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Improve Infection Control: Closed vs. Open Systems

Situation

Many nosocomial infections occur when medication/fluids are administered via an intravascular device.¹ A common example of infections caused by exposure to air and contamination via intravenous (IV) systems are bloodstream infections (BSIs). BSIs have a significant influence on patient outcomes because these infections can either be the patient's primary cause of death, or exacerbate the patient's primary condition, which could lead to death. A surveillance study by the International Nosocomial Infection Control Consortium (INICC), conducted in intensive care units (ICUs) in Latin America, Asia, Africa, and Europe, demonstrated that the mortality rate of patients with BSIs was 29.6 percent.²

Most bloodstream infections and their associated risks can be prevented. The use of innovative medical products can play an effective role in BSI prevention. For example, closed intravenous systems have a proven record of reducing BSIs, thereby potentially improving patient safety and reducing costs of associated longer hospital stays and treatment. In a closed IV system, the fluid is not exposed to the outside air, which significantly reduces the risk of contamination and infections. Studies have shown that BSI rates were reduced when changing from an open to a closed system. In Mexico, the BSI rate was reduced by more than 80 percent,³ in Argentina by 64 percent,⁴ in Italy by 61 percent⁵ and in Brazil by 55 percent.⁶ The results of a clinical study conducted in Argentina demonstrate that the mortality rate associated with BSIs can be reduced by 91 percent if patients receive fluids via a closed IV system.⁷

The reduction of BSI rates lowers costs by shortening ICU length of stay and reducing the use of antibiotics and other medications required to treat BSIs. Studies conducted in Mexico and Brazil have shown that reducing BSI rates may lead to significant cost savings.^{8,9} Recognition of closed system safety innovation

through higher reimbursement would also encourage the use of newer closed system devices over existing older open system devices that sacrifice safety for a lower unit cost.

Current Policy

In Japan, the medical fees set for many types of cases do not assume use of closed systems; indeed, there is no distinction between open and closed systems in medical fee reimbursement schedules. As a result, medical institutions must bear the additional associated costs of purchasing and using advanced closed system medical devices. The pricing rules for Special Treatment Materials also lack incentives for using closed systems: the distinction between open and closed systems is not established in existing reimbursement categories. This results in the pricing of closed system devices that are designed for enhanced safety and infection control being set at the same level as the older, less innovative, and less safe open systems.

Recommendations

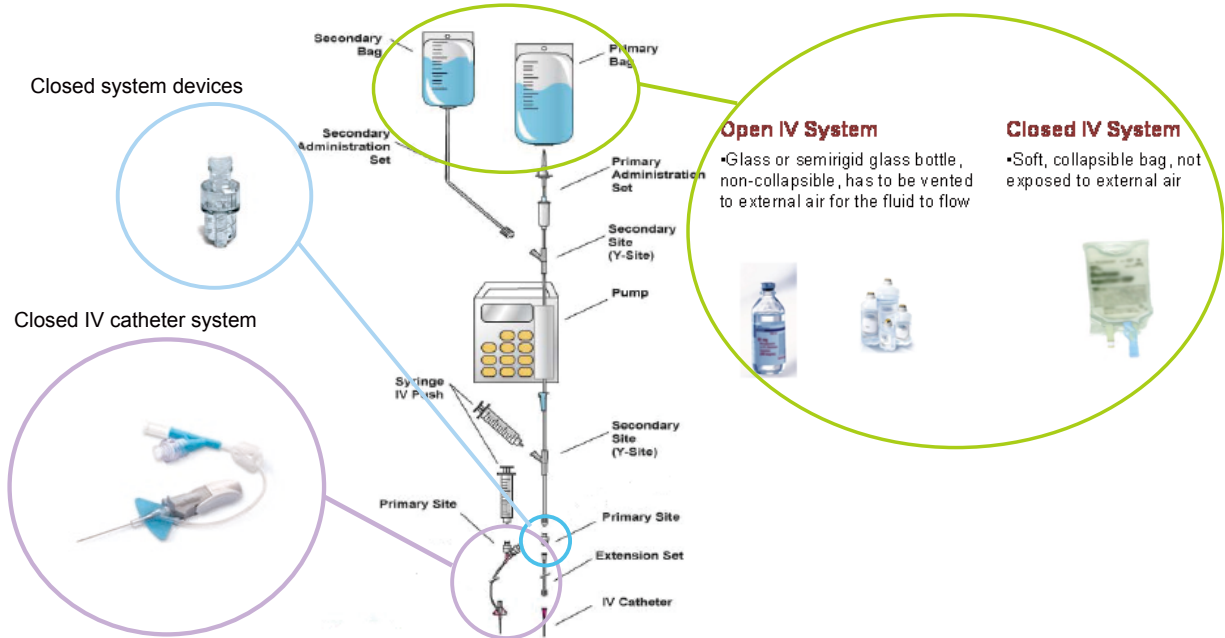
- Encourage hospitals to make the use of innovative medical products, such as closed intravenous systems, an integral part of hospital infection control policy.
- Revise medical fees to reflect the cost and use of closed system medical devices in both inpatient and outpatient settings.
- To further enhance safety and the practice of infection control, establish a clear distinction between open and closed systems through the creation of new functional categories.

References

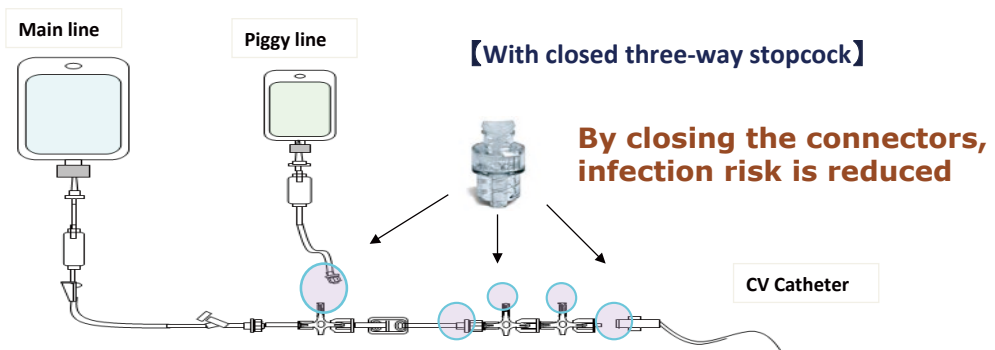
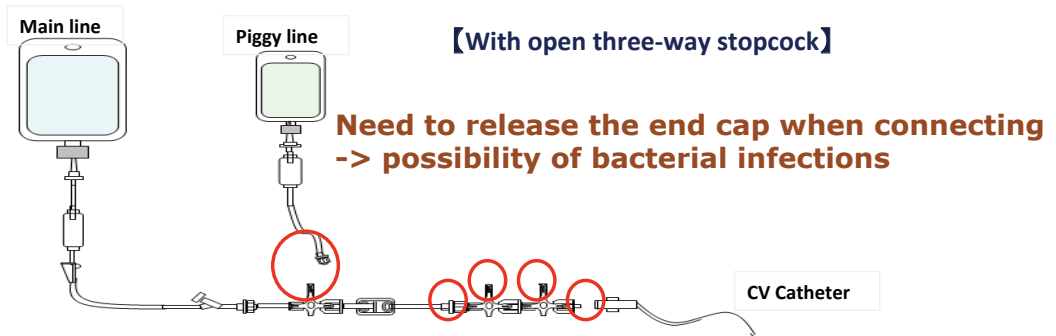
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35. Closed System in Infusion Line

Use of all in one system with IV catheter, extension tube, and fixed plate and closed IV system enable reduction of blood stream infections.



35. Development of Closed Cap



35. History of Infusion System Devices

