ndss
national diabetes services scheme

Diabetes Australia

Capillary Blood Lancing Devices in Healthcare Settings

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The National Diabetes Services Scheme (NDSS) is an initiative of the Australian Government administered by Diabetes Australia. If you require further information about this resource, please contact the Australian Diabetes Educators Association (ADEA) on 02 6287 4822. Please refer people with diabetes to the NDSS Infoline 1300 136 588 or NDSS website www.ndss.com.au for information, self-management support or products.

This NDSS information sheet was developed by ADEA in 2010 and has been revised in 2014 by the ADEA Clinical Practice Committee and ADEA members with funding from the National Diabetes Services Scheme (NDSS).

Purpose

The purpose of this document is to address technical and safety issues in regard to the use of capillary blood lancing devices by people with diabetes and health professionals in healthcare settings.

This document sets out the best practice use of capillary blood lancing devices to minimise the risk of cross-infection of blood borne pathogens to staff and people with diabetes during the sampling of capillary blood.

Recommendations

It is recommended that:

- Health care agencies actively involve Credentialled Diabetes Educators in the decision making process, around the review and choice of safe and effective lancing devices for people with diabetes within their care
- Health care professionals use standard precautions and only disposable single-use auto-disabling lancing devices
- Suitable training in relation to the appropriate use and disposal of the lancing device in compliance with established infection prevention and surveillance policy should be provided to all staff using devices. All lancing devices should be disposed of in appropriate sharps containers
- The capillary blood lancing procedure be clearly documented in the health care facility's infection prevention and surveillance policies
- When a person with diabetes in assisted care requires ongoing capillary blood sampling, and can do their own testing, a non-disposable lancing device, with reusable components, be allocated to each individual. The individual must be able to appropriately change and dispose of the used lancets themselves, otherwise testing should be performed by staff using a disposable single-use, auto-disabling lancing device
- Whilst it is recommended that disposable lancing devices are utilised, where non-disposable lancing devices are utilised, these should be stored in a safe manner
- Sharps disposal containers be easily accessible, out of reach of children but located within easy reach for the person with diabetes, at or below eye-level and located at the point of care
- Each organisation /provider ensures their specific infection control procedure adequately protects patients/residents and staff from blood-borne pathogens
- Regular diabetes education for the person with diabetes and inspection of non-disposable lancing devices, by a Credentialled Diabetes Educator, to ensure appropriateness of the lancing device being used.

Background

Lancing devices are used to obtain a small sample of capillary blood from areas of the body such as fingers, palms, forearm, earlobe or heels (in neonates only). Lancing devices are used in both primary and secondary care and are predominantly used for the monitoring of blood glucose levels.

Some health care facilities and providers purchase or obtain lancing devices without a risk analysis or input from a diabetes educator. Credentialled Diabetes Educators are suitably qualified to provide assessment, advice and recommendations for appropriate lancing devices for people with diabetes and health care facilities. By not taking consultation steps, a number of health care facilities and providers may be using capillary blood lancing devices that could be a potential cause of cross infection of blood-borne pathogens.

Needlestick and sharps injuries (NSIs) are one of the most common causes of physical, pathological and psychological hazards for many healthcare workers. In 2012, Emergency Care Research Institute (ECRI Institute) reported NSIs as one of the top 10 hazards for doctors, nurses and other healthcare workers and typically occurs during use of the device and before disposal. [1]

In 2009, The Medicines and Healthcare products Regulatory Agency (MHRA) (UK) reported episodes of continued transmission of hepatitis B linked to the use of the wrong type of lancing device to obtain capillary blood samples for analysis of blood glucose in people with diabetes [2] despite having issued four medical advice alerts in the previous 5 years. In 2010, the Food and Drug Administration (FDA) issued national communication with respect to using auto-disabling single-use fingerstick devices for assisted monitoring of blood glucose following the reporting of transmission of hepatitis B from the use of blood lancet devices in multiple patients and various settings.[3]

The National Health and Medical Research Council (NHMRC) released the Australian Guidelines for the Prevention and Control of Infection in Healthcare in 2010. The NHMRC guidelines, in particular the Handling and Disposing of Sharps (section B1.3) [4], should be read in conjunction with this document.

Safety

The use of sharp devices exposes healthcare workers to the risk of injury and potential exposure to blood borne infectious agents, including hepatitis B virus, hepatitis C virus and human immunodeficiency virus (HIV).[4] A further 20 other pathogens may also be transmitted and may occur not only with freshly contaminated needles and sharp objects, but may occur also with needles or sharp objects that carry dry blood. [1]A surprising number of NSIs occur after use, during the disposal process. Hepatitis B virus is stable in dried blood for at least seven days.[5] The prevalence of hepatitis C virus among people with diabetes has been reported to be higher than that in the general population. [6]

In settings where assisted monitoring of blood glucose is performed, single-use, auto-disabling fingerstick devices should be used.[7] This is applicable to care workers and healthcare professionals in multiple patient environments such as aged care and disability facilities, care in the home, GP surgeries, out-patient clinics, and prisons.

Patients who test their own blood should not share their lancing device with anyone else. Those caring for a person with diabetes and performing blood glucose testing are advised to always use a disposable, auto-disabling lancing device.[2-4]

Technical Considerations

Lancing devices vary in their ability to cut and penetrate tissue and can produce differences in blood volume and therefore puncture pain. A major consideration for users is that the lancing device produces sufficient blood with minimal pain and discomfort. Lancet penetration depth, speed, shape, surface, movement and skin fixation during lancing all influence lancing pain.[8]

Physiological variations in skin thickness and circulation require lancing devices to have an adjustable penetration depth. A lancet should pierce the skin to a depth that produces sufficient blood, noting that increased bleeding is more likely to be associated with increased pain.[9]

Sharps injuries where risks of potential exposure to blood borne infection agents most often occur are:

a. During the use of a sharp device on a patient (41%)
b. After use and before disposable of a sharp device (40%)
c. During or after appropriate or inappropriate disposal of sharp devices.[10]

An important safety feature available in some lancing devices is an auto-disabling mechanism that decreases the risk of needlestick injury by retracting and shielding the needle immediately after it is fired.

Operation of lancing devices can influence both effectiveness and safety. The disposable, single-use systems have the lowest number of operational steps. It is important that the appropriate training is provided for users. The introduction of safety-engineered medical devices can reduce NSIs by over 80% and in conjunction with training and guidelines can reduce injuries by over 90%.[1]

Considerations for single-use capillary blood lancing devices

Single use lancing devices should:

- have an automatic disabling mechanism with no re-usable components
- include any other safety features designed to prevent sharps injuries
- be completely disposable
- have features to reduce pain such as adjustable depth gauge, and lancet design
- require minimal instruction for new operators
- consistently provide blood samples of sufficient size
- be used only in the context of standard infection prevention and surveillance policies of the facility.

Additional considerations for personal non-disposable lancing devices

It is important that people with diabetes are provided with education on the correct use of their lancing device, including how to assemble the device, use it, clean and end cap the device, frequency of cleaning, and how and when to change/remove/dispose of the lancet safely. Consultation with a Credentialled Diabetes Educator will enable lancing devices to be used appropriately and effectively. Malfunctioning devices can create additional challenges for the user in obtaining a relatively pain-free but, sufficient volume of blood to measure their blood glucose levels. Reinforcement of the importance of only using the lancing device as directed and only for personal use is essential.

Costs

It should be noted that single-use disposable capillary blood lancing devices for healthcare facilities are widely available for healthcare facilities to procure.

Management of occupational exposure to blood and body fluids is costly. The best way to avoid these costs is by prevention of exposures. The introduction of safety-engineered medical devices has proven to be extremely cost-effective when accounting for the high risk NSIs prevented and reduced.[1]

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