Tyvek®: A Key Component of the New Abbott Drug Delivery System

Abbott Laboratories' Hospital Products Division, a world leader of in-hospital products, recently introduced a new drug delivery system that provides an alternative to saline and heparin IV flushes. Called the Abbott Energizer, this pocket-sized, ambulatory device provides a steady flow of saline over a 48-hour period. In contrast, traditional IV systems must be flushed after use to ensure that the entire drug dose is administered and to prevent blood clots from blocking catheters.

Each year, U.S. hospitals perform more than 48 million IV regimens that require flushing. In an effort to save money, some hospitals are performing saline flushes from a central IV bag -- a practice that can contaminate the bag and expose patients to potential infection. By delivering a steady trickle of IV fluid, the new Abbott Energizer eliminates the need for catheter flushes and the potential for cross contamination. A key component of this system is the gas generation pouch, which contains the reactants used to pressurize, or energize, the delivery of the drug. "To make this pouch, we looked for a material that is permeable to gas, but impermeable to powder and liquid under a predetermined pressure," explained Nick Drivas, Research and Development Engineer. "It also had to be flexible enough to be formed into the pouch shape, but strong enough to prevent the penetration of small glass shards." He added that strong sealing characteristics were another important consideration. Because Abbott Laboratories had successfully used medical-grade Tyvek® in a variety of packaging applications, it was one of the first candidates to be considered for the gas generation pouch. Other materials were evaluated; however, none met the demanding requirements of this unique application. None, that is, except DuPont Tyvek® spunbonded olefin.

"We've been using Tyvek® in packaging for years and know that it features outstanding performance properties," said Drivas. "But this was the first time we tested it as an actual product component. As we expected, dot-coated Tyvek® 1073B from Oliver Products gave us the mix of properties we were looking for, including the proper gas transmission rates and necessary sealing strengths, without impacting the porosity."

The Abbott Energizer offers hospitals several advantages over conventional methods of maintaining vein patency. For example, the system saves both time and money, costing only $10 per 48-hour cycle, compared with $16 to $41 for the same time period with traditional flush systems. And, it can be accessed with a blunt cannula or a male lure -- safer alternatives to the sharp needles hospital personnel must use with conventional systems. Overall, reactions from hospitals testing the Abbott Energizer have been favorable. "There's nothing like it on the market," said Cliff Crabtree, Assistant Pharmacy Director at Erlanger Medical Center in Chattanooga, Tennessee. He added that not only does the system appear to be a better choice economically, but the patency of the catheter has been "a lot greater."

"At Abbott, we are always looking for ways to introduce innovative new products to our customers," noted Regina Lemke, Manager, Public Affairs. "Whether it's an electronic drug infusion system, anesthesia device, or drug delivery system, our research and development team is dedicated to designing the best new products, and then specifying high-performance materials and components to turn their concepts into reality. "The Abbott Energizer is a perfect example of this," Lemke continued. "Responding to a need in the marketplace, our R&D team designed a unique drug delivery system and specified Tyvek® for the gas generation pouch because it was the only material that could meet the demanding requirements of this application. With Tyvek®, we know we're getting the best performance possible."