



身心對話：認識洗腎 - 醫生稱為透析

The Dialog between the Body and Soul: Know What Dialysis is
- What the Doctors Referred to as Hemodialysis

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在腎臟科三十年了，每次看到來求診的病人因病情惡化，到了必須洗腎的地步，總感到於心不忍。我常在想，如果大家對腎臟有多一點的認識，就能夠早期發現、及時治療，還可以預防保健。因為腎臟一旦衰竭，就不可能痊癒，不僅患者自己受苦，對家人來說，也是一大負擔。

Although having been with the renal department for thirty years, I invariably feel sorry whenever I see a patient seeking treatment whose conditions have deteriorated to a level that requires hemodialysis. I often ponder, if everyone could know a little more about the kidneys, it not only can be detected earlier and treated in time, but it can also be put on preventive medicine. Yet once the renal failure occurs, it is too late for any cure, as not only the patient suffers, and it can also be a rather big burden to the family.

腎臟位於後腰部，兩邊各有一個，長度約十二公分，重量約一百三十公克，是由240萬個『腎元』組成的一對器官。全身的血液每分鐘以1,200 c c 的速度不停地通過它來清洗身上多餘的廢物，如尿酸、尿素氮、肌酸酐等，多餘的水分也是經由腎臟製成尿液再排到膀胱，膀胱滿了再排到體外。換言之，腎臟是人體的下水道系統、血液的淨化器官，所以腎衰竭時，含氮物質無法排出，病患就會出現尿毒症狀。



腎臟是人體中非常重要的器官，主要功能包括調節水分與電解質、維持酸鹼平衡、調節鈣磷的代謝、調節血壓與製造紅血球生成素等，而且猶如便利商店，二十四小時終年無休地工作。因此，不隨便服用成藥，並定期檢查腎臟功能，才是最好的保養之道。

一般人常常到藥局買成藥，自行服用，其實很多藥物有潛在毒性，如止痛藥、風濕疾病用藥、重金屬、抗癌藥物、抗生素及某些中藥的藥粉及藥丸等，長期使用會造成腎臟與肝臟的負擔，導致代謝異常，損害腎功能。最近比利時醫學界就發表了一篇研究報告，指出減肥中藥裡含有「馬兜鈴」，將引發腎發炎，甚至腎衰竭，這種病例在門診裡不勝枚舉，所以民眾若有任何疾病，都不應該道聽塗說，吃來路不明的食品或偏方，否則可能誤了治療的時機，衍生更多的併發症。要愛護自己的身體，就是請教合格的醫師，並開立處方，最好還是諮詢腎臟科專業醫師，充分了解各種藥物對腎臟可能產生的影響。

The kidneys are located on the rear of the backside, with one on each side, which measure approximately 12 centimeters in length and weighs approximately 130 grams, and is a paired organ made up of 2.4 million renal "corpuscles". The body-wide blood flow passes through the organ at the speed of 1,200cc per minute to discharge the excess toxins from the human body, such as urea, urea ammonia, creatinine and so forth, while excess moisture content also passes through the kidneys for converting into urine, which is then discharged to the bladders, and then discharged from the body when the bladders are full. In other words, the kidneys are the human body's sewage system, and a blood cleansing organ, thus in the wake of renal failure, which hinders the discharge of nitric substance, the patient will experience the symptom of uremia.

The kidneys remain one of the very vital organs in the human body, with major functions including adjusting the moisture content and electrolytes, maintain the pH balance, adjust the metabolism of calcium and phosphate, regulate the blood pressure and manufacture the hemoglobin synthesis promoter and such, and they are likened to a convenience store that works tirelessly 24 hours round-the-clock and all year round. With that said, it is prudent not to consume over the counter medicine, and routinely check the renal functions as the best way to keep healthy.

Although many often purchase over-the-counter medicine at a drugstore and administer the drug on their own, the fact remains that many drugs contain hidden toxicity, such as painkillers, drugs for treating arthritis ailment, heavy metals, anti-cancer drugs, antibiotics and some of the medicated powder and pills in Chinese medicine, which can burden the kidneys and liver when administered over an extended period of time to result in metabolic anomalies, and damage the renal functions. A recent research report published by the Belgian medical society had pointed out that the content of "madolin" contained in diet pills can trigger nephritis, or even renal failure, and such type of case examples are innumerable in the outpatient program; therefore, it is prudent for the general public not to take in any food or formulas with unknown original through hearsays, or can miss out the best timing of treatment to suffer more complications. To care for your body, you need to consult qualified physicians, with prescription issued, and it is best to consult with specialty renal physician, and fully understand the probable impacts of a variety of drugs to the kidneys.

此外，每半年就要做一次尿液篩檢、血壓檢測，因為許多慢性疾病都會對腎臟組織造成不同程度的傷害，尤其是糖尿病、高血壓、尿酸過高及血脂肪過高等，若缺乏積極治療及良好的控制，很容易造成腎臟損害，而且腎臟損壞過程是在不知不覺中進行的，所以等到出現臨床症狀，多半已經造成相當程度的傷害了，當腎功能降低到正常值的5%以下，就已經到腎臟病末期，必須靠洗腎機活命的時候了。

近年，腎臟患者有增加的趨勢，目前台灣就有30,000個洗腎病人，罹病率高達千分之一，以2,700萬人口來計算，不到九百人就有一個是腎臟病重症患者，花費的醫療金額約一百五十億新台幣，代價慘重。所以，每當有人問道：「如何愛護自己的腎臟？」我的答案總是：絕對不要吃來路不明的東西及添加物、水分攝取充足、不憋尿、保持良好的運動習慣和定期檢查腎臟功能。

萬一不幸腎衰竭，又分為急性和慢性。前者是因為腎臟或其他疾病而導致腎功能突然降低，臨床症狀為腎機能不全、高氮血症和尿毒症，依損害程度不同，經適當治療及控制飲食，大都可以逐漸恢復正常。一般民間流傳可用某些偏方治療的腎臟疾病，應該都是屬於這類急性患者。

In addition, it is prudent to receive urine screening, blood pressure screening every six months because many chronic diseases can cause varied degrees of harm to the renal tissues, particularly of diabetes, hypertension, excessive uric acid, or excessive fat in the blood, and the absence of any active treatment and fine monitoring can easily lead to damaging the kidneys. While the kidney damage process is often progressing quietly, thus when clinical symptoms begin to occur, significant levels of harm have already been caused, and when the renal function drops to below 5% of the normal reading, it has reached the terminal stage of the renal diseases, and a patient can only rely on a dialysis machine to survive.

In recent years renal patients are on an increasing trend, and currently, there are 30,000 patients on dialysis in Taiwan, with a disease-contracting ratio of one in every one thousand. To calculate based on a 27 million population, one in less than 900 people will be a patient suffering from critical renal ailment, and which put the total medical expenditure to roughly at a staggering figure of NT\$15 billion. Thus, whenever someone asks me how best to care for one's kidneys, I invariably answer, "Absolutely do not eat anything with unknown origin, or additives, drink plenty of water, do not hold down your urine, keep to a healthy exercise regiment, and routinely undergo renal function screening".

In the unfortunate event of contracting renal failure, which can be divided into acute and chronic, where the former stems from a sudden drop of the renal functions due to renal or other diseases, and its clinical symptoms often manifest in incomplete renal functions, blood urea nitrogen and uremia, and by levels of damage, most patients are able to recover gradually through treatment and diet control. Renal diseases that folklore medicine claims to heal with certain non-mainstream formulas tend to be patients that fall under the acute category.



但如果醫師從血液中檢查出血中肌酸酐、尿素氮上昇，接著超音波中發現你的兩顆腎臟由正常的12公分縮小為10公分或8—9公分，判定您患了慢性腎衰竭而必須洗腎。相信您一定非常震驚。此時不妨再找另一位醫師診斷，作為第二意見『second opinions』諮詢，確認病情。若結果和前個醫師判斷的相同，就要趕快與醫師配合，進行正規的治療，千萬不可猶豫拖延。在腎臟科二十幾年來，我從來沒有見過一位慢性腎衰竭病人因為服用偏方而痊癒，反而常見因為一時心理無法接受，尋求偏方導致延誤病情，腎功能完全喪失。

所謂洗腎，正確的醫學名稱是「透析治療」，是一種將溶液分子由高濃度區經由半通透性薄膜擴散到低濃度區的技術。透析器的發展可以追溯到羅馬時代，羅馬人利用熱水浴清除病人體內的尿素，因為熱水使得病人大量出汗，皮膚的作用有如透析膜，水份及毒素藉此擴散至熱水中。

If the physician detects through blood screening of a rise in creatinine or urea nitrogen in the blood stream, and then found through the ultrasound that your two kidneys have shrunk from the normal 12 centimeters to 10 or 8 to 9 centimeters, you will be given the diagnosis of a chronic renal failure and would require undergoing the dialysis treatment. I am certain that you will be very shocked. At this time, it does not hurt to seek the diagnosis of a different physician, as the consultation for second opinions, for making sure your conditions of ailment. If the results were found to be identical to the previous physician's diagnosis, it is time to work with the physician by undergoing the mainstream treatment, but do not hesitate to delay the process. In my over two decades of tenure working in the renal department, I have never seen any patient suffering from chronic renal failure that has been healed by administering folklore medicine, but what I often see are patients who are unable to adjust psychologically but turn to seeking folklore medicine only to delay treatment the ailment and leading to completely losing their renal functions.

The term dialysis, which in the correct medical term should be hemodialysis, and which pertains to the technology that pumps the liquefied molecules from a high concentration area through a semi-diffused membrane to a low concentration area. The development of the dialysis machines could go back to Roman times, where the Romans had utilized hot bath to clear urea from the human body because hot water made people sweat profusely, and the skin acted as an osmosis membrane, whereby the waster moisture and toxins were diffused into the hot water.





現代人耳熟能詳的「透析」一詞，是1854年，英國化學家湯瑪士·葛雷姆（Thomas Graham）所創。第一個血液透析器是在二次大戰前由荷蘭寇夫(Willem Kolff)醫師所發明。寇夫的貢獻代表了腎臟病人照護的新時代。其卓越之處在於積極的研究設計及臨床使用以取代失去的腎臟功能。他在戰時的研究為透析新紀元開啟了曙光，自此使腎臟病人的治療成為可能。而亞洲第一個血液透析器韓戰時（1950年代）由美軍所實施的，於1960年代，台大和榮總同時引進這種治療法，除日本外，台灣是亞洲最早採用血液透析的國家。將近二十年前，台灣醫學界又引進對病患更為方便治療的腹膜透析，現今技術先進而純熟。

一般人把透析稱做洗腎，會讓人誤以為是清洗腎臟。事實上，透析是把患者全身的血液引流到空心纖維導管的透析器淨化，再把乾淨的血液送回體內，每次約需四小時，一週三次，除非換腎，否則終其一生都不能停止治療。

由於血液透析費時費力，患者需要到醫院接受治療，對於病患較不方便。所以醫學家又研究出另一種治療法，叫做連續性活動性腹膜透析。這是在病人的腹部埋進一根管子，由此注入透析液，一天四次，每月到醫院追蹤即可，手續相當簡單，患者能夠自行處理，較為人們所接受。

The term hemodialysis, which is familiar to the modern people, was first invented by the British chemist Thomas Graham in 1854, and the first hemodialysis device was invented by Netherlands Doctor Wilhem Kolff prior to WWII. Kolff's contribution marked a new era in renal patient care. Its excellence lies in that an active research design and clinical application is used to replace lost renal functions. He had shed some light in unleashing a new era in dialysis in his wartime search, making treatment for renal patients a possibility. And the first hemodialysis device in Asia was inducted by the U.S. military during the Korean War (in the 1950s), and in the 1960s, the Taiwan University General Hospital and the Veterans General Hospital had introduced the treatment method, and besides Japan, Taiwan was one of the Asian countries that had adopted the hemodialysis the earliest. Nearly twenty years ago, the Taiwan medical sector had introduced for the patients a more convenient treatment method of abdominal diaphragm dialysis, and the technology has been perfected thanks to the modern technology.

Most people refer to dialysis as renal flushing, which often misleads people to believe that it is a process of flushing the kidneys. In fact, dialysis entails drawing the blood of a patient into a hollow fibrous tube dialysis device for cleansing, and the filtered blood is sent back to the body, where each treatment takes roughly four hours, three times a week, and unless of a kidney transplant, the treatment cannot be stopped and will continue throughout a patient's lifetime.

In light that hemodialysis is a time consuming and effort consuming process, the patients are required to receive the treatment at a hospital, which is somewhat inconvenient to the patients. As a result, medical scientists have devised an alternative treatment method, which is referred to as the continuous active abdominal diaphragm dialysis. This entails inserting a tubing into the patient's abdomen, through which the dialysis fluid is injected, four times a day, and a patient is only required to visit the hospital for follow-up checkup, in a rather simplistic procedure, which the patients can administer on their own, making it a more widely acceptable to the people.



透析的發展是一個充滿只有人類才能成就的種種挑戰的過程；也是一個充滿只有人腦才能設計的種種富於創意解決方法的故事。它代表了在醫界、學術界及產業界曾經且依然繼續致力於研究提供具品質的照護，以將患有腎臟病人們的負擔減至最低。透析自羅馬時代的熱水澡開始，已走過一段很長遠的路。然而科學家們並不以此為滿。我相信克服腎衰竭病人常見的無尿；控制影響病人舒適的生化及液體平衡的波動；維持透析效力同時能更進一步縮短透析時間。此外醫師除了應防患透析病人常見的併發症疾病，亦應對腎臟病起因及預防方法有更深入的了解。

科技日新月異，透析技術也推陳出新，每隔一段時間就有新的研究報告公布，身為腎臟科專業醫師，也是透析研究成員，我相信假以時日會有一種有效、實用且可帶在身上的人工腎臟問世，對慢性腎臟病患者來說，將是一大福音。

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The dialysis process is one that is full of many challenges that only mankind is able to achieve, and it is also a story how the human brain is able to devise a variety of creative solution methods. It represents how the medical society, academic society and industry sector have and will continue to devote in research to provide quality care, and minimize the burden to the renal patients to a least possible level. The dialysis, which began in the hot bath in Roman days, has progressed over a long path. Yet the scientists are not satisfied with the status quo. I believe in overcoming the lack of urination commonly seen among renal failure patients; regulating the biological and liquid balancing fluctuations that affect a patient's comfort; and shortening the dialysis timing while maintaining the same dialysis effect. In addition, physicians not only need to prevent some of the common complications often found with patients on dialysis, but also need to understand the cause of renal diseases and prevention methods.

With the technology evolving rapidly, and the dialysis technology changing rapidly, there are new research reports being announced at a certain interval of time, and as a professional physician in the renal department, and a member of dialysis research, I believe that given time, there will soon be an effective, practical artificial kidney on the go debuted that will greatly benefit chronic renal patients as a whole.

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