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Living Kidney Donation in the Philippines: A Literature Review Informed by Global Perspectives

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Abstract: This literature review contains an overview of organ donation and transplantation, policies, and practices. It also provides a glimpse of the characteristics of the donors along with the risks and benefits of their undertaking. A literature search was completed using databases like PubMed, OVID Journals, ProQuest, Science Direct, and the Health Research and Development Information Network (HERDIN). The search terms used were "kidney donation," "living kidney donors," "kidney transplant," and "lived experiences." This literature review provides a comprehensive overview of organ donation and transplantation, with a focus on living kidney donation. It examines the rising prevalence of Chronic Kidney Disease (CKD) and the importance of kidney transplantation as a treatment. The review also discusses the ethical and legal frameworks governing organ donation, including global and Philippine-specific policies, and the factors influencing the decision to donate. Additionally, it explores the benefits and risks associated with living kidney donation for both donors and recipients. It also emphasizes the importance of thorough donor evaluation and post-donation care.

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I. INTRODUCTION

Chronic Kidney Disease (CKD) is a condition that is characterized by the gradual loss of kidney function. It affects more than 10 percent or approximately 850 million individuals worldwide, and it has emerged as one of the leading causes of mortality worldwide.[1] By 2040, it is expected to be among the 5th leading cause of death.[1] In the Philippines, it is estimated that 7 million Filipinos are afflicted with the disease, and based on the data from the Institute for Health Metrics and Evaluation, CKD is the 4th most common cause of death in the country after ischemic heart disease, stroke, and lower respiratory infection.[2] CKD is classified into five stages, with end-stage renal disease (ESRD) or kidney failure as the last stage, which requires renal replacement therapy such as dialysis or renal transplantation. Kidney transplantation is considered the gold standard treatment for ESRD because it offers superior survival and quality of life compared with dialysis.[3]

Transplantation is the transfer of an organ or tissue from one person to another or from one body part to another. It is a life-saving treatment for patients with end-stage organ diseases. The goals of treatment include modifying appearance, restoring function, or improving quality of life. The type of transplant depends on the patient's need, the function of the graft, the purpose of the graft, and the availability of tissue or organs.[4]

The early years of organ transplantation were focused on kidney transplants from living donors. The first human renal allograft transplant was done on April 3, 1933, in Ukraine by Dr. Yurii Voronoy, in which the patient survived for 2 days. The graft failure was attributed mainly to ABO incompatibility and the prolonged warm ischemia time of the kidney.[5]

The first-ever successful organ transplant was performed by Dr. Joseph Murray, which happened in 1954 between the Herrick brothers, who were identical twins. The recipient lived eight years with the renal allograft. In the 1960s, research scientists and physicians looked into immunosuppression to prevent rejection since it was noted that transplantation could be done outside genetically identical or related donors and recipients.[5] In the Philippines, the first successful living-related kidney transplant was done in November 1969 at the University of Santo Tomas.[5]

There are two primary sources of organs and tissues for transplantation: deceased donors (known in the past as cadaveric donors) and living donors.[4] Deceased donation happens when a patient is declared dead. Death can be classified into donation after circulatory determination of death (DCDD) and donation after neurological determination of death (DNDD), commonly known as brain death. DNDD refers to organ donation from an individual who has a permanent cessation of brain function, including brainstem

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reflexes.[6]

Living donation, specifically living kidney donation, occurs when a healthy person donates one of their kidneys to someone with end-stage renal disease. Living kidney donation is generally classified into three types:

- Directed or specified donation: The donor gives a kidney to a specific recipient. This can be a "genetically related" donor (like a parent, sibling, or child), which may result in a better immunological match, or an "emotionally related" donor (such as a spouse, partner, or close friend).[7]
- Non-directed altruistic or anonymous donation: The donor offers a kidney without naming a recipient, and is matched with an anonymous person in need.[7]
- Directed altruistic donation: The donor chooses the recipient, who may be someone they didn't know before learning of their need, or a relative with whom they don't have a close emotional bond (e.g., a relative they haven't seen in many years).[7]

Living kidney donation and transplantation can also occur through paired exchange or crossover donation. This involves two recipient-donor pairs where each recipient receives a kidney from the other pair's donor due to immunological incompatibility in their own pair. A similar concept, called pooled donation, involves more than two pairs, increasing the number of recipients who can receive a compatible kidney. However, pooled donation is not currently practiced in the Philippines.[7]

II. LEGAL ASPECTS AND POLICIES ON LIVING KIDNEY DONATION

Organ donation is the ultimate gift of life that can be granted by the donor to the recipient. Transplantation from a living donor also offers advantages such as better graft survival, reduced waiting time, and controlled circumstances in the planning and performance of the surgery.[4] Living kidney donation entails thorough appraisal and guidelines to safeguard the interests and well-being of the living kidney donors.

Despite the goodwill of living kidney donation, it has always been associated with several ethical and legal issues and concerns. To uphold the interests of both the donor and the recipient, living donation has been regulated by laws to ensure that there is no commercialization of organs and that there is a safety system in place to guarantee long-term donor and recipient follow-up.[7]

One of the global policies on living kidney donation is the WHO Guiding Principles on Human Cell, Tissue, and Organ Transplantation.[8] This policy articulates that adult living individuals may donate organs as permitted by domestic regulations. Generally, living donors should be genetically, legally, or emotionally connected to their recipients. Donors should be thoroughly informed of the potential hazards, advantages, and outcomes of the donation. They should be legally competent and capable of assessing this information, and should provide their informed and voluntary consent. The determination to donate should be made of their own volition, and devoid of any undue influence or coercion. Cells, tissues, and organs cannot be taken from living minors or legally incapacitated persons, and particular measures should be in place to safeguard them. The policy also asserts that donation should be given freely, without any monetary payment or other reward of monetary value. Nevertheless, the prohibition on the sale or purchase of cells, tissues, and organs does not preclude the reimbursement of reasonable and verifiable expenses incurred by the donor, including loss of income, or defraying the costs of recovering, processing, preserving, and supplying human cells, tissues, or organs for transplantation.[8]

As the practice of transplantation advanced, the Declaration of Istanbul was also established; its success has been marred by numerous instances involving organ trafficking, trafficking in persons for the purpose of organ removal, and the travel of patients abroad to procure organs from impoverished and vulnerable individuals.[9] This policy was created by The Transplantation Society (TTS) and the International Society of Nephrology (ISN) during a Summit Meeting in Istanbul in April 2008.[9] This declaration expresses the resolve of donation and transplant professionals and their colleagues in related fields to maximize the benefits of transplantation and share them equitably with those in need, without resorting to unethical and exploitative practices that have harmed disadvantaged and powerless persons worldwide.[9]

The declaration further states that the optimal care of organ donors and transplant recipients should be a primary goal of transplant policies and programs, and there should be legislation and regulations to govern the recovery of organs from living donors and the practice of transplantation that should be consistent with international standards. It prohibits trafficking in human organs and trafficking in persons for the purpose of organ removal, and it encourages health professionals and healthcare institutions to assist in preventing and addressing organ trafficking for the purpose of organ removal and transplant tourism.[9]

In the Philippines, the Department of Health formulated several guidelines in relation to organ donation and transplantation, such as the DOH Administrative Order 2008-0004, otherwise known as the Revised National Policy on Living Non-Related Organ Donation and Transplantation and its Implementing Structures.[10] This directive set the regulations on the act of donation and the conduct of transplantation from living non-related donors in the Philippines. This order came about due to the increasing demand for transplantation, and since LNRDs are becoming an acceptable source of organs, this has also opened up problems and controversy on the potential abuse and manipulation of mostly poor donors.[10]

A more recent guideline, DOH Administrative Order 2021-0059, was released by the Department of Health.[11] This is also known as the Guidelines on Ethical Donation and Transplantation from Living Donors[11], which provides a standard and reference to health professionals and transplant facilities involved in organ donation and transplantation from

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living donors in the Philippines. The aim is to protect the welfare and best interests of all living donors and recipients, ensure that donations are voluntary, and safeguard the rights, well-being, and safety of organ donors. These guidelines define living donors as individuals over the age of twenty-one who are mentally competent to make decisions about organ donation. Living donors are classified as either living-related donors (LRDs), who are related to the recipient by blood within the fourth degree of consanguinity (e.g., parents, children, siblings, nephews/nieces, first cousins), or living non-related donors (LNRDs). LNRDs are individuals without a blood relationship to the recipient but who have close emotional ties, demonstrably proven, such as spouses, relatives by affinity, friends, colleagues, fiancé/fiancée, and adoptive parents or children, and employee-employer. Relatives beyond the fourth degree of consanguinity are included in this category. "Commercial donors" or organ vendors who offer their organs in exchange for monetary compensation or other payments as a precondition, are prohibited by law.[11]

Furthermore, the Guidelines on Ethical Donation and Transplantation from Living Donors[11] specify that potential donors and their spouses (or a family member, if unmarried) must attend a Pre-Transplant Orientation at any DOH-licensed and PhilHealth-accredited transplant hospital. The orientation will provide an overview of the organ donation and transplantation procedure, emphasize the importance of informed consent, and detail the benefits and risks for both donor and recipient. It will also cover the recognition and management of adverse effects, relevant policies and guidelines, the responsibilities of donors, recipients, the transplant team, and the hospital, long-term follow-up requirements, previous outcomes, and alternatives to transplantation. In addition to medical evaluations, potential donors will undergo a psychiatric evaluation to assess their competence in decision-making, their motivation for donation, any coercion or limitations on their free choice, and their personal values, to ensure they can provide free and informed consent. A social worker will also evaluate the potential donor's socioeconomic status and investigate any potential financial incentives for the donation.[11]

III. ETHICAL ASPECTS IN LIVING KIDNEY DONATION

As living kidney donor transplantation progresses, it also presents several ethical issues and concerns. Several principles and values were outlined to guide, manifest fidelity, and achieve trustworthiness in the conduct of organ donation and transplantation, such as the principle of the common good and solidarity, which states that the organ donation shall be done most importantly to save and improve the quality of life of another. There is also the principle of non-maleficence, which states that the benefits shall outweigh the risks. There shall be no exploitation of the donor and the recipient, and conflicts of interest shall be avoided at all times. Another guiding ethical principle is respect for a person, which states that no one shall be hastily judged based on another's personal beliefs or socioeconomic status. This principle involves the importance of giving informed consent to the donor and the recipient by giving them truthful information on the procedures, possible risks, and consequences of the treatment. The principle of justice and equality upholds the interests of both the donors and recipients. It ensures that all efforts must be exerted so that benefits and burdens are equally distributed despite the transplant recipient being the main beneficiary of the transplantation procedure. Lastly, the principle of beneficence refers to the donation being a charitable act or gift and a manifestation of generosity and compassion.[10]

IV. FACTORS AFFECTING LIVING KIDNEY DONATION

The choice to donate a kidney is not a simple decision to make. Several factors contribute to the decision to become a living kidney donor.

Sociodemographic factors identified regarding the intention to donate a kidney are mostly associated with females,[12,13] and the desire to donate a kidney decreases with age.[12]

The possibility of helping others facilitates the decision to donate, while the fear of medical procedures hinders consent to organ donation.[14] Moreover, perceived risks and fear of complications, mutilation, kidney failure, and infertility were some of the barriers to organ donation.[15]

The willingness to donate a kidney can also influence the recipients' and the donors' relational ties.[16] The relationship of the donor to the intended recipient is an important consideration in the donors' decision-making. Potential donors who are parents of the intended recipient are more likely to proceed with the donation as compared to potential donors who were friends rather than relatives of the recipient.[13,17]

Religious and sociocultural beliefs also affect a person's resolve to donate since it depends on how people interpret their faith. Some religions encourage and believe that organ donation fits the altruistic belief system of their religion. The most common religious objection to organ donation lies in the need to maintain the "wholeness" of the body after death.[16]

Living donation also varies by region and country. In Asian countries, factors affecting living donation were more social than cultural; family pressures and personal conflicts for both the donor and recipients affect the decision to donate organs.[18] In nations like India and Bangladesh, where 70% of living donors were women, cultural and patriarchal norms are driving forces in organ donation. In both high and lower-middle-income countries, the perceived societal role of men as the primary income earner in the family, while the perceived need to protect the primary income earner and lower employment rates among women were seen as barriers to kidney donation among the males and females, respectively.[15]

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The donors' values, such as good health, love and friendship, knowledge, intelligence, and joy, play an important factor in the decision-making. Indicators of happiness, such as good health, successful family life, being needed, being able to work, and material conditions, also impact the decision-making.[13]

Despite the laws prohibiting payment for organ donation, one of the most important and pressing issues is still organ trafficking or commercialization. Financial motivation was reported as a compelling reason for organ donation.[17] In countries like Iran and the Philippines, financial motivations were the primary contributors to kidney donation.[15] In a study done in the Philippines on living non-related kidney donors, finances to sustain basic necessities and the need to support the educational needs of the children was identified as a strong reason for proceeding with organ donation.[19]

V. BENEFITS OF LIVING KIDNEY DONATION

Living donor kidney transplantation has been shown to have better outcomes and be more cost-effective than deceased donor kidney transplantation. Some of the documented benefits of kidney donation were taken from the perspectives of the donors, such as improved psychosocial outcomes in terms of the quality of life post-donation compared with pre-donation and as compared with non-donors.[20] In addition, donors stated that the opportunity to help people who need transplants leaves them with a positive feeling, along with the benefits of personal growth, interpersonal relationships, self-esteem, social engagement, and even spiritual growth.[13,20-22] Donors who were also the caregivers of their recipients felt relief from the burden of caregiving after donation since the recipient experienced improved health conditions and regained autonomy in self-care; they also reported having more free time and better financial status due to the recipients' ability to work again.[13,20]

On the other hand, some benefits of living kidney donation based on the recipients' perspective were related to better patient and graft survival since donated kidneys are accepted only after the donors have been rigorously evaluated and selected according to best practice guidelines.[23] Moreover, surgery can be arranged and scheduled as per protocols; transplantation can also be performed before the patient's kidney function deteriorates (in the case of pre-emptive transplantation) or has to start renal replacement therapy, hence resulting in a better quality of life.[23,24] Living kidney donation also creates more transplantation opportunities for patients needing surgery due to the increased supply of available organs.[13,23]

Even though kidney donation reported positive benefits to the donors and recipients alike, there were still some donors who reported poor experiences with donation, especially when the renal graft did not function as expected for the recipient. There were cases of depression, adjustment disorder, and anxiety even when surgery outcomes were positive for the recipient and without any medical complication for the donor.[13,20] While some donors experience high blood pressure or protein in their urine, these issues haven't been definitively linked to long-term health problems.[24] Donors are advised to avoid contact sports that could injure their remaining kidney. Additionally, certain professions like police, fire departments, and the military have been known to restrict employment for individuals with a single kidney.[24]

VI. RISKS OF LIVING KIDNEY DONATION

Living kidney donation also entails risk and medical and surgical concerns for the donor; however, with thorough evaluation and adherence to standards and guidelines, the risk of the donor developing any significant health condition is low, and studies have shown that the donors' survival rates are similar to that of healthy individuals and the general population. Below are the identified potential risks facing living kidney donors: [24]

Studies reported mortality in living kidney donors faces low surgical risk. There was a reported 0.03% perioperative mortality, and 3-6% of donors faced major perioperative complications, and 22% experienced minor perioperative complications such as infections, hernia/wound complications, thrombosis, bleeding, respiratory, cardiac, and gastrointestinal concerns.[13,25] After nephrectomy, the glomerular filtration rate (GFR) of the donor roughly halves. However, a year after donation, GFR increases to 60-70% of pre-donation levels due to adaptive hyperfiltration in the remaining kidney.[17]

Regarding long-term risks, studies revealed that the risk of developing ESRD at 15 years after donation has been reported to be low, and kidney failure in donors was lower than in the general population but higher compared to healthy non-donors. The risks of having hypertension and albuminuria are also the same between donors and non-donors. With regard to the psychosocial aspect, the majority of the donors reported good quality of life.[13,25]

VII. EVALUATION FOR LIVING KIDNEY DONATION

The evaluation of the potential living donor, and the selection and protection of the interests of the donors must be done by best practice, and evidence-based national and international guidelines.

Potential donors undergo screening and thorough physical and medical evaluation and are given careful information before being given clearance to donate. Counseling of the donor focuses on the risks of donation aside from the benefits to the recipients. Topics discussed with the donors include short-term surgical risks, long-term effects on kidney function, and expected outcomes/success of transplantation. Donors are also informed of their right to withdraw his/her consent at any time.[26]

Kidney donor evaluation is important in order to ensure the donors' safety and well-being. This process protects the living donors from losing a kidney they might otherwise need, unnecessary morbidity associated with the donation

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process, and also protects the recipient from receiving organs that may transmit disease or otherwise cause damage.

According to a local manual of kidney transplantation in the Philippines,[26] medical history of the potential donors includes taking note of the following conditions: hematuria/proteinuria/urinary tract infection, a history of peripheral edema, nephrolithiasis, hypertension, diabetes mellitus, ischemic heart disease, peripheral vascular disease, thromboembolic disease, systemic disease which may involve the kidneys, changes in weight, bowel habit, previous jaundice, previous malignancy, psychiatric history, obstetric history, and a family history of a renal condition. The donor's social history, such as smoking and current or prior alcohol or drug dependence, is assessed. Results of cervical smear, mammography, and colorectal screening are also evaluated.[26]

During the clinical examination of potential living kidney donors, points of particular importance are the following: body mass index, abdominal fat distribution, blood pressure management, and urinalysis. The donors undergo a physical examination of the cardiovascular and respiratory systems, the presence of abdominal masses or hernias, scars or previous surgeries, lymphadenopathy, breasts, and testicular exams.[26]

The same Philippine local manual of kidney transplantation[26] notes that exclusion criteria are observed to protect both the donors and the recipients. In the Philippines, absolute contraindications for living kidney donation include age of less than 21 years old, cognitive deficit severe enough to cause inability to comprehend the risk of donation, inadequately treated psychiatric disease, use of prohibited drugs or alcohol abuse, evidence of renal disease (low GFR <80 ml/minute, albuminuria/proteinuria ≥200 mg/day, unexplained hematuria and pyuria), significant abnormal renal anatomy such as a solitary kidney, horseshoe kidney, recurrent nephrolithiasis or bilateral kidney stones. Cardiovascular diseases such as prior myocardial infarction or treated coronary artery diseases, unstable coronary syndromes, heart failure, significant arrhythmias, severe valvular disease, mild angina are also contraindications for kidney donation. Hypertension with BP ≥130/90 on two occasions or patients on anti-hypertensive medications is also part of the exclusion, although some centers have accepted kidney donors with stage I hypertension on one anti-hypertensive medication. Additionally, moderate to severe pulmonary disease, diabetes mellitus (FBS ≥126 mg/dl) on at least two occasions or 2-hour with OGTT-200 mg/dl, impaired glucose tolerance, collagen vascular disease, any form of malignancy, except in situ non-melanoma skin cancer, familial history of renal cell cancer, chronic active viral infection such as hepatitis B or C infection, active HIV, significant chronic liver disease, significant neurologic disease, disorders requiring anticoagulation, a history of thrombotic disease with risk factors for future events such as anticardiolipin antibody, and severe obesity with a BMI ≥ 35 kg/m2 were identified among the exclusion parameters for kidney donor screening.[26]

Relative contraindications include ABO incompatibility, age above 60 years old, obesity (BMI of 30kg/m^2), urologic abnormalities such as multiple cysts, a history of gestational diabetes, a history of recurrent urinary tract infection (more than two episodes per year for females and any second episode in males), tattoo, and other body part piercing of less than 6 months. Persons with active tuberculosis infection cannot donate; however, they can be considered after at least two months of treatment with triple anti-Koch's drug. Females who are currently pregnant or had a very recent pregnancy cannot donate but may also be considered six months after childbirth. Another relative contraindication is a single prior episode of nephrolithiasis. A metabolic work-up should be performed to evaluate the risk of stone recurrence.[26]

The potential donors undergo routine screening investigations such as urine tests for protein, blood, glucose microscopy, culture and sensitivity, and protein excretion rate. They are also examined for blood counts, coagulation screening, kidney function tests, electrolyte levels, liver function tests, bone profile, fasting plasma glucose, glucose tolerance tests, lipid profile, thyroid function tests, and pregnancy tests if indicated. Additionally, the potential donors undergo infection screening for hepatitis B and C, human immunodeficiency virus, cytomegalovirus, Epstein-Barr virus, syphilis, malaria, and schistosomiasis (if indicated).[26]

The potential donors also undergo diagnostic examinations of the cardiovascular and respiratory systems, such as chest x-ray, electrocardiogram, 2D-echocardiogram, and/or cardiovascular stress tests as indicated.[26]

VIII. LIVING KIDNEY DONOR OUTCOMES

A narrative review[27] found that individuals who donate organs generally possess a high level of health-related quality of life (HRQoL) before the donation procedure.[28] In two studies, data collected 12 months after donation typically suggest that donors experience a return of their physical and mental HRQoL to their pre-donation baseline.[29,30] Although some studies documented a small reduction in perceived physical health at the 12-month follow-up, in the majority of cases, this level remained equivalent to that observed in the general population.[31-33] Lower HRQoL is often correlated with unfavorable outcomes for the transplant recipient or complications related to the donation itself. Key risk factors identified for impaired QoL include a pre-existing history of psychiatric symptoms, poorer physical health before donation, an extended recovery period post-donation, a substantial financial burden, and medical complications experienced by either the living donor or the recipient of the transplant.[34-37]

The impact of different surgical techniques on health-related quality of life (HRQoL) in living donors has been a subject of research. Findings suggest that the shift from traditional open surgery to laparoscopic techniques has positively affected HRQoL, manifesting as reduced pain, a shorter recovery period, and a faster return to baseline

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HRQoL. Despite these advancements, some studies have still reported that living donors experience more bodily pain than the general population.[38-42]

Similar to the trends observed with HRQoL, certain studies suggest that the level of fatigue experienced after donation is comparable to that reported in the general population.[33,43] Nevertheless, research identifying donors with fatigue lasting 12 months post-donation pointed to pre-existing fatigue, poorer overall physical function, and younger age as contributing risk factors. In some donors with chronic fatigue persisting at the 24-month mark, this was associated with lower engagement in physical activity and a clinical mood disturbance before donation. Furthermore, a small number of donors experienced fatigue that lasted for up to 5 years.[33,43]

Lastly, investigations into the psychological health of living donors generally reveal levels of psychological complaints or psychiatric diagnoses that are comparable to those observed in the general population.[43-46] Several studies that have followed mood and psychological symptoms over time have found that the patterns of change are similar between living donors and the general population.[44,47] Overall, living donors tend to have a rate of depression that is either similar to or lower than that of the general population;[48,49] however, it has been reported that some donors who develop depression perceive a connection to their donation experience.[50-52]

IX. CARE OF THE LIVING KIDNEY DONORS

According to The Kidney Disease: Improving Global Outcomes Living Kidney Donor Work Group (KDIGO) Clinical Practice Guideline on the Evaluation and Care of Living Kidney Donors,[53] the care of living kidney donors should include a personalized post-donation care plan and should be provided before donation to clearly describe follow-up care recommendations, who will provide the care, and how often the follow-up will be. The following measurements should be performed at least annually after donation: blood pressure, body mass index, serum creatinine with glomerular filtration rate estimation, and albuminuria. The donors should be monitored for CKD, and those meeting the criteria for CKD should be managed according to the KDIGO CKD guideline.[53] The donors should receive age-appropriate healthcare maintenance and management of clinical conditions and health risk factors according to clinical practice guidelines for the regional population.[53]

In addition to the physical aspect of post-donation care, the donors' psychosocial health and well-being should be reviewed and supported. They should also be reminded of a healthy lifestyle, including regular exercise, a healthy diet, and abstinence from tobacco.[53]

In the Philippines, the Department of Health released the DOH Administrative Order 2021-0059, also known as the Guidelines on Ethical Organ Donation and Transplantation From Living Donors,[11] and it stipulates that the recipient will shoulder the medical consultations, medications, and hospitalizations and PhilHealth membership payment whenever necessary that is related to kidney donation.[11] The recipient should also guarantee that the donor will receive free kidney check-ups from the recipient based on the recommended schedule of follow-up, which is one week after donation, one month after donation, three months after donation, six months after donation, one year after donation, and yearly thereafter for ten years post-donation.[11] The laboratory tests should include, but are not limited to, blood counts, urinalysis, triglycerides, blood urea nitrogen, and creatinine, with the addition of yearly electrocardiograms, chest radiographs, and abdominal ultrasounds.[11]

X. CONCLUSION

Comprehensively understanding the multifaceted challenges encountered by living kidney donors across all stages of their donation journey—from initial consideration through long-term follow-up—is crucial. By thoroughly exploring their experiences, delving into their thoughts and perceptions, and meticulously identifying their specific concerns, healthcare professionals can better address the evolving and dynamic needs of this unique donor population and optimize their care and support.

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