

Smart Pump Miscommunication with Electronic Health Records

Smart pumps can now be programmed to communicate with electronic health records (EHRs) allowing information to be shared between the two systems. Known as bidirectional interoperability, orders entered into the computerized provider order entry system (CPOE) may be wirelessly transmitted to populate settings on the smart infusion pump, and then infusion data is wirelessly sent back to the EHR. For example, an infusion order is entered into the CPOE which is sent to the pharmacy for verification and then to the smart pump with a barcode medication administration system, so the pump can be pre-programmed, thus eliminating the need for manual input. To start the infusion, the nurse must scan the barcodes on the patient's identification band, the drug/infusion, and the pump. Infusion parameters are then wirelessly transmitted from the EHR to the pump for the nurse to verify and accept. Programming information is also transmitted back to the EHR, validated by a nurse, and recorded electronically.

This system may help reduce errors in pump programming. However, there was one report in which a barcode was associated with two different pumps, being used on two different patients. The hospital's information technology (IT) department accidentally labeled both pumps with the same barcode. While the patients were each receiving the correct infusions, the wrong data was being transmitted back to the EHR. This mismatch problem may also occur if pumps are sent out for repair and are returned with a different barcode than listed on the outside encasement. To link correctly, the barcode on the serial number label on the back of the pump, the IT-applied barcode on the front, and the internal serial number must all match.

If your institution has, or is planning to, implement bidirectional smart infusion pumps, a protocol should be established to include a double check when any serial number is affixed to a pump, especially during initial implementation and during pump repairs.

Drug Library Issues in Programming Smart Pumps

Smart pumps are designed with features such as drug libraries and calculators that provide safe-guards and system checks to help reduce programming errors, however, mistakes may still occur. For example, the "Guardrails Drug" software allows an institution to create customized profiles in which comprehensive lists of drugs and infusions can be created. In one instance, a nurse who was administering PRECEDEX (dexmedetomidine), selected "Guardrail Drugs", then instead of selecting the drug from the drug library, she selected the "DRUG CALC" (drug calculation) function, which requires additional programming steps, including entry of the "TIME UNITS" in either minutes, hours, or days. The DRUG CALC function is only available after selecting "Guardrail Drugs" on the pump menu. Since there is no indication on the pump screen that the nurse was operating in a non-Guardrail mode, she may have thought she was programming the pump using the drug library and dose error-reduction software (DERS). She then accidentally selected "Min" for minute instead of hour, and the pump did not issue a dose warning. The pump delivered 0.15 mcg/kg/minute (148 mL/hour) instead of the correct dose of 0.15 mcg/kg/hour and rate of infusion of 2.5 mL/hour for several hours. Fortunately, the patient was not harmed.

References

1. Institute for Safe Medication Practices. (2018). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR201801.pdf>

One strategy to prevent this type of mistake is to limit the use of custom concentrations and the “DRUG CALC” programming function (or other functions that require manual entry of information) to avoid the risk of entering the wrong “TIME UNITS”, drug amount and/or diluent volume. The safety features of DERS are not activated when using “DRUG CALC” (or similar manual entry) function, although this may be helpful when infusing drugs that are not in the library. Educate all staff on proper programming and utilization of the drug library with DERS for all drugs and solutions that have been programmed into the library. Conduct annual competency checks to ensure staff understanding.

When possible, implement a double check of the patient, drug, dose/concentration, line attachment, and pump programming for infusions of high-alert medications that require manual entry of custom concentrations. Monitor compliance with the drug library and the use of custom concentrations or the “DRUG CALC” function.

References

1. Institute for Safe Medication Practices. (2018). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR201801.pdf>