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After graduating with a degree in Pharmacology in 2002, Helen qualified as an RVN in 2005. She began a nine year stint as a locum nurse working nationally and internationally. During this time she spent five years on BVNA council in a variety of roles, culminating in her being awarded honorary membership in 2016. Helen obtained a Post Graduate Diploma in Adult Nursing Studies in 2013. In her current role as a Transplant Coordinator she supports living kidney donors through the process of donation and organises transplant surgeries. Helen remains a Registered Veterinary Nurse and has developed a strong interest in the principles of One Health. Her first textbook, *Veterinary Nursing Care Plans: Theory and Practice* was published in 2018. She is currently working on an MSc in Healthcare Management. Email: helen_ballantyne@yahoo.com

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Needle stick injury

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ABSTRACT: Veterinary related needles stick injuries have the potential to cause significant, life changing injuries. Despite this they are still reported frequently to the Veterinary Medicines Directorate (VMD). There are also many anecdotal stories surrounding the culture and practice of using needles in veterinary medicine that suggest a high level of additional needle stick injuries may go unreported. The aim of this article is to highlight the dangers of veterinary related needle stick injuries and equip members of the veterinary team to feel empowered to seek appropriate treatment should they sustain such an injury.

Keywords: needle; needlestick; health; safety; mineral oil; vaccine

As a dual qualified veterinary and human centred nurse, I am often asked about the similarities and differences between my two professional worlds. There are some pretty obvious differences. Patients who will willingly hold their arm still for venepuncture is suddenly a game changer. Once you have trained on wriggly cats, taking blood from a tree trunk vein belonging to a fit, six-foot bloke who holds his arm still in a useful position, is a walk in the park, I could do it with my eyes closed.

Probably one of the most significant differences I have found in practice is the attitude to some aspects of health and safety. Lone working is one example, something I used to do a lot in veterinary nursing without a second thought, often being the sole member of staff overnight in a practice. In the NHS, lone working is accompanied by emergency safety protocols, physical and virtual support mechanisms and long detailed policies.

Another key example is the attitude to needles and needle stick injuries, something I discovered in the first week of my first student placement as a human centred nursing student. I was learning to do an intra muscular injection. The patient had agreed, a willing volunteer in my inexperienced hands, the whole thing being supervised by an experienced and knowledgeable nurse. Friendly and approachable, she was an ideal mentor and had already taught me a huge amount of hands-on nursing.

The injection went well, the patient flinched and my insides flipped with nerves, but the job was done and all was well. Or so I thought.

What happened next made me jump and my patient jump. The calm professional nurse standing beside me gasped in horror,

a full-on gasp that also included a proper squeak. I looked at her in amazement, completely oblivious to there being any problem.

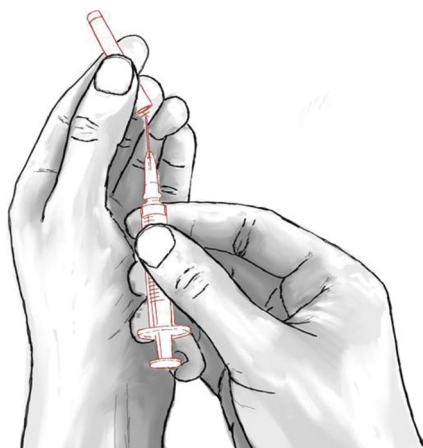
I looked back to the patient who was clearly as alarmed and surprised as I was. I looked him up and down, he looked alright. He certainly did not look like my IM injection was causing some sort of irreparable damage, as my mentors reaction was indicating. Then, she seemed to gather herself, took a deep breath pushed me gently away from the trolley holding our equipment, turned and reassured the patient and with her eyes flashing marched me back to the drugstore.

Still oblivious to any issue, I waited, unsure what was going to happen. A telling off? An apology? Illness? PTSD? The options bounced around my brain.

“You recapped that needle” she said, carefully and deliberately, with a tone of voice that was suggestive of the magnitude of my error (Figure 1).

“Please” she said, softening a little, “never do that, it puts you at such a high risk of needle stick injuries.” She went on to explain the risks associated with such injuries. Outlined the processes involved if one happened, the blood tests, for me and the patient, potential for antiviral medications, a shadow cast over my life until test results were formalised. She terrified me.

On my way home I reflected, I had been taught the theory of handling needles in the classroom before coming onto the ward, but it appeared that old habits die hard. I had reverted to my standard method when giving injections and that involved recapping



▣ **Figure 1.** Needles should NOT be recapped (Illustration by J. Ruedisueli).

the needle, one of the highest risk factors to getting stuck with the needle.

In my mind, re capping a needle made it safe. In human centred nursing it put my health at risk, and I felt like it had put my training at risk. My mentor had felt compelled to follow up with my tutor, gently, broadly, ensuring the university teaching team were doing things the right way. However, no matter how broad the email exchange, the fact my name was not mentioned, I still felt terrible. It was like my nursing career was over before it began.

I was lucky, like all professional mentors, she dealt with the issue at the time it happened and we both moved on, but I never forgot it and I have never recapped a needle since.

Now as a member of the Veterinary Product Committee, part of the VMD, I review injuries caused by veterinary products and we receive multiple reports of needle stick injuries associated with the administration of veterinary products. While it is easy to dismiss these reports as minor injuries, the fact is the impact of these events can be permanently life changing.

On initial presentation, symptoms may be minimal and considered trivial. The reality is much different, outcomes from needle stick injuries can range from soft tissue injuries from the needle, infection from dirty needles or live viral or bacterial vaccines to extreme tissue irritation, inflammation, necrosis and amputation (Figure 2).

The VMD holds reports of people suffering from prolonged pain, inflammation and restrictions to mobility as a result of veterinary needle stick injury. There are reports of people needing surgery and even digit amputation. Almost all of these reports are associated with an impact on being able to

continue working due to loss of physical functionality.

Data from a study performed in Canada (Anderson & Weese, 2015) demonstrated a culture of complacency around handling sharps in veterinary practice. In 1353 observations of needle use in veterinary practice consultations, needles were recapped in 84% of those uses. Additionally, there was evidence that one member of the team under observation sustained a needle stick injury when they handled a needle that had been disregarded. Such data stimulates shocked and horrified reactions in my medical colleagues.

More recently, anecdotal data reported on veterinary social media in 2019 demonstrated that carefully recapping a needle to transport it to a sharps pot was considered safe practice, so potentially, even though I have been away from veterinary clinical practice for nearly five years now, the culture hasn't changed.

Of course, in medical practice, the stakes are higher. The risk of contracting blood borne viruses such as Hepatitis B or Human Immunodeficiency Virus (HIV) is real. As such the health and safety frameworks on needle stick injuries in human centred healthcare are mandatory and detailed. Recently there has been a shift in paradigm, with movement away from individual behaviour modification, treatment and management of injuries to prevention. Emphasis on a no blame reporting culture, acknowledgment of the impact of psycho-social factors such as working hours and stress support a culture of respect for sharps.

While currently the risk of contracting systemic disease from veterinary needle stick injuries is low, surely the risks to the physicality of the area affected is just as alarming.

A digit amputation could result in need for significant adaptation of career or lifestyle. Notwithstanding the impact of the need for surgery, prolonged pain, inflammation and restricted mobility, the other reported symptoms.

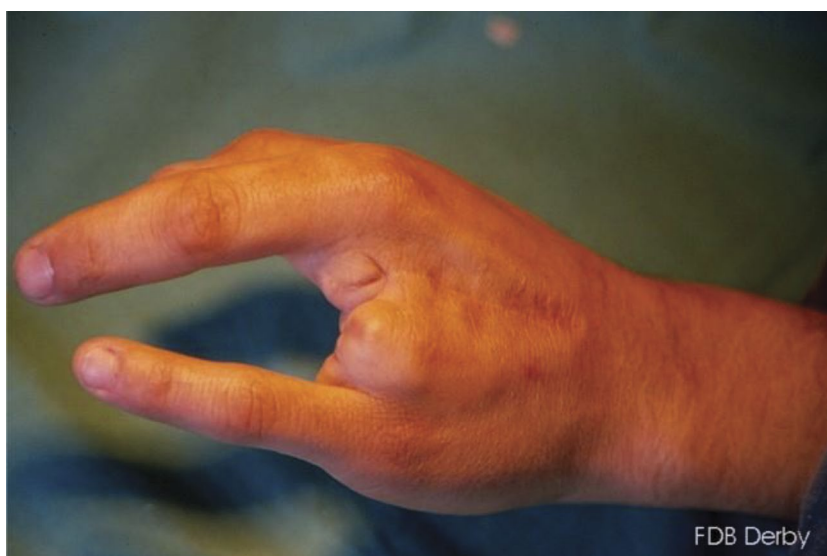
There are three factors that can affect the outcome of a needle stick injury. Firstly, if the needle stick injury is administered under high pressure, shearing forces will blast any fluid through a path of least resistance, potentially leading to a wide dissipation of injection.

Secondly the volume and consistency of the material injected is a significant factor in resulting tissue injury. As an example, an injection destined for a pig could hold up to 2mls of material. Such volumes can cause localised pressure effects, compromising perfusion.

Thirdly the nature of the material involved is highly significant. One of the most harmful products associated with needle stick injuries are those that use mineral oils as adjuvants. Adjuvants are added to some vaccines to increase the ability of the antigen to stimulate the body's immune response. If products containing mineral oil are accidentally self-injected, they can cause significant harm due to its irritant nature.

It is critical that people with needle stick injuries seek medical advice quickly. It is essential that they provide the medical team with details of the substance that may have been injected to ensure that the appropriate treatment can be delivered. In some cases, surgical debridement may be indicated.

Needle stick injuries may be ill-understood within human centred healthcare, if oil-based



▣ **Figure 2.** Finger amputation due to needle stick injury (Published by kind permission of Professor F. Burke).

products may have been injected, those involved should not be afraid to question if the treatment they are receiving is correct. Surgical debridement may be indicated.

There are numerous safety devices available on the market to reduce the risk of needle stick injuries including recapping devices. We can use alternative devices to sharps such as vented spikes in bags and bottles to allow repeated access. At the very least, we should ensure that small sharps containers

are near the work station so the needle can be disposed of straight away without having to walk through the practice. It is time for shift in approach, prevention must be prioritised and there is a need for increased awareness amongst veterinary staff to ensure that they offer needles the respect they truly deserve.

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Disclosure statement

No potential conflict of interest was reported by the author.

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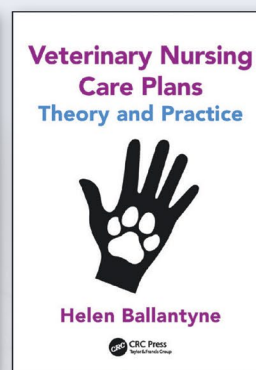
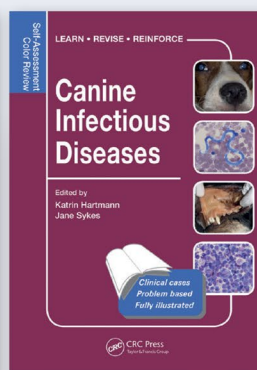
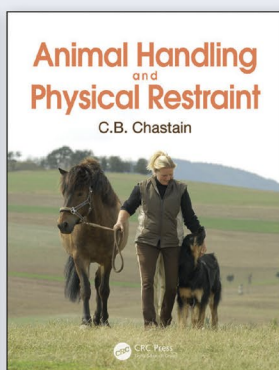
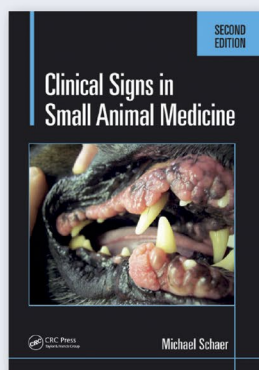
Anderson, M., & Weese, J. (2015). Video observation of sharps handling and infection control practices during routine companion animal appointments. *BioMedCentral Veterinary Research*, 11, 185.

What to do if you think you have suffered a needle-stick injury:

- Assume the needle has penetrated the skin, even if there is no visible reaction
- Find and read the product information
- Seek immediate medical treatment, showing the team the product information
- Warn medical staff that further symptoms can be expected
- Emphasise the need for surgical attention if mineral oil-based substances are involved
- Report the incident to the VMD via online reporting form <https://www.gov.uk/report-veterinary-medicine-problem/human-reacts-medicine>

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