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The A, B and Cs of Hepatitis in Kidney Transplantation

Hepatitis Testing Critical in Transplant Evaluation

by *Steven Katznelson, M.D. and Laura Miyashita*

The hepatitis B (HBV) and hepatitis C (HCV) viruses can have a significant impact on kidney transplantation, meriting careful patient screening and considerations. “While both HBV and HCV offer challenges for patients and their transplant teams, a kidney transplant is still a viable option for managing their kidney disease,” explains Steven Katznelson, M.D., transplant nephrologist with California Pacific Medical Center. He adds, “Nationwide, a growing number of patients with HBV and HCV exposure have excellent and long-lasting success after transplantation.”

Because of HBV and HCV’s impact on kidney transplantation, California Pacific uses specific tests prior to transplant. Unlike HBV or HCV, the hepatitis A virus, most commonly acquired by eating tainted food, is of little significance in kidney transplantation.

Hepatitis B and Kidney Transplantation

Because persistent HBV infection can have a negative impact on a transplant’s long-term success, HBV



patients undergo a liver biopsy to determine if the virus has caused any significant liver damage. Patients with severe liver damage (cirrhosis) may not be able to receive a transplant. Patients with chronic HBV without cirrhosis may receive a transplant.

Since routine vaccinations of dialysis patients and staff began in 1982, the occurrence of new HBV infections has decreased significantly. Most adults with HBV infection are able to “clear” the virus from their body with the help of their immune system. About 5% of adults, however, are unable to

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clear the virus and become chronically infected (this percentage is likely higher in dialysis patients with end-stage renal disease, ESRD).

HBV testing is important for ESRD patients and entails several blood tests, all with different meanings. The hepatitis B surface antigen test (HBsAg) is a marker of current HBV infection. It indicates the presence of virus particles in one's bloodstream. When a patient is exposed to HBV infection, the HBsAg test becomes positive. As the immune system fights off the infection and the virus disappears, the HBsAg test usually becomes negative. During this time, another test becomes positive. A positive hepatitis B surface antibody (HBsAb) test usually means that the virus is killed off, or cleared. A positive HbsAb test is also found in patients who have been successfully vaccinated.

In patients unable to “clear” the virus, the HBsAg test remains positive, suggesting chronic HBV infection. Patients with chronic HBV infection can develop progressive liver disease.

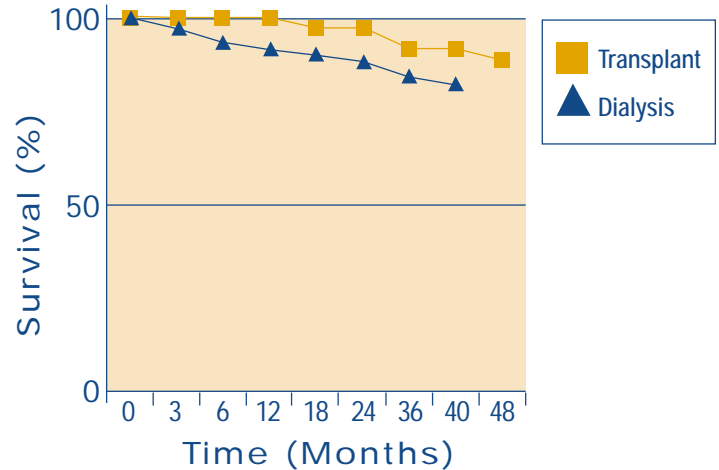
“Following kidney transplant, the required immunosuppressive drugs can make HBV more active, leading to worsened liver disease,” says Katznelson. The Kidney Team takes extreme care with these patients and often uses the drug lamivudine both before and after transplant to decrease the presence of HBV in one's blood.

Hepatitis C and Kidney Disease

HCV infection is fairly common in patients with ESRD. About 20% of dialysis patients nationwide have HCV exposure from a transfusion, “needle stick,” sexual contact or high-risk behavior. Once HCV exposure occurs, many patients can fight off the virus or clear it from their system. Too many patients, however, become chronically infected.

The most common lab test for HCV exposure in ESRD patients is the anti-HCV antibody (HCVAb) test. Patients with a positive HCV test who desire a kidney transplant should have further testing to determine whether their infection has been cleared or is still “active.” Many transplant centers will perform a “viral load” test, termed a PCR. If the PCR is positive, it suggests active infection.

Some patients with active HCV infection wanting a kidney transplant need a liver biopsy to determine if the infection



Survival of Hepatitis C infected patients with ESRD on dialysis versus transplant.

has caused any significant liver damage. Patients with cirrhosis may not be able to receive a transplant. Patients without cirrhosis can receive a transplant. However, because post-transplant immunosuppressive medications can lead to more active HCV infection and worsened liver disease, transplant teams closely monitor these patients after surgery.

As with HBV infection, new therapies exist for patients with HCV. For example, interferon may remove HCV from the system, however patients do not always have success with this treatment and experience many side effects. ☹️

Common Hepatitis Terms and Definitions

Hepatitis B

HBsAg+: indicates the presence of some viral particles in one's bloodstream

HBsAg-: indicates no viral particles in one's bloodstream

HBsAb+: usually indicates patient has cleared HBV or has been vaccinated

Hepatitis C

HCVAb+: indicates exposure to HCV

HCV PCR: a viral load test to determine the presence of active HCV infection

Patient Profiles

by Laura Miyashita



Marcea Weir

Her ‘Miracle’ Transplant Occurred After Battling Cancer

Diagnosed with glomerulonephritis, an autoimmune kidney disease in 1995 and then breast cancer in 1997, Marcea Weir wondered if she would ever regain her health. “I started peritoneal dialysis two years after my kidney diagnosis and named the machine ‘my old man’ because he was faithful every night and the closest thing to me at the time!” explains Marcea.

Because of her bout with cancer, Marcea waited in “inactive status” on the transplant list. Last July, her oncologist and primary care physician determined she had been cancer-free for five years. Marcea then met Clarissa Golden, R.N., California Pacific’s East Bay transplant coordinator, who arranged for an evaluation at the Berkeley clinic with nephrologist Steven Katznelson, M.D. “After evaluating my health, Dr. Katznelson changed my waiting list status to ‘active’ which, because of my five years waiting, helped move me to the top of the list. I was so excited!”

remembers Marcea. She was anxious for the transplant, which would mean an end to dialysis and hopefully, a healthier, more energetic life.

On August 22, Marcea received a call from transplant nurse Joanne Goettsche, R.N. with an offer for a kidney transplant. “I immediately hung up the phone and called everyone I knew to tell them “...my kidney is coming! My kidney is coming!” says

Marcea. After arriving at the Medical Center in San Francisco, doctors began her surgery preparation, performing a chest x-ray, labs, an EKG and some consultations. After the surgery, Marcea remembers surgeon Assad Hassoun, M.D. rubbing her cheek saying, “You did just fine.” Marcea praises God and all those involved for her transplant, noting that her new kidney works very well. As she says, “I am a miracle!”

Steve and Tim Thomas

A Living Donor Transplant Brought These Brothers Closer

Steve Thomas’ kidney disease endured for 16 years before his kidneys failed. At that point, in 2001, he visited California Pacific’s Roseville Clinic for an evaluation. “I brought about five relatives who might consider donating to my evaluation, but thought of my brother Tim first,” explains Steve.

“Once I found out my brother was sick, I wanted to do something to help him and make our relationship closer,” says Tim, Steve’s younger brother. “It seems like God had a plan because my kidney was a match and I was in great shape,” he explains.

On October 9, 2001, Steve and Tim both underwent surgery; first Tim whose kidney was removed with a minimally invasive laparoscopic nephrectomy procedure, then Steve, who received Tim’s kidney. Tim left the hospital in near record time—just two days later—but Steve had to return to San Francisco shortly after discharge because his labs indicated rejection. As Steve relates, “I was given additional drugs for five days and my medications adjusted, then everything turned out okay.”

Steve is grateful for his brother’s gift which has given him back his health. Of their experience at California Pacific, Steve and Tim agree that, “Both the doctors and nurses are really fabulous.”



Understanding PRA and How It Affects Your Transplant

High Panel Reactive Antibodies May Influence Transplant Waiting Time

by *Steven Katznelson, M.D. and Laura Miyashita*

While awaiting kidney transplantation, you will become familiar with a routine test called PRA, or panel reactive antibodies. Your dialysis unit will draw this test every one to three months and send it for processing at our laboratory to measure antibody levels. Specifically, PRA measures the presence of certain antibodies that can exist in a patient's blood. The three main causes of PRA development are:

1. blood transfusion
2. previous transplantation
3. pregnancy

“Not all patients who have a history of transfusion, transplantation or pregnancy develop elevated PRAs,” explains Steven Katznelson, M.D., transplant nephrologist at California Pacific Medical Center. “In fact, over-

all, only about 20-30% of patients on the waiting list have high PRA levels.” And over time, PRA levels may decrease.

In the past decade, the percentage of patients awaiting kidney transplantation with high PRA levels has decreased because of the development of the drug Epogen®. This medication has reduced the need for transfusions, which in the past were common for treating anemia associated with kidney failure.

Patients with high PRA levels may be at an increased risk for having acute rejection episodes after their kidney



transplant. Therefore, these patients often need more immunosuppressive (anti-rejection) medications early after their transplant. In addition, finding compatible kidneys for patients with high PRA levels can prove difficult. Because of this, these patients may have a longer waiting time on the transplant waiting list. 🌀

Considering Extended Criteria Donors

Nationwide Program Tries to Shorten Transplant Waiting Times

by *William Bry, M.D. and Laura Miyashita*

Is there any way to avoid the long wait for a kidney transplant? If you do not have a family member or friend available to act as a living donor, you will find yourself waiting about three to five years for a cadaver donor kidney. In an effort to shorten the waiting period for patients who are having an especially hard time on dialysis, the United Network for Organ Sharing (UNOS) has implemented a new nationwide program using “extended criteria donors.” This term refers to:

- Donors 50 and older with two of the following:
 - High blood pressure;
 - Stroke;
 - Mild acute kidney dysfunction; or
- Any donor over age 60

One would think that receiving a kidney transplant from such a donor would be very risky. In reality, some kidneys from these donors are appropriate to transplant if they demonstrate good function and a pre-transplant biopsy shows healthy

kidney tissue.



“Our team has successfully transplanted kidneys from ‘extended criteria donors’ for many years with good results,” explains William Bry, M.D., surgical director of California Pacific’s Kidney-Pancreas Transplant Program. “We are very selective in choosing only donors that we think will offer our patients

EXTENDED CRITERIA, continued next page

Your Waiting Time for a Kidney Transplant

Organ Donation Rates Affect Time to Transplant

by William Bry, M.D. and Laura Miyashita

With nearly 6,000 people waiting for a kidney transplant in Northern California, it is no surprise that it can take several years before receiving the call stating, “we have found a donor for you.” Sadly, only about 370 cadaver donor kidneys become available in Northern California each year for people on the waiting list. This is why California Pacific’s Kidney Team encourages all patients to consider having a family member or friend donate a kidney for them.


“The average wait for a kidney transplant depends on one’s blood type, but averages three to five years,” according to William Bry, M.D., surgical director of California Pacific’s Kidney-Pancreas Transplant Program. Previous transplants, blood transfusions and pregnancies can stimulate the immune system to create antibodies against potential donors because of exposure to foreign tissue antigens. Patients with elevated levels of these

antibodies may have to wait substantially longer than average if a compatible donor cannot be identified. (See accompanying article on PRA).

In Northern California, cadaver donor kidneys are allocated based strictly on waiting time. Our organ procurement organization (OPO), the California Transplant Donor Network, feels that “first come, first served” is the fairest way to handle such a precious resource. “In other parts of the country, OPOs use complex formulas combining waiting time with a donor and recipient’s tissue match in determining who receives a kidney transplant,” explains Bry.

Research has shown that it may be more important to transplant a kidney quickly after its removal from the donor than to try matching tissue types. Accordingly, the United Network for Organ Sharing (UNOS) is now changing national rules to de-emphasize the influence of tissue

typing and instead focus on speeding the kidney transplant process so the organ doesn’t have time to deteriorate.

The accompanying box lists some exclusions to the standard allocation system for a kidney transplant. Additionally, a new national program aimed at reducing waiting times using “extended criteria donors” is described in an accompanying article. 

Exclusions to Kidney Transplant Allocation System

The wait for a cadaver kidney transplant in Northern California is approximately three to five years. Exceptions to this timeframe are as follows:

- **Perfectly Matched Kidney—** A perfectly matched kidney offers the recipient improved transplant success. Because of this fact, a national program exists for sending perfect matches across the country. Five to ten percent of the transplants performed at California Pacific are for perfect matches, and can occur any time during the waiting period.
- **Pediatric Transplants—** Children waiting for a kidney transplant receive priority over adults.
- **Multiple Organ Transplants—** Patients waiting for a multiple organ transplant, such as pancreas and kidney, receive some priority.
- **Non-functioning Kidney—** If a person receives a kidney transplant that never works, he/she keeps his/her spot on the waiting list to try again.
- **Transplants for Donors with Kidney Failure—** In the unlikely event that a person who has previously donated a kidney to another person develops kidney failure, their name goes to the top of the waiting list to receive a kidney transplant.

EXTENDED CRITERIA, continued from page 4


the best long-term function and believe this rigorous screening contributes to our successful outcomes,” he adds.

Good candidates for extended criteria donor kidneys include patients on the waiting list who:

- are over 60 years in age; or
- are diabetic and over age 40; or
- are having a particularly hard time with dialysis.

The advantage to considering an extended criteria donor is a shorter

waiting time prior to transplant. This is due to a smaller patient population waiting for extended criteria donors. A separate waiting list is maintained for extended criteria donors, but patients on this list remain on the waiting list for a standard donor as well.

If you would like more information about extended criteria kidney donors, please call Laura Miyashita at 415-600-2986 or email miyashl@sutterhealth.org to receive a brochure. 

Common Questions About Living Donation and Transplant Listing

by Steven Katznelson, M.D.

Living Donation:

Q. Why can't a living donor get their work-up done before the recipient is cleared?

A. As a general rule, California Pacific's Kidney Team does not work-up a living donor until most of the recipient evaluation is completed. The main reason is that the recipient evaluation determines whether the recipient is healthy enough to successfully undergo kidney transplantation. If a recipient does not pass these tests, a kidney transplant is considered too dangerous. We would not want to put a potential donor through the battery of tests needed to clear him/her for kidney donation only to find that their recipient cannot be transplanted. Therefore, we usually clear the recipient first.

Q. Can I still have children after donating a kidney?

A. Women of childbearing age can have children after kidney donation because the donor surgery does not affect their reproductive organs. We will work with donors to plan a donation time that works best with their family planning.

Q. What happens if I am a donor and my remaining kidney fails?

A. It is rare for living donors to experience kidney failure. At California Pacific, we carefully screen for any pre-existing



Susan Elkins donated a kidney to husband Gary, who says he now has "more energy than ever."

medical conditions that could lead to new health problems after donation, including kidney disease. If there is any hint of such a problem, we will not let the donation occur. After donation, living donors are encouraged to seek annual medical check-ups to ensure they remain in good health. In the rare case that a living donor should develop end-stage kidney disease, the options of dialysis and transplant are available.

Q. What risks are there to kidney donors?

A. Once a living donor candidate has been completely evaluated and cleared, the chance of the donation affecting his/her life-span or lifestyle is extremely low. The risk of having a serious complication after kidney donation is about the same as having one's gallbladder removed (about 2 in

5,000 risk). Kidney donors are in the hospital for three or four days and often have some pain at their incision sites for one to three weeks. We provide medication to control this pain. Most living donors return to work in about four to six weeks.

Transplant Waiting List:

Q. How long does it take to get listed after I am evaluated?

A. Once a patient is seen in evaluation clinic and considered a good transplant candidate, we draw routine pre-transplant blood work (blood type, antigen testing and a screen for certain viruses) and process it. It takes about three to four weeks for us to receive and review all results, after which a patient can be listed for transplant. ☞

Your Prescription Costs Post-Transplant

Advance Planning Can Save You Money

by Bonnie Jacobson, LCSW, Pamela Rock, MSW and Laura Miyashita

When patients leave the hospital following a kidney transplant, they are initially prescribed six medications to prevent kidney rejection and infection. Because the costs associated with these medications are very high, it is critical to assess your insurance coverage prior to transplant and if necessary, obtain secondary insurance. At transplant evaluation, California Pacific's social workers will review your insurance and estimate your medication costs post-transplant. All patients are asked to notify the transplant team of any changes to insurance coverage.

Medicare Drug Coverage

Medicare pays 80% of one's immunosuppressive (anti-rejection) drugs for 44 months post-transplant. Because these immunosuppressive drugs must be taken life-long, we encourage you to secure secondary insurance.

"For patients with Medicare, secondary insurance is critical or they'll have to pay close to \$1,500 monthly for the 20% of immunosuppressive costs that Medicare doesn't cover, as well as other antibiotic drugs that Medicare doesn't pay for," says Bonnie Jacobson, LCSW, social worker with California Pacific's Kidney-Pancreas Transplant Program.

When looking for secondary insurance, Jacobson urges patients to inquire about the plan's drug benefit. Ideally, patients want a plan with full medication coverage and no annual limit. Sometimes, patients find it hard to secure secondary insurance if they

have a pre-existing medical condition. Fortunately, California offers the Major Risk Medical Insurance Program (MRMIP) that offers secondary coverage for patients under 65 years with a pre-existing condition. For more information, call MRMIP at 800-289-6574. For patients over 65, our social workers recommend plans such as AARP, although it only offers \$3,000 in prescription coverage annually.

Medi-Cal Drug Coverage

Medication costs for patients on Medi-Cal vary depending on which plan a patient has:

- Medi-Cal with no share of cost

means that a patient doesn't have to pay for any medications, as long as he/she is qualified for this plan.

- Medi-Cal with share of cost means that a patient must pay for the monthly share of costs for which he/she is responsible and Medi-Cal will cover the remainder.

Private Insurance

Private insurance plans typically have either a flat rate or percentage co-payment for medications. With a flat rate co-payment, a patient may pay \$15 for a generic drug or \$25 for a name-

PRESCRIPTION, continued on next page

Medication Costs

Following is an example of medications costs for a patient with Medicare as primary insurance (which pays for 80% of immunosuppressive drugs for three years) and Blue Cross as secondary insurance. The patient is discharged from the hospital with the following drugs. In this scenario, the co-payment price for Blue Cross is \$15 for a generic drug and \$25 for a brand-name drug. The Kidney Team prescribes generic drugs when possible.

Drug	With secondary insurance patient pays:	If no secondary insurance patient pays:
Prograf® (brand)	0 (Medicare covered)	0 (Medicare covered)
CellCept® (brand)	0 (Medicare covered)	0 (Medicare covered)
Prednisone (generic)	0 (Medicare covered)	0 (Medicare covered)
Valcyte® (brand)	\$25	\$1038.49
Septra (generic)	\$15	\$23.69
Mycellex® (brand)	\$25	\$197.49
Protonix® (brand)	\$25	\$78.30
Colace (generic)	\$15	\$5.00 (over the counter)
Vicodin (generic)	\$15	\$9.46
Total:	\$120/month*	\$ 1352.43/month

* If patient is using mail-order prescriptions offered by plan, he/she can get three months of medication for \$120, reducing the monthly cost to \$40.

** This is a general list of medications for post-transplant care and cost estimates only, which are subject to change.

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brand drug, although these prices can go up to \$100 per prescription, depending on the insurance plan the patient or employer has purchased. Transplant patients prefer flat rate plans because out-of-pocket costs are lower. In contrast, percentage co-payment plans require the patient to pay a percentage (usually 20%) of the drug costs, while the insurance company pays the remainder.

“If your insurance offers a mail-order prescription plan, we strongly encourage you to register for this option before your transplant,” says Pamela Rock, MSW, social worker with California Pacific’s Kidney-Pancreas Transplant Program. “Often, mail-order plans allow you to get a three-

month supply of a medication for one co-payment, resulting in a 66% savings,” she explains. (see example)

Fundraising

If you anticipate having trouble paying for your post-transplant medications but do not qualify for Medi-Cal, you may want to consider fundraising. Organizations such as the National Foundation for Transplants (www.transplants.org or 800-489-3863) work with families and friends of transplant candidates to organize fundraising campaigns. Even better, the organization will match donations, thereby doubling the money you raise. ∞



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