

INTRODUCTION TO COMPANION ANIMAL ACUPUNCTURE

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GOALS FOR TODAY

- Basic understanding of acupuncture:
 - What it is, theories for why it works & when to consider it
- Case examples

WHAT IS ACUPUNCTURE?

- Stimulate distinct anatomical points
- Microtrauma triggers the body to react and start healing
- Part of Traditional Chinese Medicine – developed by observing, trial and error over many centuries





WHY ACUPUNCTURE?

- Working directly with the patient to get body to heal
- Simple tools
 - Sterile acupuncture needles – low cost
 - Optional: electroacupuncture (TENS) unit, moxa sticks, 1 mL syringe + normal sterile saline/Vit B12, therapeutic laser machine or hand held acupuncture laser
- Quite safe – minimal contraindications or risks



AVOID WHEN:

- Areas of skin infection or skin cancer
- Don't do if blood clotting disorders or severely low white blood cell counts
- Can be tricky with highly reactive or aggressive patients
 - Distract with using a food filled bone or toy
 - Muzzle
 - Owner present vs. not present
 - Try laser or injections instead (more on this later)
- Avoid completely with patients having excitement-induced seizures
- Use with caution in pregnant animals – can induce labor

RISKS/SIDE EFFECTS:

- Needle risks:
 - Infection – use sterile needles only
 - Forgotten/stuck/swallowed needles – make sure remove after session, let patient reposition if needle feels stuck as often just being held by muscle
 - Careful around face/eyes
 - Labor induction in pregnant animals
- Patients often feel tired because of serotonin release – if very old & weak patient, make sure you don't overdue it

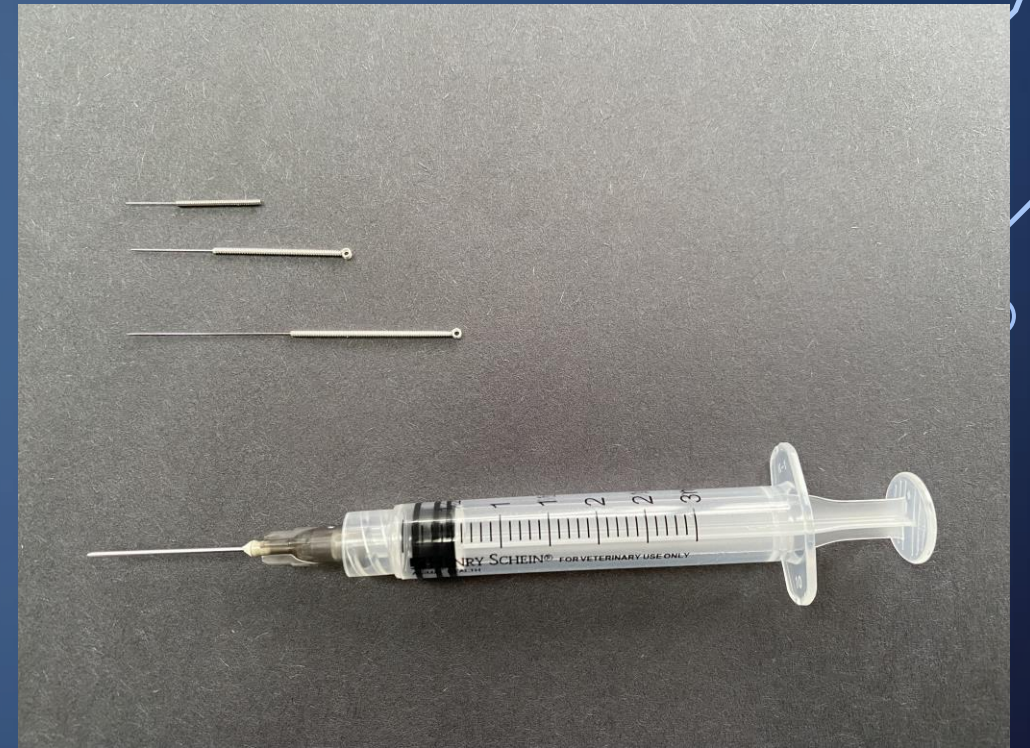
ACUPUNCTURE TECHNIQUES = ACUPRESSURE

- Deep pressure held on acupuncture point
- Hold pressure or do firm, slow circular motion
- For people – massaging trigger points; wrist bands for motion sickness press on point called PC 6
- For Dogs – muzzle straps behind the ears press against “An-shen”, a point that helps calm/relax patients



ACUPUNCTURE TECHNIQUES: NEEDLES “DRY NEEDLING”

- Choose points based on patient's diagnosis (anywhere from 5-20 points)
- Needles placed and left for 20-30 minutes
- Very thin → see comparison to 22 ga vaccination needle/syringe on right
- Different sizes used for different parts of the body depending on muscle mass/fat tissue and sensitivity (face/legs versus torso)
- Sterile packs – single or in groups of 5, include guide tube and small piece of plastic to hold needle until ready to use
- Interestingly do not typically bleed & many pets tolerate very well



ACUPUNCTURE TECHNIQUES: ELECTROSTIMULATION / ELECTROACUPUNCTURE

- Wires connected to needles that have already been inserted into acupoints
- Electrical current
- Great for disc disease, arthritis, nerve paresis/paralysis, or severe pain
- Intermittent low frequencies (5-20 Hz) help motor neurons in paresis and paralysis
- Continuous frequencies of 80-120 Hz help with endorphin release for pain or muscle spasms
- Cautions: Don't cross left/right over heart area; not for patients with defibrillators



ACUPUNCTURE TECHNIQUES: MOXIBUSTION

- Applying heat to acupuncture needles
- Use lighter to ignite end of herb stick (from plant Mugwort *Artemisia vulgaris*)
- Hold needle to make sure doesn't get too hot
- Usually will touch to each needle head for few seconds, then cycle back 2-3 times
- Believed to help dispel internal cold and dampness
- I use this for pets with painful arthritis in cold weather
- Don't use in pregnant animals, near large blood vessels or near mucous membranes; **don't touch patient skin**
- Really strong odor, so I use the smokeless variety in clinic



ACUPUNCTURE TECHNIQUES: AQUAPUNCTURE

- Tiny injections of saline or 50/50 solution of saline & Vit B12 into acupoints (~0.1-0.2 mL at each point)
- Used when patient will not remain calm enough to keep needles in place
- Use 25 ga needles or even insulin syringe for this, but need to use new needle for every 2 sites to limit dulling of needle
- Great option for cats who can handle being restrained one general time at clinic

ACUPUNCTURE TECHNIQUES: LASER

- No needles
- Using therapeutic or hand held acupuncture laser to stimulate acupoints
- Great for small, thin patients sensitive to needling



INTEGRATED VETERINARY MEDICINE

= MANY TOOLS IN OUR TOOL BAG

RADIOGRAPHS/ULTRASOUND/
ADVANCED IMAGING

MEDICATIONS/FOOD/
MODIFYING LIVING CONDITIONS

PHYSICAL EXAM
& BLOODWORK/
URINALYSIS

PHYSICAL THERAPY,
EXERCISE, LASER THERAPY,
ACUPUNCTURE



WHAT IS HAPPENING IN THE BODY???

- THINK: NERVOUS, IMMUNE/ENDOCRINE, & VASCULAR SYSTEMS
- Some aspects make sense
 - Modern medicine helps us understand the cellular reactions
 - Many points follow nerves
 - We can understand certain organ connections exist in the body - referred pain
- Some aspects will not make sense
 - Anesthesia is also a mystery
 - The body is complex – intricately designed
 - Vocabulary is hard and different – reflects its Chinese heritage
 - Skepticism for placebo effect???
- We'll talk about some basic terms/concepts and then come back to cellular reactions



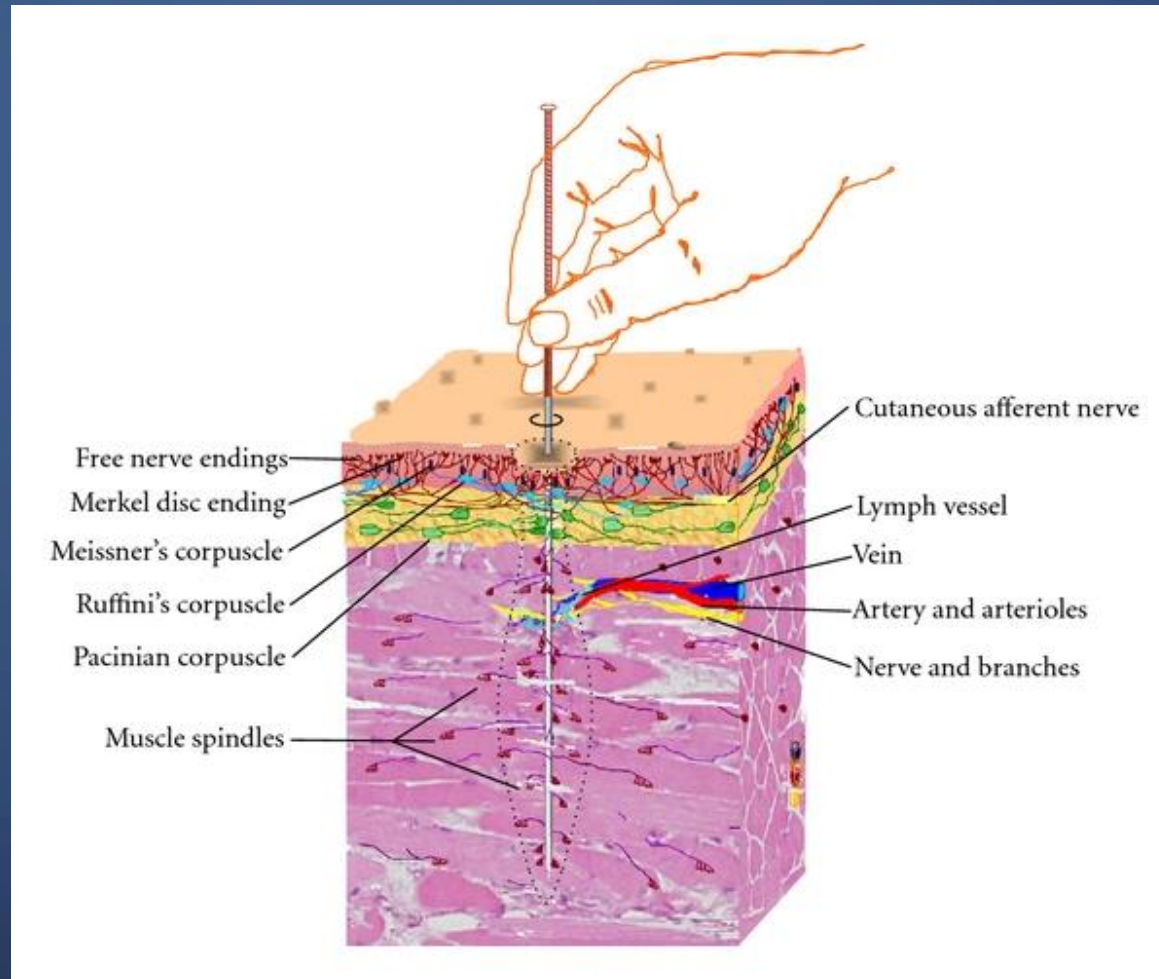
TERMS TO KNOW: ACUPOINTS

- ACUPOINTS = Specific anatomical points
- Have names
- Most acupuncture veterinarians use about 125 points (~360 points documented on body)
- *Responsible for local effects of acupuncture*

TERMS TO KNOW: ACUPOINTS

- Areas of neurovascular bundles
 - Free nerve endings, muscle-tendon sensory receptors (muscle spindles and Golgi tendon organs), mast cells, and small blood vessels
- Areas where nerves travel through bone, muscle or fascia; branch/join
- Stimulate points by deep pressure, mechanical trauma (needle), thermal/electrical/or photon energy
- Areas of low electrical resistance and high electrical conductance of the skin
- Higher calcium ion concentrations at acupuncture points vs surrounding tissue

ACUPOINT:



Neural Acupuncture Unit: A New Concept for Interpreting Effects and Mechanisms of Acupuncture - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/A-representative-muscle-spindle-rich-NAU-in-the-response-to-manual-twists-of-acupuncture_fig1_223986958 [accessed 25 Feb, 2022]

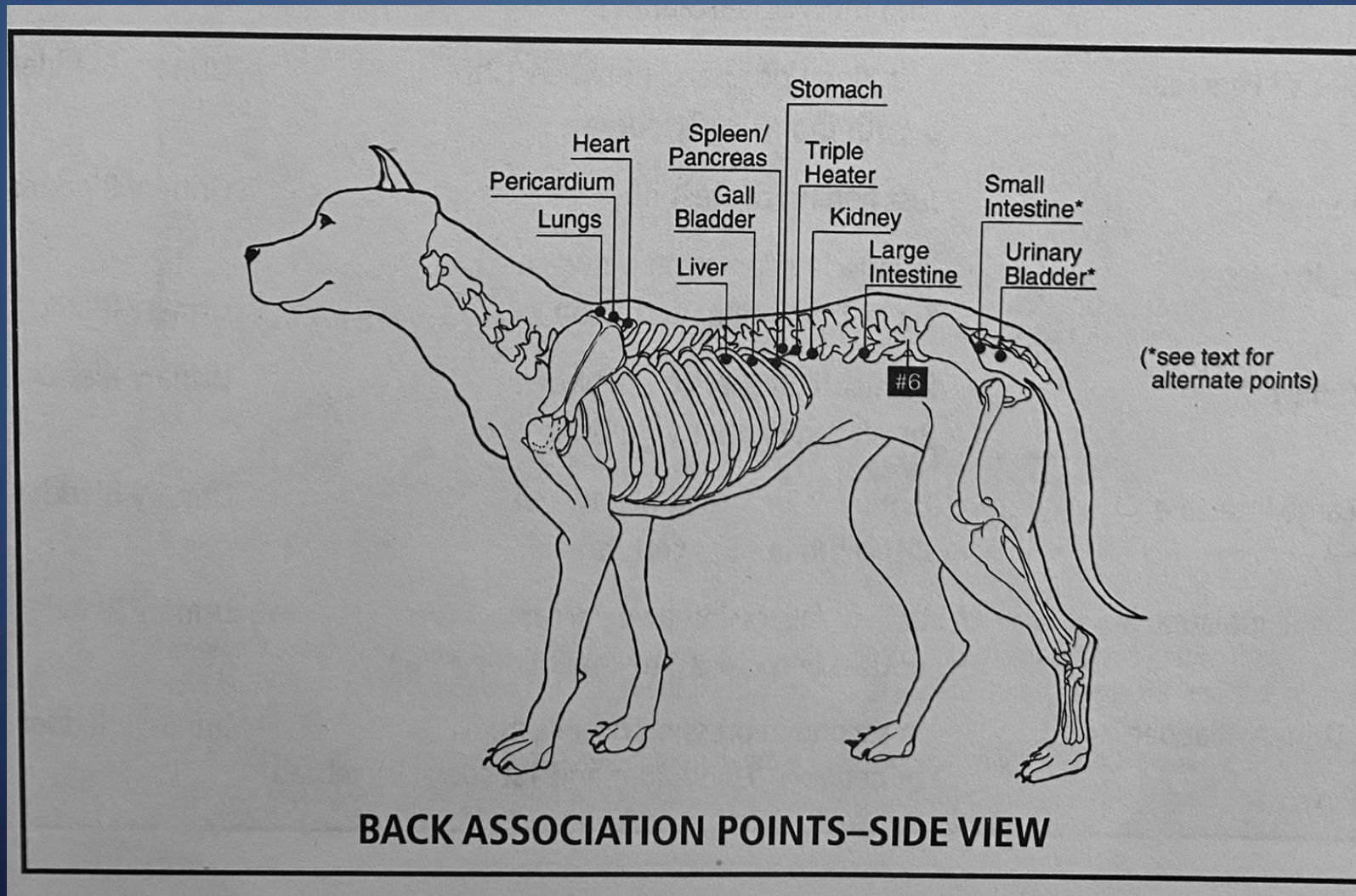
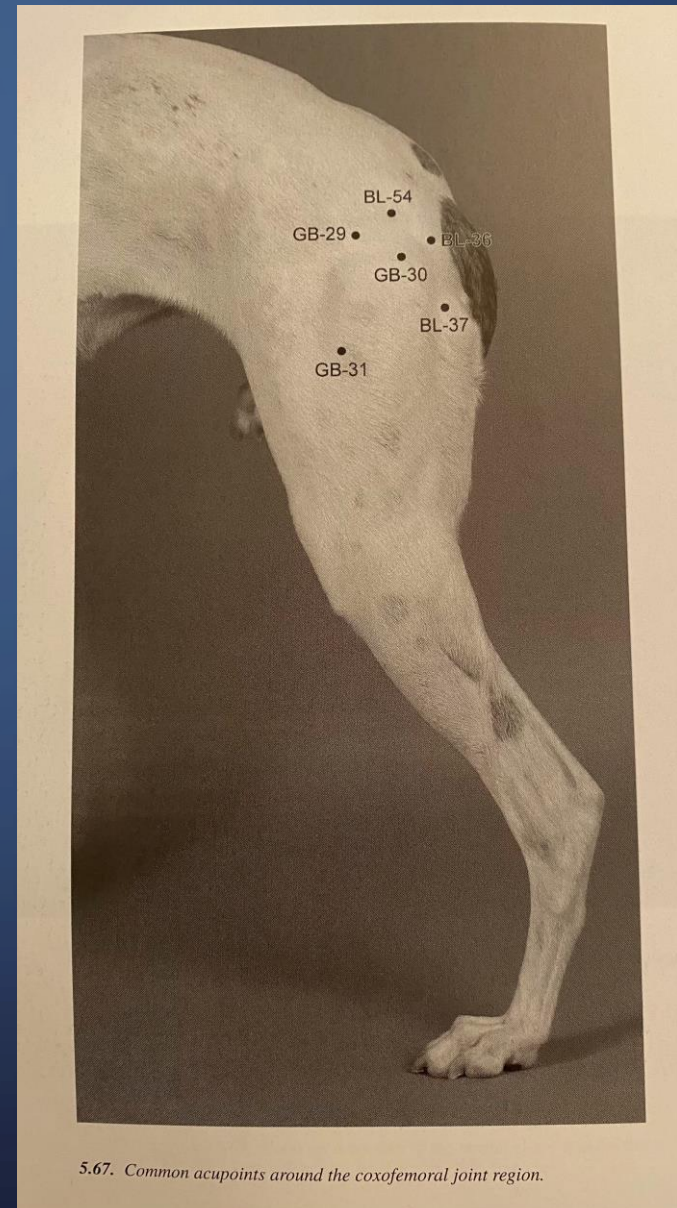
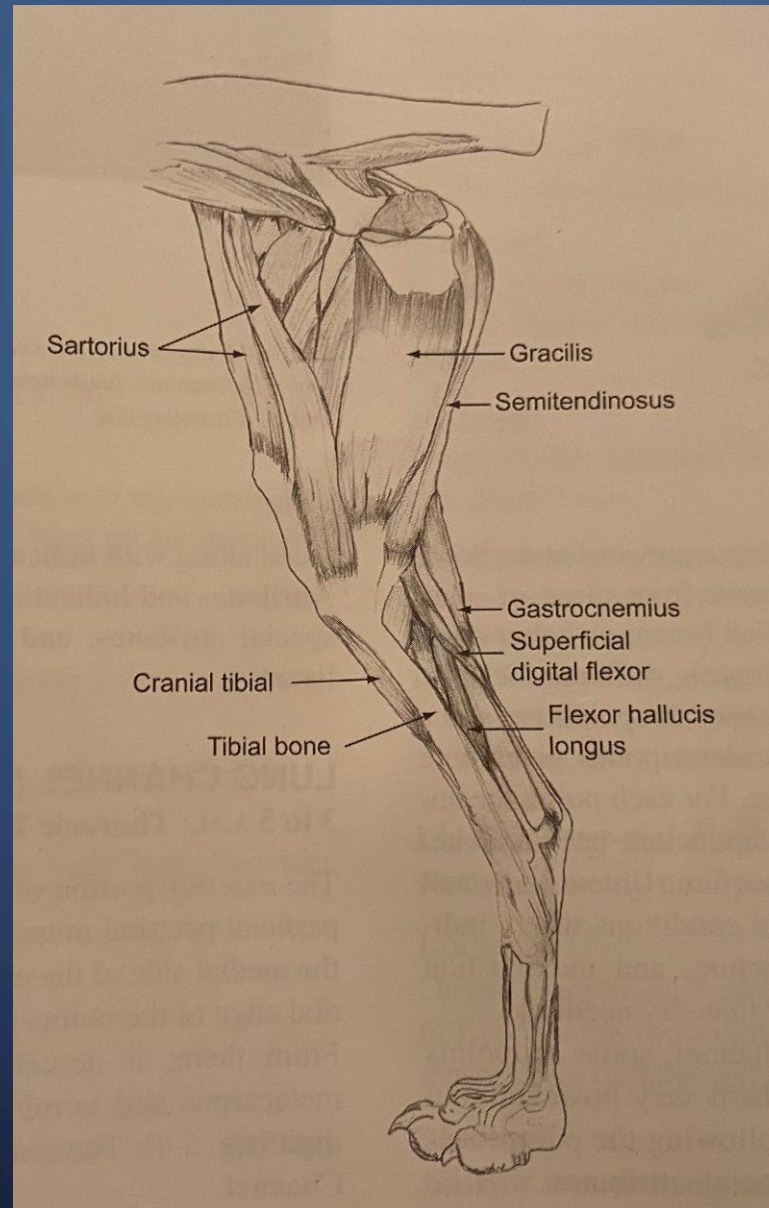


Image from [Four Paws Five Directions](#) by Cheryl Schwartz, DVM (1996)

ACUPOINTS



5.67. Common acupoints around the coxofemoral joint region.

TERMS TO KNOW:

- ACUPOINTS = specific anatomical points, named, local
- MERIDIAN = a line of acupoints that are believed to be in communication with each other; associated with and interact with specific organ systems
 - Think of this as an interstate highway and the acupoints are small local towns
 - Meridian connections are responsible for acupuncture's dispersing effects
 - 12 regular channels, 8 special channels



MERIDIANS

- A bit confusing - vocabulary can stump us here
- Remember much of acupuncture's history is in Ancient Chinese culture
 - Discovered by trial & error and observation, so it reflects the ancient culture vocabulary and ideas
- Requires memorization of names. Try not to overthink. Much like learning idioms when studying a new language.

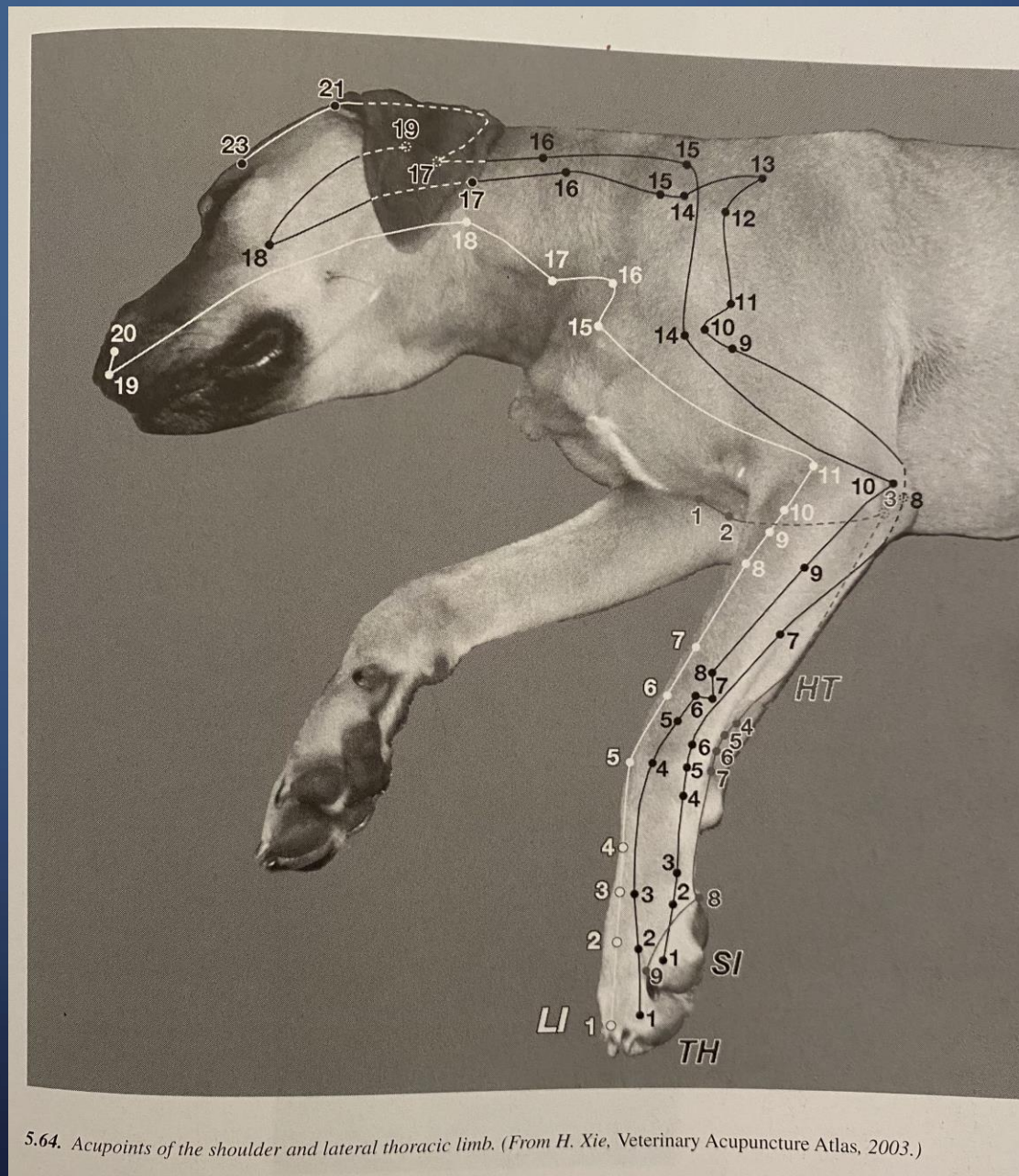
MERIDIANS

- 12 regular channels - bilaterally symmetrical
 - Named for its associated internal organ
 - Lung, Spleen, Heart, Kidney, Pericardium, Liver
 - These are considered baseline organs needed when body is resting (“yin”)
 - Large Intestine, Stomach, Small Intestine, Urinary Bladder, Gall Bladder, Triple Heater
 - These are the hard working, churning/digesting organs/hot (“yang”)
 - Triple heater ??? What is that? Basically the idea of the furnace of the body, again reflects historical ideas
- 8 Special Channels – not associated with an organ system
 - Governing Vessel (dorsal midline), Conception Vessel (ventral midline)
 - 6 more channels - conscious proprioception, coordination and motility

MERIDIANS

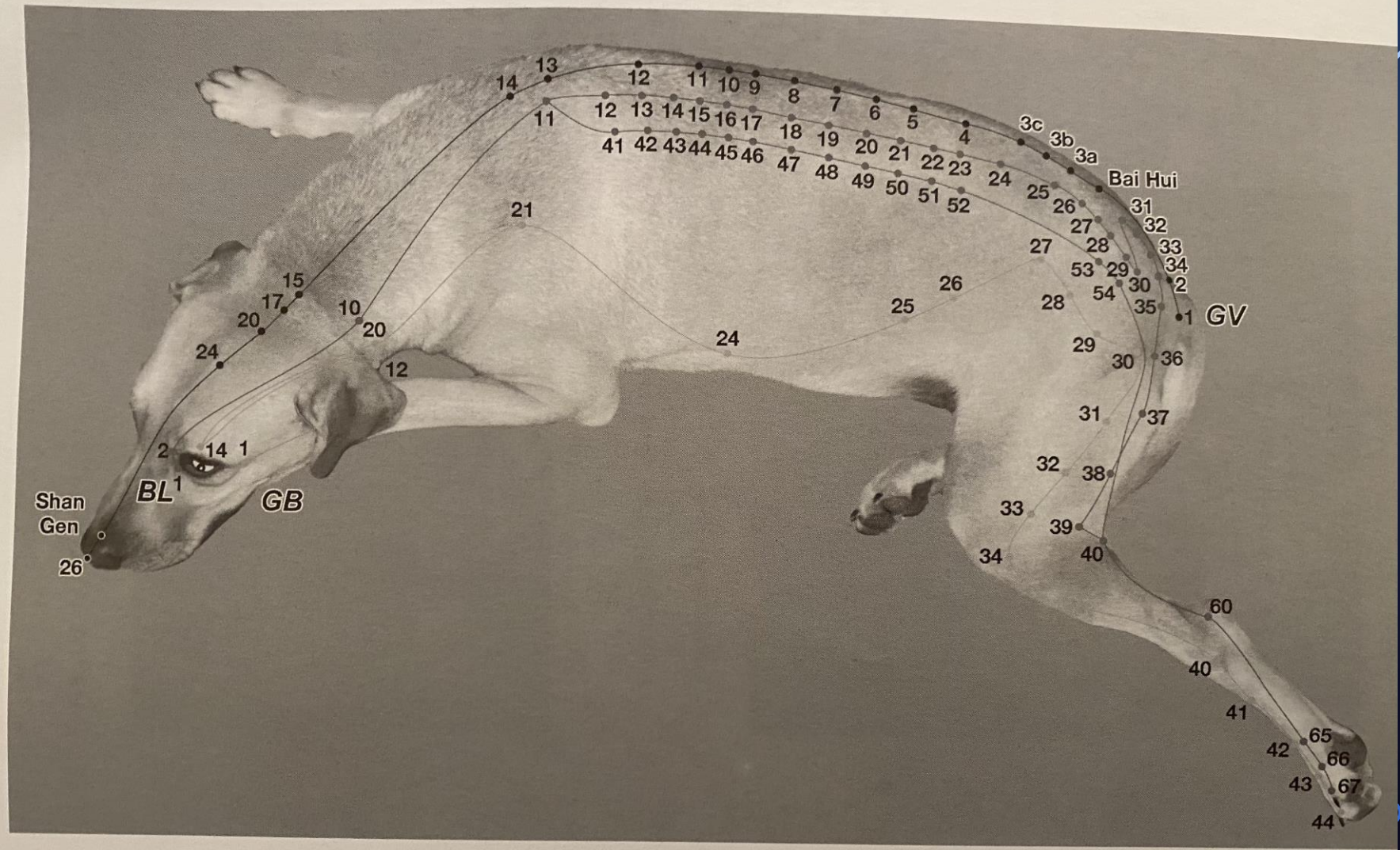
- Complex neural and cellular connections between body regions
- Idea of homeostasis and rhythms throughout the day
 - Disease when rhythm/homeostasis disrupted
 - Idea of Qi (pronounced “chee”)
- A different way of thinking about the body’s connections than we were taught in vet school

MERIDIANS



5.64. Acupoints of the shoulder and lateral thoracic limb. (From H. Xie, Veterinary Acupuncture Atlas, 2003.)

MERIDIANS



5.63. Commonly used acupoints of the head, neck, back, hips, and lateral pelvic limb. (From H. Xie, Veterinary Acupuncture Atlas, 2003.)



WHY DOES ACUPUNCTURE WORK?

- No single mechanism of action
- Cellular effects begin locally & expand to involve the entire neural axis
- Idea of a tiny bit of trauma triggers the body to respond and start healing
- Point selected, as well as how they are stimulated, influence which effects are achieved

MULTIPLE MECHANISMS OF ACTION SUGGESTED:

- Coagulation Cascade
- Pain Pathway
- Gate Theory
- Endorphins & Neurotransmitters
- Fibroblasts
- Others?

COAGULATION CASCADE

- Needle prick → local microtrauma
→ activates Hageman's tissue factor
XII → coagulation cascade
- RESULT increased local perfusion,
increased local immune response
and relaxation of surrounding
muscle and tissue

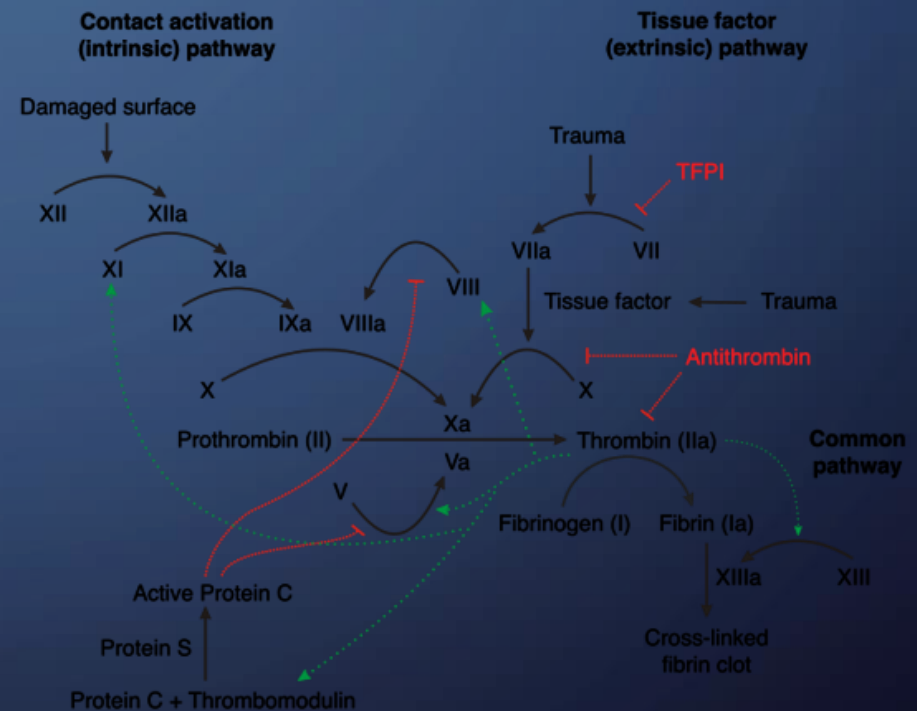
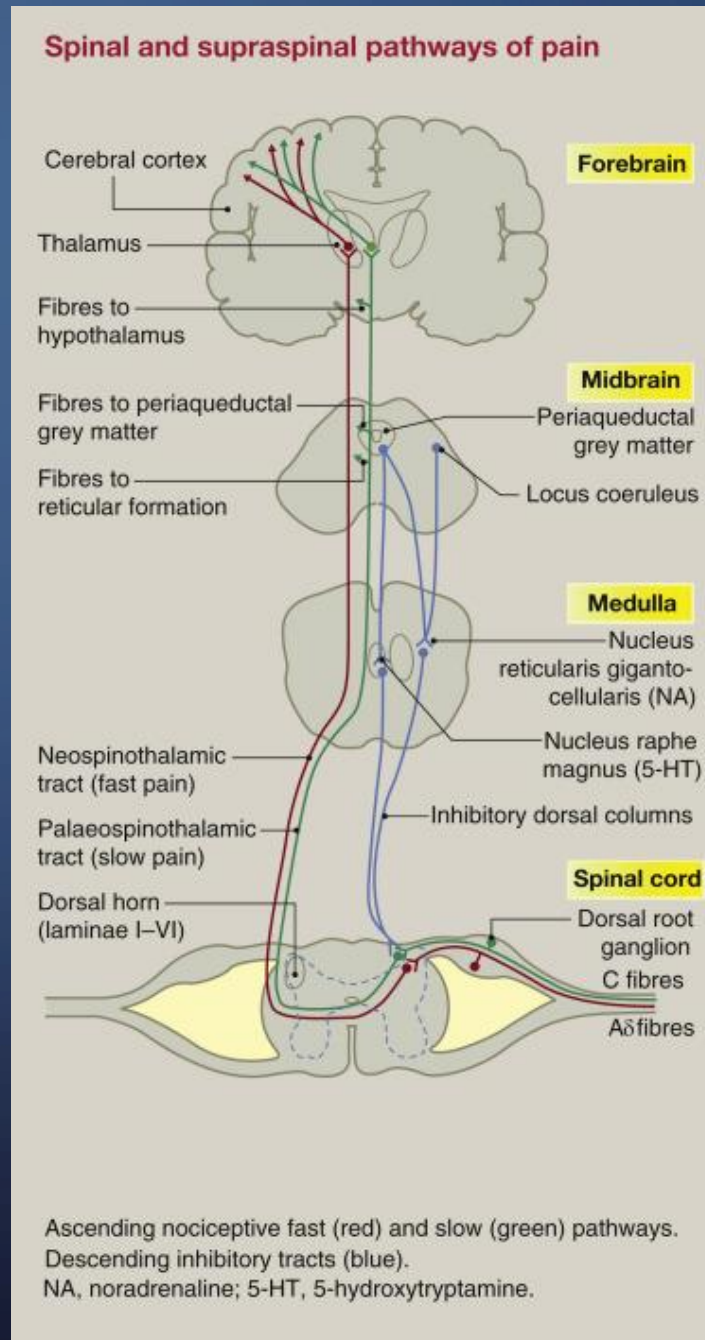


Figure 1: <https://teachmephysiology.com/immune-system/haematology/coagulation/>

PAIN PATHWAY

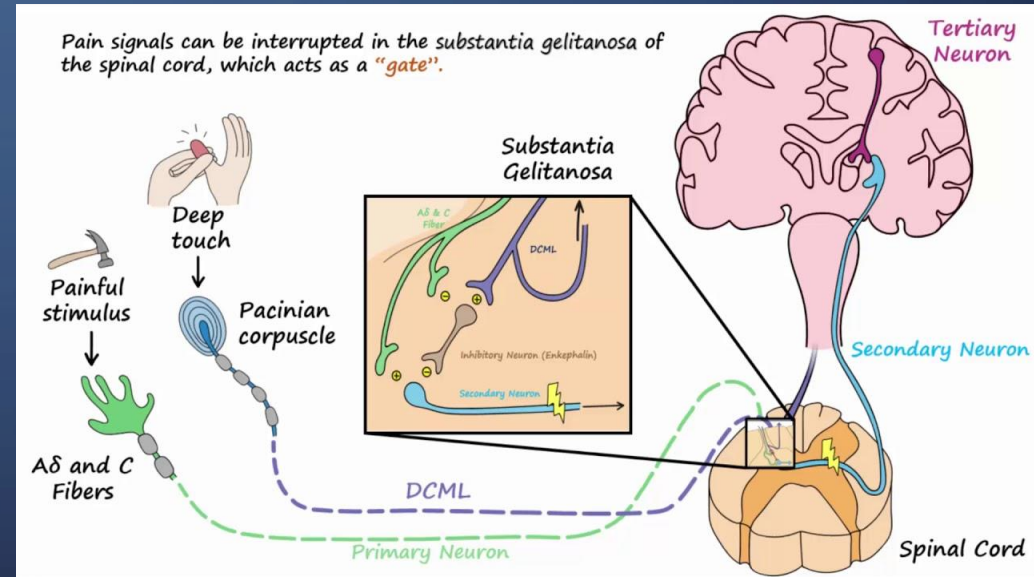
- A δ and C nerve fibers detect pain
- A δ fibers are coated and fast – cross over to opposite side of spinal cord → go to thalamus and out to basal areas and somatosensory cortex
- C fibers are not coated and are slower – synapse in the substantia gelatinosa and travel on same side up to the medulla, pons, midbrain and then up to the thalamus, hypothalamus, & basal areas
- Once brain receives pain signal, it can respond (movement, etc.)

* Remember there are two other types of A nerve fibers – A α (proprioception) and A β (touch). Manual acupuncture needle stimulation and electroacupuncture have been found to activate all 4 types of nerve fibers.



GATE CONTROL THEORY OF PAIN

- Theory: spinal cord contains a neurological “gate” that can either block or allow pain signals to go to the brain
- Touch nerve fibers can block the pain signals
- Acupuncture is thought to stimulate these inhibitory nerve fibers and therefore reduce pain signals to the brain



<https://www.youtube.com/watch?v=oQLFfvGM7nl>

ENDORPHINS & NEUROTRANSMITTERS

- Endogenous opioids (example – enkephalins)
 - released by the hypothalamus and segmental interneurons in the spinal cord → endorphins bind to receptors on the pain nerve fibers → decreases the transmission of pain
- Hypothalamus releases adrenocorticotrophic hormone → signals release of cortisol → anti-inflammatory effects
- Serotonin, dopamine and norepinephrine are released → inhibit the central pain pathways and suppress the release of Substance P (neurotransmitter for pain)
- Pituitary gland releases β endorphin
- Gamma aminobutyric acid (GABA) is also released

FIBROBLASTS

- When acupuncture needle is inserted and rotated, collagen fibrils pull on the associated fibroblasts causing remodeling of the cellular structure within 10 minutes
- Fibroblasts release purines and mast cells are caught in this wave of stretching
- Result – changes in connective tissue tension regulation
- Effects can last for hours to days

GIVEN HOW IT WORKS, WHEN TO USE?

- Orthopedic disease
 - arthritis, post-operative surgery recovery
- Neurologic disease
 - seizures (exception = excitement-induced epilepsy), nerve palsies, Degenerative Myelopathy, laryngeal paralysis
- Intervertebral Disc Disease
 - acute or chronic, post-op, preventative
- Kidney / Liver disease
 - an option for pain in these patients who cannot take NSAIDS
- Urinary incontinence
- Constipation / megacolon
- Emergency care: heat exhaustion, neonate resuscitation
- Uterine prolapse, metritis, labor induction

CASES = “SAM”

- “Sam” is a 10 year old male, neutered black lab
- Painful getting up & laying down
- Spinal spondylosis, arthritis in hips and tail
- Trouble posturing to defecate – will take steps during and prone to constipation and dropping stool in house
- Owner noticed does not wag tail much
- Muscle atrophy in rear legs
- Urinary incontinence
- Negative for genetic test for DM



CASES = “SAM”

- Is on multiple medications:
 - NSAID
 - Gabapentin
 - Glucosamine chondroitin
 - Amlodipine for hypertension
 - Tried Phenylpropanolamine HCl for incontinence but blood pressure worsened
 - Tried testosterone injection for incontinence – no improvement



CASES = “SAM”

- Consult:
 - Do complete physical exam
 - Run fingers along meridians looking for areas of depressions or sensitive areas
 - Ask about appetite/GI symptoms/cool vs. heat seeking/stiffness and if present with cold or damp or hot weather OR before vs after exercise → looking for TCVM patterns
 - What are owners concerns & goals? (Are these goals reasonable?) Give info to owner about what to expect.



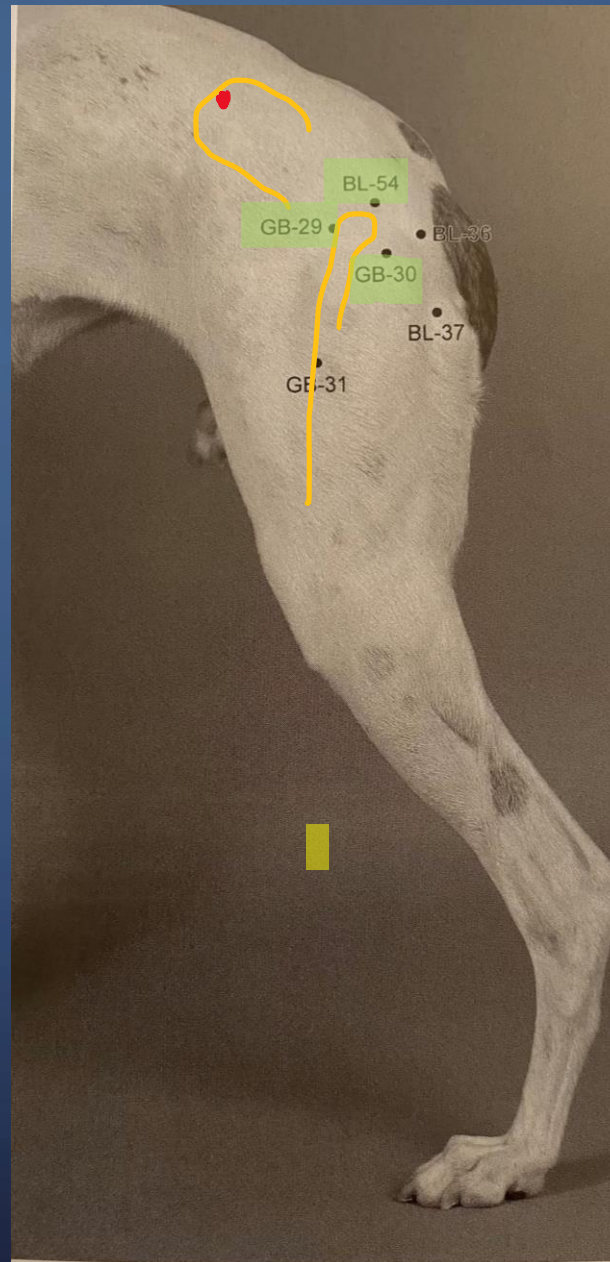
CASES = “SAM”

- Owners goals:
 - Better quality of life
 - Pain management for arthritis
 - Any improvement for incontinence
- Plan:
 - Weekly acupuncture until improvement seen (should be within 3 sessions)
 - Then space out to every other week, etc.
 - Add in electroacupuncture after 2nd session
 - Spinal, hip, urinary & constipation points

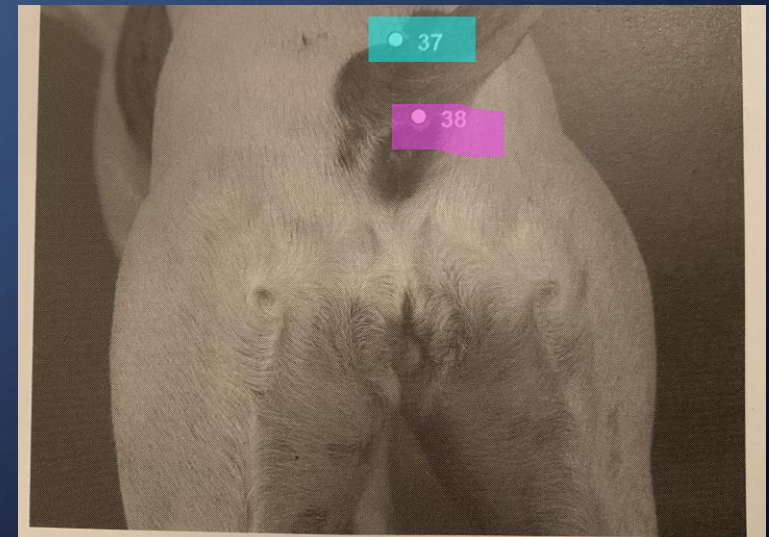


CASES: ARTHRITIS

- Simple points you could do:
 - Hip points – 3 around hip
 - GB 29, GB 30, BL 54
 - Acupressure is easy
 - One in depression just below wing of ilium
 - Jian-jiao
 - Point for constipation/diarrhea
 - GV 1 (Hou-hai), tiny needle
 - Tail arthritis or limb tail
 - Wei-jei – base of tail on midline, tiny needle



5.67. Common acupoints around the coxofemoral joint region.



6.11. The location of the classical points of the trunk and tail: 37 Wei-jei and 38 Hou-hai.

CASES: “HANK”

- 7 year male neutered Bassett Hound
- Rescued about 1 year earlier & was sickly when found (heartworm +, pyoderma, ear infections)
- Urine dribbling (bladder atony?) and had full work up (labs, urine culture, ultrasound, tests for bladder cancer)
- On bethanechol and carprofen
- No improvement with Phenylpropanolamine HCl



CASES: “HANK”

- Interesting case because he had a pattern that is in Traditional Chinese Medicine literature = *Lin Syndrome*
- Chose points for strengthening bladder sphincter and promoting diuresis
- Improved! Saw weekly, then every other week, then monthly, now every 2-4 months and will keep spacing out depending on how he does
- Owner brings him in when she starts to see him dribbling again
- Typically animals will start to show mild symptoms as effects of acupuncture are wearing off which goes away after “tune up” session



QUESTIONS?

