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CLINICAL APPLICATION AND RISK MANAGEMENT OF INFUSION PUMPS

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Abstract: As one of the commonly used clinical medical instruments, the infusion pump provides convenience for clinical treatment. At the same time, there are also many risk factors that endanger the patient's condition. Therefore, this study takes infusion pumps as the object, analyzes the clinical application and risk management research progress of infusion pumps, and provides basis and reference for clinical treatment.
Keywords: Infusion pump; Application risk; Management strategies; Medical equipment quality control; Medical safety consumables matching

1. CLINICAL APPLICATIONS AND RISKS OF INFUSION PUMPS

Infusion pump is an important medical equipment for accurate clinical delivery of medicinal liquids. Have higher Efficiency and flexibility in clinical drug delivery operations. However, due to changes in the use environment of the infusion pump, Chemicalization, human factors and equipment failure may cause problems for patients. Certain risks and hazards, Quality and safety are also related to patient safety [1]. Therefore, this The study focused on infusion pumps. Clinical application and risk management research of infusion pumps The progress is summarized below.

1.1 Clinical Applications of Infusion Pumps

Infusion pumps are a common machine used for infusion treatment in major hospital wards today. mechanical or electronic control device. It acts on the infusion catheter, Caregivers can use it To accurately and effectively control the infusion volume and infusion speed. When a patient undergoes infusion therapy When a potentially dangerous event occurs, The sensor detects unusual changes through the micrometer Computer processing sends out alarm signals, Make noises to attract the attention of caregivers around you Pay attention and provide reasonable treatment in time or deal with problems with the infusion pump in a timely manner. That middle, A door-opening alarm can alert caregivers of missed operations; a clogging alarm indicates a needle Or the conduit is damaged or the regulator is not turned on. Low voltage alarm can It indicates that the instrument is low on power and needs to be recharged. Alerts caregivers; air alarms can To reflect the presence of air bubbles in the catheter, Or inside the solution bottle or infusion bag There is no liquid medicine, and even trace bubbles can cause an alarm, which requires nursing staff to pay special attention and check carefully. Regularly confirm that there are no air bubbles in the entire catheter of the infusion pump .
In clinical practice, some patients need to strictly control the amount of fluid input, such as the treatment and rescue of critically ill patients and patients with cardiovascular disease. Use an infusion pump to distribute the medicinal solution evenly, Accurately and continuously inject into the patient's body, often used for injecting vasopressor drugs and anti-arrhythmic drugs. Abnormal drugs, etc. when using it, The infusion speed can be set according to the specific conditions of the patient. The total amount of infusion, In order to achieve the purpose of adjusting the dripping speed, controlling the dosage, and treating diseases [2] .

1.2 Infusion Pump Risks

a. Nursing staff have poor luck due to lack of knowledge about using infusion pumps Use to cause risks.
b. Some pediatric patients adjust the data at will out of curiosity, resulting in infusion planning fail.
c. The infusion pump uses a linear peristaltic pump as the power source.
d. When extravasation of the drug solution occurs, the machine operates normally. However, some patients are asleep or unconscious, etc. It is not easy to detect the spreading leakage of medicinal solution at the acupuncture site.
e. The infusion pump and pump tube do not match each other, causing the relative flow rate error to reach more than 5%. Not even under control.
f. Infusion pump liquid input unit is in mL /h setting, but liquid within an hour It is not injected at a uniform speed, It is necessary to pay attention and control in real time during the infusion process to maintain a speed to deal with drugs that require strict control of drip speed [3,4].

2. RISK MANAGEMENT COUNTERMEASURES FOR INFUSION PUMPS

2.1 Strengthen Operational Training and Assessment and Improve Safety Awareness

According to the application risks that may occur during the clinical use of the infusion pump, care Managers should improve the technical level, awareness, alarm handling and risks of infusion pumps consciousness. We should focus on strengthening and organizing the clinical application and operation training of infusion pumps for nurses. Content includes clinical application risks of infusion pumps, correct operating procedures, and Differences between Infusion Pumps and Syringe Pumps [5,6]. This training program has been included for new recruits In nurse training programs, Strictly follow the "Intravenous Infusion Pump Application Standard Procedures and Flows" "Process" for assessment [7] .

2.2 The Infusion pipeline and the Infusion Pump are Well Matched

Abnormal clinical delivery flow rate of infusion pump, The main reason is the use of infusion pump consumables irregular, The infusion pump should be strictly selected to clearly match the marked infusion set model or use Use special pump tubing. Based on patient cost considerations, It is really necessary to choose economical gravity When replacing the infusion set, Before use, relevant units in the hospital should be notified to prepare normal gravity Infusion set matching test, The replacement infusion set can be used only after it meets all the indicators. patients [8,9] .

2.3 Standard Use of Infusion Pumps

2.3.1 Standard storage

The backup equipment should be installed in a dry, ventilated and dark room. What to avoid when tidying up Violent vibrations, gentle movements, normal functioning and faulty equipment awaiting repair, Corresponding signs should be hung on each side. Place them differently, Preventing faulty equipment from being taken by mistake during emergency rescue operations also facilitates unified maintenance by the hospital equipment department.

2.3.2 Standardized maintenance

Carry out cleaning and disinfection work on time every week, Comb the power cord well to prevent damage from over-folding. Ensure that the equipment is accessible at any time and draw a table to record after each cleaning. Defective equipment accessories will be promptly replaced, and each equipment will be shut down to charge the battery every month. 12h, then perform operation and discharge, check and record the discharge time, Devices that do not meet clinical requirements (<0.5h) need to be marked for individual placement. Register and remind the head nurse to replace the battery in advance.

2.3.3 Standardized use management

a. For new nursing staff who are not familiar with the equipment, they should be provided by experienced Nursing staff conduct unified training and assessment on equipment in accordance with operating procedures. Until I can be alone Stop using the equipment immediately.
b. Conduct nursing assessments from time to time based on possible situations and emergency response, Including electricity, equipment, patients and usage safety.
c. In order to ensure the accuracy of infusion, the equipment is run every 1d Trim.
d. ursing staff actively cooperate with equipment maintenance personnel to regularly inspect whether the infusion pump is operating well, promptly report any problems during operation, and provide immediate treatment. To reduce hidden dangers, the infusion accuracy should be corrected every quarter.

2.4 Precautions for Selecting Intravenous Channels for Infusion pump Administration

Infusion pump administration should use an intravenous indwelling needle as a dedicated channel. be alone Use an intravenous channel and do not mix it with ordinary infusion. The venipuncture channel should be selected where the blood vessels are thick and straight, easy to fix and easy to observe [10]. For severe patients If patients really need to share the same intravenous infusion of special drugs, Caregivers with experience in this field should be selected, and a three-way tube or heparin cap should be used for infusion as required. For drug incompatibility, input according to time period or pipeline, avoid injecting at the same time, No more than three medicinal solutions can be injected into the same vein at the same time. Antibiotics should be used alone Used exclusively [11,12] .

2.5 Conduct Regular Inspections to Avoid Accidental Lack of Monitoring by Family Members

The infusion pump administration process requires regular inspections by nursing staff and automatic infusion pump monitoring measures such as personal alarm function and accompanying family members' assistance and care [13,14]. intensive care unit Each nurse in the nursing ward can treat 2 to 3 beds for infusion monitoring, instrument If an alarm occurs, it can be dealt with immediately. The monitoring of the infusion process in general wards is mainly performed by Completed by the patient's family, the place where the infusion pump is used is located in the ward. Even if the instrument occurs The alarm will also be called because you are far away from the nursing unit. Unable to handle in

time. The patient's family also It is impossible to know in time that there are no alarm accidents during the infusion process. When a patient is undergoing clinical medication with an infusion pump, nursing staff should have a strong sense of responsibility and strengthen Conduct regular inspections of general wards to observe whether the infusion pump is running well and whether the medicine solution Whether the intravenous drip is smooth, whether there are bubbles in the pipe, whether the injection site is normal, whether the needle Whether the head position is correct, whether the pump speed is consistent with the doctor's prescribed speed, etc., try to avoid safety occurrence of all hidden dangers.

2.6 Logistics Support for Clinical Engineers

Logistics support work is a routine job for clinical engineers. As an engineer you should Regularly go to the clinic to check the usage environment, preventive maintenance and quality inspection of the infusion pump. Conduct inspections. Nursing staff encounter various technical issues related to infusion pump administration hour, Clinical engineers should promptly provide technical support and guidance [15], which can be Effectively reduce the clinical risks of infusion pump use.

3. SUMMARY

The infusion pump should be used in strict accordance with the operating sequence and method to effectively control Risks of clinical application of infusion pumps, strict control of every step, risk management of infusion pump application Management is a project involving clinical nursing department, pharmacy department, equipment department and other related departments. It is a systematic project that cannot be completed by a single department. Nursing staff should improve Your own professional level and proficiency in using the infusion pump. Once you hear the infusion pump alarm sound, confirm the alarm immediately, determine the cause of the alarm and eliminate the fault [16]. Only no Continuously optimize the overall infusion pump drug delivery system and improve the drug delivery system in strict accordance with relevant standards every aspect of the system, From instrument selection to instrument consumables, liquid medicine categories and characteristics, etc. Only by checking at all levels can the clinical application risks of the infusion pump be minimized.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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