

# Managing Diabetes Without Jabbing Anyone Else!



By Ron Stoker

**B**rooke recently received news that would change her life forever. She was a young woman, barely 17, when she was diagnosed with diabetes. Her blood sugar was 986 mg/dl. (Blood sugar is measured by determining the number of milligrams of glucose in a deciliter of blood (mg/dL). The amount of sugar in your blood naturally fluctuates within a narrow range. The normal range for blood sugar is between 70 and 100 mg/dL—the level most people have after fasting overnight. That’s about equal to one teaspoon of sugar in a gallon of water. Brooke’s

blood sugar level was eight times the normal amount of a normal individual.

However, when the doctor informed her that she had diabetes it wasn’t a big surprise. She probably should have figured out that there was something wrong since she had had most of the symptoms for for diabetes for months. These symptoms included frequent urination, unquenchable thirst, fatigue, depression and blurry vision. The hospital informed her parents that if they had not taken her in the night when they did, she would not have lived to the next morning.

Brooke began a new way of life with diabetes; her blood glucose levels were monitored being taken many times a day and taking insulin was injected by syringe—two to three times a day with needles into the skin on her day in the arms, legs, or abdomen. With the threat of blindness and loss of limbs, Brooke was convinced to keep control of her disease.

Brooke is not alone with her new diagnosis. It has been estimated that 41 million Americans have pre-diabetes with blood sugar high enough to risk full-blown diabetes.<sup>1</sup> “These latest numbers show how urgent the problem really is,” said Health and Human Services Secretary Tommy Thompson. “We need to help Americans take steps to prevent diabetes or we will risk being overwhelmed by the health and economic consequences of an ever-growing diabetes epidemic.”<sup>1</sup>

More than 18 million Americans have full-blown diabetes. The disease takes 180,000 lives in the United States each year. The World Health Organization has estimated that the numbers of people with diabetes worldwide will more than double, from 140 million to 300 million, before 2025.<sup>2</sup> For those unfortunate enough to live with the disease, there is the risk of blindness, kidney failure, amputations and heart disease.

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Although some individuals are born with diabetes, the majority of individuals with Type 2 diabetes acquire it. Type 2 diabetes is an illness that develops typically in middle age, when many lose the ability to turn blood sugar into energy. Obesity is often associated with diabetes. Historically, Type 2 diabetes was a disease that people got when they were 40 years of age, primarily because they were overweight. Now it is not uncommon for children as young as 10 years old to be diagnosed with it. Overweight children are at a very high risk for diabetes.

Now, with the diagnosis of diabetes, Brooke is having to take blood glucose samples frequently as well as give herself injections of insulin. She is also learning that she cannot just throw her used lancets and insulin needles away. Each year there are more than 2 billion needles and syringes that are used outside of healthcare settings.<sup>3</sup> These needles and syringes are used by

diabetics, hemophiliacs, infertility patients, allergy sufferers and others. This population of self-injecting individuals continues to grow each year. In the past many of these needles and lancets have been improperly disposed of and have ended up in the municipal trash or recycling centers. This poses serious health risks to children, workers, and the general public.

California State Senator Liz Figueroa (D-Fremont) recently introduced legislation aimed at reducing the public’s risk of being punctured by discarded needles and syringes and other common sharps like lancets.<sup>4</sup> According to Senator Figueroa, “California has the nation’s most comprehensive hazardous and medical waste laws which apply to large commercial activities, not to individual households. We need to go one step further and provide an adequate framework to safely collect and destroy the millions of needles generated by self-injecting individuals.”

The proposed bill will expand the scope of household hazardous waste programs and will give cities and counties the ability to include a sharps collection program in their household hazardous waste plans, which local governments are currently not allowed to collect. The situation would be improved if the self-injecting public would put their used contaminated sharps in a container such as a bleach bottle. However, these bleach bottles can burst open when they are compressed in a garbage truck. The use of recycling also has created a problem because truck contents are routinely dumped onto a conveyer line where workers are instructed to pick out the recyclable products. Many needlesticks occur in these recycling plants.

The Environmental Protection Agency (EPA) has introduced new at-home sharps disposal options based on the recommendations of the Coalition for Safe Community Needle Disposal. It has added to its current recommendations additional new options for disposal of medical sharps outside the healthcare setting.

An estimated 9 million people in the United States use more than 3 billion needles, syringes and lancets each year to manage medical conditions at home. The majority of these needles are being disposed of in household trash.<sup>5</sup> This creates a scary situation for waste management workers who have a 3% risk of being stuck each year.<sup>6</sup> What happens when a hypodermic needle gets tossed into a household wastebasket? More often than people think, it ends up sticking the sanitation worker who picks up the trash.

But it is not only sanitation management workers that are at risk. Improperly discarded needles and other sharps put a variety of other individuals at risk including policemen and firemen, ambulance personnel, janitorial and custodial workers, laundry and dry-cleaning facilities, hotels, park and recreation employees. In the United States, more than 500,000 needlestick injuries related to residential needle disposal are reported every

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year.<sup>7</sup> Many individuals are at risk because of the current lack of a sharps disposal program. Individuals like refuse pick-up route drivers, landfill workers, recycling center workers, employees of hotels, health clubs, parks and recreation departments, transportation departments, janitorial workers, police departments, restaurants and laundry facilities are often confronted with discarded needles in the workplace.

### Safety Products

Many of the problems listed above can be avoided by the use of safety medical devices. The remainder of this article will discuss safety products that diabetes patients like Brooke should consider using while monitoring and treating diabetes.

### Blood Glucose Testing

Diabetes cannot be cured. It can, however, be controlled by keeping the level of sugar in the blood within its normal range. Blood sugar testing is important in order to find out if your blood sugar level is where it should be. If your blood sugar is too low or too high, you may need a change in your diabetes medication, diet, or exercise plan. Your blood sugar level is determined by testing a small drop of blood obtained by sticking your finger with a lancet. Blood sugar is usually tested one-to-four times per day.

### Lancing Devices

Blood for glucose testing is accomplished by piercing the skin with a device that is deep enough to cause blood to seep to the surface of the skin. The blood is then placed onto a test strip that is inserted into a blood glucose meter.

There are several types of lancing products. Most individuals use an automatic lancing device that does the “sticking” instead of forcing the diabetic to “stab” themselves with a lancet. Most of the lancing devices consist of a cylinder with a spring-loaded lancet. To obtain the blood sample, the device is pressed against the skin and is activated by pressing a button. There are lancing devices that are activated by pressing the device against the skin. Lancing devices with a variety of lengths allowing for different amounts of skin penetration are now available.

These standard lancing devices pose a risk for everyone who will come in contact with them from family members to waste management workers. Safety Lancet products are available that protect everyone from the contaminated needles. With a safety lancet the penetrating member “sticks” the patient and then retracts back into the casing where it cannot stick anyone inadvertently.

There are a number of safety lancets that are available. These include:

- ▶ **MONOLETTOR™ Safety Lancet:** provides continuous safety during blood collection, protecting clinicians from any possibility of accidental lancet sticks. Its unique design features a lever-activated retractable lancet that is permanently locked within its case immediately following skin puncture. Ideal for finger sticks and heel sticks requiring low blood volume, the MONOLETTOR Safety Lancet is quick and easy to use and ensures maximum patient comfort with a uniformly ground tri-bevel point. For more information, call 800-962-9888 or visit [www.kendallhq.com](http://www.kendallhq.com).
- ▶ **BD Genie™ Safety Lancet:** a safety-engineered, single-use capillary blood sampling device. These lancets offer a permanently retractable blade or needle feature that minimizes the possibility of injury or reuse. BD offers a full range of blade depth and needle gauges for sufficient blood volume in multiple sample requirements. For more information call 201-847-6800 or visit [http://www.bd.com/safety/products/b\\_collect/index.asp#b4](http://www.bd.com/safety/products/b_collect/index.asp#b4)
- ▶ **Surgilance One-Step Safety Lancet:** one of the most convenient and safe lancets available in the market for micro blood sampling. Its innovative design protects healthcare professionals from needlestick injury and the unique one-step activation mechanism makes it extremely simple to use. It is available with either a needle or blade, each with different depths of penetration, to provide optimal blood flow for different applications and skin types. There is no arming required. The One-Step safety needle or blade lancet is safely concealed before and after use. Once the lancet is used, it is rendered inoperative providing added safety for patient and clinician. For more information on this product call Surgilance at 888-808-6494 or visit <http://www.surgilance.com/>.

### Laser Skin Perforators

In addition to safety lancets there is also a sharps-free laser skin perforator. The Cell Robotics' Lasette laser lancing device is the only needle-free instrument available for collection of capillary blood samples by the fingerstick procedure. The Lasette uses a burst of infrared laser light to ablate a small wound in the patient's fingertip to establish capillary blood access. The process simply involves vaporization of water molecules in the skin and does not cauterize the delicate capillary vessels.

The procedure requires no physical penetration of the skin and completely eliminates the use of medical sharps for blood collection. A personal model can be used for home blood monitoring by both adults and children. Separate models are available for clinical applications. More information about this product can be obtained by contacting the manufacturer at 800-846-0590 or by visiting <http://www.cellrobotics.com/>.

### Injecting Insulin

After determining the blood glucose level diabetics will often need to inject some insulin to accommodate for the glucose level. After cleaning the injection site with an alcohol swab in a circular motion, let the skin air dry to minimize any stinging. Gently pinch up the area of skin that you cleaned with the alcohol swab between your thumb and fingers. Position the needle at 90 degree angle with the skin. Inject the needle into the layer of fat just below the skin. Slowly inject the insulin into the body. Release the skin after the injection. Patients typically count to five before withdrawing the needle to prevent insulin leakage. Activate the safety mechanism on your safety insulin syringe. Put an alcohol swab on the skin. Make sure to dispose of the syringe properly.

There are several types of products that can be used to inject insulin while preventing needlestick injuries. These include using needlefree jet injection systems and safety insulin syringes.

### Needlefree Injections of Insulin

- ▶ The Vitajet™ 3 from Bioject is an easy-to-use, economical needle-free injection system for delivering insulin. The system requires no maintenance or re-assembly. With disposable nozzles that are replaced once a week, the Vitajet™ 3 offers the quality of a reusable medical product, with the convenience and safety of a sterile disposable. The exclusive, easy-to-read Crystal Check™ disposable transparent nozzle allows you to inspect the dosage prior to injection, and visually confirm loading and full discharge of your insulin after each use.

### Safety Insulin Needles

- ▶ **MONOJECT Insulin Safety Syringe** has been a consistent favorite among clinicians since its release. Today, this group of syringes offers more size options than any other, ranging from 3/10cc to 12cc. Only the MONOJECT syringe has an exclusive transport position that eliminates the need for the needle to be recapped. Additionally, the shield will engage without splatter and can be safely locked with fluid still in the syringe barrel. For more information visit <http://www.kendallhq.com/catalog/prodlisting.asp> or call 800-962-9888.
- ▶ **BD SafetyGlide™ Syringe for Insulin**—Simply aspirate medication into syringe. Be aware that the safety arm

can be rotated for scale readability. The injection is administered following established techniques. Following the injection a single finger stroke activates the safety arm by moving it completely forward. For more information call 201-847-6800 or visit <http://www.bd.com/safety/>.

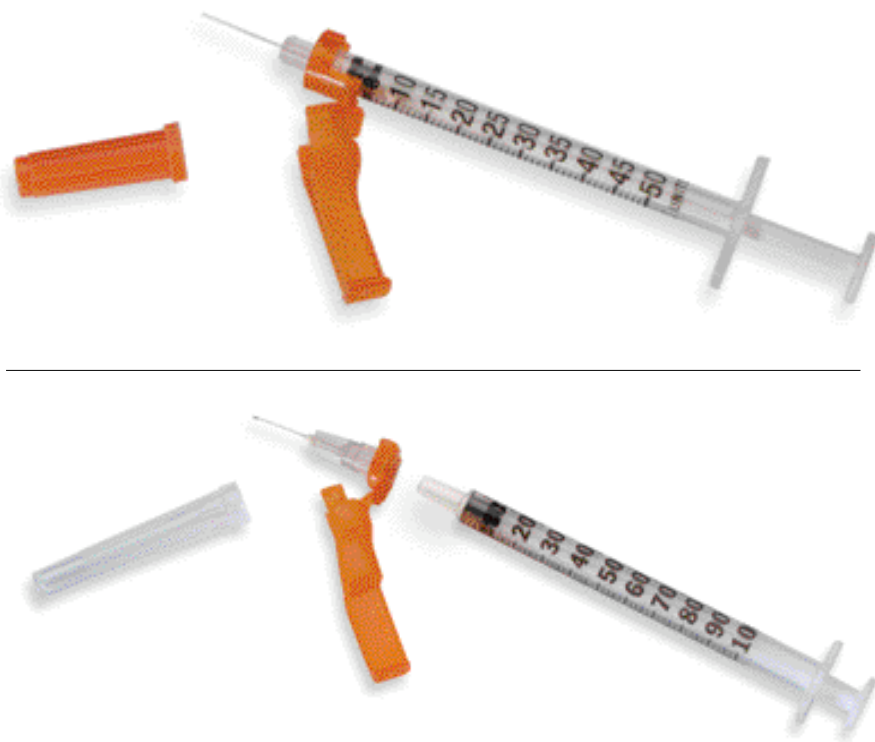
- ▶ **The Hypodermic Needle-Pro® Fixed Needle Insulin Syringe** for U-100 Insulin injections is available for 1, 0.5 and 0.3 mL syringes with 28- and 29-gauge fixed needles. Utilizing the familiar Needle-Pro® orange safety sheath integral to a fixed needle syringe, the sheath rotates for your convenience. The simple, single-handed activation of the safety feature is consistent with all Needle-Pro devices, activated against any flat surface, while keeping the clinician's hand behind the needle at all times. The easy activation of the safety sheath and visual and audible confirmation of activation allows clinicians to dispose of the entire device immediately following an injection. Smiths Medical ASD also has a removable needle safety syringe for Insulin injections—1 mL size, with 26 or 27g needles. The same Needle-Pro device is utilized, but the protected needle can be removed from the syringe to allow injection via a needleless port. For more information call Smiths Medical ASD Inc. at 800-258-5361 or visit [www.smiths-medical.com](http://www.smiths-medical.com).
- ▶ **VanishPoint® Syringe**, like a standard syringe, requires only one hand to operate. After injecting medication, continue depressing plunger to activate automatic needle retraction while the needle is still in the patient. Needle retraction occurs directly from the patient to the syringe barrel. Unlike a standard syringe, the VanishPoint® syringe is designed to discourage reuse. For more information call Retractable Technologies Inc. at 972-294-1010 or visit <http://www.vanishpoint.com>.
- ▶ **SurGuard™ Safety Insulin Syringes** from Terumo Medical are easy to use. Draw up medication and move the swivel safety sheath out of the way as needed. Make the injection as per established protocol. While holding the barrel in one hand, gently press the sheath against a hard surface until the needle is completely engaged in the sheath. After visually confirming that the needle is fully engaged in the safety sheath, dispose of in a sharps disposal container. Contact Terumo at 800-283-7866 or visit <http://www.terumomedical.com/safety>.
- ▶ **Safety Syringe**—After injecting the insulin push the plunger rod down until it the barrel is empty and the plunger is fully seated. Pull the needle from the patient. The release ring is then turned clockwise. The syringe plunger is then retracted until a slight pop is felt. Snap off the plunger handle and dispose of in a sharps container. For more information, contact Taiject Medical Device Co.Ltd at +886 3 595 9986 or visit <http://www.taiject.com>.

- ▶ **Careo Safety Syringe** can be used to inject insulin as per a normal syringe. The plunger should not be pushed past the 0.2 ml mark to avoid early hub engagement that may disable the syringe. Using your thumb push against the hexagonal barrel grip to allow the needle to retract into the barrel. Pull plunger to the end and snap it off. Reverse the needle cap and insert into the barrel opening to prevent leakage of remained liquid. Dispose of in a sharps container. For more information contact Life-Shield Products Inc. at +886 2 2299 6033 Ext. 1401 or visit <http://www.lifeshield-careo.com/>.
- ▶ **SecureGard® Safety Syringe** is used to draw up the insulin in the usual manner. Using a standard one-handed technique, depress the plunger until the insulin injection is given. The plunger should be fully depressed into the barrel. This captures the safety needle. An audible click is heard when it is engaged. The needle is retracted from the patient back into the barrel of the syringe. The plunger is withdrawn to the stop at the top of the barrel at which time the plunger is broken off. This captures the needle and ensures that the syringe cannot be reused. The syringe is disposed of in a sharps container. For more information contact SafeGard Medical at +44 0 800 389 7173 or visit <http://www.safegardmedical.com/contact.html>.
- ▶ **Inviro SNAP! Insulin Syringe** with its high quality 29-gauge needle has the “look and feel” of a standard insulin syringe. The technique of drawing up of insulin and injection is completely unchanged. When the user wishes to disable the syringe this is accomplished quickly and easily by a simple intuitive action. The plunger is rotated half a turn, freeing the needle to be retracted into the barrel as the plunger is pulled back as far as possible. The syringe design prevents the plunger and needle from being completely

removed. When fully back, the end of the plunger is then snapped off. The contaminated needle is trapped safely inside the barrel and cannot be accidentally re-exposed. No part of the syringe can be re-used. This ensures safe disposal protecting not only patients and caregivers but family and community members. This conforms to the safety guidelines advocated by the Coalition for Safe Home Disposal. For more information, visit <http://www.inviromedical.com> or call 604-681-9399.

## Needle Disposal

- ▶ **Tyco Healthcare, Kendall Sharps Safety Division**, has a variety of sharps disposal containers available for all parts of the hospital. SharpSafety™ products include Sharps-A-Gator™, ChemoSafety®, PharmaSafety™, AutoDrop®, SharpStar®, and GatorGuard®. The **Mail-away Program for Sharps Containers** features a leak-proof system and tracking document that complies with U.S Postal Service regulations. It comes in a variety of sizes designed to accommodate various sharps depending on your specific needs. Mounting brackets are available to secure containers wherever they are needed. When the container is full, the package is sealed and the required tracking information is documented. The package can then be taken to any U.S. Post Office. For more information visit the Tyco website at <http://www.kendallhq.com/catalog/prodlisting.asp> or call 800-962-9888.
- ▶ **Bemis Manufacturing Company's** sharps disposal containers are designed for safe use, effectively blocking hand access from discarded sharps. Units snap together, permanently locking with tight seams between the bases and covers. Walls are puncture-resistant, too, meeting



or exceeding ASTM standards. For more information call Bemis Manufacturing Company at 800-558-7651 or visit <http://www.bemismfg.com/catalog.cfm?dest=dir&linkon=section&linkid=17>.

- ▶ The Sharps containers from **Medi-Dose Inc.—EPS, Inc.** are for the safe disposal of IV needles, hypodermic and blood products. They are manufactured from durable,

autoclavable, puncture-resistant polypropylene. The phlebotomy containers work well for home use. Medi-Dose Inc.—EPS, Inc. has a wide variety of sizes and container openings allowing for disposal of lancets, butterfly tubing and small syringes. For more information call 407-876-5298 or visit <http://www.safegardmedical.com>. †

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