1 INTRO

The mission of SH is to improve the health of the communities we serve. Contrary to popular assumptions, patients with 10 or greater annual ED visits generally have serious health issues, and frequently experience complex combinations of medical, psychiatric, and substance abuse conditions. SH's experience with the Center for Integrative Medicine (CIM) Model also shows that approximately half of this population either lacks primary care or is linked to primary care without the capacity to meet complex patient needs.

Over the last five years with spectrum health we have been able to identify seven subsets of high/super utilizers. The now affirmed Michigan definition of high utilizer is a patient in the emergency department (ED) between six and 19 times per year or admitted to the hospital two or three times in one year. The definition of a super utilizer is any patient in the ED 20 or more times per year or admitted in the patient for more times per year. While this may describe the overriding concept of a high/super utilizer it does not identify these patients to the cohort level.

We at the Center for Integrative Medicine have further defined the patient and divided them into the following subgroups:

1) **Pre—Complex Patient:** This pertains to the unborn child of a mother who has an un-stabilized addictive disorder
2) **ED Complex Patient:** This describes any patients in the emergency department six or more times per year and further subdivided based on whether or not they were in the emergency department 6 to 19 times per year 20 to 29 times per year or 30 or greater times per year.
3) **Ambulatory complicated medical Complex Patient:** This describes any patient admitted to the hospital two or more times per year who is not homebound.

4) **Non-ambulatory complicated medical Complex Patient:** This describes the patient who is homebound or an assisted living facility with two or greater admissions per year.
5) **Patients requiring long-term care:** Patients who are admitted to a long-term care facility for the foreseeable future.
6) **Primary care sensitive ED utilizers:** This describes a sub group of the population who is in the emergency department 1 to 5 times per year for preventable reasons.
7) Patients with a **rare disease** requiring high cost interventions on an ongoing basis.

Patients with Medicaid and Medicare make up the majority of complex patients, both in Grand Rapids and nationally. We have conducted a comprehensive analysis of ED Complex patients at Spectrum Health (SH) Grand Rapids EDs. Individuals who visited the ED more than ten times annually from 2009 – 2011 made a combined total of over 55,000 visits to SH EDs. These visits generated $185,000,000 in total hospital charges and a total of $68,790,895.46 was paid by insurers for that care. Even this is an underestimation given that hospital charges do not include professional charges levied by Radiology or Emergency Medicine Physicians and would not include less visible costs related to unnecessary and/or duplicated referrals and related testing or ambulatory services. Of visits by ED super utilizers, approximately 46% were charged to Medicaid, 28% to Medicare, 16% to private and commercial insurers, and 10% were "self-pay". Of the 950 ED super utilizers identified for initial CIM services, over 50% had prior or existing network180 (CMH) authorizations for mental health or substance use disorder treatment. Research on ED super utilizers also indicates that most seek ED care based not on lack of primary care, but on dissatisfaction with the accessibility, expediency, and quality of that care. ED use is growing rapidly nationwide. With the majority of super utilizer visits charged to Medicare and Medicaid,

and the significant expansion of public insurance coverage under the Patient Protection and Affordable Care Act, effective care alternatives for this population are more critical than ever.

The second group of patients are those who cause a disproportionate amount of cost to the system because of multiple admissions, have multiple chronic medical conditions, poor communication between their multiple physicians and social parameters that make treatment of these conditions more difficult. Research has shown that intensive wraparound services can significantly enhance outcomes as well as decrease cost. For these patients we will incorporate our home-based health integration program. This will include RN case managers, bachelors level social workers and community health workers. These teams will begin the evaluation treatment and assessment of the patient while they are still in the hospital. Once the patient is discharged from the hospital, home visits will be initiated allowing for a thorough evaluation of the patient's social setting, stability, as well as a cohesive home-based plan which can be relayed back to the primary care physician for continued cohesive transitions of care. However, care coordination is only a part of what is required to improve outcomes. Accurate and consistent medical evaluation and diagnosis coupled with data based treatment plans are required.

The third group of patients are pregnant patients with a substance use disorder. Our clinic started seeing these patients in early 2013 and has since developed initial pathways of information exchange between the local NICU and the OB/GYN physicians. We have found that the vast majority of these patients are not screened for addiction and when screened are rarely properly referred for treatment. These first two issues will be mitigated by extensive education and training for the OB/GYN offices. Once these patients are referred to the clinic, intensive services focusing on all aspects of their disease, as well as the current social situation in which they live will be used along with medication assisted treatment and appropriate behavioral therapies to stabilize the mother during pregnancy as well as after delivery. We have also begun the education process of

our counties CPS workers as well as the foster care system. However, the need is so great that in our current state we are unable to see all that are referred.

2 COMPLEX CARE

One of the major lessons learned over the last 3 years is that being a Complex Patient by itself a chronic disease for most and requires a lifetime of directed care. If a patient does matriculate from the clinic in time-limited period there needs to be an appropriate explanation and directed pathways for patients. Therefore, having many integrated programs available for which patients will be both "chosen" and "eligible for" is of the utmost importance. Some of these programs already exist at some level in health systems, but will require the final touches of business development such as patient information pamphlets, system-wide education and application of new payment models such as episode of care payments or capitated rates. Along with the clinic-based aspects and approaches for patients we will also be discussing hospital-based and cooperative community-based approaches as well. A second lesson learned was that it requires an entire community to appropriately mitigate high risk behaviors in the health system.

Hospital-Based Care Coordination Program

Coordinating a patient's care within the walls of a single hospital requires a different subset of providers and coordinating elements than that of outpatient coordination. Trinity Health Systems has been piloting and will be implementing a large-scale hospital-based care coordination program over the next one year. We at the CIM have been working very closely with the administrative lead for this project and in collaboration with them we are attempting to develop a care coordination program within Spectrum Health that mirrors the one already developed by Trinity. The elements of this are relatively low cost, however it does require buy-in and consistency from all providers and caregivers within the hospital. The initial step in this pathway is to develop the IT infrastructure to identify and track those patients who would be considered either a high utilizer or Complex. These patients would then be tracked on a dashboard. Once the patients have been identified a team consisting of an RN case manager and an LBSW will run a team that meets weekly. This team should consist of the two aforementioned employees with the addition of an emergency department representative including a physician and an RN as well as a physician and an RN from the inpatient side of the hospital. This group will evaluate the patient's utilization patterns, medical record as well as any special needs identified by the patient. The group will then develop an in-hospital care coordination document which will be housed in Cerner. This document will help to guide care both in the ED as well as on the inpatient space, describe a general approach for treatment of pain, complicated medical conditions and allow for an understanding of all outpatient connections that should be made prior to patient discharge. Other key members of this group would be risk management and patient relations. Within the Trinity Health System they have shown a relatively consistent return on investment of approximately 300%. Given that the only true cost to this program is that of the full-time RN case manager and bachelors level social worker it has a low startup cost. The more

difficult aspects of this is the development of the IT infrastructure required to track these patients.

Regional High Utilizer Committees

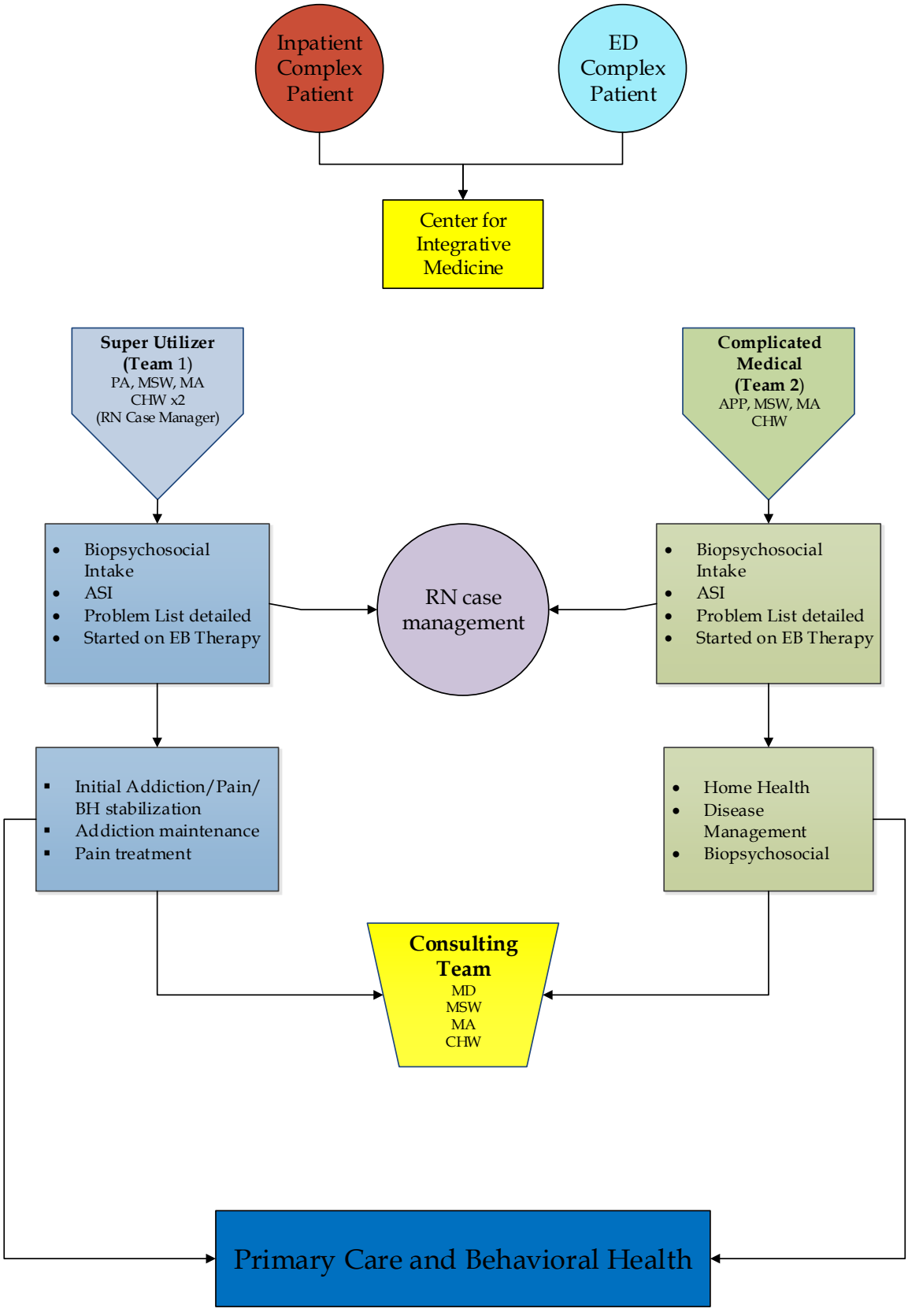
The West Michigan high utilizer committee was started approximately 9 months ago by the Center for Integrative Medicine. The original intent of this group was to develop cohesive and consistent care plans that would be placed on the Great Lakes Health Connect virtual integrated patient record and be visible for all caregivers. We are currently developing all of the data use agreements as well as cooperatives operational agreements. We have written and received a grant for the United Way that will provide a more permanent structure for this committee as well as increase the membership from the three hospitals to include Spectrum Health, Trinity Health, Metro Health, Cherry Health Services, the newly developed Community Hub Program Health Net, Family Outreach Services, Network 180, Aligning Forces For Quality, The Compass and Diamond Programs, Pine Rest and Great Lakes Health Information Exchange. The goal of this group will not only be to develop cohesive coordinated care guides for patients throughout the region, but will act as a working group that identifies treatment and delivery system gaps within the community. This will allow for all major treatment entities to identify the structural components that will most benefit the overall community rather than a single entity. This will also help to decrease the number of small one-off programs and to act as a guide for high intensity funding programs such as social impact bonds or local foundations.

Clinic Based-Health Integration Program

The Clinic Based Health Integration Program (CB–HIP) encompasses the current state of the CIM with the addition of one more Licensed Masters Level Social Worker (LMSW) as well as an RN case manager. This program will also be directly connected to the West Michigan High Utilizer Committee. There are two pathways for eligibility for this program. The first is having 6

or more visits to the ED in the last one year. The second is having 3 or more admissions to hospital in the last one year. With approximately 3500 eligible patients within the Priority Health system this is sustainable by utilizing the episode of care payment model. Below is the treatment flow diagram.

Clinic Based- Health Integration Program (CB-HIP)

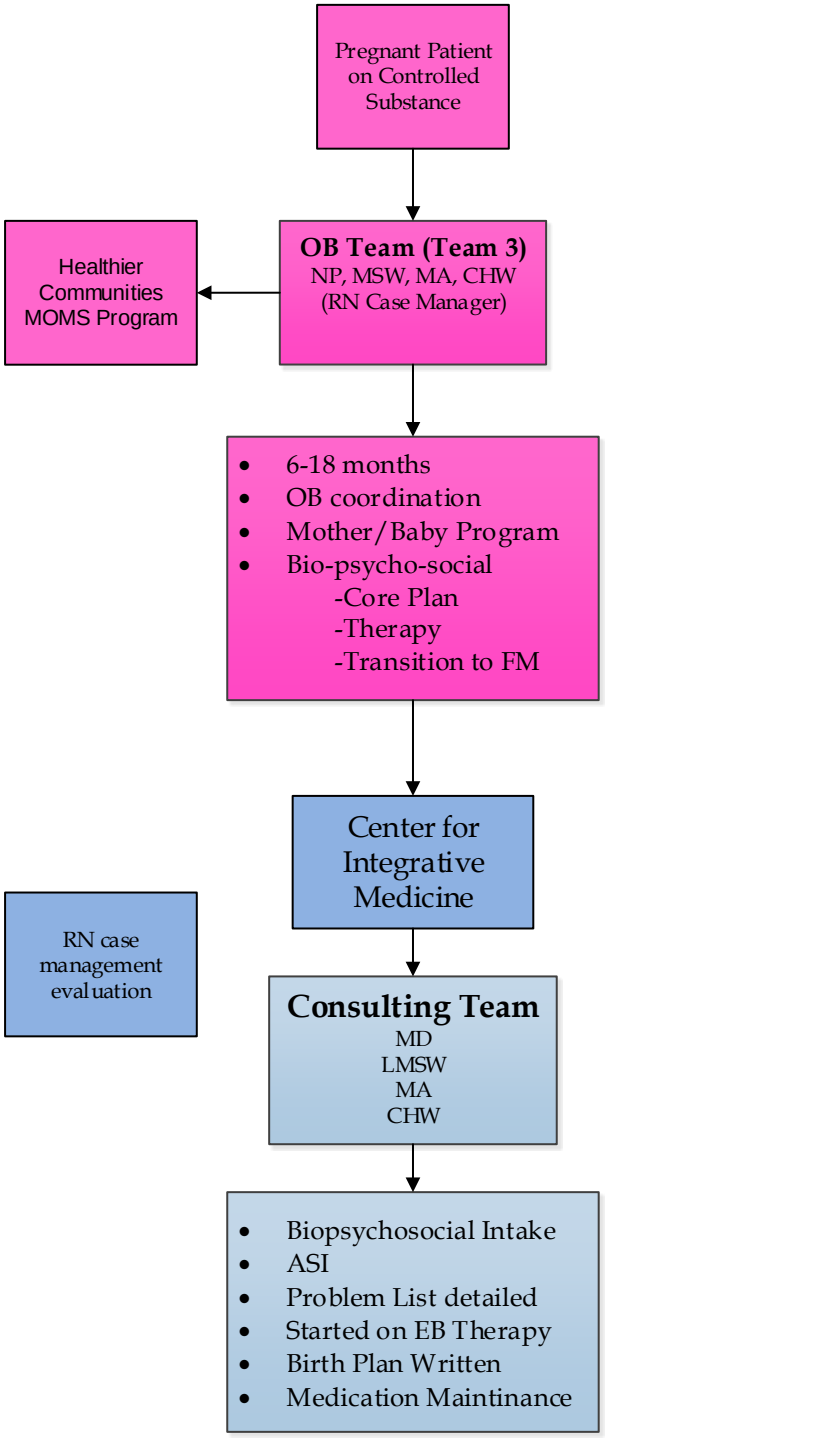


Healthy Moms Program

Over the last two years we have discovered that a number of our patients who were originally seen because of their ED utilization either were or became pregnant during the time we were treating them. We found that there are very few resources for these pregnant mothers and that if not stabilized, their unborn children once delivered have a higher risk of premature delivery and spontaneous miscarriage. Given this, we felt it was appropriate to offer this as an independent pathway. However, in order to identify, evaluate, stabilize and improve these patients we need a dedicated treatment team that can be trained in trauma informed care, prenatal education and aggressive treatment of their substance use disorders. Many of the newborn children will require the neonatal ICU for treatment of neonatal abstinence syndrome (NAS). Both the literature and internal clinic data have shown that if mother is stable and not utilizing other substances the risk of the newborn having to go to the ICU is significantly decreased. If the newborn needs to go to the ICU length of time is decreased by more than half. As stated in the introduction, each day in the neonatal ICU is between $5000 and $7000. Currently we see an average five new mothers per month. Priority Health is the primary insurer of these children within Kent County. Therefore, each month we have the potential to save them approximately $50,000. None of the above addresses the overwhelming positive impact treatment has on developing a new family unit and in many cases breaking the cycle of addiction and poverty. We also significantly decreased the need for child protective services (CPS) involvement as well as decrease the risk to the child by stabilizing the mother and the father of the baby if need be. This, coupled with connection to the Healthier Communities moms program, has changed the outcome for the better for many young mothers and newborn children in the Kent and surrounding counties. Therefore, we feel that solidifying this pathway of treatment is of the utmost importance given that we have the only level I neonatal ICU in the region and deliver more children than all of the other regional hospitals combined. To date we have already educated all of the labor and delivery

nurses, neonatal ICU nurses as well as the pediatric, OB/GYN and NICU physicians and APC staff concerning our clinic as well as the disease of addiction in these patients. Below is the treatment flow diagram for these patients.

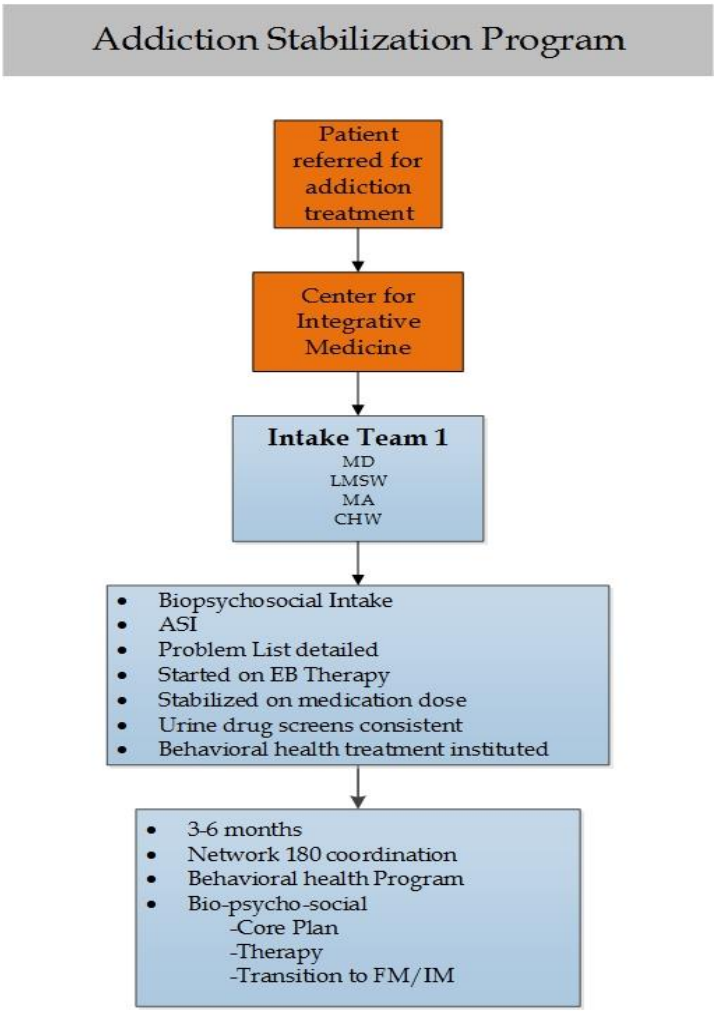
Healthy Moms Program



Addiction Stabilization Program

Since the beginning of the Complex Care project within the CIM we have seen a large number of patients who meet criteria for substance use disorder. We have treated these in the same pathway designed for patients who are super utilizers and found that we currently have significantly better outcomes than many other programs nationally. This coupled with the fact that the CIMs fully integrated behavioral health allows for consistent team-based treatment of patients with addiction puts us in a unique position to develop other systems off of this platform. One of the things we have not been able to do over the last few years is to allow for direct referral from within the Spectrum Health Medical Group. However, over 11% of all patients in any health-care system meet for an opioid use disorder. Currently there are two medications which can be prescribed by a primary care physician for the ongoing clinical treatment of a patient with an opioid use disorder. These medications are buprenorphine and naltrexone. While naltrexone does not require a special license doses are not given within the Spectrum Health Medical Group facilities, other than the CIM. Given that this medication is FDA approved for use in patients with alcoholism as well as an opioid use disorder this is interesting. Buprenorphine does require a special DEA license and an eight hour training course. While we do have four physicians with the "waiver" they do not choose to currently right buprenorphine. When we have asked the physician's system-wide why they don't feel comfortable utilizing these medications, the same reason arises over and over. They state that they do not feel comfortable transitioning the patient off of street drugs or prescription drugs onto Suboxone or naltrexone. And they do not feel comfortable with the initial stabilization of the disease of addiction. This is what led to the need for us to develop an addiction stabilization pathway. This would entail initial evaluation and initiation of treatment in both the chemical and behavioral pathways. Once the medication doses are stable the patient would be transferred out to a primary care physician who would be able to

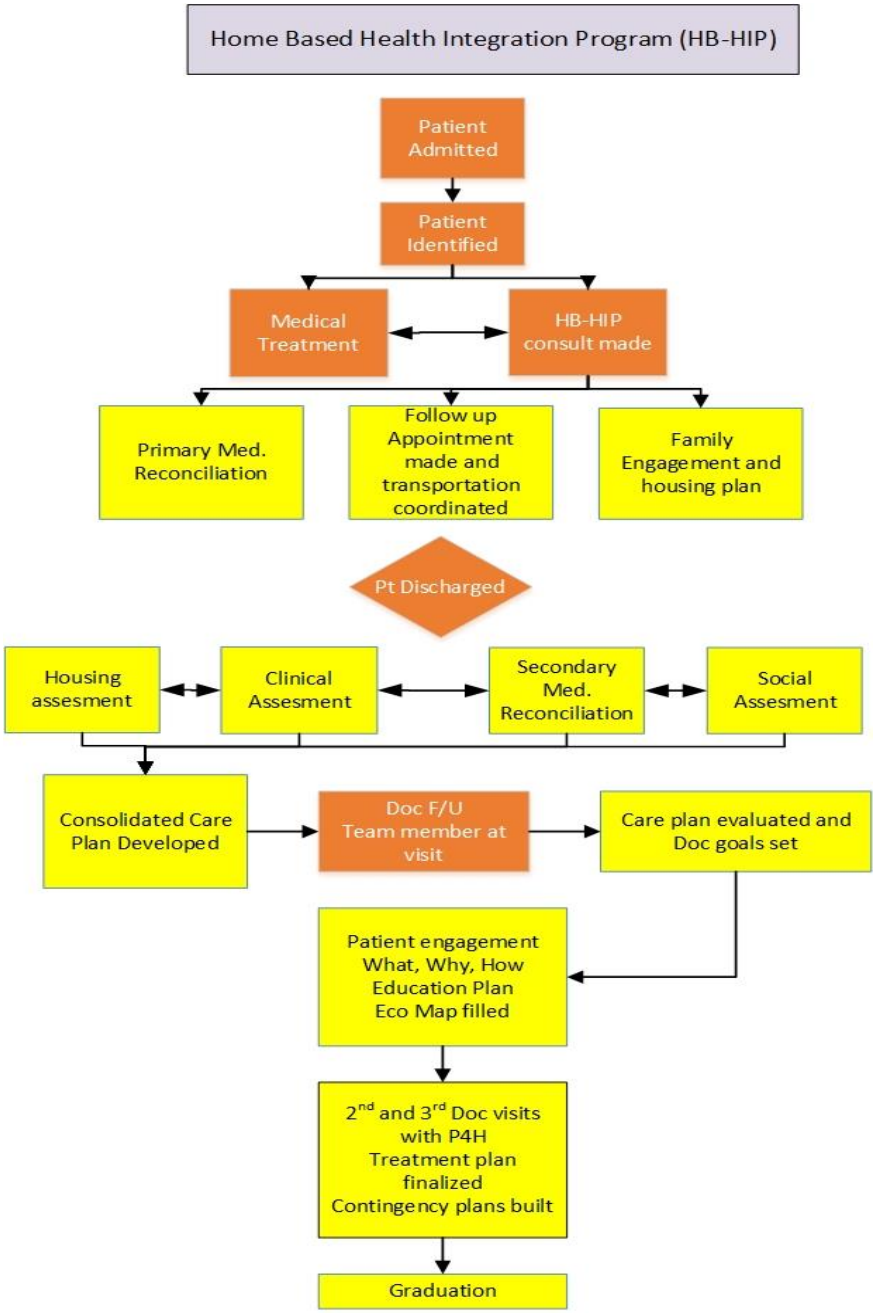
continue writing for either naltrexone or buprenorphine while taking care of their other chronic medical conditions. We would also make sure that this patient is appropriately connected with ongoing behavioral health treatment. Initially this pathway would need a 0.4 FTE physician, a 1.0 FTE LMSW, two FTE's of a community health coach/sobriety coach and on-site access to medications required for immediate stabilization of patients and withdrawal and needing to be initiated on buprenorphine or naltrexone.



Home Based-Health Integration Program

One of the more difficult aspects in the treatment of any patient after they been admitted to the hospital is the transition of care from the inpatient setting to the outpatient setting. This is fraught with risk including, but not limited to, prescribed or misunderstood medication utilization, inappropriate or unstable living situation and inappropriate or nonexistent follow-up to a primary care setting. The Camden Coalition as well as Dr. Kenneth Coburn have developed a strategic approach to the patient's admitted to the hospital two or more times per year, which has shown a significant decrease in 30 day readmissions rate, overall readmission rate as well as a decrease in total cost of care. While Priority Health and hospital-based care management teams have used telephonic case management this does not suffice for the inpatient high utilizer patient. Using what we have learned, a more integrated and directed approach can significantly impact 30 day readmissions as well as overall readmissions for this population of patients. The overriding concept is that an outreach team that consists of an RN, LBSW and a community health worker will work in concert to improve the patient's transitions of care as well as baseline home stabilization. An RN will be consulted when the patient is admitted for the second time in the last one year. They will then see the patient and do a primary care coordination evaluation and med reconciliation while they are still in the hospital. After this the team will follow-up in the home within 72 hours of discharge to complete a full housing, transportation, clinical and secondary med reconciliation evaluation. After this they will accompany the patient to their first primary care visit after discharge from the hospital. After coordinating with the primary care physician they will create an appropriate home-based medical treatment plan, medication coordination pathway, transportation coordination as well as help with expanding the patient's local eco-map. The entire intervention will take anywhere from 60 to 120 days at which point the patient will be set forth on the new pathway. This pathway has not been fully validated for ED Super Utilizers,

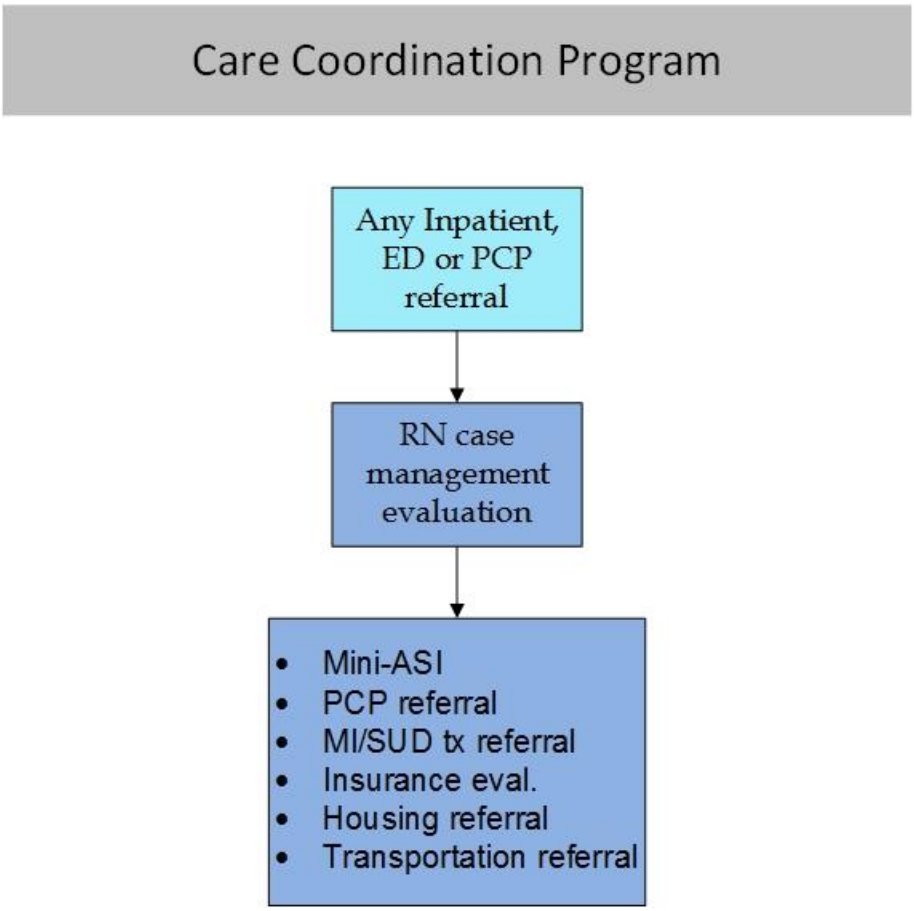
however, I feel for those with complicated medical conditions this would be an appropriate intervention. Each team can see approximately 200 new patients per year.



Health-Care Coordination Program

The health care coordination program is the simplest of the programs. This entails a referral from either a primary care physician or the hospital to be seen and evaluated 1 to 2 times by an RN case manager. The RN case manager will do a mini risk inventory which in about a 60 to 90

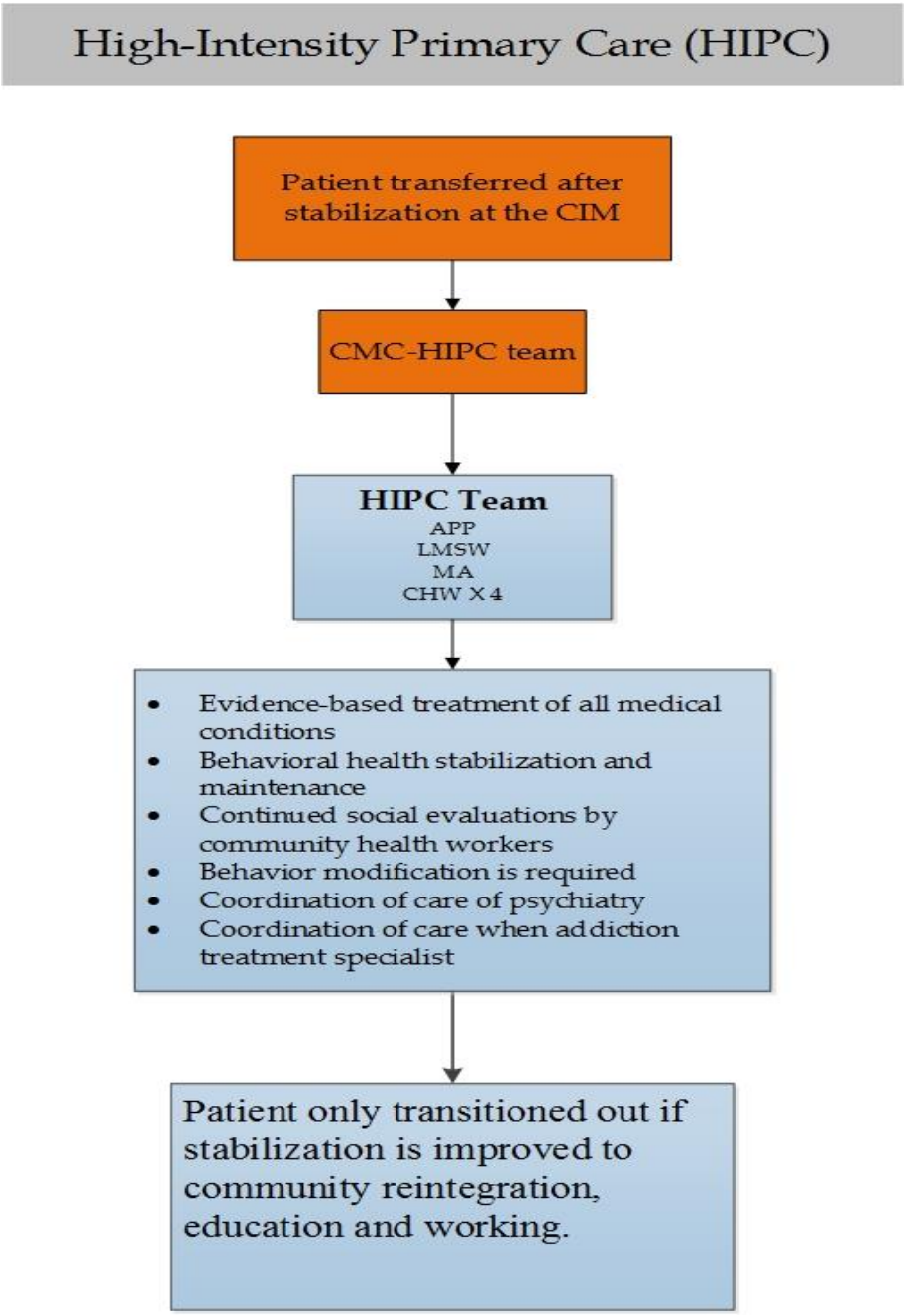
minute evaluation and gets to housing, transportation, risk of addiction, risk of depression, risk of anxiety as well as helping with paperwork for medical insurance in finding a primary care physician. While this does not take a deep dive into any of these issues that allows for us to appropriately connected patient with whatever resources the patient may need. Is not meant to be an ongoing intervention but rather a one-time attempt at coordination of care. Each RN case manager would be able to see 1000-1500 patients per year.



High-Intensity Primary Care

For a large portion of the patients seen at the center for integrative medicine is not an option to send them back to the standard primary care facility. Given this we propose developing a Masters level treatment team dedicated to the patient's in an ongoing fashion. This team would be responsible for ongoing behavioral health coordination as well as directed therapy and all medical

treatment and coordination of specialty medical care. The most logical place to house the high-intensity primary care team would be within the current Community Medicine Clinic. Thus, this team would be under the guidance of a board-certified family medicine physician. Adding a HIPC team will provide the specialized ongoing care that former ED super utilizers need to maintain health improvements. This team will also increase primary care capacity for all super utilizers in Grand Rapids, which is a known community need and is a central goal of the SH Community Medicine Clinic.



3 COMPLEX.CARE

With the recent funding by RWJF of the website www.Complex.Care, we are in the process of creating an online learning platform that enhances the education within the subjects of addiction,

pain and behavioral health. We will also be building out an integrated health policy structure which will outline best practices for treatment modalities and payment structures to be implemented within federal and state regulatory frameworks. The website will be available for utilization starting December 2015. Within the Complex Care systems we have the ability to utilize these resources to tackle the most complicated problems surrounding high cost high utilization patients. This includes developing and implementing workflows that allow for behavioral health integration into primary care, developing patient triage protocols which allow them to be seen by the appropriate treatment team and developing performance and outcome measure details which allow us to understand the value of service given to patients.

There will be four main pillars within the Complex.Care framework. These pillars are:

1. Education
2. Health Policy
3. Consultation Services
4. Research

The education that will be delivered by the website will start with the following subjects.

The Health Policy and research arms are already being utilized as well, with current State of Michigan MDCH addiction policy being written alongside the regulatory framework for opioid treatment facilities. We have been collaborating with MIT, Northwestern, RWJF and the Camden Coalition on many research projects ranging from Complex patients to neonates. This also spans into the Health Information Technology arena with our work as a consultant to Great Lakes Health Connect. We have also written new Alcohol Detox and post-operative pain treatment pathways for Spectrum Hospitals.

4 PATIENT CENTERED PROGRAM GOALS:

Goal 1-- Patients will reduce their ED/IP visits by 50% six months post Complex Care Institute (CCI) intervention, and maintain reduced usage at greater than 50% for the continued future. With an average ED/IP Super Utilizer annual cost of over $50,000, attaining this goal dramatically lowers costs. Furthermore, under the CCI Model, cost savings from avoided ED/IP visits are leveraged to increase the number of individuals who can access less costly, more appropriate care. ED/IP avoidance also removes a host of ED/IP-based health risks including radiation from unneeded CT scans, nosocomial infections, and medication administration errors. Most importantly, patients with serious chronic or complex illnesses are placed at risk when treated by ED physicians who are not traditionally trained to treat these conditions.[7] In short, this goal targets an opportunity to reduce costs sharply while improving care for emergency department and inpatient high/super-utilizers.

Goal 2--At least 50% of CCI patients will achieve improved health (as detailed below), and at least 50% of HIPC patients will maintain or increase the improved health outcomes achieved in the CCI under the same outcomes measure(s). Health outcomes will be monitored every 3 months, or as otherwise clinically warranted, using diagnosis-based subsets of patients and designated health outcome measures for each diagnosis. Patients with multiple diagnoses will be counted as a separate individual for each diagnosis they have. Specific diagnoses and associated outcomes measures are as follows: Diabetes (A1C), Obesity (BMI), Pain (Pain Inventory Scale), Cardiovascular Risk (Lipid Profile and Blood Pressure Monitoring), Hypertension (Average Blood Pressure), Sleep Disturbance (Sleep Scale from Medical Outcomes Study), Tobacco Use (Self-Report of Use and urine testing), Substance Use Disorder (Addiction Severity Index), Depression (PHQ-9), and Anxiety (GAD-7). For the population of pregnant patients with substance use disorders we will track adherence to appointments both at the CCI and OB/GYN, the number of

children who are born preterm, the number of children admitted to the neonatal ICU and the average length of stay for those children. We will evaluate the percentage of these children who develop neonatal abstinence syndrome, and percent of children either temporarily or permanently removed by CPS.

Goal 3--All CCI patients will experience better care through increased accessibility and the leveraging of cost-effective, cross-trained staff. While diagnostically heterogeneous, ED/IP super utilizers share a need to access comprehensive care at non-traditional times and in a convenient manner.[2,3] The current term used to describe the CCI is an ambulatory ICU. The programs housed within the CCI have been discussed above and will be contained within the ambulatory ICU setting. This project prioritizes care access, especially through the deployment of cross-trained CHWs as healthcare case-coordinators. We will measure quality of care through a patient satisfaction measure, as well as patient utilization of specialized access features, such as appointments at non-traditional and walk-in times, and use of CHWs (staffed by AmeriCorps workers) to connect to care. These specialty will be supported by an innovative payment model `already being used. These models employ the same mechanism (sustainable case rate per episode of care), which we are currently using at the CIM for our patients whose payer is Priority Health or Molina. These straightforward service delivery and payment models are readily replicable for ED super utilizers, inpatient super utilizers and pregnant patients with a SUD. We are also currently adapting this tool to develop an episode of care payment model for the home-based health integration program.

5 FINANCIALS

As briefly discussed above we have developed an episode of care payment model based on scoring system. The scoring system is also utilized to determine whether or not a patient is stable for transfer to a primary care physician. This breaks the patient into a level I, level II or level III. It also allows for concomitant payment of care coordination as well as behavioral health treatment (attachment 4). We have validated this tool internally and have determined that a level I requires less visitation, has less call volume as well as the lowest no-show rate. A level to patient sits firmly in the middle while level III patient requires significantly more clinic visitation time, therapy, call availability as well as knowledge of complicated medical disease. Very few of the patients who enter a level III will be able to be discharged to regular primary care doctor and will need ongoing treatment at the high-intensity primary care clinic. Below are the financials for the overall cost for the FTEs required to build out all teams described. Given that this is a team-based system of care incomplete teams are very little help and most likely will complicate treatment. Therefore expansion should be viewed by timeline capable of expanding an entire team rather than a position based expansion.

Title	FTE	Base Wages	Benefits	Total Expense
Physician	0.40	$ 116,405.12	$ 18,985.68	$ 135,390.80
Physician	1.00	$ 193,055.00	$ 31,487.27	$ 224,542.27
APP	2.00	$ 203,302.40	$ 51,476.17	$ 254,778.57
APP	2.00	$ 170,000.00	$ 43,044.00	$ 213,044.00
RN Case Managers	5.00	$ 332,800.00	$ 117,511.68	$ 450,311.68
LMSW	6.00	$ 360,000.00	$ 127,116.00	$ 487,116.00
LBSW	4.00	$ 210,920.00	$ 74,475.85	$ 285,395.85
MA	6.00	$ 177,600.00	$ 62,710.56	$ 240,310.56
MOS	2.00	$ 54,080.00	$ 19,095.65	$ 73,175.65
Administrative Secretary	1.00	$ 39,520.00	$ 13,954.51	$ 53,474.51
Research Assistant	0.50	$ 17,750.00	$ 6,267.53	$ 24,017.53
Practice Manager	1.00	$ 62,920.00	$ 22,217.05	$ 85,137.05
AmeriCorps	12.00	$ 120,000.00	$ -	$ 120,000.00
	42.90	**$ 2,058,352.52**	**$** 588,341.94	**$ 2,646,694.46**

Gross Charges

Service Line	Charge per patient (avg)	Total Patients/year	Gross Charges
Clinic Based-HIP	$2,600	400	$1,040,000
Home Based-HIP	$800	300	$240,000
Addiction Stabilization Program	$1,500	200	$300,000
Care Coordination Program	$85	1500	$127,500
Healthy Moms Program	$2,000	100	$200,000
		total	$1,857,500

Projected Savings/Cost Avoidance

Service Line	Cost per patient (avg)	Total Patients/year	% reduction	Cost Avoidance
Clinic Based-HIP	$65,000	400	10	$2,600,000
Home Based-HIP	$59,000	300	10	$1,770,000
Addiction Stabilization Program	$22,000	200	10	$440,000
Care Coordination Program	$35,000	1500	2.5	$1,312,500
Healthy Moms Program	$49,000	100	10	$490,000
			Total	$6,612,500

Gross cost avoidance - Total charges = $4,755,000 Net Cost avoidance

While the above is a rough estimate, savings of almost $4.8 million for a $2.6 million investment is a rare opportunity in medicine. Not only do the dollar amounts workout, especially over time, but we will have begun to make a significant dent in building a community of people who are well. If implemented this would also make Spectrum Health the unprecedented national leader in the data, science and math as it pertains to the super utilizer population.

R. Corey Waller MD, MS

Spectrum Health – Grand Rapids, MI