Employing Chronic and Rare Disease Printed Drug Information Related to Health Literacy to Improve Patients Perceived Knowledge in an Outpatient Setting: A Quality Improvement Initiative

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Employing Chronic and Rare Disease Printed Drug Information Related to Health Literacy to Improve Patients Perceived Knowledge in an Outpatient Setting: A Quality Improvement Initiative

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Abstract

Background: An infusion center in a critical access hospital provides education to patients and their families to address health literacy which supports shared decision-making and patient centered care. This education includes medication knowledge to support self-care. The goal of this project was to create printed drug education rack cards (DERC) for patients to review prior to their first treatment to increase their perceived confidence in drug knowledge. There are many different aspects to consider for each drug treatment given within the microsystem including side effects, administration schedules, and lab and diagnostic procedures. Many of these aspects are unknown to the patient prior to arriving to the microsystem for their first treatment. Patients may seek drug information on the Internet, most likely written at a reading level higher than 8th grade and contain information that does not fit their needs pertaining to their drug and the microsystems process for drug administration.

Local Problem: If aspects of drug administration are unknown to the patient, it can lead to missed appointments, knowledge deficit about the side effects of the drugs, and many questions from the patient to the nurse about how this drug treatment works. There were no educational information sheets to provide patients upon their first or reoccurring treatments.

Methods: To conduct this quality improvement project, the DERCs were inputted into the Flesch-Kincaid tool that calculates the grade level required to understand the text of the DERCs (Readable, 2023). The Patient Education Materials Assessment Tool for Printed materials (PEMAT-P) instrument was also used to screen the materials for content, language, visual aids, and engagement of the reader and if there were directions for action to be taken (Agency for Healthcare, 2020). To measure the patients perceived knowledge change, the project lead employed a third measurement, a retrospective and post-intervention survey.
Results: According to the Flesch-Kincaid tool, the average reading grade level a patient must be able to read at in order to read and understand the DERCs was between an 8th and 9th grade reading level, with the lowest score at 7.5 and the highest score at 10.2. The average PEMAT-P score overall was a 96%, indicating a high level of readability and understandability. According to the patient survey, the participants overall confidence in knowledge about their prescribed drug increased by 15.38%. The change in perceived confidence in knowledge about each drug information category varied greatly ranging from 0% to 28.57%. 66% of participants found the DERC to be extremely easy to read and understand.

Conclusions: The DERCs were created to enhance readability and actionability for the target population. Overall perceived confidence in knowledge increased suggesting that the use of the DERCs improved knowledge.

Keywords: Chronic Disease, Rare Disease, Patient Education, Health Literacy, Quality Improvement
Introduction

The aim of this quality improvement project is to increase patients' perceived confidence in knowledge surrounding their newly prescribed drug as it relates to health literacy. According to the Centers for Disease Control and Prevention (CDC) (2020) health literacy is “the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others” (CDC, 2020, p. 1). This quality improvement initiative was conducted in an infusion center of a critical access hospital in New England. The patients seen in the microsystem are living with one or more chronic or rare diseases. The microsystem’s mission is to deliver drugs in a controlled and safe environment on an outpatient basis, via subcutaneously (SQ), intramuscularly (IM), and intravenously (IV) for patients with acute or chronic illness (K. Sherman, Personal Communication, 2023). Care is focused on providing comfort and chronic disease relief through drug administration.

According to the CDC, chronic diseases are defined broadly as “conditions that last 1 year or more and require ongoing medical attention or limit activities of daily living or both” (CDC, 2022, p. 1). The World Health Organization (2022) refers to chronic diseases as noncommunicable disease and categorizes them as tending “to be of long duration and are the result of a combination of genetic, physiological, environmental, and behavioral factors (p. 1). There are many variations in diseases that are included under the umbrella term of chronic disease and a variation in defining the duration a disease must be present for it to be referred to as a chronic disease. The Orphan Drug Act (2018) defines a rare disease as a disease or condition that affects less than 200,000 people in the United States (U.S.).
Looking deeper into the area surrounding the infusion center, 97% of the population is white, with a median age of 52.5 years (Huggins, 2023, p. 9). Within the town where the infusion center is located, the median age is 58.2 years (New Hampshire, 2021). The infusion center has been tracking the number of patient visits per month since 2015. In 2015 the total number of patient visits was 201 for the entire year, growing to 2007 visits in total in 2022 (Appendix A) (CPSI, 2023).

Almost all patients who benefit from the infusion center are living with one or more chronic diseases. Out of 142 patients cared for in the infusion center in the past year, 32.6% of patients received services for Osteoporosis (Patient Chart, 2023). The top 7 diagnoses patients are treated for include different types of anemia (iron deficiency, myelodysplastic syndrome anemia and chronic anemia), Crohn’s disease, hemochromatosis, acute infection, moderate to severe chronic asthma, osteoporosis, and rheumatoid arthritis (Appendix B) (Patient Chart, 2023). The main drug prescribed for the number one diagnosis treated at the infusion center of osteoporosis, is zoledronic acid (Reclast) via IV infusion. The top drugs and procedures completed can be seen in Appendix C (Patient Chart, 2023). Patients can be treated between once every day to once every 6 months. Length of treatment during each visit is variable depending on the time it takes to prepare a drug and the amount of time the drug is required to be infused over. These times can vary from 30 minutes for a SQ injection to 4 hours for an IV immunoglobulin infusion.

**Problem Description**

Drugs given at the infusion center may include different side effects, administration schedules, and lab and diagnostic procedures. The coordination surrounding drug administration can become confusing and many of these aspects are unknown to the patient prior to entering the
infusion center. This confusion for the patient can lead to missed appointments, knowledge
deficit about the side effects of the drugs, and many questions from the patient to the nurse about
how this drug treatment works. Once the patient arrives for their first infusion, they have many
questions including: “how long does this take to infuse”; “how often do I have to come in for
this”; “do I need labs drawn every time I come in for an infusion”; “what side effects may occur;
what are the signs of an anaphylaxis reaction”; and “when will I see positive results from this
treatment?” When the nurses are asked these questions, they can answer many of them from their
own knowledge. Patients can forget the educational information verbally given to them or need
print outs of reminders. Patient education is “a process by which health professionals impart
information to patients and their caregivers to improve health status and encourages involvement
in decision making related to ongoing care and treatment” (Fereidouni et al., 2019, p. 2). As half
of the population in the U.S. have a chronic disease and a quarter of the U.S. population have
multiple chronic conditions, patient education is important (Boersma, 2020). This provides
evidence for the need of education regarding the prescribed drug to be given.

Patients may seek drug information on the Internet, most likely written at a reading level
higher than 8th grade and contain information that does not fit their needs pertaining to their drug
and the infusion center. The National Assessment of Adult Literacy found that “one-half of the
healthcare costs for individuals with low health literacy were due to literacy effects resulting in
an additional $237 billion in healthcare costs” (Rasu et al., 2015, p. 748). Low health literacy
along with drug information being written at a high reading level, can create many downfalls in
the patient’s treatment. Delays in treatment due the aspects listed above, can result in changes in
workflow for the nurses and time spent by the nurse away from other patients. The potential
benefits of implementing patient drug education are increased patient knowledge, decreased
confusion about the different steps necessary to treatment, patients reporting adverse effects experienced, patient’s lab work done ahead of time, prevention of cost of nurse’s time and decreasing cancellations and rescheduling of the patient’s treatment. A lack of knowledge surrounding what to expect while receiving infusion services and aspects of the drug itself, can adversely affect the patient’s overall satisfaction of care provided.

Available Knowledge

A literature review was conducted to evaluate how patients’ health literacy impacted their attained knowledge of patient education materials (PEMs), specifically for patients with a chronic disease, chronic illness, or rare disease. The Centers for Disease Control and National Institutes of Health recommend that PEMs should not be above a 6th grade reading level, yet the average reading skill level of the U.S. is at an 8th grade level (Eltorai et al., 2014). An article by Hoang and Van Ballegooie (2022) presented data collected from 55 associations, which included 2,590 PEMs collected between June to November of 2021, associated with chronic health conditions. The quality of the PEMs was assessed using the Journal of the American Medical Association (JAMA) benchmarks and Health on the Net Foundation Code of Conduct certification (HONCode) (Hoang & Ballegooie, 2022). The purpose of this information analysis was to determine the reading level of PEMs related to chronic disease and determine the best course of action for future PEMs based on 10 validated readability scales with disease cluster specific recommendations (Hoang & Ballegooie, 2022).

The readability scales showed that 95.3% and 82.7% of PEMs were above the 6th and 8th grade reading level (Hoang & Ballegooie, 2022). A difficult word analyzer, Readability Studio, was used to analyze the percent of complex words, long words and unfamiliar words used in each PEM (Hoang & Ballegooie, 2022). The examiners then used these results to identify
synonyms that could decrease the difficulty of the words identified through Readability Studio™. Some examples of difficult words include vitamin, radiation, nausea, medication, and abnormal. The examiners could not come up with synonyms for certain words such as different disease processes. It can be difficult to create a PEM that is at or below an 8th grade level due to orienting the patient to the disease or diagnosis the PEM pertains to using the diagnosis terminology. Patients with certain chronic conditions may need information presented at a higher grade level due to the disease, pathophysiology, and treatment such as dementia and Parkinson’s disease (Hoang & Ballegooie, 2022). This examination of current PEMs for the top 10 chronic diseases within the U.S. can help improve the readability of future PEMs created. PEMs should be written at a level consistent with a defined population, rather than the U.S. as a whole. This analysis helped examine the chronic diseases that need focused efforts to improve readability.

Medical information, especially for chronic conditions, can be difficult to communicate, both in written and spoken communication. Patient education materials are intended to support patients in self-management in chronic disease care. Morony et al. (2017) identified Chronic Kidney Disease (CKD) patient education materials (PEMs) from a previous systematic review conducted in 2014, to examine the materials actionability and visual aids. The reviewers of these materials applied the Suitability Assessment of Materials (SAM) and Patient Education Materials Assessment Tool (PEMAT) to evaluate how easy patient materials were to understand and act on (Morony et al., 2017). Both instruments screen the materials for content, language, visual aids, and engagement of the reader and if there are directions for action to be taken. Both tools also explain each item to be measured and how to apply the measurement to the material to examine them properly according to the tools design.
It is important to use validated tools of measurement and data collection to analyze patient education materials. A total of 11 out of the 26 materials were scored “superior” by the SAM tool, suggesting the materials are easy to read. 5 of the 26 items were scored “not suitable”, meaning the materials were both not readable and comprehensive (Moroney et al., 2017). The Morony et al. (2017) review and analysis found that the organization, and the way each material separated their information within the material, was poor. Many of the images rated through the reviewer’s tool were deemed contradicting to the text of the materials. For example, an image may illustrate what the patient should not do, when the text states what the patient should do. A patient who has a low health literacy may not understand the text and interpret the image incorrectly. When the reviewers used PEMAT, 79% of the visual aids scored a zero for item 16 “the material’s visual aids reinforce rather than distract from the content” (Morony et al., 2017, p.166). The visual aids were mainly decorative rather than informative. It is important to implement visual aids that promote and guide the patient-on-patient educational materials.

A review was conducted by Khaleel et al. (2020) to identify the scope of research addressing health information overload in patients. The records included in the review focused on measuring health information overload using different scales and predictors of health overload including low education level, health literacy and socioeconomic status (Khaleel et al., 2020). Records also focused on interventions to address information overload such as written patient information materials. Information overload can be defined as “a state where the volume of the information exceeds an individual's information processing capacity” (Khaleel et al., 2020, p. 16). Patients’ ability to retain all the information a provider educates them on, is nearly impossible. A patient’s reading level and knowledge base can affect their ability to recall new information. People who experience information overload are more likely to be stressed and
confused which can lead to incorrect interpretations of information, impacting their psychological well-being (Khaleel et al., 2020).

The study focused on the patient and consumer of the information and excluded professionals and students from the search. The reviewers found several predictors to patient’s information overload, both positive and negative factors. Factors increasing health information overload among patients included a low education level, low health literacy, poor searching skills, low socioeconomic status, older age, and lower confidence in seeking health information (Khaleel et al., 2020). Factors associated with lower information overload level included patients having higher motivation for health-related internet use, more in-depth information provided to patients, screening behavior, and passive scanning of health information (Khaleel et al., 2020). As patients began to receive an increased amount of health information, the patient’s ability to retain and process this information declined, causing information overload to be reported.

Falcao et al. (2023) published an article about a community-based participatory framework to co-develop patient education materials (PEMs) for rare diseases. Rare diseases, also known as congenital disorders of glycosylation (CDG) are rare metabolic diseases that are complex and multisystem based (Falcao et al., 2023). The goal stated by the authors in this article was to create a framework to close the gap in creating PEMs for rare diseases. Patients who suffer from rare diseases and professionals who care for these patients should be involved in the design of PEMs to better serve this population.

Several health literacy models have been created in recent years to validate, measure, and help create health literacy interventions. Low health literacy among patients is associated with poor and limited knowledge about medical conditions, non-adherence to treatment plans and medical regimens, and poorer outcomes (Falcao et al., 2023). As noted, poor health literacy can
lead to devastating effects for patients. Falcao et al. (2023) conducted a literature review and created a questionnaire to display 4 articles describing the development of PEMs for rare disease to help close the knowledge gap for lower health literacy patients. “PEMs are a knowledge translation intervention for the dissemination of reliable clinical information” (Falcao et al., 2023, p. 2). This article overall focused on a literature review and questionnaire to investigate current research for creating rare disease PEMs and the communities informational need for PEMs, to develop a framework to create future PEMs for rare disease. Creating PEMs with the use of patients and caregivers’ input, can help to create resources directed to the patient’s needs, values, and preferences. It was found that many participants of the study who completed the questionnaire implemented by the reviewers, had to wait 1-3 years for a definitive diagnosis from a provider regarding their rare disease (Falcao et al., 2023). Providers may need more education about rare diseases along with the patients themselves. Upon diagnosis, patients experience difficulty understanding the provider’s initial information. This can be due to various factors such as health literacy and the subjective processing of a new diagnosis.

During Falcao et al. (2023) research, they discovered the medical application called SumMed. This application allows patients to input a medical article into the system to then receive an easy-to-understand summary of the article (Falcao et al., 2023). This application can also provide the patient the most credible sources of information regarding their disease, and it currently available in 60 languages. This application can be used in a variety of care settings and can be especially helpful for patients with rare diseases that can be challenging to understand.

The SAM and PEMAT tools have been previously identified as effective tools for evaluating PEMs readability. An article by Morony et al. (2018) found that “an approach that seeks explicitly to assess both ‘comprehensibility’ and ‘usability’ with respect to a specific
audience’s needs is the Evaluative Linguistic Framework (ELF), which is grounded in linguistic theory and concerned with how readers make meaning from text (p. 2). The use of the ELF tool was the focus of a study conducted and has proven of value when improving quality and comprehensibility of health information but has yet to be used and tested with chronic disease self-management PEMs. The ELF tool analyzes contexts of culture and situation of the PEMs to allow relaying of meaning behind the context of the PEM. “The context of culture (what a reader would expect from a given type of text) and the context of situation (the subject matter, the acknowledged or unacknowledged identities of author and reader, and the way the text is conveyed, such as book chapter or brochure) affects its comprehensibility and usefulness for readers” (Moronoy et al., 2018, p. 2).

The ELF consists of 9 items including overall organizational or generic structure, rhetorical elements, writer-reader relationship, meta discourse, signposts, technicality of vocabulary, lexical density, factual content of text, and format (Morony et al., 2018). Overall, the ELF assessment considers how patients or consumers of the PEMs expectations about available information affects their ability to understand them. This study conducted by Morony et al. (2018) sought to use the ELF assessment to examine PEMs focused on self-management of CKD that may not be captured by other tools such as the PEMAT and SAM. This study was able to identify sections of text along with theoretical elements that can be applied to self-management PEMs for CKD. The implementation of the ELF assessment helped to make meaning of CKD PEMs. However, this assessment also found that many readers may feel PEMs can be too dense in literature and does not provide the most pertinent and easy to understand information. The advice provided in chronic disease PEMs needs to be specific for the reader to make the necessary changes to promote health and well-being. For example, ELF found that PEMs would
advise the reader to increase their exercise instead of specifically stating to exercise for at least 30 minutes a day. PEMs should reinforce provider teaching rather than contradict the providers education.

The elements of the ELF assessment, identified by Morony et al. (2018) should be used as a framework to create future chronic disease PEMs to provide an adjunct from the providers teaching to the patients understanding. When creating PEMs, the difficult word analyzer, Readability Studio, identified by Hoang et al. (2022), can be used to analyze the percent of complex words, long words and unfamiliar words used in each PEM, to create synonyms that are easier to understand. Khaleel et al. (2020) found that providing patients with a PEM that is organized, visually stimulating, with informative but concise information, may decrease the risk of information overload for the patient. As mentioned before, it can be difficult to create a PEM at or below an 8th grade level due to orienting the patient to the disease or diagnosis the PEM pertains to using the diagnosis terminology. The PEMs should be written at a level consistent with a targeted and defined population, rather than the U.S. as a whole. Patients with certain chronic conditions may need information presented at a higher grade level due to the disease, pathophysiology, and treatment such as dementia and Parkinson’s disease (Hoang et al., 2022).

The SumMed tool identified by Falcao et al. (2023), that allowed patients to input a medical article into the system and receive an easy-to-understand summary, can be very beneficial across the healthcare system regarding health literacy and drug information to be understood by many populations. PEMs that are created with clear and concise language can empower patients and their family members during these confusing and stressful times. Providing disease specific information tailored to the population being educated can also drive the amount of knowledge attained. A need has been identified by Falcao et al. (2023) for clear
and concise information for patients with rare diseases regarding disease information, and a framework to develop these tools needs to be tested and verified to better patient’s outcomes. According to Morony et al. (2017), repetition of key messages is important to include in patient information materials, especially for patients with chronic diseases who more than likely have co-morbidities such as cognitive deficits in attention and memory. The US National Action Plan on Health Literacy lists the need to develop “actionable” health information as a key goal (Morony et al., 2017). The use of the SAM and PEMAT tool have been shown to measure the readability of PEMs accurately, when used correctly.

**Rationale**

People diagnosed or living with an undiagnosed chronic disease, chronic illness or rare disease are among the most vulnerable population in terms of health literacy (Falcao et al., 2023). Patient education is an important part of chronic disease management, as it empowers patients to improve their health status, create positive outcomes, and improve quality of life. To create readable and quality PEMs, the project lead assumed the targeted population, mean age of 60 years old, would prefer a printed educational reference, rather than an online reference. The education could be provided in electronic form; however, data has shown this population is less technology savvy and this could lead to a barrier in attaining the information.

This project was being designed and implemented by following the Plan-Do-Study-Act (PDSA) framework. This is a scientific method designed for shorthand testing of change (Science of Improvement, 2023). In the “plan” phase, the problem was identified, a literature review was conducted to determine methods of delivering educational materials. and a proposal was drafted outlining the methods and planned study of the intervention. The “do” phase involved
implementing the DERCs upon the patients first visit to the infusion center. The readability and understandability were measured during the “study” phase. This quality improvement paper is a part of the “act” phase, disseminating the results and findings.

Specific Aims

To address the patient’s drug education gap, a global aim to increase patient perceived confidence in knowledge surrounding their drug administration within the infusion center, was created. To reach this goal, the specific aim of the project was to increase patients perceived knowledge of newly prescribed drug administration by 30% within the infusion center upon their first treatment.

Methods

Context

To implement this quality improvement project, there was a cost to the microsystem. Time was the highest cost, including the time of the project lead to gather the drug information; time of the masters prepared nurse (MSN) to review the information for accuracy; time of the Director of Communications to coordinate the creation and printing of the drug information; and time of the Graphic Designer to make the final DERC product. The costs to implement the printed information were $200 to print 200 copies of the information in a rack card format. However, the cost of not implementing the drug education could also impactful. A lack of knowledge surrounding what to expect while receiving services at the infusion center and aspects of the drug itself, could adversely affect the patient’s overall drug adherence and understanding of treatment. The patient could be less likely to follow drug regimen, not know what signs and symptoms to report to a provider, not know how the drug is given or the treatment schedule, and not know what to expect or be prepared with upon the first and subsequent visits. Missing a dose
of a drug could offset the administration schedule, causing the nurse to contact the provider and taking the provider and nurses time away from caring for other patients. If lab work was not completed by the patient prior to their visit, the nurse would take more time to draw labs and wait for the results, or the patient would have to reschedule their appointment.

**Intervention**

To increase the patient’s knowledge about their newly prescribed drug, a printed drug education rack card (DERC) pertaining to the patient’s newly prescribed drug was provided. The top administered drugs given included zoledronic acid (reclast), denosumab (prolia), iron sucrose (venofer), omalizumab (xolair), infliximab (remicade), ferric gluconate (ferrlecit), and vedolizumab (entvyio) in 2022 (Patient Chart, 2023). A total of 16 DERC’s were made based on the infusion center nurse’s perception of most common drugs given. These drugs included the following generic names: Abatacept, Denosumab, Epoetin Alfa, Ferric Gluconate, Golimumab, Iron Sucrose, Leuprolide, Naltrexone, Ocrelizumab, Omalizumab, Pegfilgrastim, Teprotumumab, Vedolizumab, Zoledronic acid, Infliximab, and Immune globulin. Drug information pertaining to 16 different drugs was collected by the project lead through the resources of UpToDate and each drugs manufacturers website (UpToDate, 2023). A rack card template was created to display pertinent educational material for the patients to read. The topics included in the template were deemed important by the facilities nurses and the project lead. The topics included the name of the drug, what the drug is prescribed to treat, how it is given (e.g., intravenously, subcutaneously, etc.), what side effects to monitor for, what the drug may interact with, what the patient should know or need to complete prior to starting the drug treatment, the treatment schedule (e.g., given once every 6 months, once a year, etc.), how long the treatment may take per visit, and what to expect during each visit (Appendix D). Each drug rack card also
included a quick response (QR) code to allow the patient to scan it with their mobile device and read more patient information from the manufacturer’s website regarding their prescribed drug. The Flesch-Kincaid readability scale and the PEMAT-P tool were used to measure the readability and understandability of each DERC, to measure the DERCs readability between 8th and 10th grade reading levels.

**Study of the Intervention**

Before creating the final DERC for the drugs included, each DERC was reviewed by an MSN for information accuracy. After the MSN’s edits were made, each DERC was inputted into the Flesch-Kincaid readability scale (Good Calculators, 2023). The Flesch-Kincaid tool calculates the grade level required to understand the text of the patient education material (Readable, 2023). For example, a score of 8.5 would suggest the reader of the content needs to obtain a reading level of 8th to 9th grade in order to read and understand the information presented (Appendix E). This tool was first developed in the 1940’s by Rudolf Flesch, and modified in 1976 by the U.S. Navy, assisted by John P. Kincaid (Readable, 2023). The Centers for Disease Control and National Institutes of Health recommend that PEMs should not be written above a 6th grade reading level, yet the average reading skill level of the U.S. is at an 8th grade level (Eltorai et al., 2014). Looking at the patient population the infusion center provides services for, 95% of the surrounding county are high school graduates, and 70% of adults have some postsecondary education (Huggins, 2023). Due to the reading abilities of this specified population being above the national average, the goal for each DERC was for a readability score of an 8th to 10th grade reading level.

Once the DERCs were reviewed and edited, a survey to assess patients perceived confidence in knowledge was submitted to the hospital Quality Improvement Director and
Director of Communications (DOC) who approved its contents and of its use. Once approved, the DOC relayed the contents to the Graphic Designer to be made into rack cards. A rough draft of each DERC was created and the DOC and project lead evaluated the DERCs and submitted them for printing. Each drug rack card was then measured for its readability to support health literacy needed to understand the information. To measure the readability and actionability of the drug rack cards, the project lead implemented the externally validated Patient Education Materials Assessment Tool for printed materials (PEMAT-P). This instrument screened the materials for content, language, visual aids, and engagement of the reader and if there were directions for action to be taken (Agency for Healthcare, 2020). An example of the PEMAT-P tool can be found in Appendix F. Upon implementation of the DERCs, a survey consisting of retrospective and post-implementation questions were provided to the patients upon their arrival for their first treatment along with their corresponding DERC.

**Measures**

To measure the patient’s perceived confidence in knowledge change, a survey was distributed asking for the patients perception of drug knowledge before and after receiving the DERC (Appendix G). The survey was distributed to the patient upon arrival to their treatment appointment along with their corresponding drug rack card by their assigned nurse. The patient was asked to answer questions 1 through 5 before reviewing the DERC. The first question of the survey was for the patient to decide if they would like to participate in the survey. The second question asked the patient to identify which drug they are receiving. Questions 3, 4, and 5 asked the patient to identify their knowledge of the drug, confidence in different aspects about the drug, and where the patient sought out previous drug information. Question 4 of the survey asked the patient to respond to their perceived confidence in knowledge regarding different aspects of the
drug such as the route of administration, side effects, treatments the drug may interact with, labs and tests needed, treatment schedule, visit duration, and what to expect during their visits. The patient ranked their answer on a Likert-style 5 point scale from not confident at all, to extremely confident. The patient was prompted to read the DERC and then answer the post-survey questions 6 through 11. Following the education with the DERC, question 7 asked the patient again “How well do you feel you understand why you are receiving this drug” to study the impact of the intervention. To study the intervention and reflect on the specific aim, the patient was asked to respond to their perceived confidence in their knowledge post-intervention on the same elements as in the 4th survey question given pre-intervention.

**Analysis**

The project lead developed patient survey included categorical, Likert-type and open-ended questions. The Likert-type items were descriptively analyzed with mean, standard deviation, and range noted. The mean of each question included in the first part of the survey administered prior to the review of the DERC, were compared to the corresponding post-intervention questions mean for further analysis. The Flesch-Kincaid score for each individual DERC were compared to one another, with a mean, standard deviation and range of scores noted to determine the readability and understandability of each DERC. The same analysis was conducted for the PEMAT-P results for each DERC.

**Ethical Considerations**

To prevent unethical situations arising for patients, the patients were made aware these DERCs and the survey would remain anonymous, with no patient identifiers used. A disclosure statement regarding the use and anonymity of the survey were approved by the DOC and displayed at the top of the survey. This allowed the patients to provide participant agreement
without fear of their responses being associated to them. The DERCs were provided in a printed form due to the average age of the patients being 60 years old (CPSI, 2023). The DERCs could be provided in electronic form, however data has shown this population is less technology savvy and this could lead to a barrier in attaining the drug information. The pre-intervention and post-intervention survey were provided in printed form for these reasons. The DERCs were written at an 8th to 10th grade level due to the community’s average education level. Finally, this proposal was approved by the UNH Department of Nursing Quality Review Committee. This allowed the proposal to be judged on whether it meet the criteria for a quality improvement project and was exempt from the Institutional Review Board for a full review.

Results

Results

Evolution of the Intervention

Minimal changes were made from the original plan of creating, implementing, and measuring this project. Once the DERCs rough drafts were complete, the project lead experienced a delay in printing of the DERCs, due to the DOC being unavailable. This led to the implementation phase occurring for 12 business days, from June 15th to June 30th. A revision was made to the post-intervention survey for improved data analysis. Instead of the patient’s confidence in knowledge measured in one single question, a matrix with a series of topics was created to measure the patient’s confidence for each topic of the DERC. This allowed the project lead to measure specific areas of confidence or lack of confidence of the participants. The patients also had the option of reviewing the DERC alone, with a nurse, or with the project lead. A question was created within the post-intervention survey to document how the participant reviewed the DERC.
**Flesch-Kincaid Readability Results**

Once each rack card was edited and approved for printing, they were inputted individually into the Flesch-Kincaid tool. With the goal of an 8th to 9th grade reading level for the DERCs, the individual DERCs were evaluated using the Flesch-Kincaid grading tool, with the lowest readability score of 7.5 and the highest score of 10.2 (Figure 1). The top value in the box and whisker graph in Figure 1 depicts the maximum value, followed by the next value of the third quartile of 8.8, mean of 8.55, first quartile of 7.7, and the minimum value of 7.5 for all of the DERCs overall.

**Figure 1**

*Overall Flesch-Kincaid Drug Rack Card Grade Level Scores (Box and Whisker Graph)*

![Drug Rack Card Flesch-Kincaid Grade Level Scores](image)

Figure 2 displays each drug rack cards Flesch-Kincaid readability score by drug name. The rack cards that are the most difficult to read based on the Flesch-Kincaid tool are Immune Globulin, consistent with a 10th grade reading level, and Omalizumab, written at a 10.2 grade level. The DERC for the medication Pegfilgrastim scored the lowest at a 7.5, consistent with a 7th to 8th grade reading level.
**PEMAT-P Readability Results**

The PEMAT-P tool was implemented by two individuals who are college graduates with 4-year degrees, do not work in the healthcare field, and were not involved in the development of the drug rack cards. The project lead explained how to use the PEMAT-P tool to the reviewers separately. Each reviewer analyzed all 16 drug rack cards on their own and inputted their findings into an excel spreadsheet. The reviewers scored the drug rack cards through 15 different scoring items within the PEMAT-P tool. If the reviewer agrees with the statement provided by the PEMAT, the item is given a 1. If the reviewer does not agree with the statement, the item is given a 0; and if the item does not apply to the material being reviewed, the item is deemed not applicable. A score of 15 out of 15, or 100%, would indicate the reviewers feel the material presented is extremely easy to read and understand. The higher the score, the more understandable or actionable the material is. Together, the average percent of the drug rack cards was 96%, indicating a high level of readability and understandability. The drugs that scored a
lower percentage on the PEMAT-P tool were Ferric Gluconate and Iron sucrose at 86.67%. This means the drug rack cards are more challenging to read and understand than the majority of the drug rack cards but are still easily readable and understandable. These drug rack cards had images that did not have titles to indicate what the image portrayed along with other limitations such as the medical terms not being explained thoroughly, bringing the readability and understandability score down. A total of 9 out of the 16 drug rack cards scored a 15 out of 15, or 100%, for readability and understandability. Figure 3 displays the PEMAT-P tools final scores for each drug rack card.

**Figure 3**

*Individual PEMAT-P Scores for Each Drug Rack Card*

### Survey Results

To measure the patients perceived knowledge change, the project lead employed a third measurement, a pre-intervention and post-intervention survey. The survey consisted of 11 questions, including a matrix, Likert-type items, categorical and open-ended measures. A total of
3 patients completed the survey. The results of the survey were inputted into Qualtrics to be analyzed (Qualtrics, 2023).

**Pre-Intervention Survey Results.** Pertaining to question 1 of the survey, all three patients that were eligible to participate, agreed to complete the survey. Patient A and B were receiving a drug in the Immune Globulins class of drugs, and Patient C was receiving Naltrexone (Vivitrol). Question 3 asks how well the patient feels they understand why they are receiving the drug. The patient could answer on a Likert scale with 1 being not well at all, 2 slightly well, 3 moderately well, 4 very well and 5 extremely well. Patient A answered moderately well, Patient B answered extremely well, and Patient C answered very well. Therefore, a mean score of 4.0 indicates that overall, the participants perceived they understood very well why they were receiving the drug prior to the intervention. The fourth question asks the patient how confident they are in their knowledge about different aspects of the drug. Overall, the participants confidence was highest for side effects of the drug, treatment schedule, and the length of their visit with a mean of 4.33. All 3 participants felt very confident in what to expect during their visit. Confidence was lowest for drug interactions with a mean of 3.0 and labs and diagnostics needed prior to treatment with a mean of 3.33. Figure 4 displays the minimum, maximum, mean, standard deviation, and variance for each part of question 4.
Pertaining to the question about sources used for drug information (question 5) 66% of the participants did not seek out previous drug information from the internet, provider, family, friends, or other sources. 33% received drug information from their provider. The information given by the provider was not asked about or specified in this survey.

**Post Intervention Survey Results.** After the patients reviewed the drug rack card, they completed questions 6 through 11. 66% of participants reviewed the rack card with a nurse and 33% reviewed it on their own, while none of the participants reviewed the DERC with the project lead. To study the intervention of the DERC, the participants were asked to note how well they felt that they understood why they were taking the medication before and after reviewing the DERC. Prior to reviewing the DERC, the mean of 4.0 (SD 0.82, range 1-5) was noted while following review of the DERC the mean was noted to be 4.67 (SD 0.47, range 1-5). Participants confidence in perceived knowledge changed by 15.38%, after reviewing the DERC.
Perceived Confidence in Drug Knowledge Post Intervention

To measure the overall change in perceived confidence in their drug knowledge, the statistical data from questions 4 and 8 were compared. Following the intervention, confidence for what the drug is prescribed for, how it is given, side effects, treatment schedule, visit duration and what to expect at the visit all scored the highest mean of 4.33, indicating a high confidence in these areas. Previously in question 4, drug interactions obtained the lowest mean of 3.0 before the participants received the intervention. After the intervention, labs and diagnostics still scored lower but with an increase in mean of 3.67, indicating patients are only moderately confident about what is needed prior to treatment. Figure 5 displays the minimum, maximum, mean, standard deviation, and variance for each element of the patients perceived drug knowledge.

Figure 5

Overall Post-Intervention Perceived Confidence in Drug Knowledge

<table>
<thead>
<tr>
<th>#</th>
<th>Field</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std Deviation</th>
<th>Variance</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What the drug is prescribed for</td>
<td>4.00</td>
<td>5.00</td>
<td>4.33</td>
<td>0.47</td>
<td>0.22</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>How it is given (e.g., through an intravenous infusion)</td>
<td>4.00</td>
<td>5.00</td>
<td>4.33</td>
<td>0.47</td>
<td>0.22</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Side effects to monitor for</td>
<td>4.00</td>
<td>5.00</td>
<td>4.33</td>
<td>0.47</td>
<td>0.22</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Treatments this drug may interact with</td>
<td>3.00</td>
<td>5.00</td>
<td>4.00</td>
<td>0.82</td>
<td>0.67</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Labs and/or tests needed prior to treatment</td>
<td>2.00</td>
<td>5.00</td>
<td>3.67</td>
<td>1.25</td>
<td>1.56</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Treatment schedule (e.g., once every week)</td>
<td>4.00</td>
<td>5.00</td>
<td>4.33</td>
<td>0.47</td>
<td>0.22</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>How long your visit may take</td>
<td>4.00</td>
<td>5.00</td>
<td>4.33</td>
<td>0.47</td>
<td>0.22</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>What to expect during your visits at Huggins Infusion Services</td>
<td>4.00</td>
<td>5.00</td>
<td>4.33</td>
<td>0.47</td>
<td>0.22</td>
<td>3</td>
</tr>
</tbody>
</table>
**Study of the Intervention: A Comparison of Means**

To study the intervention, the mean scores for each element of perceived drug knowledge was compared. Overall, the means and percent change from questions 4 and 8 are compared in Figure 6. Overall, patients perceived confidence in knowledge about side effects, treatment schedule, and visit duration did not change after the intervention was implemented. The percent change defines how the patient’s perceived confidence in their knowledge changed. The greatest aspect of confidence change was drug interactions at 28.57%. Patients perceived confidence in knowledge about what the drug is prescribed for increased by 16.50% from pre- to post-intervention, showing a significant increase in confidence.

**Figure 6**

*Overall Perceived Confidence in Drug Knowledge Comparison of Means and Percent Change*

<table>
<thead>
<tr>
<th>Field</th>
<th>Q4 Mean</th>
<th>Q8 Mean</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>What the drug is prescribed for</td>
<td>3.67</td>
<td>4.33</td>
<td>16.50%</td>
</tr>
<tr>
<td>How it is given (e.g., through an intravenous infusion)</td>
<td>4</td>
<td>4.33</td>
<td>7.92%</td>
</tr>
<tr>
<td>Side effects to monitor for</td>
<td>4.33</td>
<td>4.33</td>
<td>0.00%</td>
</tr>
<tr>
<td>Treatments this drug may interact with</td>
<td>3</td>
<td>4</td>
<td>28.57%</td>
</tr>
<tr>
<td>Labs and/or tests needed prior to treatment</td>
<td>3.33</td>
<td>3.67</td>
<td>9.71%</td>
</tr>
<tr>
<td>Treatment schedule (e.g., once every week)</td>
<td>4.33</td>
<td>4.33</td>
<td>0.00%</td>
</tr>
<tr>
<td>How long your visit may take</td>
<td>4.33</td>
<td>4.33</td>
<td>0.00%</td>
</tr>
<tr>
<td>What to expect during your visits at Infusion Services</td>
<td>4</td>
<td>4.33</td>
<td>7.92%</td>
</tr>
</tbody>
</table>

To conclude the results of the survey, two questions were asked about the difficulty in reading and understanding the DERC to gain a perspective on readability and health literacy. 33% of participants found the rack card to be very easy to read and understand, scoring a 4 on a scale of extremely difficult being 1 and extremely easy being 5. 66% of participants found the
rack card to be extremely easy to read and understand, scoring a 5 on the Likert scale. 100% of participants felt there was not any additional information that needed to be added to the DERC.

**Contextual Elements**

Developing the drug rack cards and receiving approval of their contents and design, took a month longer than expected. This delayed and shortened the implementation phase, and in return, provided less drug rack cards to be implemented. An element that interacted with the data collected of this quality improvement project was a decrease in referrals to the infusion center. The project lead was only able to implement 3 surveys and DERCs due to 3 patient referrals occurring during the implementation phase. The largest positive contextual element for the project’s success was stakeholder buy in from the DOC, unit manager, Directors of the hospital, and unit nurses. This project was created in collaboration with all of the stakeholders and the stakeholders saw value in the DERC’s.

**Discussion**

**Summary**

The specific aim of this quality improvement project was increasing patients perceived confidence in drug knowledge by 30% within the microsystem upon their first treatment. The global aim of this project was to create DERCs with a Flesch-Kincaid score indicating readability between the 8th and 10th grade reading level, consistent with the education level of the target population. Key findings included the enhanced readability for the DERCs as appraised by the PEMAT-P and Flesch-Kincaid instruments. An overall increase in the perceived confidence in drug knowledge as a result of the intervention. Both the PEMAT-P tool measured readability and actionability of each DERC, indicating that all of the DERCs are generally easy to read and understand by the average reader of the target population. The patient survey indicated
educational areas for improvement, such as labs and diagnostics required for the treatment. The patient survey also displayed the greatest area of perceived confidence in knowledge change as treatments the drug may interact with, at a percent change of 28.57%.

**Key Findings: PEMAT-P**

As previously noted, the average PEMAT-P score overall was appraised by two independent reviewers was 96%, indicating a high level of readability and understandability. The drugs that scored a lower percentage, Ferric Gluconate and Iron sucrose at 86.67%, are slightly less easy to read and understand than the majority of the DERCs. It was found these DERCs have images without titles in addition to medical terms needing further explanation. Images should be helpful to the reader, supporting the written education, as previously noted by Morony et al. (2017). According to the PEMAT-P results, 56% of the DERCs scored a 100% for readability and understandability, with no adjustments needed for the reader to easily read and understand the contents. However, those DERCs scoring lower may need revision.

**Key Findings: Flesch-Kincaid**

According to the Flesch-Kincaid tool, the average grade reading level a patient must be able to read and understand the DERCs is between an 8th and 9th grade reading level. 95% of the targeted population of the surrounding county are high school graduates, with 70% of adults obtaining some postsecondary education (Huggins, 2023). Each DERC was written between a 7th and 10th grade reading level.

**Key Findings: Patient Survey**

As previously mentioned, the specific aim was to increase the perceived confidence in knowledge by 30% with the revision to the DERCs. While the specific aim was not met, there was a 15.38% increase in overall in perceived confidence in knowledge. The largest increases for
perceived confidence in knowledge are noted for what the drug is prescribed for, how it is given, side effects to monitor for, treatment schedule, visit duration, and what to expect. By contrast, the lowest change to confidence in knowledge scores was noted for labs and tests required and treatments the drug may interact with. After reviewing the DERC, labs and tests held the lowest mean at 3.67 (SD 1.25, range 3), with a 9.71% increase in perceived confidence in knowledge post-intervention. Participants individual confidence in labs and tests was the largest standard deviation indicating that confidence in this aspect can vary greatly. The specific education about interactions with the drug displayed on the DERC, increased the patient’s perceived confidence in knowledge about interactions by 28.57%, showing the largest area of change.

**Key Findings: Comparison of Various Elements**

According to the patient survey, the participants overall confidence in knowledge about their prescribed drug increased by 15.38%. Each categories percent change from pre to post intervention of perceived confidence in knowledge varied greatly, ranging from 0% to 28.57%. The DERCs were written within at the target populations educational level, between an 8th to 10th, with 66% of participants finding them to be extremely easy to read and understand. The global aim to increase patients perceived confidence in knowledge surrounding drug administration within the microsystem was achieved by implementing the DERCs upon the participants first treatment.

**Interpretation**

As previously mentioned within the problem description section of this quality improvement project, the problem was defined as a lack of patient knowledge about their prescribed drug when entering the microsystem for the first time, leading to labs not being completed prior to treatment; multiple questions asked by the patient to the nurse about the drug
schedule, visit duration, side effects to monitor for and what to expect when visiting. The DERCs created a positive impact on the patient’s perceived confidence in knowledge. Question 3 asked the participant how well they felt they understood why they were receiving the drug. Question 3 in the pre-intervention survey and question 7 in the post-intervention survey encompasses the specific aim of this quality improvement, to increase patients perceived confidence in knowledge by 30%. The mean of question 3 was, 4.0 with question 7’s mean of 4.67, displaying an increase perceived confidence in knowledge by 15.38%. The question addressing their confidence in knowledge about different aspects of drug knowledge also notes an increase following the intervention of the revised DERCs. However, this change did not meet the desired increase. Patients educational and occupational background could have had an impact on the narrowed percent change in specific knowledge areas, including side effects to monitor for and how long it takes to provide the treatment.

Observed and unexpected outcomes of this quality improvement project include the nurses spending less time explaining aspects of the drug to the patient due to the patients referring to the DERCs for information. This supports the new model of healthcare and placing more of the educational responsibility on the patient in shared decision making, creating less of a paternalistic relationship and fostering more of a partnership between the patient and provider. It facilitates patient decision making, rather than provider driven decisions. The global aim to increase patients perceived confidence in knowledge surrounding drug administration within the microsystem was met but not at the scale anticipated.

The DERCs were clear and concise, providing the most pertinent information, avoiding information overload. This has been shown by Khaleel et al. (2020) to enhance patients’ comprehension of the information. In a previous study by Morony et al. (2017), the project leads
found the organization and the way each educational material separated their information within the material, was poor. The reviewers used the PEMAT-P tool for this quality improvement project, found that 100% of the DERC’s were organized extremely well. The project lead also followed Morony et al. (2018) findings and used synonyms for difficult words to create easier to read DERC’s.

**Limitations**

There are many limitations when it comes to generalizability of this quality improvement project. Only 16 DERCs were created based on the unit nurse’s perception of most common drugs given. Not all drugs given within the microsystem had a corresponding DERC, leading to potentially missed patients and data collection. Only 3 patients participated in the project, with two of them prescribed the same class of drug. It was also known that the patients surveyed were all high school graduates, with possible college degrees, displaying a potentially high health literacy. The quality improvement project was conducted within a small critical access hospital unit and may have a less diverse patient population compared to larger hospitals. There was a potential for response bias, as the patients knew the project was intended to increase their confidence in perceived knowledge. With self-reporting as the way to measure the patients change in knowledge, response bias should also be considered a factor in results.

**Conclusions**

The usefulness of this project is evident in the stakeholders buy in, including the procedure on how to create health literate education print outs with a focus on readability. The facility can utilize the project leads layout of educational information in a rack card form and the process in obtaining and implementing the education. The project is transferable to other areas of practice, including the hospital’s medical-surgical unit and outpatient provider settings such as
the pain management clinic and primary care offices. The project is easily sustainable, with the
unit nurses able to revisit the drug rack cards when new drug information becomes available. The
DERC’s are inexpensive to create and print and have a high potential for further use and
duplication.

If this project were to go through additional PDSA cycles, it should be conducted on a
larger scale, with more participants and drugs created into DERCs. The DERCs could be made
available on the hospital’s website for at home use and printability. The DERCs could be sent to
the patient through the patient portal or email in order for the patient to review it prior to their
first treatment. Patients with all levels of educational background, age, and demographics should
partake in the project, creating an increased likelihood of generalizability of the project. An
implementation phase of 1 year would also allow a larger number of participants and data to be
collected. A question on the survey should be added asking the patient if it is more beneficial to
receive the DERC prior to their first treatment or during it. Another question asking the patient
the preferred mode of delivery of the DERC, should be added.

There are a few areas for improvement regarding the education provided in each DERC.
Patients perceived confidence in knowledge about side effects, treatment schedule, and visit
duration did not change after the intervention was implemented. Depending on the drug
prescribed, there can be many side effects a patient can experience during or after treatment, both
minor or severe. The top 5 side effects were displayed on the DERC’s along with a prompt to
scan the QR code for more information. It is unknown whether the patients were seeking more
information about specific side effects or if they scanned the QR code to learn more. Another
area for improvement is education about labs and tests the patient needs to complete for their
treatment, as this was the lowest mean for perceived confidence in knowledge post-intervention.
The project lead should conduct short interviews with patients to understand what interactions and side effects are most important to understand for the patients.

To conclude, the intervention selected was the creation of DERCs that were appraised for readability and distributed to the patients with a global aim of increasing patients perceived confidence in knowledge surrounding their drug administration within the microsystem. DERCs were created with a Flesch-Kincaid score between the 8th and 10th grade reading level, consistent with the education level of the target population. Patients’ overall confidence in knowledge about their prescribed drug increased by 15.38%, alluding to a possible relationship between the presented education and knowledge attained. The unit nurses found the DERCs helpful during the patient initial treatment, leading to less questions asked and more time caring for the patients. As the quality improvement project was disseminated through a PowerPoint™ presentation to the Board of Directors of the hospital, these key stakeholders found the DERCs to be very beneficial and replicable to other areas of the hospital.
References


CPSI (2023). [Data for Huggins Infusion Center Patient Demographics] [Unpublished raw data].


Flesch Reading Ease and the Flesch Kincaid Grade Level. (2023). Readable. 
https://readable.com/readability/flesch-reading-ease-flesch-kincaid-grade-level/


https://www.cdc.gov/healthliteracy/learn/index.html
Appendices

Appendix A

Total Number of Infusion Patient Visits per Year

<table>
<thead>
<tr>
<th>Year</th>
<th># of Visits</th>
</tr>
</thead>
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<tr>
<td>2015</td>
<td>0</td>
</tr>
<tr>
<td>2016</td>
<td>0</td>
</tr>
<tr>
<td>2017</td>
<td>500</td>
</tr>
<tr>
<td>2018</td>
<td>1000</td>
</tr>
<tr>
<td>2019</td>
<td>1500</td>
</tr>
<tr>
<td>2020</td>
<td>2000</td>
</tr>
<tr>
<td>2021</td>
<td>2500</td>
</tr>
<tr>
<td>2022</td>
<td>3000</td>
</tr>
</tbody>
</table>

Appendix B

Top 7 Infusion Patient Diagnoses from January 2022 to January 2023

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th># of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>20</td>
</tr>
<tr>
<td>Crohn's Disease</td>
<td>15</td>
</tr>
<tr>
<td>Hemochromatosis</td>
<td>10</td>
</tr>
<tr>
<td>Infection</td>
<td>5</td>
</tr>
<tr>
<td>Mod-Sym Persitant asthma</td>
<td>10</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>40</td>
</tr>
<tr>
<td>Rheumatoid Arthritis</td>
<td>5</td>
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</table>
Appendix C

Top 10 Drugs and/or Procedures from January 2022 to January 2023

<table>
<thead>
<tr>
<th>Drug/Procedure</th>
<th># of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entyvio</td>
<td>3</td>
</tr>
<tr>
<td>Ferrlecit</td>
<td>5</td>
</tr>
<tr>
<td>Normal Saline</td>
<td>3</td>
</tr>
<tr>
<td>Prolia</td>
<td>2</td>
</tr>
<tr>
<td>RBC</td>
<td>2</td>
</tr>
<tr>
<td>Reclast</td>
<td>27</td>
</tr>
<tr>
<td>Remicade</td>
<td>5</td>
</tr>
<tr>
<td>Venofer</td>
<td>7</td>
</tr>
<tr>
<td>Removal of Whole Blood</td>
<td>6</td>
</tr>
<tr>
<td>Xolair</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix D

Example of a Drug Rack Card

**Infliximab (Remicade, Inflectra, Renflexis)**

*uhn-flizh-suh-mab (reh-muh-rayd)*

Drug Education Information

**WHAT IS IT?**

Infliximab can treat rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, Crohn's disease, plaque psoriasis, and ulcerative colitis.

**HOW IS IT GIVEN?**

This drug is given through a soft, flexible tube placed inside a vein, called an IV, usually placed in the hand or arm. This allows the drug to be directly infused into your vein.

**WHAT TO MONITOR**

This drug can lower your ability to fight infections. More common side effects include respiratory infections such as sinus infections, sore throat, headache, coughing, and stomach pain.

**INTERACTIONS**

This drug can interact with live vaccines and other immune suppressive drugs. Live vaccines should be given at least 4 weeks before starting this drug or at least 3 months following completion of this treatment. Talk to your provider if you have heart failure or an active infection before your infusion.

**THINGS TO KNOW**

**PRIOR TO TREATMENT**

Screening for hepatitis and tuberculosis need to be completed before your first infusion. Labs may be drawn prior to your infusion upon your provider’s orders. Drugs that treat allergies (antihistamine) and a fever reducer (e.g., acetaminophen) may be ordered by your provider to be taken prior to your infusion. These drugs can help reduce the risk of side effects.

**TREATMENT SCHEDULE**

You will receive this infusion at weeks 0, 2, 6 and then every 8 weeks thereafter.

**VISIT DURATION**

The drug takes about 1 hour to prepare once you arrive and can take 1 to 3 hours to infuse depending on your provider’s orders.

**WHAT TO EXPECT**

Upon arrival, you will be greeted by the infusion coordinator and given your consent to treat form to sign. Once seated in infusions your vital signs will be taken and an IV will be placed by your attending nurse. You may request a food menu, beverage, and a warm blanket for your comfort.

Please ask your nurse if you have any questions.

**CONTACT US**

P: 603.569.7597  |  F: 603.569.7667  
PATH: 603.569.7547  |  Billing 603.569.7529  
Email: InfusionsServices@hugginshospital.org
Appendix E

_Flesch-Kincaid Tool_

<table>
<thead>
<tr>
<th>Score</th>
<th>Estimated Reading Grade Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 to 100</td>
<td>5th grade</td>
</tr>
<tr>
<td>80 to 90</td>
<td>6th grade</td>
</tr>
<tr>
<td>70 to 80</td>
<td>7th grade</td>
</tr>
<tr>
<td><strong>60 to 70</strong></td>
<td><strong>8th and 9th grade</strong></td>
</tr>
<tr>
<td>50 to 60</td>
<td>10th to 12th grade (high school)</td>
</tr>
<tr>
<td>30 to 50</td>
<td>College</td>
</tr>
<tr>
<td>0 to 30</td>
<td>College graduate</td>
</tr>
</tbody>
</table>

Appendix F

_PEMAT-P_

**Understandability**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item</th>
<th>Response Options</th>
<th>Rating</th>
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</thead>
<tbody>
<tr>
<td><strong>Topic: Content</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>The material makes its purpose completely evident.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>The material does not include information or content that distracts from its purpose.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td><strong>Topic: Word Choice &amp; Style</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td>The material uses common, everyday language.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Medical terms are used only to familiarize audience with the terms. When used, medical terms are defined.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
</tbody>
</table>
Appendix G

Patient Survey

Huggins Drug Rack Card Survey

1. This survey is intended for the use of collecting Huggins Infusion Services patients' knowledge pertaining to a quality improvement project conducted by a UNH nursing student. This information shall remain anonymous, with no patient identifiers used. Do you agree to participate in this short survey?

○ Yes
○ No

***** Please complete this section BEFORE reviewing the drug rack card! *****

2. What drug are you receiving at Huggins Infusion Services today?

☐ Abatacept (Orencia) ☐ Leuprolide (Lupron) ☐ Vedolizumab (Entyvio)
☐ Denosumab (Prolia) ☐ Naltrexone (Vivitrol) ☐ Zoledronic acid (Reclast)
☐ Epoetin Alfa (Procrit) ☐ Ocrelizumab (Ocrevus) ☐ Infliximab (Remicade, Inflectra, Renflexis)
☐ Ferric gluconate (Ferrlecit) ☐ Omalizumab (Xolair) ☐ Immune globulin (Gammaplex,
☐ Golimumab (Simponi) ☐ Pegfilgrastim (Neulasta) Gammagard, Gammaked, Gammunex-C, Octagam, Privigen)
☐ Iron Sucrose (Venofer) ☐ Teprotumumab (Tepezza)

3. How well do you feel you understand why you are receiving this drug?

○ Not well at all
○ Slightly well
○ Moderately well
○ Very well
○ Extremely well

4. How confident are you in your knowledge about the different aspects pertaining to your prescribed drug?

<table>
<thead>
<tr>
<th></th>
<th>Not confident at all</th>
<th>Slightly confident</th>
<th>Moderately confident</th>
<th>Very confident</th>
<th>Extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>What the drug is prescribed for</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>How it is given (e.g., through an intravenous infusion)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Side effects to monitor for</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Treatments this drug may interact with</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Labs and/or tests prior to treatment</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Treatment schedule (e.g., once every week)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>How long your visit may take</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>What to expect during your visits at Huggins Infusion Services</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
5. If you sought previous education information about this drug, where did you find this information? (Select all that apply)

☐ On the internet
☐ My provider
☐ Family and/or friend
☐ N/A
☐ Other: ____________________________

***** Please review the drug rack card at this time and then complete this section AFTER! *****

6. How did you review the drug rack card?

○ On my own
○ With the help of the project lead/ Nursing student
○ With the help of a nurse

7. After receiving the drug rack card, how well do you feel you understand why you are receiving this drug?

○ Not well at all
○ Slightly well
○ Moderately well
○ Very well
○ Extremely well

8. After receiving the drug rack card, how confident are you in your knowledge about the different aspects pertaining to your prescribed drug?

<table>
<thead>
<tr>
<th></th>
<th>Not confident at all (1)</th>
<th>Slightly confident (2)</th>
<th>Moderately confident (3)</th>
<th>Very confident (4)</th>
<th>Extremely confident (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What the drug is prescribed for</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>How it is given (e.g., through an intravenous infusion)</td>
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