

CNS Excitation Toxicities

STRYCHNINE (aka nux vomica)

Infrequent poisonings (in NZ) as no longer sold here as a rodenticide, still available overseas

Nux vomica is used as a stimulant in Ketovet®

Dog - LD₅₀ 0.5 mg/kg

- Muscle rigidity
- Sawhorse stance
- Opisthotonos
- Violent seizures (stimulated)



Mechanism of Action

STRYCHNINE

ANTAGONISES

AXON

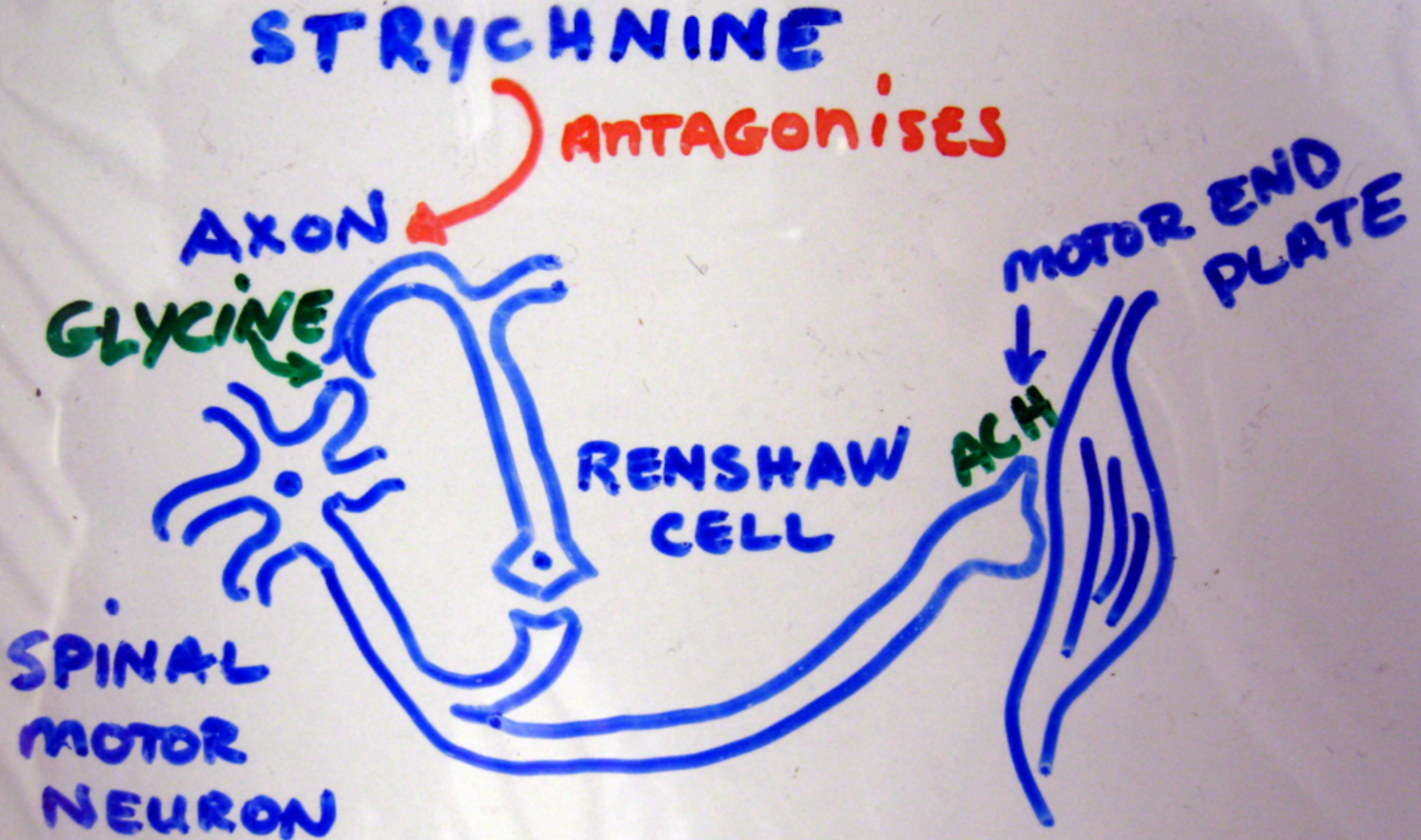
GLYCINE

MOTOR END PLATE

RENSHAW CELL

ACh

SPINAL MOTOR NEURON



CNS Excitation Toxicities

STRYCHNINE TREATMENT

Would you, should you, give an emetic? Why or Why not?

- Anticonvulsants
- Symptomatic and supportive care
- Dark, quiet environment
- Acidify the urine EXCEPT if acidotic

CNS Excitation Toxicities

CHOCOLATE



- methylxanthine
 - theobromine, caffeine
- chronotropic and inotropic cardiac effects
- causes diuresis (like coffee)
- dark chocolate more toxic than milk chocolate

| COMPOUND | COMBINED METHYLXANTHINES | AMOUNT CHOCOLATE TO HARM | |
|--------------------------------|--------------------------|--------------------------|----------|
| | | 5kg dog | 20kg dog |
| White chocolate | 0.04 mg/gm | 14 kg | 56kg |
| Milk chocolate | 2.26 mg/gm | 250gm | 1kg |
| Dark sweet choc | 5.29 mg/gm | 106gm | 427gm |
| Dark baking choc (unsweetened) | 15.52mg/gm | 36gm | 144gm |
| Cocoa beans | 21.16mg/gm | 26gm | 105gm |
| Cocoa powder | 28.21mg/gm = 2,257mg/cup | | |

[chocolate calculator](#)

CNS Excitation Toxicities

CHOCOLATE

- Hyperactive, restless, vomiting
- Hyperthermia
- Urinary incontinence
- Hyperreflexive
- Cardiac arrhythmias (tachycardia)
- Ataxia, seizures and coma



CNS Excitation Toxicities

CHOCOLATE TREATMENT

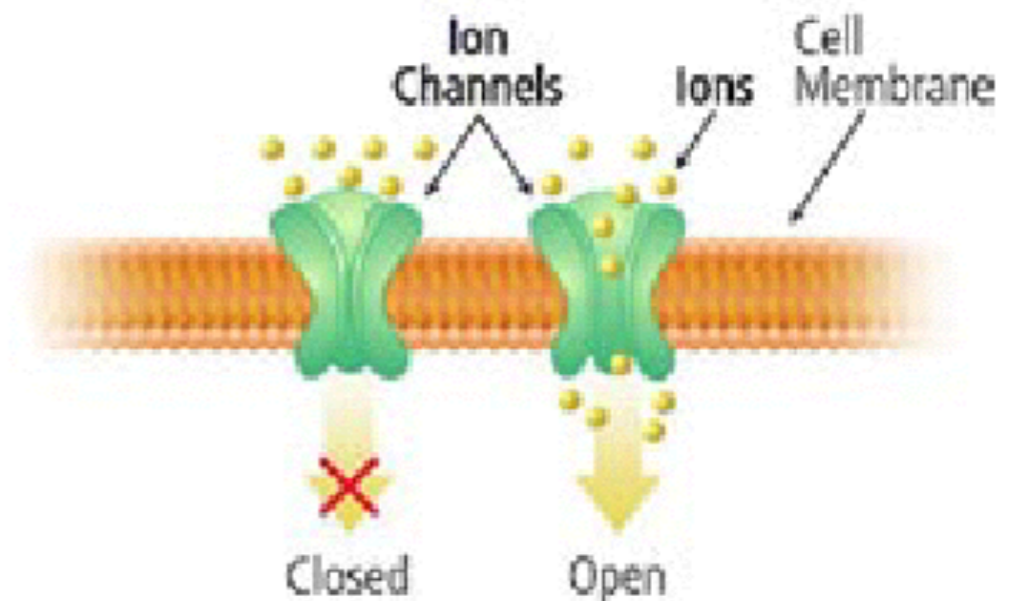
- Decontaminate - Repeat Activated Charcoal
- Anticonvulsants
- Symptomatic and supportive care
- Premature Ventricular Contractions -
lignocaine
- Tachycardia - beta blockers if persist

CNS Excitation Toxicities

RYEGRASS STAGGERS

SOURCE

- Mycotoxin - Lolitrem B (Neotyphodium lolii)
- Ryegrass pastures (Lolium perenne)



Ions enter and exit cells through pores in the cell membrane created by ion channels. Ion channels open and close in response to particular stimuli. BK channels open in response to calcium, to changes in electrical voltage, or to drugs. Two ion channels, in open and closed conformations, are shown.

CNS Excitation Toxicities

RYEGRASS STAGGERS

Clinical Signs

- Trembling, twitching of muscles
- Head nodding, jerky movements
- Incoordination, ataxia
- Severe - opisthotonus

CNS Excitation Toxicities

RYEGRASS STAGGERS

Treatment

- Symptomatic
- Provide feed, water and shelter if severe
- Most deaths are from misadventure so avoid "traps" in paddocks, e.g. dams

Is it poisoned?

- **History:** It is spring time. A Linton Camp dog owner is away. Neighbor looking after dog discovers it is missing. A search of the neighborhood finds the dog in a distressed state. Rogan is a 5 yo male, mixed breed dog, weighing 33kg.
- On physical examination the dog is alert, salivating, and has a TPR of 39.7, 160 bpm, 60 bpm. He is incoordinated and has whole body muscular tremors.
- Neighbor has no idea what the dog has been doing for the past several hours.
- Is it poisoned?
- **What are you going to do?**

Is it poisoned?

- Rogan 5 yo male mixed breed dog, 33kg.
- dog is alert, salivating, TPR of 39.7, 160 bpm, 60 bpm, incoordinated, whole body muscular tremors.
- While you begin treatment the dog starts convulsing.
- What are you going to do now?
- What would be highest on your list of differentials?