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Critical Care Systems, Inc.

**FINAL ABSTRACT #1**

**TITLE:** Regional Home Infusion Company Establishes Ethical and Conduct Benchmarks for Clinician-based Social Media Program

**AUTHORS:** Stacy Bryant-Wimp, BA, PhT; Jay Bryant-Wimp, RPh, Franco Puetz and Ashley Fisher Accurate Rx Pharmacy.

**BACKGROUND:** While practice guidelines have been developed to attempt to establish standards of conduct as it pertains to communication in health care, specialty pharmacies and home care agencies may find it difficult to implement concrete criteria and finalize guidelines as it pertains to the ever-evolving social media platform. This provider’s interdisciplinary home care team adopted a structured model to establish specific conduct guidelines on their social media platform that reflect a consistent and ethical approach to communication.
PURPOSE: The National Home Infusion Association (NHIA), American Medical Association (AMA), Pharmaceutical Research and Manufacturers of America (PhRMA), Infusion Nurses Society (INS), Oncology Nursing Society (ONS) and American Society of Health-System Pharmacist (ASHP) all share common elements of ethical conduct and have been established for a variety of health care services. These elements include maintaining boundaries, confidentiality, professionalism, and integrity. Our goal was to incorporate standards into our social media platform.

METHODS: To emulate these common dimensions, this peer reviewed nationally accredited organization established a Social Media Program Plan (SMPP) to include an internal interdisciplinary team with a designated team leader. This team includes representation from pharmacy, nursing, reimbursement, operations and marketing. Weekly meetings were executed to implement the SMPP, and continuously evaluate the program, monitoring our compliance with our standards. The program plan includes monitoring requests for physician referrals by providing physician contact information to the patient, assessing clinical and support staff competence as they respond to questions, evaluating Health Insurance Portability and Accountability Act (HIPAA) and the Health Information Technology for Economic and Clinical Health Act (HITECH) compliance, and completion of a test developed using professional organization criteria qualifications.

RESULTS: Since April 2011, this organization has implemented the first phase of its SMPP and has established a framework for measurement of organizational performance reflecting the appropriateness of this providers’ role in social media. With a social media audience of over 5,000 it is even more important to adhere to standards as we move forward. Results include 100% follow-through on consumer requests for a needed physician, 100% HIPAA/ HITECH compliance and 100% completion of annual certification of employees. In the previous 8 months, we have posted 64 peer-reviewed links to medically related articles and 19 evidenced-based studies. Additionally we gave two responses for additional evidence-based studies when social media participants asked our clinicians for opinions on treatment protocols. We have also helped to facilitate two physician appointments for social media users. Continued weekly team meetings allow for the critical evaluation of user feedback and referral services provided.

CONCLUSION: Team implementation of a clinician-based SMPP model has provided a systematic approach to implementing and improving appropriate use of the internet as it pertains to health care. This organization looks forward to the next phase of its plan and reporting on the successes and challenges of providing high-level customer service, value added education, and clinical information to its patient population.

FINAL ABSTRACT #2

TITLE: An innovative community approach to homecare of non-funded chronic infusion clients.

AUTHORS: Darla King, RN
Home Intensive Care Pharmacy

BACKGROUND: The County hospital system is the primary source of healthcare for the un-insured and under-insured in the County of Bexar. The average daily charge per day of a patient at the County Hospital in 2010 with a diagnosis of infection was $5,710. The County designed a financial assistance plan, using tax funds, to assist with cost containment and improve the over-all healthcare of the un-insured and under-insured.

PURPOSE: The purpose of this presentation is to demonstrate how a County wide effort between the County Hospital, home health and independent home infusion company can successfully decrease the cost and improve the health care for chronic infusion clients.

METHODS: The County of Bexar, developed a financial assistance program, funded by tax dollars, for County residents who are un-insured and under-insured. Upon qualifying, clients gain access to the county clinics, laboratory, radiology, are designated a primary care physician and have full access to the County health
facilities as well as home care benefits to its members for its long term, chronic home infusion clients. This is done through a collaborative partnership with the Hospital, a home health company and a home infusion pharmacy. These entities are reimbursed directly thru the financial assistance program for services provided. The hospital is able to reduce its in-patient cost, discharge the client earlier and provide a strong continuation of care. Monthly QCI meetings between the party's assist in defining trends in infections, re-hospitalizations and compliance issues. Clients are required to take an active role in their care.

RESULTS: Patients sent home under the collaborative approach have a cost savings, to the tax payers, of approximately $3510 per day as well as improved compliance. The financial assistance program oversees the direct re-imbursement to the home infusion and home health providers.

CONCLUSIONS: The establishment of the financial assistance program allows patients to seek cost effective, preventative and acute care, reducing the tax load on the County hospital system. Payment to the home care and home infusion company is as a fee for service and financed by the financial assistance program. Compliance with overall healthcare is improved with weekly home health monitoring. The home health and home infusion company become an integral part of the overall health care delivery system for the county healthcare delivery system. This increases their awareness in the community and validates the overall cost savings of home health versus hospitalization. In today's difficult economic times there are increasing numbers of un-insured. Hospitals, pharmacies and home health companies are dealing with lower reimbursement rates and higher costs of supplies. When communities communicate and collaborate, patient care can be improved in a cost effective manner. Managing care for the un-insured is costly. Innovative and collaborative practice between County agencies and private industry provide safe, cost effective, high tech care of clients who typically would have to stay in the hospital for treatment or be returned home without the proper tools to successfully return to healthy state.

FINAL ABSTRACT #3

TITLE: Implementation and Assessment of a Hereditary Angioedema Home Infusion Program

AUTHORS: Steve Kennedy, PharmD; Kendra Curry, PharmD and Donna Ford, RN, BSN Walgreens Infusion and Respiratory Services

BACKGROUND: We were approached by a manufacturer of ecallantide to develop a home infusion solution for patients with Hereditary Angioedema. Ecallantide had a rate of hypersensitivity reactions of 2.7% in clinical trials thus has a label requirement that it must be administered by a healthcare professional. Due to this requirement, and the need to administer the medication upon symptom onset, the medication was not being utilized in the home setting. Patients were required to travel to an Emergency Department or Physician office for treatment. The goal of the program was to allow patients to be treated with ecallantide in the home in a safe, cost effective manner.

PURPOSE: To share a unique treatment program and assess the success of the program compared to the performance measures to date.

METHODS: A multidisciplinary team was formed to review treatment options for Hereditary Angioedema patients, the medication characteristics, clinical service requirements, and reporting components needed to develop a quality program. Initial concerns included the hypersensitivity rate, response times, patient and physician acceptance, and reimbursement. To overcome these obstacles, the team met on a routine basis with the manufacturer and prescribing physicians to develop key components of the program which included: Clinician Education, Clinical Assessment and Monitoring Forms, and collection of Outcomes. Details will be provided in the poster.

RESULTS: Our organization has had a response time of less than 1 hour in 66% of requested treatments, less than 2 hours in 91% of requested treatments, and less than 4 hours in 99% of the requested treatments in the first 4 months of the program. In 94 treatments, 84% of patients reported time to relief of their HAE attack
symptoms in less than 60 minutes from the time of the ecclantide injection by the RN. The average Patient Satisfactions score for Overall Satisfactions with the program is 4.68 on a 5 point scale. All 96 treatments given by the home infusion nurse were well tolerated with no reported adverse events or anaphylactic reactions.

**CONCLUSIONS:** Home Infusion Clinicians are faced daily with unique patient care challenges. To overcome these challenges, the clinician must properly assess the situation, become educated, and develop a sound treatment plan. Our multidisciplinary team took this same approach when developing a Hereditary Angioedema plan. The result was the creation of a program that is extremely advantageous to the patients, is safe, and is cost effective for the payer.

**FINAL ABSTRACT #4**

**TITLE:** Emerging Pathogen: *Mycobacterium abscessus* in Cystic Fibrosis, A Case Report of Home Treatment with Intravenous Amikacin, Tigecycline and Imipenem-Cilastatin

**AUTHORS:** Sheryl Wear, BPharm, RPh and Edith Way, RN
Walgreens Infusion Services at Legacy Health LLC

**BACKGROUND:** *M. abscessus* is considered among the most pathogenic and drug resistant of the rapid growing mycobacterium (RGM). It is the 3rd most frequently recovered non tuberculous mycobacterial (NTM) pathogen in the United States and accounts for approximately 80% of RGM respiratory disease isolates. *M. abscessus* isolates are uniformly resistant to the standard antituberculous agents, and are generally susceptible only to parenteral antibiotics and the newer oral macrolides, requiring long courses of treatment. The American Thoracic Society and Infectious Diseases Society of America recommend combination therapy of intravenous amikacin with cefoxitin or imipenem and oral clarithromycin or azithromycin for treatment of *M. abscessus* infection. Susceptibilities should be used as a clinical guide for treatment.

**PURPOSE:** To review a case of an emerging pathogen and its treatment in the home care setting.

**METHODS:** A.R is a 19 year old female with a history of pulmonary cystic fibrosis, who presented with several weeks of increasing fatigue, cough, dyspnea, weight loss and ground glass opacity in CT scan of the right middle lobe (RML) of her lung. She failed to improve following 4 weeks of oral antibiotic therapy. Patient’s sputum culture was found to have *M. abscessus* in addition to colonization with pseudomonas and MSSA. She was initially hospitalized and treated for colonization and then began on a regimen for the atypical acid fast bacilli (AFB). She was discharged to home on IV tigecycline daily and IV amikacin 10mg/kg (wt 55 kg) three times per week. Patient also received oral azithromycin 250mg daily. Lab orders were for amikacin levels at 2 hours and 6 hours post 2nd dose, CBC and CMP every other week.

**RESULTS:** Culture and sensitivities showed susceptibility to cefoxitin, tigecycline, clarithromycin, azithromycin and intermediate susceptibility to imipenem. During the first 3 weeks of therapy her amikacin dose was gradually increased from 550 to 700mg three times per week. Tigecycline was discontinued after 2 weeks due to nausea. She was started on imipenem-cilastatin 1Gm every 12 hours and has tolerated this well. Her renal function tests have remained normal, but she did have some mild elevations in her liver function tests initially possibly related to the tigecycline. At her follow-up appointment in February 2012 she showed clinical improvement as evidenced by 17-pound weight gain, improvement in cough, the absence of sputum and impressive improvement on repeat CT scan. Parenteral antibiotics were stopped and she was continued on oral suppressive therapy. A repeat scan will be done in 3 months to evaluate her progress.

**CONCLUSION:** *M. abscessus* is an emerging pathogen in the Cystic Fibrosis population. Clinically *M abscessus* pulmonary infection is a chronic disease characterized by variable clinical response to therapy, recurrence and little chance of cure. The prolonged course of treatment with intravenous antibiotics provided a successful outcome in this patient which will hopefully be sustained in the future. Home infusion allowed this patient to receive her therapy at home, thereby avoiding extended hospitalization or residence at a long term care facility.
FINAL ABSTRACT #5

TITLE: Bleeding Disorder Services: Model of Care and Best Outcomes

AUTHORS: Christa N. Schmitz, MSN, RN, FNP; Janell Badami, BSN, RN and Kim L. Spencer, MS, RN, CPNP
Walgreens Hemophilia Services

BACKGROUND: Patients diagnosed with bleeding disorders have an opportunity to obtain care at comprehensive hemophilia treatment centers (HTC). Comprehensive treatment centers have improved patient outcomes. A CDC study of 3,000 people with hemophilia showed that those who used a HTC were 40% less likely to die of a hemophilia-related complication compared to those who did not receive care at a treatment center. A successful HTC is staffed with many team members. Generally, a HTC consists of hematologists, pediatricians, nurses, social workers, physical therapists, orthopedists, and dentists. Coordination of care among team members is important in achieving optimal care and best outcomes.

PURPOSE: The purpose of this poster is to demonstrate how our Bleeding Disorder Services has a customized model of care that is similar to the hemophilia treatment center model which results in best outcomes.

METHODS: Our model of care works effectively because of its comprehensive components. We unite our local nurses, pharmacists, and pharmacy technicians with our national hemophilia team to provide care for our patients. Each patient is assigned a regional clinical coordinator (RCC). The RCC is responsible for collaborating with the local pharmacist, pharmacy technicians, and nurses. The RCC initiates patient contact when a referral is received; monitors bleeding episodes, participates in monthly and/or quarterly calls with the local office to review patient status, provides clinical support and education, and ensures each office receives Center of Excellence certification. Like at a HTC, the team social worker is available to assist patients with their socioeconomic and emotional/mental health needs. The patient advocate helps facilitate local support groups and assists with coordination of family to family encouragement and mentoring programs. The clinical director is responsible for the overall management, direction, and compliance of clinical services and checks every order and dose to ensure safety and appropriateness.

RESULTS: Monitoring bleeding episodes with the hemophilia manager program ensures adherence to factor regimen, reduces unscheduled hospitalizations, and helps achieve patient satisfaction. Our goal is to provide exceptional care and receive 100% patient satisfaction. Collectively, our home infusion services have resulted in a 99% patient satisfaction rate as reported in 2011.

CONCLUSION: The comprehensive team is able to provide best practices for the patients, similar to that of a HTC. Our model of care demonstrates that we care about our patients’ health and well-being, provide friendly and courteous service, and deliver the medication expertise that our patients expect.

FINAL ABSTRACT #6

TITLE: Has Anything Really Changed? - Using Control Charts on Operational and Financial Data

AUTHORS: L. Rad Dillon, RPh, MA, ASQ CMQ/OE.
Bioscrip, Inc.

BACKGROUND: Although the control chart, invented in the 1920s by Walter Shewhart of Bell Labs, has been a cornerstone of quality management in many industries for almost a century, their use to evaluate financial and operational performance is still rare, including in the home infusion industry.

PURPOSE: Control charts, as popularized by statistician Donald J. Wheeler in such books as Understanding Variation, were used to analyze a variety of financial and operation information important to home infusion operations reviewed for three specific reasons: (a) deciding if a given data point is either a statistically significant departure from prior data and therefore worthy of investigation, or not (b) deciding if a series of
data points represents a trend or not (c) evaluating if a known intervention has in fact caused a statistically significant change in results.

METHODS: A variety of information routinely reviewed by this organization’s management has been inserted into several types of control charts in order to test their utility in providing insights towards the three ends described above. Priority was given to information that (a) is seen as highly important to operational and financial success (b) is frequently misinterpreted as either being statistically significant when it is not, or not significant when it in fact is (c) is often subject to debate as to whether it represents a meaningful trend or not (d) can lead to major managerial decisions based on how it is interpreted.

RESULTS: Many instances of such data where discovered in a variety of reports and contexts. Control charting was instituted in a number of cases to improve analysis and lead to better decision-making. Efforts are now underway to educate managers at several organizational levels in the application of control charting and the successful interpretation and use of resulting insights.

CONCLUSIONS: The statistical techniques involved in control charts can make a major contribution to improved operation and financial control of home infusion organizations.

FINAL ABSTRACT #7

TITLE: Innovative Approach to Preparation of Subcutaneous Immune Globulin 20% for Administration

AUTHORS: Michael Fadeyi, PharmD, MS and Victor Oyeniyi, 2012 PharmD Candidate American Outcomes Management, L.P.

BACKGROUND: SCIg20 (Human) 20%, a fairly new 20% human immune globulin subcutaneous injection, has increasingly become an alternative replacement therapy for primary humoral immunodeficiency (PI) in adults and pediatric patients 2 years of age and older. Due to its increased concentration of 20%, it can be administered subcutaneously which has been shown to achieve more constant IgG levels as compared to intravenous administration, and can also be easily self-administered by patients. In practice, a common problem that has surfaced from use of SCIg20 injection has been the difficulty of patients withdrawing the required dose in supplied syringes. Patients have complained that it is very difficult and strenuous on the hands to withdraw SCIg20 from the vial with a syringe, despite the needle gauge used.

PURPOSE: This pharmacy wanted to institute a less stressful and painless preparation process by using a Mini Transfer Pin to withdraw the SCIg20 for subcutaneous self-administration by patients at home. This problem was looked at with the objective of reducing the problems of withdrawing the drug from vials of SCIg20, relieving the strain put on the hands and wrist associated with these difficulties during patient’s self-administration of SCIg20 so the patient is more compliant with drug use, and able to achieve a positive outcome of therapy.

METHODS: The pharmacy staff sends 20 ml, 30 ml, or 60 ml polypropylene syringes and 16 or 18 gauge, 1 inch needles for withdrawing the viscous 20% Hizentra® (SCIg20; CSL Behring, Berne, Switzerland) from the vial. The pharmacy asked the nursing staff involved to try the Mini Transfer Pin (Codman & Shurtleff Inc, Raynham, MA) , which is usually used in pharmacy compounding, for the withdrawal process. This preparation method was used by the nurse in the preparation and subsequently taught to the patient. Initially, three patients who had voiced preparation complaints were utilized in this subcutaneous self-administration preparation process.

RESULTS: All three patients (100%) reported better and faster methods of preparation which improved administration times. Moreover, because of the larger bore size of the transfer pin, all three patients reported increased satisfaction and zero stress in withdrawing the viscous SCIg20 liquid from the vials. The patients started to request these transfer pins, which have become a standard preparation supply for the home. There was no reported incidence of infection in all three patients using the needle method versus the transfer pin
method. The nurses preferred this preparation method and the pharmacy decided to apply this preparation method on all SCIg patients.

CONCLUSION: This preparation method has proven beneficial and is now a standard teaching protocol for patients on SCIg20 in our company.

FINAL ABSTRACT #8

TITLE: Long-Term Antibiotic Infusion Therapy for Chronic Lyme disease: A Case Study

AUTHORS: Autumn Romanowski, BSN, RN, OCN and Cathy Luntsford, RN
Walgreens Infusion and Respiratory Services

BACKGROUND: Lyme disease is considered the fastest-growing vector-borne disease in the United States by the Centers for Disease Control. It is caused by a spirochete bacterium known as *Borrelia burgdorferi*, which is carried by the deer tick. There are two organizations that specialize in the treatment of Lyme disease and disagree on the preferred treatment: The Infectious Diseases Society of America (IDSA) and the International Lyme and Associated Diseases Society (ILADS). The IDSA guidelines indicate that Lyme disease is an acute disease which only requires short-term oral antibiotic therapy and that long-term antibiotic treatment is not proven to be effective and can be dangerous for the patient. The IDSA believes that the long-lasting symptoms experienced are a post infectious autoimmune response rather than Chronic Lyme disease. The ILADS believes that the Lyme disease infection can become sequestered in the body following short term antibiotics with sufficient strength to recur and cause Chronic Lyme Disease. ILADS guidelines for treatment are that “the prescribed treatment depends on the severity of each case, patient’s response to therapy and the doctor’s own clinical judgment. The duration is decided by clinical response rather than an arbitrary treatment course.”

PURPOSE: Facilitate education for the home infusion community regarding the incidence of Chronic Lyme Disease and the contrasting theories regarding treatment modalities.

METHODS: A 20 year old female presented with severe fatigue, cognitive impairment, uncontrolled myalgia, joint pain, photosensitivity, dizziness, neutropenia, migraine headaches and urinary incontinence. The patient history is significant for a tick bite in 1999 followed by two weeks of fever, four tick bites in 2004 and a positive blood test for Lyme disease in 2007. Throughout the disease progression, the patient consulted several infectious disease physicians who dismissed the theory of chronic Lyme disease, thereby causing the patient to seek a Lyme disease specialist as her overall health had continued to deteriorate. A chest port was placed and the patient was prescribed multiple IV antibiotics. She was prescribed 6 different classifications with 12 unique antibiotics over a 2 year period. The antibiotics were changed every 6-20 weeks depending on her response to them; she rarely had the same specific antibiotic twice and occasionally received several antibiotics simultaneously.

RESULTS: Throughout her course of treatment, the patient had slow but near resolution of her symptoms with improved pain control and subsequent discontinuation of pain medication. The patient did experience severe Jarisch-Herxheimer (Herx) reactions with successive antibiotics. This is a cytokine inflammatory response which is caused by the large volume of bacterial cellular debris present in the patient’s body due to subsequent bacterial cell death from antibiotics.

CONCLUSIONS: When caring for patients diagnosed with Lyme disease, one should be educated on the different viewpoints regarding treatment modalities. Our case followed the ILADS guideline treatment which resulted in a significant improvement in her health and functionality to near normal. It would be interesting to see if no treatment yielded the same results.

FINAL ABSTRACT #9

CONTRIBUTING AUTHORS: Katie Birks, RD; Rachelle Landry, RN, BSN and Maria Kelly, RPh, MBA. Walgreens Infusion and Respiratory Services

BACKGROUND:
Our local branch has worked to become a designated Nutrition Center of Excellence. To achieve this designation we maintain an integrated team of nutrition experts, provide cost effective clinically appropriate nutrition therapies, deliver customized patient education, coordinate services, and focus on patient outcomes, research and therapy results.

While a multidisciplinary approach to managing patients contributes to patient outcomes, it was important to create a standardized tool to help identify significant patient laboratory trends. By creating a standardized procedure to track and assess parenteral nutrition (PN) patients, patient outcomes can be impacted and appropriate adjustments to therapy can be made.

PURPOSE: To track laboratory data in a standardized tool that allows for collaboration between nutrition support multidisciplinary team members in an effort to increase quality of care provided to our nutrition patients.

METHODS: Parenteral patient data has been collected in two separate tracking spreadsheets accessible by all members of the multidisciplinary team. The first spreadsheet serves as a communication tool between the multidisciplinary team members. The second spreadsheet tracks all patient laboratory data over length of therapy. This spreadsheet allows each user to filter data by individual patient to see trends in key categories such as Calcium, Magnesium, Phosphorus, etc. The effectiveness of the standardized tracking tool has been measured using a branch clinician survey consisting of five questions to rate the value of various components of the tool. A three month post implementation evaluation will provide feedback from monthly updates, patient outcomes, and collaboration will be taken into account to determine if the tool will become a permanent means of tracking.

RESULTS: Results from the branch clinician survey illustrated the standardized tracking tool to be useful in daily functions of the multidisciplinary team in tracking and trending of laboratory values. All of the survey respondents placed value in seeing/comparing laboratory values per patient in one document versus the patient chart and using the standardized tool for communication with managing physician. Sixty percent of clinicians stated the tool was “Most Helpful” in improving patient care. Of the surveyed respondents, 80% gave value to the tool in increasing collaboration between multidisciplinary team members.

CONCLUSIONS: The standardized tracking tool has allowed for initiation of lab trending at the local branch. Other improvements at the branch level include: improved timing in receiving and reviewing patient laboratory data, greater efficiency in reviewing labs and correlated adjustments, enhanced communication between branch clinicians and managing physician, improved patient outcomes, and collaboration between multidisciplinary team members. Functioning as a complete multidisciplinary team, clinicians now can effectively collaborate on the management of patients’ PN using the tool. An important aspect of this collaboration is effective tracking and trending of patient labs to increase quality of care and outcomes. Implementation of this process provides a cohesive approach to successfully tracking and trending of PN patient’s lab values allowing for more timely and appropriate adjustments in PN formulations by the pharmacist and registered dietitian.

FINAL ABSTRACT #10

TITLE: Impact of Needle Sets on Delivery of Subcutaneous IgG (SCIG) in Patients Reporting Infusion Site Reactions

CONTRIBUTING AUTHORS: Andrew Sealfon1 and Paul Mark Baker, MD2
1RMS Medical Products; 2Pediatric Associates
**BACKGROUND:** Increased IgG concentrations, higher doses, and faster delivery rates place greater performance demands on delivery peripherals such as infusion pumps and needle sets. Many factors are involved in achieving an optimal SCIG infusion and patient satisfaction, including needle size, tip configuration and performance, flow consistency (especially among multi-site needle sets), infusion pump characteristics and pressures, and even the type of dressing applied over the needle sets. We theorized that poor needle design and quality could exacerbate complications of site pressurization which forces IgG into the dermal layers containing mast cells, and may contribute to local SCIG infusion site reactions.

**PURPOSE:** We set out to determine if needle parameters (needle size, tip configuration and quality, and needle set performance) are significant predictors of adverse injection site outcomes and dissatisfaction for the patient, and how these disparate parameters may be measured and assessed prior to patient use.

**METHODS:**
A consistent methodology to assess needle performance was created by comparing needle force data with optical comparisons, including assessment of damage at the tip of the needle. Once reasonable correlation was achieved for all subcutaneous needle sets on the market, we tested needle tip sensitivity on 30 volunteer patients. We then provided HiExit Flo™ (RMS Medical Products) needle sets to fourteen patients who had reported adverse site reactions with their previous needle sets (from several manufacturers). Each patient received a minimum of two needle sets to evaluate with their next two doses of SCIG, and completed a questionnaire or followed up by telephone regarding their experience, evaluating measures such as pain on needle insertion, site reactions, and ease of needle insertion/set use compared to their previous needle set.

**RESULTS:** 29 out of 30 of patients reported less pain on insertion with the new needle set. In a separate cohort of 14 patients who expressed specific site complaints following their SCIG infusions, all 14 reported significantly fewer local adverse reactions (induration, redness, discomfort) after switching to the new needle sets. They also reported improvement in solution flow and administration time when no other parameters (infusion pump, volume or concentration of drug) were changed. The new needle sets were identified in the lab as having the best overall performance, including more “even” flow characteristics to each needle in the multi-needle set, least amount of out-of-the-box damage at the needle-tip, and optimized bevel for subcutaneous administration.

**CONCLUSIONS:** Patients are capable of sensing needle tip damage in the range of 10 microns (10x10^-6m). Needles identified in the lab as having more out-of-the-box damage were associated with more local site reactions, possibly due to greater tissue damage during insertion, leaving more tissue exposed and susceptible to IgG and stimulating a greater inflammatory response. Although not specifically studied in this evaluation, patient feedback indicated there may be a tradeoff between a fast infusion into a limited number of sites, and the prevalence of site complications. By controlling these factors, SCIG with minimal or no site reactions may represent a new paradigm for this modality. Determining the relative effects of all of these parameters is a goal for future studies.

**FINAL ABSTRACT #11**

**TITLE:** Impact of an Education Program: Improving staff confidence in caring for the patient receiving continuous home inotropic therapy

**AUTHORS:** Denise Bass, RN, CRNI®; Kevin M. McNamara, PharmD; Lynn Smith, RPh, CNSC; Kim Giacomelli, RPh and Lecia Snell, APRN-CNS, CCTN.
Bioscrip, Inc.

**BACKGROUND:** Continuous inotrope home infusion has resulted in improved quality of life for the end stage heart failure patient. Due to the acuity and complexity of caring for the home inotrope patient, some clinicians may feel unprepared to manage these patients in the home environment. To address this educational gap and to ensure the highest level of clinical confidence, a mandatory three phase, discipline specific-educational program was developed. All employees of a national home infusion program were required to complete mandatory training related to the care of patients receiving the continuous home inotropic medications. The educational program consisted of three modules that covered an overview of heart failure in module 101 and
the monitoring and management of patients with end stage heart disease in modules 102 and 103. All employees were required to complete module 101, all clinicians were required to complete module 102 and all pharmacists were required to complete module 103. All employees were encouraged to take additional modules if desired. A score of 90% on the post education competency was required. An optional survey was available for completion at the conclusion of each module. Additionally, each site was required to hold a monthly multi-disciplinary team meeting to discuss all patients receiving milrinone or dobutamine and any concerns related to their care.

PURPOSE: This project was developed to increase the knowledge base and confidence level of all home infusion team members caring for the heart failure patient and, therefore, improve the overall quality of care provided to patients receiving home inotropic therapy.

METHODS: A retrospective review of all optional program evaluations associated with the three competency modules was performed. The optional survey consisted of four questions; three were multiple-choice and one was short answer. The results of the survey were evaluated based on the employee’s assessment of the program to determine if the educational material improved the employee’s confidence when caring for inotropic patients. The comments from the short answer question were reviewed for ongoing improvement of the program.

RESULTS: Overall 58% of employees completed the 101 survey, 51% completed the 102 survey while 44% completed 103. Of those completing the survey, 88% of employees completing module 101 and 84% of the clinicians completing module 102 and 103 either agreed or strongly agreed the educational program improved their professional confidence in caring for patients with end stage heart failure and improved their ability to perform their job. Upon review of the comments for ways to improve the program, six clinicians felt additional education on the calculations associated with inotropic therapy was needed.

CONCLUSIONS: The vast majority of employees felt the program increased their confidence when caring for this population or prepared them for caring for a patient on continuous inotropic therapy. Based on the comments requesting additional calculation training, a 3 patient case-based follow-up competency has been developed and will be implemented in early 2012.

FINAL ABSTRACT #12

TITLE: Pumping Up Patient Safety: Optimizing the Health Care Experience

AUTHOR: Daphne Broadhurst, RN, BScN, CVAA(c)
Desjardins Healthcare Group

BACKGROUND: User error with infusion devices are three times more prevalent than with any other medical device.¹ The Institute for Safe Medication Practices recommends the use of infusion therapy devices with safeguard technology to prevent infusion errors. Home infusion providers must balance the need for infusion pumps that minimize the risk of error with the patient’s need for equipment that is simple and easy to use. User satisfaction with the medication delivery method is a cornerstone of quality service delivery, and an important consideration in any supply/pump selection process.

PURPOSE: The purpose of this evaluation was to assess patient and healthcare provider satisfaction with new infusion pump technology implemented to enhance patient safety.

METHOD: A local community healthcare provider has implemented safe pump technology in dual phases over the past 3 years. In phase 1, clients receiving chemotherapy via an electronic infusion device, CADD Prizm®, were converted to elastomeric infusion devices (Infusor®). Oncology case managers, nursing providers, pharmacy and medical suppliers completed vocation-specific surveys after this transition to evaluate their satisfaction with these infusion devices new to the community healthcare setting. Our client population demonstrated a 90% client preference for the elastomeric device over an electronic infusion device in a previous study.² In phase 2, patients receiving parenteral nutrition and/or hydration entered in a
post market assessment study to evaluate the first ambulatory infusion pump with smart pump technology available on the North American market. Patient diary logs, patient surveys and clinician surveys were used to assess patient and clinician satisfaction with the infusion pump, to characterize difficulties experienced with the use of the device and to summarize alarms.

RESULTS: In phase one of the project, nurses preferred the elastomeric infusion device due to a decreased risk in pump programming errors, its small and lightweight design, ease of client teaching, ease of use for patient & ease of use for nurses, while case managers, and pharmacy/medical suppliers showed an unequivocal preference for the elastomeric devices. Overall, 80% of providers recommend the elastomeric pump over the electronic infusion device. In phase 2, patients indicated a strong satisfaction level with the electronic infusion device with smart pump technology. Limited clinician feedback rated pump quality, reliability, performance and ease of use as satisfactory. No significant adverse events were reported in either phase.

CONCLUSION: Selection of the appropriate infusion device influences both client and healthcare provider satisfaction. This project provides further data to support healthcare providers striving to provide safe infusion therapy that supports positive healthcare experiences.

REFERENCES:

FINAL ABSTRACT #13

**TITLE:** Patient Perceptions and Experiences with Sites of Care among Patients with Immunology Conditions Currently Using Intravenous Biologic Therapy

**AUTHORS:** Susan Bolge, PhD; Julie Vanderpoel, Phd; Helen Eldridge, MS; Brad Schenkel, MS. Janssen Scientific Affairs, LLC

**BACKGROUND:** Numerous options exist for selecting a site of care (SOC) where patients may be treated with intravenous (IV) therapy. They range from in-office infusions taking place in the doctor’s office, a hospital outpatient department, an infusion therapy provider such as ambulatory infusion centers or home infusion providers, and additional alternate sites of care. Despite the wealth of options available, limited data exist regarding the perceptions impacting choice of SOC, particularly from the patients’ perspective. In the current context of patients taking a greater role than ever before in the care they receive, it is important to understand the patient perspective as it relates to their experiences across different sites of care.

**PURPOSE:** To evaluate patient perceptions, satisfaction, and experiences, by site of care, among patients with immunology conditions currently treated with an IV biologic medication.

**METHODS:** Semi-structured telephone interviews were conducted with 405 patients self-reporting a diagnosis of ankylosing spondylitis, Crohn’s disease, psoriasis, psoriatic arthritis, rheumatoid arthritis, or ulcerative colitis. All patients were currently receiving IV biologic therapy. SOC was categorized as: rheumatologist in-office infusion (rheum IOI), gastroenterologist in-office infusion (gastro IOI), hospital outpatient department (HOPD), or infusion therapy provider (ITP). Patient experience with attributes of infusion centers were rated on 7-point Likert scales (1=Poor, 7=Excellent).

**RESULTS:** Of the 392 patients reporting SOC information, 154 (39.3%) received infusions in rheum IOI, 102 (26.0%) in gastro IOI, 111 (28.3%) in HOPD, and 25 (6.4%) in ITP. Rheum and gastro IOIs were more likely to receive high ratings for interaction with staff compared with HOPD. Gastro IOIs were the most likely to
receive high ratings for waiting times compared to rheum IOIs and HOPD, though waiting time was still more highly rated in rheum IOIs than HOPD. HOPDs were least likely to receive high ratings for ease of parking, waiting time, interaction with staff, and expertise of staff. ITPs were most likely to receive high ratings for convenient scheduling of infusions. ITPs also received high ratings for expertise of staff and ease of access (parking).

**CONCLUSIONS:** Patients’ experience with specific attributes of infusion centers significantly differ by SOC. Therefore, patient perceptions and experiences should be considered in choice of SOC. Future research should investigate potential effects of patient characteristics on satisfaction with attributes of infusion centers.

**FINAL ABSTRACT #14**

**TITLE:** Assessment of infliximab utilization for Crohn’s disease and ulcerative colitis patients across different sites of care

**AUTHORS:** Susan Bolge, PhD; Julie Vanderpoel, Phd; Helen Eldridge, MS and Brad Schenkel, MS Janssen Scientific Affairs, LLC

**BACKGROUND:** Infliximab (IFX) is indicated for the treatment of patients with Crohn’s disease (CD) and ulcerative colitis (UC) and is administered via intravenous (IV) infusion. Patients may receive IFX at a variety of different types of infusion centers, including hospital outpatient departments (HOPD), in-office infusion settings (IOI), and alternate sites of care (ASOC), such as home infusion providers or ambulatory infusion centers. Currently, there are limited data characterizing the utilization of IFX across different sites of care in a real-world setting.

**PURPOSE:** The purpose of this analysis was to assess the consistency of IFX vial utilization for CD and UC patients across different sites of care.

**METHODS:** This study analyzed IFX claims between 01/01/2009 and 12/31/2010 from data provided by 72 U.S. commercial insurers representing approximately 192 million covered lives throughout the United States. IFX claims were identified for this analysis by J Code (1745) and claims specifically for CD and UC were further identified by ICD-9 codes (CD-555.x; UC-556.x). The number of IFX vials per infusion (VPI) was derived from Health Care Procedure Code System entries and verified by associated charges. Mean VPI was analyzed across the aforementioned sites of care in the 2009-2010 study period.

**RESULTS:** Of the 766,297 IFX infusion claims identified, approximately 276,717 (36%) were associated with a diagnosis of CD or UC and included in the analysis. For CD patients, there was an average of 95,158 and 118,091 infusions in 2009 and 2010, respectively. For UC patients, the average number of infusions was 25,357 and 38,111 in 2009 and 2010, respectively. IFX vial utilization per infusion was consistent between 2009 and 2010 for CD and UC patients across sites of care. The 2009 mean VPI for CD patients was 4.96 in IOI, 4.89 in HOPD, and 4.88 in ASOC. For UC patients, the 2009 mean VPI was 4.65 in IOI, 4.92 in HOPD, and 4.67 in ASOC. The 2010 mean VPI values for CD and UC patients were similar to those observed in 2009 (Table 1).

**CONCLUSIONS:** These findings indicate that IFX utilization for CD and UC patients was stable from 2009 to 2010 and was consistent across different sites of care (i.e., IOI, HOPD, and ASOC). Further research exploring additional measures such as patient adherence and patient satisfaction may provide further insight into the complete patient care experience across sites. Further research will also support optimal site of care decision making.

**FINAL ABSTRACT #15**

**TITLE:** Assessment of Infliximab Utilization Patterns Across Different Infusion Sites of Care for Patients with Arthropathy
AUTHORS: Chureen Carter, PharmD, MS; Julie Vanderpoel PhD and Denise Zomorrodian, MS; Brad Schenkel, MS
Janssen Scientific Affairs, LLC

BACKGROUND: Various infusion sites of care (SOC) exist in the United States (U.S.) for the administration of infusible therapies, such as infliximab (IFX). Rheumatologists may have knowledge of multiple SOC options and assist patients in selecting the most appropriate SOC for them. An understanding of IFX vial utilization across SOC may further inform the rheumatologist and patient in the shared decision-making process of infusion site selection.

PURPOSE: The purpose of this analysis was to explore IFX vial utilization patterns for in-office infusion settings (IOI), hospital outpatient departments (HOPD), and alternate sites of care (ASOC). ASOC included ambulatory infusion suites, home-based infusions, and employer-owned infusion suites.

METHODS: IFX claims were analyzed between 01/01/2010 and 12/31/2010 from the data of 74 U.S. commercial insurers representing approximately 192 million covered lives. IFX claims for a mixed population of patients (e.g., with and without biologic experience; newly started and continuing) were identified by J Code (1745) and ICD-9 codes 720.x, 714.x, and 696.0. The number of IFX vials per infusion (VPI) was derived from Health Care Procedure Code System entries and verified by charges. Mean VPI was analyzed across the aforementioned sites of care. Data were further analyzed across different regions of the U.S.

RESULTS: A total of 255,799 IFX infusions administered in rheumatoid arthritis (RA), psoriatic arthritis (PsA), and ankylosing spondylitis (AS) were analyzed (76.6% RA, 16.6% PsA, 6.8% AS). Ninety percent of the combined RA, PsA, and AS infusions were administered in the IOI setting, with a minority of infusions administered in HOPD or ASOC facilities (approximately 8% and 2%, respectively). The 2010 mean VPI for RA was 4.54, 4.90, and 4.78 in IOI, HOPD, and ASOC settings, respectively. Similarly, the mean VPI for PsA and AS were 5.59, 5.16, 5.11 and 5.11, 5.18, 4.89, respectively, for IOI, HOPD, and ASOC. IFX vial utilization was consistent across the different geographic regions of the U.S.

CONCLUSIONS: These findings indicate that IFX vial utilization is similar among a population of patients with arthropy, in all combined SOC, with a mean of 5 vials per infusion. IFX utilization is also consistent within RA, PsA, and AS across different sites of care (i.e., IOI, HOPD, and ASOC). Therefore, the anticipated quantity of IFX administered does not appear to be variable across SOC settings. Observed slight variation in mean VPI across indications may be attributable to differences in patient characteristics and recommended dosing. Evaluation of other factors such as patient satisfaction, patient adherence, clinical outcomes, and costs may be useful in further characterizing existing SOC options for rheumatologists and their patients in site selection.

FINAL ABSTRACT #16

TITLE: Infliximab Utilization Patterns within an Alternate Site of Care Setting among Patients with Inflammatory Bowel Disease

AUTHORS: Julie Vanderpoel, PhD1; Jennifer Lofland, PharmD, PhD1; Susan Bolge, PhD1; Brad Schenkel, MS1; Samir Mody, PhD2; Cheryl Kassed, PhD2; Charles Ruetsch, PhD2; Joseph Tkacz, MS2; Lance Nicholls, PharmD3; and Julie Tanner, RNC3
1Janssen Scientific Affairs, LLC; 2Health Analytics; 3InfuScience

BACKGROUND: There are limited data available characterizing the utilization of infliximab with an alternate site of care setting.

PURPOSE: To examine infliximab dosing patterns among patients with inflammatory bowel disease (IBD) receiving therapy in an alternate site of care setting (i.e., ambulatory infusion centers).
METHODS: A retrospective analysis of drug utilization data from nine ambulatory infusion centers (AIC) was conducted. Patients were required to be aged 18, have 2 ICD-9 codes for Crohn's disease (555.x) or ulcerative colitis (556.x), and have 3 infusions administered at an AIC during the measurement period (6/2008 – 3/2010). Both “new” patients (those receiving their first infliximab dose within the AIC) and “existing” patients (those receiving infliximab doses at another site prior to the AIC) were included in the analysis. Available data included demographic information, diagnosis fields, and infliximab infusion information. Patient weight was also available, allowing for direct calculation of infliximab dose. Dosing intervals were calculated as the number of days between infusions. Mean and median infusion intervals and infliximab doses were compared to FDA prescribing information. To measure possible interval and dose changes over time, repeated-measures analyses of covariance (ANCOVA) were conducted.

RESULTS: A total of 167 patients with IBD were included in the analysis (Crohn's disease=107, ulcerative colitis=60). Of these patients, 84 were new patients and 83 were existing patients. Approximately 56% of the new patients were male, mean age was 45 years, mean weight was 82 kg, and mean number of infusions during the measurement period was seven. Among existing patients, 45% were male, mean age was 40 years, mean weight was 74 kg, and mean number of infusions during the study period was eight. Approximately 94% of new patients (n = 79/84) received a starting infliximab dose of 5mg/kg. Over the first eight infusions, the mean infliximab dose for new patients ranged from 4.94 mg/kg to 5.18 mg/kg. Among existing patients, the mean infliximab dose ranged from 5.52 mg/kg to 5.77 mg/kg over the first eight infusions received within the AIC setting. Among new patients, the median number of days between the 1st and 2nd infusion was 14 days, and between the 2nd and 3rd infusion was 28 days. For the third through eighth infusions, the median number of days between infusions ranged from 55 to 56 days. Similarly, among existing patients, the median number of days between the first eight infusions ranged from 50 to 56 days. Based on ANCOVA results, there was no evidence of systematic change in dose or dosing interval over time.

CONCLUSIONS: Among IBD patients receiving infusions in an AIC, the infliximab dose and dosing frequency were consistent with FDA prescribing information and there was no evidence of systematic dose or dosing frequency change over time. Infliximab utilization patterns within the AIC setting, as identified in this analysis, appear to be consistent with the in-office infusion setting1. Evaluation of other factors, such as patients’ preferences, may be useful in further characterizing this site of care and supporting optimal site of care decision-making. References: Waters H, Vanderpoel J, McKenzie S, et al. Stability of infliximab dosing in inflammatory bowel disease: results from a multicenter US chart review. J Med Econ. 2011;14(4):397-402.

FINAL ABSTRACT #17

TITLE: Development and implementation of a standardized assessment tool for home parenteral nutrition patients ©2012 Critical Care Systems, Inc. All rights reserved.

CONTRIBUTING AUTHORS: Ibtissam Ouardani, PharmD; Don Filibeck, PharmD, MBA; Caryn Dellamorte Bing, RPh, MS, FASHP; Penny Allen, RD, LD, CNSC and Carolyn Timm, PharmD Critical Care Systems, Inc.

BACKGROUND: Parenteral nutrition (PN) provides a sterile form of liquid nutrients into the bloodstream through an intravenous (IV) catheter. PN provides patients with daily requirements of essential nutrients and can be administered in the hospital or home setting. Although PN can be life-saving, it can also be harmful if not administered and monitored correctly. Initial nutritional assessment is necessary to evaluate patients at the start of care, with ongoing assessment to evaluating patient progress, tolerance, and adherence.

PURPOSE: The purpose of this study was to create and implement a standardized electronic initial and ongoing nutritional assessment tool for evaluating Home PN (HPN) patients. The assessment is similar in goals and format to the American Dietetic Association’s Nutrition Care Process, providing a consistent approach to assessment of PN patients. The electronic assessment tools should be concise, effective and time efficient, facilitate consistent assessment of patients’ nutritional needs, and collect outcome data regarding this national company’s HPN population, which is not possible with paper forms, electronic chart notes, and other tools currently in use.
METHODS: Two electronic nutritional assessment questionnaires were created, an initial HPN assessment, and an ongoing follow-up home nutritional assessment. The initial assessment contains key information to evaluate nutritional status at the start of care and appropriateness of the HPN prescription. The shorter follow-up assessment summarizes and communicates patient care information regarding ongoing patient progress, tolerance and adherence to therapy, needs for intervention, and any recommendations. Pre and post assessment employee surveys evaluated the satisfaction of clinicians involved in the trial of the new nutritional assessment tools. Prior to rollout to all company sites, both assessments were utilized, reviewed and critiqued by a pilot group of 32 dietitians and pharmacists. A job aid training tool was created, and participating clinicians were trained using emails, webinar sessions incorporating computerized hands-on training, and follow up conference calls.

RESULTS: Surveys indicated that it took clinicians longer to complete previously used tools than the new assessments. Prior to the pilot, 50% of clinicians took 5-10 minutes to complete an assessment, and 39% of clinicians took over 15 minutes; versus 80% taking less than 5 minutes, and 60% taking 5-10 minutes to complete with the new tools. Regarding effectiveness, the new assessment was perceived to be more effective with 38% of clinicians rating the tools as very effective compared to only 25% who gave the previous tools this rating. The new tools allow for specific types of data collection, whereas the preexisting manual forms and narrative chart notes do not. Post-survey responses called for several improvements to the new tools, including increased space for documentation, connection to the clinical intervention assessment and additional space for lab result evaluation.

CONCLUSION: Both nutritional assessment tools will be updated, modified and implemented companywide to allow standardized assessment, clinical monitoring and management of HPN patients. The new tools will allow collection of outcome data to improve our standards of practice for the home PN population.

FINAL ABSTRACT #18

TITLE: Conducting a Prospective Research Trial in a Home Infusion Setting

AUTHORS: Carlotta M. Meier-Irving, PharmD, MS1; Connie Sullivan, RPh1; Patrick McDaneld, PharmD2 and Scott McConnell, PharmD2

1Heartland IV Care Pharmacy; 2Cubist Pharmaceuticals, Inc.

BACKGROUND: Research trials in the health system setting have long been the standard. However, to date, there have been no published prospective, randomized research trials in the home infusion setting. Patient safety and desire to resume a normal lifestyle and work activities, coupled with an emphasis on cost-effectiveness and cost-containment has created a shift toward providing infusion therapy in the home setting instead of the hospital or other more restrictive site. As the number of patients rise in the home infusion setting, so do the challenges of reimbursement coverage. For this reason patients referred for home infusion therapy often seek an alternate, more restrictive site of care, or opt for a potentially suboptimal oral medication. To obtain relevant data supporting the home infusion arena, we conducted a prospective, randomized study comparing clinical, economic, and patient related outcomes in patients treated with daptomycin versus vancomycin for complicated skin and skin structure infections in the home infusion setting.

PURPOSE: The purpose of this review is to highlight the process for managing a research study in the home infusion setting, including site selection, education of staff, oversight of clinical and distributive activities and data collection.

METHODS: After the agreement was signed between this provider and Cubist Pharmaceuticals, Inc., preparation to undertake this study included selecting each site for participation, producing educational tools for all staff, creating functional tools for daily activities, and preparing specific templates for study related data. Training for pharmacy, nursing, sales, billing and physicians was conducted. The clinical trial was conducted according to our standard operating procedures so that it would simulate actual home infusion
practice, however, we did identify a small group who were responsible for all discussions with patients regarding randomization and informed consent. All patients referred for home infusion vancomycin therapy were screened for enrollment. Randomization to vancomycin or Cubicin (daptomycin) occurred after initial verbal consent via telephone. Final informed consent was accomplished at the patient’s home prior to drug administration. Study subjects were assigned to a pharmacist lead team overseeing all clinical activities until discharge from service. Patients were contacted several times after discharge to complete survey questions. All patient specific data was collected for analysis.

RESULTS: At the conclusion of the trial, a total of 382 patients were screened, 89 patients randomized into the study and 80 patients provided informed consent for participation. The study period was 14 months. Analysis of the final data is still being completed.

CONCLUSIONS: Although there are challenges, conducting a prospective clinical research trial in a home infusion setting can be a valuable and worthwhile undertaking. This trial demonstrated that conducting prospective, randomized clinical trial in home infusion can be accomplished in the presence of solid operating procedures, multi-faceted staff education, exceptional clinical staff and consistent monitoring. Hurdles to overcome for a successful trial included timely discussions with admitting physicians, the randomization of patients physically off-site, the informed consent process and clear and consistent documentation. Overall, the experience was very positive and we look forward to participating in future studies.

FINAL ABSTRACT #19

TITLE: Process Improvement in Home Infusion: Medication Error Reduction Strategies
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CONTRIBUTING AUTHORS: Nicole Etti, PharmD; Barbara Prosser, RPh; Robin Espiriti RPh and Caryn D Dellamorte Bing, RPh, MS
Critical Care Systems, Inc.

BACKGROUND: The development of better practice models and strategies to reduce medication errors has been a challenge in the home infusion setting. In the home care setting the process for entering and filling prescriptions varies from company to company and even within each company. As part of our organization’s performance improvement and risk management processes, we report and track all medication and supply errors. Our division implemented the use of computerized quality dispensing intervention (QDI) assessments in January 1, 2011 which captures specific information and data points based on the type of error reported.

PURPOSE: The initial purpose of this project was to analyze the QDI data and identify common types of medication and supply errors in our home infusion practice setting, then formulate and implement a better practice model to aid in the reduction of identified errors. Analysis of QDI data revealed inconsistent data reporting. It was not possible to determine if this inconsistency was due to under reporting, training needs, and/or opportunities to improve the current QDI tool. The revised project goal is to improve QDI supply and medication error reporting.

METHODS: As part of the revised goal, the QDI reporting process was evaluated using a Fishbone diagram. The QDI assessment was compared with the 2011 QDI data in an excel sheet. Once the comparison was complete, response to QDI questions that contained unclear responses were further evaluated. A training tool was developed to serve as a quick reference for the clinical team. The new training tool was presented to the national infusion company’s clinical managers in February 2012. As part of the presentation, additional recommendations were summarized for management. Three months after management roll out of the training tool to the company’s clinicians, a focused analysis of QDI data will be repeated.

RESULTS: After the completion of the company wide training session, the goal is an improvement in the consistency of dispensing error reporting. The improved quality and quantity of the supply and medication error reporting will provide adequate data for future analysis. Examples of QDI data analysis methods and training tool will be presented on the poster.
CONCLUSION: The new training tool provides a way for current employees to refine the way they document dispensing errors and also will assist in training new employees on how and when to document dispensing errors. Utilization of this training tool by the infusion team will provide for increased consistent medication or supply error reporting, subsequent data analysis, and ultimately the development of better practice models.

FINAL ABSTRACT #20

TITLE: Collective look at the costs associated with the administration of the most frequently prescribed antimicrobials in an outpatient home infusion organization.

CONTRIBUTING AUTHORS: Armando Riggi PharmD; Steve Kennedy PharmD and Lisa Siefert RPH, FASHP, CMQ/OE
Walgreens Infusion and Respiratory Services

BACKGROUND: The cost-effectiveness of outpatient versus inpatient antimicrobial therapy has been well documented in several studies. While this evidence has led to more patients being treated in the home, there is limited data that examines the specific individual costs, including clinical services, associated with these treatments.

PURPOSE: The goal of this study was to compare the administration costs of the top ten outpatient antimicrobial agents given by this national home infusion organization to determine the most cost-effective drugs and delivery methods.

METHODS: A retrospective analysis was conducted utilizing the home infusion organization's dispensing records. From these records, fifty patients were randomly selected to determine the most common doses, frequencies, and administration method of the top ten antimicrobial medications prescribed. Cost was calculated using AWP of the medication, supplies for administration, labs, delivery costs and average time spent by pharmacist, nurses, and pharmacy technicians. Once cost was calculated, antimicrobial treatments with similar efficacy were compared to determine the most cost effective options. Furthermore, a final evaluation was conducted by the clinical services group to evaluate if antimicrobial costs had an effect on which antimicrobials were used.

RESULTS: Analysis revealed that the most commonly dispensed antimicrobials/doses at our organization include: vancomycin 15mg/kg(1gm), daptomycin 6mg/kg, ceftriaxone 2gm, ertapenem 1gm, piperacillin-tazobactam 3.375gm, cefepime 2gm, cefazolin 2gm, ampicillin 2gm, gentamicin 5mg/kg, and ceftazidime 2gm. Six out of the top ten outpatient antimicrobials were most commonly administered IV push. Comparison of costs for therapeutically similar agents revealed vancomycin to be more cost effective at $346.46/day versus daptomycin at a cost of $425.29/day. Other therapy costs included ertapenem therapy at $280.66/day, piperacillin-tazobactam at $290.85/day, ceftazidime at $238.49/day, gentamicin at $297.73/day, and cefepime at $281.90/day. Ceftazadime was found to be the most inexpensive antimicrobial therapy for infections caused by *Pseudomonas aeruginosa*.

CONCLUSION: Despite shorter administration times (IV push vs. 90-120 minute infusion) and the possibility of less frequent lab draws, daptomycin therapy was more expensive than vancomycin. We did not attempt to measure or compare clinical outcomes in this study. Another interesting finding demonstrated that ertapenem therapy was slightly less expensive when compared with piperacillin-tazobactam, and ceftazidime was found to be the most economical antimicrobial for pseudomonas infections. The most inexpensive antimicrobial medication administered was cefazolin, calculated to cost $173.81/day. Finally, one of the more surprising results was that the majority of patients received medications via the IV push method. This is significant because IV push medications are reported by clinical staff to be easy to teach patients to self-administer, and are associated with a lower overall cost. Future research that considers clinical outcomes of treatment in addition to the cost of therapy would provide meaningful data about both cost and clinical effectiveness.
Final Abstract #21

Title: Clinical outcomes of continuous vs. intermittent infusion of beta-lactam antibiotics in the home infusion setting.

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Contributing Authors: Stephanie Manning, PharmD; Cindy Kunzendorf, RPh, MBA and Caryn Dellamorte Bing, RPh, MS
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Background: Beta-lactam antibiotics exhibit time-dependent bactericidal properties. The bacterial kill rate is not improved by increasing the concentration of the drug. In vitro pharmacokinetic and pharmacodynamic studies support continuous infusion administration of beta-lactam antibiotics. Previous studies on the use of continuous infusion beta-lactam antibiotics in a clinical setting have focused primarily on critically ill patients with inconclusive results to date. No studies on this topic have been reported in the home infusion patient population.

Purpose: The purpose of this project is to evaluate clinical outcomes of patients who have received continuous infusion beta-lactam antibiotics, as compared with intermittent infusion beta-lactam antibiotics, in the home infusion setting.

Methods: This retrospective review of both continuous and intermittent infusion nafcillin, piperacillin/tazobactam, ceftazidime and meropenem captured and analyzed data from the electronic medical records of a national home infusion provider. Data reviewed included patients who were on service from January 10, 2011 to September 30, 2011. Markers of clinical outcome included length to completion of antibiotic therapy, successful completion of therapy, hospitalizations and adverse drug reactions due to antibiotic therapy. Inclusion criteria included only those therapy codes that corresponded to nafcillin, piperacillin/tazobactam, ceftazidime or meropenem and patients were only included if an approved therapy code was used. Exclusion criteria included any data in which the therapy stop date was not documented, as well as any therapy initiated before January 10, 2011.

Results: A total of 776 intermittent and 147 continuous therapies were observed for piperacillin/tazobactam and nafcillin (meropenem and ceftazidime therapies were excluded due to an insignificant amount of continuous therapies present in these groups). Average length of therapy was 28 days (N=707) for the intermittent group and 40 days (N=136) for the continuous group (P<0.001). There was no significant difference for overall hospitalizations (RR=1.03; P=0.917), hospitalizations due to clinical deterioration (RR=0.82; P=0.626), successful completion of therapy (RR=1.015; P=0.578), or adverse drug reactions (RR=2.615; P=0.063).

Conclusions: Use of beta-lactam antibiotics via a continuous infusion dosing method did not demonstrate any significant difference in hospitalizations, successful completion of therapy, or adverse drug reactions when compared with an intermittent infusion dosing method. There was a significant difference in average length of therapy, with intermittent infusion showing a shorter duration. This may suggest that use of an intermittent infusion method may be favorable to a continuous method in order to shorten length of therapy and decrease costs. Further randomized clinical trials are needed to corroborate these findings.

Final Abstract #22

Title: Retrospective review of unplanned hospitalizations and missed school days in children under the age of 12 with a diagnosis of primary immune disease (PID) receiving home infusions of commercially available subcutaneous and intravenous immune globulin (SCIG, IVIG) therapy.

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**BACKGROUND:** Healthcare providers and patients have utilized immune globulin solutions, 10-20% administered subcutaneously or intravenously, for the prophylactic treatment of various primary immune deficiency diseases (PIDD). Patients self-administer (SCIG) or are infused (IVIG) with nursing support. With a primary goal of treatment to prevent recurrent infections and thereby minimize disruptions to normal activities, therapy success for school-aged children is often measured in terms of avoidance of missed school days.

**PURPOSE:** This organization was interested in comparing clinical outcomes of children with primary immune disease (diagnosis codes 279.04, 279.05, 279.06, 279.12, 279.2) currently being treated in the home with IVIG or SCIG, to published reports of missed school days and unplanned hospitalizations in similar patient populations treated in other sites of care.

**METHODS:** This organization conducted a retrospective review of a population of 102 children, 12 years old and under, who received either IVIG or SCIG. Of this patient population, 60 children were school-aged (5-12 years old) and chart reviews, customer service note reviews, unplanned hospitalization forms, clinician interviews and patient interviews were conducted to identify their total number of missed school days in 2011. Unplanned hospitalization forms are a quality monitor reviewed monthly at the branch levels.

**RESULTS:** A total of 233 school days were missed by the 52 children who qualified for the study in 2011, or an average of 4.48 days / patient / semester. Published data for treated PIDD patients is 8.9 school / work days missed / year.¹ In the same period, a total of 11 of the 102 children studied (or 11%) reported 13 unplanned hospitalizations, leaving 89% of this patient population with no unplanned hospitalizations for the entire year. The 13 unplanned hospitalizations resulted in a total of 82 hospital days. Of the 13 hospitalizations, 7 were related to an infection that resulted in 31 hospital days or 4.4 days per hospitalization. Published data for treated patients with PIDD is 5.1 days in the hospital.²

**CONCLUSION:** Missed school days were tracked on a semester basis and compared to the national average of missed school/ work days reported by Jeffrey Modell Foundation. The majority of our patients, 73% (n=38) missed 0-5 days. Ten of the patients with serious co-morbidities accounted for 169 of the missed days, or an average of 16.9 days/child. For the remaining 42 children, only 64 days of school were missed, an average of 1.5 days/child. Hospitalization days were slightly lower at 4.4 days compared to the reported data of 5.1 days. The average cost of a hospital inpatient/ day rate nationally in 2009 was $1853³ so a decrease in hospital LOS of 0.7 days would result in a savings of $1297 per hospitalization, based on these results.

**REFERENCES:**
1. Jeffery Modell Foundation, Comparing Quality of Life Data for Undiagnosed and Diagnosed Patients with Primary Immunodeficiencies, 2007
2. Jeffery Modell Foundation, Comparing Quality of Life Data for Undiagnosed and Diagnosed Patients with Primary Immunodeficiencies, 2007

**FINAL ABSTRACT #23**

**TITLE:** Development of a computerized assessment for the management of home infusion parenteral heart failure therapies

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BACKGROUND: The management of heart failure patients, who receive parenteral inotropes as a home therapy, provides opportunities for interventions that minimize disease state deterioration and re-hospitalization. This home care setting can improve quality of life and provide independence for patients. Parenteral inotropes are life sustaining therapies that require ongoing monitoring of the patient’s status to maintain stability and delay progression of disease.

PURPOSE: Our home infusion clinicians currently use a variety of tools to document the evaluation of heart failure patients. The development and implementation of a standardized assessment tool will provide a consistent approach to the documentation of care provided to this patient population in this national company with multiple locations. Additionally, it will capture data trending the patient’s progress and response to treatment, which can be provided to physicians and/or payers upon request. The object of this project was to create and pilot a standardized assessment tool for clinicians to document patient care within the electronic medical record using a uniform method.

METHODS: Five company locations were selected to trial the new heart failure assessment tool prior to its release company wide. A satisfaction survey was distributed to clinicians involved prior to the implementation of the new assessment tool. The survey questions reviewed the current processes which clinicians use to document their interventions and assessments of heart failure patients, and also queried their satisfaction with current documentation methods. After the results from the "Pre-Assessment Survey" were gathered, the participating branches were introduced to the new "Heart Failure Management Tool". Clinicians and staff received training that included a job aid, and a presentation introducing the assessment tool that highlighted the purpose and important elements of the tool. The new assessment tool consists of pertinent questions to assess the patients, such as documentation of weight, changes in medication and quality of life measurements on a regular basis. It also documents other key parameters such as lab work, enabling clinicians to view trends in the lab results weekly and make appropriate interventions, as required. Lastly, the assessment tool allows clinicians to document and track any patient re-hospitalization. After piloting the electronic assessment tool for thirteen weeks, a follow-up survey was distributed. This allowed the staff involved the opportunity to assess the effectiveness of the new tool and provide constructive criticism to further refine the assessment tool prior to the release company-wide.

RESULTS: Analysis of survey results revealed: 92% of the participants will continue using the new assessment; 76% declared it more efficient; 84% thought it improved ability to trend data; 46% declared it easier than chart notes; 30% felt it provided better patient care and 70% found it made tracking weekly weights easier.

CONCLUSIONS: The goal is a refined electronic assessment tool that clinicians will use to efficiently monitor heart failure patients receiving home parenteral inotropic therapy. The staff surveys served as a guide to differentiate the satisfaction rate between previous tools used and the new tool, efficiency of documentation, and provided constructive feedback to improve the assessment tool.