A Heart Pump without a Cord

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When an ailing heart can't move blood on its own, an implanted pump can help keep it flowing smoothly. But there's a major drawback: the power supply is large, must be housed outside the body, and is usually connected to the pump via an electric cord that runs through the abdominal wall—a source of constant irritation and potential infection.

Researchers have now demonstrated a prototype wireless heart pump that eliminates the need for the cord altogether. And unlike some wireless implants, it is reliable and efficient over a range of distances, from a few centimeters to a meter or more.

The pump was developed by Josh Smith [1], associate professor of computer science and electrical engineering at the University of Washington, and Pramod Bonde [2], a heart surgeon at the University of Pittsburgh Medical Center, and presented at the American Society for Artificial Internal Organs' annual meeting in Washington, D.C., last month.

Most implanted medical devices, such as pacemakers and defibrillators, can work with internal batteries, but heart pumps and artificial hearts require more power. An artificial heart called the AbioCore is powered wirelessly, but the power transmitter, affixed to the skin, has to stay aligned with the receiver inside the body. "Just a few millimeters of separation and misalignment results in energy loss," says Bonde.

Smith and Bonde's new wireless pump gets around the alignment problem by modifying the way power is sent and received. The external power transmitter is a metal coil that emits an oscillating magnetic field around
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