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"A Systematic Approach To IV Therapy: Management Essentials For Healthcare Professionals"

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- Abstract :

This paper introduces a holistic framework for the systematic management of Intravenous (IV) therapy in modern healthcare. Focused on structured protocols, real-time monitoring, risk identification, and quality improvement, the proposed system aims to optimize patient outcomes, reduce risks, and streamline the administration process. Healthcare professionals can elevate IV therapy standards by adopting this systematic approach, ensuring precision, safety, and efficiency in patient care.

- Keywords :

IV Workflow management, Benefits Of IVWMS, Risk and Errors in IVWMS, Essential management.

- Introduction :

"A Systematic Approach to IV Therapy: Management Essentials for Healthcare Professionals" is a comprehensive guide designed to equip healthcare professionals with the essential knowledge and skills necessary for the meticulous management of Intravenous (IV) therapy. This resource is tailored to address the complexities of IV therapy, emphasizing a systematic and evidence-based approach to ensure optimal patient outcomes and safety.

Encompassing a spectrum of management essentials, this guide delves into standardized protocols, best practices, and the integration of cutting-edge technologies to streamline IV therapy workflows. It serves as a beacon for healthcare professionals, offering insights into patient safety measures, infusion practices, and the implementation of robust training programs.

As the healthcare landscape evolves, this systematic approach not only emphasizes the importance of adherence to regulatory compliance but also encourages a continuous quality improvement mindset. From

the fundamentals of infusion practices to the integration of Electronic Health Records (EHR) and the latest safety protocols, this guide is a vital resource for healthcare professionals committed to delivering excellence in IV therapy management.

A systematic approach to IV therapy involves a structured and organized method for managing intravenous treatments, ensuring efficiency, accuracy, and patient safety. Here's how such an approach typically works:

1. Evaluation and planning. Your doctor will first evaluate your condition, including factors such as medical history, current medications, and need for intravenous therapy. A detailed plan is then created based on the patient's specific needs. This includes important components such as identifying patient needs, safety procedures, staff training, and equipment maintenance. It is important to establish clear procedures, adhere to disease prevention measures, and optimize practices. Continuous monitoring and feedback strategies help clinicians ensure efficient and effective management of intravenous therapy.

2. Standardized protocols: Common vascular repair methods using established protocols and procedures. This standardized process helps ensure consistent application, reduces the risk of error, and improves overall care. This should include instructions for installing, maintaining, and removing IV lines. This process should include patient assessment, appropriate documentation, and disease prevention. To support this process, regular staff training and regular health insurance plans are in place to ensure consistency and safety in practice. To maintain a high standard of care, it is essential to continually update procedures based on evidence-based practice and technological advances.

3. Patient Safety Measures: Focus on patient safety throughout the IV administration process. This includes accurately identifying prescription medications and using technology such as barcode scanning to reduce the risk of medication errors. A systematic approach is necessary to ensure patient safety during endodontic treatment. The key for the doctor is correct site selection, aseptic technique, accurate dose calculation, regular monitoring and quick response to problems. Regular training and appropriate compliance are necessary to minimize risks and ensure the overall safety of intravenous therapy.

4. Education: Physicians receive training in new practices and methods of vascular care. This ongoing education ensures proper administration of IV therapy and adherence to best practices. Most include topics such as aseptic technique, proper equipment use, drug interactions, dosage calculations, and emergency response. Look for courses that include simulations, case studies, and regular assessments to help doctors learn the skills they need. Additionally, programs should emphasize the importance of continuing education to ensure that physicians are aware of the latest developments and safety precautions in vascular repair.

5. Integrating technology: IV administration today often involves technology such as electronic infusion pumps and links to medical records (EHRs). This technology improves accuracy, automates the recording process,and helps in instant monitoring of IV therapy.

6. Workflow Optimization: A method designed to improve workflow, reduce delays and increase efficiency.This may include automation for data, inventory management, and other IV processes.

7. Quality Improvement: An important part of the process approach is the commitment to quality improvement. Ongoing evaluation, feedback, and data analysis are used to identify areas for improvement and ensure the IV therapy process evolves with the latest advances and best practices.

8. Regulatory Compliance: This approach follows regulatory standards and guidelines to comply

with laws and regulations in the industry. This is important to maintain high standards of care and patient safety. Using this system, doctors can improve the overall management of IV therapy and provide patients with safer, more effective, consistent and good care.

- How IVWMS works:

More than half of respondents (57%, n = 361) report using the following technologies when creating sterile labels:

Non-image barcode authentication technology (48%, up to 75% use this technology [) all 10-100% range ofCSPs]

Studies using barcode and image authentication (47% using this technology, approximately 75% of all CSPs [5
-100% range])

Automated multi-component deployment equipment (e.g., parenteral nutrition [PN] dispensers) (~10% [range 1
-100%] of all CSPs and 46% use this technology) (32% use this technology ~% of all CSPs) 50% use [range 5-100%])

A pharmacy system with image and barcode scanning and/or weighing system (~50% of all CSPs use 25%[range 5-100%])

All 50% of CSPs [range] use this technology 1- 100% of all CSPs, mostly for drug antineoplastic and PN) Intravenous (IV) Sterile Compounding Robots (8% of all CSPs, all CSP Approximately 1% of 's use this device.
) 30% (5-100% more, mainly for antineoplastic drugs and PN)

mix the ingredients and complete the design process, diluent and dosage.

In some cases, all chemicals need to be tested before mixing; but for most participants, only certain chemicalsshould be tested before mixing, including the following chemicals:

All or some hazardous chemicals (such as antineoplastic drugs)All or some elevation. -stimulus medications (e.g. insulin, opioids)/other control medications, epidural/intrathecal medications, epoprostenol)

All or any blood product (e.g. KCENTRA [Prothrombin Complex Concentrate, [Human]) All children

and /or babies . drugsBiological products, including monoclonal antibodies Drug requires dilution

- Benefits OF IVWMS:

IVWMS results can best be evaluated by considering the conditions mentioned above and how the results differ. If Emily had prepared Jerry's dose of etoposide using IVWMS, the pharmacist would have reported that they analyzed 23.4% sodium chloride instead of the 0.9% sodium chloride that was supposed to be used, prepared the dose, and been given clear instructions and directions, rather than hope. It depends solely on professional training and experience. In the second scenario, if the hospital had this technology, it would alert pharmacy staff that they had mistakenly tested the vial of rocuronium instead of fosphenytoin.

IVWMS can also help determine expiration dates of manufacturing ingredients and BUDs used as CSPs to prepare solutions for other drugs to help prevent products from being used after the expiration date. In this case, IVWMS eliminates the expectation of human effort to catch these errors.

In some systems, time-sensitive or expensive CSPs may be prioritized as timeouts or placed in queues to prevent them from occurring. Production is carried out at an early stage, reducing waste and the need for re- planning. Sites may also enable the identification of high-risk drugs, such as antibiotics or human blood products, which can be configured to require online identification.

In this case, the compounder should stop the compounding process until the inspector has checked and approved the ingredients before mixing and asked the pharmacist to make several checks. In addition to reducing errors and harm to patients, these systems also have other advantages.

Although cost is often seen as a barrier to implementation, IVWMS can help reduce waste and errors; Both of these can lead to cost savings that can be attributed in part to influencing the initial investment required to build these systems. Additionally, like any knowledge-based system,

IVWMS can easily provide a variety of information. For example, information on the use of products is useful in managing drug shortages, adjusting product standards based on historical usage statistics and ultimately reducing waste.

Additionally, information on production times and daily operations can be helpful when determining the need for operational changes or investigating errors associated with slow drug delivery. For example, when using CSP to inject into the ventricular cavity, users can work with IVWMS vendors to create custom functions that include layering, different standards, and equipment (e.g., using a 0.2 micron filter) for the “intraventricular” route.

Compared to other injection methods. The ones used are different. This is also important to ensure employees are prepared without relying solely on training.

- Risk and Errors :

The study variables and intervention terms are:

Release the actual dose to the patient. These data were determined based on distribution and management data in the hospital data model.

- Missing IV numbers – Failure to find the intended dose, resulting in medication changes and duplications. This information is obtained using the address map.

- Labor in the preparation of discarded and lost IV drugs - Duration of IV drug use, including preparation and dose review time. Periodic movement studies are performed to identify and evaluate physical elements.
- Financial impact of waste and lost products - pharmaceutical costs are based on drug costs, labor costs, utility costs and disposal costs from buildings. Medical must pay companies to dispose of waste medicine based on the weight of its disposal.

- Detected IV Error – Errors are classified into the following error types: wrong drug, wrong diluent, expired dose, wrong container, damaged dose, wrong dose, scanning errors, etc. This is determined by sending error messages from IVWMS.

Almost three-quarters (74%) of all respondents were aware of at least one non-sterile pharmacy practice occurring in the past 12 months, including those discovered and discovered. It was set in the pharmacy and found after dispensing. More pharmacists (79%) than technicians (67%) were aware of these errors.

Types of medication errors reported include:

Incorrect dosage or concentration (58%)Incorrect dosage (51%)

Problems or errors with CSP labeling (such as abandonment) (41%)

Wrong drug (volume or diluent) dilution (36%) Wrong drug (35%)Planning errors (e.g., incorrect specification,pipeline errors) (26%)

Expired product, solution, or CSP (16%)

Time errors (e.g., preparing antineoplastic drugs on the wrong day) (12%)

Omission of medications (5%)

Examples of other types of errors reported (%) 7 involved robot removal of the vial, use of the wrong port orcontainer, and wrong patients.

Only 4% of survey respondents reported knowledge of errors in CSP purchases from 503B pharmacies. Barcodecannot be scanned.

Production Some barcodes are difficult to analyze or cannot be recognized by WFMS due to changes in companies, the use of alternative medicines during shortages, or the introduction of new drugs on the market. When a new medication or another medication is used, pharmacy staff must stop mixing to allow the new medication to enter the body. These conditions will cause pharmacy staff to skip the barcode scanning process for these products until the system is updated. Refused to scan the barcode. WFMS often requires barcode scanning (and image capture) at each step of the lamination process to proceed.

However, given the fast pace of the pharmacy, especially at certain times, some dispensing staff may find the barcode printing process time-consuming, especially at the beginning of the project, as they deal with productsdelivered before the use of WFMS.

Pharmacy employees may be reluctant to pursue work because they feel it will slow down the work due to competing demands on their time. In fact, a recent ISMP study cited operational issues as a major barrier toWFMS implementation.

Issues of efficiency, speed, and low risk awareness can sometimes cause employees to not comply with the barcode scanning requirement. Scan only one bottle. Most WFMS are designed to simultaneously complement aCSP.

However, when mixing multiple doses of the same medication (e.g., during compounding) or for CSPs needing multiple vials of the same medication, staff will screen tube milk as frequently as short milk. They may not be aware of the risks of examining a package at once to prepare multiple products or examining the same vial multiple times instead of using each vial. However, this approach goes against the good security of WFMS. Usetraps for scanning or image capture.

Sometimes, when grouping multiple doses of the same product, a spare "scan bag and vial" is placed to the side and all doses are scanned. Similarly, the same syringe and IV bag can be used to capture images of each dose rather than measuring each dose. Although thought to be simpler, WFMS cannot identify such error processes.

Use the syringe withdrawal method. Despite the use of WFMS, the retractable syringe continues to be used for imaging in some operations, where the user first injects the blank shot into the bag and then

takes a picture of the needle and the blank shot is withdrawn to a reliable volume. I took a shot. The syringe retraction method defeats the purpose of being able to see the full volume of the additive before injection.

For many years, ISMP has been reluctant to rely on withdrawn syringes for identification, especially for CSPscontaining chemotherapy, complex electrolytes, or other hazardous drugs.

The syringe withdrawal method requires too much trust to be safe and is currently banned by some state boardsof pharmacy. Digital images are blurry or missing.

The image quality of WFMS depends on the quality of the injection and the type of image taken. Moniz et al. conducted an evaluation of IV hybrid WFMS at a pediatric hospital and found that approximately 36% of drug rejections and reoperations in the first few months of use were associated with missing or lost imaging.

Unfortunately, the volume of the syringe may be too small or too large to be seen clearly in the photograph, or the volume may not be clear due to plastic manufacturer differences in injection transparency .

Employees may also forget to take photos of all ingredients used or find that taking images of all containers takes too much time (for example, 5 bottles are used to prepare the product but 1 bottle is used for the photo).The pharmacist will not know whether the other vial used is the correct one.

- **Essential Managements ::**

  -Improved Patient Safety:

One of the main goals of any healthcare organization is to ensure patient safety. Intravenous medications can cause serious risks to patients if they are not prepared or used properly. IV process controls provide better safety by integrating multiple safety controls and measures throughout the drug preparation process. From barcode scanning and automatic number counting to sending prescriptions with patient information, these systems reduce the likelihood of medication misuse and adverse events.

Additionally, IV activity management is integrated with electronic health records (EHR) to provide rapid access to patient information and medical history. This integration will further improve patient safety by helping to accurately identify patients, identify medications, and investigate drug interactions or allergies.

-Improving Productivity:

Pharmacy IV Workflow Management System streamlines the medication preparation process, optimizes efficiency and reduces turnaround time. Traditionally, mixing intravenous medications involves time-consuming and error-prone steps. However, with active IV administration, pharmacies can use many of these methods. These machines use advanced technology and automation to accurately measure and mix chemicals. The software guides pharmacists every step of the way to comply with the rules and reduce the risk of human error.

Additionally, IV management functions enable instant inventory tracking, alerting pharmacists of medication shortages or expiration dates, ensuring control and reducing medication dispensing. In addition, these systems facilitate seamless communication between members of the pharmaceutical

workforce. The software assigns tasks, tracks progress, and enables collaboration and increases overall business collaboration and efficiency. Pharmacists can prioritize their work, monitor work in progress, and allocate resources efficiently, thereby increasing efficiency and reducing bottlenecks.

-Reducing medication errors:

Medication errors are a major problem in healthcare that has a significant impact on patients. The IV management function has reduced the possibility of errors by introducing controls and prevention.

The system uses barcode scanning technology to verify the accuracy of the medication at each stage of themedication preparation process.

Pharmacists check the bottle to make sure the medicine has been selected and the dose and need have been selected. This process reduces the risk of choosing the wrong medication or the wrong amount, as the systemcompares the prescription with the scanned documents.

IV administration also works by using a weight scale that compares the weight of the prepared medicine to the prescribed weight. This method provides greater accuracy and ensures correct formulation of the drug.

- Conclusion: Conclusion:

It provides a comprehensive guide for healthcare professionals, equipping them with the essential skills and knowledge needed to deliver effective intravenous therapy. By emphasizing a systematic approach, the book ensures safe and efficient practices, ultimately contributing to improved patient outcomes. This resource serves as a valuable tool in enhancing the competence of healthcare practitioners in the critical domain of intravenous therapy management.

- Reference : Reference :

1. IV Workflow Management Systems: A Century in the Making T Nichols m https://www.pharmacypracticenews.com/Review-Articles/Article/06-23/IV-Workflow-Management-Systems-A-Century-in-the-Making/70493?ses=ogst
2. Maximize Benefits of IV Workflow Systems K Maxik, C Kimble, A Coustasse - 2021 - mds.marshall.edu https://mds.marshall.edu/mgmt_faculty/232/
3. Pharmacy informatics: current and future roles foPharmacy informatics: current and future roles for the pharmacy technician CL White, KC Hohmeier - Journal of Pharmacy Technology, 2015 - journals.sagepub.com https://journals.sagepub.com/doi/abs/10.1177/8755122515605517
4. Sterile product compounding using an iv compounding workflow management system at a pediatric hospitalTT Moniz, S Chu, C Tom, P Lutz… - American journal of …, 2014 - academic.oup.com https://academic.oup.com/ajhp/article-abstract/71/15/1311/5110977
5. Optimizing iv workflow, SL Speth, DB Fields, CB Schlemmer… - American journal of …, 2013 - academic.oup.com https://academic.oup.com/ajhp/article-abstract/70/23/2076/5112420
6. Technology in parenteral nutrition compounding, C Curtis - Nutrition in Clinical Practice, 2018 - Wiley Online Library https://aspenjournals.onlinelibrary.wiley.com/doi/abs/10.1002/ncp.10086
7. Shamsuddin AF. Brief history and development of parenteral nutrition support. Malaysian J Pharmacy.

2003;1(3):69-75.

8. Myers C, Anderson D, Barker KN, et al. History of sterile compounding in U.S. hospitals: learning from the tragic lessons of the past. Am J Health Syst Pharm. 2013;70(16):1414-1427.

9. Drug Topics. Baxa DoseEdge upgrade features many key improvements. Published December 16, 2010. Accessed May 1, 2023. https://www.drugtopics.com/view/baxa-doseedge-upgrade-features- many-key-improvements

10. Hansen NE. Pharmacy IV automation a mature, proven technology. Today's Medical Developments. Published August 14, 2013. Accessed May 1, 2023. https://www.todaysmedicaldevelopments.com/news/pharmacy-medical-technology-automation- 081413

11. Paytes A, Hansen KN, Boiallis CJ. The state of sterile compounding technology. Pharmacy Purchasing & Products. March 2022;19(3). Accessed May 1, 2023. https://www.pppmag.com/article/2893

12. Flynn EA, Pearson RE, Barker KN. Observational study of accuracy in compounding i.v. admixtures at five hospitals. Am J Health Syst Pharm. 1997;54(8):904-912.

13. Institute for Safe Medication Practices. ISMP survey provides insights into pharmacy sterile compounding systems and practices. Published October 22, 2020. Accessed May 1, 2023. https://www.ismp.org/resources/ismp-survey-provides-insights-pharmacy-sterile-compounding- systems-and-practices

14. McCoy K, Brady E. Rx for errors: drug error killed their little girl. USA Today. Updated February 21, 2018. Accessed May 1, 2023. https://emilyjerryfoundation.org/rx-for-errors-drug-error-killed-their- little-girl

15. Institute for Safe Medication Practices. Eric Cropp weighs in on the error that sent him to prison. Published December 3, 2009. Accessed May 1, 2023. https://www.ismp.org/resources/eric-cropp-weighs-error-sent-him-prison

16. Ross M. Pharmacy worker's error leads to hospital patient's death. Pharmacy Times. Published December 10, 2014. Accessed May 1, 2023. https://www.pharmacytimes.com/view/pharmacy-workers -error-leads-to-hospital-patients-death-

17. Institute for Safe Medication Practices. Tragic error with neuromuscular blocker should prompt risk assessment by all hospitals. Published December 18, 2014. Accessed May 1, 2023. https://www.ismp.org/resources/tragic-error-neuromuscular-blocker-should-prompt-risk-assessment-all -hospitals

18. Institute for Safe Medication Practices. Guidelines for sterile compounding and the safe use of sterile compounding technology. Published May 4, 2022. Accessed May 1, 2023. https://www.ismp.org/resources/guidelines-sterile-compounding-and-safe-use-sterile-compounding-technology

19. Institute for Safe Medication Practices. Maximize benefits of IV workflow management systems by addressing workarounds and errors. Published September 7, 2017. Accessed May 1, 2023. https://www.ismp.org/resources/maximize-benefits-iv-workflow-management-systems-addressing-workarounds-and-errors

20. Deng Y, Lin AC, Hingl J, et al. Risk factors for i.v. compounding errors when using an automated

workflow management system. Am J Health Syst Pharm. 2016;73(12):887-893.