



CASE STUDY

Making Dialysis Affordable and Accessible

NephroPlus: A Personal Journey to Create Industry-wide Change

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ABOUT IFC

IFC, a member of the World Bank Group, is the largest global development institution focused exclusively on leveraging the power of the private sector to tackle the world's most pressing development challenges. Working with private enterprises in more than 100 countries, IFC uses its capital, expertise and influence to help eliminate extreme poverty and promote shared prosperity.

ABOUT THE CASE STUDY

Expanding access to quality and affordable health care is a central element to eliminating extreme poverty and promoting shared prosperity. The World Bank Group has a goal of ending preventable deaths and disability through Universal Health Coverage (UHC). In many developing countries, governments do not have the capacity to service the entire population and private health care providers often play a critical role in meeting the needs of society. In particular, private providers who employ inclusive business solutions play a powerful role in reaching underserved segments through core business.

IFC's focus on inclusive business looks specifically at companies that expand access to goods, services, and income-generating opportunities for people living at the base of the pyramid. By combining purpose with profit, inclusive businesses redefine business-as-usual.

IFC's health and inclusive business practices jointly develop case studies that demonstrate the contribution of the private sector to achieving global and national health care goals and to serving lower income people.

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PHOTOS

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NephroPlus

Country: India

Sector: Health Care

IFC Investment: \$10 million

Chronic kidney disease (CKD), which causes people to lose their kidney function over time, affects nearly 12 million Indians.¹ Once kidney failure occurs, affected individuals require a kidney transplant or weekly dialysis treatment to stay alive and will live only a few months at most without treatment.

Demand for dialysis is growing at a rate of 31 percent in India, compared to eight percent globally.² India's high rates of diabetes and hypertension, as well as increased awareness of CKD and treatment options, have contributed to rapid growth in demand for dialysis. Despite the importance of dialysis, more than 90 percent of the 230,000 Indians newly diagnosed with CKD each year die within months due to lack of treatment.³ Services are fragmented and largely concentrated in big cities. Also, high prices and the need for frequent treatments make dialysis a financial burden for many patients and unaffordable for others. A kidney transplant is a permanent solution, but availability is extremely limited due to

stringent regulation, low kidney donation rates, and poor infrastructure in the country. Moreover, kidney transplants can fail. This makes dialysis a critical alternative for people living with CKD.

Yet dialysis providers have shied away from expanding services as they struggle to make clinics profitable in a low-margin industry. Industry-wide operational inefficiencies, often related to equipment deployment and organizational structure, keep costs high. A shortage of trained nephrologists, nurses, and technical staff has also constrained the expansion of dialysis services. Reaching patients in lower income brackets presents a particular



challenge given the reluctance of providers to reduce prices in the face of tight profit margins. All of these challenges have deterred new entrants into the dialysis market, widening the gap between the supply and demand for services.

NephroCare Health Services Private Limited (NephroPlus), a provider network of dialysis services, entered the Indian dialysis market in 2010 with the goal of transforming the entire industry. The company provides the complete range of healthcare services that kidney failure patients need to lead productive lives, including hemodialysis, peritoneal dialysis, and kidney transplant services. To deliver these services NephroPlus designs, builds, and operates low-cost centers that provide high quality and affordable dialysis services. Centers are established through partnerships with hospitals or as standalone facilities.

At roughly \$25 per treatment, NephroPlus prices are 30 to 40 percent lower than large hospitals in India—and up to 50 percent lower in some cases. Today, NephroPlus is the largest provider network of dialysis services in India with 75 centers in 50 cities in 15 states across the country. Its centers are located in large metropolitan areas as well as underserved, small cities. Through its presence in smaller cities, NephroPlus reaches patients who would otherwise have to travel up to 100 kilometers for dialysis. The company served more than 6,000 patients in 2015 and now provides approximately 50,000 dialysis treatments each month.

A PERSONAL JOURNEY

In 1997, 21-year-old Kamal Shah, a software developer who co-founded a company that developed apps for Apple, was diagnosed with kidney disease and put on dialysis. After a year and a half, he experienced a failed kidney transplant and returned to dialysis. For many years, Shah was on peritoneal dialysis, which allowed him to work with minimal disruption.⁴ After being caught in the 2004 tsunami, however, he was badly infected and had to switch to daily nocturnal home hemodialysis. In the years that followed, Shah started a blog to encourage others with kidney disease to lead a full life.

HOW DOES DIALYSIS WORK?



The kidney performs the critical functions of removing waste and extra water from the body. Dialysis artificially conducts these functions by circulating blood outside the patient's body using an external filter called a dialyzer. Most NephroPlus patients are on hemodialysis which is highly time consuming. Hemodialysis patients visit a clinic two to three times a week with each session lasting around four hours. In the absence of an opportunity for a transplant, individuals afflicted by kidney failure require dialysis for the rest of their lives.

Vikram Vuppala, who worked as a healthcare services strategy consultant with McKinsey & Company in the United States and was looking for opportunities to improve the health sector in India, discovered Shah's blog. Vuppala contacted Shah and proposed the idea for a dialysis start-up. Shortly thereafter, Vuppala brought on board Sandeep Gudibanda, whose entrepreneurial experience with technology start-ups and social enterprises would make him a valuable asset to the team. The three of them founded NephroPlus in 2010.

Through their experiences speaking with nephrologists, dialysis staff, and scores of patients, the three co-founders identified several areas where NephroPlus could effect high-impact, fundamental changes to the sector. These included improving the quality of kidney dialysis, reducing the gap between the demand and supply of services, particularly in underserved regions, and designing a model for centers that would overcome the operational and financial challenges experienced by other providers.



NephroPlus's Value Chain

An Overview of Challenges and Solutions



Value Chain

	Procurement	Product & Service Development	Distribution	Marketing & Sales
Challenges in the Dialysis Industry	<ul style="list-style-type: none"> • Expensive equipment and consumables • Inefficient deployment of equipment in public hospitals 	<ul style="list-style-type: none"> • Affordability of dialysis • Low quality of service delivery 	<ul style="list-style-type: none"> • Talent shortage constrains expansion of services • Inefficient use of nurses • Lack of dialysis services outside large cities 	<ul style="list-style-type: none"> • Lack of awareness of kidney disease and treatment options
NephroPlus's Solutions	<ul style="list-style-type: none"> • Uses demand-based approach for distribution of equipment at centers • Purchases in bulk 	<ul style="list-style-type: none"> • Reduces prices by lowering operational costs • Leverages public insurance • Implements strict clinical protocols • Uses patient-centric approach 	<ul style="list-style-type: none"> • Builds a skilled workforce for dialysis industry • Implements a streamlined staffing structure to enable expansion • Establishes centers in smaller cities 	<ul style="list-style-type: none"> • Focuses on preventative care • Hosts community events to raise awareness about kidney disease and treatments



Challenges in the Dialysis Industry



NephroPlus's Solutions

MOVING THE NEEDLE ON QUALITY AND PATIENT EXPERIENCE

Dialysis services in India were generally of low quality when NephroPlus was first launched, due primarily to insufficient regulation and disorganized operations. Negligent clinical processes and infection protocols caused high rates of cross infection, with more than a third of dialysis recipients at risk of contracting a chronic viral disease such as Hepatitis C, Hepatitis B, or HIV.⁵ Cross infections occurred when the blood of an infected individual came into contact with the blood of an uninfected individual.

NephroPlus believed that it needed to become a role model in order to bring about the desired improvements in the industry. The company focused on identifying processes it could implement in its centers that would ultimately raise quality standards among all providers. The risks of cross infection, for example, could be drastically reduced through stringent clinical processes for hygiene. Yet service providers generally did not take necessary precautions and, in the absence of industry regulation, were not held accountable for negligence. NephroPlus engaged international nephrologists to introduce standardized clinical procedures across all their own centers to eliminate cross-infection.

India's dialysis industry also lagged in patient care, including consideration for patients' psychological well-being. Counseling and diet support services were used in many countries to address challenges such as stigma, depression, and the impact of dialysis on a patient's professional life. Most dialysis providers in India, however, had not introduced such considerations into their care mandates.

Having undergone lengthy treatment sessions, Shah knew that incremental changes to service delivery could go a long way toward making a dialysis patient's life feel more normal. NephroPlus developed a care philosophy in which all patients were treated as guests ('guest care'). Implementation of the idea entailed the creation of a comfortable dialysis experience with safe and painless treatment. The company also offered pick-up and drop-off transport service, to reduce dependence on family members, while dietary counseling and patient support groups promoted mental health.



56-step process

Identifies and eliminates potential sources of infection during dialysis. This patent-pending process is implemented by NephroPlus staff at all centers.



Zero infection point kit

Ensures that separate dialysis kits are used for each patient to reduce cross-infection risks.

NephroPlus's Measures to Reduce Cross Infections

NephroPlus Dialysis Index

Enables the company to track patient outcomes on a monthly basis and compare outcomes across patients and centers. It is modeled on the "Good Dialysis Index," which is used to measure dialysis performance in many countries, and is customized to suit India's dialysis market.



KEEPING COSTS DOWN

Another priority for NephroPlus was achieving and maintaining profitability, which has long been a challenge for Indian dialysis providers plagued by inefficient operations. From its inception NephroPlus kept operational costs low through several measures:



LEAN STAFFING. Many hospitals in India mostly used nurses to perform all tasks including lower-skilled, non-medical tasks such as data entry and machine operations.

NephroPlus opted to create new staffing categories such as a dialysis therapist for medium value-add tasks and a dialysis assistant for low value-add tasks. Nurses could then be used for very high value clinical care and tasks related to medical complications, reducing the number needed to manage a single clinic. At the same time, NephroPlus trimmed overall staffing costs through a differentiated pay scale commensurate with skill and training level.



VIRTUAL SUPERVISION. NephroPlus introduced a centralized patient monitoring system which enabled medical staff at its headquarters to monitor patients at service centers through closed-circuit television. The company also

created an online portal to collect patient data to support virtual supervision. Clinical data ranging from a patient's medical history to their weight and blood pressure was entered into the portal during each session. If an issue arose at a center—for example, whether a patient with low hemoglobin required medication—an on-site staff member could call experts who provided medical advice by instantly accessing this data.



BULK AND DEMAND-BASED

PROCUREMENT. NephroPlus purchased consumables and equipment in bulk, allowing the company to negotiate prices 15 to 20

percent lower than large corporate hospitals. In addition, a management information system helped staff share and monitor their use of consumables and equipment across



centers. This ensured optimal distribution of resources and avoided waste.

Together these measures became the critical building blocks for NephroPlus's low-cost service center model, one that it would replicate throughout India.

To begin operations, NephroPlus raised \$200,000 from angel investors along with personal savings from Vuppala. They established three centers in the first two years of operation. The first clinic—a small facility with five beds and ten employees—opened in Hyderabad in the state of Telangana in South India in 2010. An additional \$400,000 from investors funded a second clinic in Hyderabad the same year. A third clinic followed a year later, set-up in a medical college in a small city about 100 kilometers from Hyderabad.

MAKING DIALYSIS MORE AFFORDABLE

In order to serve more low-income people, NephroPlus needed to both increase the number of service centers and make dialysis services affordable. Market prices for dialysis were on average INR 20,000 (roughly \$310) per month, a steep price for the poor. NephroPlus's low-cost model enabled it to offer services at prices 30 to 40 percent below market prices. Yet despite this significant price decrease the poor found it difficult to afford treatment.

NephroPlus had to think of additional ways to make its services accessible to the poor. It began to register its centers with the government, which allowed patients to pay via public insurance plans. The Indian government offered two types of public insurance: Employees' State Insurance (ESI) for workers earning \$230 or less per month and a white-card plan for individuals below the poverty line.⁶ People using white-card insurance plans paid no out-of-pocket costs for treatment. This enabled NephroPlus to deliver dialysis to those least able to pay for services even at a reduced price point. As of 2015, approximately 25 percent of NephroPlus patients used public insurance to cover their treatment costs.⁷

But even with no out-of-pocket expenses for treatment many poor Indians faced transportation expenses and foregone income which prevented them from seeking treatment. So NephroPlus introduced other measures, including subsidized travel, to make treatment more accessible for public insurance patients.

SHIFTING TO HOSPITAL-BASED CENTERS

By the end of 2011 NephroPlus had grown to five centers, delivering roughly 10,000 kidney dialysis sessions per year, and securing \$4.25 million in equity from Bessemer Venture Partners, a venture capital firm which invests in enterprise, consumer, and healthcare technology start-ups worldwide.

ALIGNING INTERESTS OF PARTNERS



NephroPlus entered into revenue-sharing agreements with private hospitals for its captive centers. The company billed guests and split the revenue with the partner hospital. It also partnered with lead nephrologists at each of its centers, from whom it secured an upfront minority investment. These arrangements aligned stakeholder interests at each center and helped to ensure consistency in an expansion strategy that involved an increasingly diverse group of stakeholders.



NephroPlus's early centers had been set up as standalone facilities to shift their guests' association with dialysis away from being "sick" toward being a normal part of life. However, nephrologists and guests wanted proximity to a hospital in case anything went wrong during treatment. To accommodate this NephroPlus reoriented its distribution strategy to establish clinics within private hospitals called "captive centers." To do so, the company would either assume control of an existing dialysis ward or would build a new center within a hospital looking to expand into dialysis services.

To reach more low-income patients, NephroPlus also bid for government contracts to build dialysis centers in public hospitals. As of 2015, the company had four dialysis centers at public hospitals in South India. Roughly 500 patients received treatment at these centers with no out-of-pocket costs. A 2016 study found that 67% of NephroPlus's patients were considered to be living at the base of the pyramid. NephroPlus continued to establish standalone centers, but only as a secondary strategy.

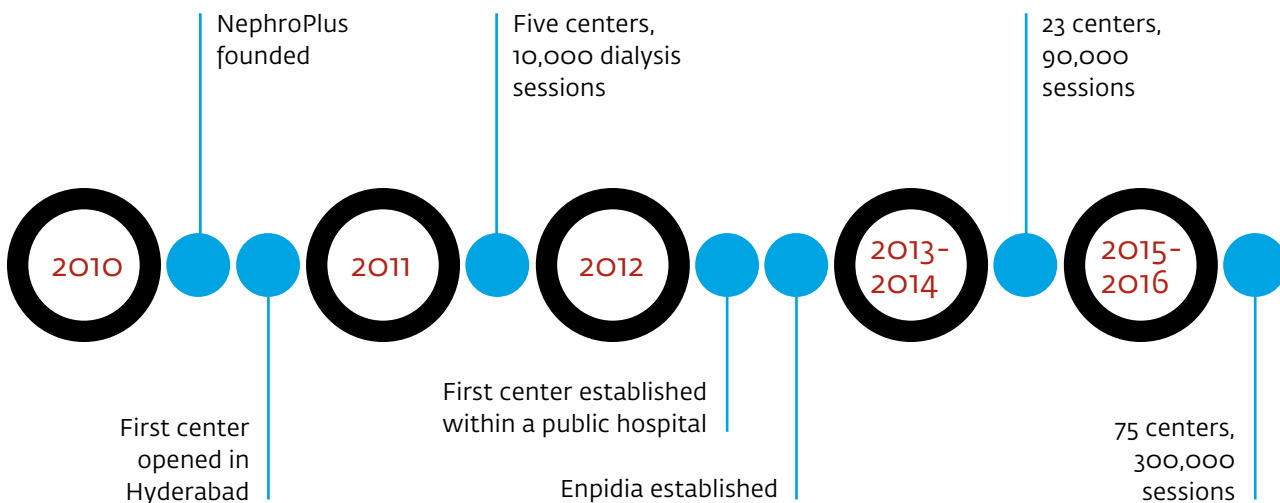
ADDRESSING THE SKILLS SHORTAGE

In 2012, NephroPlus created Enpidia, a dialysis training institute for technicians and nurses, in Hyderabad. The institute offered standardized training according to the company's best practices, ranging from clinical protocol and technical know-how to the firm's unique "guest care" philosophy. The company also trained employees of hospital centers it acquired so all staff were sufficiently equipped to implement its practices. The purpose was to address the shortage of skilled technicians in India's dialysis industry before the company embarked on expansion.

NephroPlus offers services at 30 to 40 percent below market prices; Two-thirds of its patients live at the base of the pyramid.

Enpidia offers a two-year program covering technical training in dialysis, patient care etiquette, and spoken English. It is the only Indian institution registered with BONENT, the certification agency for dialysis personnel in the United States. Enpidia graduates can work at NephroPlus centers or elsewhere. As of 2015, 60 to 70 percent of BONENT certified dialysis staff in India worked with NephroPlus.

Figure 2: Key Milestones in NephroPlus's History



COMMITMENT TO QUALITY AND PATIENT CARE

NephroPlus is committed to adapting its methods in order to remain current with evolving international best practices. A recently introduced audit mechanism, for example, will ensure that quality standards are met across all facilities.



Technology: Investments in cutting edge technology and equipment enable improvements in the company's patient monitoring capabilities and maintain its high standard of treatment. NephroPlus centers use a Reverse Osmosis Remote Monitoring System, for example, which enhances monitoring of water quality during dialysis. The centers also use the "button hole" technique in which blunt needles are inserted in the same spots every time a patient undergoes dialysis. This technique is estimated to reduce pain during treatment by 90 to 95 percent.



Patient Surveys: Another quality control area is guest care. To ensure excellence NephroPlus seeks regular patient feedback through surveys that identify "pain points." For example, NephroPlus has installed televisions and Internet access at centers in response to patients' complaints of boredom during treatment. Internet access allows professionals to work during treatment. Patients can also opt for nocturnal and daily short dialysis before or after work at select locations.

GOING NATIONAL

While NephroPlus began in South India, it aimed to expand its services to other parts of the country over time. This became a reality in 2013 when the company opened its first centers in the North and West, increasing the total number of facilities from 23 to 40 between 2013 and 2014. The company's success also led to the creation of several other dialysis companies, helping to create a healthy ecosystem.

NephroPlus's expansion also stirred interest among new investors. In 2014 the company raised \$10 million, including \$7 million from the International Finance Corporation (IFC), and an additional \$3 million from Bessemer Venture Partners. This was IFC's first healthcare venture capital investment in South Asia and the first from IFC's \$250 million Early Stage Investment Program. IFC was a long-term investor and had the ability to support NephroPlus through future stages of growth. The investment in NephroPlus was part of IFC's broader healthcare sector strategy, both globally and in India, which aimed to overcome obstacles to the development of accessible and affordable healthcare facilities.

As it grew, NephroPlus further honed its approach to selecting cities for its national expansion. The company first assessed the level of need by examining dialysis demand and supply in various locations. It then identified key hospitals and nephrologists to approach for partnership in the selected cities.

Partner hospitals became key players in NephroPlus's national expansion. As of 2015, centers established through partnerships with hospitals accounted for 52 centers. Increasingly, NephroPlus leveraged these relationships to achieve efficiencies and better deliver on its mission. In late 2015, for example, NephroPlus expanded its hospital-based services to include peritoneal dialysis and kidney transplants. It also hosted community events with partner hospitals in order to raise awareness among a broader population and potential patient base.

Raising Public Awareness

Building a happy community among patients has been a cornerstone of NephroPlus's holistic approach to "guest care." Given the low level of awareness of chronic kidney disease and treatment options among people in semi-urban and rural areas, NephroPlus has developed education programs and continues to host community events. Some events provide hands-on support. At NephroPlus Kidney Camps, for example, staff check kidneys and facilitate follow-up appointments. This event was designed to both identify kidney disease and raise awareness at the pre-diagnosis stage to encourage screening.

Other events were focused on having fun and promoting the idea that dialysis can become a normal part of life. NephroPlus organized the world's first Dialysis Olympiad, for example, a game day attended by 500 patients from

across India. Importantly, these events were offered free of charge in order to encourage active participation.

LEADING CHANGE IN THE INDUSTRY

Through its ambition to "change the way dialysis is done in India," NephroPlus's mission has transcended the walls of its own treatment centers. Unique standardized processes, patent-pending innovations to prevent cross-infection, and staff certification and expertise have all served as models for the dialysis sector. Endipia has benefitted the broader industry by producing high-caliber and certified technicians.

By engaging in advocacy work, NephroPlus hopes to improve quality standards for dialysis services in India as well as regulation of the industry. The company is working with the Indian Society of Nephrology, for example, to



introduce standardization and accreditation processes and procedures in order to prevent the ad hoc establishment of dialysis centers that do not meet clinical quality requirements.

LOOKING AHEAD

Over the next five years, NephroPlus aims to reach over 40,000 patients and help create 10,000 skilled jobs, including doctors, nurses, and dialysis technicians. Almost a third of these jobs will be for women.

NephroPlus is on track to continue its growth in India: The company is planning to establish one clinic in every district of the country by 2018. Also, half of its future centers will be located in smaller cities to make dialysis services more accessible to lower-income patients. Future clinics will continue to be a mix of hospital-based and stand-alone centers, with an emphasis on increasing the number of centers in public hospitals. Continuing to serve those on public insurance will be key to reaching low-income populations.

International expansion is also on the horizon for NephroPlus and IFC committed an additional \$3 million in funding in August 2016. The company has set a goal of expanding to five additional countries by 2020 and is planning to open clinics in Africa and elsewhere in Asia. As NephroPlus assesses whether it can apply its model in an international context, it must consider other factors such as policy advocacy, talent acquisition, supply chain development, and the availability of public insurance programs—all of which have enabled the company to deliver affordable, high-quality dialysis in India. As it seeks to expand access to the underserved, NephroPlus is focused on countries that have the greatest need and that can accommodate affordable prices for dialysis.



ENDNOTES

- 1 Pacific Bridge Medical. 2013. "India's Dialysis Market." <http://www.pacificbridgemedical.com/publication/high-rates-of-chronic-kidney-disease-lead-to-medtech-opportunities-in-india>.
- 2 IBID
- 3 Narayan, Adi. Bloomberg Businessweek. 2012 "The Big Market for Dialysis in India." <http://www.bloomberg.com/news/articles/2012-01-05/the-big-market-for-dialysis-in-india>.
- 4 In Peritoneal Dialysis, a plastic tube is placed in the stomach via surgery. Cleansing fluid enters and exits the body through this catheter, initiating a filtering process. This form of continuous dialysis allows the patient to control extra fluid more easily and poses fewer restrictions in terms of diet, daily activities, and ability to work.
- 5 NephroPlus. 2014. "Cross Infections in Dialysis Units." <http://www.nephroplus.com/cross-infections-in-dialysis-units>.
- 6 The Below Poverty Line benchmark is determined using various parameters which vary from state to state in India. In Andhra Pradesh, white cards are issued to individuals with a monthly income equal to or below INR 11,000 (\$US 166). More information at: http://www.archive.india.gov.in/howdo/service_detail.php?service=7. While public hospitals accept both insurance plans, private providers must attain government approval in order to accept either form of public insurance.
- 7 This figure is expected to grow to 30 percent by 2020.

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