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Prospectus for Creating a Nurse Suggestive Acuity-Based Staffing Model in Ambulatory Infusion Settings to improve Patient Safety and Quality of Care

Yongli Qiu
qiu.yongli@gmail.com

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Yongli Qiu, RN

University of San Francisco

Abstract

Due to the lack of reliable and valid infusion nurse suggestive acuity-based staffing model, ambulatory infusion settings are burden with potentially compromised patient safety, poor quality of patient care with over-scheduling of unexpected complex patients, limited resources related to nurses and infusion chairs, the dissatisfaction of patients and family members, and infusion nurses' burn out. This project seeks to determine the appropriate nurse to patient acuity-based point ratio in staffing and scheduling factors that influence nurse staffing model, and established nurse staffing strategies. This three-month project was conducted with the infusion nurses, a nurse manager, a nurse supervisor, an assistant nurse manager, an infusion scheduling leader, and patient advisers to create a safe and high-quality of patient care in ambulatory infusion settings. Patients were classified by using both current existing staffing, scheduling system and nurse suggestive acuity-based points tool. Data analysis related to daily encounter numbers, daily nurse staffing, assignments comparison between nurse to patient's acuity-based point ratios and nurse to patient ratio, patient satisfaction, nurse over time, and job-turnover was collected by an infusion nurse who is enrolled in a clinical nurse leader (CNL) program through independent observation. A total of 1,218 patients who received care in two ambulatory infusion settings in May, were analyzed for this project. Based on the evidence-based practice and literature, on average, infusion nurse suggestive sixteen acuity-based points per nurse per day and appropriate levels of infusion nurse staffing are defined with minimal over time in ambulatory infusion settings. In conclusion, implementation of acuity-based staffing model provides consistent staffing, improves safety, quality, and efficiency, reduces nurse over time, and results in patients, family members, and staff satisfaction.

Prospectus for Creating a Nurse Suggestive Acuity-Based Staffing Model in Ambulatory Infusion Settings to improve Patient Safety and Quality of Care

It is estimated that more than four-fifths of oncology treatments have transitioned from inpatient to ambulatory settings; therefore, ambulatory infusion settings are facing diverse and complex patients with increased acuity clinical presentations (Vortherms, Spoden, & Wilcken, 2015). Registered nurses (RNs) in ambulatory infusion settings have a pivotal role in administrating intravenous, subcutaneous, and intramuscular medications, and monitoring of treatment related hypersensitivity reactions (HSR) and adverse events (AEs) during treatments.

Currently, the nursing care delivery models in ambulatory infusion settings are described as either primary care or functional delivery model (Liang & Turkcan, 2016). In primary care delivery model, patients are scheduled to be treated by the same primary care nurse every time (Liang & Turkcan, 2016). Meanwhile, in functional care delivery model, patients are scheduled based on the regimens, and patients are likely treated by different nurses on different cycles of regimens (Liang & Turkcan, 2016). Functional care delivery model is utilized in most of ambulatory infusion settings (Liang & Turkcan, 2016). Due to the high variability in daily appointments and different nurse staff, inappropriate nurse staffing constantly leads to long waiting times for patient and nursing over time (Liang & Turkcan, 2016).

According to Vortherms et al. (2015), staffing and scheduling challenges for infusion nurses, charge nurses, nurse managers, schedulers, and administration have been exacerbated with increased transitioned oncology care from inpatient to ambulatory settings; therefore, infusion nurses should take the lead to suggest and implement the evidence-based practice for acuity-based staffing model to provide safety, quality, and efficiency of nursing care, reduce nurse over time, and increase patients, family members, and staff satisfaction.

Problem Description

Unbalanced workload distributions between the infusion settings and infusion nurses, patient dissatisfaction, and nurse over time, burn out, and job-turnover contribute to inefficient staffing in the ambulatory infusion settings. For example, two ambulatory infusion settings with total seven oncologists and hematologists are less than three miles distance away from each other. However, resistance to scheduling and staffing between two setting has become a significant problem due to the nurse staff disagreement and unbalanced patient assignments. The infusion setting with eight infusion nurses and 15 chairs are over-scheduled with increased higher acuity level chemotherapy than the other infusion setting with 11 infusion nurses and 16 chairs. However, neither current nurse to patient ratio or patient to chair hours measurement with current scheduling and staffing system can identify and distinguish the nurse workload and patient complexities between two settings.

Charge nurses are overburdened with scheduling and staffing to accommodate patient preference, unsafe assignment due to high ratio, and unexpected inappropriate shortage of nurse staff. For example, future patient appointments are randomly scheduled based on pre-programmed nursing hour and chair hours among presumptive five infusion nurse availability on a nine operational hours shift. With average encounters “ranging” from 20 to 38 patients daily census, charge nurses spend two to four hours manually checking, verifying, and modifying assignments to balance the nurse to patient ratio and distributions of chemotherapy daily. A high nursing cost related to scheduling and staffing brings infusion settings financial burden and low nurse satisfaction.

Nurse dissatisfaction, burn out, and perceptions for unfair patient assignments are prevalent due to inadequate staffing models. With current scheduling and staffing system,

assignments defined with types of appointments, nurse hour, and chair hour are ineffective to measure expected nurse workload, pace of work, and treatment complexities. For example, both oncologic Nivolumab intravenous treatment and oncologic Bortezomib subcutaneous injection are classified into oncologic chemotherapy with 30 minutes nurse time and 60 minutes chair time; however, infusion nurse might have different work pace if a patient has increased acuity influenced by clinical presentations and history of difficulty in peripheral intravenous access.

Therefore, a need to create infusion nurse suggestive acuity-based staffing model is proposed to direct the optimal staffing to support safe and high-quality patient care in ambulatory infusion settings. The aim of this project is to describe the infusion nurse suggestive acuity-based staffing model to improve collaborative safe and high-quality patient care in both infusion settings and infusion nurses in ambulatory settings.

Available Knowledge

According to American Nurses Association (ANA) (2012), appropriate nurse staffing impacts the safety, quality, and cost of care delivery. There is no universal single staffing model that can provide adequate evidence to be utilized in any health care setting. Therefore, each setting should have staffing model based on safety indicators and quality of care, and patient status such as patient acuity level should be analyzed to determine the staffing needs (ANA, 2012). Two evidence-based practice articles were analyzed in the evidence table listed in Appendix A. According to DeLisle (2009), creating and utilizing an acuity tool impacts the equitable assignment distribution and increase nurse satisfaction. DeLesle (2009) suggests classifying patients into five different acuity levels with appropriate acuity-based points. Acuity level one is assigned one acuity point. Acuity level five is assigned 5 acuity points. Any combination of a total of 20 acuity points per nurse per day determines the ideal nurse workload

in Appendix B. By utilizing the acuity tool as a guideline, appropriate amount of nurse time can be efficiently allotted under each level despite the different length of stay (DeLesle, 2009). Therefore, daily acuity-based points are accurate representations of patient complexity and appropriate to determine staffing in ambulatory infusion settings.

According to Vortherms et al. (2015), ideal nurse to patient acuity points should be 16 acuity-based points per day. After implementation of an acuity-based staffing tool in a 35 chairs outpatient chemotherapy infusion department, Vortherms et al. (2015) suggest nurse to patient ratio can vary from six to 15 patients daily based on acuity and regimen complexities. The definition of acuity-based point in the acuity-base staffing tool is listed in Appendix C. Therefore, evidence supports the effective acuity-based staffing tool to provide consistent staffing, improve efficiency, reduce over time, and improve nurse satisfaction.

Population, intervention, comparison, and outcome (PICO) statement is utilized to compare the acuity-based staffing model to current existing nurse to patient ratio staffing model in ambulatory infusion settings to establish nurse to patient acuity-based points ratio to deliver safe, high-quality, and cost-effective patient care.

Rationale

To create an environment that optimally establish the infusion nurse suggestive acuity-based staffing model in ambulatory infusion settings, Kotter's theory of change was introduced into the current ambulatory infusion settings to provide best practices and sustain changes for positive changes (Barrow & Toney-Butler, 2019). According to Barrow and Toney-Butler (2019), Kotter's theory of change, which has expanded on Lewin's three step process change theory since 1995, provides a unique support to solve healthcare issues. Kotter's Eight-Step Change Model listed in Appendix D is to "create a sense of urgency for change," "form a

guiding change team," "create a vision and plan for change," "communicate the change vision and plan with stakeholders," "remove change barriers," "provide short-term wins," "build on the change," and "make the change stick in the culture" (para 6).

In addition, Seijts and Gandz (2018) suggest that institutions should encourage younger and less experienced characters to become further leaders of change projects. The infusion nurse who is currently enrolled in the CNL program in University of San Francisco should initiate and establish a sense of urgency for effective collaboration among infusion nurses, charge nurses, a nurse manager, a nurse supervisor, an assistance nurse manager, and schedulers to establish the acuity-based staffing model to improve patient-centered care. Since no leader can lead a project alone, a group of nurses and administrations will form a coalition for change. Therefore, developing a vision to create a safe culture and facilitate high quality and cost-effective patient care is essential to reach the desired direction for change.

Specific Project Aim

The project seeks to improve safety, high-quality, and cost-effective patient-centered care by establishing the acuity-based staffing model in the ambulatory infusion settings.

1. The nurse team leaders will determine an acuity-based tool worksheet to each assigned appointment by the first week of project.

2. Reasonable amount of maximum acuity-based points per nurse per day will be discussed by the second week of project. Maximum 16 patient acuity-based points per nurse per day will be communicated with the current management team.

3. Schedulers will document acuity-based points into current appointment system.

4. A two-month test of change will test and validate the acuity-based staffing work sheet. At the end of two-month implementation, a 50% reduction in charging nurse cost among the test

group is expected. Furthermore, increased nurse satisfaction score will be seen after implementation.

Evidence-based practice (EBP) supportive acuity-based staffing model is the needed solution to ensure safety, high-quality, and efficient nursing care in ambulatory infusion settings.

Methods

Clinical microsystem assessment was conducted in two current ambulatory infusion settings. With one chair difference, the test group is randomly assigned to eight infusion nurse team with 15 chairs, and the comparison group is 11 infusion nurse team with 16 chairs. Average nurse staff, daily patient numbers, nurse to patient ratio, and chair time per patient in May are compared to establish the baseline data in table 1. More patients were scheduled in comparison group than test group due to the one chair advantage; however, nurse to patient ratio is higher in comparison group than test group.

Table 1

Summary of daily nurse, patient, and chair utilization comparison

Group	Comparison Group	Test Group
Average nurse Staff	4	5
Average patient numbers	31	27
Average nurse to patient ratio	8	6
Average chair time per patient	5	5

Reasons for patient appointments include venous access device care and blood draw, oncologic and non-oncologic injections, intravenous infusion for hydration, antibiotics, iron, and zoledronic acid, transfusions of packed red blood cells and/or platelets, non-oncologic immunotherapy and biotherapy, oncologic immunotherapy, biotherapy, and chemotherapy, and intravesical administration of Bacillus Calmette-Guérin or gemcitabine. In current scheduling and staffing system, patient appointments are classified into chemotherapy, intravenous

treatment, and other procedures. Nurse hour is grouped into 30 minutes, 60 minutes, and 90 minutes, and chair hour is categorized into 30 minutes, 60 minutes, 90 minutes, 120 minutes, 180 minutes, and 240 minutes.

The driver diagram of IHI cultural assessment tool is utilized to assess the ambulatory infusion settings in Appendix E. Strengths, weaknesses, opportunities, and threats (SWOT) analysis is completed prior to the intervention in Appendix F. The strengths help to guide the planned return with improvements in increasing nursing satisfaction scores, saving the nursing cost, and increasing the efficiency of staffing process. A return on investment (ROI) for nursing flow improvements is inducted in reducing charge nurse workload and hours. Improved patient satisfaction scores can lead to patient loyalty and increases the returning clinic appointments during the whole regimen.

A Situation-Background-Assessment-Recommendation (SBAR) communication plan (IHI, 2017) listed in Appendix G provides an effective communication between team members of the health care team about the condition. By utilizing SBAR, it allows infusion nurses “an easy and focused way to set expectations for what will be communicated and how between members of the team, which is essential for developing teamwork and fostering a culture of patient safety” (IHI, p1).

Intervention

The proposed intervention is to create an infusion nurse suggestive acuity-based point tool to determine staffing in the ambulatory infusion treatment settings. The project is divided into three stages: pre-test stage, test stage, and post-test stage.

Pre-test stage will be for one month to establish the evidence-based practice (EBP) team, review research and literatures, and design an acuity-based point tool worksheet.

1. Evidence-based practice (EBP) research and literatures for staffing model in ambulatory infusion settings were searched and reviewed by an infusion nurse who is currently enrolled in the CNL program in University of San Francisco before establishing the evidence-based practice (EBP) team.

2. EBP team will be composed of multidisciplinary key stakeholders, including infusion nurses, charge nurses, a nurse manager, a nurse supervisor, an assistant nurse manager, schedulers, and patients for the three-month project. The infusion nurse who is a CNL student will represent the EBP team. The EBP literatures, need for change, and Gantt chart timeline listed in Appendix H will be reviewed and finalized in two-week period before implementation.

3. A worksheet for acuity-based points and instructions listed in Appendix I will be designed and approved by EBP team in the pretest stage. Charge nurses, infusion nurses and schedulers will participate the training to interpret the worksheet and review the worksheet. The infusion nurses should be responsible to identify and submit special needs to charge nurse on the worksheet. For example, history of difficulty in peripheral IV stick is prevalent among oncologic patients, and one acuity point should be assessed and applied to qualified oncology patients. In addition, infusion nurses should determine that maximum acuity-based points for non-oncologic patients. The “reasonable” maximum points to each infusion nurse is based on safety, high-quality, and efficiency of care delivery.

4. A weekly baseline daily nurse satisfactory report score sheet in Appendix J will be collected by the CNL student among infusion nurses and charge nurses in both test and comparison groups. When issues arise concerning, a MIDAS report will be submitted by infusion nurses.

The test stage will be one month long for EBP team, infusion nurses, and schedulers to implement the acuity-based point tool to determine staffing in the test group.

1. The staffing model will be based on the calculation of acuity-based points for each patient by infusion nurses and charge nurses on daily basis within the test group. In the comparison group, infusion nurses will continue current scheduling and staffing system. In the test group, infusion nurses will calculate the daily assignments in the beginning of the day to ensure that the maximum 16 acuity points per day. At the end of shift, debrief huddle for verifying the acuity-based staffing tool worksheet on each patient will be discussed between infusion nurse, charge nurse, and the CNL student.

2. Daily nurse satisfaction report score sheet will be documented during the test stage. Nurse satisfactory scores will be reported in the beginning of the shift and the end of the shift.

3. Schedulers will be aware late submission for future appointments by infusion nurses.

4. Charge nurses in the test group will be collaborate with schedulers to verify that there is an average 16 acuity-based points per nurse per day three clinic days in advance. Schedulers will notify charge nurses when total acuity-based points are over 80 points. Charge nurses will be responsible for finalizing the 16 acuity-based points distribution per nurse per day. Schedulers will follow the existing nurse time and chair time to schedule patient appointments to safely distribute arrival time.

5. The infusion nurse who is the CNL student will support the implementation of the acuity-based staffing model and worksheet during the test stage. The infusion nurse who is the CNL student will discuss guidelines, daily achievements, challenges to infusion nurses, charge nurses, nursing assistants, a nurse supervisor, a nurse manager, and schedulers during staff meeting. Content will include an overview of the acuity-based staffing model, development

process, worksheet, instructions to infusion nurses and schedulers, staff role expectations and responsibilities, and test group workflows.

The post-test stage will be one month long for EBP team to evaluate the outcome of implementation of the acuity-based point tool to determine staffing in the test group.

1. The evaluation will be conducted by the EBP team to evaluate the needs to implement the acuity-based point staffing worksheet and model. Nurse satisfaction in the test group will be higher than the comparison group and baseline of the test group. Sixteen acuity-based points per nurse per day will be appropriate to determine staffing to provide safety, high-quality, and efficiency of care delivery in ambulatory infusion settings.

2. Charge nurses and schedulers will express the desire for consistent acuity-based staffing model to reduce workload and working hours.

3. The CNL student will present cost-effective analysis and cost-benefit analysis results.

4. EBP team will implement acuity-based tool worksheet and staffing model in the comparison group. Charge nurses and infusion nurses will collaborate to schedule patient appointments cross the two infusion settings.

5. Charge nurses will lead huddles on daily base to discuss acuity-based staffing model to encourage a balanced workload and work-environment to enhance patient care experience.

Measures

Outcomes will be measured to evaluate staffing model. Nurse-sensitive indicators such as direct nurse hours related to charge nurse and infusion nurse will be measured in the pre-test, during test, post-test, and one year after project to evaluate the project. In addition, work-related nurse satisfactory score will be measured to evaluate the outcome of acuity-based staffing model

(ANA, 2012). Nurses make irreplaceable contribution to safety, high-quality, and efficiency of care; therefore, nursing satisfaction score should not be underestimated (ANA, 2012).

Potential cost-saving and cost-benefit analysis for implementing the project will be evaluated. According to ANA (2012), current healthcare system is imperative to shift to better care with low cost. With infusion nurse suggestive acuity-based staffing model, the average hours will be reduced to two hours for two charge nurses per day to balance the assignments; therefore, average realistic saving from charge nurses will reduce $12100 in three months based on average salary of $50 per hour. The current hours for schedulers to reschedule and cancel patients are not included in the project.

The input of the project associated with nursing hours will be mainly huddle and staff meeting. Fifteen minutes daily huddle on both settings will be utilized in the project and associated cost will be calculated based on two charge nurses, the CNL student, a nurse manager, a nurse supervisor, and an assistant manager. Every other week staff meeting will be held among a nurse manager, a nurse supervisor, an assistant manager, and 19 staff nurses, but only associated 15 minutes cost will be calculated in the project. With average salary of $50 per hour, the total calculated costs for the project will be $4725 during the project. Nurse cost benefit analysis of acuity-based staffing model for a three-month period net benefit cost is listed in Appendix K. Therefore, the estimated potential net savings are $8500 in ten weeks.

Ethical Considerations

The project is determined to qualify as an evidence-based change in process improvement, rather than a research project. Institutional review board (IRB) review is not required, and Statement of Non-Research Determination Form is listed in Appendix L. The goal of the project is to improve safety, quality, and efficiency in ambulatory infusion settings.

While the staff team may want to meet the measures, we must always be aware of the goals of the safety and quality of the patient care. One must also consider opportunity costs relating to the project, especially during the huddle and biweekly staff meeting; therefore, nurse manager, nurse supervisor, and assistant nurse manager should be aware of these potential costs and will monitor to determine if any huddles or meeting time should be used before initiating the huddle and meeting.

Expected Results

The evidence-based practice and literatures was searched and reviewed by the CNL student in May. The leadership team is receptive of the proposal and has given their support for project implementation. Based on the CNL student's planning, the project will start pre-test stage in August, test stage in September, and post-test stage in October. Plan, Do, Study, Act (PDSA) is listed in Appendix M. The one year follow up is recommended to ensure the success of acuity-based staffing model in ambulatory infusion settings.

Expected results include:

1.The project will improve nurse job satisfaction. 100% nurse job satisfactory related to perceptions of assignments fairness will be reached at the end of project.

2. The project will reduce 50% of charge nurse work time at the end of project. Infusion nurse overtime will be eliminated from over-scheduling or inappropriate staffing.

3. Parameters to guide staffing will be 16 acuity-based points per nurse per day to provide safety, quality, and efficiency of nurse care in ambulatory infusion settings.

4. Patient acuity-based points worksheet will be utilized to verify daily assignment and guide future appointment at the end of project.

5. Daily acuity-based points per nurse and per setting will be included in the morning huddles for both settings.

6. Charge nurses will obtain daily total scheduled acuity-based points report listed in Appendix N from schedulers three clinical days in advance to direct staffing during the test stage and post-test stage.

Discussion

The project was initiated by an infusion nurse who is enrolled in the CNL program in University of San Francisco, and it will take long preparation time to narrow down the project into an applicable test stage. The initial step is to identify the room for improvement by using current scheduling and staffing system. The second step is to utilize evidence-based practice and literatures to target a realistic goal. Third step is to obtain stakeholders buy-in. In this project, key stakeholders include a nurse manager, an assistant nurse manager, a nurse supervisor, charge nurses, schedulers, administration, physicians, and pharmacists. In the future, the last step will include multidisciplinary team to break down barriers of process change and adopt a suitable infusion nurse suggestive acuity-based staffing model. Barriers or challenges to conduct this project consists late start, time-limit, and budget restraints. For example, multidisciplinary teamwork needs coordination, flexibility, and management support.

Conclusion

Acuity-based staffing model is an effective process to enhance safety, high quality, and efficiency of care delivery in ambulatory infusion settings. The CNL student proposed project will establish multidisciplinary team to guide the problem-solving process. With the implementation of acuity-based staffing model, collaboration, balanced workload, and safe work-environment enhances nurse job satisfaction and patient care. As a CNL, it is our role to disseminate successful EBP to other healthcare organizations.

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Appendix A

Evidence Table

Question: what EBP exists to create acuity-based staffing model in ambulatory infusion settings to improve patient safety and quality of care					
Article #	Author & Date	Evidence Type	Sample Size	Finding	Evidence Level
1	DeLisle 2009	Quasi-Experimental	60 nurses 250 patients daily 11 clinics	DeLesle (2009) suggests classifying patients into five different acuity levels with appropriate acuity-based points. Any combination of a total of 20 acuity points per nurse per day determines the ideal nurse workload.	Level II
2	Vortherms et al 2015	Quasi-Experimental	35 infusion chairs 80 patients daily	Ideal nurse to patient acuity points should be 16 acuity-based points per day. The effective acuity-based staffing tool to provide consistent staffing, improve efficiency, reduce over time, and improve nurse satisfaction.	Level II

Appendix B

Acuity Level, Number of Patients, and Acuity Points Per Day (DeLisle, 2009)

Acuity Level	Number of Patients	Acuity Points
One	4	4
Two	2	4
Three	1	3
Four	1	4
Five	1	5

This is an example of nurse assignments. In this assignment, a nurse has nine patients with 20 acuity points per day. According to DeLisle (2009), acuity level should be considered to distribute assignment. The target acuity points per nurse daily will be sixteen points in the project.

Appendix C

Nursing Acuity-Based Tools Worksheet for Patient Assignment (Vortherms et al., 2015)

Acuity Criterion	Points
Any encounter	1
More than two drugs	1
First treatments including oncologic chemotherapy, immunotherapy, biotherapy	1
Less than Two Vesicant or irritants or chemotherapy IV push	1
More than Two Vesicant or irritants or chemotherapy IV push	1
Special needs (at least four needs) **Interpreter** **Oxygen dependent** **Mobility issues** **Mental issues** **Infection control issues** **Difficult IV stick or port access**	1
Predetermined Maximum Acuity Points Levels	Points
PRBCs	4
Platelets	2
CADD Pump connect or disconnect	1
Peripherally inserted central catheter or port laboratory draws	1

Appendix D

Kotter Eight-Step Change Model (Foster, 2013)

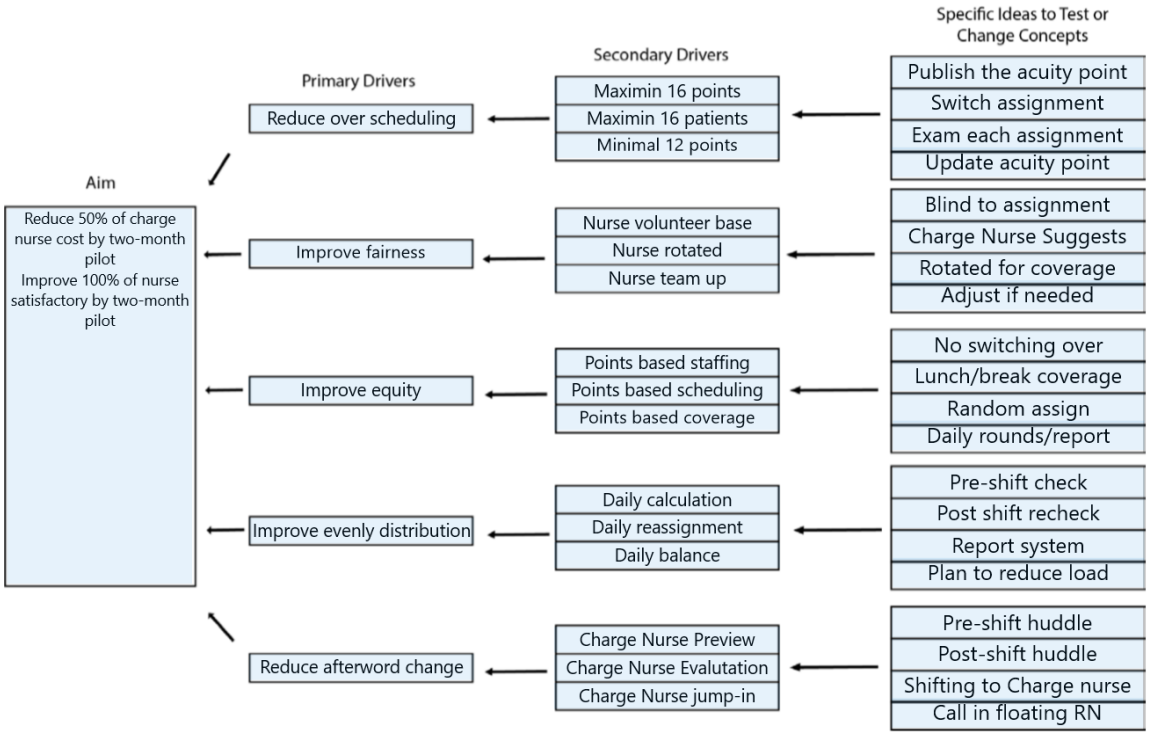
Adapted from Foster 2013

The CNL student identified the lack of reliable and valid infusion nurse suggestive acuity-based staffing model. With the increased urgency for potential compromised patient safety and poor quality of patient care, the CNL student suggests building the EBP team to resolve the problem. The two first steps are initiated in the project.

The next steps will get the right vision for the project, communicate for buy-in stakeholders, empower actions, create short-term wins, deploy support systems, and integrate the staffing model to improve the patient care.

Appendix E

Driver Diagram (Institute for Healthcare Improvement, 2017)



Appendix F

Strengths, Weakness, Opportunities, and Threats (SWOT) Analysis

Appendix G

IH SBAR: Situation-Background-Assessment-Recommendation (IHI, 2017)

S	**Situation:** What is the situation you are calling about? • Identify self, unit, patient, room number. • Briefly state the problem, what is it, when it happened or started, and how severe.	Charge nurse is overloaded with adjusting scheduled appointments daily
B	**Background:** Pertinent background information related to the situation could include the following: • The admitting diagnosis and date of admission • List of current medications, allergies, IV fluids, and labs • Most recent vital signs • Lab results: provide the date and time test was done and results of previous tests for comparison • Other clinical information • Code status	1. Oncology patient vs non-oncology patient 2. Special needs listed 3. Multiple drugs: less than two drugs vs more than two drugs 4. Vesicant or irritant or IV push: less than two vs more than two 5. Predetermined Maximum Acuity point level
A	**Assessment:** What is the nurse's assessment of the situation?	Charge nurse readiness to lead changes Infusion nurse readiness to learn to use new worksheet Schedulers readiness to document the new acuity based points Management readiness to implement the polit
R	**Recommendation:** What is the nurse's recommendation or what does he/she want? Examples: • Notification that patient has been admitted • Patient needs to be seen now • Order change	Test, validate, and evaluate Acuity-based points worksheet Staffing model implemented in one pilot setting to improve workflow and reduce cost Staffing model expanded to other settings

The SBAR tool will be utilized by the CNL student to communicate with a nurse manager, a nurse supervisor, an assistant manager, infusion nurses, charge nurses, and schedulers to create the infusion nurse suggestive acuity-based staffing model.

This is an example to describe the situation, background, assessment, and recommendation to decrease the charge nurse workload.

Appendix H

Three Months Gantt chart of infusion nurse's suggestive acuity-based staffing model Evidence-Based Project

	2019.8-2019.10					
Name of Activity	Week of August 1	Week of August 16	Week of September 1	Week of September 16	Week of October 1	Week of October 16
Identify issues Data/EBP review						
Roll-out of Project Consultations with identified task team						
Continue consultations						
Data collection and analysis						
Protocol finalized and incorporated to practice						
Summarization of what was learned						
Data results are disseminated						

Appendix I

Patient Acuity-Based Point Worksheet

Acuity Criterion	Points	Patient ID
Any Encounter	1	
Non-oncologic encounter: New patient for intravenous infusion	1	
For oncologic encounter: each item for one point		
More than two drugs	1	
New patient	1	
New regimen	1	
Less than Two Vesicant or irritants or chemotherapy IV push	1	
More than Two Vesicant or irritants or chemotherapy IV push	1	
Special needs (two needs will be one point)		
Interpreter needed		
Mobility	0.5	
Mental	0.5	
Infection precaution: contact	0.5	
Difficult IV/CVC access	0.5	
Phlebotomy	0.5	
Others: _____	0.5	
Predetermined Maximum Acuity Points Levels	Points	
PRBCs	2	
Intravascular BCG or Gemcitabine	2	
Platelets	1	

CADD Pump connect or disconnect	1
Peripherally inserted central catheter or port laboratory draws	1

The CNL student will use the acuity-based point worksheet for infusion nurses. Infusion nurses will use the worksheet to calculate each assignment. Charge nurses and the CNL student will collect and review each patient worksheet.

Appendix J

Nurse Job Satisfaction Score table

Month/Week	**Satisfaction**	**Test group**		**Comparison group**	
August Week 1	**0-10**	Start of Shift	End of shift	Start of Shift	End of shift
Monday	RN1				
	RN2				
	RN3				
	RN4				
	RN5				
	RN6				
	Charge RN				
Tuesday	RN1				
	RN2				
	RN3				
	RN4				
	RN5				
	RN6				
	Charge RN				
Wednesday	RN1				
	RN2				
	RN3				
	RN4				

	RN5 RN6 Charge RN				
Thursday	RN1 RN2 RN3 RN4 RN5 RN6 Charge RN				
Friday	RN1 RN2 RN3 RN4 RN5 RN6 Charge RN				

The table will be utilized for the CNL student to collect the nurse job satisfactory score. Each nurse job satisfactory score will be reported to the CNL student, and the score will be documented in the table.

Appendix K

Nurse Cost Benefit Analysis of acuity-based staffing model for a Three-month Period

	2019.8	2019.9	2019.10	Total cost
CNL cost	0	0	0	0
Infusion nurse training cost	0	0	0	0
Meeting cost	1575	1500	1650	4725
Benefits				
Saving from charge nurse less working hour	4200	3800	4100	12100
Net benefits	2625	2300	2450	7375
Benefit-cost ratio (B/C ratio)	1.7	1.5	1.7	1.6

Appendix L

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST

STUDENT NAME: Yongli Qiu

DATE: 5/6/2019 .

SUPERVISING FACULTY: PAMF .

Instructions: Answer YES or NO to each of the following statements:

Project Title:	**YES**	**NO**
The aim of the project is to improve the process or delivery of care with established/accepted standards, or to implement evidence-based change. There	**YES**	
The specific aim is to improve performance on a specific service or program	**YES**	
The project is **NOT** designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective	**YES**	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the	**YES**	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an	**YES**	
The project is conducted by staff where the project will take place and	**YES**	
The project has **NO** funding from federal agencies or research-	**YES**	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal	**YES**	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: "This project was undertaken	**YES**	

ANSWER KEY: If the answer to these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. IRB review is not required. Keep

a copy of this checklist in your files. If the answer to ANY of these questions is **NO**, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partner

Appendix M

Patient Total Scheduled Acuity-Based Points Daily Report

Date	Total acuity-based points	Number of nurses needed
September 2	80	5
September 3	90	6
September 4	85	6
September 5	96	6
September 6	64	4

This is an example of the daily report.

Daily report will be created three clinical days in advance.

Charge nurses will determine the staffing based on 16 points per nurse daily.

Appendix N

Plan, Do, Study, Act (PDSA) (IHI, 2017)