Nurse Led Protocols
Twice the face time, half the cost

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**Executive Summary**

Improving the care of chronic illnesses for urban, underserved populations will require substantially different care delivery models that restructure the way that routine care is provided. Significant barriers exist in this population including: low reimbursement rates; limited supply of providers; high no show rates of patients; complexity of medical conditions; language/cultural/literacy barriers; high rates of addiction, mental illness, and homelessness; and isolation.

To better address the complex needs of medically underserved patients with chronic medical conditions, the Cooper Urban Health Institute (UHI), a business unit at the Cooper Health System, established Licensed Practical Nurse (LPN) led protocols focused on improving care of chronic illness. As expected, LPN-led protocols resulted in improved quality, reduced costs, and greater access for patients. This white paper describes key learning from implementing these protocols during a three-year initiative funded by The Nicholson Foundation.

**Background**

The US currently spends $2.8 trillion dollars on healthcare, which is twice the per capita spending of other industrialized countries. Despite our high spending, significant disparities in care exist and internationally we rank at the bottom in measures of quality, access, and patient satisfaction. For state governments, the fastest rising cost and the biggest part of their budget is Medicaid. Fundamental and painful restructuring of Medicaid and Medicare will be necessary to find savings and avoid draconian rationing. Designing and implementing new models of healthcare delivery, which can provide better care at lower cost for the most vulnerable, is a crucial task moving forward.

UHI was established in 2012 by the Cooper Health System as a dedicated business unit focused on improving care of the underserved. With 32,000 visits per year across 23 different specialties, UHI is the primary source of Medicaid specialty care across the region. UHI was formed to improve quality, reduce cost, expand access, and build a replicable model.

An important part of the project was segmentation of populations with employees and commercially insured patients moving to a different office and UHI specializing in the needs of underserved patients. Prior to the formation of UHI, clinical services for the

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1 Working paper for The Nicholson Foundation - please contact authors for use of information

2 Underserved defined as New Jersey Medicaid patients and Camden residents with Medicare, as well as some uninsured patients.
underserved had a high no show rate of 20-40% and ran at a significant financial deficit of greater than $3 million per year.

Using modern business and quality improvement techniques of task shifting, protocolization, standardization, segmentation, workflow redesign, metrics/dashboards, and group visits, UHI has demonstrated improvements in all three domains: access, cost, and quality. This paper will describe improvements due to implementation of LPN-led protocols.

**LPN-led Protocols- An Overview**

Each day, in even the most well-run, highly regarded medical organizations, healthcare is an ad-hoc, one-act improvisation that is full of non-standard work. Staff move about quickly to put out the endless smoldering fires of a disorganized system, often standing in the gap, alone, struggling to provide good healthcare services, but eventually burning out. The historical medical model functions with staff who are not trained or organized to work in high functioning, integrated teams. The end result for patients is confusing, expensive, and often dangerous healthcare services.

UHI’s goal in implementing LPN-led nurse protocols was to provide care for the most vulnerable patients where and when they need it—in their own community in a standardized, culturally sophisticated model. Health systems across the country including the Veterans’ Affairs Health System and Duke University use a variety of nurse-driven protocols for the management of chronic diseases with outstanding efficacy and patient satisfaction\(^3\),\(^4\)

Task shifting, according to the WHO, is the reallocation of responsibilities among a healthcare team, usually from more-qualified healthcare professionals to less specialized workers, in order to promote efficiency and cost-effective patient care. For example, physicians are highly skilled and highly compensated members of the healthcare system who often manage both simple and complex medical conditions. Much of their work can be protocolized, standardized, and safely delegated to team members with appropriate oversight and training. According to Clayton Christensen et al., matching the physician’s skill to the complexity of the problem at hand will help address the problem of overspending in healthcare.\(^5\)

Several members of the UHI team travelled to Maduri, India in 2014 to learn about the work being done at the Aravind Eye Hospital. The staff at Aravind provide high-quality,

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low-cost cataract surgery for the most vulnerable in India by protocolizing common, repeatable tasks and training lower-cost personnel to perform these tasks. Task-shifting created a seamless, highly-productive organization that served as the inspiration for implementing LPN-nurse led protocols at the Urban Health Institute.

A common example of a nurse led protocol is for the management of a very dangerous blood thinner called Coumadin. All over the country, in many health systems, RN-level nurses manage Coumadin without direct oversight through the use of a protocol. With close attention to patients who fall out of the parameters of a protocol, care can be standardized and delivered with higher fidelity to specific quality metrics.

The average salary for a licensed practical nurse is $41,540, while an internist makes an average of $185,000, suggesting that the use of LPN time versus physician time is financially desirable when clinically appropriate.\(^6\)\(^7\)

Two types of LPN-nurse led protocols have been implemented in UHI: insulin management for diabetes mellitus and hypertension management (HTN). This paper outlines implementation, outcomes data, and key lessons learned from these protocols. Use of LPN-level nurses to start and titrate medication under a protocol is unusual and we do not know of any other similar use of LPNs to utilize protocols in the way that we have implemented.

**Implementation**
They key to successful implementation of nurse-led protocols was physician buy-in, well-designed protocols, regular monitoring and oversight, and well-trained staff. The process of implementation began with protocol development and project planning.

**Protocol development and planning**- During this phase the following issues were addressed:

- **Literature review**- A comprehensive literature review was conducted and examples of officially recognized guidelines were collected.
- **Stakeholder engagement**- Physician providers in UHI were engaged to get their input and buy-in for the LPN-nurse led protocols. They were asked to review the draft protocols.
- **Data analysis**- The number of potential patients was calculated using claims data for patients with a diagnosis of diabetes and/or hypertension.

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Communications plan- Scripts were written for call center and front-line staff to explain the project to patients. Staff were educated on the project.

Oversight- A plan for moment-by-moment clinical back-up for the LPN’s was developed as well as ongoing monitoring.

IT- LPN scheduling and templates were added to the scheduling and EPIC (electronic medical record-EMR) systems. “Smart Phrases” or stock note structures, were created in the EMR to simplify and make uniform the documentation of visits.

Legal and compliance- LPN protocols were discussed, reviewed, and approved by the compliance departments at Cooper to ensure appropriate oversight, clinical roles, documentation, and billing.

Medical Director approval- The final protocols were formally approved and signed by the medical director of the office.

Pilot- A crucial part of the project was to conduct a very small pilot to ensure patient acceptance, staff training, and appropriate oversight.

Protocol training and implementation- LPN staff were carefully recruited for their ability to learn and follow a clinical protocol. Extensive training was done by an APN who had drafted the protocols.

Written competencies- A job description with written competencies was drafted for the LPN’s required for this project.

Training sessions for PCP’s- Training was provided for physicians at UHI so they would understand the protocols, referral process, and method of patient follow-up.

LPN training- LPNs received extensive one-time and ongoing training and mentoring from an APN, endocrinologist, and pharmacist. It took 3 months for LPNs to be trained and mentored into the project. All new LPNs receive 6 weeks of initial training with 2 weeks of in-depth training in both the HTN and insulin protocols.

Communications- Ongoing communication was provided to key staff, stakeholders, and providers to ensure their awareness of the growth and development of the protocols.

Back-up plans- Extensive back-up plans were in place during all clinical sessions to ensure LPNs could consult with an in-house primary care provider to see a patient or discuss a case, if needed.

Protocol enrollment- The protocols have very specific criteria for enrollment. The enrollment can occur through direct referrals from providers, by request from patients, or through identification of patients not reaching clinical goals.

Criteria for HTN protocol- New diagnosis of HTN. Patient with uncontrolled HTN defined as a blood pressure (BP) greater than 140/90.

Criteria for insulin protocol- New diagnosis of diabetes mellitus (DM) requiring insulin, initiating insulin treatment, or patients on insulin with HbA1C>7%.
Protocols implementation-

- **Hypertension protocol** - Patients attend a series of 4 visits for blood pressure readings, education and titration of anti-hypertensive medications. Educational topics include pathophysiology of HTN, low-salt diet, exercise, and medication management. Verbal education is supplemented with videos and printed materials. Re- and post-intervention blood pressure readings are collected and assessed.

- **Insulin Titration** - Patients enroll in four sessions for blood glucose review, education, and insulin titration. The education curriculum covers blood glucose log review, insulin injection technique, hyper- and hypoglycemia recognition and management, dietary education using The My Plate Method and diabetes self-care behaviors using videos and other instructional materials. Pre- and post-intervention HbA1c readings are collected and assessed.

**Access and Quality Outcome Data**

LPN protocols demonstrated improvements in cost, quality, and access for patients with HTN and/or DM.

**Hypertension protocol**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access</strong></td>
<td>Enroll patients in an LPN led HTN protocol</td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td>Achieve reduction in blood pressure for at least 50% of patients</td>
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<thead>
<tr>
<th></th>
<th>Protocol participant (115)</th>
<th>Control (115)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. Initial SP</td>
<td>155</td>
<td>145</td>
</tr>
<tr>
<td>Avg. Initial DP</td>
<td>89</td>
<td>86</td>
</tr>
<tr>
<td>Avg. SP change</td>
<td>-13</td>
<td>12</td>
</tr>
<tr>
<td>Avg. DP change</td>
<td>-5</td>
<td>3</td>
</tr>
<tr>
<td>% at &gt;140/&gt;90 goal</td>
<td>50%</td>
<td>17%</td>
</tr>
<tr>
<td>% that improved SP and DP</td>
<td>83%</td>
<td>22%</td>
</tr>
<tr>
<td>Avg. age</td>
<td>60</td>
<td>UNAVL</td>
</tr>
<tr>
<td>Avg. LPN visits</td>
<td>2.3</td>
<td>N/A</td>
</tr>
</tbody>
</table>

8 http://www.choosemyplate.gov/
**Insulin Titration Pilot**

- 37 patients were seen for over 90 visits. Mean age was 59.5 yrs.
- The population was African American (24%) and Hispanic (76%), and 51.3% had Medicaid insurance.
- Of the 21 patients eligible for a 12-week follow-up HbA1c, 0%, 37.4%, 31.3% and 31.3% of the patients completed 1, 2, 3 or 4 sessions, respectively.
- 16 of 21 eligible patients completed the pre- and post HbA1c levels with a mean decrease of 1.89% (95% CI, -0.41 to -3.38, p< 0.05).

<table>
<thead>
<tr>
<th>Objective</th>
<th>Result</th>
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</thead>
<tbody>
<tr>
<td><strong>Access</strong></td>
<td>Enroll at least 10 patients in a pilot project for LPN titration of insulin</td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td>Achieve HbA1c improvement for 2/10 patients</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Objective</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pilot patients</strong></td>
<td><strong>Control patients</strong></td>
</tr>
<tr>
<td>Avg. starting HbA1c</td>
<td>10.8%</td>
</tr>
<tr>
<td>Avg. age</td>
<td>60.4</td>
</tr>
<tr>
<td>Avg. time in months btwn result</td>
<td>4.5</td>
</tr>
<tr>
<td>Avg. change in HbA1c</td>
<td>-1.05%</td>
</tr>
<tr>
<td>% reached goal of &lt;9% HbA1c</td>
<td>40%</td>
</tr>
<tr>
<td>% clinically improved</td>
<td>70%</td>
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**Cost Outcome Data**

<table>
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<tr>
<th>Objective</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td>Measure and reduce staffing costs</td>
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</tbody>
</table>

The driving outcome for LPN led protocols is to reduce staff costs and create physician capacity to care for more acute patient visits. By task-shifting protocolized visits to LPNs from physicians we simultaneously provide a longer visit (LPN led visits are 30 minutes compared to an average 15 minute physician visit) with half the staff costs. Allowing patients to have double the provider face time at half the cost. This also frees up appointments on the physician schedule once patients are being followed by the LPNs.

⁹ Calculations made assuming an average annual salary for physicians of $180,00; and an average hourly rate of $21.00 for LPN staff
for the duration of the protocol, allowing physicians to see patients with greater medical complexity.

**Lessons learned**

Innovating new models of care while stabilizing a rapidly growing urban specialty office targeting the most complex patient population was exceptionally challenging. The two suites, medical and surgical specialty offices that UHI began to run had underdeveloped operational structure and leadership. Over the last three years, 90% of the front-line staff intentionally turned-over and all of the leadership has been replaced. The organizational structure is significantly different than when UHI took over 3 years ago. During this same time, the volume was increasing by 20% per year due to Medicaid expansion.

Much has been written about the use of community health workers to bridge the cultural and language divide between traditional health system and underserved communities. Most community health workers provide patient education, navigation, and support. Our LPNs are hired from the community and are often bilingual and bicultural. They can spend more time with patients and build very strong relationships. They are in some sense, the next incarnation of the community health worker model because they can start and titrate treatments and order tests under a signed protocol.

Nurse led protocols are a good first introduction to the ideas of task-shifting and protocolized work within a clinical setting. Implementation of the LPN-nurse led protocols went much smoother and had less challenges than implementation of group visits. In retrospect, implementing the nurse protocols should have occurred first because they lay a good foundation for later implementation of group visits. Nurse protocols do not significantly change the flow or behavior of most physicians working in UHI; they can be passive participants and do not need to actively engage with the LPNs. There was very positive uptake and response from patients and the positive clinical outcomes from patients helped to win over physicians who were sitting on the ‘sidelines.’

**Key lessons**-

1. **Start small**- We started with a HTN protocol because our baseline data for HTN control was not good, the number of patients needing treatment was too large for physicians to manage, and treatment of HTN is well described and easily protocolized. We started with one LPN working closely with one APN which helped to win over physicians.

2. **Grow slowly**- LPN protocols were allowed to grow slowly. We added a second protocol after 1 year.
3. **Dedicate staff** - Management and growth of LPN protocols requires dedicated staff on the clinical and operational side. Fortunately, thanks to outside funding we were able to dedicate specific staff to the development of LPN protocols.

4. **Operations vs clinical knowledge** - Having dedicated operational staff was important. LPN protocols are a significant logistical and operational challenge that requires non-clinical skill sets on the team.

5. **LPN training and recruitment** - It’s crucial to hire LPNs with the ability to learn and manage protocols. Several LPNs have not worked out well because they couldn’t learn the protocol or didn’t work well in a team-based structure. Extensive training and onboarding is required to train new LPNs into the existing protocols.

6. **Schedule aggressively** - All eligible patients should be directly targeted with mailings and phone calls in order to fill the LPN protocols. Scripts need to be written for front desk staff and call centers in order to “sell” the model.

7. **Linkage to group visits** - The combination of diabetes group visits with hypertension and insulin LPN protocols was very powerful. The patient cycles through a group visit every 4-6 weeks to assess their progress and goes through the weekly LPN protocols as needed based on physician recommendation from the group visit. This combination allows patients to have learning reinforced through individual attention from an LPN and with weekly changes to medication improves time to control. Ideally LPN protocols would be launched first prior to implementation of group visits. Well trained LPN’s who have experience with the protocols make the group visits easier to run.

8. **Patient engagement** - Patients build very powerful relationships with LPNs - often much stronger bonds emerge than they have with their primary care provider alone.

**Conclusion**

Innovative delivery models require institutions to rethink how they define and deliver health care services to patients in order to achieve better results at lower cost. With low reimbursement rates, underserved offices cannot continue to deliver the same type of healthcare services and hope to increase quality or improve access. The implementation of LPN-nurse led protocols within UHI was an important accomplishment and new types of LPN protocols will be added in the coming year. The next targeted area will be prevention and health maintenance protocols.

This paper contains important lessons learned for organizations hoping to implement LPN-led nurse protocols, particularly within a busy hospital outpatient setting.

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