Hemodialysis
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Animal Internal Medicine Service, who pioneered the first hemodialysis pro-
gram at UC Davis in 1990.

“While the procedure does not cure
damaged kidneys, hemodialysis is
life-sustaining while the acute kidney
injury heals or as a replacement for
permanently damaged kidneys,” says
Dr. Cowgill. “Our goal is to help a pet
survive until the animal’s own system
can return to normal or it is strong
enough to undergo treatment for the
underlying problem.”

For more information about the pro-
gram, contact Dr. Larry Cowgill, UC Da-
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What is hemodialysis?
Strictly speaking, dialysis is the diffusion of
water and dissolved molecules (solutes) across
a semi-permeable membrane. In hemodialy-
sis, a dialysis machine is used to pump blood
from the patient through an artificial kidney,
which removes accumulated waste prod-
ucts (urea, creatinine, phosphate and many
others) that the patient’s own kidneys nor-
mally would filter and excrete from the body.
Hemodialysis also helps to restore electrolyte
and water balance, another task the kidneys
would normally perform in addition to remov-
ing solute wastes.

When is it used in veterinary
medicine?
Most human hemodialysis patients have
chronic renal failure—they rely on treat-
ments 2–3 times per week for their entire
lives, unless they receive kidney transplants.

Conversely, most veterinary hemodialysis
patients have acute renal failure—the sudden
failure of previously well-functioning kidneys
that can result from a variety of causes.
Hemodialysis does not treat or repair kidneys,
but serves as a bridging measure for patients
with acute renal failure—it re-establishes
and maintains metabolic stability in order to
give the damaged kidneys a chance to heal.
Without the extra time hemodialysis provides,
the large majority of acute renal failure
patients would die before their kidneys could
recover enough function to sustain life.

Most canine hemodialysis patients have
damaged kidneys from antifreeze poisoning,
kidney infections (like leptospirosis or pyelone-
phritis) or complications due to other systemic
disease. Cats, like dogs, may suffer from anti-
freeze poisoning, kidney infection or kidney
toxins—lilies, for instance, are potent kidney
toxins in cats. Hemodialysis can stabilize
cats with stones obstructing their ureters (the
tubes connecting the kidneys to the bladder),
to either give the stones a chance to pass on
their own, or to make the cats stronger candi-
dates for surgical stone removal.

Hemodialysis treatments two or three times
per week can also maintain some pets with
chronic renal failure, when medical manage-
ment alone can no longer provide a good
quality of life. Some of these pets, especially
cats, may be candidates for kidney transplan-
tation, and hemodialysis is sometimes needed
before and/or after transplantation surgery
for stabilization and support.