Alaris infusion pump user manual

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An infusion pump is a medical device that delivers fluids, such as nutrients and medications, into a patient’s body in controlled amounts. Infusion pumps are in widespread use in clinical settings such as hospitals, nursing homes, and in the home. In general, an infusion pump is operated by a trained user, who programs the rate and duration of fluid delivery through a built-in software interface. Infusion pumps offer significant advantages over manual administration of fluids, including the ability to deliver fluids in very small volumes, and the ability to deliver fluids at precisely programmed rates or automated intervals. They can deliver nutrients or medications, such as insulin or other hormones, antibiotics, chemotherapy drugs, and pain relievers. There are many types of infusion pumps, including large volume, patient-controlled analgesia (PCA), elastomeric, syringe, enteral, and insulin pumps,. Some are designed mainly for stationary use at a patient’s bedside. Others, called ambulatory infusion pumps, are designed to be portable or wearable. Because infusion pumps are frequently used to administer critical fluids, including high-risk medications, pump failures can have significant implications for patient safety. Many infusion pumps are equipped with safety features, such as alarms or other operator alerts that are intended to activate in the event of a problem. For example, some pumps are designed to alert users when air or another blockage is detected in the tubing that delivers fluid to the patient. Some newer infusion pumps, often called smart pumps, are designed to alert the user when there is a risk of an adverse drug interaction, or when the user sets the pump’s parameters outside of specified safety limits. Over the past several years, significant safety issues related to infusion pumps have come to FDA’s attention. These issues can compromise the safe use of external infusion pumps and lead to over- or under-infusion, missed treatments, or delayed therapy. From 2005 through 2009, FDA received approximately 56,000 reports of adverse events associated with the use of infusion pumps, including numerous injuries and deaths. During this time period, manufacturers conducted 87 infusion pump recalls to address identified safety concerns. Seventy of these recalls were designated as Class II, a category that applies when the use of the recalled device may cause temporary or medically reversible adverse health consequences, or when the probability of serious adverse health consequences is remote. Fourteen recalls were Class I – situations in which there is a reasonable probability that use of the recalled device will cause serious adverse health consequences or death. These adverse event reports and device recalls have not been isolated to a specific manufacturer, type of infusion pump, or use environment; rather, they have occurred across the board. Although some adverse events may be the result of user error, many of the reported events are related to deficiencies in device design and engineering, which can either create problems themselves or contribute to user error. The most common types of reported problems have been associated with software defects, user interface issues, and mechanical or electrical failures and are explained on the Examples of Reported Infusion Pump Problems page. In 2010 the FDA announced three steps it would take to improve infusion pump safety. These steps were to (1) increase user awareness, (2) proactively facilitate device improvements, and (3) publish new guidance for industry. For more information on FDA’s progress in completing these steps see the Infusion Pump Improvement Initiative page. On this website, you can learn more about infusion pump problems, actions FDA is taking to improve pump safety, strategies to reduce pump-related risks, and how to report problems to FDA. Additional Resources Discontinued fentanyl infusion left attached to patient contributes to his death, but risk-reduction strategies can prevent similar mistakes.A patient, who had been hospitalized after suffering a stroke, died following an inadvertent infusion of fentanyl.Although the patient’s condition at first had improved, he later developed difficulty swallowing. After aspirating food and suffering acute respiratory arrest, the patient was placed on a ventilator, during which he was sedated via an intravenous (IV) fentanyl infusion (10 g/mL) connected to 1 of multiple channels on a smart infusion pump. Over the next several days, the patient received fentanyl, ranging from 25 to 100 g per hour, with the dose titrated daily as needed for sedation. Several days later, the patient’s physician discontinued the fentanyl infusion in the morning, hoping to extubate the patient that afternoon. The pump channel infusing the fentanyl was turned off, but the infusion container was left in place and remained connected to the patient’s IV line.Later that day, the smart infusion pump alarm went off, alerting practitioners that a bag of Lactated Ringer’s, which was infusing via a different pump channel, was near completion. A nurse filling in for the patient’s primary nurse responded to the pump alarm, turned off the corresponding pump channel, retrieved a new Lactated Ringer’s infusion, attached it to the correct pump channel, and programmed the infusion correctly. However, she accidentally restarted the fentanyl infusion instead of the Lactated Ringer’s solution. Although the pump alarm went off, the nurse silenced it, thinking that it had happened accidentally. An evening nurse caring for the patient also did not notice that fentanyl, not Lactated Ringer’s, was infusing. The rate of the fentanyl infusion was not disclosed.Several hours later, the patient’s blood pressure had dropped significantly, and the error was recognized. Although the fentanyl infusion was then quickly discontinued, the prolonged hypotension caused by the fentanyl infusion caused serious brain and organ anoxia and ultimately resulted in the patient being removed from life support several days later.SAFE PRACTICE RECOMMENDATIONSAlthough the Institute for Safe Medication Practices (ISMP) has no additional details other than what could be gathered through the news media, there are several risk-reduction strategies that might have pre- vented this error.Change-of-shift verification. Require oncoming nurses to verify all their assigned patients’ infusions, tracing the lines and inspecting the pump settings and infusion labels, and then matching each with orders. The oncoming nurse and the nurse finishing her shift should perform this verification process together.Disconnect and discard all discontinued or held infusion bags/ syringes. Discontinued or held infusions should be immediately removed from the pump, disconnected from the patient, and discard- ed. A discontinued infusion should not be left set up via a stopped infusion pump that either remains connected to the patient and/or hanging on the patient’s IV pole at bedside. Also, the tubing should be changed to ensure no residual medication is left that could be inadvertently administered as a bolus when the tubing is used to administer other fluids and medications.Implement interoperability. Implement bidirectional (ie, autodocumentation and autoprogramming) smart infusion pump interoperability with the electronic health record to reduce the risk of pump programming errors.Label the tubing and pump channel. Labels with the name of the drug being infused and route of administration should be affixed to each access line (eg, epidural and IV) at the distal end of the tubing closest to the patient and on the tubing above the channel or pump. If available as a pump feature, ensure the name of the infusion is clearly visible on the pump screen.Manage operational alarms. For a variety of reasons such as alert fatigue or poor warning design, operational alarms may be overlooked or quickly overridden. To maximize efficiency and response to operational alarms, establish thresh- olds for duration and frequency, identify the top alarms by type and care area/profile, and deter- mine whether they are critical alerts. Remove non- critical alerts as needed to decrease alert fatigue.Trace the tubing. When parenteral infusions are changed (new bag or syringe), reconnected, or started or the rate is adjusted, the tubing should be traced by hand from the solution container to the pump and then to the patient for verification of the proper channel/pump and route of administration.Michael J. Gaunt, PharmD, is a medication safety analyst and the editor of ISMP Medication Safety Alert! Community/Ambulatory Care newsletter at the Institute for Safe Medication Practices in Horsham, Pennsylvania.REFERENCEEvans T. Drug error at Eskenazi Hospital killed prominent cancer researcher. Here's how it happened. Indianapolis Star. Updated October 31, 2020. Accessed September 8, 2021. www.indystar.com/story/news/investigations/2020/10/30/drug-error-cancer-researcher-eskenazi-hospital-killed/5979448002/Download Issue: November 2021