

What You Need to Know about Adult Living Donor Liver Transplantation

Usually, organs for transplantation are obtained from people who have died and whose families have given permission for their organs to be donated. These are called deceased organs. However, there are not enough of these deceased donor organs available for everyone who needs one and, as a result, increasing numbers of patients are being added to the national deceased transplant list. Nationally, there are approximately 18,000 patients on this liver transplant list, with more being added each day. Annually, about 6,000 patients receive a liver transplant. Because of the organ shortage, many patients waiting for liver transplants die on the list or become too sick to undergo transplant. Each year, approximately 10% of patients listed for a liver transplant in the United States die while waiting for transplantation.

In light of these statistics, living donor liver transplantation can be an important alternative for many prospective transplant candidates. If a patient can receive a piece of a liver from a relative or friend, he or she need not wait for a deceased organ to become available. This may lessen the chances of a patient becoming too sick to undergo transplant or of dying while waiting on the list. In living donor liver transplantation, a piece of liver is surgically removed from a live donor and transplanted into a recipient after the recipient's diseased liver has been removed.

Living donor liver transplantation is possible because the liver has the ability to regenerate, or grow. Regeneration of the liver happens over a very short period-possibly days to weeks, and certainly within 6-8 weeks. When surgeons remove a piece of the donor's liver, the part that remains in the donor grows back to its original size.

More than a decade ago, surgeons around the world began to perform live donor transplants using adult donors for children who needed transplants. Surgeons at UCSF have performed living donor transplants between adults and children since 1992. Surgeons outside the United States, mostly in countries where deceased organs are unavailable, expanded the technique to adult recipients in the mid-1990's. Since then, many centers throughout the world and in the United States have begun to perform living donor liver transplants between adults. UCSF performed its first adult-to-adult living donor transplant in January of 2000.

What are the advantages of living donor liver transplant?

The main advantage for the recipient is that when the recipient needs a transplant, he or she can receive it without having to wait on the deceased transplant waiting list. Patients who are on the national deceased transplant wait list may have their liver failure progress while they wait and become weaker going into the surgery. When patients are sicker and weaker they are more likely to have more complications shortly after surgery and have a higher risk of not doing well after transplant, compared to patients who can be transplanted sooner with a living donor. The advantage for the donor comes from the knowledge that he or she is helping a family member or friend who is very sick and in need of a liver transplant.

What are the general requirements to become a living donor?

Generally, you should be between the ages of 18 and 55 years old. You (and your liver) must be large enough, relative to the size of the recipient, in order for the donated piece of your liver to support the recipient. During the evaluation, a CT scan (similar to an x-ray) will be performed in order to provide a measurement of your liver size. You must not be pregnant. You should not be overweight, although if you are overweight, you may still be considered a potential donor if you can lose weight. We limit the donors to a body mass index of 30 or less. The body mass index is a calculation based upon your height and weight. You cannot smoke. If you do smoke, you must quit for 6 weeks prior to surgery. You should not have any major medical or psychiatric illness. You must also be able to understand the risks of this surgery and be able to comply with our instructions for short- and long-term follow-up medical care.

Does the donor need to be related to the recipient?

No, blood relation is not necessary between the donor and recipient. Spouses, parents, children, other relatives, as well as unrelated friends have donated a part of their liver.

If the donor is related to the recipient, will he or she experience less rejection?

There does not appear to be a lower risk of rejection if the donor is a blood relative. The relationship between donor and recipient also does not appear to affect the amount of immunosuppressive medication the recipient will need after transplant.

Will the recipient be removed from the regular transplant waiting list if a potential donor is being evaluated for possible donation?

While a potential donor is being evaluated, no changes are made to the recipient's status on the regular deceased list.

What are the first steps in the evaluation process?

The first step is to know your blood type. Your doctor or a local blood bank can do this simple test. You must be either the same blood type as your recipient or blood type "O." Your Rh factor does not affect your suitability to donate.

What do I do once I know my blood type?

Call our Transplant office at (415) 353-1888 and advise the receptionist that you wish to discuss living donor liver transplantation. You will be put in touch with the Transplant Coordinator who will assist you to access information for the living donor liver transplant program. We will do a brief health screening over the phone, and you will have a chance to ask questions.

You will receive a medical questionnaire in the mail that you will be required to complete and return to us.

By doing this we can tailor the next step in the evaluation process. Please take your time in completing this questionnaire. Some questions, such as family history, may require the help of other family members. Other questions, such as smoking, alcohol or drug history, can be quite sensitive. We need you to be absolutely truthful, as hiding information may be dangerous to you or the recipient. This questionnaire is considered extremely confidential. Only the health professionals on the Transplant Team will use this information. This information will not be shared

with the recipient or others without your permission. Please attach confirmation of your blood type to the questionnaire before mailing it back to us.

As a potential donor, all of the information that you give us will be kept confidential. To that end, after you have completed the questionnaire, it will be your responsibility to contact the Transplant Coordinator to make further arrangements for the rest of the work-up. Any information or findings will be shared between the Transplant Service and you, the potential donor. We will not communicate any information to the recipient, nor will we try to contact you through the recipient.

May I get my evaluation done by my own doctor?

In general, the tests will be done at UCSF. Some insurance companies want some of the tests done at other hospitals. We require that the more crucial tests be done at UCSF. If you live far from our hospital, we can have some portions of the initial evaluation done locally. No matter where the evaluation takes place, the evaluation process will require several visits to UCSF to complete.

Will my evaluation be covered by medical insurance?

You should not incur any medical expenses related to the evaluation, surgery or hospitalization. If there are complications you may incur medical expenses (i.e., deductible, co-insurance and/ or co-pays) from your own insurance policy. All of these charges are billed to the recipient's insurance company. After you leave the hospital, some recipients' insurance carriers do not cover additional medical expenses for the donor. Because of this, we insist that donors have their own medical insurance or have an agreement with the recipient's insurance company that it will cover all expenses related to the donor surgery both in and out of the hospital. Any questions about your coverage can be addressed by our financial counselor.

What is the purpose of the evaluation process?

The purpose of the evaluation is to make sure that your liver is normal and of adequate size and that you do not have any medical or psychiatric illness that would make this procedure risky or difficult for you. We also want to make sure you do not have any medical conditions that could be transmitted to the recipient. Finally, we want to make sure that the decision to donate is a voluntary one. To complete the donor evaluation, numerous tests and consultations are required over a period of several days to several weeks.

What takes place during the evaluation?

In general, the donor evaluation involves a full medical history and physical including cardiovascular and cancer screening. A medical evaluation by a physician who is not a member of the Liver Transplant Team is done. This doctor serves as a "donor advocate" physician and looks at the donor transplant surgery with only the donor's interests in mind. You will meet with a social worker who can help you understand some of the issues related to donation. None of these tests, procedures, or consultations will be scheduled for the donor until insurance authorization has been obtained for both the recipient's transplant surgery and the donor's work-up and surgery.

What are the next steps of the evaluation?

Next, we will need to obtain various blood tests, a chest X-ray, an EKG, and an ultrasound of the abdomen. If these tests suggest that you could be a donor, a CT scan of the abdomen will be performed to make sure that your liver is large enough to donate. We also look at the blood vessels to make sure that they branch in a pattern that will allow us to remove the right lobe of your liver. Other tests and/or consultations may also be necessary, depending on your individual circumstances. A liver biopsy (a small sample of liver cells) is required in some cases.

Do I need to fast before my appointments?

It may be necessary for you to fast for some of the tests and you will be instructed to do so (for example, the ultrasound and the CT scan). Most tests do not require fasting. Please ask for this information if it is not provided to you when your exam is scheduled.

Should my family come with me to the appointments?

It is important to have your immediate family or next of kin come with you to at least some of the appointments so they can participate in the process and understand what is involved before you decide to proceed. All these appointments offer the opportunity for you and your family to ask questions and learn about the procedure so you can make an informed decision. Your designated next-of-kin or your health care proxy must participate in the evaluation process or attend the final appointment before the scheduled surgery. Also, certain tests require sedation (medication to help you to relax), so you will need another person to drive you home safely.

Is the information shared by the donor with the Transplant Team confidential?

Yes. It is important that the donor feel completely comfortable disclosing all requested information in the evaluation process. The Transplant Team is as concerned with the safety of the donor as it is with the safety of the recipient. Many factors contribute to the possibility of you becoming a donor, both medical and psychological. For these reasons, anything discussed in the course of the donor evaluation process is between the donor and the Transplant Team. Further, any information regarding the recipient that is shared with you as a donor should also be considered confidential.

Should the chances for success or failure of the transplant affect my decision to donate?

You are volunteering, with extraordinary generosity, to donate part of your liver in an attempt to save another person's life. Before you make this gift, it is important that you understand that there is no guarantee that your sacrifice will actually save your recipient's life. Some diseases (such as Hepatitis C and cancer of the liver) can recur after transplant. We will be discussing the recipient's medical condition with you, what outcome we can expect from transplant, and what possible additional complications, if any, may be associated with the recipient's particular disease. We expect that you will respect the confidential nature of these discussions and will be sensitive to maintaining the recipient's privacy in these circumstances.

How quickly will I know if I can be a donor?

Generally, within 2 weeks of completing every component of the evaluation, we will let you know if you can be a donor. Further tests are sometimes needed, however, which could delay your clearance for surgery. It is important that you allow yourself time to review the information you are reading here and the additional information you will get when you meet with us. We do place importance on whether you complete your testing or not. For **example, if you do not return the questionnaire or do not get your blood type tested**, we will assume that you do not want to donate. Your willingness to complete the evaluation determines, to some extent, how quickly the surgery will happen. The decision to donate a piece of your liver is not one you should make lightly. You should consider it very carefully, and discuss it with your family and significant others. You can make the decision not to donate at anytime. Your decision will be kept confidential.

If I am cleared to be a donor, how is it decided when the transplant will take place?

This decision is made jointly by the Transplant Team, by you, and by the recipient. The Transplant Team, particularly the physicians involved directly in your recipient's care, will determine as accurately as possible the best time to do the transplant, based on the recipient's medical condition. Once we know this, we ask for your input as to what suits you best and try to accommodate your schedule, if possible. There may be specific weekdays when we are unable to do living donor liver transplants due to Operating Room availability.

Once the transplant is scheduled, will it definitely happen?

A number of things could happen that could change our plans. For example, your recipient's condition might deteriorate to the point where he or she is too sick for a transplant. Or, the recipient might develop an infection or some other condition that would need to be treated before the transplant could be done.

Do I need to do any special preparation prior to surgery?

Once you have completed your evaluation and there has been a decision to proceed with transplantation, there is not much additional testing to be done. If you opt to donate your own blood in the event of the need for transfusion you will need to donate a unit of your blood within 2-4 weeks prior to your surgery. Some of your blood tests, may need to be repeated if they were done more than 30 days before your surgery date. You will also need to give a sample of your blood to our blood bank within 72 hours

of the surgery. This is usually done when you are admitted the day before surgery. We may have you, your recipient, and your immediate family come in 2 or 3 days before the surgery for a final pre-transplant review, for any minor tests that may be needed, and to answer any remaining questions you may have.

Should I stop smoking before my surgery?

You must stop smoking to be a donor, even if you are a light smoker. Smokers have an increased risk of cardiovascular complications with any surgery.

Should I stop drinking alcohol?

If you are going to be a liver donor, it is best that you stop drinking. If you have a history of heavy alcohol use, it is very important that you tell our physicians. Alcohol use may not preclude you from being a donor, but you may need to undergo a liver biopsy to be sure your liver has not sustained any damage. You should not return to drinking alcohol after surgery until advised it is safe to do so by the Transplant Team.

Should I stop taking my medication(s)

Should I stop taking my medication(s) before surgery?

You should not stop any prescription medication unless advised to do so by a physician. You should avoid aspirin or non-steroidal medications (such as Advil or Motrin) for 7 days before a liver biopsy or surgery. These medications can affect the ability of the blood to clot and put you at higher risk of bleeding complications. Instead, you may take Tylenol (Acetaminophen) if needed. Women who take birth control pills will be advised to stop taking them 30 days before surgery because of the increased risk of blood clots after surgery. If you regularly take any medications, we will instruct you about these when you come in for the final appointment before surgery.

Do I need any special diet before surgery?

No, you can eat and drink normally until midnight before the surgery. There is no need to take laxatives or enemas.

Will I be admitted to the hospital the night before surgery?

On the day before surgery both the donor and the recipient will come to the Admissions Office to be admitted. Usually both the donor and the recipient are admitted to rooms on the same unit of Long Hospital. Sometimes, however, there are not rooms available on the same unit and patients may be admitted to a different unit. The donor and the recipient will be in separate rooms.

Will I have a private room in the hospital prior to surgery?

Unfortunately, we cannot promise that you will have private rooms the night before surgery. We certainly try to arrange a private room for both the donor and the recipient whenever possible. However, critically ill patients and those patients who need to be isolated because of certain infections have the first priority for any available private room. If there are no private rooms free on the day before surgery, you may have to share a room with another patient.

Will I be allowed to have family members stay with me the night before surgery?

On the night before surgery, family members can stay with you until visiting hours are over at 8:30 PM. If you are in a private room, one person may stay with you overnight. Your family may come as early as 7:00AM in the morning of the surgery to see you before you go to the operating room. You may choose one person to accompany you to the pre-operative area outside the operating room.

What should I bring with me to the hospital?

Bring only minimal belongings and no valuables. Because we have your insurance information, there is no need to bring any documentation with you unless we specifically ask you to. Leave all jewelry and other valuables at home or give them to your family for safe keeping. You may be asked to bring a list of all medications you are currently taking. You may want to bring a basic toiletry bag for your use in the hospital.

Will my family members be able to wait nearby during the actual surgery?

During the surgery, family members can wait either in the donor's hospital room or in the ICU waiting room. The donor will go to a room on the floor after surgery. If the donor had a room on the 9th floor the night before surgery, he/she will return to the same room after surgery.

Where will the recipient go after surgery?

The recipient will go to the ICU after surgery. We have two ICUs, one on the 9th floor and one on the 13th floor. There are waiting rooms outside each ICU. After the patient goes to the Operating Room, the floor nurse can help your family find out where both the donor and the recipient will be following surgery.

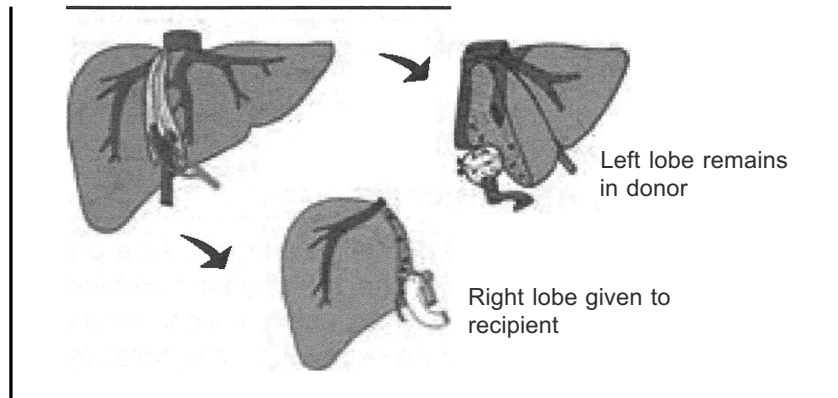
How much of the donor's liver is removed?

Usually, about 40-60% of the donor's liver is removed. The liver is divided into a right lobe and a left lobe. The division between the lobes permits surgeons to divide the liver into two distinct parts that can function independently of each other. The right lobe comprises approximately 60% of the total liver volume and the left lobe comprises approximately 40%. When the recipient is a small child, a piece of the donor's left lobe, called the left lateral segment, is removed. In adults, the right lobe is removed.

Adult Donor for an Adult Recipient

Right lobe (60%)
(given to recipient)

Left lobe (40%)
(remains in donor)



How much time passes between removing the piece of liver from the donor and transplanting it into the recipient?

The operations on the donor and the recipient take place at the same time, in separate operating rooms. The donor operation lasts 6-9 hours and the recipient operation takes 8-12 hours.

Will my gallbladder be removed?

When adults donate to adults, the gallbladder is removed because it is in the path of the division of the liver. When adults donate to children the gallbladder is usually not removed, because the gall- bladder is not in the division path. Not having a gallbladder will not affect your life.

How long before my liver grows back to normal size?

The liver begins to grow back almost immediately. Most of the growth occurs in the first 2 weeks after surgery. By 3 months, your liver should be back to normal size.

Will I require a blood transfusion during my surgery?

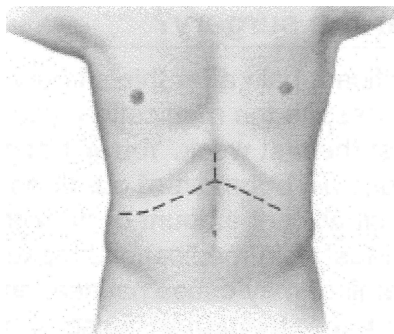
Blood transfusion may be needed during this surgery. As a precaution, we will ask you to "donate" one unit of your own blood before the surgery. If you do need a transfusion, we can then use your own blood so you should not be exposed to the possible risks of a transfusion from someone else. However, it is possible that, with a great deal of blood loss, you will need blood from the blood bank.

What are some of the possible complications of the donor's operation?

As with any surgery involving general anesthesia, there are possible complications of the anesthesia itself including heart complications, stroke, and blood clot formation in the legs or lungs. **There are risks associated with any operation on the abdomen**, which are bleeding, infection, and failure of the wound to heal. With liver surgery, complications include bleeding, bile leaks, or injury to the bile ducts. There is also a risk that the remaining portion of your liver will fail and you will need an urgent liver transplant yourself. There is even a risk that you might die. We will discuss these risks with you in more detail during the evaluation. The most common short term complications of this surgery are small bile leaks from the remaining portion of your liver, minor wound infections, and gastrointestinal upset (such as constipation, indigestion, nausea, or diarrhea). These complications are usually resolved after a couple of weeks without any long-term physical damage.

How big is the incision?

The incision is a large one and is the same for the donor and recipient. It is called the "Mercedes" incision and will look similar to the incision shown below:



Will I be in the Intensive Care Unit after my surgery?

After your surgery, you will be taken to the Recovery Room for close observation by the nursing and medical staff. As you recover and it is determined that you do not have any bleeding or other complications, you will be transferred to the regular transplant floor.

How long will I be in the hospital?

The average hospital stay for donors is 5-8 days after surgery.

Will I have a scar after the surgery?

In most cases, the incision heals quickly; leaving a scar that fades over time but will always be visible. If a wound infection develops, you may be left with a wider scar that will be more

obvious. Occasionally, people develop what is called a keloid, which is the over-growing or over-healing of the skin and results in a raised scar. Keloids can be corrected by plastic surgery if you so chose. However, this corrective cosmetic surgery is unlikely to be covered by your recipient's insurance in the case of the donor.

Will I have much pain after the surgery?

Unfortunately, you will have significant pain after this surgery. You will receive pain medication but, despite the medication, you may be very uncomfortable for at least the first week. You will begin to have less pain as each day goes by, but most of our donors have told us that they still had a significant amount of discomfort for 2-4 weeks after the surgery. Most pain medications make you drowsy, can affect your breathing, may cause nausea, and/or constipation. We will be trying to get the right balance of pain medication to make you comfortable, but not drowsy, so you can do your deep breathing exercises, coughing, and walking. A prescription for pain medication will be provided to you before you leave the hospital for pain control at home.

Will pain medication be administered by injection or orally after the surgery?

We use a variety of methods to administer pain medication. Sometimes the anesthesiologist inserts an epidural catheter that permits numbing medication to be administered directly along the spinal cord to prevent pain. You may also have what is called a PCA (Patient Controlled Analgesia). With a PCA, you have an intravenous line attached to a computer-controlled pump. You press a button whenever you need pain medication and the medicine is immediately administered directly into your vein. Once you are eating normally, we will switch you to a pain medication that is taken orally.

Will I have any tubes or drains in me after the surgery?

You will have one or two intravenous lines during and after the surgery so we can give you fluids to keep you hydrated and give you medications. One of these lines may be used to give your pain medication after the surgery. You will also have a catheter (drainage tube) in your bladder so we can monitor how your kidneys are working during and after the surgery. Having the catheter in your bladder also means that you will not need to get up to use the bathroom immediately after your surgery. You may also have one or two small drainage tubes, called JP drains, in your abdomen to drain any blood or bile that might leak after the surgery. The tubes and intravenous lines are usually removed within 2-3 days. The JP drain may stay in for as long as a week or two if there is a lot of drainage or if there is bile in the drainage.

Will I be in the same room as my recipient after the surgery?

No, the recipient goes to the Intensive Care Unit before being transferred to the transplant floor.

How soon will I be able to eat and drink after my surgery?

As soon as your intestines start to work again after the surgery, you will be able to begin to eat and drink again. If you do not have nausea or vomiting with sips of water, you will be able to progress to clear fluids and then to a regular diet within the next 2 days.

Will I have a normal life after surgery?

We expect that most patients will return to a normal life within 3 months after surgery. We do not expect any long-term complications but, as this procedure is still relatively new, we cannot yet

give you any statistics on the long-term follow-up of donors who have undergone this surgery.

How long will I be off work?

The minimum amount of time you need to allow yourself to recover is 4-6 weeks. Because people recover differently, with varying degrees of fatigue and pain, you may need as long as 8-12 weeks. We prefer that you be in a position-both financially and from a job security perspective-to be able to take 12 weeks off from work, should you need it.

Will I be entitled to disability pay?

If your job provides disability coverage and you have applied, then you will most likely be entitled to disability pay. Because living donor liver transplantation is still relatively new, however, it is best that you discuss this with your benefits department before you decide to proceed with donation.

When can I restart my birth control pills?

We advise you to wait for a minimum of three months after surgery.

Will I need to come back to the hospital for check-ups?

This procedure is major surgery and we need to monitor you very closely at first to ensure that your recovery is progressing normally. You must come back for a check-up about a week after you leave the hospital. You will probably need a check-up at 1 and 2 weeks and 2 months after your surgery along with an ultrasound of your liver. You may need other appointments as well, depending on how you are feeling and how the surgeons feel you are progressing.

Must I remain close to the UCSF hospital after my surgery?

You need to remain close to UCSF for at least 2-3 weeks after your surgery. You also need to be able to return to UCSF if you experience any problems during your recovery. We recommend that you have a relative or friend stay with you, especially immediately after you leave the hospital.

Will I need to take any medications after I donate a piece of my liver?

You will not need any medications except for some pain medication. If you were to develop a wound infection, you might be prescribed antibiotics. We do not think that you should need any medications specifically related to liver donation in the long term.

Will I need a nurse to take care of me when I leave the hospital?

Although this is a very big operation and you will be extremely tired and weak, you should not need any professional nursing care at home. You will need a friend or family member to do your food shopping, perhaps cook your meals, and just generally be available should you run into any difficulties. It is also nice to have some company when you first come home from the hospital. You should have someone available to take you to and from the UCSF clinic for your check-ups.

When will my sutures be removed?

Usually the wound is closed with sutures beneath your skin. These sutures dissolve and do not require removal. Small strips of tape are placed over the external incision and can be removed about one week after surgery.

When will I be able to drive after my surgery?

We advise you not to drive for at least the first 2-3 weeks after the surgery. You must be physically and mentally strong, with normal reflexes, and not experiencing any abdominal pain or discomfort before you decide to drive. You should also not be taking any medication that can affect your mental alertness. Pain medications containing narcotics (like Vicodan, Percocet or Tylenol with codeine) can affect your mental alertness and you should not drive if you are taking these types of pain medications.

When can I begin to exercise?

As soon as you wake up from the anesthesia you will begin "exercising." You will need to take deep breaths and cough in order to prevent pneumonia. You will be helped out of bed the day after your surgery and will begin walking. Each day you should be pushing yourself a little bit more. Walking soon after surgery will help to prevent complications such as blood clots, pneumonia, and muscle wasting. You are encouraged to continue a program of daily walking when you go home. Remember: the goal is to be back to normal health within 2-3 months.

When can I resume physical activities?

If you are feeling well and are not having any complications, you may begin to return to your normal exercise activities. Begin slowly and build up your strength and stamina. You will need to avoid any heavy lifting for the first 4 weeks until your abdomen has completely healed.

When can I engage in sexual intercourse?

You will probably want to refrain from sexual intercourse for a couple of weeks until you have less discomfort and are feeling stronger. This decision is based on how you are feeling.

How long should I wait after surgery to get pregnant?

There is no definite answer to this question. We recommend that you do not become pregnant for at least 3-6 months after a surgery. It is unknown if this operation will effect a woman's fertility. The experience with women donating a piece of their liver to a child suggests that fertility is not affected.

When can I go on vacation or fly?

You should not plan any vacations or trips outside the U.S. for at least 4 weeks and preferably 8-12 weeks after your surgery. If you wish to return to your home in the U.S., and you have a trusted local physician, you may be able to do so 2-4 weeks after the surgery depending on how you feel and how you are recovering. Remember, if we have any concerns about any possible complications, we will want you to return to UCSF for evaluation and treatment.

Will I be able to donate part of my liver again, in the future, to someone else?

No, once you donate a portion of your liver, you cannot do so again in the future.

Please read through this information carefully and discuss living donor liver transplant with your family and loved ones. If you have further questions, please call the Transplant Center or, better yet, come with the recipient to his/her next clinic appointment with a UCSF hepatologist.

Remember to attach confirmation of your blood type to the questionnaire before mailing it back to us.

UCSF Liver Transplant
Attn: Living Liver Donor Coordinator
350 Parnassus Avenue,
Suite 805, Box 0740
San Francisco, CA 94143

Please remember, after you have completed the questionnaire, it will be your responsibility to contact the transplant coordinator to make further arrangements for the rest of the work-up. We will not try to contact you through the recipient. To contact us, please call: (415) 353-1888 and ask for the Living Liver Donor Coordinator.

We would like to extend our thanks to Mt. Sinai Medical Center Liver Transplant Program for allowing us to adapt their donor literature for our patients.