

Snakes 101: Introduction to pet snakes

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Who are we:

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What do we do? *Giants*

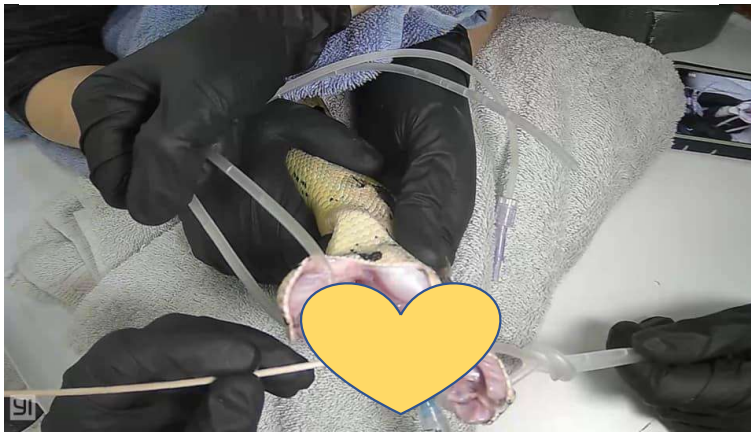


What do we do?

Medical



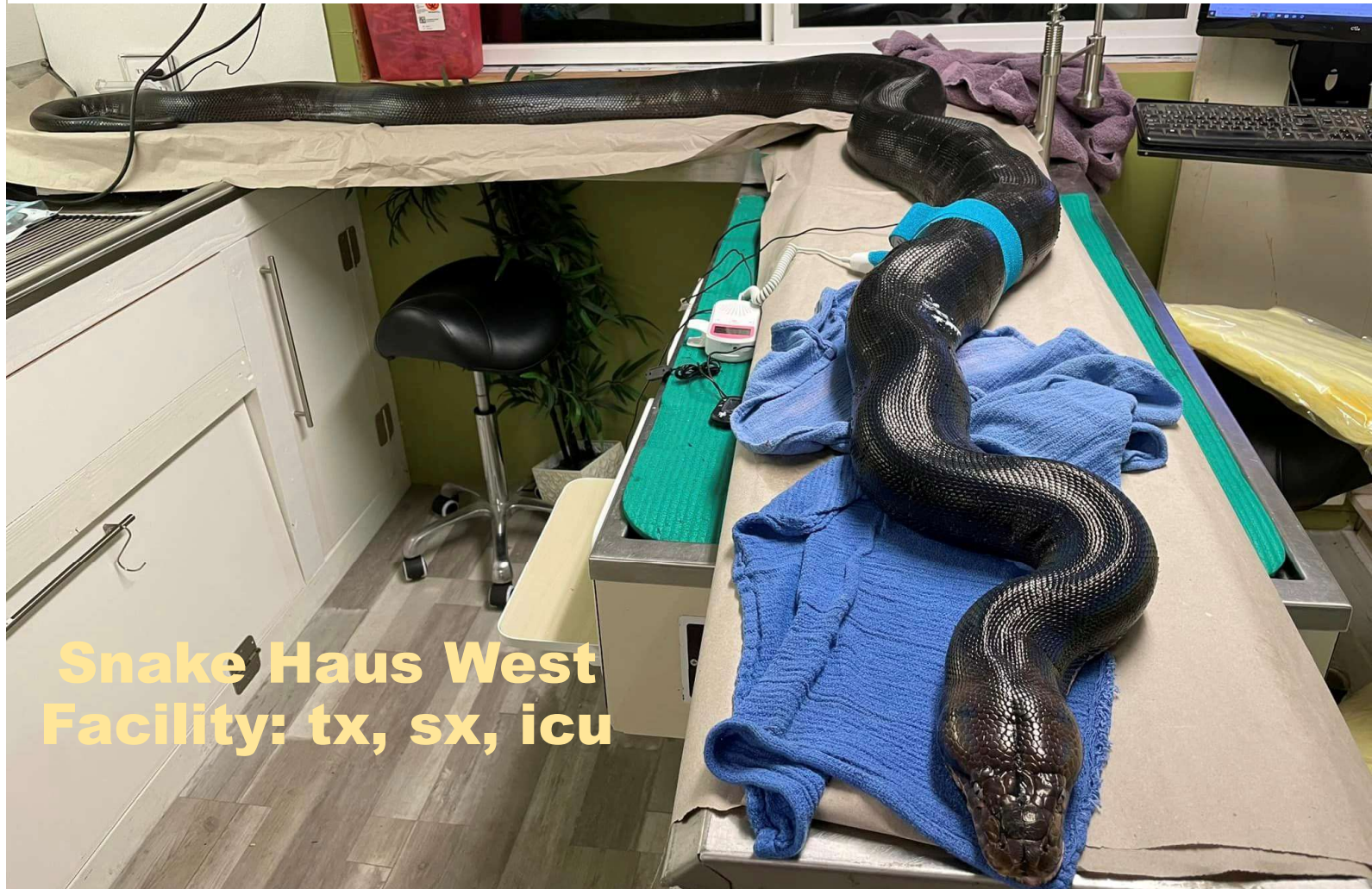
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Behavioral



What do we do? *surgery*



**Snake Haus West
Facility: tx, sx, icu**

Topics

- 1) What makes snakes unique:** special anatomy and physiology
 - 2) Snake Behavior:** understand them
 - 3) Husbandry and basic care**
 - 4) When and how to intervene**
 - 5) Types of snakes:** common pets, identification, and behavior
- LIVE ANIMALS at the end



Topic 1: What makes snakes unique?

- **Ectotherms:** solar powered
- **Thermoreception:** heat pits
- **Special anatomy:**
 - No eyelids or ears
 - Shed cycle
 - Flexible jaw and airway
 - Smell with their tongue
 - No legs: ribs & spurs
- **Organs:**
 - One lung and no diaphragm
 - Renal portal system
 - No urinary bladder
- **Venomous vs Poisonous**



Ectotherms: solar powered



An energy saving adaptation that gives them the ability to feed infrequently

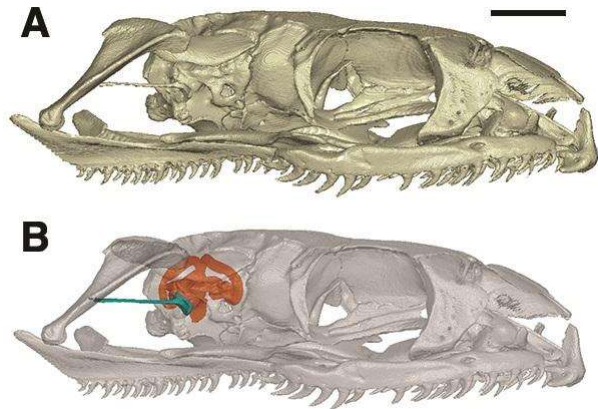
Large body surface area needs to be exposed to heat

- **Poikliotherm:** adapted to temp variations – frogs, marine life, desert species, camel
- **Homeotherm:** requires stable temps (most mammals)

Why is this important to us? *Heat MUST be provided in captivity*

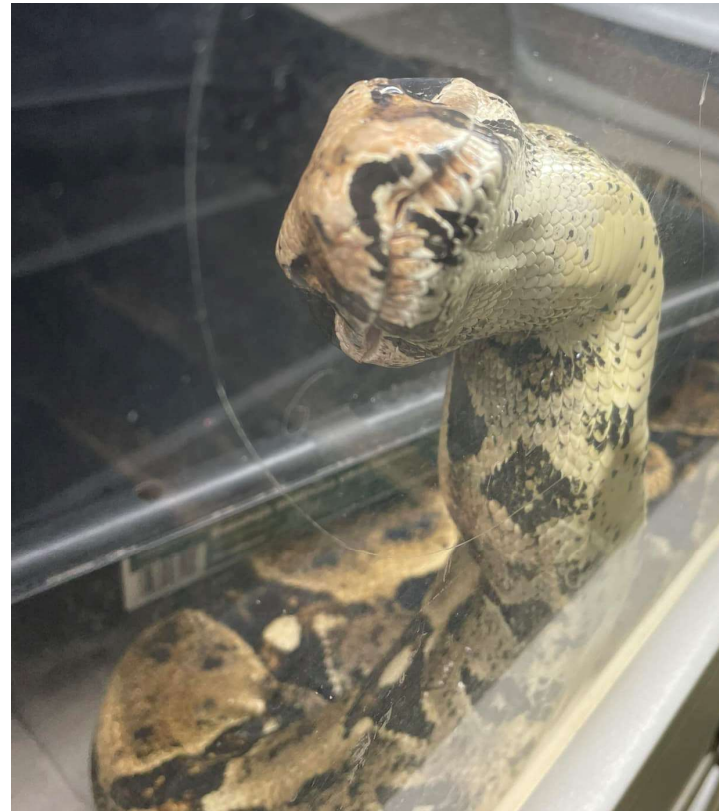
Ears: where are they?

- No outward ear
- Inner ear senses vibrations



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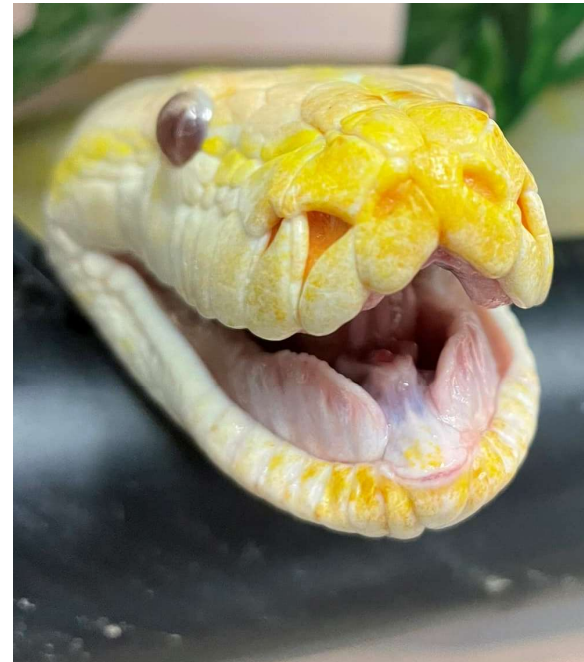
<https://www.eurekalert.org/multimedia/877311>



Why is this important to us? *Enclosure location and communication*

Thermoreception: Heat pits

- Special nerve cells that sense infrared radiation
- Directional distance receptors



Why is this important to us? *They see heat more than visual cues*

Special anatomy: No eyelids



Spectacle – this is a modified scale that acts like a contact lens and protects the eye instead of lids.



Why is this important to us? *Sleep with their eyes open*

Shed cycle: a snake super power

- Skin does not stretch and grow
- Scales do not stretch and grow
- New scales are not added with growth – scale counts remain the same for life
 - so how does a snake grow??

Shed cycle: growing an entire new layer of skin and shedding the old.
Without doing this they would be trapped in the skin as they grow.



Why is this important to us? *Requires correct humidity*

Vomeronasal Organ

- Snakes & lizards – the tongue
- Cats – the “stinky face”
- Bats, Rats, Dogs
- Primates: vestigial in humans



Why is this important to us? *Nothing sinister; NOT indicative of impending bite*

Mobile jaw and airway

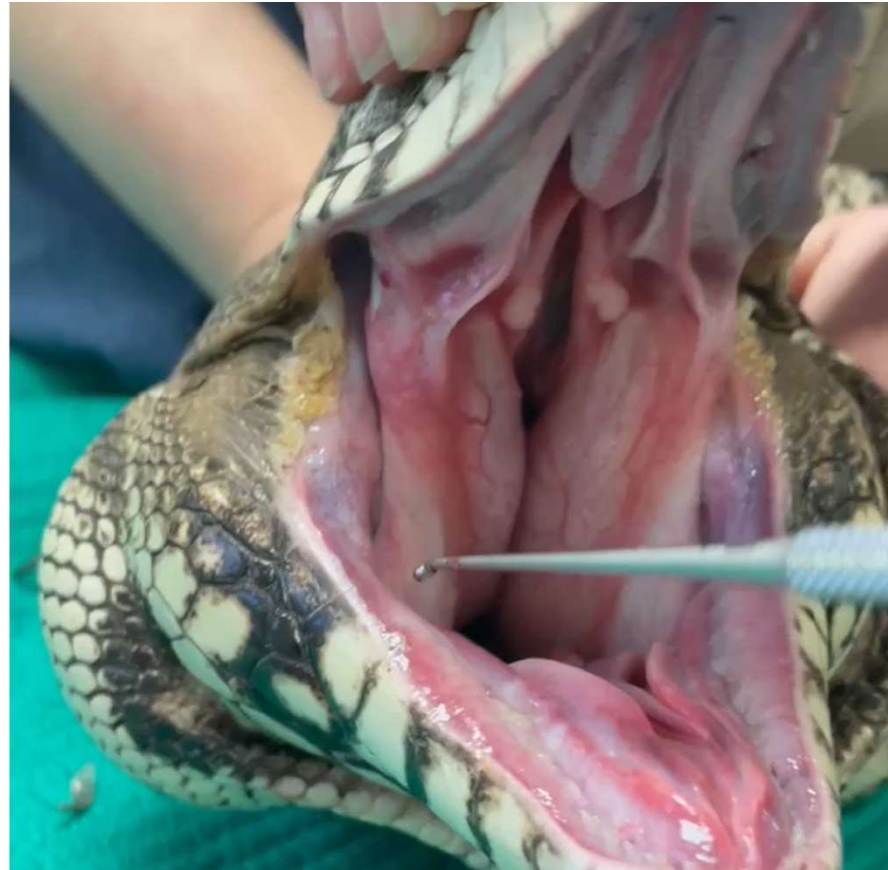
- **Flexible joints:** maxillary and mandibular symphysis and the TMJ are open.
- **Epiglottis location:** in the base of the tongue so it is also mobile



Why is this important to us? *Easily injured, easy to intubate and tube feed*

Mobile jaw and airway

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Why is this important to us? *Easily injured, easy to intubate and tube feed*

Respiratory system

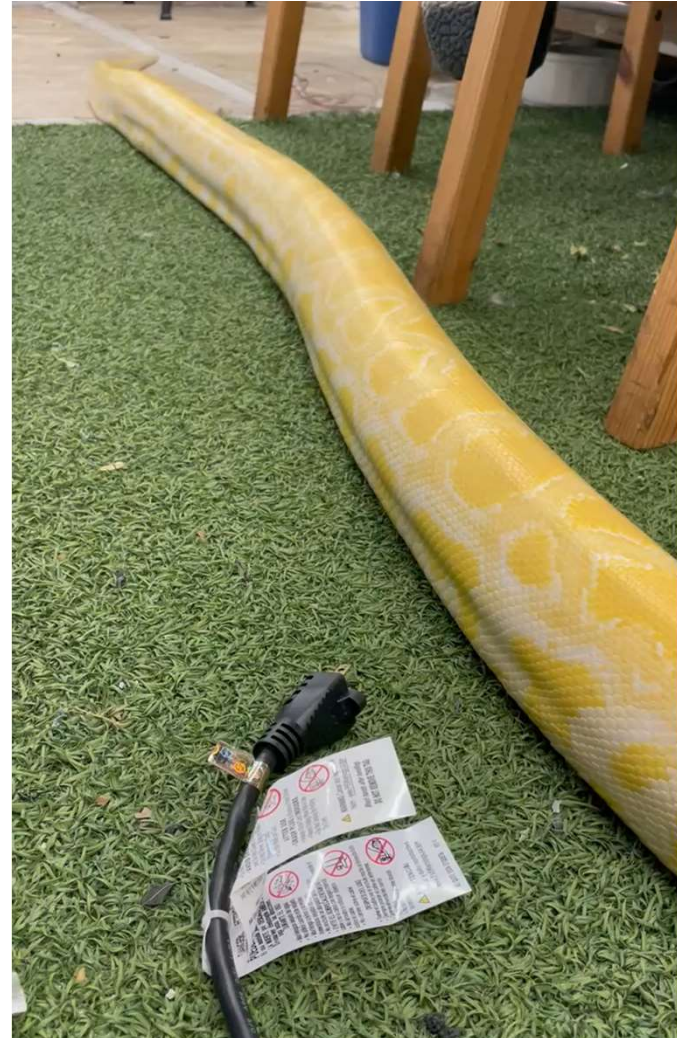
- **One lung:** The left lung is vestigial or absent
 - No second lung to assist if the primary lung is injured
 - No bronchiole ciliary bodies (mucous elevator)
 - Right lung is very long but only half of it participates in gas exchange
 - Caudal half of the lung is an air sac that can fill with mucus → *behavioral body position when in respiratory distress worsens this* ***PICTURE***
 - Respiration is induced by low oxygen in the blood rather than high CO₂ like in mammals → *relevant for anesthesia b/c hyperoxygenation during forced ventilation can reduce their spontaneous respiratory reflex resulting in deeper anesthesia level and prolonged recovery*
- **No diaphragm:** Coelom is the combined chest cavity and abdominal cavity
 - Active respiration driven by rib movement which can be inhibited by things like obesity, injury, arthritis, body position, and activity level.
 - Not very good at coughing
 - Any fluid in the abdomen will also surround the lung



Ribs instead of legs!

- Snakes use their ribs to push themselves along
 - Strong
 - Efficient
 - Fast
 - Collapsible
- More agile and mobile than other types of animals but can be injured in obese animals

Spurs: vestigial legs



Why is this important to us? *No anatomical markers for internal organs and limited sites for blood draws and IVC*

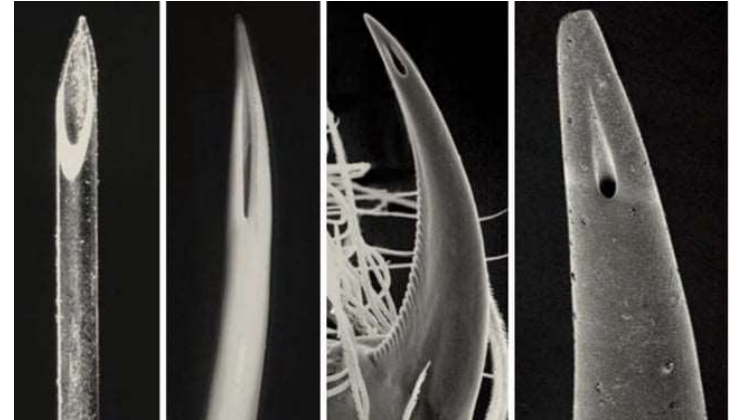
Renal system (urinary)

- **Renal portal system:** Prevents kidney damage during periods of water deprivation. Low blood volume and/or low blood pressure in mammals can result in renal ischemic necrosis. Snakes are able to shunt blood to the kidneys before the rest of the body to maintain adequate perfusion.
- **No urinary bladder:** Snakes rid their body of nitrogenous wastes via uric acid solids rather than liquid urine. This is another adaptation for water conservation as their kidneys are able to conserve much more water than mammals can.



Venomous vs Poisonous

- Venom is **INJECTED**
- Poison is **INGESTED**



- How **NOT** to tell if Venomous: *these don't work*
 - Triangle head? Pythons and boas have fat heads too
 - Elliptical pupils? Cobras and black mambas are round
 - Color? Mimicry
 - Tail rattle? Defense mechanism, corn snakes

The only way to tell:

take photos and compare to a reputable resource for snake identification

Illegal reptiles: front fang venomous, water species, or native

• RCW [16.30.010](#)

• **Definitions.**

(1) "Animal control authority" means an entity acting alone or in concert with other local governmental units for enforcement of the animal control laws of the city, county, and state and the shelter and welfare of animals.

(2) "Potentially dangerous wild animal" means one of the following types of animals, whether bred in the wild or in captivity, and any or all hybrids thereof:

(a) Class mammalia

(i) Order carnivora

(A) Family felidae, only lions, tigers, captive-bred cougars, jaguars, cheetahs, leopards, snow leopards, and clouded leopards;

(B) Family canidae, wolves, excluding wolf-hybrids;

(C) Family ursidae, all bears;

(D) Family hyaenidae, such as hyenas;

(ii) Order perissodactyla, only rhinoceroses;

(iii) Order primates, all nonhuman primate species;

(iv) Order proboscidae, all elephants [elephant] species;

(b) Class reptilia

(i) Order squamata

(A) Family atractaspidae, all species;

(B) Family colubridae, only *dispholidus typus*; - **The Boomslang** (*the only rear fang on this list*)

(C) Family **elapidae**, all species, such as **cobras, mambas, kraits, coral snakes, and Australian tiger snakes**;

(D) Family hydrophiidae, all species, such as sea snakes;

(E) Family varanidae, only water monitors and crocodile monitors;

(F) Family **viperidae**, all species, such as **as rattlesnakes, cottonmouths, bushmasters, puff adders, and gaboon vipers**;

(ii) Order crocodilia, all species, such as crocodiles, alligators, caimans, and gavials.

(3) "Person" means any individual, partnership, corporation, organization, trade or professional association, firm, limited liability company, joint venture, association, trust, estate, or any other legal entity, and any officer, member, shareholder, director, employee, agent, or representative thereof.

(4) "Possessor" means any person who owns, possesses, keeps, harbors, brings into the state, or has custody or control of a potentially dangerous wild animal.

(5) "Wildlife sanctuary" means a nonprofit organization, as described in RCW [84.36.800](#), that cares for animals defined as potentially dangerous and:

(a) No activity that is not inherent to the animal's nature, natural conduct, or the animal in its natural habitat is conducted;

(b) No commercial activity involving an animal occurs including, but not limited to, the sale of or trade in animals, animal parts, animal by-products, or animal offspring, or the sale of photographic opportunities involving an animal, or the use of an animal for any type of entertainment purpose;

(c) No unescorted public visitations or direct contact between the public and an animal; or

(d) No breeding of animals occurs in the facility.

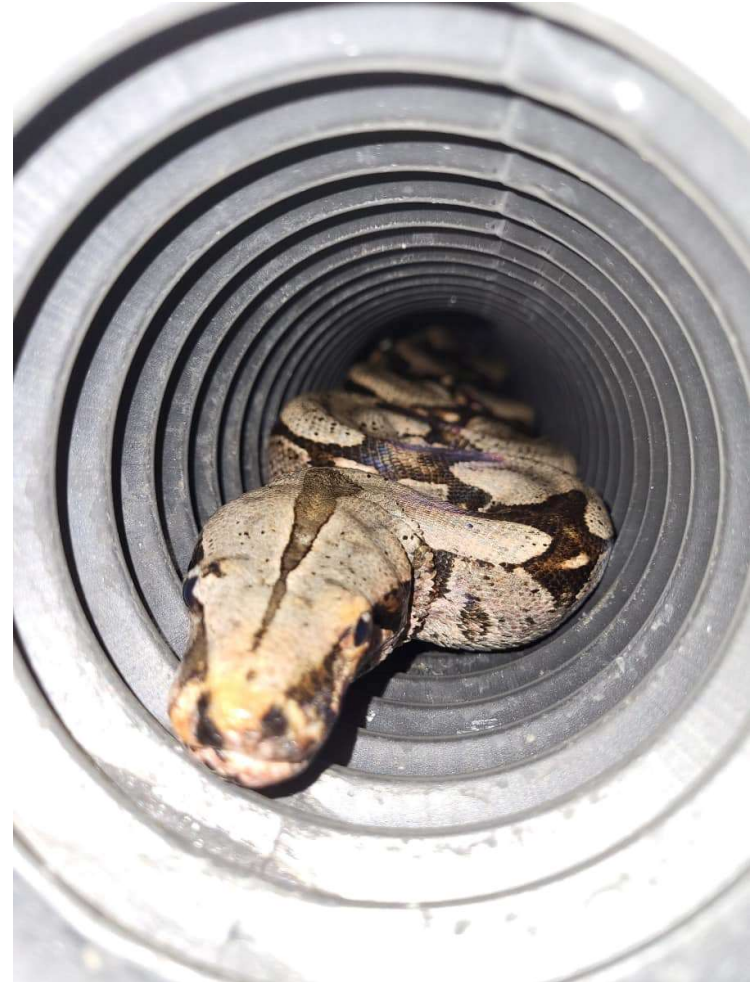
MOST CITIES – size restrictions

Topic 2: Snake Behavior

Habituated vs Domesticated

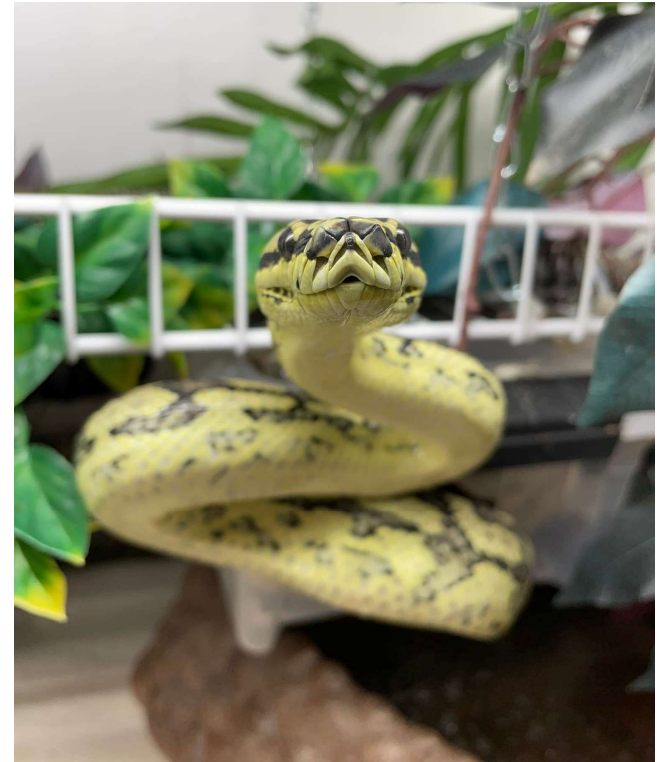
- Have learned to tolerate us
- Not social animals
- Will avoid you unless they sense food
- Give them an escape route instead of cornering them

Fight or Flight: give them the option to flee and they will take it



Body Language: indicates intent

- **Eye contact:** assume the worst and act accordingly
 - direct eye contact means “I’m hungry” or “I will defend myself”
- **Body Posture:** very important!!
 - S shape to body
 - Front 1/3 elevated off the ground
- **Moving towards or away:** fight or flight
- **Tongue flick:** tasting the air
 - Tells you they’re awake and interested



Snake Bites: no big deal. . .



Snake Bites: what to do

Types of Bites:

- **Defense:** false strike or strike and let go
 - Back off and give animal somewhere to hide
- **Food:** strike, hold on, and wrap
 - Hold still; do not pull your hand back
 - Hand sanitizer
 - Hold head behind the neck once they let go
 - Cover the snake with a towel
 - Unwrap backwards from the tail up
- **Fight Mode:** some males will fight via a bite delivery that can cause lacerations
 - Requires gentle handling! Don't push back just try to steer them.
 - Respond better to female handlers



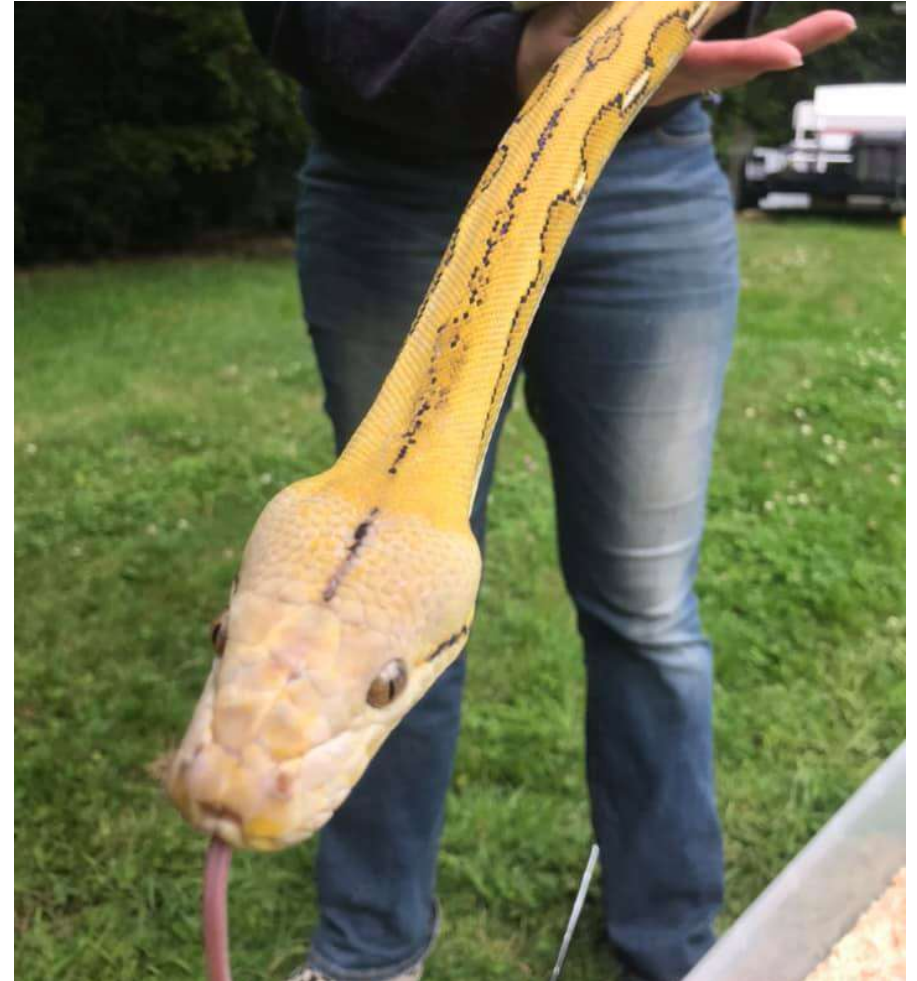
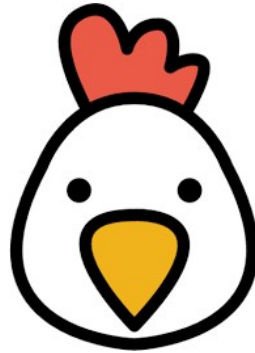
Snake Bites: how to avoid

Proper Preparation pppp 😊

- **Use a hook:** communicate and judge their mind set
- **Wash your hands:** don't smell like food
- **Cold hands:** if your hands are hot wear thin gloves to make them "look" cold to the snake

Adjust for their behavioral needs:

- Offer hides Go slow
- Give the snake an escape route
- Hands off capture is possible



Topic 3: Husbandry & Basic Care

- **Heat:** cold blooded - can not survive long without heat (80-95 degrees)
- **Water:** needs clean water for bathing and for drinking
- **Contained:** can not survive out of its enclosure
- **Clean:** it does not have the ability to get away from its own excrement
- **Hides:** positive thigmotaxis; sensitive and needs to feel safe
- **Substrate:** must be present and clean
- **Food:** mice, rats, rabbits, chickens, guinea pigs – pre-killed or frozen/thawed

Enclosures: size

Foot print vs Height

Most snakes, even the arboreal ones move, sleep, stretch, breath, and eat laterally. Which means the size of the enclosure foot print is more important than height.

A tall narrow enclosure is not ideal.

**Enclosure Length + width
≥ length of the snake**

Heat? **Water?** **Contained?** **Clean?** **Hides?** **Substrate?** **Food?**



Enclosure Length + width \geq length of the snake

55 gallon aquarium:

Length 48"

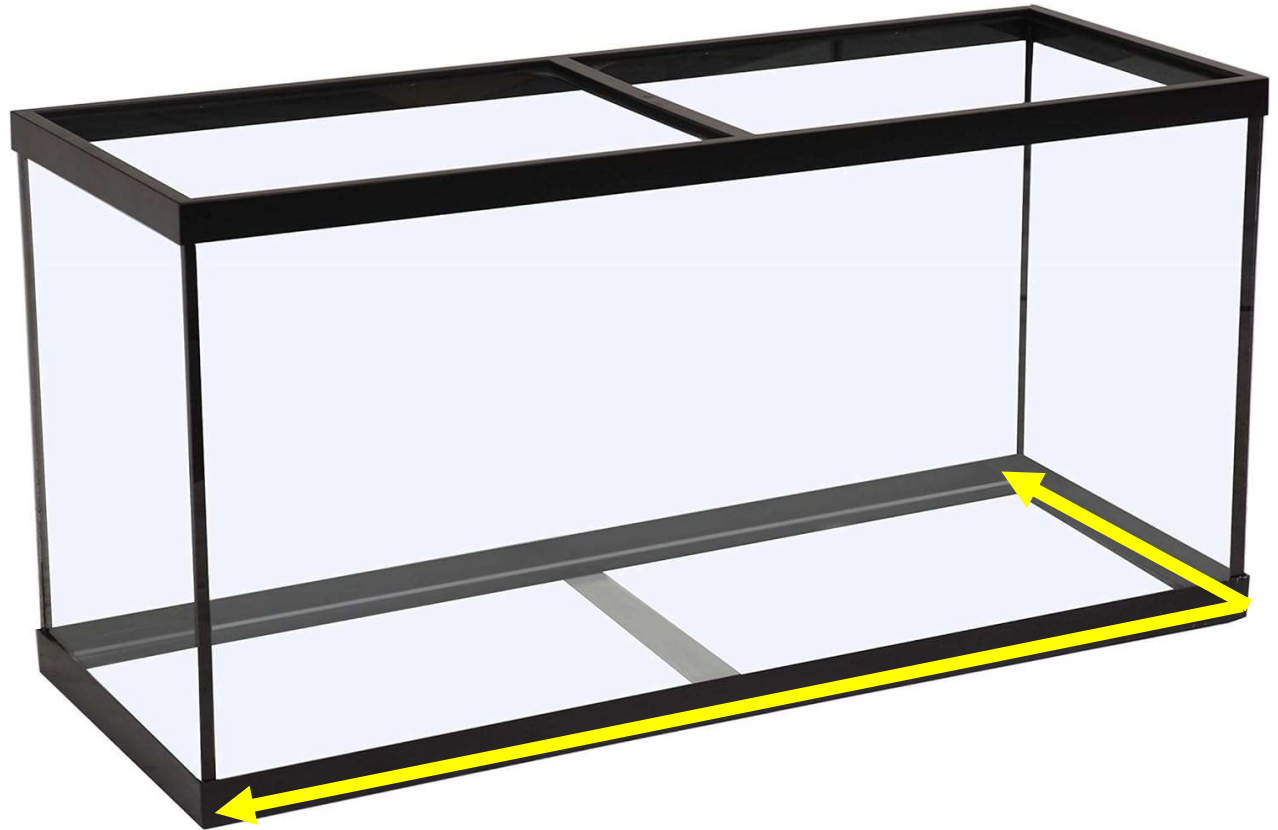
Width 13"

Height 20"

Maximum occupant length:

????

5 feet



Most adult ball pythons and boas will outgrow this!

How big of a snake can fit in here?

**12x3
feet**



Common enclosure types

Glass aquariums: fish tanks are for fish

- Special note: screen tops can cause tremendous harm
- Follow link: www.snakehaus.com/frontpage/education/



Display cases: reasonable with modifications

Much better for snakes:

- Plastic tubs
- PVC
- Wood
- Melamine

Be creative! Most pet stores don't have suitable snake enclosures or supplies.

Length + Width \geq Length of Snake

Heat? **Water?** **Contained?** **Clean?** **Hides?** **Substrate?** **Food?**

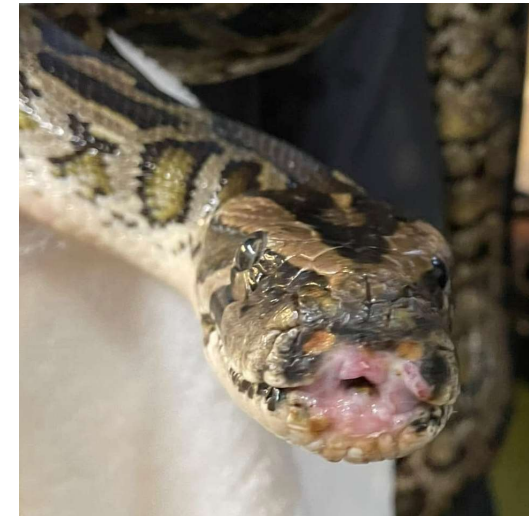
Screen Top Aquariums: bad for snakes

- **Humidity control:** heat rises and take water vapor with it
- **Temperature regulation:** heat exits out the top
- **Scale rot and respiratory disease:** evaporation from dirty substrate
- **Feeling of exposure:** clear on all sides
- **Nose damage:** trying to get out the top
- **Handling from above:** predators approach from above – stress
- **Inappropriate dimensions:** too narrow front to back, too tall
- **Danger from other animals:** cats, dogs, etc



This is the most common type of enclosure used. It can be done but requires significant work to be done well.

Reading material: [Snakes in Tanks](#)



How to improve a Screen Top Aquarium

- **COVER THE TOP WITH FOIL:**
 - **Humidity control:** www.snakehaus.com/frontpage/education/humidity-control/
 - **Temperature regulation:** www.snakehaus.com/frontpage/education/climate-control/
 - **Nose damage:** trying to get out the top
- ADD thermostats and belly heat – probe placement is important though
- ADD digital thermometers
- **COVER THE SIDES WITH PAPER:**
 - **Feeling of exposure:** clear on all sides
- **CLEAN IT!**
 - **Scale rot and respiratory disease:** evaporation from dirty substrate
- **TURN IT ON ITS SIDE:** www.snakehaus.com/frontpage/education/enclosures-2/aquariums/
 - **Handling from above:** predators approach from above – stress
 - **Inappropriate dimensions:** too narrow front to back, too tall
 - **Danger from other animals:** cats, dogs, etc

Better Enclosure options

- Animal Plastics: <https://apcages.com>
- Boaphile: <https://boaphileplastics.com/>
- Vision cages: <https://www.visionproducts.us>
- Reptilekages <https://reptilekages.com>
- Zen Habitats: <https://www.zenhabitats.com>
- Reptile Basics: <https://www.reptilebasics.com/racks-cages/>
- Apex Reptile: <https://apexreptile.com/>
- Black Box Cages: <https://www.blackboxcages.com/collections/cages>
- Dubia: <https://dubiaroaches.com/collections/reptile-enclosures>
- Focus Cubed Habitats: <https://focuscubedhabitats.com/>
- Cornel's World: <https://www.cornelsworld.com/>
- Build your own: <https://www.snakehaus.com/.../build-your-own-enclosure/>
- Snakes in Tanks: <https://www.snakehaus.com/.../snakes-in-tanks-please-stop/>



****NOTE* some of these come with SCREEN TOPS and will need to be modified; screen tops are really dangerous for many reasons.***

Please read the article listed as the last link for more details on that topic.



Topic 4: When to intervene

- Neglect
 - Too cold
 - No water
 - Extremely dirty
 - Live food should NEVER be left in enclosure
- Injured
 - Wounds: bites, burns, or rubs
- Other illness
 - Skin dz
 - Mites
 - Respiratory dz
 - Mouth rot
 - Eyes
 - Spinal deformities



Neglect— basic husbandry is lacking

- Old poop
- Broken items
- Shed skin
- No heat
- Dirty water or no water

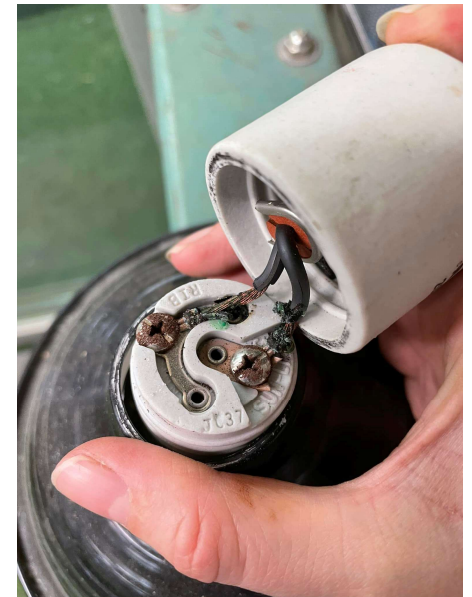
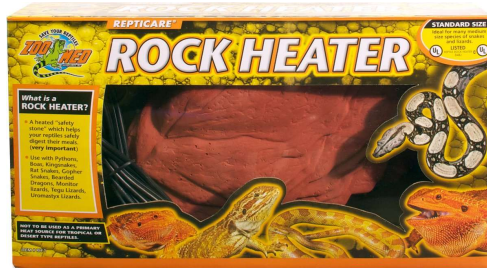


Heat? **Water?** **Contained?** **Clean?** **Hides?** **Substrate?** **Food?**

When to intervene: NO heat
→ immediate husbandry change needed



When to intervene: DANGEROUS heat → immediate husbandry change needed



Thermostat probe placement significantly affects internal environment. We need to make sure our heat translates to a warm snake and not just a warm enclosure.

When to intervene: poor BCS or dehydration → neglect



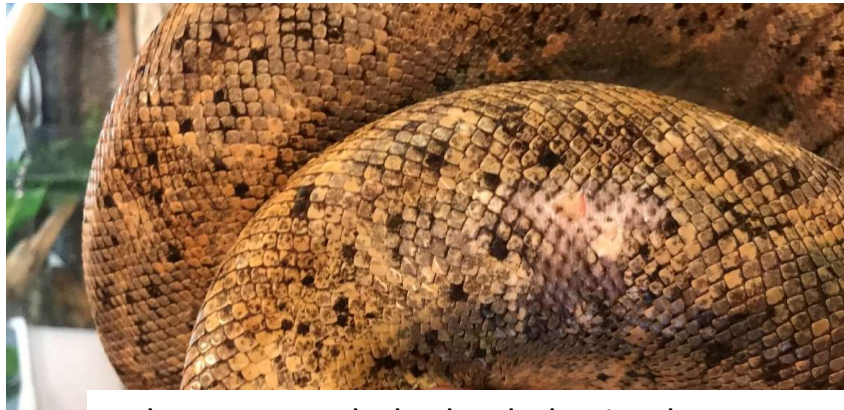
When to intervene: injuries → husbandry changes + vet visit



Burn



Scale Rot, Poor skin health, behavior



Rub spot – stuck shed or behavioral



Laceration – partial or full thickness

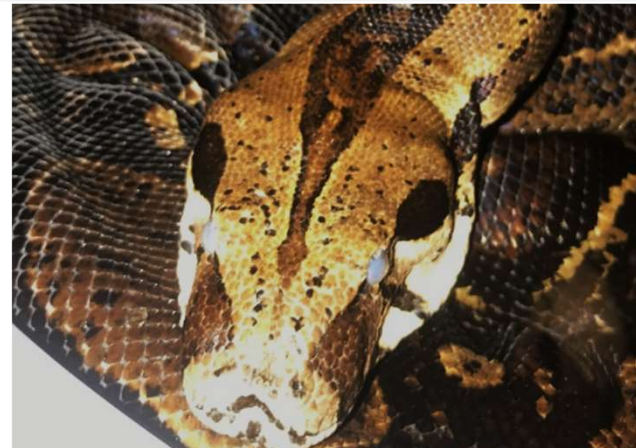
SCARS: healed

no treatment needed



When to intervene: eye infections

→ can you tell which one needs a vet visit?



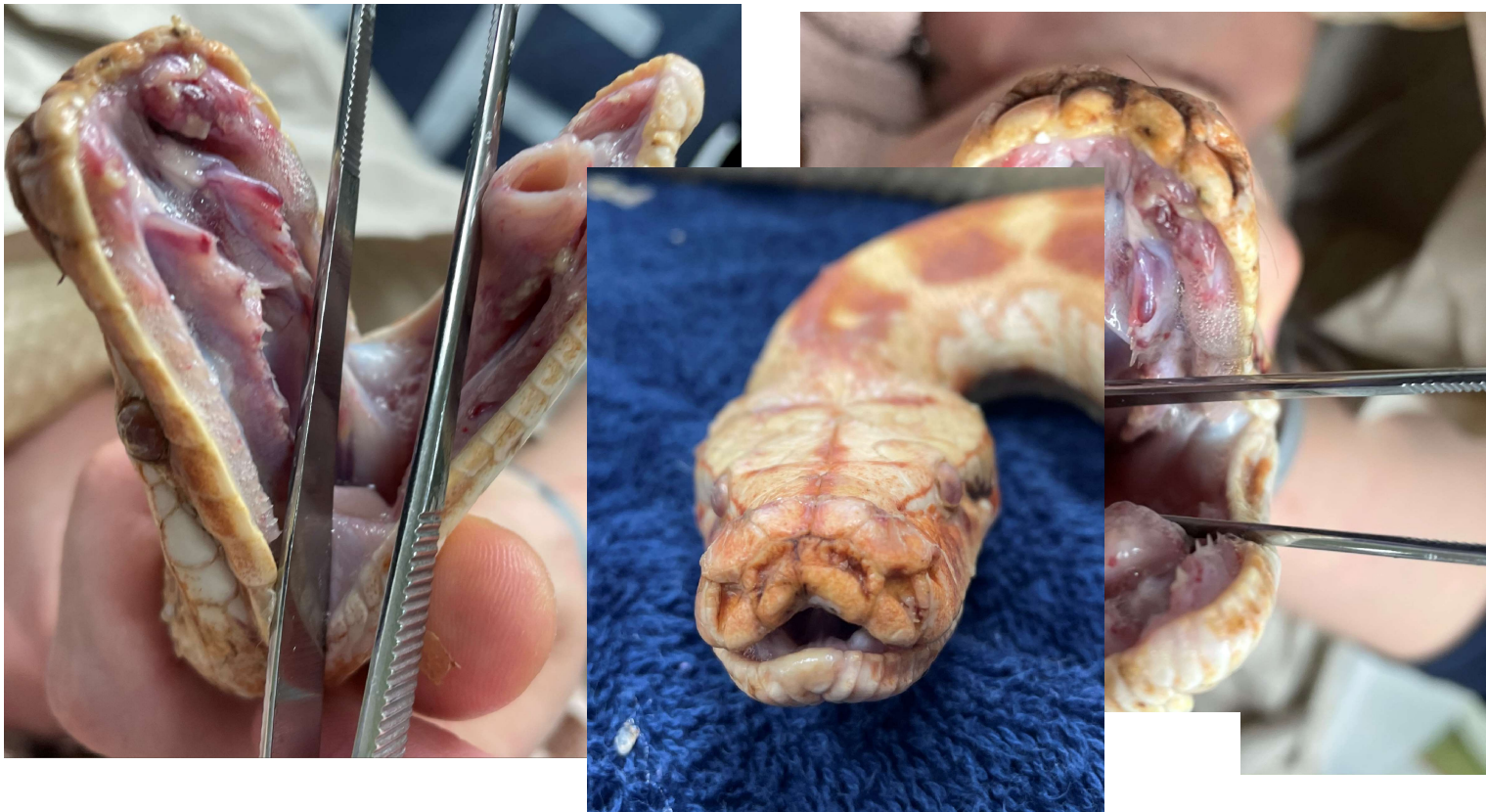
When to intervene: mouth injury or infection

Immediate husbandry changes
AND
vet visit



When to intervene: stomatitis

Needs a vet visit: don't forget to look inside the mouth



When to intervene: retained shed → husbandy



When to intervene: retained shed → husbandry



When to intervene: retained shed → husbandy



When to intervene: this is NOT retained shed



Inclusion Body Disease - euthanasia

When to intervene: behavior



Neurological deficits: vet visit needed



Coughing: vet visit needed



Self harm: husbandry



Abnormal perching: husbandry

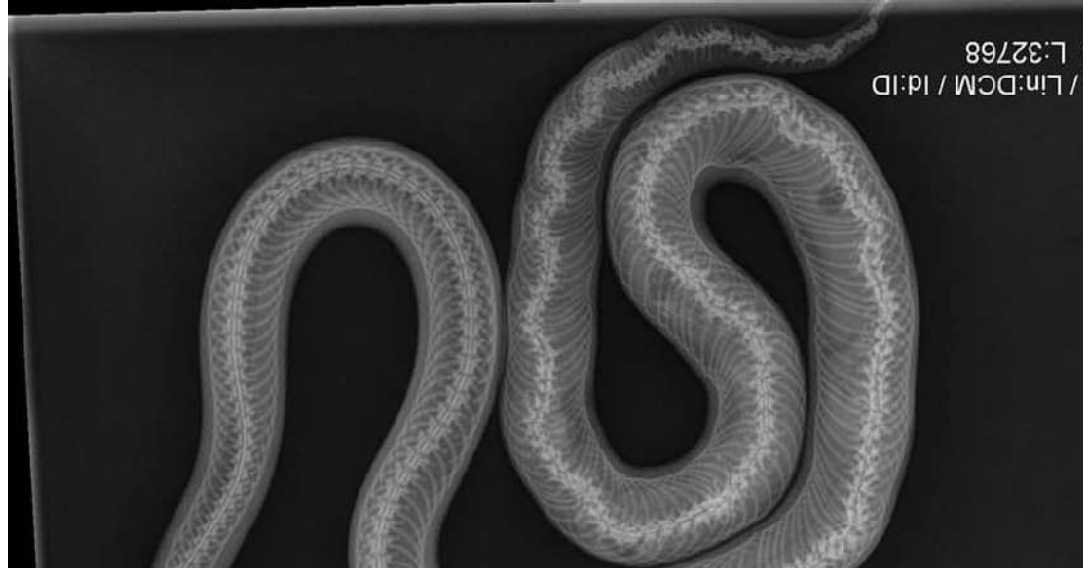


Pushing: husbandry

When to intervene: lumps and bumps → chronic illness



When to intervene: lumps and bumps → chronic illness



When to intervene: LIVE FOOD

→ immediate husbandry change; PLEASE PREVENT THIS!



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How to intervene: Confiscation vs In home Coaching

There is NO WHERE for these animals to go:

- Rescues are full
- Zoos do not want them
- More babies are being produced than there are homes for
- Shelters are ill equipped to house reptiles

Local Rescue: [Pacific Northwest Aquatics & Exotics](#)

In home coaching: sara@snakehaus.com

[Home to Home Surrender Program](#)

Recommended Veterinarians:

Seattle: [Bird and Exotic Clinic of Seattle](#)

Bothell: [Center for Bird and Exotic Animal Medicine](#)

Maple Valley: [Pine Tree Veterinary Hospital](#)

Pullman: [Exotics ward](#)

Olympic Peninsula: [Uptown Animal Hosp & Urgent Care](#)

Local Reptile Facebook groups:

Puget Sound Reptiles: <https://www.facebook.com/groups/495446607206360/>

Pacific northwest reptile community: <https://www.facebook.com/groups/1032559303564726/>

Oregon and Washington Reptiles for Adoption: <https://www.facebook.com/groups/1810836755874709/>

Seattle/Washington Reptile and Invertebrate enthusiasts: <https://www.facebook.com/groups/910485439104422/>

Northwest Reptile and Aquatic Enthusiasts: <https://www.facebook.com/groups/662950200431215/>

How to intervene

Emergency Enclosure:

Locking plastic tote - <https://a.co/d/6PsFeEX>

Heat pad – <https://a.co/d/h2p5y9n>

Thermostat - <https://a.co/d/2S7nR2m>

Papertowel, p.pads, cardboard box, dog dish



Heat
Water
Contained
Clean
Hides
Substrate
~~**Food**~~

Handling Tools

- Hook
- Hide
- Towels
- Thin gloves
- Plastic tub
- Clean hands
- Time and patience
- Close observation and flexibility



*Training should not start until the animal feels safe inside their enclosure

Hook

A communication tool:

- Break the food drive: smell and heat signature
- Applied behavioral pressures: elicit a desired response and reward
- Redirection: steering rather than forced movement



Hides

Positive thigmotaxis

- security blanket for the animal
- Reward for redirection w/ hook
- Elicits cooperation from the animal
- Vital for moving giants around
- Feeding bin – CAUTION – not the same thing!



Gloves



Towel



Handling basics

Size Matters:

One person for every 6' of snake

Respect the animal:

- Say hello first; make sure they are awake
- Give them time to look around and think
- Invite them out; must give them somewhere to go
- Avoid the head and tail
- Be strong but gentle

No snake scarves: one shoulder only



Common Pet Snakes

Common Pet Snakes

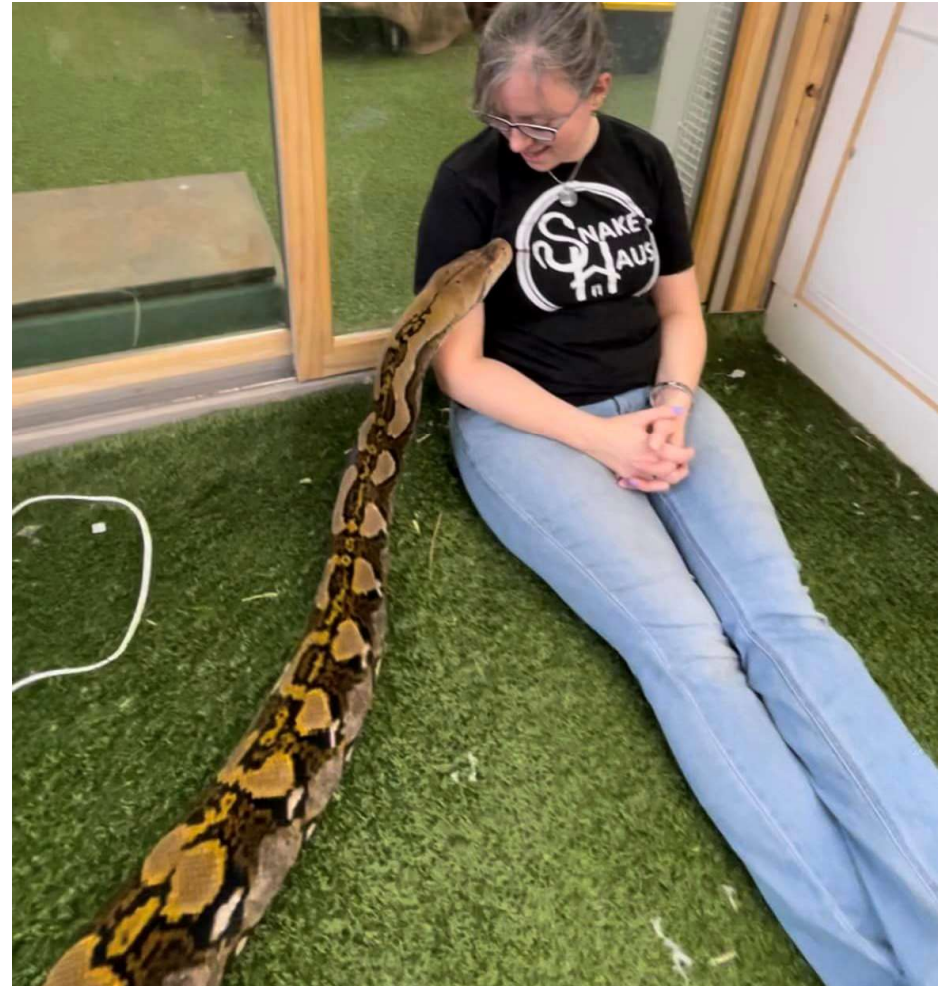
- Colubrids
- Ball Pythons
- Carpets, Bloods

Giants

- Boas (the BCC's and the Colombians)
- Reticulated Python
- Burmese Python
- Anacondas

Venomous *NOT COVERED*

- **Rear fang:** Mangrove, Asian Vine Snake, False Water Cobra, Garter Snake, Hog Nose, **Boomslang**
- **Front fang:** Copperhead, Vipers Cobra, Rattlesnake, etc



Back to common PETS: Who's who?

Boas: the Americas

- Boas
- Anacondas

Pythons: Africa, Asia, Aus

- Retics & Burms
- Ball Pythons
- Carpets



Colubrids: every continent except Antartica

Behavior

Colubrids – fast and agile

Pythons – variable

- Burms, Blood, and Balls: slow and cautious
- Retics, Carpets: fast and agile

Boas – slow and cautious

***LIVE
ANIMALS***

Basic Identification

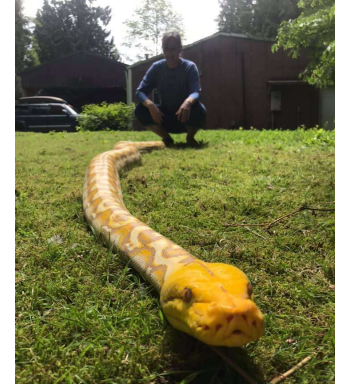
Colubrids:

Corns, Kings, Rats, Milk
(The largest snake family)



Pythons:

Balls, Burms, Retics,
Blood, Carpets



Boas: Red Tails, Brazilian
Rainbows, Anacondas



Colubrids – small and fast



Corn Snake



Colubrids – small and fast



Milk Snake



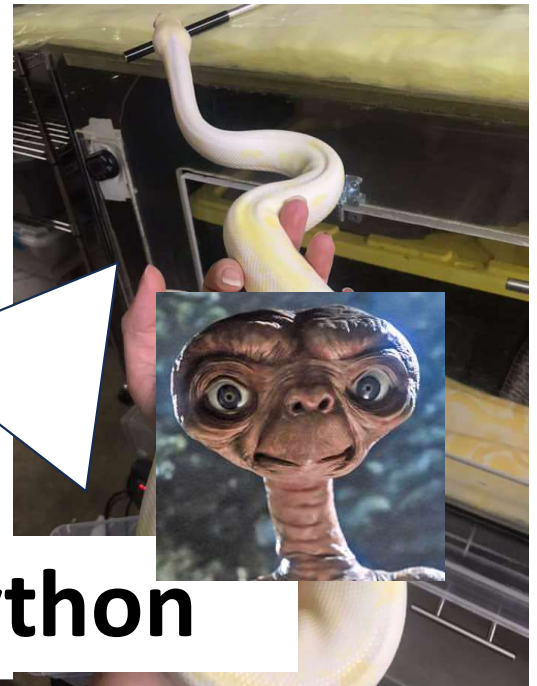
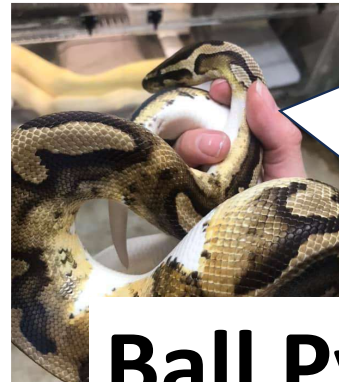
Colubrids – small and fast



King Snake



Pythons – tremendous variation



Ball Python

Pythons — tremendous variation



Carpet Python

Pythons — tremendous variation



Blood Python

Pythons – tremendous variation



Reticulated Python



Burmese Python

Pythons – tremendous variation



Reticulated Python



Burmese Python

Pythons – tremendous variation

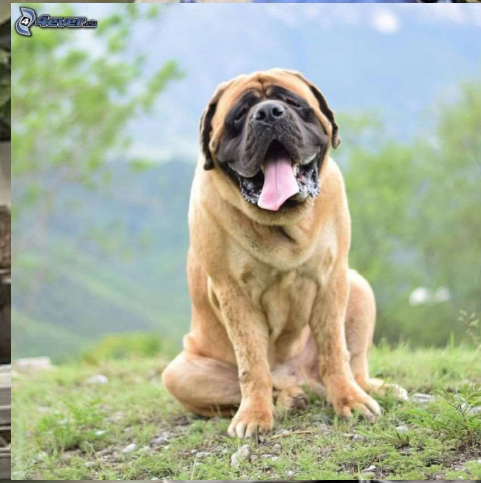


Reticulated Python

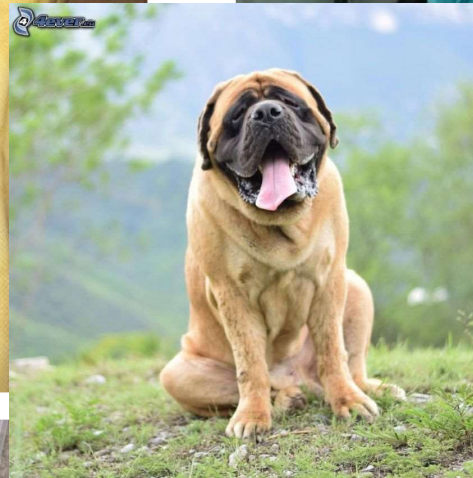
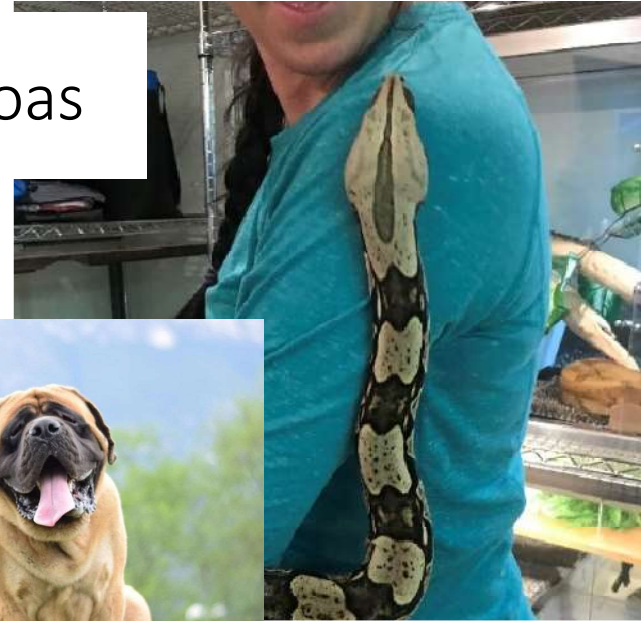


Burmese Python

Boas – Red Tails and Common Boas



Boas – Red Tails and Common Boas



Boas – other boas



Green Anaconda



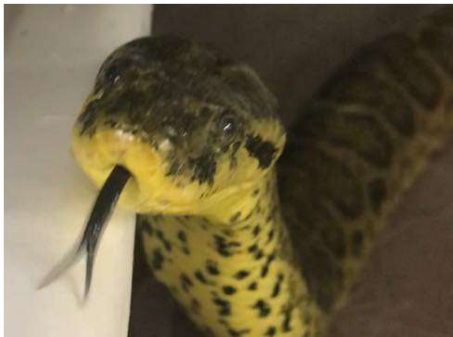
Dumerils Boa



Dumerils Boa



Sand Boa



Yellow Anaconda



Argentine Boa



Brazilian Rainbow Boa

POP QUIZ – who am I?



POP QUIZ – who am I?



POP QUIZ – who am I?



POP QUIZ – who am I?



POP QUIZ – who am I?



POP QUIZ – who am I?



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