

Preventing Needlesticks on the Farm

Resources compiled by Iowa's Center for Agricultural Safety and Health (I-CASH)



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Agricultural Safety and Health

The University of Iowa ■ Iowa State University
Iowa Department of Agriculture and Land Stewardship
Iowa Department of Public Health ■ Non-profits for Farm Health

Strategies to prevent needlesticks are an important part of your livestock handling procedures. Although most needlestick injuries are minor, they can be life-threatening. About 80% of agricultural workers report having experienced a needlestick, making this an unfortunately common experience.

Use the resources in this packet to help you:

- Develop injection procedures that reduce the risk of needlesticks
- Train employees on best practices when giving injections
- Design better livestock handling procedures to reduce the risk of injury
- Implement a sharps disposal plan

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All materials in this packet are available on the I-CASH website at <https://icash.public-health.uiowa.edu/>
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Additional Resources

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Research Papers

Needlestick Injuries in Agriculture Workers and Prevention Programs. Buswell, M. L., Hourigan, M., Nault, A. J., & Bender, J. B. (2016). *Journal of agromedicine*, 21(1), 82-90.

Unintentional Needlestick Injuries in Livestock Production: A Case Series and Review. Jennissen, C., Wallace, J., Donham, K., Rendell, D., & Brumby, S. (2010). *Journal of agromedicine*, 16(1), 58-71.

Videos and Online Training Resources

Hazards Associated with Livestock Handling - Training Source

Preventing Needlestick Injuries - Proper Use on Dairy Farms
Previniendo lesiones por piquetes de agujas – El uso apropiado en lecherías

Preventing Needlestick Injuries - Proper Use on Swine and Hog Farms
Previniendo lesiones por piquetes de agujas – El uso apropiado en granjas porcinas

Websites

Prevention of Needlestick Injuries in Livestock Production (South Dakota State University)
<https://extension.sdstate.edu/prevention-needlestick-injuries-livestock-production>

Practice Needle Know-how (National Hog Farmer)
<https://www.nationalhogfarmer.com/livestock-handling/practice-needle-know-how>

Proper Animal Handling & Restraint (Veterinary Medical Center of Long Island)
<https://vmcli.com/continuing-education/proper-animal-handling-restraint/>

Safe Animal Handling, Needlesticks, Hormone Use in Swine Production and Worker Safety
(Pork Information Gateway)
https://porkgateway.org/resources/category/worker-health-safety/?fwp_type=factsheets

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Needlesticks

Introduction

Needlestick injuries can occur when injecting pigs with animal health products. If the pig suddenly jumps or moves, a worker could accidentally be stuck by the needle. Needlestick injuries have also occurred when workers have carried syringes loaded with medication in their pockets. Needlestick injuries should be considered serious as their effect on humans can vary greatly depending on the type of drug injected.

OSHA Rule(s)

The Occupational Safety and Health Act (OSH Act) requires employers to comply with hazard-specific safety and health standards. In addition, pursuant to Section 5(a)(1) of the OSH Act, often referred to as the General Duty Clause, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm.

OSHA has previously used the General Duty Clause to cite employers when employees experienced cuts, punctures, and injections due to poor handling practices of needles and scalpels when processing piglets and administering treatments to pigs.

Other violations of the General Duty Clause related to needlesticks include repeated straightening of 1.5" x 16 gauge needles in a pump syringe gun; carrying multiple needles, new and recapped, in overall pockets of uniforms; and employer failure to educate on safe sharps handling practices such as avoiding the recapping of sharps and proper disposal of sharps.

Hazard

Needlestick injuries can be very serious. Certain antibiotics and other medications designed for animals can result in severe medical reactions, or even death, if they are injected into a person. Needlestick injuries can result in several types of injuries (from Agricultural Medicine, by Donham and Thelin, 2006). They include:

Infection from a contaminated needle

- When injecting pigs, needles are often used multiple times. These needles can become contaminated with skin organisms or fecal organisms which may cause an infection if injected accidentally into a human.

Infection from the product injected

- Some vaccines (for example, a live Erysipelas vaccine) could cause a local infection if accidentally injected into a human. This infection is typically mild.

Inflammation from the product injected

- Some vaccines are made with agents designed to enhance the immune response, called adjuvants. Adjuvant containing vaccines, typically known as “killed vaccines,” are very irritating and can cause inflammation when accidentally injected into a human.

Hyperimmune response due to the product injected

- If a human has been previously exposed to an infectious agent, and he or she is then exposed to the same agent via a needlestick, a hyperimmune response can result. Often, this response will consist of excessive swelling in the area of the needlestick, but serious disease affecting the whole body can occur.

There are specific dangers faced by women who come into contact with reproductive hormones by needlestick or absorption. These drugs can disrupt the menstrual cycle and cause future reproductive issues and can also disrupt the normal cycle of pregnancy (cause miscarriage or prolong pregnancy). Lutalyse, Prostamate, or Estrumate are administered by injection and are used to induce farrowing in sows. If absorbed by a pregnant employee it can cause her pregnancy to be aborted.

Although PG600 and oxytocin do not have any specific warning for female workers on their MSDS label (occupational exposures have not been fully investigated for oxytocin) they are still reproductive hormones and may be a risk to female workers. Oxytocin and prostaglandins, when injected into women, have resulted in miscarriages.

If a female worker does not feel comfortable handling a reproductive hormone due to its effects, she should not be required to perform tasks that require handling the hormone.

Prevention and Control

Your employer should always direct you to the Material Safety Data Sheet (MSDS) for any drug or vaccine used in your facility. This will inform you of any other risks or treatments associated with that drug. If you have questions about your safety after reading the MSDS for any compound used in your facility, you should consult with a physician to assess any specific health risks that you may have.

To ensure you understand the safety concerns related to compounds used in your facility and that you are confident in your ability to work with them, your employer will have you sign a Hazardous Chemical Disclosure Form. This form will be specific to the chemicals used in the facility. Women who do not feel comfortable working with hormones do not have to sign the form nor are they obligated to perform the specific task.

Make copies of the MSDSs and have them available in various locations throughout the facility (e.g. near the phone, in areas where they are used, and at supervisor stations). In case of emergency, you will want to be able to provide the MSDS to emergency providers.

Because a potential risk exists for the transmission of diseases from animals to humans and because the OSHA standard does not cover all exposures to animal blood, it may be important to employers and employees working in facilities with animals to practice the principles of general industrial hygiene, including the institution of a hierarchy of controls. Standard precautions, good work practices, the implementation of engineering controls (e.g., sharps disposal containers, self-sheathing needles) and the use of personal protective equipment are means to prevent occupational exposures to animal blood and other potentially

infectious materials. The American Veterinary Medical Association (AVMA) recommends voluntary compliance with OSHA's bloodborne pathogens standard in order to best protect employees working in veterinary or other animal settings. See February 1994 journal article (JAVMA, Vol. 204, No. 3).

Employers are responsible for the safety of their employees and should have guidelines and training for sharps safety and to prevent needle stick injuries.

Develop a sharps handling plan. See Model Infection Control Plan for Veterinary Practices, 2006. (<http://safety.cfans.umn.edu/pigs/>).

Needle stick Injury Prevention from the National and State Public Health Veterinarians (<http://www.nasphv.org/Documents/VeterinaryPrecautions.pdf>):

- Never remove needle caps by using your mouth.
- Do not recap needles except in rare instances when required as part of a medical procedure or protocol. Recapping causes more injuries than it prevents. When it is absolutely necessary to recap needles as part of a medical procedure or protocol, or if a puncture-proof, leak-resistant sharps container is not available, a mechanical device such as forceps can be used to replace the cap on the needle or the one-handed "scoop" technique may be employed. This technique involves holding the syringe with the attached needle or the needle hub alone (when unattached) and scooping or sliding the cap, which is lying on a horizontal surface, onto the needle's sharp end. Once the point of the needle is covered, the cap is tightened by pushing it against an object, or by pulling the base of the needle cap onto the hub of the needle with the same hand holding the syringe.
- Dispose of all sharps in designated puncture-proof sharps containers.
- Dispose of the used syringe with attached needle in the sharps container when injecting live vaccines or aspirating body fluids. For most other veterinary procedures, use the needle removal device on the sharps container and dispose of the syringe in the regular trash.
- Sharps containers should be located in every area of the workplace where sharps are used.
- Do not transfer sharps from one container to another.
- Devices that cut needles prior to disposal should not be used because they increase the potential for aerosolization of the contents.
- Never dispose of sharps in the regular trash.
- Document the periodic evaluation of safe needle devices that may prevent recapping action.
- Develop, communicate and enforce standard operating procedures for safe sharps handling. Implement satellite locations of sharps containers to make immediate disposal of used sharps more convenient for employee practice.

Suggested methods to prevent accidental injection of medications or vaccines.

- Make sure employees are trained on hazards of handling drugs, hormones, vaccines, etc.
- Develop a training plan that includes information delivery in written and verbal formats relevant to the MSDS and demonstration of the safety information and assessment for understanding.
- Consider developing a policy for reporting and documentation of each needle stick injury.
- Develop and implement a protocol to ensure medical evaluation of all needle stick injuries

Note: Workers whose duties involve giving shots to animals – or administering medication at any time – should be instructed to immediately report any accidental injections of antibiotics or medications to their supervisor. In case of accidental injection, the employee should immediately wash the area with soap and water and report the incident to their supervisor. If the medication can cause serious reactions to humans, it will also be important to see a doctor. Deaths and severe medical reactions have been reported after accidental injections by humans of certain medications meant for animals. If an employee is accidentally injected with a medication and has a seizure, stops breathing, or has another severe reaction, immediately call 911 for professional emergency medical help.

Summary

Understand how to safely administer medications to pigs and what to do in case of accidental needlesticks.

DO:

- Read the package insert, label, and MSDS for any medications administered to the pigs, and use the product only as directed on the package or as directed by your veterinarian.
- Immediately report all accidental needlesticks to your supervisor.
- Use the product only as directed.
- Work with your veterinarian to determine how often you should change needles.

DON'T:

- Place your hands between a pig and the side of the stall when injecting drugs.
- Carry a syringe and needle in your pocket.
- Use damaged or bent needles.

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This material may be available in alternative formats.

Hormone Use in Swine Production and Worker Safety

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Introduction

Many drugs or chemicals used in conventional swine production facilities can impact employee health. Drugs used for reproductive purposes in swine are most dangerous to female employees. Although employees may be exposed by different routes, accidental injection is particularly of concern. Little is known about needlestick rates in female pork production workers. Limited research shows that of female veterinarians, 75% reported a needlestick in a 12 month period in Australia, and 64% reported a needlestick after graduation in the U.S. Of veterinary technicians more than 90% have experienced a needlestick during their career. However, needlestick events are probably underreported. Other routes of exposure to hormones may occur. Some hormones can be absorbed through the skin. Handling of hormones by males may be an exposure risk for spouses through handling clothing or by skin contact.

Objectives

- List hormones commonly used in swine production.
- Provide guidelines to reduce exposure for female employees.

Reproductive Hormones

Although you may be familiar with different brand names, there are several reproductive hormones that are commonly used in swine production. These drugs belong mostly to three different classes: prostaglandins, FSH/LSH compounds, and progesterones (Table 1). Accidental exposure to these hormones may have serious consequences for female workers, especially pregnant women.

Table 1. Hormones used in swine production.

Drug class	Example trade names*	Administration	Use in swine	Potential effects in pregnant women
Prostaglandins	Prostamate® Estrumate® Lutalyse®	Injection	Induction of farrowing, or pregnancy termination at early stages	Premature menstruation, induction of labor, or abortion
FSH/LSH compounds	PG600®	Injection	Stimulation of estrus in non-cycling gilts and sows	Disruption of the menstrual cycle, uterine or abdominal cramping, increased or decreased uterine bleeding
Progesterones	Matrix® Regumate®	Oral	Estrus synchronization in gilts or sows	Disruption of the menstrual cycle or prolongation of pregnancy
n/a	Oxytocin	Injection	Stimulation of uterine activity and milk let down	Uterine contractions

*Trade names are used solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product.

In addition to the reproductive hormones, there may be other products used in facilities that could potentially have a medical impact. One such example is a group of drugs called corticosteroids (e.g. dexamethasone and Predef® 2x). They are known to disrupt pregnancy in animals.

Finding Information on Reproductive Hormones

Hazard communication is an important part of safety programs; it is required under the OSHA agriculture standard known as 29 CFR 1910.1200. The objectives of this standard are:

- To ensure that the hazards of chemical substances used by [Company Name Here] are identified and appropriate safeguards are instituted
- To ensure that employees are trained in the hazards of the chemical substances with which they work, and
- To facilitate compliance with OSHA Standard 1910.1200. Note: your state may have requirements in addition to the federal standard. Check with your state OSHA official for more information.



Your employer should always direct you to the MSDS sheet for the specific reproductive hormones used in your facility. This will inform you of any other risks or treatments associated with that drug. If you have questions about your safety after reading the MSDS for any compound used in your facility, you should consult with a physician to assess any specific health risks that you may have.

To ensure you understand the safety concerns related to compounds used in your facility and that you are confident in your ability to work with them, your employer will have you sign a Hazardous Chemical Disclosure Form. This form will be specific to the chemicals used in the facility. Women who do not feel comfortable working with hormones do not have to sign the form nor are they obligated to perform the specific task. Some of the reproductive hormones containing drugs used in a hog facility are dangerous to all employees. If employees suffer from medical conditions listed on the MSDS, they may be exempted from performing tasks involving that drug.

Reducing Exposure to Reproductive Hormones

Accidental exposure to reproductive hormones may occur by several routes. For drugs that are administered to pigs by the oral route (i.e. progesterone compounds), workers should wear gloves and avoid skin contact with the drug. Accidental injection is also a route of exposure to reproductive hormones. There are several ways that workers can reduce their risk of needlestick injuries:

- Educate all employees and volunteers about safe sharps handling and needlestick avoidance.
- Do not recap needles unless absolutely necessary. If recapping is necessary, use a one-hand scoop method, hold the cap with a mechanical device such as forceps or use a needle recapping device.
- Ensure convenient access to sharps containers in all areas where needles might be used.
- Promptly dispose of needles into approved sharps containers.
- Never use temporary or unapproved containers for sharps.
- Never try to remove anything from a sharps container.
- Do not fill sharps containers beyond the designated fill limit.
- Consider the use of protective devices such as retractable needles or hinged syringe caps.
- Do not walk around with an uncapped needle.
- Ensure all personnel report all needlestick injuries and record information regarding the circumstances.

The National Association of State Public Health Veterinarians recommends that injuries should be reported, investigated, and documented. Practice managers should develop policies that encourage reporting. An incident report form, such as OSHA form 300, should include details as follow:

- Date, time, and location of the incident.
- Name of person injured or exposed.
- Names of other persons present.
- Description of the incident.
- Whether or not a health-care provider was consulted.
- Plans for follow-up.

Summary

You may be asked to work with reproductive hormones in the pork production environment. Hormones may have adverse reproductive effects in women, especially when pregnant. Pregnant workers should avoid handling hormones altogether. For non-pregnant women, care should be taken to avoid exposure to reproductive hormones through the skin or by accidental injection. OSHA requires employers to furnish information to employees (via the MSDS) about hormones used on the farm.

References

Donham KJ and A. Thelin. 2006. *Agricultural Medicine: Occupational and Environmental Health for the Health Professions*. Ames, IA: Blackwell Publishing; p.352-353.

Leggat PA, Smith DR, Speare R. Exposure rate of needlestick and sharps injuries among Australian veterinarians. *J Occup Med Toxicol*. 2009 Aug 28;4:25.

National Association of State Public Health Veterinarians. *Compendium of Veterinary Standard Precautions for Zoonotic Disease Prevention in Veterinary Personnel*. www.nasphv.org/Documents/VeterinaryPrecautions.pdf

National Pork Board. *Pork Production Safety System*. <http://www.pork.org/Resources/1000/WorkerSafetyPorkProduction-SafetySystem.aspx>

University of Nebraska–Lincoln Extension. *Safe Use of Animal Medicines*. <http://www.ianrpubs.unl.edu/epublic/pages/publicationD.jsp?publicationId=414>

Weese JS, Faires M. A survey of needle handling practices and needlestick injuries in veterinary technicians. *Can Vet J*. 2009 December; 50(12): 1278–1282.

Weese JS, Jack DC. Needlestick injuries in veterinary medicine. *Can Vet J*. 2008 Aug;49(8):780-4.

Wilkins JR 3rd, Bowman ME. Needlestick injuries among female veterinarians: frequency, syringe contents and side-effects. *Occup Med (Lond)*. 1997 Nov;47(8):451-7.

Animal Behavior and Restraint:

Cattle

Animal health emergencies involving cattle will require the handling and possibly restraint of the animals. Having a basic understanding of cattle behavior results in more effective efforts, minimizes stress on the animals, and reduces the risk of injury to responders.

Cattle Characteristics

- Cattle are grazers and browsers by nature, and have a strong herd instinct. Individuals that are isolated from the rest of the herd become anxious. They have a natural curiosity, but may be excited and frightened by new persons in their midst. Cattle have keen hearing and vision and can see 310° around their bodies.
- Cattle are gregarious and have a strong herd instinct. When other cattle are seen, they will seek their company. For this reason, individual animals become anxious in situations that lead to isolation from the herd. An agitated or excited lone animal can be very dangerous and may charge at people or injure itself trying to rejoin the herd.

Cattle Handling

When handling cattle, most injuries occur because of a lack of understanding of cattle behavior. People often make the mistake of chasing cattle, which results in agitated, stressed cattle. This makes the situation dangerous for both humans and animals. Sometimes the best course of action is to sit and wait. Cattle become dangerous when isolated from the herd, or when they are protecting their calves.

- Avoid: Abuse, loud noises, yelling, isolating animals and distractions.
- Use slow, deliberate movements.

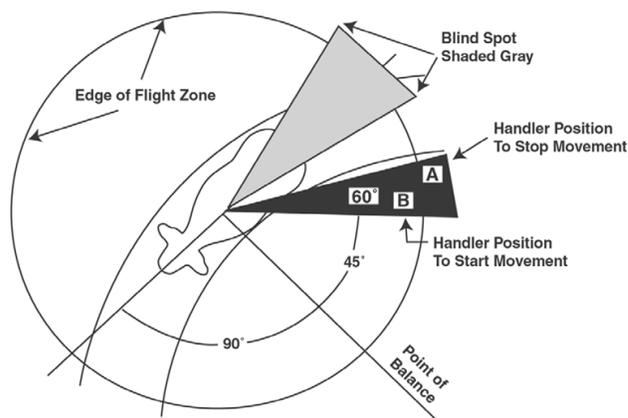
Flight Zone

An understanding of an animal's flight zone makes handling much easier. The size of an individual's flight zone is determined by their tameness and their level of excitement or stress. Most cattle have a flight zone.

- The blind spot behind the animal (light gray), this area should be avoided.
- To make an animal move forward, the handler should enter the edge of the flight zone behind the

"point of balance" or shoulder.

- It is best to work at a 45-60° angle behind the animal's shoulder, moving back and forth parallel to the direction you would like the animal to move in. The ideal location for the handler is between positions A and B on the edge of the flight zone.
- Move toward B to start the movement.
- Move to A to stop the animal's movement.
- If a handler walks deep into the flight zone, cattle will have a tendency to move in a direction opposite of the handler's movement (e.g. an animal will usually move forward if the handler moves from the head toward the rear).
- To make an animal move backwards, the handler must move in front of the point of balance.
- Sudden, deep invasion of the flight zone may cause the animal to panic.



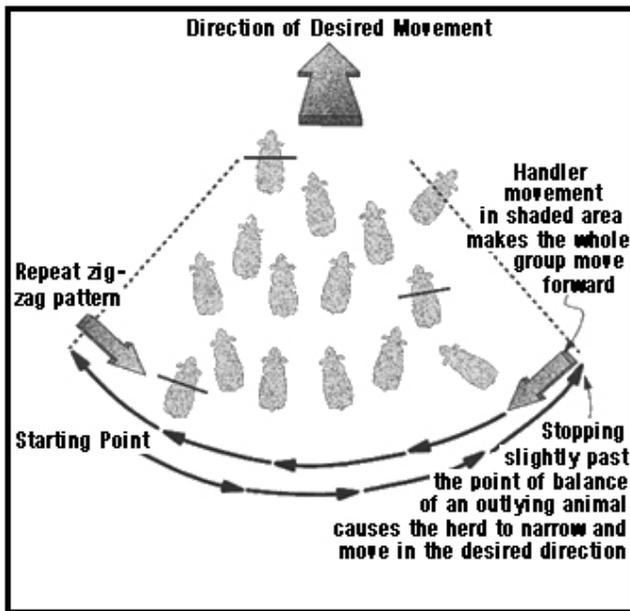
Collective Flight Zone

Moving a herd of cattle can be done by using the "collective" flight zone.

- Get cattle into a loose bunch by making wide back and forth movements on the edge of the herd in a straight or very slight arc (like a giant windshield wiper). The movement should not exceed a quarter circle.
- Take your time and ignore any stragglers – they will be attracted to the herd by herd instinct and will rejoin the group.
- Once the majority of animals are together, increase pressure on the collective flight zone to initiate

movement. Alternately penetrate and withdraw from the flight zone to get the desired movement.

- Animal movement should occur at a slow but steady pace. Running indicates panic and will lead to unpredictability in the animal's behavior.



Methods of Restraint

The method of restraint of cattle will depend on available resources, the number of handlers present, and the behavior or agitation level of the cattle.

- **Cattle Chute with Head Restraint** – This is the most desirable restraint device. With a cattle chute, diagnosis and treatment is much easier and safer.
- **Lariat and Halter** – This is a common form of restraint, but dependent upon having something to which the animal can be secured.
- **Tranquilization/Sedation** – The use of drugs should be used in extreme or emergency cases only.

Things to Avoid to Prevent Injury

- **Separating cow-calf pairs** – Mother cows can get extremely agitated and aggressive while attempting to protect her young. Handlers could get injured if they come between a calf and its mother.
- **Sudden movements in a cow's blind spot** – This can cause the animal to either panic and run away, possibly causing injury to the cow, or to kick, possibly injuring the handler.
- **Cornering isolated animals** – Cattle become extremely nervous when separated from the herd.

Cornering or posing a threat will only increase the stress on the animal. The potential exists for injury to both handler and animal.

- **Abuse, loud noises, noisy machinery** – These can all startle cattle and may cause panic either in individual animals or throughout the herd.
- **Distractions while trying to move cattle** – Things like patches of light and dark, rattling chains, or flapping clothing will cause cattle to balk or stop moving. If a handler attempts to force the animals past the distraction, they will get increasingly stressed and may injure themselves or the handler.
- **Wire fencing** – A stressed, excited, or frightened cow may run through wire fencing, inflicting injury upon itself.

Additional Resources

- Recommended Basic Livestock Handling: Safety Tips for Workers. *Temple Grandin, PhD*
<http://www.grandin.com/behaviour/principles/principles.html>
- Low Stress Methods for Moving and Herding Cattle on Pastures, Paddocks, and Large Feedlot Pens, by Temple Grandin
<http://www.grandin.com/B.Williams.html>
- Understanding Livestock Behavior
The Ohio State University Extension
http://nasdonline.org/static_content/documents/1704/d001709.pdf
- Cattle Handling and Working Facilities.
The Ohio State University Extension
<http://ohioline.osu.edu/b906/>
- Cattle Handling Safety in Working Facilities.
Oklahoma Cooperative Extension Service
<http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-4821/BAE-1738web.pdf>

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Remove sheets along perforation and place near livestock pharmaceutical storage area

Injectable Pharmaceutical Safety Checklist

Farm Name:

Reviewed by:

Date:



Injectable Pharmaceutical Inventory	Location of Medications and Pharmaceuticals (shelf, refrigerator)	Location of Drug Labels, Inserts, and Safety Data Sheets (SDS)
1.	1.	
2.	2.	
3.	3.	
4.	4.	
5.	5.	
6.	6.	
7.	7.	
8.	8.	
9.	9.	
10.	10.	
Emergency Number: 911	Health Care Provider	Locations of First Aid Kits:
Poison Control:	Name and Number:	
State Veterinarian:	Sharps Container(s)	REMEMBER <ul style="list-style-type: none"> Immediately after sharps have been used, place them in a sharps disposal container. Never burn or dispose of individual sharps in trash; labeled and secured sharps containers can be disposed in trash.
Sharps Container(s) Location(s):	Last Date Changed:	

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Scan the QR Code below to print the checklist.
Additional resources are available on the website at

<https://icash.public-health.uiowa.edu/>



NEEDLESTICK PREVENTION

ON THE FARM

OUCH!

Needlestick injuries are usually minor, but they can be serious.

Most common injuries

- Skin infections
- Allergic reactions
- Deep tissue wounds that require surgery

Don't Get Stuck

- Slow down - don't rush with injections
- Restrain animals properly
 - » Get help from coworkers
 - » Use the correct equipment and techniques
- Don't recap needles
- No needles/syringes in your pockets
- Don't hold caps in your mouth
- Discard bent or dull needles
- Use approved sharps containers

Did You Know?

- Over 80% of farm workers vaccinating animals have accidentally stuck themselves.
- Vaccines are the most common type of drug involved in needlestick injuries.

Got Stuck?

- Wash the skin with soap and water immediately
- Report injury to your supervisor
- Call your healthcare provider



Be Careful

Especially with these Products

Tilmicosin (Micotil®)
Sedatives (e.g., Xylazine)
Oil-based products or vaccines
Brucella abortus Strain RB51 vaccine
Modified live vaccines (e.g. Erysipelas vaccine)
Johne's vaccine
Hormones - especially if pregnant
Antibiotics - especially if allergic



MORE INFORMATION:

umash.umn.edu/needlestick

<https://www.cdc.gov/niosh/topics/bbp/sharps.html>



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NEEDLESTICK PREVENTION

PRODUCERS AND VETERINARIANS

Needlestick injuries are usually minor, but they can be serious.

Most common injuries

- Skin infections
- Allergic reactions
- Deep tissue wounds that require surgery

Less common injuries

- Miscarriages due to hormone products
- Serious cardiovascular events (Micotil/tilmicosin)
- Suppression or coma from sedatives like xylazine
- Systemic infections
- Allergic reactions to antibiotics

How Common are Needlestick Injuries?

Needlestick injury research shows that over 80% of farm workers and 73% of swine veterinarians working in animal agriculture have accidentally stuck themselves. Vaccines are the most common type of product involved in needlestick injuries.

IMPLEMENT A COMPREHENSIVE NEEDLESTICK PREVENTION PROGRAM

Employee Practices

- Slow down - don't rush with injections
- Restrain animals properly
 - » Get help from coworkers
 - » Use the correct equipment and techniques
- Don't put needle caps in your mouth
- Discard bend needles - don't use or straighten
- Don't carry needles/syringes in your pockets
- Use approved sharps containers
- Don't remove needles from sharps container
- Don't recap needles
- Report all needlestick injuries to management
- Contact your healthcare provider

Management Practices

- Train employees about
 - » Safe needle handling
 - » Safe injection procedures
 - » Type of drugs used
- Routinely re-train employees to reinforce safety procedures
- Provide safe animal handling equipment; ensure proper staffing
- Provide readily accessible sharps container for safe needle disposal
- Provide needle/syringes with protective devices, such as retractable needles or hinged syringe caps
- Remind employees to use caution when using products of concern
- Pregnant employees should not inject hormones
- Encourage employees not to rush
- Encourage employees to report injuries
- Employee should contact a healthcare provider

Products of Most Concern

Tilmicosin (Micotil®)
Sedatives (e.g. Xylazine)
Oil-based adjuvants
Brucella abortus Strain RB51 vaccine
Modified live vaccines (e.g. Erysipelas vaccine)
Johne's vaccine
Hormones - especially if pregnant
Antibiotics - especially if allergic

MORE INFORMATION:

umash.umn.edu/needlestick

<https://www.cdc.gov/niosh/topics/bbp/sharps.html>



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SHARPS

DISPOSAL AND SAFETY FOR LIVESTOCK SETTINGS

Livestock-related sharps are considered **medical waste**.

If not disposed of properly, sharps pose a significant **risk of injury and illness** to farmers, on site workers and waste handlers.



Visit [SafeNeedleDisposal.org](https://www.SafeNeedleDisposal.org) for guidance on how to safely dispose of used sharps in your area.

Sharps disposal rules can vary by state, county, and city.

1 STORAGE

- After sharps have been used, **immediately** place them in a sharps disposal container.
- If an FDA approved container is not available, use a laundry detergent bottle as an alternative.
- **Do not** use milk jugs or pop bottles.
- **Label the container** "Sharps - Do not recycle" to warn of hazardous waste inside.

CONTAINERS



All sharps disposal containers should be:

- » made of heavy-duty plastic and leak-proof
- » closed with a tight-fitting, puncture-resistant lid
- » upright and stable during use

2 DISPOSAL

- Dispose of your container when it is 3/4 full.
- Render the contents inactive (*e.g. pour bleach into the container before sealing*).
- Seal it with duct tape before disposal.
- **Do not** reuse sharps disposal containers.
- **Do not** recycle.

BEST

- » Check to see if your local landfill accepts medical waste.
- » Use a mail back system.

GOOD

- » Contact your local veterinarian or health department for assistance.

ACCEPTABLE

- » Dispose of sharps in household trash using a laundry detergent bottle that is labeled and secured with duct tape.

VIEW OUR NEEDLESTICK PREVENTION RESOURCES AT [UMASH.UMN.EDU/NEEDLESTICK](https://umash.umn.edu/needlestick)



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WORKPLACE SOLUTIONS

From the National Institute for Occupational Safety and Health

Preventing Worker Deaths and Injuries When Handling Micotil 300®

Summary

Livestock producers, veterinarians, and other workers may be exposed to the toxic hazards of the animal antibiotic Micotil 300® through needle-stick injuries, skin cuts, puncture wounds, and contact with skin and mucous membranes. Cardiotoxic effects of Micotil 300® on the human heart, including a reduced cardiac contractility and tachycardia (rapid heart beat), can be severe enough to cause death.

The National Institute for Occupational Safety and Health (NIOSH) recommends that extreme care be given to following safe drug handling and injection procedures to avoid the possibility of self injection. Although no antidote exists for Micotil 300®, exposed persons should seek immediate medical intervention as the drug's cardiotoxic effects may be reversed.

Description of Exposure

Tilmicosin phosphate, sold under the trade name Micotil 300®, is an animal antibiotic developed to treat "shipping fever," a bovine and ovine respiratory disease. In the United States, veterinarians give Micotil 300® to animals, but more frequently prescribe it for their clients to use on cattle and sheep at livestock facilities.

The 2002 Census of Agriculture reported 80,743 U.S. farms with cattle feed operations involving 14.9 million head of cattle [USDA 2004]. Thousands of workers on these farms could be exposed when they inject cattle with Micotil 300®.

Elanco, the company that developed and produces Micotil 300®, received 2,392 reports of human exposures worldwide to Micotil 300® between 1992 and 2000 [Elanco 2002]. Thirteen confirmed Micotil 300®-associated human fatalities have been recorded worldwide since 1995, most associated with suicides [FDA 2006].

Case Studies

The Nebraska Fatality Assessment and Control Evaluation Program (NE FACE) investigated two separate incidents involving unintentional injection of Micotil 300®.

Case 1

On March 8, 2003, a 38-year-old cattleman was preparing to inject Micotil 300® into a heifer secured in a squeeze chute inside a barn. The cattleman was carrying a 12-cc plastic disposable syringe in his right hand. The man was knocked to the ground when a cow in an adjacent pen charged, striking the fence panel. As a result of either the strike or the fall, the cattleman was injected with an unknown amount of the antibiotic. He immediately began to feel dizzy and nauseated. He was able to call for help, and his wife, in the house nearby, called an ambulance. The victim was rushed to a nearby hospital where he died an hour and a half later. The death certificate indicated the cause of death was respiratory failure as a consequence of cardiac arrest caused by a lethal injection [Nebraska Department of Labor 2003].

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National Institute for Occupational Safety and Health



Case 2

On November 16, 2004, a 41-year-old cattle rancher was preparing to inject two calves with Micotil 300® using a 20-cc plastic disposable syringe. The calves were in an outside lot squeeze chute. After injecting the first calf, the rancher placed the syringe in his mouth to hold it, freeing his hands to open the squeeze chute gate. At the same instant, the injected calf lunged forward, flinging open the end doors and causing the handle to strike the victim's left hand, driving it backwards into the needle. The rancher was injected between his left thumb and first finger with 1 to 1.5 cc of Micotil 300®. He immediately felt a burning sensation at the injection site. Within a few minutes, he developed a severe ringing in his ears and felt as though his tongue and lips were swollen. He called out for help, and his wife called the Rocky Mountain Poison Control Center. They advised her to place ice on the injection site and immediately get her husband to an emergency room. As his condition worsened in the emergency department, he was airlifted to a regional medical center and treated in the intensive care unit for 2 days. After his condition stabilized, he was discharged [Nebraska Department of Labor 2005].

Controls

Workers and employers should take the following steps to protect themselves and others when handling or administering Micotil 300®. In the case of human injection, consult a physician immediately and apply ice to the injection site. Transport the victim immediately to a hospital and call 1-800-722-0987 for further emergency information.

Veterinarians

- Consider prescribing animal medications that do not have toxic effects on humans.
- Do not administer Micotil 300® if animals cannot be restrained in an appropriate restraint, or if there is concern over operator skill.
- Using the client information sheet attached to each bottle of Micotil 300®, verbally review Elanco's revised user safety warnings with each purchaser. Use a co-signed Micotil 300® *Client Dispensing Information* form [Elanco 2006] to document that each purchaser understands that Micotil 300® has been fatal to humans. This form details the hazards associated with Micotil 300® and identifies safe administration methods, appropriate first aid treatment, and emergency phone numbers.

- Provide guidance to purchasers on proper equipment for administration. Multiple dose dispensers are available and include specific handling instructions.

Employers

- Store Micotil 300® in a safe location that is not readily accessible by untrained persons.
- Train workers assigned to handle Micotil 300® by using training videos, DVDs, laminated dosage sheets, material safety data sheets (MSDS), client information sheet, and safe handling cards. To obtain these materials, call Elanco at 1-800-428-4441 or visit Elanco's Web site at www.elanco.com.
- Ensure that proper handling procedures for Micotil 300® are available at the worksite and are reviewed by all workers before they handle this drug. These procedures should be written in the primary language(s) of drug handlers and at their reading level.
- Provide a means to adequately restrain animals during treatment. An animal that is adequately restrained will not be able to move in an unpredictable manner. Work with a veterinarian to determine what adequate restraint means for the particular operation.
- Provide a sharps disposal container for safe handling and disposal of syringes and needles, and goggles and impermeable, needle-puncture-resistant gloves for personal protection.
- Ensure that only persons trained in the hazards of Micotil 300® and safe handling procedures are allowed to handle this drug and that workers do not work alone while handling or injecting the drug.
- Ensure that coldpacks and icepacks are available at the workplace where injections will be given.
- Ensure that telephones are available to workers. Post the following telephone numbers in visible locations such as near the office, barn, and house telephones:
 - Emergency Medical Services
911 or dial 0 (operator) and report the emergency and specific location
 - Rocky Mountain Poison Control and Drug Center
1-800-332-3073 (This center has been trained by the drug manufacturer to handle emergencies specific to Micotil 300® exposure in both English and Spanish)
 - Elanco: 1-800-722-0987, medical emergency hotline; 1-800-428-4441 (English only)

Workers

Drug handling and preparation

- Read, understand, and follow all directions located on the label and on the client information sheet that is provided with each bottle of Micotil 300®.
- Wear goggles and impermeable, needle-puncture-resistant gloves, and wash hands after handling.
- Never work alone when handling or injecting Micotil 300®.
- Fill syringes in an area restricted for that purpose alone (preparation room). Never allow children in this area.
- Do not smoke, eat, drink, or store food in the restricted area.
- Never use automatically powered syringes.
- Never fill one syringe with medication for injecting several animals. Use a separate syringe for each animal. If provided with a multiple dose dispenser, ask employer for specific handling instructions.
- Always use a 16- to 18-gauge needle that is 1/2 inch to 5/8 inches long.
- Keep a protective cover on needles until ready for use.
- Place filled syringes in a puncture-proof carrying case before moving to the animal's location.
- Never place or carry a loaded syringe in a pocket, other clothing, or in the mouth.
- Clean up spills immediately.
- Call one of the emergency contact numbers if an exposure occurs, apply ice, proceed immediately to a hospital emergency room, or call 911 for emergency transport.

Injection of livestock

- Keep children and bystanders out of the area where Micotil 300® is to be given.
- Wear goggles and impermeable, needle-puncture-resistant gloves, and wash hands after handling.
- Evaluate the animal to be injected as well as the animal's surroundings to determine whether it is safe to give the drug.
- Do not give the drug to an animal that cannot be adequately restrained.
- Restrain animals in a restraint that the employer, in consultation with the veterinarian, has determined is adequate for the operation.

- Identify a useable exit route in case the animal breaks out of the restraint.
- Inject Micotil 300® by holding the syringe in one hand while inserting the needle subcutaneously and at a top-down angle. Avoid penetrating the animal's underlying muscle.
- Do not replace the protective cap over the needle of the syringe after use.
- Immediately after use, place the syringe with needle attached in a puncture-proof sharps disposal container. Return the disposal container to the preparation area for final disposal.

Acknowledgments

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For More Information

For more information about intervention after human exposure to injected Micotil 300[®], contact Elanco Animal Health, a Division of Eli Lilly & Company: P.O. Box 707, 2001 W. Main St., Greenfield, IN 46140; telephone 1-800-722-0987.

For Micotil 300[®] safe handling and use materials, visit the Elanco Web site at www.elanco.com.

The information in this document is based on fatality investigations, literature, and expert review. More information about the Fatality Assessment and Control Evaluation Program is available at www.cdc.gov/niosh/face.

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Preventing Worker Deaths and Injuries When Handling Micotil 300[®]

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DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health
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SOP: Cattle Restraint

These SOPs were developed by the Office of the University Veterinarian and reviewed by Virginia Tech IACUC to provide a reference and guidance to investigators during protocol preparation and IACUC reviewers during protocol review. They can be used as referenced descriptions for procedures on IACUC protocols. However, it is the sole responsibility of the Principal Investigator to ensure that the referenced SOPs adequately cover and accurately represent procedures to be undertaken in any research project. Any modification to procedure as described in the SOP must be outlined in each IACUC protocol application (e.g. if the Principal Investigator plans to use a needle size that is not referenced in the SOP, simply state that alteration in the IACUC protocol itself).

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Version: 1
Original date: 12/12/17
Version date: 12/12/17

I. Procedure Summary and Goal

Describes procedures for the safe and humane restraint of cattle for routine handling and treatments.

Considerations

Having a basic knowledge of the animal's behavior is important in safe and humane handling. Amount of restraint required varies with breed of cattle and frequency of handling. The more frequently animals are handled in a calm, non-stressful manner, the more easily they will become accustomed and accepting of handling and restraint methods.

Knowledge and use of the flight zone of cattle is important. To determine flight zone, approach the cow and note at what distance it moves away. When handler is outside of the flight zone, the cow will turn and face the handler. Recognition of the flight zone of an individual or herd as well as understanding of how to work within the flight zone in a calm and patient manner is key to minimizing stress and reducing risk of injury to animals and handlers. Good communication between handlers is also important to maintain control.

- a. Cattle are herd oriented, motivated to maintain visual contact with each other, and will follow the leader. Separating an individual from the herd may be stressful.
- b. Cattle have a large field of vision (330°) and can see in almost any direction without turning their head; they do have a blind spot (approximately 30°) directly behind.
- c. Cattle may spook easily and are sensitive to intermittent loud noises, high frequency noises, and hissing sounds. They also are sensitive to harsh contrast in light and dark and may balk at variations in lighting (e.g., shadows, band of bright light); they will tend to move towards light.
- d. Cattle will look in the direction that they are about to go and will move toward the point of escape.

Handlers should be vigilant at all times so as to avoid injury to animals or themselves

- a. Head butting and arc of swing
- b. Being caught between animal and solid structure (e.g., wall, fence, chute)
- c. Avoid being kicked or stepped on
 - i. Front foot pawing
 - ii. Hind foot swings forward and then backward out to the side ("cow kick")

Basic types of restraint

- a. Halters
- b. Mechanical restraints (e.g., chutes, stocks, stanchions)
- c. Chemical restraint

II. Personal Protective Equipment (PPE) and Hygiene

- a. Ensure appropriate PPE is used to protect handler from accidental injury or exposure to blood and other body fluids, such as:
 - i. Scrubs or coveralls
 - ii. Steel-toed shoes or boots
 - iii. Leather or fabric gloves

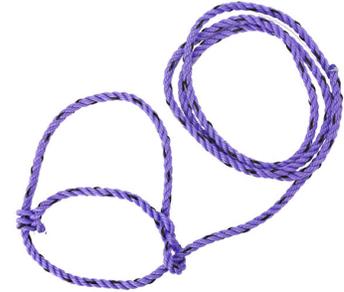


Figure 1. Livestock Rope Halter

III. Supply List

- a. Halters
- b. Mechanical restraint equipment (e.g., chutes, stanchions)
- c. Chemical restraint

IV. Detailed Procedure

- a. Rope Halters ([Figure 1](#))
 - i. Hold slip lead and top of nose piece in left hand, and head stall in right hand.
 - ii. Approach animal, typically from the left side, being respectful of the animal’s flight zone.
 - iii. Slip nose piece over nose with slip lead under chin, and place head stall over the top of the head and behind ears.

OR

Place head stall over poll and behind ears, then place nose piece around nose, with slip lead under chin ([Figure 2](#)).

- iv. Pull the rope to adjust slip lead to proper size – for length of head and around nose ([Figure 3](#)).
- v. Lead can be tied using a quick-release knot to a secure location, such as a ring or post, or to the stanchion if being used, with minimal slack ([Figure 4](#)).



Figure 2. Place Head Stall over Poll and Behind Ears

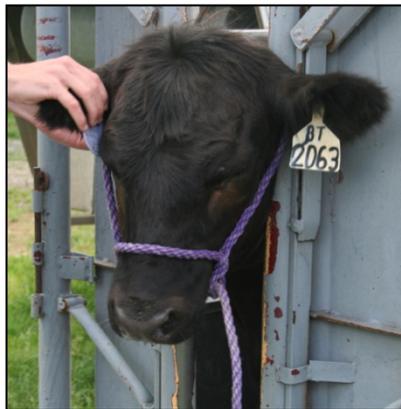


Figure 3. Adjust Slip Lead to Proper Fit



Figure 4. Secure Lead with Quick Release Knot

SOP: CATTLE RESTRAINT

b. Mechanical Restraint

- i. Cattle can be effectively and safely restrained in squeeze chutes, consisting of a headgate, tailgate, and sides that can be moved to change the width of the chute. The working chute leading up to the squeeze chute may include back-up or tailgate bars so that each animal can be enclosed as they pass through, so as to not move forward or backwards once secured (Figures 5 and 6).
- ii. Handler should inspect all working parts and ensure that there are no obstacles or sharp objects that might injure animals prior to using chute or stanchions.
- iii. As animal moves head through headgate, one handler closes head gate while a second handler places tailgate bar or rear gate depending upon style. Ensure that all latches, catches, or locks are secure. If squeeze chute, handler may be able to slowly squeeze animal to slow its progress to the headgate, to prevent injury from hitting headgate too fast.
- iv. Once chute is secured, a rope halter can be used to restrain head as needed.



Figure 5. Use of Working Chute with Squeeze Chute for Multiple Animals

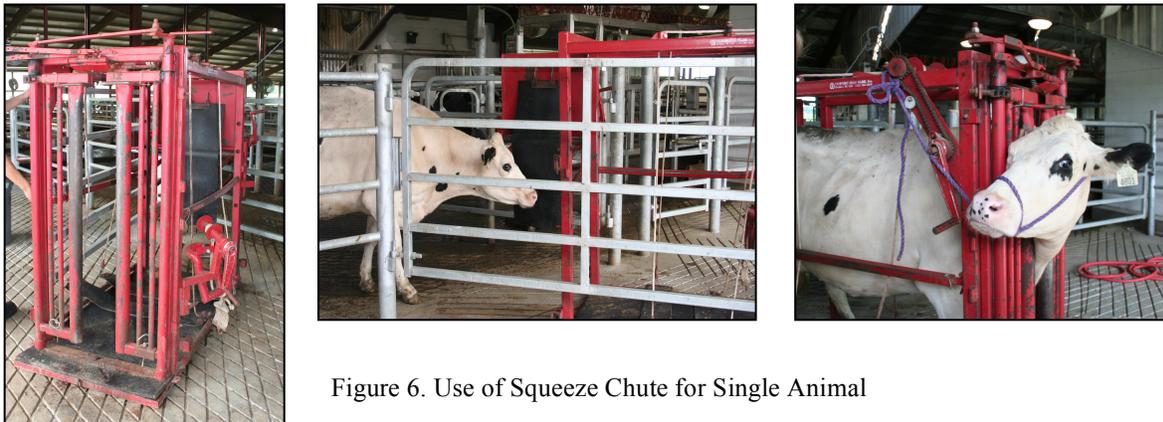


Figure 6. Use of Squeeze Chute for Single Animal

- v. Applying even pressure with the squeeze allows the animal to remain upright and balanced; optimal pressure induces a calming effect.

SOP: CATTLE RESTRAINT

- vi. If animal should go down while restrained, prolonged pressure against the carotid can cause asphyxiation. A simple technique for encouraging animal to stand back up involved placing flat hands firmly over both nostrils to occlude breathing (Figure 7). The animal will hop up and back to take a deep breath and usually right itself. Handler should position themselves so as to not get hit by animal movement. If the animal does not get up, the rope lead and squeeze chute and/or head gate should be released.

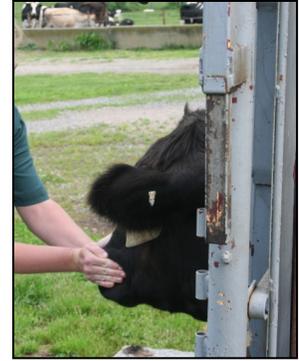


Figure 7. Occluding Nostrils

c. Tail Restraint

- i. The tail lift acts as a distraction to prevent kicking. When done properly this technique will not break the tail, but will pinch the vertebrae and the caudal nerves sufficiently to keep the animal from kicking and reacting to manipulations in other areas.



Figure 8. Tail Restraint

1. Tie the animal up or put it in a stanchion, and stand directly behind it.
2. Lift the tail with one hand and grasp the base of the tail with the other.
3. Lift the tail gently but firmly straight over the back, until resistance is felt, making sure to only bend up from the base. Maintain constant pressure without excessive exertion.
4. The tail can also be curled slightly to maintain hold (Figure 8).

d. Chemical Restraint

- i. In addition to the previous methods of restraint, chemical restraint may be required for major procedures under the direction of a veterinarian.

V. Variations

There are many variations for cattle restraint, including nose tongs or manual nose twitch which divert attention (as does the tail restraint), flank rope, hobbling, flanking and casting.

VI. Potential Adverse Effects, Mitigation, or Treatment

a. Trauma

- i. Bruising, lacerations, fractures, neuropraxia, permanent nerve damage
 - a. Contact veterinary staff

b. Distress

- i. Physiological changes

SOP: CATTLE RESTRAINT

- a. Tachycardia, tachypnea, hypertension, hyperthermia, etc.
 - i. Contact Veterinary Staff
- c. Metabolic/hematologic disturbances
 - i. Stress leukogram

VII. References

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DON'T GET STUCK



- ✓ Don't rush injections
- ✓ Don't recap needles
- ✓ No needles in pockets
- ✓ No caps in mouth
- ✓ Discard bent or dull needles
- ✓ Approved sharps containers

GOT STUCK?

- Wash the skin with soap and water immediately
- Report injury to your supervisor right away
- Call your health care provider
- Call Poison Control: 1-800-222-1222



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