely corrective action when necessary.[1] As important time may be wasted when looking for information during emergencies resulting in delays and potential medical errors, "Personalized Medicine" offers a way for medical and emergency personnel to immediately obtain accurate, adequate patient information which can be useful, especially if the patient is unable to communicate verbally.[1] By drawing insights from one's health data "Personalized Medicine" enables patients to seek medical care early on and helps them to make the right treatment choices.[1] Storing, retrieving and having access to one's health information, being able to edit and update it when necessary, the ability to draw valuable insight's from one's health data, and the availability of personal health information for quick and easy access by medical personnel and first responders encompasses the concept of "Personalized Medicine".[1] Microchip technology can make patient information more accessible especially in rural and remote areas.[1] It improves productivity and quality of patient care by providing patients with the relevant information for making better treatment choices and reduces the cost of health care through early diagnosis and treatment.[1] A micro-chipped Personalized Medical Card is a convenient medium to store and retrieve up-to-date health information.[1] By conforming to the standards of privacy and security patient's can have access to their health data without compromising their personal information.[1] A subcutaneous gold-plated microchip insert designed to store vital life saving patient information can be accessed via a smartphone, tablet, or other electronic device from anywhere, anytime.[1] The gold-plated microchip implant is inserted underneath the patient's skin and contained in the subcutaneous layer.[1] The gold-plated microchip has a wireless connection with the device using the state-of-the-art technology and can be paired with a software application that can be readily edited and updated.[1] Therefore, the device saves not only extensive amount of time and effort but also eliminates the need for unnecessary medical tests and treatment.[1] In addition, timely access to updated information can prevent written or spoken patient information which might be lost in transition or translation thereby leading to medication error or wrong treatment.[1] A gold-plated microchip inserted inside the patient's body as a medical device or tagged to a medical device allows patient self-monitoring of vital statistics of specific conditions such as heart disease, diabetes, kidney functions and other metrics associated with different aspects of body function.[1] It acts as a sensor which enables patients to monitor vital parameters of their condition precisely in real time and allows them to lead independent and more productive lives without the need for continuous monitoring or medical supervision.[1] It could potentially be used for investigating structural and functional abnormalities of the heart, liver, kidney, etc.[1] The gold-plated microchip can prove useful in the treatment of conductive disorders such as dysaarythmias and to mitigate symptoms and dysfunction due to myocardial infarction, neurodegenerative disorders, chronic renal disorders, etc.[1] With soaring health care costs the patient's ability to manage their health condition with ease and convenience in the absence of their health care providers empowers patients to enhance their productivity and quality of life, and reduce the cost of care.[1] In addition to patient participation, leveraging technology drives better outcomes and empowers patients to lead a better quality of life which essentially is the true objective of "Personalized Medicine".[1]**

"Personalized Medicine" is a patented concept.[1] If you are interested as an investor or partner for "Personalized Medicine" please contact me at dr.rupamurthy@yahoo.com

***Index Terms*—Innovative, Microchip, Personalized Medicine, Medical Card, Medical device, Patient information, Smartphone.**

I. Problem Statement[1]

Obtaining patient information is one of the first and most important steps for medical and emergency personnel.[1] Unfortunately, valuable time is wasted when looking for information during emergencies, resulting in delays and potential medical errors.[1] Some written or spoken patient information may be lost in the transition or translation process.[1] Moreover, some people, especially those involved in an emergency might be unable to communicate vital information to relevant health care providers involved in the process.[1] Notably, in most cases, emergency health problems require collaboration among different health care providers thus effective communication is vital.[1] Therefore, timely access to updated information can prevent errors and unnecessary medical tests and treatment.[1] All too often, patients with severe conditions such as diseases of the heart, kidney, etc. need regular and frequent monitoring for which patients spend most of their time going back and forth to their health care providers.[1] For many patients this could mean traveling long distances which not only is a drain on their limited time and resources but also on their quality of life.[1] Therefore, there is a need for a device/medium that is configured to collect, store, retrieve, and transmit personal user data for quick and easy access by medical personnel and first responders.[1]

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II. Solution[1]

"Personalized Medicine" is an innovative concept that provides access to one's health information, encourages patient participation and leverages technology to drive better outcomes.[1] It improves productivity and enhances quality of life while reducing costs.[1] "Personalized Medicine" results in a well informed patient and comprises of:[1]

A. The Concept of "Personalized Medicine"[1]

"Personalized Medicine" is about empowering patients to have access to their health information at all times.[1] Empowering implies patient participation through the ongoing process of diagnosis, treatment, and rehabilitation.[1] More importantly, "Personalized Medicine" is about having insights into one's health by being able to visualize, recognize, and take timely corrective action when necessary.[1] As important time may be wasted when looking for information during emergencies resulting in delays and potential medical errors, "Personalized Medicine" offers a way for medical and emergency personnel to immediately obtain accurate, adequate patient information which can be useful, especially if the patient is unable to communicate verbally.[1] Timely access to updated information saves not only extensive amount of time and effort but also eliminates the need for unnecessary medical tests and treatment.[1] In addition, it can prevent written or spoken patient information which might be lost in transition or translation thereby leading to medication error or wrong treatment.[1] It improves communication and collaboration amongst physicians and health care providers especially during emergencies.[1] By drawing insights from one's health data "Personalized Medicine" enables patients to seek medical care early on and helps them to make the right treatment choices.[1] In addition to patient participation, leveraging technology to drive better outcomes is essentially the objective of "Personalized Medicine", thus empowering patients to enhance their productivity and quality of life.[1]

Storing, retrieving, having access to one's health information, being able to edit and update it when necessary, the ability to draw valuable insight's from one's health data, and the availability of personal health information for quick and easy access by medical personnel and first responders encompasses the concept of "Personalized Medicine".[1]

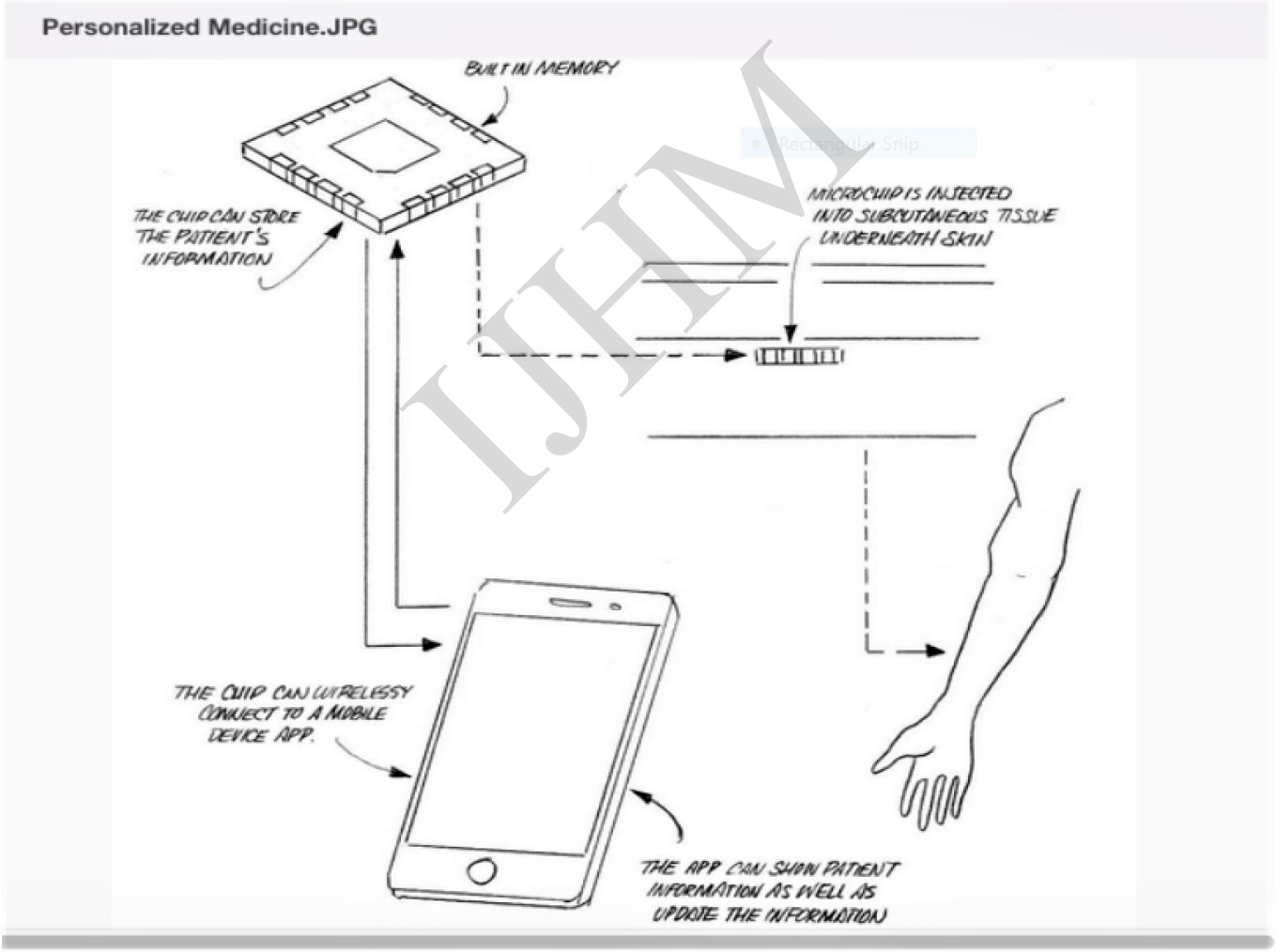


Fig. 1. A graphical representation of "Personalized Medicine".[1]

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B. THE INNOVATIVE CONCEPT OF "PERSONALIZED MEDICINE"[1]

Microchip technology can make patient information available for quick and easy access by medical personnel and first responders.[1] The microchip can be inserted underneath the skin to offer immediate access to all relevant and vital patient information.[1] The device also allows a scanner system, such as a smartphone application to be used to obtain a patient's information such as age, height, weight, blood type, allergies, and other relevant medical information with ease and convenience.[1] Equally important, the microchip can be inserted directly into the subcutaneous tissue located underneath the skin thus eliminating the worry of the microchip being tampered with or lost.[1] In addition, the microchip offers a way for medical and emergency personnel to immediately obtain patient information which can be especially useful if the patient is unable to communicate verbally.[1] It also saves extensive amount of time and effort while accessing patient information while reducing the chance of medical and surgical errors.[1]

Figure 1 is a pictorial representation of the innovative concept of "Personalized Medicine" showing where the microchip can be inserted underneath the skin and how information can be obtained from the microchip via the smartphone application.[1] In a similar context, a microchip insert inside a patient's body that allows self-monitoring of their condition adequately, and without having to travel long distances will save time, effort and cost of care while improving their quality of life especially in rural and remote areas.[1] It can improve productivity and quality of patient care by providing patients with the relevant information for making better treatment choices, and reduce cost of health care through early diagnosis and treatment.[1]

Access to patient information such as blood type, height and other vitals also need to be measured thus taking a lot of time which could be utilized in treatment.[1] The microchip will save such time by relying only on smartphone and other devices without the need for measurements to generate such information.[1] Therefore, the gadget will improve the convenience of treatment by saving time and reducing errors.[1] Last but not least important, information can be easily edited or updated at the patient's convenience.[1]

C. PERSONALIZED MEDICAL CARD[1]

A Personalized Medical Card contains vital patient information in a microchip, magnetic strip or other technology that can be read by an electronic device such as a scanner or a mobile application such that the user has access to his/her health information at all times.[1] The card could be processed and maintained through financial institutions, governmental agencies or an entity that conforms to the safety and security standards that protects patient information.[1] Figure 2 shows how patient information can be accessed by first responders and medical personnel saving precious time and resources.[1] It

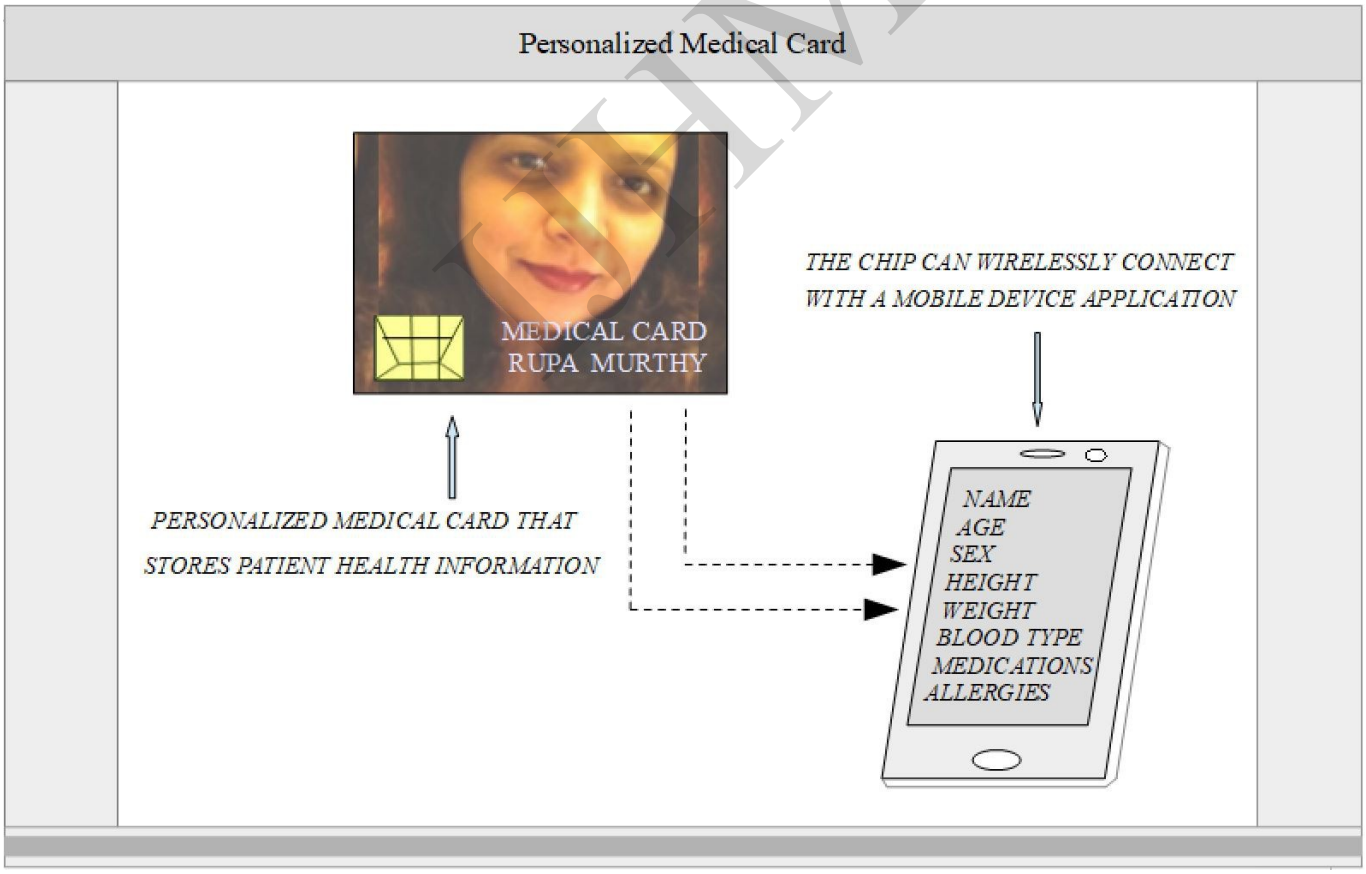


Fig. 2. A schematic representation of a Personalized Medical Card.[1]

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also helps patients to better manage their health without compromising their personal information.[1]

D. GOLD-PLATED MICROCHIP IMPLANT[1]

A gold-plated microchip implant is provided.[1] The gold-plated microchip is inserted underneath the patient's skin and contained in the subcutaneous layer.[1] The insert is configured to gather and store personal user data such as pertinent medical information relating to the user and to transmit and receive the data via a wireless communication.[1] Therefore, the product enables a user to access his/her data.[1] The device can be paired with a software application that can be readily edited and updated.[1] One of the main concerns in health care regarding the quality of health services delivered in emergencycases is the availability of patient's health information and efficient communication among physicians.[1] Indeed, many cases of medical errors as well as malpractices can be avoided if adequate and relevant patient information can be accessed at the right time and place.[1] The subcutaneous gold-plated microchip insert will help physicians to access relevant and timely patient information thus enhancing service delivery.[1] Moreover, patients are treated by different health providers in different health care organizations.[1] As such, information should be accessible by all health personnel for better communication.[1] The implant will help health care providers to access such information and seek any clarification from other physicians about the patient's health.[1]

The product will also enable users to monitor their health and seek treatment on time.[1] The information can also be accessed by a third party such as guardian with the help of an electronic device, such as a smartphone or computer tablet.[1] Personal data stored on the gold-plated microchip implant can be edited or updated to improve the quality of health care and prevent long stay in hospitals or readmission shortly after discharge.[1] In addition, the product is easy to carry and use anywhere and anytime.[1] Notably, most of the electronic health care devices rely on network connections thus limiting their use only to some areas within the network.[1] However, the microchip insert can work even in areas without network connections thus making information available anytime.[1] Patients will also be able to read the information and inform their health care providers for timely guidance and counseling.[1] This will avoid the cost of transport as the patient travels to seek the doctor for minor health care concerns.[1]

Patient's information is also confidential thus health care personnel should ensure privacy.[1] However, that might not be possible in the case the information is kept on papers or in electronic devices that can be accessed by anyone.[1] The gold-plated microchip will enhance privacy since only legitimate users will be allowed to read the information during diagnosis and treatment.[1]

Figs. 3–7 show different views of the subcutaneous gold-plated microchip implant.[1] Detailed description of drawings attached.[1]

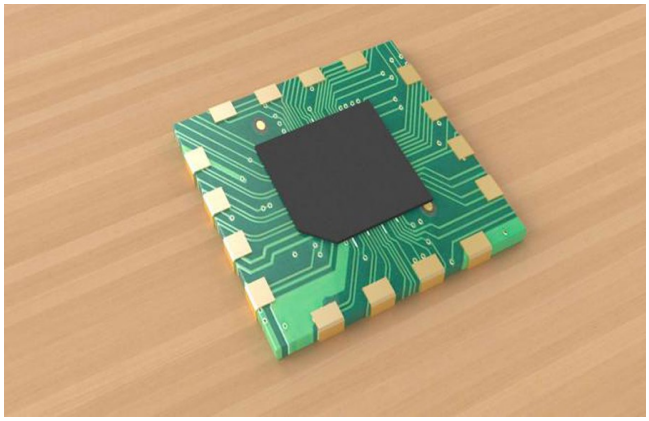


Fig. 3. shows a standalone view of a gold-plated microchip implant that has built-in memory containing vital patient information.[1]

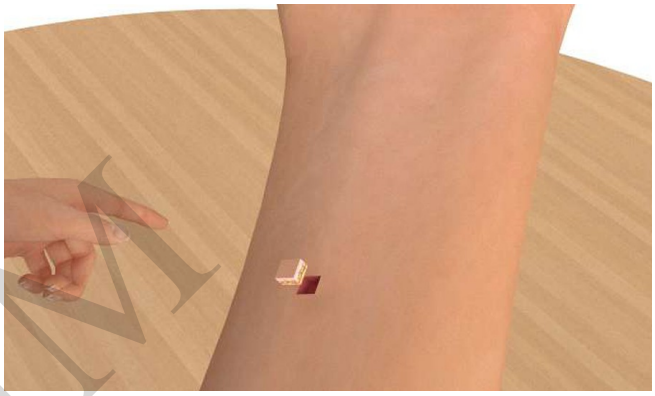


Fig. 4. illustrates a view of an area of the body in which the gold-plated microchip can be placed, that is, underneath the skin.[1]

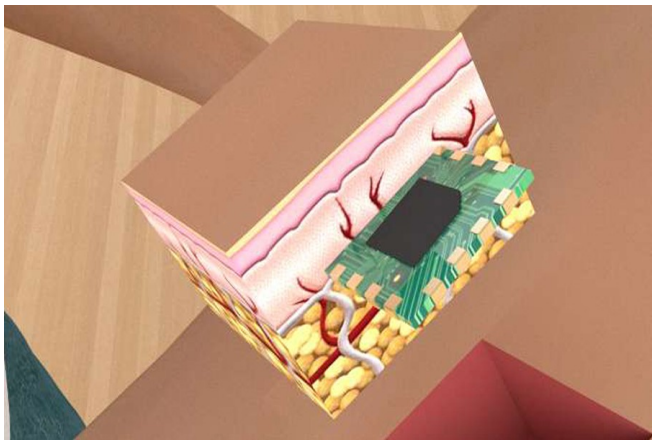


Fig. 5. shows a close-up view of the gold-plated microchip inserted into the subcutaneous layer of a user's skin.[1]

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Fig. 6. is a view of the subcutaneous gold-plated microchip implant communicating with a graphic user interface to obtain information.[1]



Fig. 7. shows a view of data stored by the subcutaneous gold-plated microchip implant being displayed on a graphic user interface, such as name, age, blood type, height, weight, allergies, and more that can be edited and updated.[1]

E. GOLD-PLATED MICROCHIP AS A MEDICAL DEVICE[1]

As a medical device a gold-plated microchip can provide valuable information of vital statistics in real time.[1] It could potentially be used for investigative and treatment purposes, where possible.[1]

1) A gold-plated microchip tagged with an internal medical device or in it by itself can potentially detect changes in the parameters and functionalities of the internal milieu of the body in real time.[1] The device acts as a sensor which allows patient's to monitor vital parameters of their condition precisely.[1] For e.g. a mountaineer can detect low oxygen levels as he ascends, a diabetic patient can monitor blood glucose levels with every meal, a heart patient can monitor rhythm changes and changes in blood pressure with activity, so on and so forth.[1] Figs. 8a and 8b depicts the mechanism of detection of a patient's pulse being displayed on a smartphone application in real time respectively.[1] This helps patients monitor their condition in real time without medical supervision and is especially important if they have no immediate access to their health care providers or are in remote areas where access to health care is very limited.[1] By being able to better manage their health condition patients can enhance their quality of life enabling them to be more productive while saving time and money.[1]

2) A gold-plated microchip can be used for investigating structural and functional abnormalities of the heart, liver, kidney, etc.[1] Fig. 9 shows the pulse rate and rythm being recorded to detect abnormalities.[1]

3) A gold-plated microchip is useful in the treatment of conductive disorders such as dysarrythmias and to mitigate symptoms and dysfunction due to myocardial infarction, neurodegenerative disorders, chronic kidney disorders, etc.[1] Fig. 10 is a simplified outline of how a gold-plated microchip can help mitigate symptoms and improve function in conductive and structural disorders.[1]

Figs. 8–10 show different views of the subcutaneous gold-plated microchip implant as a medical device.[1] Detailed description of drawings attached.[1]

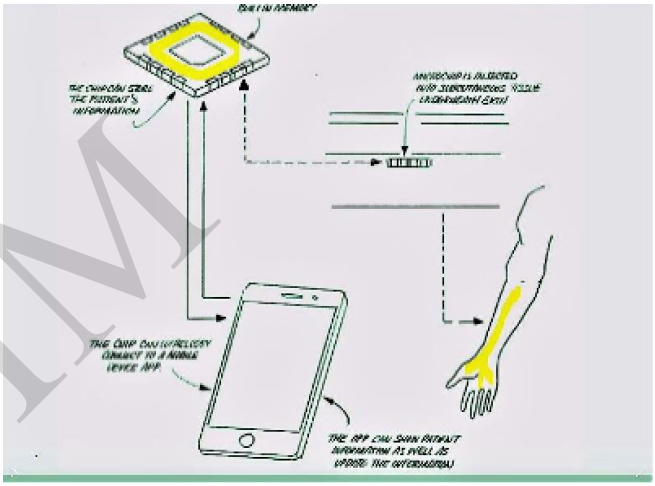


Fig. 8a. shows how the gold-plated microchip implant can detect the pulse of a person at rest in real time.[1]

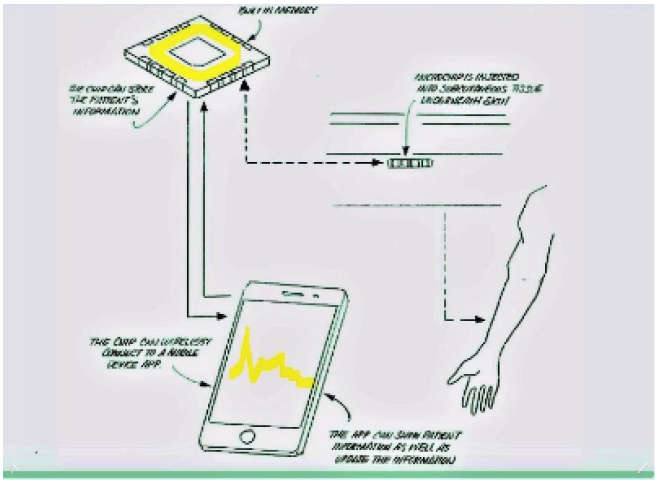


Fig. 8b. shows a view of the pulse rate and rythm being displayed on the smartphone application in real time.[1]

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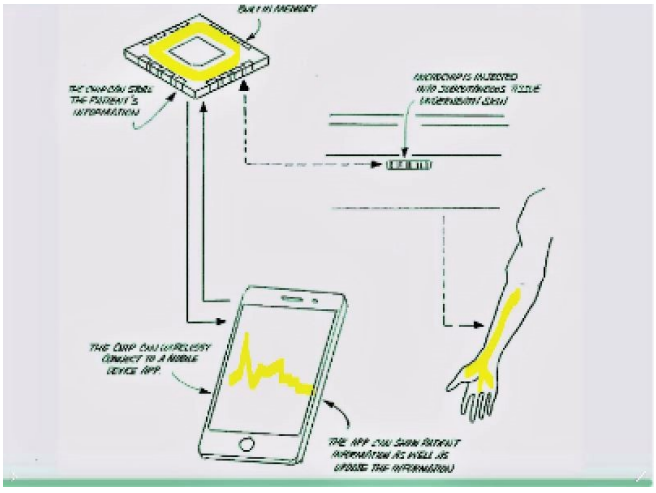


Fig. 9. illustrates how the gold-plated microchip can be used for investigative purposes to detect structural and functional abnormalities.[1]

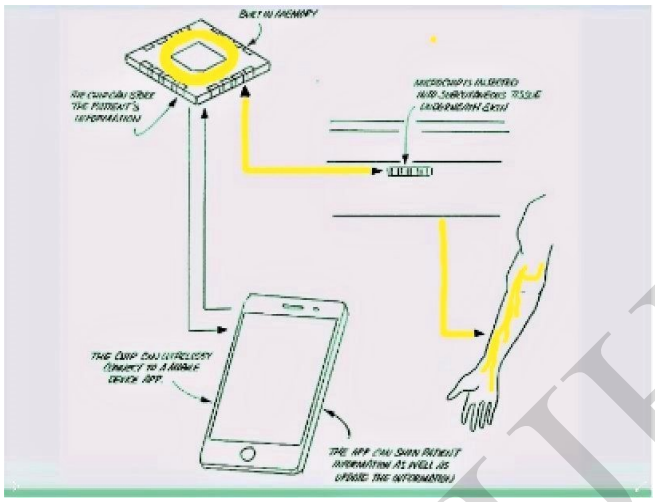


Fig. 10. illustrates how the gold-plated microchip can be used for treatment purposes such as conductive and structural disorders.[1]

III. How The Microchip Works

The microchip consists of an integrated circuit and uses RFID (Radio Frequency Identification) technology to store, process and transmit data.[2] The chip is innately inert in nature until it connects with a wireless device such as a scanner.[2] The encoded information in the electronic circuits are powered by the scanner which then processes the stored information and transmits the data across the electromagnetic fields created by the proximity of the microchip with the electronic device.[3]

Fig. 11 is a diagrammatic representation of data transfer between the transponder, also known as tag and the transciever, also known as an RFID reader.[4] The transciever has a radiofrequency module and a control unit that is capable of the generating high-frequency electromagnetic waves.[4] It is connected to an antenna.[4] The transponder on the other hand, consists of a microchip with an antenna.[4] As mentioned earlier, the transponder is an inert piece of equipment until it is switched on by the electromagnetic fields generated by the transciever.[4] The induction from the electromagnetic field generates a voltage to power up the microchip in the transponder.[4] The powered up transponder is then able to receive data from the transciever.[4] The changes in voltage from the microchip allows data to be transferred back to the transciever.[4] The transponder can also generate it's own electromagnetic field from the power source it recieves from the transciever which can further drive the transfer of data between the transponder and the transciever.[4] The load fluctuations indicate how data is sent and received between the two units.[4]

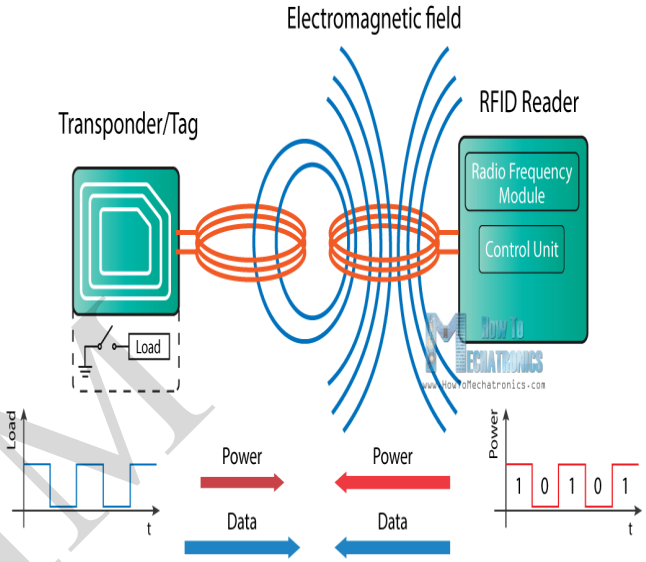


Fig. 11. is a diagrammatic representation of data transfer between transponder and the transciever.[4]

IV. Summary[1]

"Personalized Medicine" is about empowering patients to have access to their health information at all times which is readily available to health personnel and first responders.[1] It entails patient participation through the ongoing process of diagnosis, treatment, and rehabilitation.[1] Equally important, it allows patients to have insights about their health by being able to visualize, recognize and take corrective action when necessary.[1] Making patient information available to medical personnel and first responders, having access to one's health data and the ability to draw insights to take timely corrective action, and being able to easily edit and update the information with ease and convenience encompasses the concept of "Personalized Medicine".[1]

Microchip technology can make health care more accessible to patients especially in rural and remote areas through better communication and collaboration, thus improving quality of patient care and reducing cost from unnecessary tests and treatment.[1] With immediate access to life saving medical information vital time and effort can be used for treatment of patients instead of wasting precious time

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seeking for information.[1] This also reduces the chance of medical and surgical errors and any information that is potentially lost in transition or translation.[1]

A simplified version of storing and retrieving patient information is a microchipped Personalized Medical Card that contains accurate and up-to-date patient health data that can be processed and maintained via financial institutions, governmental agencies or any entity that uses best practices to protect the security and privacy of patient information.[1] A gold-plated microchip implant configured to store data makes patient information readily accessible by medical personnel and first responders.[1] It is inserted underneath the skin and contained in the subcutaneous layer.[1] The device is comprised of a memory chip readable by non-invasive means and stores important medical information about the patient such as name, age, blood type, height, weight, allergies, and more.[1] A software application can be paired with the microchip, capable of being installed on an electronic device such as a smartphone or tablet.[1] The application can be used to scan the microchip and display information on the smartphone application or tablet screen.[1] Verified personnel may be able to edit and update information associated with the patient for precise and accurate medical information.[1] Using non-invasive technology patient's can draw insights from their health data and seek early treatment which can enhance their quality of life, productivity and provide them with the necessary tools to make better treatment choices.[1] A gold-plated microchip inserted inside the patient's body as a medical device or tagged to a medical device allows patient self-monitoring of vital statistics of specific conditions such as heart disease, diabetes, kidney functions and other metrics associated with different aspects of body function.[1] This will pave the way for patients to lead independent and more productive lives away from the hospitals while being able to adequately monitor their health without medical supervision.[1] As a result, both patients and health care providers can benefit from huge cost savings in addition to improving quality of care immensely.[1] The gold-plated microchip can be used in the investigation of structural and functional abnormalities of the heart, liver, kidney, etc.[1] It can also be useful in treating conductive disorders such as dysarrythmias and in mitigating symptoms and dysfunction due to myocardial infarction, neurodegenerative disorders, chronic kidney disorders, etc.[1] Therefore, a well informed patient with all the necessary medical information within arms way is more likely to play an active role in managing one's own health thus driving down costs, increasing productivity and enhancing quality of life which truly is the objective of “Personalized Medicine”.[1]

"Personalized Medicine" is a patented concept.[1] If you are interested as an investor or partner for "Personalized Medicine" please contact me at dr.rupamurthy@yahoo.com

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