

# Artificial liver may extend lives

June 2 2009

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The first artificial organ for liver patients that uses immortalized human liver cells, the Extracorporeal Liver Assist Device, or ELAD®, is a bedside system that treats blood plasma, metabolizing toxins and synthesizing proteins just like a real liver does.

NewYork-Presbyterian Hospital/Columbia University Medical Center is currently one of only a small number of hospitals in the U.S. offering this therapy to acute liver failure patients as part of ongoing clinical trials.

"These studies are looking at how well the system can extend patients' lives until a [liver transplant](#) becomes available. We're also interested to see if it can relieve the burden on the patient's liver enough so that it can regenerate and regain some of its function," says Dr. Robert Brown, site principal investigator, chief of the Division of Abdominal Organ Transplantation, and director of the Center for [Liver Disease](#) and Transplantation at NewYork-Presbyterian Hospital/Columbia University Medical Center. Dr. Brown is also the Frank Cardile Professor of Medicine and Pediatrics (in Surgery) at Columbia University College of Physicians and Surgeons.

The ongoing studies look at whether ELAD liver support improves survival compared with standard medical therapy. Patients are randomly assigned to receive either standard medical therapy plus the ELAD system, or standard medical therapy alone. Patients eligible for the study have life-threatening acute liver failure, often due to an infection. Another trial open to patients with liver failure due to drug overdose

without underlying liver disease is expected to begin enrollment later this year.

The current trials expand on prior results from Phase 1 and 2 trials in the U.S. and U.K., and a pivotal, randomized, controlled clinical trial at two sites in China during 2006 and 2007. In the latter study, 69 patients with [hepatitis B](#) or C who had suffered ALF were treated with either ELAD or standard therapy. Thirty-day transplant-free survival rates were statistically higher in the ELAD group compared with the control.

Artificial livers have been attempted since the 1960s. Because previous designs didn't use human liver cells, they couldn't adequately filter toxins or create chemicals essential to metabolism and blood-clotting.

With the ELAD system, four 12-inch cartridges containing cells derived from human liver cells and fibers are mounted on a standard blood-pumping unit. The patient's blood plasma flows inside of hollow fibers to allow appropriate two-way transfer of metabolites across the fiber membrane.

Liver transplantation is limited by the supply of donor livers. According to the United Network for Organ Sharing (UNOS), there were approximately 6,500 liver transplants performed in 2007; however, there are more than 16,000 patients on the waiting list. Each year only about one-third of those who need a donor liver will receive one, and many patients die while waiting.

Acute [liver failure](#) afflicts more than 30,000 Americans each year, including those with chronic [liver](#) diseases like hepatitis, as well as those whose livers were damaged, such as by taking too much acetaminophen pain medicine. If not treated effectively and promptly -- usually by transplantation -- [patients](#) experience organ failure, bleeding, coma and death. When a donor organ isn't available or if the patient is too sick for

surgery, ELAD could be their only option.

Source: New York- Presbyterian Hospital ([news](#) : [web](#))

Citation: Artificial liver may extend lives (2009, June 2) retrieved 20 July 2023 from <https://medicalxpress.com/news/2009-06-artificial-liver.html>

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