



**MEDICAL NEEDS ASSESSMENT OF THE
CHICHIGALPA COMMUNITY HEALTH CENTER
and
DIALYSIS OPTIONS
for
CHRONIC RENAL INSUFFICIENCY PATIENTS**

**Independent Consultant Report to the
Office of the Compliance Advisor/Ombudsman
of the International Finance Corporation and
Multilateral Investment Guarantee Agency**

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INTRODUCTION

Chronic kidney diseases show a tendency to increase in the western region of the country, constituting a public health problem, mostly affecting the SILAIS of Leon and Chinandega.

In response to the request of the dialogue table participants, ASOCHIVIDA (*Asociación Chichigalpa por la Vida*) and NSEL (Nicaragua Sugar Estates Limited), the Office of the Compliance Advisor/Ombudsman (CAO) for the International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA) - members of the World Bank Group - has considered important to carry out an updated medical needs assessment in the treatment of Chronic Renal Insufficiency in the Chichigalpa Health Center in order to verify current needs and resources, and to identify new gaps in the provision of medical services to CRI patients. In this regard, the purpose of this assessment is to provide up to date information to MINSA, INSS, PAHO/WHO, NSEL and ASOCHIVIDA on medical services to CRI patients in Chichigalpa, as well as participatory and collaborative medical service planning and coordination.

This situation is a challenge for health development and therefore for quality of care provided to these people, which is why we emphasize the relevance of this assessment, both in the awareness of the problem and in the provision of alternative solutions for strengthening the services network to deal with this epidemic.

In the preparation of this assessment, the opinions of prestigious specialists, patient caretakers and, especially, of the people who face this problem every day were taken into account.

This report offers a series of preliminary options arising out of the common issues expressed by key stakeholders. These options have been developed in respect of existing good practices for CRI from a medical, clinical and public health standpoint. A holistic approach was intentionally adopted to address the challenging medical needs of CRI patients, as well as the causes underlying these challenges.

The intention of this medical needs assessment is not to provide a critical voice of health institutions which face the dire challenges surrounding adequate provision of care to patients affected with CRI. Rather, we are largely confirming most of what is already well acknowledged by physicians and public health professionals working on CRI in the Departments of León and Chinandega, as well as CRI patients; our purpose is to provide a framework from which to move forward in improving care for CRI patients.

Finally, on behalf of our assessment team, I want to thank all those people who contributed to this assessment, which will serve as the basis for strengthening the quality of care for people living with this challenging disease.

Dr. David Silver
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Staff of the Municipality of Leon
Staff of the Center for Research and Health Studies (CIES)

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Abbreviations

ANF.....	American-Nicaraguan Foundation
ASOCHIVIDA.....	<i>Asociación Chichigalpa por la Vida</i> (Chichigalpa Association for Life)
CAO.....	Office of the Compliance Advisor/Ombudsman
CAPD.....	Continuous ambulatory peritoneal dialysis
CIES.....	<i>Centro de Investigaciones y Estudios de la Salud</i> (Center for Research and Health Studies)
CRI.....	Chronic renal insufficiency
HEODRA.....	<i>Hospital Oscar Danilo Rosales</i> (Oscar Danilo Rosales Hospital, León)
HISA.....	<i>Hospital Ingenio San Antonio</i> (Ingenio San Antonio Hospital, Chichigalpa)
INSS.....	<i>Instituto Nicaragüense de Seguridad Social</i> (Nicaraguan Social Security Institute)
ISA.....	<i>Ingenio San Antonio</i>
JABA.....	<i>Jornada de Análisis y Balance</i> (Workday of Analysis and Balance)
MINSAL.....	<i>Ministerio de Salud</i> (Ministry of Health - MOH)
MOSAFC.....	<i>Modelo de Salud Familiar y Comunitario (del Ministerio de Salud)</i> (Family and Community Health Model of the Health Ministry)
NSEL.....	Nicaragua Sugar Estates Limited
PAHO.....	Pan-American Health Organization
SILAIS.....	<i>Sistema de Atención Integral de la Salud</i> (Integrated Healthcare System)

Executive Summary

Medical Needs Assessment at the Chichigalpa Health Center and Dialysis Options for Chronic Renal Insufficiency Patients

In response to the request of the dialogue table participants, ASOCHIVIDA (*Asociación Chichigalpa por la Vida*) and NSEL (Nicaragua Sugar Estates Limited), the purpose of this study was to determine current resources and needs and to identify new gaps in the delivery of medical services to CRI patients at the Community Health Center in Chichigalpa.

In addition, activities focused on determining the access of CRI patients in Chichigalpa to treatment for end-stage renal disease (ESRD), focusing on the current capacity of local hospitals to provide renal replacement services, specifically, dialysis. Data was analyzed by reviewing key informant interviews to identify and prioritize common themes expressed as well as new topics that arose during the interviews.

Results

Current situation and identified gaps

Key components of health care provision for CRI patients occur at different levels of the healthcare system: Primary healthcare services, emergency care and hospitalization, provision of renal replacement services for ESRD, and national level health services.

Primary Healthcare Services

Although many gaps in the health system have been identified in the medical attention of CRI patients, the existing gaps at the Health Center probably have the greatest impact on local CRI patients. This is because almost all CRI patients in Chichigalpa receive their primary healthcare from this local health center. Adequate ongoing management of CRI is the most effective way to slow down the progression of the disease and to avoid complications as well. Good management of CRI emergencies at the local level can also reduce the need for transport to regional hospitals.

Overall, the primary healthcare provided for CRI patients at the Health Center is suboptimal, arising from 3 general areas:

-Infrastructure: insufficient space for the adequate management of CRI patients, including observation when in unstable condition;

-Organization of health services: lack of medical attention for emergency care after hours, insufficient multi-disciplinary management of CRI patients and their families that addresses educational, dietary and psychosocial needs, and weak systems for monitoring, supervising and evaluating the management of CRI patients (and other chronic illnesses as well); and

-Equipment and supplies: insufficient laboratory equipment and supplies for the adequate management of CRI patients, and frequent depletion of essential medications and laboratory supplies.

Emergency care and hospitalization

Hospital España is the highest level health institution for referral of CRI patients in the Department of Chinandega. *Hospital España* faces the difficult task of having the responsibility of providing critical care and dialysis services to CRI patients without having all the institutional resources necessary for an adequate management.

Specific needs identified for *Hospital España* to be able to provide adequate critical care services for unstable CRI patients parallel many of the same gaps identified in the infrastructure, organization of services, and equipment and supplies facing the Chichigalpa Health Center. These include a lack of adequate medical and ancillary personnel and training, need for critical equipment, medications, supplies and laboratory capacity, as a result of insufficient support from the public health system to meet these needs.

Availability and obstacles in the provision of renal replacement services for ESRD

Although survival for patients with ESRD depends on the availability of renal replacement therapy, major financial, political and social challenges make these essential services unavailable to the vast majority of CRI patients. Specific barriers to the provision of dialysis services include: unreliable availability of medications, equipment, laboratory reagents and supplies and space necessary to provide dialysis services, widespread fears of PD complications, cost barriers of hygienic requirements for PD (tiled floors), high protein diet, PD catheters, lack of budget of *INSS* and *MINSa* to pay for current high dialysis costs or initial transplant costs, and exclusion of all sick CRI patients that do not have pensions or social security benefits.

Renal transplant is the treatment that is absolutely necessary to offer complete rehabilitation of patients with CRI. In spite of the long term cost, survival and quality of life advantages of renal transplant over dialysis, the current feasibility of this treatment is quite low for a variety of financial, technical, and legislative reasons.

Systemic needs at the department and national level

In developing a strategic plan to bridge identified gaps in the medical treatment of CRI in the Department of Chinandega in a substantive, sustainable way, it becomes essential to identify and address their underlying root causes. Usually, these comprise systemic challenges for the public health system that undermine the capacity to sustain a functional treatment approach at the local level. These include: *insufficient financial resources and budgetary allocation for CRI (and for chronic diseases in general), insufficient personnel and capacity to provide adequate CRI services, weak surveillance system utilizing epidemiological guidelines, need for programs for CRI health promotion, need for implementation of CRI protocols and necessary information systems, insufficient system of CRI medication and reagent procurement and distribution, need for a program for renal replacement services for ESRD, and weak coordination between primary and secondary levels of attention.*

The root problem underlying the primary difficulties in addressing CRI was echoed by key medical and public health officials at all levels, as well as CRI patients: *Need for a national integrated approach for CRI.*

Options for next steps

This report offers a series of preliminary options arising out of the common issues expressed by key stakeholders, as well as from the experience and technical expertise of the needs assessment team members. As such, a list of options has been developed for the short, intermediate and long term that reflects existing best practices for chronic illnesses through a medical and public health lens. This condensed list of options corresponding to the identified needs is summarized in table format in the last section, 6: *Summary of Options: Next Steps*.

Short term options

Targeting funds for specific improvements at the Chichigalpa Health Center provides an opportunity to make substantial improvements to close the gap of identified healthcare needs for CRI patients in Chichigalpa. Moreover, addressing these specific needs at the Health Center will also serve to improve primary healthcare services for all clinic patients as well.

Although it will be essential to address fundamental health system issues, there are some immediate steps that can be taken in the short run to directly improve the capacity of the “Julio Duran” Health Center to provide improved medical attention improved for CRI patients. A list of potential short term options for the Chichigalpa Health Center are provided that addresses the above gaps in infrastructure, organization of health services and integration of health services with *Hospital España*. A few key options include: *clinic remodeling and expansion, provision of urgent care 24 hours a day by CRI trained general physicians, provision of ancillary services of a nutritionist, psychologist and social worker, provision of fuel for ambulance transport, provision of necessary CRI laboratory equipment, and creation of a medication and laboratory supplies fund to supplement the purchase of essential CRI medications and test reagents*.

Intermediate term options

Several key gaps in the medical attention of CRI patients at the Chichigalpa Health Center have a common theme- insufficient provision of services. Thus the only substantive approach for adequately addressing the medical care needs of CRI patients is to directly address the quality of care. To this end, an appropriate option is for MINSA *to develop and implement an initiative (“a national experience”) to improve the quality of medical care with technical support from CIES¹*.

A second option that could be pursued in the medium term is: *To improve emergency and hospital care of CRI patients at Hospital España, Chinandega*. In light that *Hospital España* shares many of the same gaps observed at the Chichigalpa Health Center in terms of infrastructure, organization of health services, equipment and supplies, similar options are suggested.

A third option in the medium term is: *To improve access to dialysis services for CRI patients*. Although long term, systemic changes are needed to adequately address this challenging need, several more

¹ Since its inception in 1982, *CIES* (Center for Research and Health Studies) of the National Autonomous University of Nicaragua (*UNAN*) has been a primary public health resource in Health Services Administration, Public Health and Epidemiology available to the Ministry of Health of Nicaragua, as well as to other Central American countries. As such, it is a leading national institution in quality medical care.

immediate steps could include: *improving the capacity of Hospital España so that it may expand dialysis services, researching options so that ESRD patients in Chichigalpa may receive dialysis treatment at HEODRA, identifying opportunities for building the capacity of the Chichigalpa Health Center so that it may provide dialysis services (feasibility study), strengthening the capacity of HEODRA León (Hospital Oscar Danilo Rosales) so that it may provide renal transplant services, and increasing access to renal transplant services in Managua.*

Long-term options

Although long-term needs for changes in policy and inter-agency collaboration are more of a formidable challenge than short and intermediate term steps, addressing these needs will be essential in assuring the feasibility and sustainability of CRI health services at the local level. By involving a basic set of collaborative processes among key CRI stakeholders, several steps may be taken to move ahead toward the goal of meeting the healthcare needs of Nicaragua's CRI patients.

It seems clear that, for both immediate and long terms, the most pressing need to address health system gaps is *to develop a strategic plan and an integrated national CRI program with the participation of key stakeholders.*

Other key long-term options address the need for:

-Building alliances and advocacy for resources to strengthen the ability to address diagnostic means and treatment options for CRI,

-Expanding the surveillance system by using epidemiological guidelines to build an organized national database for early detection of CRI and to inform policy decisions, and

-Collectively developing a special renal replacement program with all key stakeholders for end-stage CRI.

It is the intention of this report that the identified needs and set of options may be used by ASOCHIVIDA and NSEL to better plan and coordinate activities with other key CRI stakeholders — *MINSA (Ministry of Health), INSS (Nicaraguan Social Security Institute), PAHO (Pan-American Health Organization)*— to improve the quality of medical attention provided to CRI patients.

In order to meet the difficult challenges in the provision of adequate care to CRI patients, it will be necessary to build and maintain strong working partnerships with political will and commitment that maintain ongoing institutional coordination between public and private institutions at the local, national, and international level for the long term.

At present, a unique opportunity exists to build these partnerships between *MINSA, INSS*, academic institutions, sugar companies and CRI patients in the Department of Chinandega.

1 Background

In the western region of the country there is a high prevalence of people affected with Chronic Renal Insufficiency, thereby constituting a serious public health problem. Mortality from CRI shows a rising behavior since the 1990s, mostly affecting the SILAIS of León and Chinandega. In 2007, mortality rates from CRI of 5.3 and 5.2 per 10000 inhabitants were reported for the SILAIS of León and Chinandega, respectively. From 1995 to 2000, the municipality of Chichigalpa in Chinandega was the most affected.

For the reasons stated above, the Ministry of Health made a diagnosis of the situation in 2004, with the objective of implementing an attention program for CRI patients. In 2005, the National Institute of Social Security (INSS) built and equipped a module at the Julio Duran Health Center, initially staffed by a medical internist from the Chichigalpa health center. In 2007, a nephrologist was recruited and funded by INSS.

In meetings held with the members of the Association of Chichigalpa for Life (ASOCHIVIDA), who are concerned by the increase in the number of deaths from Chronic Renal Insufficiency, they requested better quality care. In March 2008, a team sponsored by CAO conducted a health needs assessment in the departments of León and Chinandega. This assessment identified nine short term and long term options for addressing unmet medical needs of CRI patients. Although some highlighted options were not strictly "medical," a more holistic approach was followed, including options that will likely have a positive impact on the health and overall well-being of CRI patients. This list was accepted by the dialogue table participants. It was also prioritized by them, in order of importance, as follows:

1. *Provision of food security;*
2. *Better diagnosis, surveillance and treatment of CRI (including adequate provision of medications, laboratory reagents, and medical equipment);*
3. *Income-generating opportunities;*
4. *Increased knowledge on CRI;*
5. *End-stage CRI treatment;*
6. *CRI prevention;*
7. *CRI norms;*
8. *Social and psychological help; and*
9. *Provision of palliative care.*

Significant progress has been made in addressing these options since this list was first accepted nearly 2 years ago. In respect of the first 4 items, food provision has been secured for a period of two years, an investigation of income-generating opportunities has begun, and a series of CRI information workshops have been completed. Essential equipment for CRI management, i.e. ultrasound, has been donated to the Chichigalpa Health Center by NSEL, together with a financial commitment to supplement MINSA's provision of CRI medication and reagents. In addition, a protocol for CRI has been approved by MINSA (*Norm and Protocol for Management of Chronic Kidney Disease*).

However, individuals with CRI in Chichigalpa have shared many concerns regarding their medical attention in the Health Center. In spite of the specialized attention provided by the CRI clinic in the Health Center, patients continue to experience:

- **Frequent depletion of essential CRI medications and reagents;**

- **Insufficient amount of time allotted to CRI patients at the CRI clinic;**
- **Difficulty getting a timely appointment to be seen for an urgent health issue;**
- **Lack of adequate medical attention to CRI patients for emergencies arising after clinic hours, and**
- **Lack of services for end-stage CRI, such as dialysis.**

Responding to the requests made at the dialogue table by both participants, ASOCHIVIDA and NSEL, CAO has considered important to carry out an updated reassessment of medical needs to determine existing resources and current needs and to identify new gaps in the provision of medical services to patients with CRI at the Health Center of Chichigalpa.

2 Objectives

The principle objectives of this medical needs assessment were:

- *To determine the existing resources and current needs and to identify new gaps in the provision of medical services to patients with CRI at the Health Center of Chichigalpa, and*
- *To provide MINSA, INSS, PAHO, NSEL and ASOCHIVIDA with current information regarding CRI medical services in Chichigalpa to better inform collaborative planning and coordination of medical services among all stakeholder agencies.*

The principle activities enacted in order to achieve said objectives included:

- *Conducting an assessment of current needs in the provision of CRI medical services at the Centro de Salud de Chichigalpa, and*
- *Conducting an assessment of the access of CRI patients in Chichigalpa to the treatment of end-stage renal disease (ESRD) focusing on the current capacity of local hospitals to provide dialysis services*

3 Methodology

To accomplish these objectives, the CAO team sought to identify medical treatments currently provided by local health institutions for people suffering from CRI. In addition to existing services, key gaps in essential healthcare provision for CRI patients were also identified.

The methodology for conducting the assessment was organized around 3 principle components of healthcare for CRI patients:

1. Primary healthcare needs (Health Center of Chichigalpa)
2. Secondary healthcare needs (Specialty care for emergencies and hospitalization), and
3. Medical needs for end-stage renal disease (Dialysis and Renal Transplant).

As regards primary healthcare needs, the main emphasis of this assessment was placed on the health facility where the vast majority of CRI patients in Chichigalpa receive medical attention (Public Health Center of Chichigalpa). Access to quality primary healthcare services can provide a better level of care for CRI management so as to mitigate the progression of this chronic illness and extend the time

before the end-stage renal disease is reached. Accordingly, identifying needs and options in greater detail for this health facility would most likely offer the greatest overall impact in addressing health needs of local CRI patients.

The second consideration of this evaluation was to identify the ability of referral hospitals to provide emergency care and hospitalization for CRI patients referred from the Chichigalpa Health Center. At present, Hospital España in Chichigalpa is the first-line referral hospital for patients living in the Department of Chinandega. CRI patients from Chichigalpa essentially have no access to HEODRA in León for emergency services, being in a different department (León).

The third consideration of this evaluation was to conduct an assessment of the access of CRI patients in Chichigalpa to the treatment of end-stage renal disease (ESRD), focusing on the current capacity of local hospitals to provide dialysis services. Since HEODRA León as well as Hospital España provide these services, at least in theory, both institutions were included in this aspect of the assessment. Renal transplant, another treatment for ESRD, was not evaluated in depth, however, since this service is not currently provided at the departmental level in Nicaragua.

To help confirm the findings of the health institutions and more accurately identify local priorities, inputs were requested from local key stakeholders, ASHOCHIVIDA and Hospital Ingenio San Antonio (HISA).

Finally, to better understand the actual situation and needs occurring at the departmental and national levels in the organization and provision of health services for CRI, input from key stakeholders- MINSA SILAIS (Chichigalpa and León), INSS, PAHO, and CIES- was sought.

In terms of logistics, the study was carried out by four members of the assessment team consisting of Dr. David Silver (independent medical consultant for CAO, public health specialist), Dr. Norman Jirón (nephrologist) Dr. Juan José Amador (epidemiologist), Dr. Martha Pastora (Family Medicine and Chronic Disease) and Mr. Irving Góngora (part of the CAO team in Nicaragua).

In designing the evaluation process, we relied on an evaluation guide, in which our goals were laid out and included a series of questions to pose, key issues, methodology, and assessment tools (Annex 1).

The evaluation process took place from December 13 through 16, 2010, in addition to a previous week of coordination and preparation for the visit led by Dr. Martha Pastora. The team visited SILAIS offices of León and Chinandega, established coordination with the SILAIS authorities and the hospitals, chiefs of the Department of Internal Medicine of both hospitals, whom we interviewed.

In Chichigalpa, coordination was done with the director of the “Julio Duran” Health Center in Chichigalpa and the medical staff in charge of treating CRI patients.

For SILAIS León, the team coordinated with the SILAIS Director, the SILAIS epidemiologist, the CRI coordinator, the planning and statistics coordinator, and with representatives from the local municipal authority (2 physicians), as well as the Director, Assistant Director and the Chief of Nephrology Services for HEODRA Hospital, and Chief External Consultant.

In Managua, coordination was done with the Center for Research and Health Studies (CIES) and the Pan-American Health Organization (PAHO).

To hear the voice of the community of CRI patients, we interviewed the board of directors of ASOCHIVIDA.

The data was analyzed to identify and prioritize the common themes expressed. Our intention is not to provide a critical voice of the dire challenges surrounding adequate provision of care to patients affected with CRI. Rather, we are largely confirming most of what is already well acknowledged by physicians and public health professionals working on CRI in the Departments of León and Chinandega; our purpose is to provide a framework from which to move forward in improving care for CRI patients.

4 Characterization and Analysis of the Situation

The Municipality of Chichigalpa, located in the Pacific region of Nicaragua, is part of the Department of Chinandega, located 119 km. from Managua and 16 km. from the departmental seat. The total land area is 257 km², with a population density of 180 people per square kilometer. There are 25 urban neighborhoods, 5 suburban localities, and 29 rural regions.

The healthcare network is made up of 10 health centers. The population of the municipality of Chichigalpa is estimated at 46,455 inhabitants, of which 34,338 live in the urban areas and 12,065 in the rural areas. The health center serves a population of 8,166 people. The rest of the population is attended at the health posts.

Among the determinants of health, the rate of illiteracy is 12.1% in men and 11.8% in women. With a poverty level of 26.5%, Chichigalpa is the 15th poorest city in the country.

The main health problems are CRI, Acute Diarrheal Disease, Acute Respiratory Infections, Dengue fever, pneumonia, tuberculosis, HIV/AIDS and malaria.

In 2004, 799 cases of CRI were registered in Chichigalpa, while currently there are 2073 cases. This indicates that in the 6 year interim, 1,274 new cases of CRI were recorded for an average of 212 new patients per year for the CRI program.² As a result, this increased demand for human resources, medications and diagnostic testing. It is a fact that CRI significantly affects the quality of life of those affected, as well as family members. Mitigation of this problem becomes more complex due to the lack of certainty of all the underlying causes, which undermines preventive measures.

The vast majority- 90%- of CRI patients is from Chichigalpa and adjacent areas, and the rest are from other departments, including León, Boaco, and the north region.

In order to face chronic diseases such as CRI, three different levels of action are required: policy development, community activities and access to healthcare services. The challenges are enormous, and important efforts are being carried out to address this epidemic. It is hoped that this present study evaluating the medical needs of CRI patients in the Chichigalpa Health Center will contribute to the improvement of medical care offered to those affected.

² Statistics from the CRI Clinic at the Chichigalpa Health Center (December, 2010).

Because the definitive etiology remains unsolved, the only preventive strategies address general measures to slow the progression of the disease, such as antihypertensive medications, a specialized diet, and avoiding smoking, alcohol ingestion, heat exposure, and NSAIDs (non-steroidal anti-inflammatory medications).

5 Results

In order to present key findings in the most relevant and comprehensible way, assessment results are divided into 4 main sections, each one addressing a main health component for CRI patients. For each component, a set of identified needs and options is included:

1. Primary Healthcare: *Needs and Options (Health Center of Chichigalpa)*
2. Secondary Healthcare: *Needs and Options (Specialty emergency care and hospitalization), and*
3. End-stage renal disease: *Needs and Options (Dialysis and renal transplant)*
4. Departmental and National level: *Systemic Needs and Options*

Each section includes input from principle stakeholders involved in the provision of medical services for patients with CRI at the corresponding level of care.

For further clarification, each section begins with a description of the current situation, with **identified gaps and needs for medical attention** indicated in bold font.

These findings are then followed by a list of potential **options** to address the identified needs, indicated by bold blue font.

5.1 Primary Healthcare: Needs and Options *Julio Duran Health Center in Chichigalpa*

The majority of CRI patients in Chichigalpa receive their primary healthcare from the local health center in Chichigalpa. Accordingly, the main emphasis of this evaluation was placed on assessing the current CRI services and needs of this principle health facility. Key findings are divided into 3 sections, each of which represents a basic component in the provision of CRI services. These include:

1. Infrastructure
2. Organization of health services
3. Equipment and supplies

Each section describes the current situation, including identified needs, followed by a list of potential options to address the identified needs.

5.1.1 Infrastructure

A hygienic, comfortable environment with ample space to treat patients is an essential component in the adequate provision of healthcare.

Current Situation and Needs

The Health Center is the MINSAs-run public health clinic in Chichigalpa. Although functional, it is a basic setting with barely enough space to provide a full range of primary health services to all local patients requiring attention. Next to the Health Center is the small CRI Clinic. It consists of a very modest waiting room with two small adjacent examining/consultation rooms where two physicians examine close to 40-50 patients during a five-hour period in the morning five days a week. It was built by INSS in 2004 to care for CRI patients (then 779 patients), many of which are former sugarcane workers. The number of CRI patients has now reached 2073 as of December 2010.

The space assigned to the waiting room is small for the number of patients. The waiting room can accommodate about 15 patients. However, often more than 40 patients seek attention. As a result, the rest need to wait outside. In the waiting room entrance, there is a sign that explains that all of the examinations, ultrasound, referral patients (filling out medical history forms), medical evaluations and pension issues are free of charge and are covered by *INSS*. **The waiting room is not air conditioned**, which causes an additional degree of discomfort as well as an additional potential strain on the kidneys of CRI patients.

CRI patients are examined and treated in one open exam room with two desks, one for the nephrologist and one for the internist. Since both physicians sometimes are examining patients at the same time, there is often **a lack of privacy and confidentiality for the patients**. The consultation room is air conditioned.

The Health Center only has a small observation room for unstable patients (including CRI patients). **This observation unit only has two beds that do not provide privacy and are used by patients of all ages.**

Also, it was notable to observe that **the clinic lacks a small meeting room to provide health education to families and technical training to the clinic's health staff**, which is fundamental for patient management.

CRI patients complain that the waiting room lacks chairs, is very hot and uncomfortable. They are especially critical of the lack of an independent CRI clinic. The CRI clinic shares a pharmacy, laboratory and supply room with the general clinic. CRI patients state that they prefer not to have to wait in the crowded general clinic along with children and pregnant women before appointments or when they wait to receive medications or basic monitoring such as weighing. Despite complaints about medication shortages and facility problems, many CRI patients are grateful to have a clean health facility that is centrally located where they can go to get treatment.

Although many components of the Health Center are in substantial need of repair, the **clinic needs an adequate budget for either maintenance or remodeling**. For example, there is a problem with the air-conditioning in the lab.

Options to improve the infrastructure of the Chichigalpa Health Center

- ***Design and build two separate pavilions: one to expand the current CRI clinic, and another to set up an observation unit for patients in unstable condition***

Expansion of the CRI clinic:

Separate spaces to provide care for patients in a more private and confidential way

Larger waiting room to better accommodate the growing number of CRI patients and improve the flow of patients

Provision of air conditioning in this space to support the health of CRI patients

Inclusion of a meeting room (auditorium) to provide health education to CRI patients and families, as well as ongoing training for health personnel, which is fundamental for good patient management

Expansion of the observation unit:

Additional space should be provided to adequately stabilize CRI patients in unstable condition when possible so as to reduce the need of transporting patients and their families to Hospital España in Chinandega. As a result, patients and their families will not incur higher transportation, food and accommodation costs or disrupt their daily activities. Efficient use of an observation unit includes shared space for all unstable patients at the Health Center.

An emergency room separated from the observation unit for all patients at the Health Center, including CRI patients, is also an essential part of a well-functioning clinic.

Other design considerations:

Consider the possible inclusion of a dialysis unit located as part of the Health Center.

- ***Assure adequate funding for ongoing maintenance and remodeling needs***

In addition to new construction of additional space, it is important to address ongoing clinic needs in terms of maintaining a safe, hygienic, and comfortable environment for patients and staff alike.

There are reasons to believe that establishing a CRI clinic that could operate more independently of the Health Center's general public health clinic could potentially solve a number of the main challenges of assuring better overall care for CRI patients. Nevertheless, we believe that it is not feasible to have a completely independent clinic (in another location) from the Health Center, mainly because this would entail substantial duplication of overall operating costs. This would include, for example, land purchase, construction of a new building suitable for providing healthcare, purchase of medical equipment, provision of separate laboratory, pharmacy, hiring a staff nephrologist, CPF, statistician, ambulance, general physicians, nurses, medications, approval from *MINS*A, sustainable funding. All these costs would be duplications of already provided facilities and services by the Health Center.

It is convenient to consider an improved structure dedicated to the care of CRI patients, especially with the quality of the physical space offered by new pavilions in a space next to the Health Center. From this perspective there would be a short-term answer to the urgent needs faced by CRI patients. In addition, there is a recent offer from the *Ingenio San Antonio* to support the remodeling of the Health Center, which would facilitate the improvement of the existing structure for the care of CRI patients. Moreover, adequate land is available to an expansion next to the Health Center.

5.1.2 Organization of Health Services

To address the medical care of 2073 registered CRI patients in Chichigalpa, the MOH health service network consists of the “Julio Duran” Health Center in Chichigalpa for primary healthcare, and 2 hospitals for secondary healthcare: *Hospital España* in Chinandega and *HEODRA* in León. The areas of medical attention for CRI patients include health promotion, prevention, early detection and care and treatment. Services for the care and treatment of CRI patients are provided free of charge, and are primarily covered by INSS, and secondarily by the MOH when required.

Clinical services for CRI patients, as for all patients, are organized around the goal of providing quality medical attention by competent and caring healthcare providers in a safe, hygienic, and sufficiently equipped setting. Achieving a high level of the quality of attention to meet the health needs of CRI patients requires a number of components in place: sufficient capacity of health center personnel to provide necessary services, feedback systems for monitoring and evaluating quality of services, and overall level of empathy of health staff towards patients.

Current Situation and Needs

Clinical services provided

Clinical services consist not only of medical services provided, but also includes essential ancillary services of a diagnostic laboratory, an amply stocked pharmacy, and patient counseling to address the significant dietary, psychosocial and informational needs of CRI patients and their families.

Medical services

Quality medical care by competent health providers is a cornerstone in providing good care for any illness. To this end, the Health Center has a designated CRI clinic staffed by a nephrologist and an internal medicine physician. Together they provide ongoing clinical care to a group of 2,073 CRI patients registered in Chichigalpa. The majority of patients attended in this clinic are ex-workers of the Ingenio San Antonio, while others are either new cases or are referred by *INSS*.

Of the 2,073 registered patients, 9% (183) are in stage 0, 16% (332) in stage 1, 21% (428) in stage 2, 35% (726) in stage 3, 14% (291) in stage 4, and 4% (85) in stage 5 (see Annex 3: *Stage of CRI: Patients registered at the Chichigalpa Health Center, December 2010*).³ Patients in this last group (stage 5) are in the terminal phase (end-stage) of CRI, and require renal replacement therapy (peritoneal dialysis, hemodialysis, or renal transplant) to survive.

Patient appointments are made according to their creatinine levels. Patients with a creatinine level below 3 mg/dl are examined every 3 months, and if the creatinine level is greater than 3 mg/dl, every month. This is equal to 700 consultations per month by two physicians with a heavy load of 40-50 patients per day. As a result of this demanding schedule, CRI patients complain that **insufficient time is**

³ Statistics from the CRI Clinic at the Chichigalpa Health Center

allotted to them during their appointments, usually just a few minutes, and **difficulties in getting an appointments for urgent health problems**.

The CRI Clinic operates from 8:00 am to 3:00 pm, Monday through Friday, including an hour for administrative activities. **These limited schedule does not provide sufficient time for individual evaluation and education of patients and emergency care is limited after normal operating hours**.

A physician funded by ISA conducts ultrasound examinations for CRI clinic patients on Saturdays (see *Equipment and Supplies* below for more details).

The nephrologist plays a key role in providing essential specialty clinical services for CRI patients, and gathers and analyzes clinic statistics to help plan for medication and lab reagent needs. But the CRI clinic could be better served by having a designated person to administrate an integrated CRI program. This person would serve as a focal point for the strategic planning, coordination and implementation of a more comprehensive CRI program that could offer a wider complement of ancillary services (see below section). The Clinic also has a designated statistician and a cleaning person.

With regard to renal replacement treatment for the final phase of CRI, **the Health Center does not offer peritoneal dialysis or hemodialysis services**. This situation exists in spite of a substantial demand for such services locally in Chichigalpa, and the presence of a nephrologist with the capacity of supervising these specialty services (see section 5.3: *End-stage renal disease: Needs and Options* for a more thorough discussion).

The need for the prevention of additional CRI cases is an essential component of CRI medical care. Immediate steps are necessary to help slow the rising tide of the CRI epidemic as swiftly as possible. Part of an effective prevention strategy includes improving measures to diagnose CRI at the earliest stage possible of the disease. Towards this end, a separate epidemiological study is underway by Boston University School of Public Health in seeking to establish more effective CRI screening measures for early detection. **As soon as more definitive surveillance measures are developed, there is a need to assure that they are implemented as soon as possible**.

Ancillary services (laboratory, pharmacy, dietary and psychosocial counseling)

Adequate management of CRI also requires that basic information about CRI be accessible to patients and their families. Lack of knowledge about CRI among patients and families clearly contributes to their sense of powerlessness, mistrust, and fear about the natural progression of the disease. Increasing the understanding of the course and treatment for CRI helps CRI patients and their families make better plans and choices around how to handle the illness, especially in its terminal phase. Although there is some degree of health education provided for health personnel and patients, it was reported that **the Health Center lacks an overall systematized approach to providing essential knowledge about CRI**.

Additionally, CRI health promotion efforts should extend to reach the community at large. These should include measures to improve the entire community's knowledge of CRI disease prevention, development, potential complications, and treatment. Although the Health Center is not directly

responsible for public health campaigns, **there is currently limited clinic participation in efforts to help raise community awareness of CRI.**

Patients with CRI in Chichigalpa face a number of formidable challenges in maintaining their level of health. Because of the critical dietary needs of CRI patients, nutritional counseling is especially important in counseling patients and their families. CRI patients must know how to choose foods that help mitigate their disease and that do not additionally harm their already compromised renal function.

Another essential need of CRI patients and their families is to address the serious psychological effects that accompany living with a life-threatening chronic disease. This is one of the most pervasive and potentially damaging issues affecting both CRI patients and their families. A vicious cycle is created when lack of intervention for high levels of stress cause adverse physiological effects that only compound an underlying chronic illness.

There are no nutritionists or social workers staffed at the Health Center to provide necessary dietary and counseling services for CRI patients and their families. Patients must travel to Hospital España in Chinandega to receive these supplemental services, but rarely do so because of travel expenses and time involved. A lack of ancillary personnel to provide these essential services locally at the Health Center does not permit an integrated approach for CRI patients and their families.

End-of-life care is another important component in the continuum of care for CRI patients. Palliative care assistance offers relief of suffering through the dying process by providing both physical and emotional support for patients and their families. At present, ***the Health Center, as well as most Nicaraguan health facilities, lacks a palliative care program.*** This is an additional burden for CRI patients, who already suffer from **lack of access to treatment for their end-stage disease** (see below Section 5.3 *Medical Need for Treatment of End-stage Renal Disease: Dialysis and Renal transplant options*).

Demand for a palliative care program by CRI patients in Chichigalpa has remained low. Understandably, their priorities are greater for more immediate improvement of their current health needs, such as access to essential medications and emergency care. Nevertheless, as the number of CRI patients with end-stage renal disease increases, a corresponding increase in demand for palliative care services can be anticipated. In addition, increasing the awareness of CRI patients and their families about all of the potential benefits that a palliative care program can offer is also likely to increase interest and demand for these beneficial services.

Quality of care

Apart from the types of clinical services offered, an important aspect for CRI patients and all patients is the quality of care received. The basic components of quality care include feedback systems to monitor and evaluate the quality of the services provided, the capacity and availability of health staff to care for CRI patients, and the level of empathy provided by health staff to the patients in the clinic.

Feedback systems

For CRI, as with other chronic illnesses, feedback systems of medical care are necessary to decrease complications, maximize health outcomes, and provide services of the highest quality at the lowest

cost at the same time. Specifically, such feedback mechanisms can assess the quality of care provided, identify problems in the delivery of care, design activities to overcome these deficiencies, and provide follow-up monitoring to ensure the effectiveness of corrective steps. Additionally, feedback systems can address system issues that have specifically been raised by CRI patients including patient scheduling, appointment time, adequacy of medication and reagent supplies, and patient satisfaction. Although maintaining accurate statistics about the types and number of medical conditions seen, **it is uncertain whether or not the Health Center has an operational feedback system that can ensure quality of attention for its patients at present.**

Capacity and availability of health center personnel

One mechanism that helps ensure quality of attention for patients is the utilization of protocols. A set of protocols based on current medical knowledge and best practices for CRI insures that patients are receiving the most appropriate means of early diagnosis, staging, management and prevention of their illness. Although CRI care standards have now been approved by MINSAs,⁴ **physicians treating CRI patients during emergencies lack specific protocols for managing CRI emergencies.** In this case, patients are managed according to different criteria by each individual physician.

Similarly, capacity of health center personnel to provide an acceptable level of CRI services represents another quality of attention aspect. Besides lacking the guidance of a set of protocols for emergency CRI situations, **general physicians and the health personnel that attend patients (nurses) have not received sufficient training to provide adequate emergency attention for CRI patients.**

Furthermore, to meet after hours care needs for CRI patients, a medical team consisting of a CRI-trained physician, nurse and auxiliary staff need to be available to cover a daily schedule from 5pm to 6am as well as weekend coverage. While offering some after-hours coverage, at present, **the Health Center is unable to provide the personnel necessary to provide the extent of coverage required by CRI patients.**

Lastly, it is also necessary to have adequate back-up personnel for diagnostic laboratory testing available for after-hours emergencies. **Such laboratory after-hours coverage is currently unavailable at the Health Center** and is a necessity for physicians to adequately diagnose and treat complex conditions such as those of CRI patients.

Level of empathy provided by health staff

Despite the valuable resource offered by the Health Center to CRI patients, some patients continue to express dissatisfaction with their care. Concerns that CRI progresses despite medication may contribute to CRI patients having an underlying sense of mistrust of physicians that treat them. Moreover, **some CRI patients continue to express dissatisfaction with the way they are treated by physicians and nurses.**

Integration of services among institutions

4 ANINEF (Nicaraguan Nephrology Association) has been involved in national quality care planning for CRI through the set of protocols drafted in March 2009 (Standard and Protocol for Management of *Chronic Kidney Disease*).

At present, a complicated patient must be referred to Hospital España in Chinandega in an ambulance provided by the Health Center. In spite of the importance of close communications between health institutions, **coordination for providing care to CRI patients is weak between the Health Center and Hospital España. This is most evident in the lack of referral mechanisms between these two key organizations to coordinate and provide care for CRI patients.** Guidelines for adequate referral mechanisms can be found in MINSA's *Family and Community Health Model of the Health Ministry (Modelo de Salud Familiar y Comunitaria del Ministerio de Salud - MOSAFC)*. (See section 5.2 *Secondary healthcare needs*)

Hospital España is about 17 kilometers from Chichigalpa and the trip takes more than half an hour. In contradiction with the provisions of the Health System that guarantee free transportation to the hospital for very ill CRI patients, fuel costs sometimes have to be covered by the patients. As a result, **lack of affordable ambulance transport to the Hospital España** continues to be an incompletely met need for CRI patients attending the *Centro de Salud*. An additional concern raised by CRI patients was whether or not one ambulance is sufficient in meeting all patient transportation needs at present.

Options to improve the organization of healthcare services

Clinical services provided

- ***Provide sufficient human resources for a physician and nurse team trained in CRI protocols to be available for emergency care for CRI patients 24 hours a day***

Urgent and emergent situations can easily arise at any time of the day for patients with complex chronic illnesses such as CRI. The clinic's current operating hours (8:00 am-3:00 pm on weekdays) provide only 35 hours of care of a total of 168 hours per week. With over 2,000 registered CRI patients, there is a correspondingly high demand and significant gap in after hours care availability that needs to be prioritized. Addressing this need will allow for local treatment for many CRI emergencies that are currently transported to Chinandega by ambulance.

To support this substantial expansion of clinical services, improving infrastructure is a key step, such as building and adequately equipping the observation and emergency units in the Health Center. Equally important are human resource needs of clinical physicians and nursing staff by providing additional training on CRI emergency management. Increasing the number and capacity of health personnel will improve availability and quality of care not only for CRI patients, but general patients as well. It seems that some interns are available for contracting, who could provide emergency care at the Health Center. MINSA has already established a health fund (*Fondo de Salud*) to address this type of human resource gap.

- ***Develop a health education strategy for CRI patients and their families***

Armed with information about their disease, CRI patients will be better able to improve their attitudes toward medications, physicians, and treatment approaches, and increase the level of medication compliance and knowledge of preventive practices such as proper diet.

Responsibility to carry out health education extends beyond the Health Center to MINSA, INSS, academic institutions and civil society. Nevertheless, basic health education efforts can be initiated within the Health Center and integrated into direct patient care and clinic personnel training.

Organized clubs for patients with different chronic diseases such as diabetes has been an effective way to involve patients in better understanding and self-care of their illness. In the same way, [organizing a club for CRI patients](#) can improve their level of participation in their own care. This strategy has been successfully done by SILAIS León.

- ***Make available the services of a nutritionist, psychologist and social worker to provide needed professional counseling and support for CRI patients and their families***

There is a great need for dietary services to provide important nutritional information, as well as for psychological and social services to address the high level of mental anguish that accompanies living with a terminal illness. Together, these key ancillary services can also improve the physical health and the ability to live with the CRI, both for patients and their families. Adequate service provision includes an initial evaluation and ongoing follow up on a routine basis. Contracting a nutritionist, psychologist and social worker on a half time basis might be sufficient to begin addressing this wide gap in critical services needs of CRI patients in Chichigalpa.

- ***Provide additional means of assisting in the identification of CRI in its early stage (preventive measures)***

At present, a separate epidemiological study undertaken by Boston University School of Public Health is seeking to establish more effective CRI screening measures. An opportunity exists to expand epidemiological surveillance of CRI by more closely monitoring the renal function of at risk populations throughout the Department of Chinandega. In addition, conducting household surveys can substantially help build a CRI database, as currently underway through health centers in León.

- ***Designate a director and a focal point in charge of a Program for CRI patients***

The administration of a more comprehensive CRI program would benefit from having a designated personnel taking responsibility for planning and coordinating activities. This position could possibly be filled with existing resources at the Health Center.

- ***Find out if CRI patients and their families are interested in receiving end-of-life (palliative) care***

In addition to end-stage treatments such as dialysis, end of life care is an essential component in the continuum of care for patients with CRI. Palliative care assistance provides both physical and emotional comfort through the dying process for patients and their families.

Although there has been low interest in pursuing this option in the past 2 years since it was suggested, this may be primarily due to a lack of familiarity with the concept and practice of palliative care. Until there is adequate familiarity of this aspect of terminal healthcare, additional efforts should be made to determine potential interest of CRI patients and their families in palliative care.

A home-based end of life program in Chichigalpa could offer MINSA the opportunity for a palliative care pilot project for the country. In addition, a palliative care center with a half dozen beds or so could provide a higher level of technical support for patients in their last days of life and offer a dignified death.

It would be worth considering the future addition of a small palliative care unit at the time of designing the above-mentioned option for remodeling the CRI clinic and observation room. Aside from the physical structure of a small building, equipment and supplies are basic and relatively inexpensive.

Quality of care

- ***Develop specific CRI guidelines for general physicians and provide training***

Until specific CRI protocols are implemented and general practitioners are trained to use them, CRI diagnosis, management and prevention practices will continue to vary among practitioners caring for CRI patients. A standard set of guidelines and protocols for chronic renal insufficiency will help to ensure that a majority of CRI patients, likely managed by general practitioners after hours, receive a current and appropriate standard of care for this complex chronic disease (see next option).

- ***Develop and put in practice a referral program (“a national experience”) to improve the quality of medical attention with the support and coordination of CIES and MINSA***

Several key gaps in the medical attention of CRI patients at the Health Center mentioned in the previous section have a common theme - insufficient provision of services. Some examples include inadequate amount of time allocated for appointments, lack of adequate CRI emergency training for general physicians to provide coverage after hours, lack of education, dietary and psychological counseling for CRI patients, feedback systems to monitor and evaluate quality of services, as well as the level of empathy provided by the health staff to the patients.

Taken as a whole, these deficiencies point directly to medical care quality issues. Thus the only substantive approach for satisfying the medical needs of CRI patients is to directly address the underlying quality issue.

For example, a quality of attention program could address the provision of quality care emergency services to CRI patients. The first steps would include creating a set of quality standards for the characteristics of quality control- in essence, a set of protocols. For example, in the case of CRI emergency care management of hypertension, quality standards could include: *All CRI patients presenting with systolic blood pressure greater than 180mm or diastolic pressure over 110mm should be treated according to the hypertension protocol immediately.*

Although CRI standards have now been approved by *MINSA*, there is currently no mechanism to ensure that these protocols will be fully and properly implemented. Moreover, general physicians who provide emergency care to CRI patients lack protocols or adequate training for these medical conditions. In this case, patients are managed based on different criteria of individual general physicians. Until specific CRI protocols are developed and general physicians are trained to use them, CRI diagnosis, management and prevention practices will continue to vary among medical practitioners caring for CRI patients. A standard set of treatment guidelines through defined CRI protocols will help ensure that the majority of CRI patients, likely to be managed by general practitioners after hours, will receive an updated and appropriate standard of care for their complex chronic disease.

Even if reliable and appropriate availability of medication was secured, there would still be no assurance that medicines will be correctly prescribed or that adequate and readily accessible medical staff will be available to prescribe them. It is uncertain whether or not there is a viable ongoing mechanism at the Health Center that conducts adequate ongoing monitoring, evaluating

and improvement of medical practice issues such as CRI diagnosis and management, as well as system issues such as patient scheduling, appointment time, adequacy of medication supplies, and patient satisfaction. These are all quality of care issues.

As mentioned in the introduction at the beginning of this report, nine options for addressing current medical needs of CRI patients were initially identified in the September 2009 assessment. As regards the remaining unmet needs, a Quality Care program would also provide a mechanism to implement a CRI protocol, find care options for end-stage renal disease, and provide ancillary services such as psychosocial and palliative care.

To summarize, the overall goal of a quality medical care program at the Health Center CRI clinic is to assure standard care for all CRI patients. An operational Quality Care Program adapted by the Health Center has the potential of directly addressing key medical issues for CRI patients and providers alike, for both the short and long term. A quality care program can serve to reduce complications, maximize outcomes and provide high quality services at the lowest cost possible. For these reasons, a quality of care approach has become the international standard to achieve the outcomes and results that patients experience and care about.

Accomplishing this goal will require approval of national health authorities, local endorsement and active participation of clinic medical and administrative personnel together with patient involvement, potential support and resources provided through private institutions, and technical assistance from quality of attention specialists from educational institutions such as *CIES*.

An important and immediate step for developing a quality of care approach would be to improve communication between CRI patients, through ASOCHIVIDA, and the Health Center. Essential inputs from CRI patients could well inform actions that seek to improve quality of care at local and regional level (SILAIS).

Towards this end, an opportunity exists for MINSA to more adequately meet the medical care needs of CRI patients in Nicaragua by establishing a national quality of care program at the Health Center in Chichigalpa.

Integration of services among institutions

- ***Strengthening communication and coordination of activities between the primary and secondary levels of care***

It is necessary to establish a referral mechanism that is well-defined and implemented between the Health Center and *Hospital Española* in order to assure that CRI patients' primary and secondary care needs are adequately coordinated. *MOS AFC* can provide existing guidelines to address this essential need.

- ***Securing funding for provision of fuel for the availability of an ambulance to freely transport very sick CRI patients***

This recommendation would help resolve the economic barrier limiting access to hospital care in Chinandega (*Hospital Española*) for CRI patients in Chichigalpa.

5.1.3 Equipment and supplies

Medical and nursing personnel need basic clinical equipment to be able to take vital signs and adequately examine CRI patients. Greater use of existing ultrasound equipment can provide more valuable information about the size of the kidney and the progression of the disease. Accurate staging, ongoing clinical management, and, as well, early screening of CRI further relies on precise laboratory monitoring of renal function. This requires well functioning laboratory equipment that can be precisely calibrated, as well as a ready supply of test reagents. Finally, CRI patients depend on an uninterrupted supply of medications used to help treat symptoms and complications and to slow the development of further kidney damage.

Therefore, an equipment and supplies assessment at the Health Center included an assessment of: basic equipment for clinical tests, laboratory equipment and test reagents, and supply of medication.

Current Situation and Needs

Equipment for clinical tests

Basic clinical equipment for patient care, such as stethoscopes, blood pressure cuffs, ophthalmoscope, scale, is used in the CRI clinic. But in general, **the condition of this equipment is inadequate and requires fixing or replacing** (see *Annex 4: Equipment and Materials for the CRI Clinic for the attention of CRI patients at the Health Center in Chichigalpa*).

Another important need for CRI patients is to have periodic renal ultrasound testing to determine the size of their kidneys, which can indicate the progression of their disease. Ultrasound testing is also used to determine whether or not patients qualify for social security pension, depending on the size of their kidneys, which reflects the extent of underlying damage. Essential CRI ultrasound equipment was donated to the Health Center in Chichigalpa by NSEL nearly 2 years ago, along with funding for a qualified physician to conduct and interpret ultrasound examinations (52 per month).

Occasional apparent discrepancies in the interpretation of ultrasound tests at the Health Center CRI clinic has continued to feed a sense of mistrust among CRI patients either about the reader or the accuracy of machine's calibration. Such a discrepancy arises when a current ultrasound report from the Health Center interprets kidney size as normal, while an exam outside the clinic interprets kidney size as abnormal (small). In order resolve this issue, *INSS* plans to conduct a study to evaluate this situation.

ISA has provided some of the CRI clinic's equipment including a computer and air conditioning for the CRI clinic and laboratory, among other donated items. *ISA* indicates that it also helps support the center to cover basic supplies like paper goods and prescription pads, as well as helping to pay for cleaning services.

The CRI clinic still lacks critical equipment like an EKG machine. In addition, for the whole *Centro de Salud*, it is currently not possible to maintain an updated database because there is **insufficient computer capacity**.

In order to provide emergency treatment of CRI patients, basic equipment is needed that includes: an EKG machine, oxygen delivery system, respirator, manometer, wheelchair, hospital beds and a stretcher. Since the pharmacy closes at 4pm, an emergency/observation unit should contain a separate stock of emergency medications.

Laboratory equipment and test reagents

The Health Center in Chichigalpa conducts and covers the cost of between 6-7,000 tests per month for CRI and general clinic patients. **The equipment is currently working satisfactorily, but it is old and will have to be replaced soon.** MINSA typically does not have the resources to replace the equipment, but sometimes they are able to get additional resources from INSS. Several medical personnel expressed **doubt that some of the laboratory equipment in medical facilities in the Department of Chinandega is adequately calibrated** and suggested ongoing monitoring.

Renal function testing requires an uninterrupted supply of laboratory reagents to measure creatinine, uric acid, calcium, phosphorus, and electrolytes. A concern raised by ASOCHIVIDA that was confirmed by several key medical professionals was **the ongoing lack of reagents to test renal function at the Health Center.** This continuous deficit and unreliable availability of essential laboratory reagents is a critical issue that undermines the ability of physicians caring for CRI patients to adequately manage their patients.

Also, to adequately manage CRI patients, the laboratory requires additional capacity to be able to analyze levels of serum calcium, phosphorus, triglycerides and iron. Patients developing other CRI disorders (such as tubulopathy) require analysis of blood electrolytes (sodium, potassium, etc). Therefore, at present, **the laboratory at the Health Center lacks the ability to conduct these essential diagnostic tests for CRI** and needs support to do so.

Drug supply

A continued supply of medications necessary for the clinical management of CRI is another cornerstone of good care. INSS provides CRI patients with essential medications, supporting MINSAs who provide medicines for other health problems. Over the past few years, there have been substantial medication shortages for several months at a time. These shortages, however, appear to have been addressed more adequately recently and there is currently an ample supply of essential CRI medications (enalapril, allopurinol, erythropoietin) and supplements (iron, calcium, vitamins).

Although an agreement has been reached between MINSAs and INSS to determine responsibilities in the procurement of essential drugs for CRI, the possibility of counting with a continuous supply at the Health Center remains uncertain. This situation has been aggravated by several other challenges: **budget constraints for certain drugs, the monthly ordering process that does not take into account the increasing number of CRI patients, the lack of inclusion of some drugs for CRI in MINSAs' essential drug list, and difficulties in the procurement process itself.** To help address these chronic shortcomings, NSEL has made an initial financial commitment to supplement the supply of CRI drugs and reagents.

The pharmacological efficacy or potency of the drugs is another key factor in adequate treatment. Generic formulas are more commonly used by the Health Center because they are relatively inexpensive and are produced in the region. All drugs are regulated by MINSAs based on the purity of the pharmacological composition and activity and they should provide the same beneficial effects as proprietary (brand) drugs.

However, CRI patients continue to **question the efficacy of the generic drugs they receive at the Health Center** and attribute to them adverse side effects, as well as lack of efficacy. They express their discontent and distrust about discrepancies in drug prescriptions between private doctors and Health Center CRI clinic physicians. It is of note that 5 out of 6 members of the ASOCHIVIDA board of directors seek medical care outside of the Health Center primarily for this reason, even though private medical care represents a higher cost for them.

These current concerns seem to reflect a lack of understanding of the natural course of CRI, the limited efficacy of any drug in significantly altering the inevitable progression of the disease and the belief that some drugs (brand names) are more effective than cheaper generic drugs provided by the Health Center. Thus, these continuous patient concerns are best addressed by efforts to educate patients and not by efforts to provide more expensive brand drugs with the same efficacy.

Options to improve equipment and supplies

Equipment for clinical exams

- ***Provide necessary critical equipment for CRI clinic to function adequately***

The immediate improvement of CRI service provision could be achieved by providing critical equipment, such as an EKG machine, stethoscopes and blood pressure machine, and by replacing

equipment in poor operating condition (oto-ophthalmoscope). A list of additional office furniture and supplies can be seen in Annex 4.

Additional equipment will be needed to furnish the remodeled observation and emergency room.

- **Ensure that INSS conducts a study to evaluate the accuracy of the interpretation of ultrasound examinations in order to resolve the apparent discrepancy issue**

Laboratory equipment, test reagents and Medication supply

- **Improve laboratory capacity to accurately measure renal function for the improved management of CRI patients**

This will require the accurate calibration of all lab equipment, evaluation for proper functioning, replacement of malfunctioning equipment, and purchase of new equipment capable of conducting essential diagnostic tests for CRI that are currently unavailable.

- **Provide critical equipment necessary for the accurate CRI diagnostic testing**

Physicians are unable to accurately monitor the condition and treat CRI patients without renal function test results. Laboratory equipment in the Health Center is old and, at a minimum, requires accurate ongoing calibration. Faulty equipment should be replaced immediately, and a strategic plan developed for purchasing equipment that will soon require replacing. Equipment needed to conduct critical CRI tests that are currently unavailable should also be purchased immediately (i.e. Diagnostic 500). Assistance from MINSAs, INSS and ISA might be necessary to meet these equipment needs.

- **Create a drug and reagent fund managed by MINSAs to supplement the purchase of essential CRI drugs and reagents for diagnostic tests to prevent lack of availability.**

The reliable provision of essential CRI laboratory test reagents and drugs remains an ongoing critical need for the *Centro de Salud*. In the short run, this need might be at least partially addressed by NSEL's initial financial commitment to supplement MINSAs's supply of CRI medications and reagents for the Health Center in Chichigalpa. In the long term, however, it will be essential that key stakeholders such as MINSAs and INSS reach a coordinated approach for CRI to meet all of the ongoing needs of CRI patients (see section 7.3 *Long term options to address gaps in the health system at large*).

Key issues that need to be addressed by MINSAs, INSS and NSEL are budget constraints for certain drugs, a dysfunctional monthly ordering process that does not take into account the growing number of CRI patients, the lack of inclusion of several essential CRI drugs in MINSAs's essential drug list,⁵ and barriers in the procurement process. PAHO's assistance will certainly facilitate the process for developing a coordinated approach at national level.

⁵ Essential drugs for adequate CRI treatment not included in MINSAs's essential drug list include calcium, phosphorus, iron, allopurinol and cochlincine. Erythropoetin is included, as are antihypertensives, such as lisinopril, although availability is often limited.

5.2 Emergency Care and Hospitalization: Needs and Options *Hospital España, Chinandega*

Current situation and needs

Hospital España is the highest level health institution for referral of CRI patients in the Department of Chinandega. As such, *Hospital España* has the responsibility to provide three principle types of services for CRI patients: emergency treatment of CRI patients in unstable condition, hospitalization of these unstable patients when necessary, and provision of renal replacement services (dialysis) for patients with end-stage renal disease.

In terms of demographics, 80% of the patients suffering from renal failure are former agricultural male workers, and the remaining 20% has developed renal failure as a complication of diabetes, and are mostly women.

Emergency treatment is sought by CRI patients in Chichigalpa primarily due to lack of care at the Health Center after hours, as well as a lack of sufficient training for general clinical practitioners on CRI emergency management. This situation was discussed at length in the previous section that was centered on the Health Center in Chichigalpa. As previously mentioned, **the referral and counter-referral system between the Health Center and *Hospital España* also needs to be strengthened** in order to assure adequate coordination of critical care for CRI patients.

Hospital España provides 24 hour care for CRI patients, which includes emergency treatment and hospitalization. Nevertheless, *Hospital España* has a serious lack of capacity to provide CRI services for those who need it. There is a substantial **need for support to overcome the deficiencies in the organization of CRI services, including a lack of supplies, essential medications, and equipment. The internal medicine service lacks a multidisciplinary and integrated team, including a nephrologist-** a remarkable shortcoming for the principle departmental hospital treating complicated CRI patients in the region of highest prevalence of CRI in Nicaragua. Moreover, as mentioned in the previous section, **a technical protocol to address this disease in a more comprehensive manner is lacking.**

As a result of these substantial deficiencies, **the capacity of *Hospital España* to provide dialysis services is also extremely limited.** This issue is addressed in more detail in the following section (5.3, *Medical Needs for End-stage Disease: Dialysis and Renal Transplant*).

Even with such limited capacity for care, *Hospital España* is still viewed by CRI patients as their only option for terminal support, which is **often the only type of care (palliative) that the hospital can provide.** As such, CRI patients focus on the need to have improved access available through free ambulance transport from their homes in Chichigalpa to the hospital. Even still, they realize that their hospitalization is likely to be the way they spend their last days- and possibly their last savings as well, for the cost of food for the rest of the family staying at the patient's bedside in Chinandega is high.

Hospital España faces other challenges as well. These include: **lack of other facilities to refer CRI patients that are difficult to manage, inability to monitor primary patients, and insufficient**

availability of social workers and psychologists on staff for all CRI patients and their families requiring their services.

In summary, *Hospital España* faces the difficult task of having the responsibility to provide critical care and dialysis services to CRI patients without the institutional support necessary for their adequate management.

Options to improve the provision of emergency services and hospital care for CRI patients

- ***Develop a national CRI program that includes emergency attention***

The lack of institutional support constitutes a fundamental obstacle in the ability of *Hospital España* to provide adequate emergency services. As a result, an institutional commitment for CRI is necessary to substantially alleviate the poor status of emergency care for CRI patients. The same situation is applicable for the changes that are needed in the provision of renal replacement therapy (discussed in greater detail in the next section: *5.3 Medical Needs for End-stage Renal Disease*).

Specific options for *Hospital España* rely on national CRI policy change and parallel the recommendations presented for the Health Center in the infrastructure, organization of services, and equipment and supplies. Additional infrastructure options to strengthen *Hospital España's* capacity to provide dialysis services are addressed in the following section (*5.3 End-stage Renal Disease: Needs and Options*).

5.3 End-stage Renal Disease: Needs and Options

Dialysis and Renal transplant

CRI is a progressively fatal disease with no cure. Most all CRI patients progress to end-stage renal disease (ESRD) and require either transplantation or ongoing kidney dialysis for survival. Both treatments are very costly and pose a substantial challenge to provision of care for patients. This is especially true in Nicaragua, a country where the national annual per capita health expenditure is \$232.⁶ Although survival for patients with ESRD depends on the availability of renal replacement therapy, major financial, political and social challenges make these essential services unavailable to the vast majority of CRI patients in Nicaragua.

Current situation and needs

Needs for Dialysis

The extent of need of CRI patients for dialysis is vast. In the Department of Chinandega alone, over 3,000 patients at all stages of CRI have been identified that require ongoing treatment and monitoring (and about 4-5,000 CRI patients in León, according to HEODRA). Although an estimated 3-5% (90-150) now needs dialysis, the majority of all 3,000 patients will continue to develop end-stage renal disease requiring dialysis or transplant for survival.

⁶ 2010 Human Development Report, UNDP, Table 14, p. 199.

In Chichigalpa, there are approximately 85 patients awaiting the opportunity to start dialysis. (*HEODRA* estimates that the current present need for dialysis in Chichigalpa is closer to 200). **No dialysis services presently exist in Chichigalpa**, even though the Health Center CRI Clinic has a nephrologist, so ESRD patients must be referred to *Hospital España* in Chinandega. Access of CRI patients from Chichigalpa to *HEODRA* León is limited because of its location in a different department.

Peritoneal Dialysis: Availability and Obstacles

Peritoneal dialysis (PD) is a process that uses the patient's peritoneum in the abdomen as a membrane across which fluids and dissolved substances (electrolytes, urea, glucose, albumin and other small molecules) are exchanged from the blood. Fluid is introduced through a permanent tube in the abdomen and flushed out either every night while the patient sleeps (automatic peritoneal dialysis-ADP) or via regular exchanges throughout the day (continuous ambulatory peritoneal dialysis- CAPD). The main advantage is the possibility of providing treatment without the need to visit a medical center. The main complication of PD is the risk of infection due to the presence of a permanent tube in the abdomen.

For CRI patients living in the Department of Chinandega, peritoneal dialysis (PD) is offered only at *Hospital España*. There are currently 20 patients on continuous ambulatory peritoneal dialysis (CAPD), and another 85 waiting to start the dialysis program, which cannot begin due to the difficulty with the supplies.

PD is essentially not a viable program at *Hospital España* at present for several reasons. There is a **lack of personnel to manage dialysis**, so internists need to be rotated to provide this service. Internists usually have the technical capacity to insert PD catheters and treat PD patients, but the **hospital lacks a nephrologist to provide overall supervision of dialysis services**.

The **excessively high cost (about US\$900/month/patient, the initial cost of PD catheters is US\$600)** and the **uncertain availability of essential supplies** are the main constraints. Currently, 20 patients on PD at *Hospital España* face difficulties due to the lack of availability of dialysis solution.

In contrast to the uncertain availability and very limited amount of dialysis supplies at *Hospital España*, *HEODRA* indicates that their access to supplies is virtually unlimited. *HEODRA* has a contract with Baxter, a private international dialysis supply company that can reliably provide the necessary inputs for PD in a reliable and constant way. Further, Baxter provides training for nurses and doctors on the use of PD machines. **There is no agreement at the present time between MINSA and Baxter to ensure a more reliable provision of PD supplies as well as the provision of training for hospital staff**. The American-Nicaraguan Foundation (ANF) has also provided dialysis supplies for *HEODRA*'s patients during the last five years.

Currently, *HEODRA* attends 50 PD patients, only 10 of whom are farmers ("*campesinos*"), the rest being diabetic women, primarily urban dwellers. As previously mentioned, access of CRI patients from Chichigalpa to *HEODRA* León is limited because of its location in a different department. In *HEODRA*'s experience, the 5 year success rate for maintaining PD treatment is 80% for city dwellers, while the rate for people living in the countryside is much lower, probably less than 1 year.

Another major obstacle to the widespread implementation of PD for CRI patients is the **requirement for homes to be hygienic** to help lower the risk of infection. This typically means that **floors need to be tiled** in order to be adequately kept clean, which presents an insurmountable economic barrier for most all Chichigalpa CRI patients and their families. Rural people's contact with animals also can increase the risk of peritonitis. Patients receiving PD at *HEODRA* are urban dwellers with hygienic living conditions confirmed by a social worker.

PD patients and their families also require a certain level of education and training on sterilization techniques and on how to prevent infections in order to properly and safely perform PD in their homes. A close relative of the patient with literacy skills needs to provide assistance with changing the dialysis bags 4 times a day and to be available on a 24 hour basis. The relative also needs to undergo 10 days of training to be able to adequately provide proper assistance to the PD patient.

PD patients also require **a high protein diet, which is very expensive for most CRI patients**. As a result of all these criteria required for PD, **poor patients living in the rural areas have more difficulties as candidates for PD**.

Widespread fears exist about peritoneal dialysis given the high incidence of fatal complications from peritonitis in recent years. *HEODRA*'s medical staff stated that the broad scope of this fear is the main obstacle for most CRI patients. However, some CRI patients said they would be immediately willing to undergo dialysis if it became available to them. Thus it seems important to confirm the actual current demand for PD and, if indicated, address the extent of fears constituting a potential barrier to treatment.

As an essential component in emergency management of CRI patients, a functional referral system between the health centers and hospitals that provide dialysis is necessary. Both ***Hospital España* and *HEODRA* currently lack sufficient training for such system**. A referral system forms part of a broader integrated plan of information, education and communication necessary to improve the CRI program.

Hemodialysis: Availability and Obstacles

Hemodialysis (HD) is a highly technical method for removing from the blood waste products such as potassium and urea, as well as free water, during the end-stage (Stage 5) renal disease (ESRD). Hemodialysis utilizes sophisticated medical equipment and expensive reagents and is performed in an outpatient dialysis facility, either a room built in a hospital or a dedicated, stand alone clinic. Specialized nursing and technical staff is necessary to initiate and administer the hemodialysis treatments. Typically, 3-4 hour treatments are required 3 times a week for patients with ESRD.

In Nicaragua, the annual cost of HD is nine thousand dollars per patient. In a country where the national per capita health expenditure is \$232 per annum, this cost is a far reach from the national health budget. **The social security system, INSS, benefits all patients with pensions or social security benefits, and uninsured patients are excluded. MINSa provides dialysis to patients at the Hospital San Juan de Dios of Esteli, Hospital Lenin Fonseca of Managua, and Hospital HEODRA of Leon, but coverage is still insufficient.**

Hospital España received a donation of 8 new HD machines in 2008, but it still does not have a cold storage room for supplies so it cannot provide any treatment. In addition, due to an insufficient budget, the unit built to house HD is not operating.

HEODRA León has 6 HD machines available, 5 for CRI patients and 1 for HIV/AIDs patients. Nevertheless, they only are able to provide HD services for 21 patients because of limited number of personnel with the necessary technical skills to manage HD treatments. If they were able to provide evening services, *HEODRA* could accommodate another 23 HD patients.

HEODRA León has a contract with NIPRO, a private company supplying HD machines, filters and supplies. It provides 24-hour support in the provision of necessary supplies, as well as operating and maintenance services as needed. Since **not all necessary CRI drugs are included in MINSa's essential drug list**, NIPRO also remains available to supplement the need of essential medications. These include calcium, phosphorus, iron, allopurinol and colchicine. Even in Managua, where there are 10 new hemodialysis machines for 40 patients, chemicals are insufficient to maintain treatment.

National funding of expensive CRI treatments could be more of a prioritization issue. With national and global health priorities focusing on the considerably higher cost/benefit ratio of investing in mitigation of preventable diseases (i.e. vaccine preventable illnesses, diarrheal and respiratory disease in infants and children), CRI, a chronic, fatal disease, is often relegated.

There is a growing demand among CRI patients for HD services, which do not carry the same accompanying fear as PD at the current time.

Needs for Renal Transplant

Renal transplant is the treatment that is absolutely necessary to offer complete rehabilitation of patients with CRI. It is known that the overall costs for dialysis are more expensive than renal transplant over time (see Annex 5: *Treatment costs for End-stage CRI*). In addition, dialysis has a higher mortality rate than renal transplant. At present, it is known that the best CRI management includes a shorter pre-transplant time period to potentially avoid the need for any dialysis treatment.

In spite of all the advantages of renal transplant over dialysis, the current feasibility of this treatment is quite low for the following reasons:

Renal transplantation demands a highly skilled team, is a very expensive procedure, and requires a lifetime of relatively expensive anti-rejection medications post-transplant. The cost to private patients is about \$34,000 in Nicaragua. Because of an agreement between private hospitals and *INSS*, the cost to CRI patients is about half (\$17,000) of this amount.

Three hospitals in Managua —La Mascota, Hospital Militar and Hospital Salud Integral—have capacity to perform renal transplants. The teams that perform pediatric and adult renal transplants have been trained in Italy. *La Mascota* is a public hospital that only performs pediatric transplants. *Hospital Militar* is a private facility that only performs adult renal transplants. In recent years, about 40 adult renal transplants have been performed in Nicaragua with a very low rejection rate.

Another obstacle facing the option of renal transplant is the **lack of a national law that permits the use of cadaver kidneys for donors**. Although living donor kidney transplants are more often successful, cadaver kidneys provide a much larger pool of potential organs available for transplant.

In the context of the limited annual per capita health budget in Nicaragua and established **national and global priorities for public health issues**, maternal and child health has been prioritized. With this priority, the possibility of having access to a renal transplant seems more remote for a majority of patients with end-stage CRI.

In order to begin to address this challenging situation, it will be necessary to know the comparative costs and capacity requirements of each treatment both for start-up and ongoing expenses involved. In the meantime, it becomes even more essential that all CRI patients have access to their maintenance medications to better control disease progression and hopefully slow down the potential avalanche of CRI patients who will eventually need dialysis or renal transplant.

Options for renal replacement therapy for ESRD patients (*Dialysis and Transplant*)

As previously mentioned in the case of emergency services provision, because of the associated high budgetary and infrastructure requirements, a national approach to CRI is similarly necessary to improve access to renal replacement therapy. These important issues facing the health system at large are addressed below in the following section (5.4 *Systemic needs identified at the departmental and national levels*). Furthermore, patients with ESRD include not only ex-agricultural workers, but patients with longstanding diabetes and hypertension. Thus, an inclusive approach should be

developed that addresses all patients requiring dialysis or renal transplant. The fundamental underlying need, then, for all renal replacement therapy options is to:

1. *Develop an integrated national plan that includes an approach to renal replacement services for all patients with ESRD*

In the long run, steps that may be taken toward achieving this end are included in the following section (5.4) *Options for systemic needs identified at the departmental and national level. Apart from these long-term actions, the most immediate measures that can be locally adopted include #2-6 below:*

2. *Improve the capacity of Hospital España to provide dialysis services*

Infrastructure:

- ***Increase the designated space for dialysis services and cold storage provision***

Organization of health services:

- ***Recruit the services of a nephrologist to supervise dialysis services (and to provide specialty care for emergency and hospitalized CRI patients)***
- ***Provide technical training for hospital personnel (doctors and nurses) to increase their capacity to manage dialysis patients***
- ***Extend the distribution and implementation of MINSA's technical protocols for CRI***
- ***Increase the number of ancillary personnel- social worker, psychologist, nutritionist- necessary to provide hygiene and nutritional education and emotional support for ESRD patients on dialysis as well as for their families***

Equipment and supplies:

- ***Assure the procurement of necessary medications and diagnostic laboratory supplies to manage dialysis patients***
- ***Assure a steady supply of PD and HD supplies for patients***
- ***Secure additional hemodialysis machines***

An HD machine can be utilized to treat a maximum of 6 patients per week. At this time, there are about 80 patients with ESRD from the Health Center in Chichigalpa that require dialysis. To be able to accommodate these patients, a total of 14 machines are required to meet this need.

Outside of *Hospital España*, there are several additional options to consider in terms of securing the availability of dialysis services for ESRD patients in Chichigalpa. These include:

3. *Investigate options for Chichigalpa ESRD patients to receive dialysis treatment at HEODRA*

At the present time, ESRD patients from the Department of Chinandega are referred to *Hospital España* for dialysis services. It is clear that *HEODRA* has higher technical capacity and more resources available and is thus in a stronger position than *Hospital España* to provide dialysis services. Nevertheless, *HEODRA* still has the same basic needs that require systemic

changes to meet the ongoing high level of ongoing financial and human resource requirements to provide ongoing dialysis services.

4. Investigate opportunities for building the capacity of the Health Center to provide dialysis services (feasibility study)

Some local health officials believe that the Chichigalpa Health Center should develop its own dialysis center to accommodate the increasing numbers of ESRD patients. Towards this end, a feasibility study could assess long-term funding options, as well as determining facility and personnel capacity needs for providing dialysis services.

Providing PD services at the local Health Center has many advantages. Clinic-based services can assure a more hygienic environment (tiled floors, running water, and practice of sterile technique). Clinic personnel can assist with dialysis bag changes, freeing family members of this challenging responsibility. Ancillary services (nutritionist, social worker, and psychologist) can be more readily available to patients. Heavy, cumbersome PD supplies can be provided at a central location, foregoing the need to transport them to every patient's home. The municipality of León is already considering the option of providing dialysis in their health centers.

Although PD is preferred in most Central American countries, it has often been rejected in Nicaragua by CRI patients and their families out of fear for life-threatening complications such as peritoneal infection. Nevertheless, CAPD (continuous ambulatory peritoneal dialysis) is a safe and viable treatment for renal replacement therapy in remote and rural areas. CAPD has been revolutionized as a viable treatment of CRI patients with end-stage disease in remote and challenging geographical locations in developing countries like Mexico and India.⁷

Although a majority of medical doctors who treat CRI patients are skeptical about the level of acceptance of patients and their families, it seems that a growing patient demand for services of dialysis exists, especially for hemodialysis. Therefore, at the same time of pursuing ESRD options for dialysis, it will be important to:

- ***Determine the actual level of acceptance, interest and demand among CRI patients and their families for PD and HD***

Understanding existing barriers to acceptance will help inform health education campaigns to promote understanding of the potential risks and benefits of dialysis options. Firstly, though, it would perhaps be less potentially frustrating for patients and providers alike to confirm the feasibility of such a program (e.g., assurance of an adequate PD or HD supplies).

- ***Improve the understanding of CRI patients about the risks and benefits of dialysis***

⁷ S Vikrant, Continuous ambulatory peritoneal dialysis: A viable modality of renal replacement therapy in a hilly state of India, Indian Journal of Nephrology, Vol.: 17, Issue: 4, pp. 165-169, 2007.

It is only through a clear and accurate understanding by patients and their families of dialysis treatment options that they can make good decisions about their healthcare.

- ***Consider the potential for a dialysis unit within the Health Center in the planning of CRI clinic annex and clinic remodeling***

(See *Options to improve the infrastructure, Chichigalpa Health Center, page 7*).

- ***Secure necessary funding for ongoing dialysis service needs (clinic and laboratory equipment and supplies, medications, personnel)***

Options to help secure necessary financing for dialysis include:

- ***Building alliances and advocacy necessary to guaranty resources that can strengthen the capacity to provide dialysis treatments (equipment, supplies, human resources)***
- ***Continuing dialogue with key CRI stakeholders at the local, national, and international level -MINSA, INSS, ISA, PAHO- to build necessary support and financial resources.***
- ***Opening the lines of communication between the Internal Medicine Association and the Association of Nephrology***

Finally, regarding renal transplant options for Chichigalpa ESRD patients:

5. Strengthen the capacity of HEODRA León to be able to provide renal transplantation services

HEODRA hospital currently has the laboratory and human resource capacity to offer renal transplantation.

- ***Investigate opportunities for financing the development of HEODRA to provide renal transplant services (feasibility study)***
- ***Strengthen the capacity of HEODRA medical personnel to provide renal transplant services***

HEODRA hospital indicates that the primary obstacle preventing them from having the capacity to provide renal transplantation services is the **lack of a nephrologist**.

6. Increase the access to renal transplant services in Managua

5.4 Departmental and National level: Systemic Needs and Options

The underlying causes of many identified needs at the level of the local health center are often key issues facing a health system at large. Such critical challenges include insufficient budgetary allocation and distribution, and lack of national policy including the need for an integral strategic approach for CRI and chronic diseases in general. This is the situation facing Nicaragua as well as many other developing countries.

According to national law, MINSA is responsible for Nicaragua's national health system, and consequently provides medical care to all Nicaraguans. Similarly, INSS is responsible for providing social security benefits to insured beneficiaries, including ex-workers affected by CRI. For a variety of

difficult and complex reasons, **collaborative efforts between these two key public health institutions have, as yet, been insufficient to develop an integrated national approach to CRI.**

Current situation and needs

Over the last few years in Nicaragua, the prevalence of non-transmittable chronic diseases has been increasing at a sustained level. Cardiovascular disease, diabetes, and CRI have superseded infectious diseases as the main causes of death. In just a few years, more than 50% of the population will develop CRI or will die of a heart attack, presenting an immense challenge for *MINSA*.⁸ This demographic change in the prevalence of chronic diseases over infectious diseases as countries become more developed is not unique to Nicaragua. Thus, the new path to follow- addressing the advance of chronic illnesses- has now become clear.

Without any doubt, *MINSA* has made great strides in controlling the spread of infectious diseases, but their **efforts to address chronic diseases have been insufficient up to this time.** With the support of PAHO, *MINSA* has been able to better understand the magnitude of the problem. Accordingly, in 2003, *MINSA* conducted a diabetes prevalence study that included hypertension and other risk factors in young adults in Managua. In 2004, they also conducted an evaluation of several diabetes treatment centers in Managua, which indicated that an inadequate level of medical care was being provided.

On the basis of these results, *MINSA* implemented two PAHO initiatives in 2007 that contained more integrated and far reaching strategies: the CARMEN initiative sought to improve the population's health by reducing risk factors associated with non-transmittable diseases (chronic), aimed at improving the health of patients in three health centers in Managua, adopting the family and community health model (MOSAFC).

There is an inter-institutional agreement that facilitates medical care provision by INSS in support of *MINSA*. INSS guarantees 15 drugs for CRI patients, although some essential CRI drugs are not included in this list.

Even though these steps are a progress in establishing an approach for chronic diseases, a unified strategic plan that includes CRI, along with other major chronic diseases, such as diabetes, hypertension and cancer, is an initiative that eventually needs to be taken by *MINSA*, *INSS* and national health policy makers.

Need for a national integrated approach to CRI

Nevertheless, a **national integrated approach to CRI led by *MINSA* and *INSS* has yet to be developed.** This problem underlying the main difficulties in the treatment of CRI was consistently and often emphatically pointed out at every level by all interviewed practitioners, SILAIS health officials, clinical and hospital departmental directors, municipal leaders, and shared by CRI patients in Chichigalpa.

The consequences of the lack of a strategic plan for a national integrated CRI program are many-fold, and can be summarized as a list of systemic gaps in the care of CRI patients:

- ***Need of sufficient financial resources and budget allocation for CRI (and for chronic diseases in general)***

⁸ Interview with Dr. Lesbia Altamirano, Official, Department of Non-Communicable Diseases, PAHO/Nicaragua

Without a comprehensive strategic plan in place, it is impossible to develop an operating budget that can account for the financial resources necessary to implement a set of integrated CRI activities. It is very understandable that substantial budgetary limitations exist for chronic illnesses in a country with relatively low per capita health expenditure. Nevertheless, a meaningful approach to CRI cannot begin in the absence of a cohesive, integrated national strategy for this disease.

A comprehensive plan does not necessarily implicate budgetary changes in the prioritization of already limited resources. Rather, having a collaborative, strategic approach toward CRI in place can help utilize scarce resources more efficiently and provide opportunities to more readily identify additional resources that might exist nationally and internationally.

- ***Need to strengthen a surveillance system by utilizing epidemiological guidelines to build an organized national CRI database to help in early detection and to inform policy decisions***

Key stakeholders should rely on a set of solid data to develop effective policies. **A national organized CRI database is yet to be built**, although some departments, such as León, have started to collect critical data. One reason why **key CRI information is missing** is that only causes of death are currently reported and not morbidity. **Measures to strengthen CRI surveillance are needed to gather critical information.**

The need for the prevention of additional CRI cases is an essential component necessary to help slow the rising tide of the CRI epidemic as swiftly as possible. Part of an effective prevention strategy includes methods to diagnose CRI at the earliest stage possible of the disease. Nevertheless, early detection of CRI presents the additional challenge that patients in the initial stages of CRI are usually asymptomatic and thus do not seek a medical exam.

PAHO has encouraged *MINS*A to double its efforts to give more priority to this new epidemic as long-term costs would be greater if this condition is not treated. Better surveillance and early detection of CRI cases have the potential of further demonstrating the extent of the CRI problem, and perhaps provide the motivation necessary to advance in the development of a national strategic plan.

- ***Need to strengthen efforts for CRI health promotion***

To help halt the current CRI epidemic in Nicaragua, it is also essential to increase the knowledge about CRI and CRI preventive practices for the community. Lack of a formal national public health campaign on CRI makes it unfeasible to mount such an organized, concerted effort for CRI public education.

- ***Need to strengthen implementation of CRI protocols and necessary information systems***

A set of CRI-specific basic standards and indicators has already been developed and clearly enumerated by the Nicaraguan Association of Nephrologists and accepted by *MINS*A for its implementation at local level.⁹ Nevertheless, there is no mechanism to ensure that these protocols

⁹ Standard Compliance Indicators: Prevention and Early Detection, pp. 26-27; and Medical Care, Norm and Protocol for Addressing Chronic Renal Disease, *MINS*A

will be adequately distributed and implemented fully and properly. In addition, although these guides set standards for how to monitor CRI patients, they lack specific algorithms defining the standard of care for the treatment of CRI patients. These specific CRI care guidelines are especially needed for general physicians treating this complex illness.

In addition, the current CRI protocols do not address the underlying need for information systems necessary to ensure quality of care for CRI patients is being practiced at primary and secondary levels.

A best practice usage of protocols may be seen with those already developed for MCH (Maternal and Child Health). These guidelines have been widely implemented, and continue to be commonly practiced. As a result, these protocols have resulted in the continued improvement in quality of care in maternal and child health.

- ***Need to strengthen the system of CRI medication and reagent procurement and distribution (to prevent frequent CRI medication and reagent stock-outs)***

It is evident that some type of assistance to MINSa and INSS will be necessary to ensure continuous procurement of essential drugs for clinical management of CRI patients at the Chichigalpa Health Center and Hospital España.

- ***Need for a program for Renal replacement services for ESRD***

(For an in-depth discussion, see section 5.4 *Medical Needs for End-stage Renal Disease: Dialysis and Renal transplant*)

- ***Need to strengthen the coordination between primary and secondary levels of attention***

As exemplified by the Chichigalpa Health Center and *Hospital España*, referral systems between primary and secondary levels of care of CRI patients are weak. This systemic gap diminishes the ability to provide coordinated care essential for good management of patients with complex diseases such as CRI.

Options to address systemic needs identified at the departmental and national levels

In order to face the challenge of CRI in Nicaragua, the overarching recommendation emphasized by medical doctors and public health physicians at all levels, as well as municipal leaders and CRI patients, was to:

1. ***Develop a national CRI plan with an integrated approach that includes: prevention (surveillance), promotion, primary and secondary treatment, and renal replacement therapy***

For efficacy and sustainability of healthcare for CRI patients in the long term, it is essential that key stakeholders pursue strategic planning and coordinate finite resources and activities. Only through a well-planned, integrated approach to CRI can the specialized services necessary to manage this complex illness be achieved for CRI patients in Nicaragua.

To more effectively advance an integrated national approach to CRI, PAHO has suggested the formation of a committee composed of key stakeholders. *MINSa* already has the mandate and

capacity to take the lead in initiating this requisite activity. Technical assistance could well be provided by *ANINEF (Asociación Nicaragüense de Nefrología)*, who has already been involved in national planning for CRI through the set of protocols drafted in March 2009. Additionally, CIES can provide technical guidance in developing a CRI strategy integrated to the national approach for other chronic diseases.

There is a good opportunity to build on coordination activities at the departmental level with the National Commission on Public Health (*Comisión Nacional de Salud Pública*). Departmental stakeholders in CRI could include government organizations, municipal leaders, private sector institutions, churches, academic institutions, and community service organizations.

Concurrently with national activities, changes should be made in planning and assigning priorities at the local level. In the municipality of León, CRI has been included in the political agenda with the participation of key stakeholders. CRI has been clearly prioritized as an important public health problem, and prevention, medical care and research need to be addressed. With the assistance of SILAIS León, health promotion and monitoring activities have already been initiated, modeled on the *MOSAFC*.

A national program for CRI could address key systemic public health challenges by containing the following components:

- a) Prevention, promotion and renal protection*
- b) Primary and secondary healthcare and renal treatment replacement (dialysis and renal transplant - see option 4, Special program for ESRD)
(Personnel, equipment, supplies, medications, infrastructure, referral systems)*
- c) Appropriate information distribution systems*
- d) Sharing and application of norms and protocols for the approach to CRI*
- e) Research, and*
- f) Securing adequate levels of funding and budgetary allocation for CRI*

2. Build alliances and advocacy for resources to strengthen the ability to address diagnostic means and treatment options for CRI:

- Facilitate dialogue between key CRI stakeholders -MINSAs, INSS, ISA, PAHO, CIES and other public health universities, associations of internal medicine physicians, nephrologists, and public health***

MINSAs should coordinate CRI planning activities on a national level in collaboration with *INSS, HISA* and other private institutions, *PAHO*, and universities (*UNAN, CIES*). Universities are included as the source of training for human resources and scientific research, as well as specialized medical societies that can provide technical resources and training personnel.

3. Expand the surveillance system utilizing epidemiological guidelines to build an organized national database for CRI, to assist in early detection, and to inform policy decisions

For appropriate epidemiological surveillance of this disease, comprehensive information for each case needs to be collected once a diagnosis of CRI is made. Currently, there is no formal surveillance system in place in Nicaragua, despite the fact that a CRI protocol exists (but has yet to be implemented).

A surveillance system should be prioritized for areas of highest CRI prevalence such as Chichigalpa and adjacent municipalities in the Department of Chinandega. Participating stakeholders in the surveillance system should include the health facilities of Chinandega (health centers and hospitals), *HISA* and other private sector clinics, as well as members of the affected community (*ASOCHIVIDA* and others). Epidemiological guidelines already may be found in the *MINSA*-approved CRI protocols (*Anexo de la normativa 016 Norma para el Abordaje de la Enfermedad Renal Crónica, 3 de marzo 2009*).

SILAIS León has already started the implementation of an initiative of renal health promotion and CRI prevention. They sponsored a Workday of Analysis and Balance (*Jornada de Análisis y Balance-JABA*) on the importance of pursuing a more integral, preventive approach to CRI. Based on the *MOSAFC*, the approach focuses on the promotion of a healthy lifestyle.

SILAIS León has also initiated an early diagnosis plan based on the *MOSAFC* that encourages community members to obtain a renal function testing at their local health center. There are plans to facilitate early diagnostic testing by training community health brigade members (*brigadistas*) to conduct door-to-door urine testing for renal disease. In addition, *MOSAFC* utilizes epidemiological door-to-door surveys of family history to create a more complete database of CRI patients.

4. Plan and implement programs for CRI health promotion

A CRI health education campaign has been successfully launched and implemented by several health centers at the neighborhood level with the assistance of community leaders. Such community health centers such as the municipality of León can serve as best practices.

An opportunity also exists to take advantage of the existing National Public Health Commission to develop a more comprehensive CRI awareness and prevention campaign program.

5. Develop and implement CRI protocols for general physicians along with information systems necessary to support quality of care for CRI

Development of quality standards and indicators for national health problems is not new for *MINSA*. *MINSA* has recently published the 3rd edition of *Standards and Indicators of Quality of Healthcare Processes for Family Planning, Maternal Health, Neonatal and Infant Health, and HIV/AIDS*.¹⁰ Driven by high rates of maternal and neonatal mortality, this set of standards was initially developed as part of the Maternal and Child Health (MCH) initiative led by the USAID-supported Healthcare Improvement Project (previously, the Quality Assurance Project). A nephrologist with quality of care experience could readily help adopt this same set of standards and indicators for use for CRI. Moreover, the Healthcare Improvement Project could itself serve as a best practice in developing a multi-institutional approach to a national health problem.

An opportunity exists for *MINSA*, with the assistance of *CIES*, to more adequately meet the medical care needs of CRI patients in Nicaragua through a Quality of Attention Program at the *Centro de Salud* in Chichigalpa. Such a program can assist in developing quality standards, indicators for implementation, and information systems to support quality of care for CRI as part of a national referral experience for the country. For a detailed discussion of this option, see section 5.1.2 *Organization of Health Services: Options - Quality of Care*.

6. Strengthen processes of procurement and distribution for CRI medications and reagents (including adequate budgetary allowance and a provisional plan for shortages)

Technical obstacles in the procurement process can be addressed with the assistance of medication procurement specialists. Availability of adequate funding is another key challenge that needs to be faced. In the short run, this need might be at least partially addressed by NSEL's initial financial commitment to supplement the Health Center's supply of CRI medications and reagents. In the long term, however, it will be essential that key stakeholders such as *MINSA* and *INSS* develop a coordinated approach for CRI to meet all of the ongoing needs of CRI patients, of which medication provisions is just one need.

PAHO has the willingness to provide support with medication provision, as they did last year in helping the National Diabetes Association. New approaches are also being attempted by departmental health departments. SILAIS León, for example, has implemented a program to more

¹⁰ Quality standards and indicators of healthcare processes: Family planning, maternal health, neonatal and child health, HIV/AIDS and correct use of antiseptic solutions and hand hygiene, Health Ministry, Managua, October 2009,

closely determine the magnitude of CRI so as to more accurately anticipate medication needs. They then identify potential resources within different sectors to meet these anticipated needs.

7. *Collectively develop among all the key stakeholders a special program for renal replacement services for end-stage CRI*

The high cost of care for CRI patients has made the organization of an appropriate program for end-stage CRI difficult. As a result, renal replacement services have not been promoted by the health system nor, furthermore, has dialysis been accepted by CRI patients and their families out of fear for life-threatening complications such as peritoneal infection. Nevertheless, chronic ambulatory peritoneal dialysis (CAPD) has been revolutionized as a viable treatment of CRI patients with end-stage disease in remote and challenging geographical locations in developing countries like Mexico and India.

Also, renal replacement therapy can be organized and utilized in an appropriate manner to allow for scientific advancement and technical development that will make renal transplants more viable. Towards this end, participation of all key stakeholders is necessary in the search for solutions and the wellbeing of CRI patients. Finally, care of end-stage CRI patients will require psychosocial support for both the patient and the family.

Although the financial challenges are enormous, renal replacement remains the only chance of survival for CRI patients with ESRD. To meet the growing need for these costly services, the design of national program that addresses renal replacement must have an accurate picture of the feasibility and the most cost-effective, affordable approaches to take. In the meantime, continued efforts must be made to strengthen the capacity of hospitals to provide renal replacement services. (For a more complete discussion of options for renal replacement, see section 5.3 *End-stage Renal Disease: Needs and Options*).

8. *Strengthen the communication and coordination of activities between first and second levels of care*

A well defined and implemented mechanism of referral between different healthcare levels assure that primary and secondary care needs for CRI patients are adequately coordinated. *MOSAFC* can provide existing guidelines for how to approach meeting this essential need.

6 Summary of Options: *Next Steps*

Nicaragua is a poor country with limited resources, so, understandably, substantial gaps in the health system exist for many chronic diseases. Especially for this reason, it is essential to prioritize cost effective measures that can address in the short term most immediate problems faced by CRI patients.

At the same time, immediate measures taken at the local level depend on the ongoing support of the healthcare system at the national and regional level to ensure their sustainability over time. Steps at these levels necessarily require inter-institutional collaboration, political will, policy change, and prioritization of scarce resources; as such, they are considerably more challenging to plan and

implement. Nevertheless, long term steps at these broader levels are essential to adequately address systemic issues.

This report offers a series of preliminary options arising out of the common issues expressed by key stakeholders, as well as from the experience and technical expertise of the needs assessment team members. As such, a list of options has been developed that reflects existing best practices for chronic illnesses through a medical and public health lens, and is summarized in the following tables below.

Options are divided into 3 sections- short, intermediate and long term. Short and intermediate term steps are focused on more concrete actions that can be started immediately and have a more direct effect on improving the level of primary and secondary healthcare for CRI patients in Chichigalpa. Long term options focus on root healthcare system issues that need to be addressed at a national level.

To provide a more specific context for these three groups of summarized options, they are paired with their corresponding set of identified needs addressed, which are also summarized in the tables below.

6.1 Short term Options

Adequate ongoing management of CRI is the most effective way to slow down the progression of the disease and to avoid complications as well. Good management of CRI emergencies at the local level can also reduce the need for transport to regional hospitals.

Since the Health Center is the health facility at which the vast majority of CRI patients in Chichigalpa receive their medical attention, prioritizing short term steps for this health facility would most likely offer the greatest immediate impact in improving the health needs of local CRI patients. Towards this end, targeting funds for specific improvements at this local health facility provides an opportunity to make substantial improvements to close the gap of identified healthcare needs for CRI patients in Chichigalpa. Moreover, addressing these specific needs at the Health Center will also serve to improve primary healthcare services for all clinic patients as well.

Although it will be essential to address fundamental health system issues, there are some immediate steps that can be taken in the short run to directly improve the capacity of the "Julio Durán" Health Center to provide improved medical attention improved for CRI patients. A more complete discussion of these options is included in Section 5.1 *Primary Health Needs: Health Center*. In summary, these options along with the needs addressed include: *(continued on next page)*

6.1.2 To immediately improve the Julio Duran Health Center (Primary Healthcare - local level)	
Needs Identified	Options
<p>Infrastructure:</p> <ul style="list-style-type: none"> • <i>Need for additional space to more adequately manage CRI patients</i> • <i>Need for additional space to more adequately observe more seriously ill patients</i> • <i>Need for an adequate budget for maintenance and remodeling</i> 	<ul style="list-style-type: none"> • <i>Design and construct two separate pavilions: One to expand the current CRI clinic (separation of patient cares spaces, waiting room expansion, meeting space), and a second for an observation unit for patients in unstable condition</i> • <i>Assure adequate funding for ongoing maintenance and remodeling needs</i>
<p>Organization of health services: <i>Clinical services provided</i></p> <ul style="list-style-type: none"> • <i>Need to strengthen the availability of medical attention for emergency needs arising after limited clinic hours, due to need for more personnel with necessary training</i> • <i>Need to strengthen the multi-disciplinary management of CRI patients and their families that addresses educational, dietary and psychosocial needs</i> • <i>Integration of services among institutions</i> • <i>Weak communication and coordination of activities between first and second levels of care</i> • <i>Need for funding for the provision of fuel for an ambulance availability for the free transport of very ill CRI patients</i> 	<ul style="list-style-type: none"> • <i>Provide sufficient human resources for a physician and nurse team trained in CRI protocols to be available for emergency care for CRI patients 24 hours a day</i> • <i>Develop a health education strategy for CRI patients and their families</i> • <i>Make available the services of a nutritionist, psychologist and social worker to provide needed professional counseling and support for CRI patients and their families</i> • <i>Designate a director and a focal point in charge of a program for CRI patients</i> • <i>Investigate the interest of CRI patients and their families in receiving end of life (palliative) care</i> • <i>Strengthen the communication and coordination of activities between first and second levels of care</i> • <i>Secure funding for the provision of fuel for ambulance availability for the free transport of very ill CRI patients</i>

<p>Equipment and supplies:</p> <ul style="list-style-type: none"> • <i>Need to strengthen laboratory equipment essential for the adequate management of CRI patients, and</i> • <i>Need to strengthen the sufficient supply of essential medications and laboratory supplies</i> 	<ul style="list-style-type: none"> • <i>Provide critical equipment necessary for the CRI clinic to function adequately</i> • <i>Ensure that INSS conducts a study to evaluate the accuracy of the interpretation of ultrasound examinations in order to resolve the apparent discrepancy issue</i> • <i>Create a CRI medication and lab reagent fund managed by MINSA to supplement their purchase and to assure their steady supply</i>
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6.2 Intermediate Term Options

<p>6.2.1 To address the root issue of quality of attention at the Julio Duran Health Center (Primary Healthcare - local level)</p>	
Needs Identified	Options
<ul style="list-style-type: none"> • <i>Need to strengthen feedback systems for monitoring, supervising and evaluating the management of patients and quality of services for CRI (and other chronic illnesses as well)</i> • <i>Need for specific CRI guidelines and CRI capacity building for general physicians, especially for emergency management</i> 	<ul style="list-style-type: none"> • <i>Develop and implement a program (“a national reference experience”) to improve the quality of medical attention with the support and coordination of CIES and MINSA</i>

<p>6.2.2 To improve emergency and hospital care of CRI patients at Hospital España, Chinandega (Secondary and Tertiary Healthcare - departmental level)</p>	
Needs Identified	Options
<ul style="list-style-type: none"> • <i>(Institutional needs identified for Hospital España rely on national CRI policy change and parallel the group of needs presented for the Health Center in the infrastructure, organization of services, and equipment and supplies)</i> 	<ul style="list-style-type: none"> • <i>(Specific options for Hospital España rely on national CRI policy change and parallel the list of recommendations presented for the Health Center in the infrastructure, organization of services, and equipment and supplies)</i>

6.2.3 To improve access of CRI patients to dialysis services (Secondary and Tertiary Healthcare - Departmental level)

In the long run, steps that may be taken toward achieving the goal of dialysis provision are included in the following section (5.4) *Options for systemic needs identified at the departmental and national level*. Specifically, the objective of this component is to *develop an integrated national plan that includes an approach to renal replacement services for all patients with ESRD*.

Short of addressing these long term measures, more immediate steps that can be taken locally include:

Needs Identified	Options
<p>Barriers to the provision of dialysis services (PD and HD) include:</p> <ul style="list-style-type: none"> • Availability of medications, laboratory reagents and supplies necessary to provide dialysis services • Necessary hemodialysis equipment and adequate space for service provision and cold storage of supplies • Widespread fears of PD complications (death from peritonitis) • Expense of hygienic requirements for PD (tiled floor) • Expense of high protein diet needed for dialysis patients • Very high expense of dialysis (PD costs about \$900/month/patient, \$600 initial patient cost for PD catheters) • Challenge for INSS and MINSA to pay for high ongoing costs for dialysis or initial cost of transplant • Exclusion of all sick CRI patients without pensions or social security benefits 	<ol style="list-style-type: none"> 1. Improve the capacity of Hospital España to provide dialysis services (PD and HD) <ul style="list-style-type: none"> • Increase space for dialysis services • Provide necessary cold storage • Recruit nephrologist to supervise dialysis services • Provide dialysis training for hospital personnel • Extend the distribution and implementation of MINSA's technical protocols for CRI • Increase the number of ancillary CRI personnel • Assure a steady supply of PD and HD supplies for patients • Secure additional hemodialysis machines 2. Investigate options for Chichigalpa ESRD patients to receive dialysis treatment at HEODRA 3. Investigate opportunities for building the capacity of the Chichigalpa Health Center to provide dialysis services (feasibility study)

<p>Barriers to the provision of renal transplant services include:</p> <ul style="list-style-type: none"> • <i>Need of national legislation supporting living transplant donors</i> • <i>Need of a transplant surgeon (in Western Nicaragua)</i> • <i>Need for histocompatibility testing</i> • <i>High cost of immunosuppression medications (necessary on a chronic basis post-transplant)</i> • <i>Need of a nephrologist (HEODRA)</i> • <i>Need of necessary funding</i> 	<p>4. Strengthen the capacity of HEODRA León to be able to provide renal transplantation services</p> <ul style="list-style-type: none"> • <i>Investigate opportunities for financing the development of HEODRA to provide renal transplant services (feasibility study)</i> • <i>Strengthen the capacity of HEODRA medical personnel to provide renal transplant services</i> <p>5. Increase the access to renal transplant services in Managua</p>
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6.3 Long term Options

Although long term needs for changes in policy and inter-agency collaboration are more of a formidable challenge than short and intermediate term steps, addressing these needs will be essential in assuring the feasibility and sustainability of CRI health services at the local level.

By involving a basic set of collaborative processes among key CRI stakeholders, several steps may be taken to move ahead toward the goal of meeting the healthcare needs of Nicaragua’s CRI patients.

6.3.1 To address gaps in the health system at large (departmental and national levels)	
Needs Identified	Options
<ul style="list-style-type: none"> • <i>Need of an integrated national approach for CRI</i> • <i>Need of greater financial resources and budgetary allocation for CRI (and for chronic diseases in general) for trained personnel and adequate supplies</i> • <i>Need to strengthen a surveillance system utilizing epidemiological guidelines to build an organized national database for CRI, to assist in early detection, and to inform</i> 	<ol style="list-style-type: none"> <i>1. Develop a national CRI plan with an integrated approach (that includes prevention (surveillance), promotion, primary and secondary treatment, and renal replacement therapy)</i> <i>2. Build alliances and advocacy for resources to strengthen the ability to address diagnostic means and treatment options for CRI:</i> <i>3. Expand the surveillance system utilizing epidemiological guidelines to build an organized national database for CRI, to assist in early detection, and to inform policy decisions</i>

<p><i>policy decisions</i></p> <ul style="list-style-type: none"> • <i>Need of greater efforts for CRI health promotion</i> • <i>Need to strengthen the implementation of CRI protocols and necessary information systems</i> • <i>Need to strengthen the system of CRI medication and reagent procurement and distribution (to prevent frequent CRI medication and reagent stock-outs)</i> • <i>Need for a program for Renal replacement services for ESRD</i> • <i>Need to strengthen the coordination between primary and secondary levels of attention</i> 	<ol style="list-style-type: none"> 4. <i>Plan and implement programs for CRI health promotion</i> 5. <i>Develop and implement CRI protocols for general physicians along with information systems necessary to support quality of care for CRI</i> 6. <i>Strengthen processes of procurement and distribution for CRI medications and reagents (including adequate budgetary allowance and a provisional plan for shortages)</i> 7. <i>Collectively develop among all the key stakeholders a special program for renal replacement services for end-stage CRI</i> 8. <i>Strengthen the communication and coordination of activities between first and second levels of care</i>
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Assuring the viability, sustainability and impact of the extensive list of options mentioned in this report requires a global focus to integrate the different options into a unified strategic plan. Only through a well-planned, integrated approach to CRI can the specialized services necessary to manage this complex illness be achieved for CRI patients in Nicaragua.

6.4 Options: *Conclusions*

Although it will be essential to address fundamental health system issues, there are some concrete, immediate steps that can be taken in the short run to directly improve the capacity of the Julio Duran Health Center to provide improved medical attention improved for CRI patients.

An operational Quality of Attention Program adapted by the Health Center can serve to decrease complications, maximize health outcomes, and provide services of the highest quality at the lowest cost at the same time. Towards this end, an opportunity exists for MINSAL to more adequately meet the medical care needs of CRI patients in Nicaragua through establishing a Quality of Attention Program as a national reference experience at the Health Center in Chichigalpa.

Regarding renal replacement treatment options, we believe that it is possible to provide dialysis in the Health Center if there is an agreement among *MINSAL, INSS, ISA* and other stakeholders that can assure necessary improvements in both the infrastructure and the organization of health services.

Several important considerations for these proposed CRI options to improve care are essential to address at the onset of the strategic planning process. First, priorities will need to be established based on such criteria as relative costs versus potential impacts, feasibility and sustainability, and relative risks and chances for success of each recommendation. Potential opportunities lost and implications of choosing one recommendation over another must also be taken into consideration. Thus, as a first step in this prioritization process, all dialogue participants will need to be sufficiently informed about each recommendation so that they can make the best decisions possible.

Immediate measures taken at the local level will depend on the ongoing support of the healthcare system at the national and regional level to ensure their sustainability over time. Steps at this level necessarily require building and maintaining strong working partnerships with political will and commitment that maintain ongoing institutional coordination between public and private institutions at the local, national, and international level for the long term. As such, they are considerably more challenging to plan and implement. Nevertheless, long term steps at this level are essential to adequately address systemic issues.

The challenge facing *MINSA* and *INSS* as key stakeholders in the care of CRI patients and patients with chronic diseases is immense. It is very understandable that substantial budgetary limitations exist for chronic illnesses in a country with relatively low per capita health expenditure. Nevertheless, a meaningful approach to CRI cannot begin in the absence of a cohesive, integrated national strategy for this disease. Not directly facing the need to develop essential policy at a national level in a timely manner only serves to exacerbate the current and future status of an already devastating disease.

A comprehensive plan does not necessarily implicate a change in the prioritization of already limited resources. Rather, having a collaborative, strategic approach toward CRI in place can help utilize scarce resources more efficiently and provide opportunities to more readily identify additional resources that might exist nationally and internationally in both public and private sectors.

The necessary path to follow to improve access to healthcare for CRI patients is clear- it only awaits the willingness of key stakeholders to take the first steps.

Annexes

Annex 1: List of Key Informant Interviews

Dr. Francisco López, Director, Dialysis Center, Hospital España, Chinandega.

Dr. Byron José Lezama, Internist, Hospital España

Dr. Alejandro Marín, Director, Hospital Ingenio San Antonio

Dr. Félix Zelaya, Clinical Hematologist/Oncologist, Hospital Ingenio San Antonio.

Dr. Rebeca Torres, Director, Julio Duran Health Center in Chinandega.

Dr. Ervin Reyes, Nephrologist, CRI Clinic at the Chichigalpa Health Center.

Dr. Emérita Rugama, Medical Internist, Chichigalpa Health Center.

Dr. Gilberto Moreno, Director of Epidemiology, SILAIS León

Dr. Rafaela Briceño, Epidemiological Surveillance, SILAIS León

Dr. Mercedes Centeno, Responsible for CRI, SILAIS León

Dr. Marcial Montes, Medical Assistant Director, Hospital HEODRA, León

Dr. Mauricio Jarquín, Head of Nephrology Services, Hospital HEODRA, León

Dr. Benjamín Barreto, Municipality of León.

Dr. Argentina Parajón, Municipality of León.

Dr. Humberto Ramírez, Subtiava Health Center, City of León.

Dr. Miguel Orozco, CIES Director.

Dr. Iván García, Director of Curative Services, INSS

Dr. Carmen González, Quality Director, INSS

Dr. Carlos Delgado, Medical Analyst of Curative Services, INSS

Dr. Lesbia Altamirano, PAHO/WHO Official for Non-Communicable Diseases.

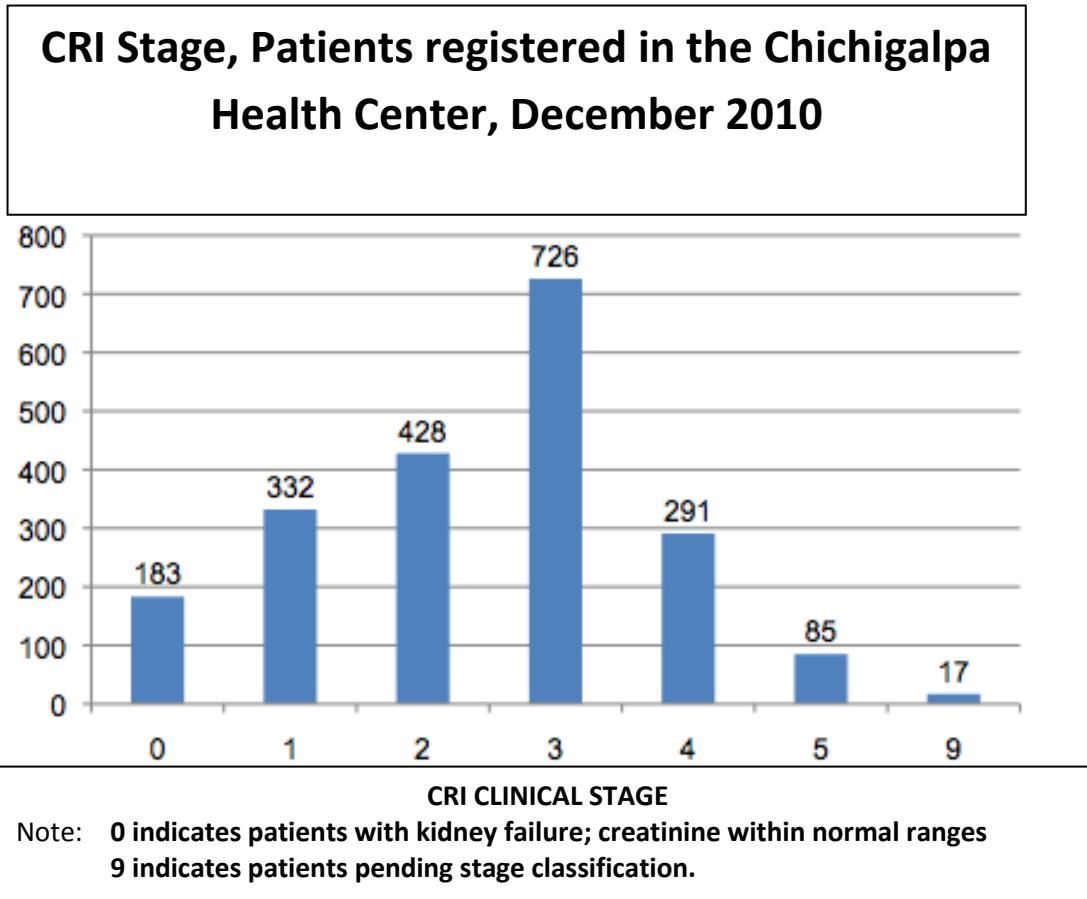
Members of the Board of Directors of ASOCHIVIDA: Donald Cortés, Ezequiel Ramírez, Cecilio Ferrufino, Vicente Espinales, Salvador Soto. **Annex 2: Evaluation Guide to Identify Health Needs of CRI Patients at the Chichigalpa Health Center**

What questions/issues do we want to answer?	From whom / where do we get this info?	What data gathering tool shall we use?
<p>What are the existing resources and needs at the Health Center, specifically regarding:</p> <ul style="list-style-type: none"> • Facility / physical needs (CRI clinic versus general clinic) Waiting room, bathrooms, A/C, water cooler, etc. • Capacity of staff Number of staff treating CRI Staff training/ability to treat CRI (especially during emergencies) Availability of staff (clinic hours) Quality of care capacity (knowledge, attitudes, practice) • Equipment and supplies Laboratory, pharmacy General clinic versus CRI clinic • Referral sources (for complications) Availability Access (cost, time, transportation) 	<p>Health Center: -Director -Director of CRI Clinic -Clinical staff -Laboratory staff -Pharmacy</p> <p>Ingenio San Antonio -Dr. Felix Zelaya -Dr. Alejandro Marín -Dr. Mauricio Jarquín</p> <p>ASOCHIVIDA Board of Directors</p>	<p>Key informant interviews</p> <p>Focus groups (health center clinical staff)</p>
<p>In what ways would a CRI clinic independent of the Health Center improve the attention that the patients currently receive?</p> <ul style="list-style-type: none"> • What are the benefits? • What are the costs/risks? • What is the feasibility? 	<p>Health Center: -Director -Director of CRI Clinic -Clinical staff -Laboratory staff</p> <p>SILAIS Chinandega</p> <p>ASOCHIVIDA Board of Directors</p>	<p>Key informant interviews</p> <p>Focus groups (health center clinical staff)</p>
<p>What options are there for dialysis for CRI patients with ESRD in Chichigalpa?</p> <ul style="list-style-type: none"> • What is the current need for dialysis? • What is the current access to and availability of hemodialysis and peritoneal dialysis for ESRD patients from Chichigalpa? • What is the current and anticipated capacity of Hospital España and Hospital Rosario-León for dialysis patients? • What is the need and feasibility of a separate dialysis unit in 	<p>Hospital España and Hospital Rosario-León: -Director of Dialysis Unit -Hospital Director</p> <p>Health Center: -Director -Director of CRI Clinic</p> <p>ASOCHIVIDA Board of Directors</p>	<p>Key informant interviews</p> <p>Focus groups</p>

Medical Needs Assessment at the Chichigalpa Health Center
Dialysis Options for Patients with Chronic Renal Insufficiency

<i>Chichigalpa?</i>	SILAIS Chinandega MINSAs (Central) PAHO	
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Annex 3: CRI Stage, Patients Registered in the Chichigalpa Health Center, December 2010



**(Statistics of the CRI Clinic at the Chichigalpa Health Center)*

Annex 4: Equipment and Materials Needs of the CRI Clinic at the Chichigalpa Health Center

Existing equipment and condition

Type of furniture and/or equipment	Condition
2 Desks	Regular
1 Reception desk	*Poor
17 Plastic chairs	Good
1 Air conditioner	Regular
1 Computer with damaged CPU	Regular
1 Scale with integrated measuring rod	Regular (broken measuring rod)
1 Tensiometer	Regular
1 Stethoscope	Regular
1 Oto/Ophthalmoscope	Poor condition
1 File cabinet	Regular
1 Ultrasound	Good

*Loan from the Statistics Unit at the Chichigalpa Health Center.

Materials Needs

- 2 tensiometers, two stethoscopes and two oto-ophthalmoscopes
- 1 scale with integrated measuring rod
- 1 water cooler for patients
- 1 “Diagnostic 500” or higher laboratory equipment
- Reagents for uric acid
- 1 CPU and toner
- 1 shelf for stationery
- 1 file cabinet
- 1 small refrigerator
- 2 small tables (85x 50x73 cm)
- Stationery

Annex 5: Treatment costs for end-stage CRI

		Monthly cost (per patient)	Annual cost (per patient)	Annual cost for 20 patients
Continuous ambulatory peritoneal dialysis	CAPD	\$888*	\$10,658	\$213,166
Automated peritoneal dialysis	APD	\$294**	\$3,525	\$70,502
Hemodialysis*		\$1,132***	\$13,586	\$271,711
Renal transplant		(initial cost) \$17,000		

*MINSAs, 2007 (based on 4 dialysis bags per day)

**MINSAs, 2007 (based on 2 sessions per week)

***This represents the actual price that INSS pays to the private hospital in Managua for hemodialysis services