

## "Darts to deliver medications is a serious BQA concern."

Dee Griffin, DVM, UNL-GPVEC, October, 2015

There seemingly is logarithmic growth in the use of darts for delivering medication in pasture setting. The rumor is the Pneu-Dart company sold 4 million darts last year. That said, cattle folks when questioned most often mention Cap-Chur darts as the system they use. Additionally, Medi-Darts manufactured by a Canadian company sell medication darts in the U.S. With the growing adoption of darts for remote delivery of medication, undoubtedly new medication dart manufacturers will develop.

The NCBA BQA developed a dart use advisory statement (Appendix). While pro-dart proponents find fault with some of the bullets listed, it is important to note, multiple phone calls and letters sent to the manufactures from both the NCBA and the AVC starting in 2012 requesting dart use information were ignored. It is vital for remote-medication-delivery efficacy information to be available and accurate. Information such as the manufacturer's dart delivery system's ability to deliver a medication dart safely to the BQA injection triangle located on cattle necks and a dart's ability to deliver an intended volume of medication at an intended SQ or IM route of administration required by the FDA. The final paragraph in the NCBA advisory statement includes the information requested. This paragraph summarizes critical issues with medication dart usage.

**MOST IMPORTANT:** It seems to me important to reaffirm the importance of following BQA guidelines for medication use.

In situations in which remote delivery of medication must be used, it should comply with the National BQA Guidelines for; Injection site selection (Figure 1 and 2), Routes of administration, Needle selection, Medication selection, Medication volumes, Keeping proper medication use records and Actions required should a broken needle leave metal in the animal.

Besides reaffirming the important to follow BQA guidelines for injectable medication use, there are several pragmatic cautionary statements that should be considered for inclusion in the discussion. These include ...

### Points of concern:

- There are confirmed reports of darts and/or dart components being found in carcasses at packing plants. Adulteration of food by with metal violate food safety regulations and is prosecutable.
- There are confirmed reports of injection site abscesses from medication dart usage. These are likely caused by using unsterile darts and/or contamination while filling the dart with medication. Confirmed fatal cases of phlegmonous cellulitis have occurred from contaminated needles.
- There are confirmed reports of violative drug residues being traced to medication dart usage.
- The FDA regulates the approval of routes of administration of all animal drugs. Dart deliver falls under the FDA AMDUCA regulations and therefore all drugs used in medication dart require a Valid Client Patient Relationship with a licensed veterinarian. These regulations require the use, including route of administration of all prescription medications to strictly follow the written directions of the veterinarian prescribing the drugs. Without these written instructions the use of medications in darts is illegal.
- Over powering the dart deliver charge can easily implant the body of the dart through the animal's hide and leave the dart embedded in the animal's muscle.

- Ballistic tests at UNL-GPVEC with both of the common systems in use (Pneu-Dart and Cap-Chur) using a scoped rifle clamped in a sighting stand demonstrate targeting at 20 yards and beyond fail to keep the darts delivery within a six inch target, therefore the ability target a 6" BQA injection site triangle would be unlikely. In these tests medication darts failed to deliver the full dose contained in the dart over 10% of the darts fired. Additionally, the tests indicate charges larger than the green charge in 22 caliber dart rifles should not be used to deliver a medication dart within 20 yards of cattle. Within 20 yards, yellow, Red and Black charges are not acceptable.
- Medication darts have horrible flight predictability. UNL-GPVEC tests with a scoped medication dart rifle in a gun vice target at 20 yards had a precision of 6". When the medication viscosity was changed the hold on the target changed. When darts were not completely filled the precision degenerated between 4" to 6" meaning the darts had a 10" to 12" spread at 20 yards.
- There are reports of cattle being injured by darts hits their heads, fracturing shoulder blades and spinal damage from darts hitting cervical neck vertebrae.
- Targeting areas other than the BQA injection site triangle such as the rear leg is never acceptable!
- There are reports of cattle becoming so "gun shy" the entire group became difficult to handle. Some cattle will react wildly with exaggerated movement following darting trying to shake the dart from their body.

#### **Additional points:**

- Medication dart manufactures continue to ignore repeated requests to responsibly supply efficacy of their systems to deliver the intended volume of medication and to consistently deliver low velocity medication darts within a 6" BQA injection site triangle on cattle necks.
- Safety to humans & animals is critical, therefore never use a medication in a dart that could cause death or severe tissue damage when injected. Examples include tilmicosin, flunixin and 300 mg/ml oxytetracycline.
- Only select remote medication delivery when moving an animal to a proper treatment facility that offers adequate restraint is not possible.
- Never use a medication protocol that requires more than one dart to deliver the needed treatment medication. If the animal is so sick as to require multiple drugs they should be to a treatment facility so that proper examination and restraint can be provided.
- Darts should never be used unless the animal's health and well-being are in jeopardy. Therefore, convenience should never be a consideration when making the decision to use remote medication delivery.
- Never attempt to dart a moving animal with a treatment medication.
- Darts should never be used for delivery of vaccines or other products not intended to address the animal's immediate health and well-being.
- Dart delivery should be as close to the animal as practical. Five to 10 yards if possible but never farther than 20 yards.
- Use the lowest powered delivery charge that will allow the dart to reach the animal. For this reason, pneumatic dart delivery guns such as CO2 or pump-up pistols and rifles may be more appropriate than rifles that use 22 caliber charges.
- To help avoid using an inappropriate size charges, purchase multiple magazines so that different size charges can be readily available for dart systems that require different size charges for different distances.
- Never use dart delivery charges that are not provided by the dart system manufacturer. Never use charges designed to for nail guns in medication dart delivery guns.
- Improve sighting of the medication dart delivery guns. Example: adding a Red Dot scope.
- Maintenance of dart delivery systems is critical.

- Dart system usage training and non-animal target sighting and practice is critical. Additionally, re-sighting with practice darts is critical before animal health episodes that may require remote medication deliver.
- Cleanliness and sterility of darts is critical !!! Refillable darts must be thoroughly cleaned just as re-usable syringes are cleaned with hot water, not using soap or disinfectants and a final sanitizing with boiling water.
- The size of the dart select must match the volume of the medication to be delivered. Partially filled darts have an erratic flight pattern, therefore the targeting is not dependable. Currently dart manufacturers do not label the size of the darts they sell so it is important for dart users to keep the different sizes separate.
- Never mix medication in the same dart and never add liquid fillers so as to completely fill the dart medication chamber ... select the proper size dart.
- Never select darts that will hold more than 10 CC of medication.
- Never select a medication that will require more than 10 CC to effectively treat the animal.
- Only 1/2" and 3/4" dart needles 16 gauge or larger should be selected. To better obtain a SQ injection, the 3/4" needles should utilize medication expelling ports located on the side of the needles. Never use dart needles longer than 3/4". Never use barbed dart needles.
- Only select medications that are labeled for both SQ and IM use, as delivery for either SQ or IM is not dependable. Medications that are not approved for use as either SQ or IM in the neck region, such a Excede which is approved only for injection at the base of the ear or Flunixin which is approved only for IV injection, are never acceptable.
- Federal regulations require medication use records be kept that include the; Date, Animal ID (minimum is their description and group), Name of medication used, Amount of medication used and Assigned Withdrawal (the withdrawal can be applied to the entire group based on the last animal treated in the group).
- Dart users should make a serious attempt to recover all spent dart! Serious injury to cattle, a horse or especially a human could occur if spent dart is stepped on. When possible, select darts that the manufacturer has painted safety orange or safety lime green to make them easier to find following use.
- Follow all safe gun use rules such as; keeping the safety on until ready to fire, always point in a safe direction, know your target, know what's beyond your target, etc.

## Appendix

### **BQA Advisory Statement Regarding the Use of Pneumatic Darts or Other Remote Injection Methods in Cattle.**

NCBA BQA Advisory Board, June 2015

BQA Guidelines for the administration of injectable drugs/products to cattle are available in the BQA National Manual and at [bqa.org](http://bqa.org) and other places.

There are no BQA guidelines for the administration of injectable drugs/products by the use of pneumatic darts or other similar methods designed to administer injectable products into cattle from a distance.

There are several challenges associated with the use of pneumatic darts or similar technologies for the administration of injectable drugs/products to cattle, including but not limited to the following:

1. Accurate assessment of cattle weights is not possible in these situations, leading to inaccurate dosing. Under dosing of antibiotics promotes an increase in antimicrobial resistance. Over dosing unnecessarily increases the costs of production and may increase withdrawal times.
2. The volume of many appropriate drug dosages cannot be accommodated with the current dart technology.
3. The product delivery can be administered to non-approved injection site(s) resulting in off-label or illegal drug use. This would include the subcutaneous administration of an intramuscular drug or vice versa.

4. The potential for significant bruising or collateral injection site lesions is directly in conflict with BQA guidelines and principles. Additionally, accurate individual identification becomes much more challenging, leading to mis-identification, inaccurate withdrawal time assignment, increased potential for illegal residues, and/or managing a group of cattle based on the withdrawal time of a single unidentified animal.
5. The needles' potential to penetrate ligaments, joints and other tissues could result in permanent damage to the cattle, raising concerns for animal well-being and additionally, result in ineffective therapy.
6. Injection(s) administered beyond label directions without a veterinarian's approval and prescription is considered an extra label drug use (via method of administration) and may be out of compliance with FDA regulations.
7. The possibility of needles remaining in the tissue following this type of administration presents an additional risk. Darts that remain attached to the animal for a period of time and subsequently become dislodged in the field or pasture can become a hazard to other livestock or personnel.
8. The entire dart can become imbedded in muscle tissue and create a significant BQA issue at the packing plant or at the consumer level if not identified at the packing plant.
9. Experiences with the use of darts in cervid production indicate that "gut shots", broken limbs, darting the wrong animal, establishing the correct animal ID for drug withdrawal records, and other problems are commonplace and do not conform to BQA guidelines for food animal production.
10. The potential for illegal compounding of drugs is probable with these methods.
11. In the process of trying to target the injection triangle in the neck, it becomes more likely for the dart to strike sensitive tissue in the head, such as the eye or cranial nerves.
12. Some antibiotic compounds have significant human health impacts if accidentally injected into people. An accidental occurrence of an injection into a human could result in death.
13. The cylinder of the delivery dart, where the antibiotic or other injectable product is placed, can become contaminated by bacteria. This can promote antimicrobial resistance as well as infections/abscesses at the site of injection.

Companies manufacturing, selling and promoting these methods of drug and product delivery have the responsibility and the obligation to develop data to establish efficacy, safety, animal welfare, food safety, and other concerns as compared to current BQA approved methods of drug/product administration. It is also possible that FDA approval may be required for drug delivery by these methods of injecting drugs/products and that issue needs to be addressed by the manufacturers. Until such time as this critical data becomes available these methods do not meet BQA injectable product administration guidelines.

