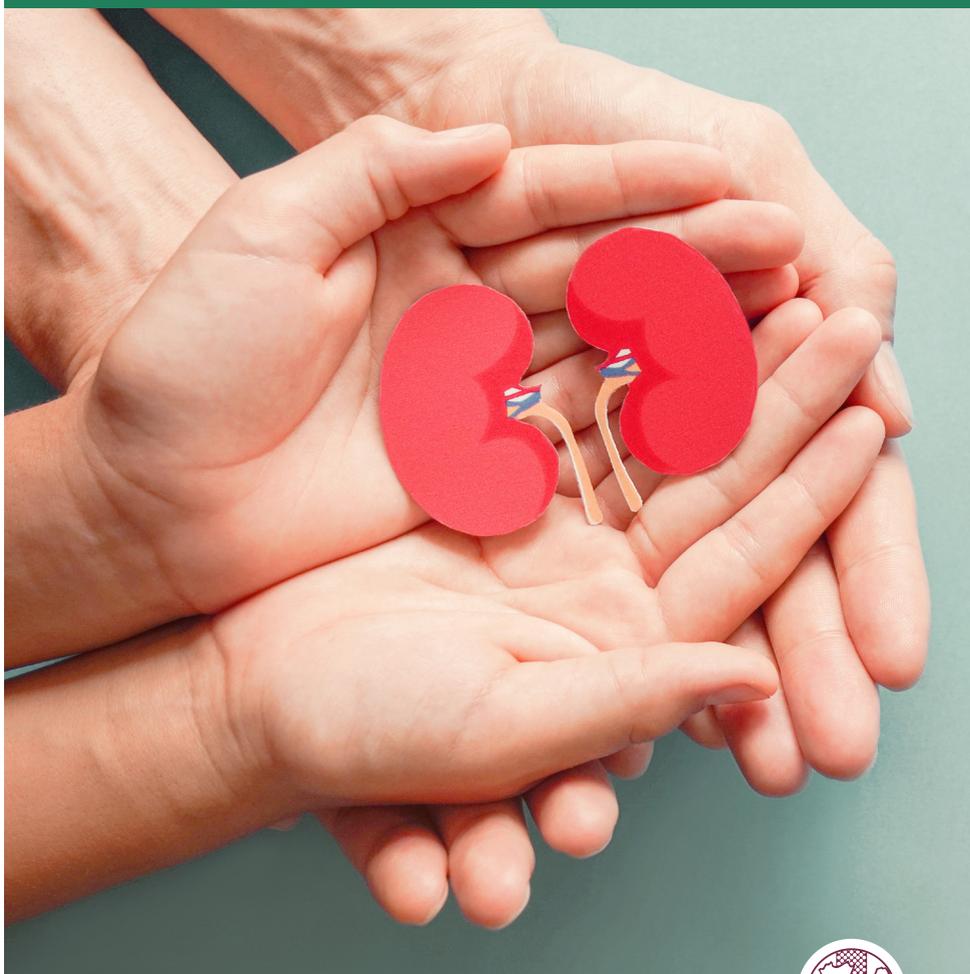


# Living Donor Kidney Transplantation



*Azienda Provinciale  
per i Servizi Sanitari  
Provincia Autonoma di Trento*



*This booklet is intended for persons with severe kidney failure who require renal replacement treatment, for their families and for anyone wishing to learn more about issues related to kidney donation.*

**Donation** is essential because without it **transplantation** would not be possible.

The donation of organs, tissues and cells represents an act of solidarity by a person who has reflected on their own life and death and decides to offer, free of charge and selflessly, a part of their body, thus saving a life or improving the existence of patients suffering from serious pathologies.

Kidney donation can either be from a **living donor** or from a **cadaver donor**. **Transplant** refers to the replacement of an organ that no longer functions with that of a donor.

**When kidney disease shows its irreversibility**, well before the terminal condition of the organ, the nephrologist expert in transplants informs the patient, depending on their clinical conditions, about the potential evolution and possible treatments to replace renal function: conservative therapy, dialysis (hemodialysis or peritoneal dialysis) and transplantation.

**Kidney transplantation** represents the best method of replacing renal function because, unlike dialysis, the transplanted kidney allows recovery of all the activities performed by the native kidney and not just some.

In fact, over the course of 24 hours, the kidney fulfils important functions such as purifying our body from toxic metabolism-related substance, maintaining the water-salt balance and producing hormones such as vitamin D and erythropoietin: all activities that medical therapy and dialysis treatment, lasting a few hours a day, can do only partially.

Transplantation allows the patient to recover what they have progressively lost with the worsening of renal activity, both physically and socially and psychologically.

The first human kidney transplant was performed from a living donor on 23 December 1954 in Boston between identical twins.

Subsequently, living transplantation was used less due to the lack of effective immunosuppressive therapy and scientific progress in the field of cadaveric transplantation.

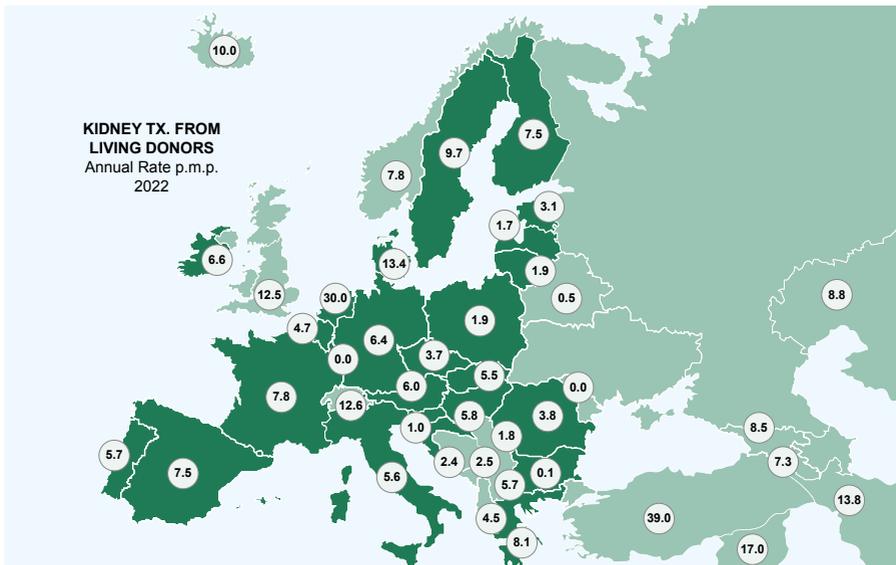
As the years passed and new drugs were discovered, the interest and importance of living transplantation has been renewed as it allows for an increase in the number of transplanted patients.

The improvement of both surgical and pharmacological skills gives the possibility of accessing the transplant path to many more people: unfortunately the pool of donors is still unable to meet the needs of those on the waiting list.

In the updated report of the National Transplant Centre as of 30.09.2023, there are 5900 patients on the kidney transplant waiting list with an average wait of approximately two years. The number of kidney transplants in Italy in 2022 was 2033, of which 336 were performed thanks to the generosity of living donors.

Year	2022	2021
Cadaveric kidney transplant	1697	1725
Living kidney transplant	336	341
Patients on the waiting list	5998	6055
Waiting list time (time)	20.6 months	24.2 months

The percentage of transplants from living donors and from deceased donors varies greatly depending on the countries considered and on their cultural, social and economic situation.



Regarding our continent, transplantation from living donors is more widespread in Northern Europe and less so in the Mediterranean basin countries where donation from cadavers prevails. In recent years, living donor transplant programs have been implemented in all European countries.

## Living donation/cadaveric donation

The limited availability of organs from deceased donors is one of the causes of the long wait before transplantation.

The living donor transplant option reduces waiting times, often even avoiding the need to start dialysis. In this case, the wait for the transplant depends only on how long it takes for the donor and recipient evaluation process. Unlike cadaveric transplants, living transplants are scheduled and can be performed as soon as the donor and recipient evaluation process is completed, when both are in an optimal condition to undergo surgery.

In the case of living donation, the transplant is almost simultaneous with the collection and this allows for better results in both the short and long term. The increase in living donor transplants also allows for a reduction in the

number of people waiting for a cadaver transplant, an option that those who do not have compatible family members must resort to.

## Who can become a living kidney donor?

A family member or person who has emotional ties with a patient requiring renal replacement treatment can become a donor.

For some years now in Italy there has also been the possibility of donating a kidney to strangers, anonymously, as part of what is called “Samaritan donation”. In many cases, the Samaritan donation also allows the activation of cross-over chains (to perform living transplants that would otherwise not be possible due to immunological incompatibility).

## Are there age limits for living donation?

As long as the donor is adult, capable of understanding, is willing and healthy, there are no age limits: what allows or disallows donation is the donor’s mental and physical health conditions.

## Can you donate even if you have a different blood type?

Living kidney donation is possible on certain occasions even if the donor and recipient have different and incompatible blood types. If the blood group is incompatible or there are insurmountable immunological obstacles, desensitisation programs for the recipient are planned before the transplant. Furthermore, in some particularly complex cases where direct donation is not possible, there is a cross-over program between multiple donor-recipient pairs. This program involves the national or international exchange of living donor organs for incompatible couples: thanks to this, it is possible to perform transplants in patients who would otherwise have little chance of finding a suitable organ.

## What tests must a donor undergo?

In our country, those who decide to donate an organ while alive are subjected to a series of tests to verify their mental and physical health and to evaluate their choice (conscious, informed and free).

The clinical evaluation aims to determine the physical conditions of the potential donor and the absence of unknown factors that could represent risks for the donor or recipient (evaluation of the function of the various organs and systems, neoplasms, diabetes, cardiovascular diseases, ...).

During the donor study, risk factors such as borderline hypertension, glucose intolerance or hypothyroidism may be found, which are managed early and in some cases postpone the donation, which can however take place at a later time.

An experienced psychologist oversees the psychological evaluation of the donor and of the recipient.

Clinical and psychological suitability are assessed by the health professionals responsible for the pre-transplant phases. To ensure the correct procedure, a further evaluation is then envisaged: a team consisting of health workers not involved in the transplant activity, called a “third party”, establishes the opportunity for the transplant and the suitability of the donor, thus guaranteeing maximum safety.

Italian law also establishes that the judicial authority supervises the correct performing of organ transplant activities from living donors, for which a meeting with the guardianship judge is necessary.

The potential donor must not be subjected to pressure, coercion, solicitation, economic or other incentives and is guaranteed the right to withdraw consent up until the last moment before the surgical intervention, without there being any consequences for them.

## How does the procedure for removing a donated kidney take place?

There are two types of surgery to remove a kidney for donation:

- 1) laparotomy: this is the traditional procedure, an incision is made at the side where the kidney is removed;

2) laparoscopically: the surgical access involves two holes and a small suprapubic incision (similar to a caesarean section). This method is also performed using robotic instruments.

The type of surgery depends on the Transplant Centre that will perform the surgery, its experience and the characteristics of the donor.

## Which of the two kidneys is donated?

The choice generally falls on the left kidney, for anatomical reasons; however, there are variables (morphological, vascular, ...) that make the surgeon decide, on a case by case basis, which kidney to remove. If there is a difference in the functionality of the two kidneys, the better one is left to the donor.

## What are the surgical risks for the donor?

The procedure is performed when the clinical conditions of the donor and of the recipient are suitable. However, no surgical procedure is without risks and in the following list we compare the risk of death for some abdominal procedures (Clin J Am Soc Nephrol 10:1670–1677, 2015):

- Nephrectomy outside of donation 260/10,000
- Laparoscopic Cholecystectomy 18/10,000
- Liposuction 3–20/10,000
- Delivery by caesarean section 3–10/10,000
- Kidney donation for transplant 3/10,000
- Natural birth 1/10,000

## What are the medical risks for donors?

The presence of only one kidney does not generally affect good kidney function and an excellent quality of life; for example, it might be the case that you are born with only one kidney or only one functioning one and still lead a normal life.

As for the long-term risk, anyone could develop kidney failure: the literature shows that the risk of developing it in the population is 326 out of 10,000, while among donors it is much lower, equal to 90 out of 10,000.

The in-depth pre-transplant study and post-transplant follow-up significantly minimise the risks and help to recognise symptoms such as proteinuria or arterial hypertension early.

## What are the hospitalisation and convalescence times for the donor?

Hospitalisation for kidney donation lasts approximately one week (also depending on the type of surgery, laparoscopic or laparotomic). The donor is advised to undergo a period of convalescence and to abstain from strenuous physical effort for at least one month.

## Is it expensive for the donor to undergo pre- and post-transplant investigations?

In Italy, the tests that the donor is subjected to are completely free: the high social value inherent in the donation is recognised and an exemption is granted that allows all the necessary tests to be performed both before and after the donation.

In addition, the donor is entitled to justify their absence from work for the execution of tests, hospitalisation and convalescence.

## Local facilities

In Trentino-Alto Adige there are no Transplant Centres, that is, centres where organ transplant surgery is performed, in this specific case a kidney. Despite this, the multi-zone Nephrology and Dialysis Unit of the Santa Chiara hospital in Trento has an active kidney transplant clinic with a team of dedicated and expert doctors and nurses who assist recipients and donors both pre- and post-transplant. Other specialists and the Psychology service also collaborate.

The Trento clinic is networked with all Italian Transplant Centres, in particular with those in Northern Italy where patients most frequently choose to go for a transplant. There are also close relations with the Innsbruck hospital, a historic site of transplants in recent decades.

The choice of the Transplant Centre can be made according to the underlying pathology (nephrological or systemic pathologies), the type of transplant (kidney-only transplant or combined kidney and other organs transplant) or based on logistical reasons and/or patient preferences. The patient can choose, but the clinic supports with its expertise to identify the best centre on a case by case basis.

Trentino-Alto Adige is the only Italian region where the number of transplant recipients is greater than the number of dialysis patients. In particular, regarding the province of Trento, the number of transplant recipients has increased significantly over the years and in the graph below it is possible to see how since 2010 it has exceeded the number of patients on dialysis (hemodialysis and peritoneal).



The Trento clinic has over three hundred transplant patients, including a number of double transplants (kidney-pancreas, kidney-liver) or multiple kidney transplants. Regarding living donation, there are approximately 60 couples in follow-up and approximately 10 couples in pre-transplant evaluation.

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### **Link utili**

<https://www.apss.tn.it/Servizi-e-Prestazioni/Centro-regionale-trapianti-della-Provincia-autonoma-di-Trento>

<https://www.apss.tn.it/Azienda/Luoghi/Ambulatorio-del-trapianto-di-rene>

<http://www.trapianti.salute.gov.it/trapianti/homeCnt.js>

<https://www.aido.it/>

<https://www.aned-onlus.it/>

<https://sinality.org/>

<https://www.renepolicistico.it/>

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