MEDICAL BREAKTHROUGHS
RESEARCH SUMMARY

TOPIC: ARTIFICIAL KIDNEY REPLACES DIALYSIS
REPORT: **MB #4817**

BACKGROUND: Around 15 percent of U.S. adults have chronic kidney disease, and about nine in 10 do not know they have it. It is more common in women aged 65 years or older. Kidney failure, the last stage of chronic kidney disease, is when your kidneys have stopped working well enough for you to survive without dialysis or a kidney transplant. Diabetes is the most common cause of kidney failure, and high blood pressure is the second most common cause. Some other problems leading to kidney failure can be autoimmune diseases, such as lupus and nephropathy; genetic diseases, such as polycystic kidney disease; nephrotic syndrome; or urinary tract problems.
(Source: https://www.cdc.gov/kidneydisease/publications-resources/2019-national-facts.html and https://www.kidneyfund.org/kidney-disease/kidney-failure/)

CURRENT TREATMENTS: When kidneys can't keep up with waste and fluid clearance on their own, you have end-stage kidney disease and need dialysis or a kidney transplant. Dialysis artificially removes waste products and extra fluid from your blood. In hemodialysis, a machine filters waste and excess fluids from your blood. In peritoneal dialysis, a thin tube (catheter) inserted into your abdomen fills your abdominal cavity with a dialysis solution that absorbs waste and excess fluids. After a period of time, the dialysis solution drains from your body, carrying the waste with it. A kidney transplant involves surgically placing a healthy kidney from a donor into your body. Medications will need to be taken for the rest of your life to keep your body from rejecting the new organ. For some who choose not to have dialysis or a kidney transplant, a third option is to treat kidney failure with conservative measures.
(Source: https://www.mayoclinic.org/diseases-conditions/chronic-kidney-disease/diagnosis-treatment/drc-20354527)

ARTIFICIAL KIDNEY ON THE HORIZON: The Kidney Project headquartered at UCSF was granted $1 million, from The John and Marcia Goldman Foundation, to advance its bioartificial kidney. The grant will support the development of the device's bioreactor, which will perform essential kidney functions that dialysis treatments don't replace. This first-of-its-kind artificial organ will be implanted in the abdomen to replace a damaged or diseased kidney without the need for immunosuppressant drugs and at less than one-third the cost of chronic dialysis. The bioreactor contains a culture of human kidney cells, which help filter a patient's blood by reabsorbing nutrients and routing toxins and excess water, the urine, to the bladder for excretion. It will also assist with blood pressure regulation and hormone production which is an important advantage over dialysis treatments.
(Source: https://pharmacy.ucsf.edu/news/2020/10/bioartificial-kidney-aims-mimic-natural-kidney-function-1-million-grant-john-marcia)

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If this story or any other Ivanhoe story has impacted your life or prompted you or someone you know to seek or change treatments, please let us know by contacting Marjorie Bekaert Thomas at mthomas@ivanhoe.com