



益处及风险

有关肾脏/胰脏的移植

移植可以大大地改进您的生活。但它也带着很大的风险。此章节就是讲解移植的利益及风险。

肾脏移植有什么益处？

移植是一个治疗肾脏疾病的方法、但不是治愈方法。肾脏或肾脏/胰脏移植不是每个人的最佳选择。您及您的医生将共同决定、移植的益处是否大于风险。

肾脏移植的益处

延长生命

一般来说、移植的病人比肾透析的病人要活得长久。肾脏病患在开始肾透析前接受移植其效果最佳。

提高生活品质

大多数人接受肾脏移植后：

- 与在透析期间相比有更好的整体生活素质
- 对生活更满意、情绪和身体都感觉更好
- 可能恢复工作
- 因为不再受透析的束缚、通常是可以自由的旅行

增进健康

许多长期肾透析后的问题在接受移植后就有所改进。例如：

- **改进贫血（血液指标低）**。骨髓需要用**促红细胞生成素（erythropoietin）**来造红血球。它是由肾脏制造的。健康的新肾脏就可制造以前有疾病的肾脏不能制造的这种激素。其结果就改进了红血球指数。



如您对移植的利弊有任何疑问、请与您的医生讨论

- **减轻心肌增厚（左心室肥厚）。** 这种增厚可导致永久性损伤及心脏衰竭。这些问题大多数是发生于肾脏衰竭、体液超载有关。移植后此超载减少、这些心脏问题的风险就降低了。
- **减轻血管堵塞（心血管病）的风险。** 血管堵塞可导致心脏病发作或中风。移植后这种病情恶化的风险会降低。
- **减轻因肾衰竭导致的神经伤害（神经病变）。** 神经病变可导致“腿动症”、疼痛、腿或胳膊的触感降低、睡眠及记忆的问题。在肾脏移植后、这些问题就可减轻。
- 如过去需要限制的饮食、移植后通常就不需要再节制。例如对磷及钾可能就不需再限量了。

胰脏移植的益处

如有必要 1 型糖尿病患者有资格获得胰脏移植以及肾脏移植。一个成功的胰脏移植可以让病人不需要使用胰岛素就可控制血糖。病人不再发生血糖过低（*低血糖*）、或糖尿病酮症酸中毒（DKA）或因高糖昏迷（*高血糖*）的问题，两者都有生命危险。同时、正常的血糖也可预防糖尿病所导致的长期并发症。

对肾功能很好的 1 型糖尿病患者、仅作胰脏移植可预防肾脏病的延发。如您有轻微的肾脏病、肾脏病也会好转。

如您已经因 1 型糖尿病导致肾衰竭、接受肾脏及胰脏移植可以防范新的肾脏再被糖尿病伤害。

1 型糖尿病的患者可能还有其他的问题如：

- *如视网膜病变*（伤及眼睛的视网膜）可能导致眼部出血、失明。
- *神经病变*（损伤到帮助感觉或运动功能的神经）神经病变可导致手脚的剧痛、麻木、针扎的感觉、或四肢力度上的问题。敏感度降低特别是在脚部、就可导致脚部受伤、或溃烂而增加了感染的风险。

视网膜及神经的病变在胰脏移植后就可改进。但可能在移植后 3 到 5 年才看到改进。视网膜及神经的病变是否在移植后能改进是基于在移植前受损的程度。

例如：一位患糖尿病的病人有严重的视网膜病变、且做过多次镭射（极光）治疗术、但因为镭射（极光）治疗术留下的疤痕是无法挽回的。这疤痕会减低视力、因此病人的视力在移植后也是不能改进的。

移植的成功率如何？

所谓的移植成功一般是由 2 方面来报告：*病人的存活率* 及 *移植器官的存活率*。下面是 2016 年八月的存活率。如要取得近期的数据、请上移植接受者科学登记处 (Scientific Registry of Transplant Recipients at srtr.org.) 查看。

病人的存活

病人存活率是病人移植后在几年内存活的百分率。一般是以 1 年后及 3 年来计算。

- **1-年后病人的存活率：**

- 在美国 1 年后的存活率是 97% (100 人中有 97 位存活)。
- 根据 2016 年 6 月的报告华大医疗中心 UWMC 接受肾脏移植者一年后的存活率为 **99.54%**。即 **100** 位接受移植的病人在一年后有超过 **99** 位存活。

- **3-年后病人的存活率：**

- 在美国 3 年后的存活率是 **93%** (100 人中有 **93** 位存活)。
- 根据 2016 年 6 月的报告华大医疗中心 UWMC 接受肾脏移植者 3 年后的存活率为 **96.73%**。(100 位接受移植的病人在 3 年后几乎有 **97** 位存活)。

一般来说、移植的病人比肾透析的病人要活得长久。特别是对患糖尿病及肾衰竭的病人。

与透析相比、肾移植可降低患心脏病的风险。但是、在移植后最初的几个月内、可能会导致死亡的风险增加。

这些可能是手术、感染或心脏病发作或中风的问题。渐渐地这些对生命有威胁的问题就会降低。

移植器官的存活

移植器官的存活是指器官在移植后乃然有功能。

- **1-年后您移植器官的存活率：**

- 在美国、被移植的肾脏在一年后的存活率为 **95%** (即 **100** 个被移植的肾脏有 **95** 个仍然有功能)。
- 根据 2016 年 6 月的报告华大医疗中心 UWMC 被移植的肾脏 1 年后的存活率为 **98.68%** (**100** 被移植的肾脏在 1 年后几乎有 **99** 个乃然有功能)。

- **3-年后您移植器官的存活率:**

- 在美国、被移植的肾脏在 3 年后的存活率为 **88%**（即 100 个被移植的肾脏 **88** 个乃然有功能）。
- 根据 2016 年 6 月的报告华大医疗中心 UWMC 被移植的肾脏 3 年后的存活率为 **94.23%** (即 100 个被移植的肾脏在 3 年后有 **94** 个乃然有功能)。

什么会影响移植后的存活率?

因肾衰竭而接受肾移植的病人比接受透析的病人的生命要长。但移植后的病人比一般人的死亡风险要高。

移植后最常见的死亡因素是:

- 心脏病（心血管病）
- 中风
- 感染
- 癌症

在移植后我们会一直与您合作来减少这些并发症的风险。

心脏病及中风

很多病人在移植时已有严重的心脏病。这就可能影响移植的成功而可能提高移植后的死亡率。

肾脏病及高血压会增加心脏病的风险。这些问题是肾移植术后病者死亡的主要原因。如果您抽烟或有糖尿病、延发这些问题的风险就会更高。

我们会与您商讨减低延发心脏病及中风风险的方法。可能包括:

- 有效地控制血压
- 服用降低胆固醇的药物
- 服用阿司匹林

抽烟

抽烟会增加心脏问题、中风、及某些癌症的风险、如您希望排名移植、我们要求您**不要**抽烟才可。我们也要求您在接受移植后持续不抽烟。

感染

移植后的病人必须服用**免疫抑制药**。这些药物可以帮助避免排斥新的器官、但也都会减弱免疫系统。这就增加了被感染的机会。

大多数的感染是很轻微的、如尿道感染等是很容易控制。但偶而、感染可能较为严重、很难控制、甚至有生命危险。

我们会密切观察每一位病人、尽可能地及早发现感染的症状。我们也在移植前及移植后对某些类型的传染病做筛查、来评估可能被感染的风险或这些感染的早期症状。

癌症

移植的病人可能对某些类型癌症的风险要高、特别是皮肤癌。为减低移植后患皮肤癌的风险、请使用防晒油及穿保护性的衣服来保护皮肤。

过去患皮肤癌的病人就要更加谨慎。我们建议这些病人要请皮肤专科（看皮肤的医生）做定期检查。

淋巴瘤 (Lymphoma) 是一种白血球的癌症。移植病人患淋巴瘤的风险较高、但还是很少见的。移植病人患淋巴瘤的风险约为 1% (100 人中有 1 位)。

我们要求每一位移植病人做定期的健康筛查、如肠镜来筛查直肠癌。妇女在接受移植后可能患宫颈癌的风险较高、因此需要做周年的柏氏膜片检查、妇女也需要定期做乳房 X 光检查。

移植手术的并发症

肾移植的病人约有 5% (100 人中有 5 位)、约 10% (100 人中有 10 位) 肾脏/胰脏移植的病人、在移植手术时发生重大的并发症。并发症包括：

- 血栓
- 出血
- 淋巴腺水肿 (淋巴腺积水)
- 尿液渗漏
- 肾动脉狭窄 (肾动脉变窄)

深静脉血栓或肺栓塞

任何的手术后、腿都有形成血栓的风险、包括移植的手术。腿部的血栓被称为深静脉血栓。它们是很危险的、因为它可能会穿流到肺部形成肺栓塞、导致呼吸的问题。为了降低形成血栓的风险、我们可能需要开稀释血液的药物（抗凝血药物）、并采取其他预防的措施。

肾动脉或肾静脉血栓

肾移植手术后肾动脉或静脉（供血液进出肾脏的血管）都可能形成血栓。虽然这是很罕见、可是一旦发生、可能就要再做手术。因为血栓可以失去移植肾脏。

出血

由于移植手术的性质、以及肾功能衰竭及所服用的药物如华法林都增加了出血的风险。

- 如出血、您可能就需要输血。
- 如是严重地出血、您可能需要再做一种手术来寻找出血的来源、并止血。
- 血液也可能聚集在肾移植附近成为**血肿 (hematoma)**。它可能会自行消失、但也可能需要手术。

淋巴腺水肿

淋巴管是靠近动脉及静脉的细管。它将组织内的体液运送到大的静脉、然后到心脏。

因为他们很细小、因此在移植手术的部位可能会受到损伤、导致淋巴液集积即为**淋巴腺水肿 (lymphocele)**。

一般来说这是个很小的问题、且不需治疗就会自行消失。但如积液量大导致移植器官疼痛、腿部肿胀、或对移植的器官造成压力、就可能需要将它导流出来。一般是经由皮肤用很细小的针抽出。偶尔、需要再做手术来排出积液。

尿液渗透

尿液经输尿管从肾脏输送到膀胱。如移植肾脏的**输尿管**与您的膀胱相接处裂了一小口时可能就会尿漏。尿液渗透的症状包括：

- 移植处感到意外的疼痛
- 液体由伤口渗溢
- 移植肾脏功能有问题

治疗尿液泄漏、我们在膀胱内放置**导管**（管子）以排出尿液并释放压力。当该部位愈合期间、导管可以留在膀胱内。我们也可能放置一个**肾造口术导管**来转移尿液流量。以便移植的肾和膀胱之间的连接能够愈合。

肾动脉狭窄

肾动脉狭窄是供血给肾脏的血管变窄。这可能是由于血管与移植肾之间的愈合的状况所造成的。

这是很少见的问题。可能发生在移植后2至3个月或之后。如情况严重、可能导致大大地减少流向肾脏的血液。这问题可能的症状包括：

- 高血压更为严重
- 新的腿部浮肿
- 肾功能减退

可能要做肾脏及动脉的超声检查、来查看是否有这问题。也可能需要做其他的测试如**血管造影**。血管造影是以 X-光及显影剂（又称“染料”）来检测动脉及静脉内的血流状态。

肾动脉狭窄一般的治疗法可在做血管造影时用气球来将动脉扩张。有时需要做支架。

输尿管狭窄

输尿管狭窄 是输尿管变狭窄。如发生了这情况、可能就需要在输尿管安放支架或再作手术。我们也可能需要在肾脏里安插一**肾造口术导管**。这导管分流了尿液的流向、这样输尿管就可以在放置支架后或手术后愈合。

其他的问题

移植功能延迟

有时因为将肾脏由一个身体移植到另一个身体所产生的“休克”导致移植后肾功能不能即刻启动。

- 接受遗体捐赠者最多有 **30%** 的病人（**100** 人中最多有 **30** 人）可能发生这情况
- 接受活体捐赠者最多有 **2%** 的病人（**100** 人中最多有 **2** 人）可能发生这情况。

大多数的肾脏是会有功能。但可能要几天、或甚至要几周后。并且没有任何人能加速这过程。您仍然需要继续做肾透析、直到肾功能开始启动、足以独自操作。在少数的病人移植后可能肾脏始终不起作用、而需要将它取出。

排斥

排斥是身体对外来的肾脏或胰脏的自然反应。您需要服用抗排斥（又称**免疫抑制药**）的药物。如此您自身的免疫力就无能排斥移植的器官。排斥会导致移植器官的炎症。如不治疗会造成疤痕及永久性的伤害。

移植后的 6 个月是排斥的高风险期。肾脏的排斥率是 **15%** 至 **20%**（**100** 人中有 **15** 到 **20** 位）。胰脏的排斥率较为高一些。

如及早发现而且及早治疗、排斥是可以成功地逆转的。但只有做移植器官的**穿刺活检**、才能确知是否有排斥的状况。（见下一页）。

急性排斥

急性的排斥反应发生在移植后 6 个月内。大多数的情况是可以治疗并逆转的。即使在病人正确地服用抗排斥药物的情况下、急性的排斥反应仍是可能发生。

通常；急性排斥反应不会有任何症状。您的医生可能因为肾功能的血液测试中的变化而怀疑有排斥。

慢性排斥

移植 6 个月后发生的排斥称为 *慢性排斥*。此类排斥就比较难治疗。经常是因为病人没有正确地服用抗排斥的药物。但慢性排斥也有其他的因素：

慢性肾脏排斥的症状包括：

- 尿液减少
- 浮肿
- 体重增加
- 移植处疼痛或肿胀
- 类似流感的症状：如疲乏、疼痛及发烧

穿刺活检

您的医生如顾虑到有排斥的情况时、就会用 *针穿刺* 的 *活检*。也可能为了排除 **不是** 因排斥而导致移植的肾脏功能不正常而做此测试。

穿刺的活检是以一个很细的针插入移植后的器官。由针头抽取小量的组织。以局部的麻醉、在超声波的指引下插入器官、就可很安全地完成这程序。穿刺活检出血的风险很小。

做好针穿刺的活检后、有一位 *病理学家* 会在显微镜下检视组织样本。病理学家是一专科医生、他们检视组织、细胞来诊断健康的状态。

如您需要做活检来检查是否有排斥、那在术后我们需要观察您一段时间、确认您没有出血、或其他问题。如有需要您的医生会向您更详细地解说这活检、及其风险。

请参看“移植肾脏活检”以获取活检有关的资讯。

慢性同种异体移植肾病

慢性同种异体移植肾病 是指移植肾功能逐渐减退。也被称为 *慢性排斥*。它与移植后很快就发生的“急性排斥”不同。此类对移植肾脏的伤害可能是免疫系统导致的。

其他如高血压、糖尿病、高胆固醇、或免疫抑制指数偏高也可能逐渐地伤害肾脏。最初导致肾脏病的因素也同样会影响移植的肾脏而造成损伤。

您的医生会关注这些问题的病征。往往需要做穿刺活检来找移植肾脏不断发生的问题、但不论是什麽原因、将血压控制好、就能减缓肾功能减退的速度。

感染

移植后被感染是可能有生命危险的。移植后抗排斥的药物会减低您的免疫系统的抵抗力。这就导致您容易被感染。

移植后 6 个月内、也就是抗排斥药物服用最高剂量的时期、是被感染的高风险期。此外在治疗排斥的期间、也是高风险期。

整体来说、当您服用抗排斥药物的剂量减低时、被感染的风险就低。但是、您被感染的风险总是比不服用抗排斥药物时高。

感染可能是由细菌、病毒、或真菌所导致的。移植后 6 个月内、会嘱咐您服用某些抗生素来防止某些较常见的感染。

我们要求病人注意、并报告可能显示感染的症状。这包括：

- 发烧
- 咳嗽
- 夜间盗汗
- 发冷
- 喉痛
- 腹痛
- 腹泻
- 新的头痛
- 小便时疼痛

癌症

癌症是另一种移植后可能发生的危及生命的问题。服用免疫抑制药会提高患这些癌症的风险：

- **皮肤癌**：移植病人患皮肤癌的风险比一般人要高。而且会更严重、更具侵略性。*鳞状细胞*及*基底细胞癌*是最常见的皮肤癌的类型。对移植前已患皮肤癌的病人、其风险就更高。

我们建议您移：

- 移植后需看皮肤科的医生以便密切地关注
- 避免长时间、没有遮盖的晒太阳
- 在户外必须搽防晒油
- **淋巴癌**：大多数移植后患的淋巴癌均被归类为*非霍奇金*类型。它们也被称为*移植后淋巴增生性疾病*、或简称为**PTLD**。移植后淋巴增生性疾病**PTLD**是一种很罕见的并发症、仅发生在低于**1%**的肾移植病人（**100**人中少于**1**位）。

淋巴癌的早期症状包括不明原因的体重减轻、发烧、或淋巴结肿大。如患了淋巴癌、就需要看肿瘤医生进行治疗。肿瘤科医生是一位专门治疗癌症的医生。

关节及骨骼的疾病

肾脏病可以导致骨病。抗排斥的皮质类固醇（一种类固醇）也与骨质流失相关。也因此、我们尽可能地使用最小的剂量来抗排斥。

骨质流失主要是发生在脊柱及髌部骨骼、会导致骨质疏松（骨质变薄、骨骼脆弱）及增加骨折的风险。医生会与您讨论您是否属高风险、以及是否必需治疗以保存您的骨质密度。预防骨质疏松的一种方法就是做负重的锻炼。

糖尿病患者如已经发生周围神经病变（外层四肢神经损伤）就可能有低骨质密度。特别是脚部或脚踝的神经已有损伤、因为它会让患者有这些部位发生骨折的风险。目前尚不清楚糖尿病患者在服用类固醇后是否比一般人的风险要高。因为类固醇对脚部及脚踝的伤害还是不像对其他部位这么严重。

类固醇还可能导致另一种骨骼问题、称为骨骼缺血性坏死（AVN）。骨骼缺血性坏死（AVN）可导致关节炎、主要是在髌关节。但是；它也可能影响到其它骨骼如膝盖骨及一些手腕的骨骼。

痛风

痛风是关节红肿疼痛、一般是发生在大脚趾。是一些移植的药物很可能导致的副作用。在移植前就有痛风的病者在移植后的风险就更高。

糖尿

有些以前没有糖尿病的病者在移植后可能延发了糖尿病。这是因为一些抗排斥的药物影响了身体制造及使用胰岛素。

您可能需要开始使用药物、不论是药片或胰岛素的针剂来控制您的血糖。不能控制血糖在短期内的的问题包括增高感染的风险。长期的问题包括伤害肾脏、眼睛的问题、及心脏病的风险增高。

如您有以下的情况，您可能在移植后发生糖尿病的风险更高：

- 超重
- 有糖尿病的家庭史
- 患有 2 型糖尿病、糖尿病前期者、或边缘性糖尿病者、即使在移植前、透析过程中不需要治疗糖尿病

对于超重的人来说、即使是轻微的减肥及经常运动也可以改善血糖控制。这可以消除他们对胰岛素或药物的需要、或至少降低其剂量。

抗排斥药物的副作用

(请参看“药物”的讲义以取得更详细的资讯)

- **他克莫司 (Tacrolimus)** 是最常用的钙调磷酸酶抑制剂的药物。它可能会引起：
 - 颤抖或震颤
 - 头痛

- 烧心
- 腹泻
- 钾的指标升高（高血钾症）
- 少许的脱发（一般会逐渐减轻）
- 糖尿病
- 痛风
- 吗替麦考酚（**Mycophenolate**）可能会引起：
 - 烧心
 - 腹泻
 - 高血钾症
 - 白血球指标降低
 - 红血球指标降低(贫血)
- 泼尼松（**Prednisone**）可能引起：
 - 皮肤变薄
 - 皮肤青紫
 - 关节及骨骼的疾病

体重增加

许多病人在移植后体重增加、一般是可能是泼尼松的关系。但是、很多病人虽没有服用泼尼松体重却仍然增加。这可能是因为移植后食欲改善、自我感觉改善的缘故。我们辅导病人注意这状况。关注您的饮食、常规的锻炼有助于避免体重过重。

我因该如何防范问题发生？

在移植后很多病人提出这问题。在某些情况、如早期的排斥及感染都不是您所能控制的。但是有些事项是您能掌握的。包括认知您所服药物的关键性、并且正确地服用。特别是您抗排斥的药物、以便使您的康复平稳顺利。

我们知道我们对您的要求很多、特别是在移植后。我们要求您经常来诊所、及抽血检测、但是我们必须如此执行以便万一有问题时可以及早发现。

我们希望您有疑问或顾虑时就告诉我们。我们宁可您为一些小事故来电联系、而不希望任何看来好像是小事就没告诉我们、但后来却变为非常重大。即便是以回到您以前转荐的医生来负责您长期的医护后、任何在移植方面的问题、我们还是一直会为您服务。请不要犹豫、我们乐于为您服务。

费用

移植手术涉及许多费用。手术、住院、门诊及药物都是主要费用。

根据您的保险，您可能需要自付部分费用。今后您都需要为自己提供良好的健康保险、以帮助您支付药物及后续门诊。

备注

您有疑问吗？

我们很重视您的疑问。当有疑问或顾虑时，请致电您的医生或医护人员。

移植科电话：
206. 598. 3882

Benefits and Risks

Of a kidney/pancreas transplant

A transplant can greatly improve your life, but it also involves serious risks. This chapter describes the benefits and risks of a transplant.

What are the benefits of having a transplant?

Transplant is a treatment for kidney disease, not a cure. A kidney or kidney/pancreas transplant is not the best choice for everyone. You and your doctors will decide together if the benefits of having a transplant outweigh the risks.

Benefits of a Kidney Transplant

Longer Life

Most people who receive a transplant live longer than those who stay on dialysis. Kidney patients who receive a transplant before starting dialysis have the best outcomes of all.

Better Quality of Life

Most people who receive a kidney transplant:

- Have a better overall quality of life as compared to those who stay on dialysis
- Are more satisfied with life and feel better emotionally and physically
- Are more likely to be able to return to work
- Are freer to travel since they are not tied down by their dialysis visits

Improved Health

Many problems that occur from long-term dialysis improve after getting a transplant. Some of these are:



Talk with your doctor if you have any questions about the benefits and risks of having a transplant.

- **Anemia (low red blood cell count) improves.** The bone marrow needs the hormone *erythropoietin* for creating red blood cells. This hormone is made in the kidneys. The healthy transplant kidney will be able to make this hormone that diseased kidneys no longer can. The result is an improved red blood cell count.
- **Thickening of the heart muscle (*left ventricular hypertrophy*) improves.** This thickening can lead to long-term damage and heart failure. Much of this problem is due to fluid overload that occurs when the kidneys fail. This overload eases after a transplant, and the risk of these heart problems lessens.
- **The risk of getting blockages in your blood vessels (*heart disease*) decreases.** Blocked blood vessels can lead to heart attack or stroke. The chance of this problem getting worse lessens after transplant.
- **Nerve damage (*neuropathy*) caused by kidney failure decreases.** Neuropathy can cause “restless legs,” pain, decreased sensation in the legs or arms, and sleeping and memory problems. These problems can become less severe after a kidney transplant.
- **Limiting fluids and certain foods is usually not needed after transplant.** For example, your intake of phosphorous or potassium may not need to be restricted any longer.

Benefits of a Pancreas Transplant

People with type 1 diabetes may qualify for both a pancreas transplant and a kidney transplant. With a successful pancreas transplant, blood sugar can be controlled without using insulin. You will no longer have problems with very low blood sugars (*hypoglycemia*), or *diabetic ketoacidosis* (DKA) or coma from very high sugars (*hyperglycemia*), both of which can be life-threatening. Normal blood sugars can also prevent long-term problems that often occur with diabetes.

If you have type 1 diabetes and your kidneys are working, getting only a pancreas transplant can prevent kidney disease from developing. If you have minor kidney disease, this can get better.

If you already have kidney failure due to type 1 diabetes, getting a pancreas transplant and a kidney transplant together can keep the new kidney from being damaged due to diabetes.

People with type 1 diabetes may have other problems such as:

- **Retinopathy** (damage to the retina of the eye). Retinopathy can cause bleeding in the eye, which can lead to blindness.

- *Neuropathy* (damage to the nerves that help with sensation or motor function). Neuropathy may cause severe pain, numbness, tingling in the hands and feet, or problems with motor strength. Lack of feeling, especially in the feet, can lead to injury, sores on the feet, and a greater risk of infection.

Retinopathy and neuropathy can get better after a pancreas transplant, but it may take 3 to 5 years after transplant to see improvement. The chance that problems related to retinopathy or neuropathy will get better after transplant depends on how much damage there was before transplant.

For example, if someone with diabetes has severe retinopathy and has had several laser surgeries to treat it, the scarring that is left from the laser surgeries cannot be reversed. This scarring decreases vision, and so the person's vision would not be expected to improve after transplant.

What are the success rates of transplants?

Success rates of transplants are usually given in 2 ways: *patient survival* and *graft survival*. The survival rates given below are from August 2016. To see the most recent numbers, visit the Scientific Registry of Transplant Recipients at srtr.org.

Patient Survival

Patient survival is the percentage of patients who are alive a certain number of years after transplant. It is usually measured at 1 and 3 years.

- **1-year patient survival rates:**

- In the U.S., the patient survival at 1 year after transplant is 97% (97 out of 100 patients are alive 1 year after transplant).
- As of June 2016, 1-year patient survival for UWMC's kidney transplant center is 99.54%. This means that more than 99 out of 100 patients are alive 1 year after transplant surgery.

- **3-year patient survival rates:**

- At 3 years, patient survival in the U.S. is 93% (93 out of 100 patients are alive).
- As of June 2016, the 3-year patient survival for UWMC's kidney transplant center is 96.73% (almost 97 out of 100 patients are alive 3 years after transplant).

Most people who receive a kidney transplant live longer than if they stay on dialysis. This is especially true for people who have both diabetes and kidney failure.

Kidney transplant lowers your risk for heart disease compared to staying on dialysis. But, in the first few months after a transplant, there is an

increased risk of having problems that could cause death. These may be problems from the surgery, infections, or heart attack or stroke. Over time, the risk of these life-threatening problems will decrease.

Graft Survival

Graft survival means that the transplanted organ is still working.

- **1-year graft survival rates:**
 - In the U.S., the graft survival at 1 year after kidney transplant is 95% (95 out of 100 kidney transplants are still working).
 - As of June 2016, the 1-year graft survival for UWMC's kidney transplant center is 98.68% (almost 99 out of 100 kidney transplants are still working).
- **3-year graft survival rates:**
 - At 3 years after kidney transplant, graft survival in the U.S. is 88% (88 out of 100 kidney transplants are still working).
 - As of June 2016, the 3-year graft survival for UWMC's kidney transplant center is 94.23% (94 out of 100 kidney transplants are still working).

What affects patient survival after transplantation?

Patients with kidney failure who receive a kidney transplant can live longer than if they stay on dialysis. But overall, transplant patients still have a higher risk of death than average.

The most common causes of death after transplant are:

- Heart (cardiovascular) disease
- Stroke
- Infections
- Cancers

We will work with you after your transplant to lower your risk of these types of problems.

Heart Disease and Stroke

Many patients have severe heart disease at the time of their transplant. This may affect the success of their transplant and may increase their chance of dying after transplant.

Kidney disease and high blood pressure increase the risk for heart disease. These problems are a major cause of patient death after a kidney transplant. If you smoke or have diabetes, the risk of having these problems can be higher.

We will talk with you about ways to lower your risk of having heart problems or stroke. These may include:

- Good blood pressure control
- Taking medicine to lower cholesterol
- Taking aspirin

Smoking

Smoking cigarettes can increase the risk of heart problems, stroke, and some types of cancer. We require that you **not** smoke if you want to be placed on the transplant list. We also require that you not smoke after receiving your transplant.

Infections

After transplant, you will take medicines called *immunosuppressants*. These drugs help prevent rejection of the new organ, but they also weaken the immune system. This can increase your risk of getting infections.

Most of these infections are minor and can be easily controlled, such as urinary tract infections. Rarely, infections can be much more severe, hard to control, or even life-threatening.

We closely monitor all patients for early signs of infection. We also do screening tests before and after transplant for certain infections. This helps us assess your possible infection risk or find early signs of infection.

Cancer

Transplant patients can be at higher risk of some types of cancers, especially skin cancer. To lower your risk of skin cancer after transplant, protect your skin from the sun by using sunscreen and protective clothing.

Patients who have had skin cancer in the past have to be very careful. If you have had skin cancer, we advise seeing a *dermatologist* (skin doctor) for regular checkups.

Lymphoma is a type of cancer of the white blood cells. The risk of this cancer is higher in transplant patients, but it is still rare. The average rate of lymphoma in transplant patients is about 1% (1 out of 100 patients).

We advise all transplant patients to get regular health screening tests, such as a *colonoscopy* that checks for colon cancer. Women may have a higher risk of cancer of the cervix after transplant, so it is important to have yearly Pap smears. Women should also have routine mammograms.

Problems from Transplant Surgery

About 5% of kidney transplant patients (5 out of 100 patients) and about 10% of kidney/pancreas patients (10 out of 100 patients) have major problems from the transplant surgery. These problems can include:

- Blood clots
- Bleeding
- *Lymphocele* (buildup of lymph fluid)
- Urine leak
- *Renal artery stenosis* (narrowing of the renal artery)

Deep Vein Thrombosis or Pulmonary Embolism

There is a risk of blood clots in the legs after any type of surgery, including transplant surgery. Clots in the legs are called *deep vein thrombosis*. These clots are dangerous because they can travel to the lungs, form a *pulmonary embolism*, and cause breathing problems. To lessen the risk of blood clots, we may prescribe blood-thinning medicine (*anticoagulants*) and will also take other precautions.

Renal Artery or Renal Vein Blood Clot

After kidney transplant surgery, a blood clot could form in the *renal artery* or *renal vein* (blood vessels that move blood to and from the kidney). These clots are rare, but if one occurs, surgery may be needed. This type of blood clot could cause loss of the transplanted kidney.

Bleeding

There is an increased risk of bleeding from transplant surgery, from kidney failure, and from taking medicines such as warfarin.

- If bleeding occurs, you may need a blood transfusion.
- If the bleeding is severe, you may need another surgery to find the source of the bleeding and to stop it.
- Blood may also collect near the kidney transplant as a *hematoma*. This may go away on its own or it may require surgery.

Lymphocele

Lymph vessels are small tubes next to your arteries and veins. These vessels carry fluids from the tissues of the body back into the large veins and the heart.

Since they are very small, lymph vessels in the area of the transplant can be damaged during surgery. This can cause lymph fluid to collect in the area around the transplanted organ. This buildup of lymph fluid is called a *lymphocele*.

Most times, this is only a minor problem and it goes away without being treated. But if the fluid buildup causes symptoms such as pain over the transplanted organ, leg swelling, or compression of the transplanted organ, it may need to be drained. Usually it is drained through the skin using a small needle. Rarely, another surgery is needed to drain the fluid.

Urine Leak

Urine travels through a tube called the *ureter* as it goes from the kidney to the bladder. A urine leak can occur if there is a small opening where the ureter of the transplanted kidney connects to your bladder. Signs of a urine leak include:

- Unexpected pain in the area of the transplant
- Fluid draining from the incision
- Problems in how the transplanted kidney is working

To treat a urine leak, we place a *catheter* (tube) in the bladder to drain the urine and relieve the pressure. The catheter may stay in place while the area heals. We may also place a *nephrostomy* tube to divert the flow of urine. This allows the connection between the transplanted kidney and the bladder to heal.

Renal Artery Stenosis

Renal artery stenosis is a narrowing of the blood vessel that supplies blood to the kidney. It may be caused by the way healing has occurred between your blood vessels and the transplanted kidney.

This problem is rare. It can be seen 2 to 3 months or longer after the transplant. If it is severe, it may cause a large decrease in blood flow to the kidney. Signs of this problem include:

- Blood pressure is getting higher
- New leg swelling
- Kidney function is getting worse

An ultrasound exam of the kidney and artery may be done to check for this problem. Other tests such as an *angiogram* may also be needed. An angiogram is an imaging test that uses X-rays and contrast (X-ray dye) to study blood flow in arteries and veins.

Renal artery stenosis can often be treated by dilating the artery with a balloon at the time of an angiogram. Sometimes a stent is needed.

Ureteral Stenosis

Ureteral stenosis is a narrowing of the ureter. If this occurs, it may require a stent in the ureter or another surgery. We may also need to place a *nephrostomy* tube into the kidney. This tube diverts the flow of urine so that the ureter can heal after a stent or surgery.

Other Problems

Delayed Graft Function

Sometimes the kidney transplant does not work right away because of the shock from being removed from one body and placed in another. This happens in:

- Up to 30% of patients (up to 30 out of 100 of patients) who receive a kidney from a deceased donor
- Up to 2% of patients (2 out of 100 patients) who receive a kidney from a living donor

Most times, the kidney will start to work after a few days or even a few weeks. There is nothing we can do to speed up this process. You will need to continue dialysis until the kidney starts to work well on its own. Very rarely, the kidney does not start to work and must be removed.

Rejection

Rejection is the body's natural response to the foreign kidney or pancreas. You need to take anti-rejection (immunosuppressant) medicines so that your body's immune system does not reject the transplanted organ. Rejection causes inflammation in the transplanted organ. If it is not treated, it will cause scarring and permanent damage.

The 6-month period just after transplant is when the risk of rejection is highest. Rejection occurs in about 15% to 20% of kidney transplant patients (15 to 20 out of 100 patients). The risk of rejection for pancreas transplants is a little higher.

Reversing rejection is most successful when it is caught and treated early. The only way to know for sure if there is rejection is to do a *needle biopsy* of the transplanted organ (see next page).

Acute Rejection

Acute rejection occurs within 6 months after transplant. Most times, acute rejection can be treated and reversed. Acute rejection can happen even when the patient is taking their anti-rejection drugs correctly.

Often, acute rejection does not cause any symptoms. Your doctor may suspect acute rejection based only on your blood test results.

Chronic Rejection

Rejection that occurs more than 6 months after transplant is called *chronic rejection*. This type of rejection can be harder to treat. It often occurs because the patient has not been taking their anti-rejection drugs correctly. There are also other reasons for chronic rejection.

Signs of chronic rejection of a kidney transplant include:

- A decrease in urine output
- Fluid retention
- Weight gain
- Pain or swelling in the area of the transplant
- Flu-like symptoms such as fatigue, aches, and fevers

Needle Biopsy

Your doctor may order a *needle biopsy* of your transplanted organ if there is concern about rejection. A biopsy may also be done to make sure rejection is **not** the source of problems with the transplanted organ.

In a needle biopsy, a thin needle is inserted into the transplanted organ. Small pieces of tissue are removed through the needle. The procedure is done very safely under local anesthesia. Ultrasound is used to guide the needle into the organ. There is a small risk of bleeding from a needle biopsy.

After the needle biopsy, a *pathologist* will look at the tissue samples under the microscope. A pathologist is a doctor who examines tissues and cells to diagnose health issues.

If you need a biopsy to check for rejection, we will monitor you afterward to make sure you do not have bleeding or other problems. Your doctor will talk with you about a biopsy and its risks in more detail, if needed.

See “Transplant Renal Biopsy” to learn more about having a biopsy.

Chronic Allograft Nephropathy

Chronic allograft nephropathy is when your transplanted kidney slowly starts not working. It is also called *chronic rejection*. This type of damage may be caused by your immune system. It is different from *acute rejection*, which usually happens more quickly.

Other issues such as high blood pressure, diabetes, high cholesterol, or high levels of immunosuppressants may also slowly damage your new kidney. The original cause of your kidney disease can also cause problems.

Your doctor will watch for any signs of these problems. A needle biopsy may be needed to find the reasons for ongoing problems with the kidney transplant. Whatever the cause, we know that controlling blood pressure can help slow the decline of kidney function.

Infection

Infection is a possible life-threatening problem after transplant. The anti-rejection medicines you need to take after transplant will lower your immune defense system. This will increase your risk of getting infections.

Your infection risk is highest in the first 6 months after transplant, when you are taking the highest doses of anti-rejection medicines. You are also at higher risk during treatment for rejection.

As your doses of anti-rejection medicines are lowered, your risk of infection will decrease. But, your infection risk is always higher than if you were not taking these medicines.

Infections may be caused by bacteria, viruses, or a fungus. For 6 months after transplant, you will be asked to take certain antibiotics to help prevent some of the more common types of infections.

You will need to watch for any signs of infection and report them to your doctor. These include:

- Fever
- Cough
- Night sweats
- Chills
- Sore throat
- Abdominal pain
- Diarrhea
- New headache
- Pain when you urinate

Cancer

Cancer is another possible life-threatening problem after organ transplant. Taking immunosuppressants increases your risk of these cancers:

- **Skin cancer:** The risk of skin cancer for transplant patients is much higher than average. The cancer can also be more severe and aggressive. *Squamous cell* and *basal cell carcinoma* are the types of skin cancer that occur most often. If you had skin cancer before receiving a transplant, your risk is even higher.

We recommend that you:

- See a dermatologist for close monitoring after your transplant
 - Avoid long, unprotected sun exposure
 - Use sunscreen every time you go outside
- **Lymphomas:** Most lymphomas that occur after transplant are *non-Hodgkin's* lymphomas. They are also called *post-transplant lymphoproliferative disease*, or PTLN. PTLN is a very rare problem. It occurs in less than 1% of kidney transplant patients (less than 1 out of 100 patients).

Early signs of lymphoma include unexplained weight loss, fevers, or enlarged lymph nodes. If you have lymphoma, you will need to see an *oncologist* for treatment. An oncologist is a doctor who specializes in cancer treatment.

Joint and Bone Disease

Kidney disease can cause bone problems. Anti-rejection drugs called *corticosteroids* (steroids) are also linked to bone loss. Because of this, we use the smallest doses of steroids possible for anti-rejection.

Bone loss occurs mostly in the spine and hip bones. It can lead to *osteoporosis* (thin, weak bones) and increase your risk of fractures. Your doctor will talk with you about whether you may be at higher risk for this problem, and what treatment you may need to help your bone density. One way to prevent osteoporosis is to exercise with weights.

People with diabetes may have low bone density if they also have *peripheral neuropathy* (nerve damage in the outer limbs). Nerve damage in the feet and ankles means a higher risk for fractures in these areas. We do not know if steroids add more risk for people with diabetes, since bone loss from steroids usually does not affect feet and ankles as much as other areas.

Steroids can also cause a bone problem called *avascular necrosis* (AVN). AVN can lead to arthritis, mostly in the hip joint. But, it may also affect other bones such as the kneecap and some bones in the wrist.

Gout

Gout is a painful, red swelling of a joint, usually the big toe. It can occur as a side effect of some of your transplant medicines. People who have had gout before transplant are at highest risk for it after transplant.

Diabetes

Some people who do not have a history of diabetes may have diabetes after their transplant. This is because the anti-rejection drugs affect how the body makes and uses insulin.

You may need to start taking medicine, either pills or insulin shots, to control your blood sugar. If your blood sugar is not controlled, it can cause a higher risk of infections. Over time, high blood sugar can damage your kidneys, cause eye problems, and raise your risk of heart disease.

You may have a higher risk of developing diabetes after transplant if you:

- Are overweight
- Have a family history of diabetes
- Have type 2 diabetes, pre-diabetes, or borderline diabetes, even if you did not need diabetes treatment while on dialysis before transplant

For overweight people, even a small weight loss and regular exercise can improve blood sugar control. This can eliminate their need for insulin or pills, or at least lower the amount of medicine needed.

Side Effects of Anti-Rejection Medicines

(See chapter on “Medicines” for more complete information.)

- **Tacrolimus** is the most commonly used *calcineurin inhibitor* drug. Its side effects include:
 - Shakiness or tremor
 - Headaches
 - Heartburn
 - Diarrhea
 - High potassium levels (*hyperkalemia*)
 - Mild hair loss (usually lessens over time)
 - Diabetes
 - Gout
- Side effects of **mycophenolate** include:
 - Heartburn
 - Diarrhea
 - Hyperkalemia
 - Low white blood cell count
 - Low red blood cell count (*anemia*)
- Side effects of **prednisone** include:
 - Thinning of the skin
 - Bruising
 - Joint and bone disease

Weight Gain

Many people gain weight after transplant, and prednisone is usually blamed for this. But, many patients who are not on prednisone also gain weight. This may be because their appetite is better and they feel better overall after transplant. We ask patients to be aware of this. Monitor your diet and exercise regularly to keep from gaining too much weight.

What can I do to avoid problems?

Many patients ask this question after transplant. Some things, such as the risk of early rejection and infection, are not within your control. But, there are things you can control. This includes understanding all your medicines and taking them correctly, especially your anti-rejection drugs, to help things go as smoothly as possible.

We know that we ask a lot of you, especially right after your transplant. We ask you to have many clinic visits and blood tests, but this is so that we can find any problems early.

We want you to tell us about any problems or concerns that you may have. We would rather have you call about something that turns out to be minor than not to hear about an issue that turns out to be important. Even after you return to your referring doctor for long-term follow-up care, you can always call us about problems related to your transplant. Please feel comfortable asking us for help.

Costs

There are many costs involved with transplant surgery. The surgery, your hospital stay, clinic visits, and medicines are all major expenses.

Depending on your insurance, you may need to pay some of these costs out of pocket. You will need to have good health insurance for the rest of your life to help cover your medicines and follow-up visits.

