



**BY THE NUMBERS:**

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# SIX TECHNOLOGIES THAT MAY RESHAPE MEDICINE

New biomedical devices and technologies are poised to provide a veritable fountain of middle age.

According to the McKinsey Global Institute, poor health shaves a full 15 percent from worldwide economic activity annually. In July 2020, MGI published *Prioritizing Health*, a report that examined health investments as a means to provide social and economic benefits.

The report identified six innovations in what it called “the visible pipeline” involving advanced bioengineering solutions that should provide material health gains in the next two decades. These innovations won’t simply add years to the end of someone’s life, but instead extend the period of robust health. “For people at middle age, the shift could extend the number of years in good health by a decade, essentially making 65 the new 55,” the report states. While no explorers have tramped through swamps looking for the “Fountain of Middle Age,” that’s what these new innovations may provide.

Here are those six innovations, as identified by MGI.

## SIX BIOMEDICAL INNOVATIONS TO EXTEND MIDDLE AGE

### ADVANCED SURGICAL PROCEDURES

Minimally invasive or robotic surgery using small instruments, as well as any technique that improves surgery-related processes outside the operating room.

**EXAMPLE: Suspended animation for severe trauma patients**

A cold saline solution could be injected to cool the body to 10–15 °C and stop its normal functions. This would allow time for the surgeon to operate before resuscitating the patient.

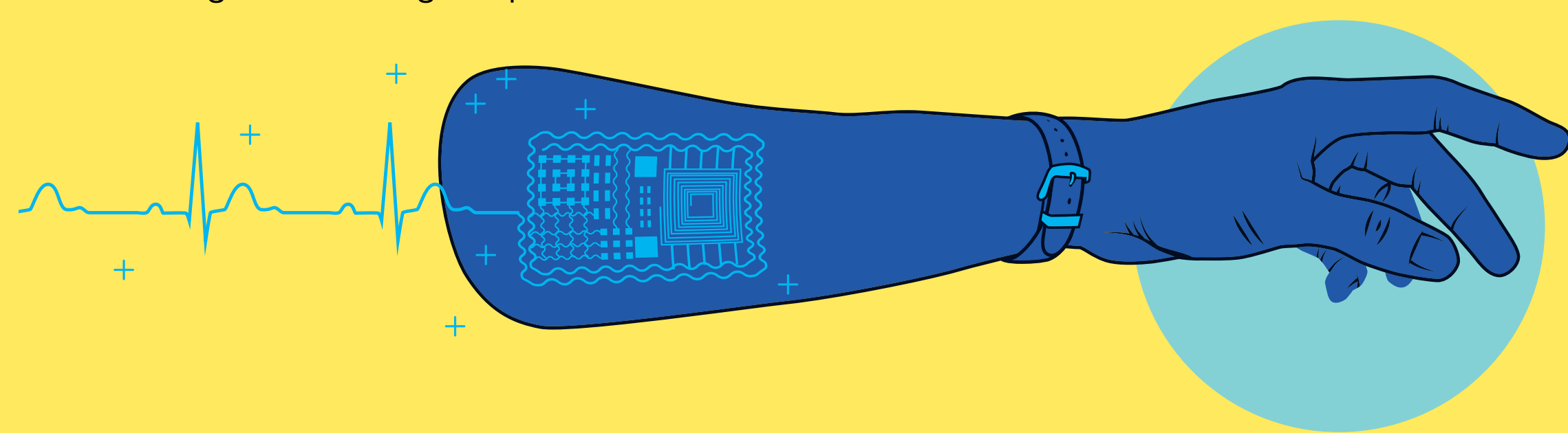


### CONNECTED AND COGNITIVE DEVICES

Portable, wearable, ingestible, or implantable devices that can monitor health and fitness information and deliver self-regulated therapies autonomously.

**EXAMPLE: E-tattoos for heart diagnostics**

Electronic tattoos could provide longer periods of heart monitoring and increase patient comfort while offering a wider range of patient data to doctors.

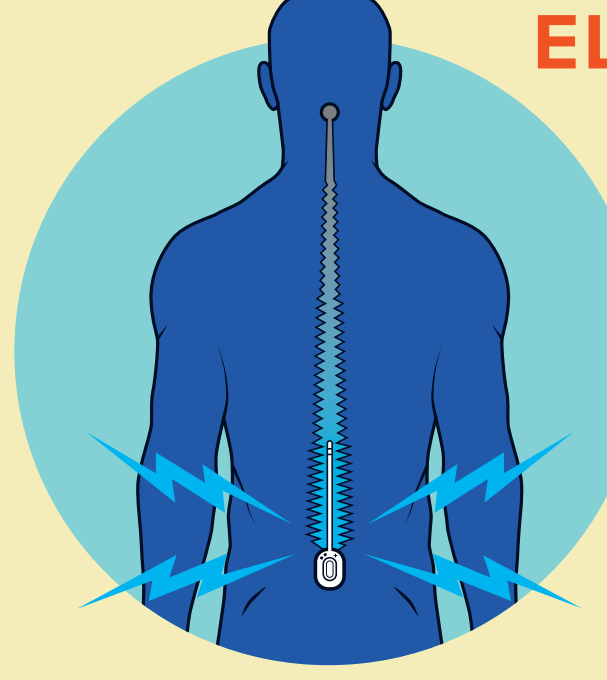


### ELECTROCEUTICALS

Implantable devices that target the neural circuits of organs. Therapy involves mapping neural circuitry with neural impulses.

**EXAMPLE: Implantable microchips and the mitigation of chronic pain**

Spinal cord stimulation can improve patient quality of life, allowing increased mobility, enhanced sleep, and reduced need for pain medication.



### ROBOTICS AND PROSTHETICS

Programmable, self-controlled devices consisting of electronic, electrical, or mechanical units and artificial substitutes or replacements for a part of the body.

**EXAMPLE: Next-generation exoskeletons and mobility support**

Next-generation exoskeletons, powered by small motors that mimic human muscles, could allow older patients to recover their autonomy.

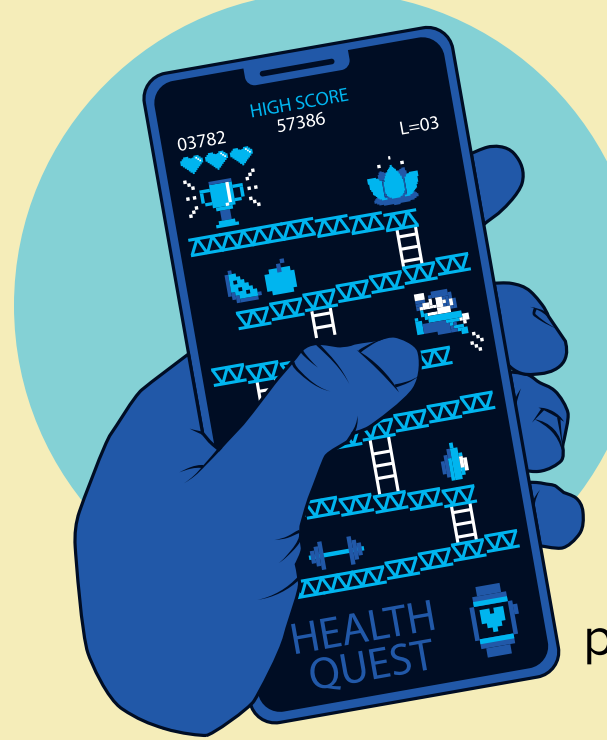


### DIGITAL THERAPEUTICS

Preventive and therapeutic evidence-based interventions driven by software for a broad spectrum of physical, mental, and behavioral conditions.

**EXAMPLE: AI-powered app to enable behavior change**

An app powered by AI, patient data, and behavioral science could help patients adopt and sustain healthy behaviors through gamification.



### TECH-ENABLED CARE DELIVERY

Technology that enables providers and patients to improve care outcomes through access to Big Data and advanced analytics capabilities.

**EXAMPLE: Multichannel care delivery**

Online platforms that facilitate data sharing between patients and physicians to improve the efficiency of treatments for chronic conditions like diabetes.



Source: McKinsey Global Institute.