IMMOBILIZATION OF CROCODILES



Dr. Silke Pfitzer

Dr. Samuel Martin

Dr. Paolo Martelli

Wildlife Pharmaceuticals (Pty) Ltd

Why should we immobilize crocodiles?

- Trade and transport between farms
- Wild crocodiles can be a nuisance and need translocation
- Escaped crocodiles from farms
- Research
- Medical attention
- Crocodile industry - management



Methods:

- Mechanical capture
- Chemical capture
- Electric Immobilisation
- Combination



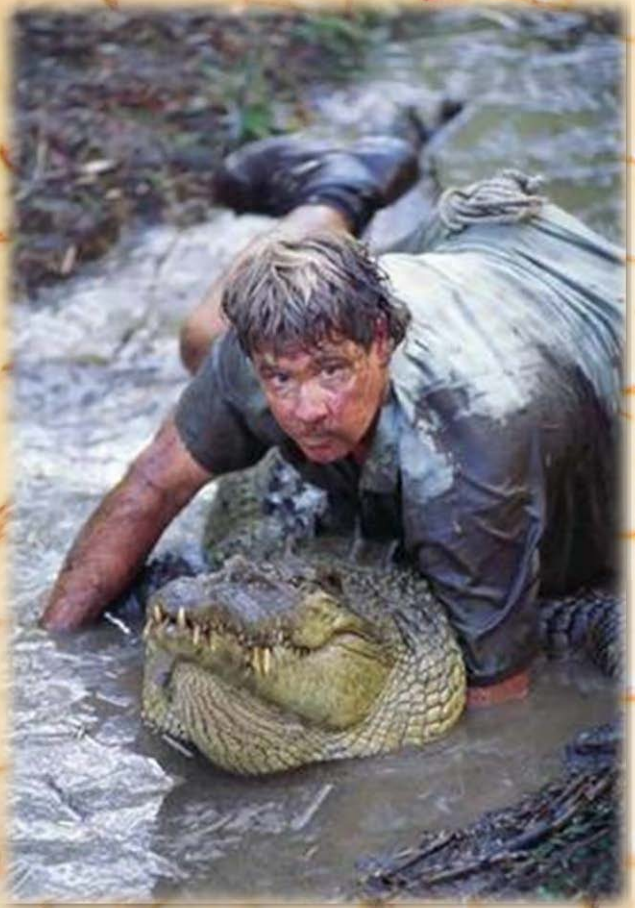


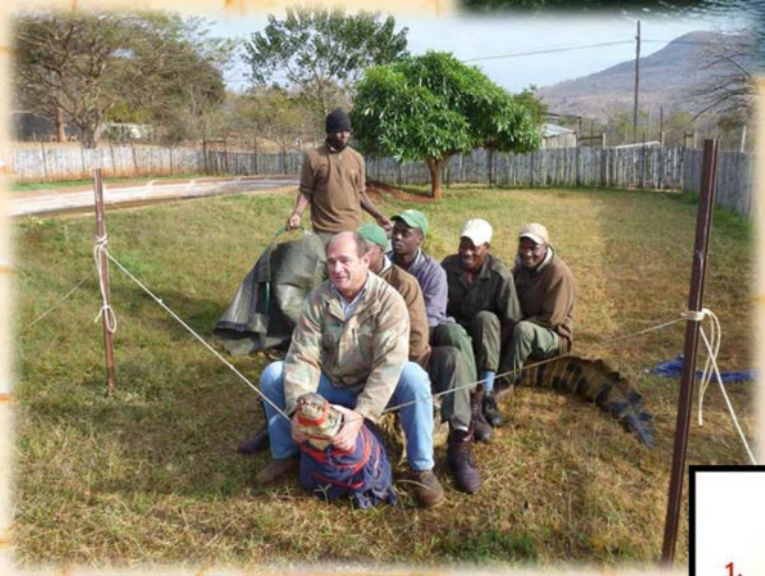


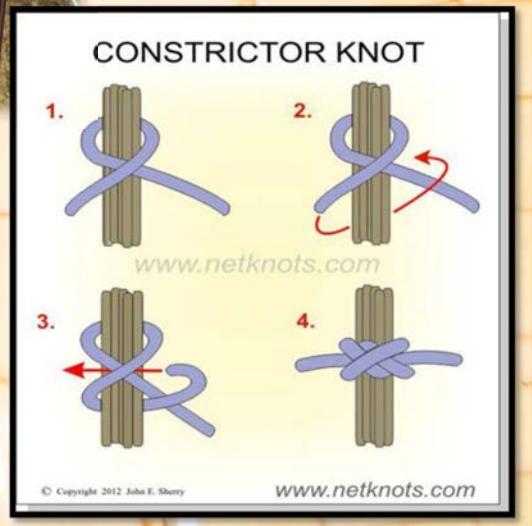


Mechanical capture









Transport







Chemical Immobilization



Basic rules:

- **Starve crocodiles 48 hours (where possible)**
- **Remove water to avoid drowning**
- **Drug absorption and distribution is temperature dependent in reptiles!**
- **Blindfold**
- **Preferably inject in front half of body (renal portal system / first pass effect)**

Immobilization Drugs

- Opioids ✓ reversible
- Alpha-2 agonists ✓ reversible
- Cyclohexamines
- Benzodiazepines
- Muscle relaxants
- Combinations



Opioids

- Very high dosages – limited opioid receptors

- <u>Capture:</u>
- Etorphine (0.3-0.5 mg/kg)
- Thiafentanil

- <u>Pain:</u>
- Butorphanol (0,6-2mg/kg)
- Morphine (1mg/kg)
- Hydromorphone (1mg/kg)

- Antagonist: Naltrexone



Alpha-2 agonists

Often combined with Ketamine or Butorphanol



- **Xylazine: 0.5mg/kg (with Ketamine)**
- **Medetomidine: 0.05 - 0,2mg/kg**

<u>C. porosus:</u> (Olsson & Phalen 2012 / 2013)
0.5mg/kg for juv.
0.13-0.17mg/kg for adults (metabolic scaling)
Induction: 20 min



<u>Antagonist:</u>
Atipamezole: 5mg Atipam. per 1mg Medet.

Cyclohexamins

- **Ketamine: 2-5mg/kg**
- **Zoletil / Telazol: 3-8mg/kg**







Benzodiazepines



- **Diazepam (Valium): 5mg/kg (unpredictable)**
- **Midazolam: 1mg/kg**



Others

- **Alfaxan: 2-5mg/kg IM/IV**
- **Alfaxolon: 20-30mg/kg IM/IV**
- **Propofol: 2.5-5 mg IV**
- **Thiopentone: 15mg/kg IV**



BAM Combination



- Butorphanol 30 mg/ml
- Azaperone 12 mg / ml
- Medetomidine 10 mg/ml

1ml per 50 kg crocodile

Reversible:
- Naltrexone:1mg per mg Butorphanol;
- Atipamezole: 5mg per mg Medet

- No righting reflex
- No pain reflex



Medetomidine / Ketamine



<u>Nile crocodiles</u>:

- **0.1 to 0.3 mg/kg Medet. + 5 to 10 mg/kg Ket.**
- **Unpredictable induction: 20 to 105 min**
- **Acceptable anaesthesia for minor procedures**
- **Acceptable muscle relaxation**
- **Wide safety margin**

<u>Alligators</u>: (Heaton-Jones et al. 2002)

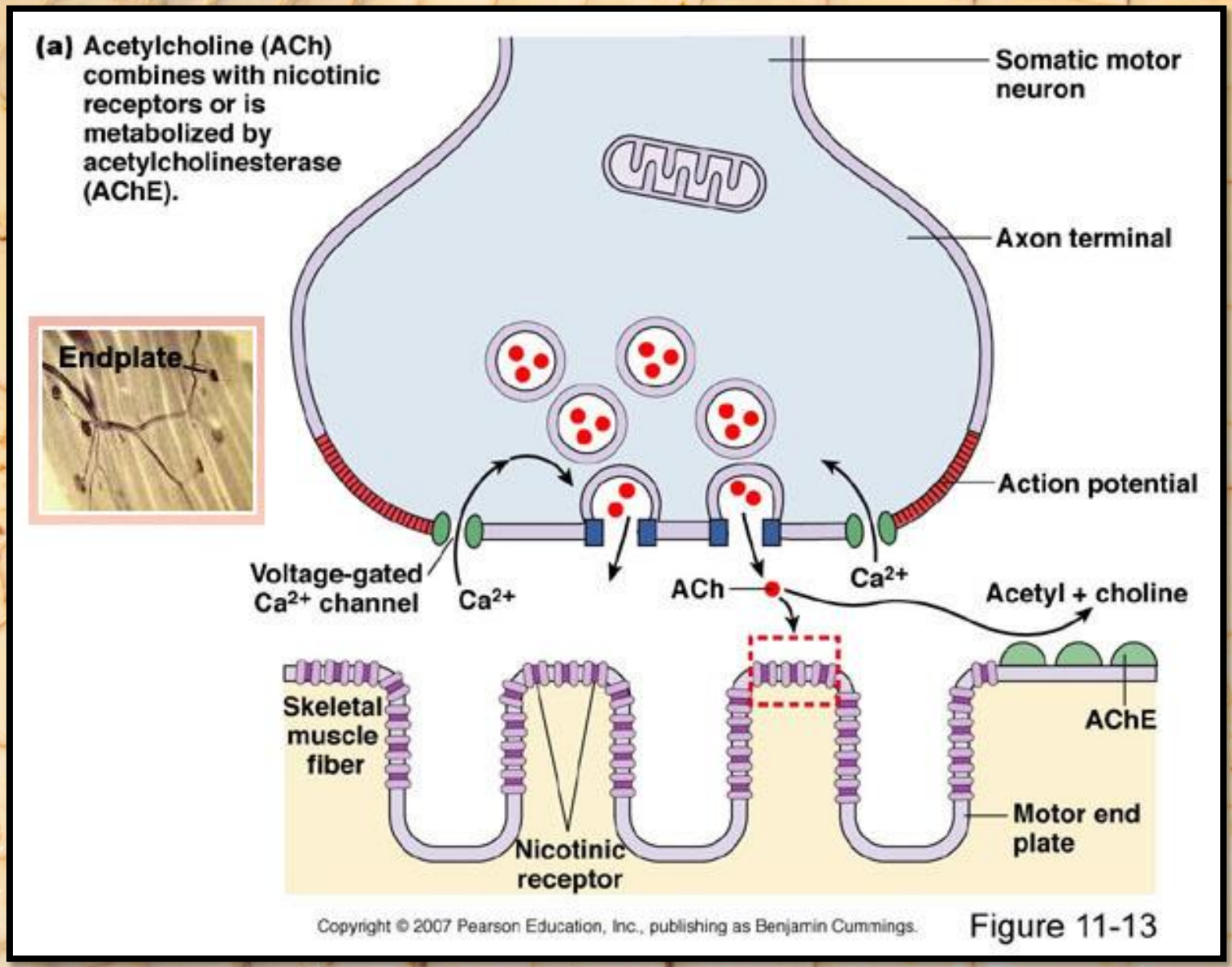
- **0.2 mg/kg Medet + 10mg/kg Ket.**
- **Induction: 20 – 30 min**

Muscle relaxants



- Succinylcholine(depolarising)
- Gallamine (non-depolarising)

- Animals are fully conscious – blindfold!
- Danger when lifting (use ladder)
- Resp. depression
- No antagonist



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Figure 11-13



Gallamine dosage: 0.4 – 2 mg/kg

Nile Crocodiles: 40 mg/m

Anaesthetic monitoring

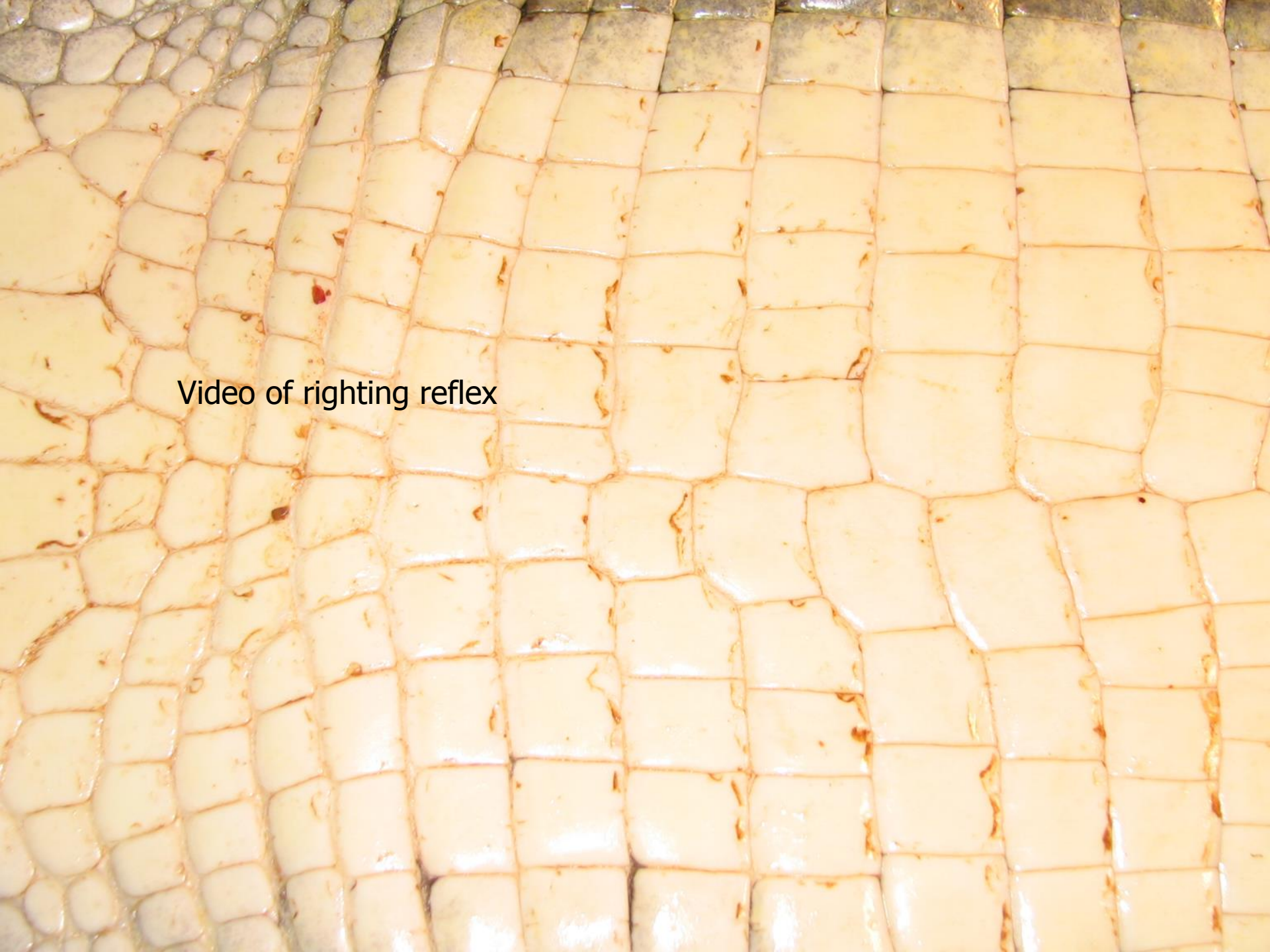
Depth of anaesthesia:

- Righting reflex
- Pain reflex
- Nictitating membrane reflex

During anaesthesia:

- **Respiration rate**
- **Heart rate**
- **Pulse oximeter**
- **Multi-monitor**

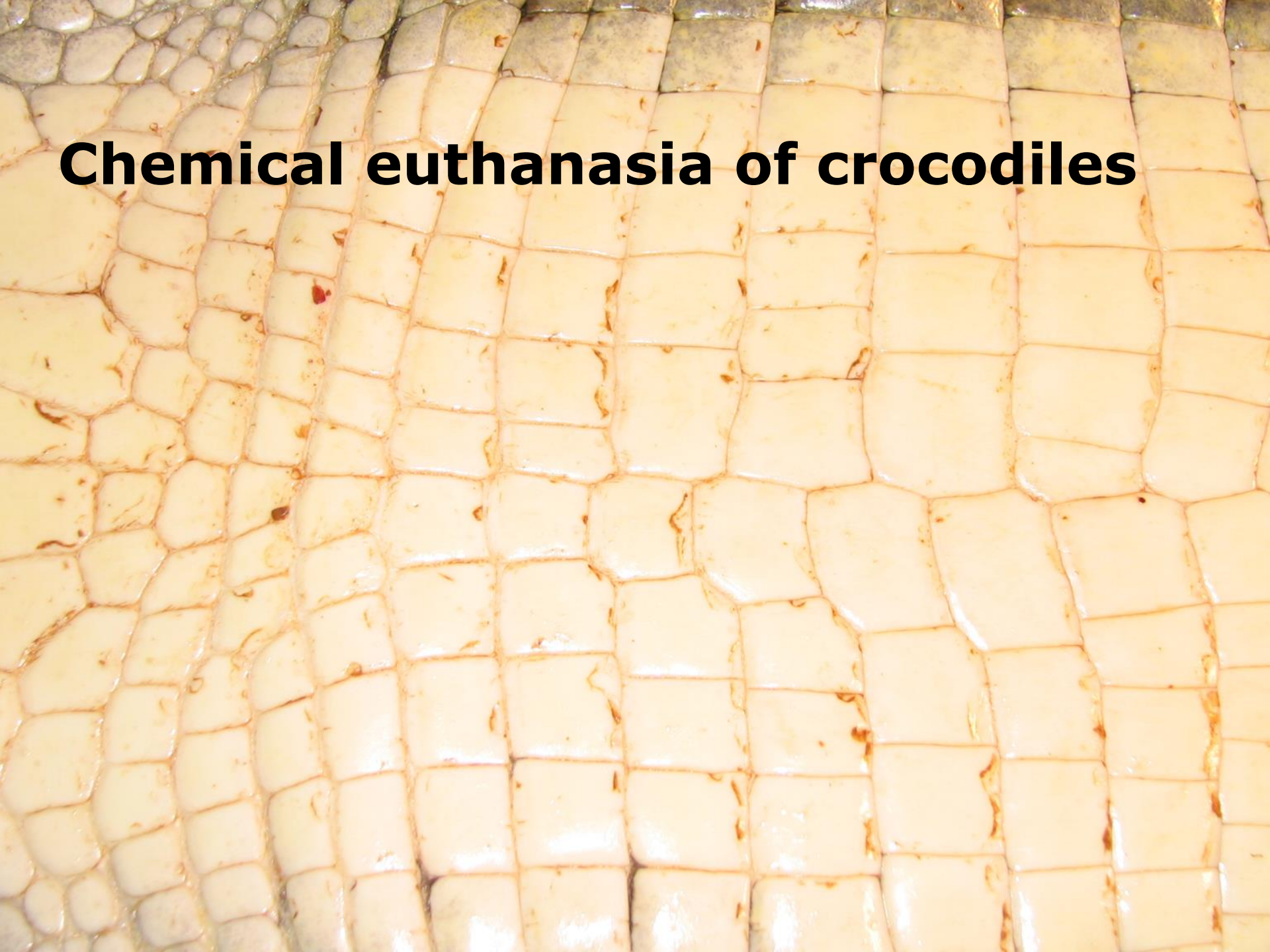
- **Monitoring of crocodiles can be challenging**


Video of righting reflex

Pain Management

- Opioids
- Non steroidal anti-inflammatories (NSAID)
- Local blocks

Chemical euthanasia of crocodiles



Questions / Discussion

