

## DARTING

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### Workshop Objectives:

- Review the necessary preparation involved in darting an animal
- Familiarize the participants to:
  - Essential safety issues
  - Best darting strategies
  - Assessment of darting equipment and dart preparation
- Provide hands-on practical experience using various darting equipment

Stress is an ever-present phenomenon that may nullify any good done by well-intentioned therapy

W.J. Boever

### Introduction

- Each procedure will have some effect on the behavior, life and activity of the animal. Each of the following questions must be addressed:
  - Is the procedure justified?
  - What procedure will produce the greatest gain with the least hazard?
  - When will it be most desirable to proceed?
  - Who is the most qualified to accomplish the task with the least stress to the animal?

### Evaluating the situation



### Planning

- What is the procedure?
- Is this an emergency?
- Address all safety issues (animal and staff)
- Make sure the equipment is working (maintenance and testing prior to procedure)
- Training of staff (on going and review)



## Planning

- Determine environmental conditions
  - Temperature
  - Humidity
  - Time of the day
  - Intensity of the wind
- Assess location
- Determine if method of confinement is safe
- Can the animal be observed post-procedure?



## Considerations

- Which species is involved?
- Determine the psychological status of the individual
- What is the present condition of the animal?
- Review past history with darting

## Considerations

- Location of procedure
  - Small area, no moats or pools, bedding, solid walls
  - Adjacent pen free
- Isolation of animal if possible
- One animal at a time
- Keep area QUIET



## Risks related to locations:

- Escape behavior
  - Running away from predator
  - Running animals are unable to see obstacles
  - For some species: safety = water



## Risks related to behavior

- Social species
- Prey species
- Herd mentality
- Male aggression
- Aggression towards the injured or sick
- Mixed species exhibits: dominant males will chase weaker animals



## Training to facilitate administration of drugs



## Training to facilitate administration of drugs



## Delivery Systems

- Oral administration
  - Transmucosal absorption
- Hand injection
  - Stationed animal
  - Squeeze cage
  - Net
- Pole syringe
- Darts and projectors

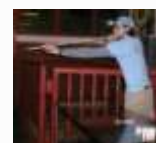


## Pole syringe



## Remote Delivery Systems: Effective Darting Range

- Blowpipe (1-10 m)
- Pistol
  - Air/gas propelled 1-15 m or 1-30 m
  - Explosive charge propelled 10-30 m
- Rifle
  - Air/gas propelled 2-40 m
  - Explosive charge 10-60 m



## Remote drug delivery systems

- Powdered charged projectors
- Carbon dioxide powered projectors
- Compressed air powered projectors



## Darts: discharge mechanisms

- Explosive
- Air or gas activated
- Spring activated
- Soda acid activated

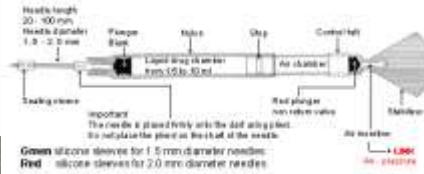


Cap-Chur Syringes w/ Side Port Dropout Needles



## Darts

www.dan-inject.com



## Darts



## Specialty Darts: Biopsy Needle



www.dan-inject.com

## Remote Drug Delivery System Kit



## Injection sites



## Injection sites



## Darting confined animals

- Isolate the animal if possible
- Remove obstacles, platforms
- Restrict access to water
- Make direct shot is available
- Make sure other animals and humans are not in the target line



## Darting strategies

- Approach from the ground (hide/vehicle)
- Approach from the air (helicopter)

## Darting



- Approachability of animals depends on their past experiences with humans
- Animals used to tourist trucks will react differently to truck driving off roads and purposefully pursuing them
- Approach from ground (greater range) or from air

[www.gamecapture.info](http://www.gamecapture.info)

## Darting from a vehicle



- Get as close to the animal as possible (approach closer with vehicle than by foot)
- Drive on roads as much as possible, use tangential approach, stop often, avoid direct approach towards group/herd
- Adjust your approach according to the reaction of the animals





## Darting from a vehicle



- Wait for the animal to be at the periphery of the group and has exposed hindquarters
- Make sure the trajectory is not obscured by as much as a twig (dart will deflect)
- Once the animal is darted never let it out of your sight
- The animal may run off for a while. If there is no further disturbance, the group will stop. If the animal runs fast, stay with it
- Wait for the clinical signs of sedation, ataxia

## Darting from a hide



- Observation of the behavior of the animal to determine pattern and response to other species
- Place the bait outside the hide (same time of the day), wait for the animal to approach, equipment ready to fire

## Darting from a hide

- Be aware of wind direction (avoid light colored clothes, strong perfumes, tobacco)
- Avoid excessive activity in hide
- Have effective tracking after the animal is darted



www.ramsar.org

## Darting from a helicopter

- Strong, reliable with stable darting platform
- Pilot with capture experience
- Prepare all the darts in advance and set gun at appropriate range (Telinject /DanInject darts may be too fragile)



newlewa.org

## Darting from a helicopter

- Notify ground crew of location of herd/animal
- Evaluate the terrain (tree, bush cover, river)
- Pilot will guide you
- Select the animal to be darted and if possible isolate it from the group



www.thabamanzi.co.za/

## Darting from a helicopter

- Approach from the back, aim at rump, upper hind legs, either sides of tail
- Make sure dart is entering perpendicular to skin; fire only under best circumstances and when helicopter and animal are traveling at same speed – no need for shooting ahead



www.thabamanzi.co.za

## Darting from a helicopter



www.ifaw.org

## Darting from a helicopter

- Once the animal is darted, it should be herded towards the ground crew and away from problem areas (< 1 minute to avoid excitement during induction)
- If the animal is recumbent before the ground crew arrives, you will be dropped to assess it.



www.wt.org.uk/



www.thabamanzi.co.za

## Complications of darting

- Wrong animal darted
- Animal too stressed
- Failure of drug delivery
- Intraosseous injection
- Improper dosage
- Trauma from projectile
  - Muscle
  - Fractured bone
  - Infection



## Human safety:

- Carfentanil, Etorphine, Thiofentanil:
  - Potent opioids: severe respiratory depression, death
  - Transmucosal (ocular, nasal, oral) or percutaneous absorption
- Other anesthetics: do not underestimate danger
- Accidents if negligence during loading or cleaning of darts or careless handling of equipment



*Emerg Med J* 2005; 22:524-525

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Accidental human poisoning with a veterinary tranquilliser . F H Cummins

## Human safety

- Site of use (zoo, in field, abroad)
- On site human exposure protocol (drills)
- Notification and training of staff, local hospital and emergency room personnel (incl. paramedics)



## Human Safety: Prevention

- First aid kit: CPR equipment, drug labels and inserts, antidotes
- Never work alone when preparing, using or cleaning darts
- Train staff to recognize clinical signs post-exposure



## Human Safety: Prevention

- Wear protective glasses/shield, gloves (double?), long-sleeve jacket
- Avoid spraying, spilling, squirting drugs
- Treat darts, syringes and gun with utmost care
- Locate and retrieve darts immediately after use
- Loading of darts in helicopters is hazardous



## In case of human exposure:

- Seek medical help immediately – communication cascade
- Wash area immediately
- If injected use pressure bandage to reduce absorption (?)
- Monitor consciousness and breathing
- Place an IV catheter
- Decide if antidote is needed (naloxone, naltrexone)
- CPR if warranted
- Transport to medical unit - bring first aid kit with patient

## Practical experience

- Physical restraint
  - Proper physical restraint of various species
  - Use of ropes
  - Use of rabies pole
  - Use of squeeze cage (for injection)
  - Use of live traps
  - Use of foot hold trap
  - Use of pole syringe
- Darting
  - Description of equipment (pistols, blowpipe and darts)
  - Practice darting using pistol
  - Practice darting using blowpipe



Practical experience



Practical experience

