NC State engineers are finding new ways to help all of us enjoy longer, healthier and more productive lives. This graphic shows just some of the ways NC State Engineering is improving health and health care.

**Blood filtering**  
NC State chemical engineers developed a filter that removes the human form of “mad cow disease,” a fatal brain disorder, from blood. The device filters the blood prior to transfusions into patients.

**Charging implants**  
Tiny retinal prosthetics and cochlear implants help people see and hear, but they can’t store enough energy in a battery. NC State electrical engineers are designing more efficient wireless power transfer circuits to keep these devices running longer.

**A smarter inhaler**  
A new “Smart Inhaler” developed by NC State mechanical engineers targets drugs onto diseased tissue without affecting healthy areas of the respiratory system, signaling a breakthrough for treating diseases like lung cancer.

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**Particle project**  
NC State civil, construction, and environmental engineers are studying how tiny airborne particles inhaled by humans affect rates of asthma and heart disease. The results could help lead to better air-quality standards.

**Watching cancer**  
Biomedical engineers at NC State have developed a noninvasive way to monitor metabolism in malignant tumors, such as those associated with breast cancer. This information can help doctors plan further treatments.

**Modeling radiation dose**  
CT scans produce images that help doctors diagnose and treat disease, but they also expose the patient to potentially harmful radiation. NC State nuclear engineers modeled the radiation dose to human embryos in the womb to learn more about these effects.

**Groundbreaking Prosthetics**  
NC State industrial and systems engineers are working with veterinary surgeons on prosthetic implants that are attached to bone, giving patients who have lost an arm or leg a stable, permanent limb. The implants have been tested in cats and dogs.

**Improving the system**  
NC State is a leader in health systems engineering, filling a growing national need to improve the organization, delivery and cost-effectiveness of health care.

**Vascular Sensors**  
Patients suffering from aching legs, lymphedema and other vascular conditions often wear compression stockings to aid circulation. NC State electrical and biomedical engineers are developing sensors for the stockings that can monitor vascular system health.

**Protecting Privacy**  
As confidential patient information travels across computer networks, it becomes vulnerable to hackers. NC State computer scientists are leaders in the ongoing effort to keep health care records secure.

**Nanostructures**  
Researchers in chemical engineering and materials science and engineering at NC State are designing tiny structures to deliver drugs to specific areas in the body, a process that also helps researchers learn more about how these structures work.

**Microneedles**  
NC State biomedical engineers are developing tiny hypodermic needles that could one day deliver glucose to diabetics. The new system would provide controlled and painless drug delivery in response to blood-sugar fluctuations.

**Attacking Arthritis**  
NC State biomedical engineers use pig joints to study the effects of impact collisions on bones and cartilage. The research could help scientists find the cause of osteoarthritis.