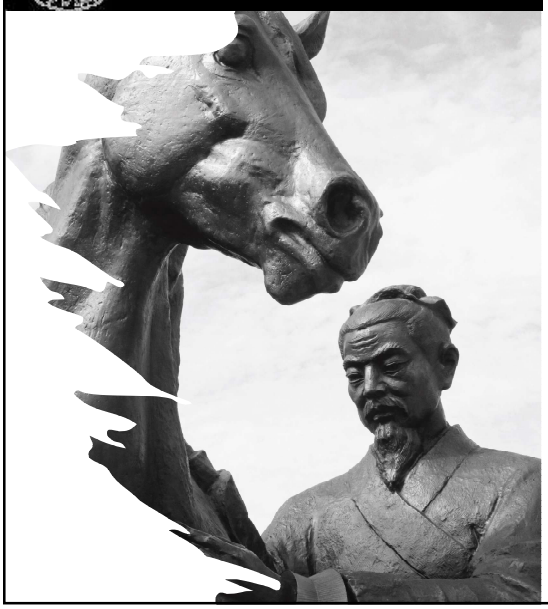
日本ウマ科学会
Japanese Society of Equine Science



Evidence-based Clinical Application of Acupuncture in Equine Practice

馬臨床における科学的証拠に基づいた鍼治療

- Huisheng Xie DVM & PhD
- Professor Emeritus, University of Florida
- Professor, Chi University

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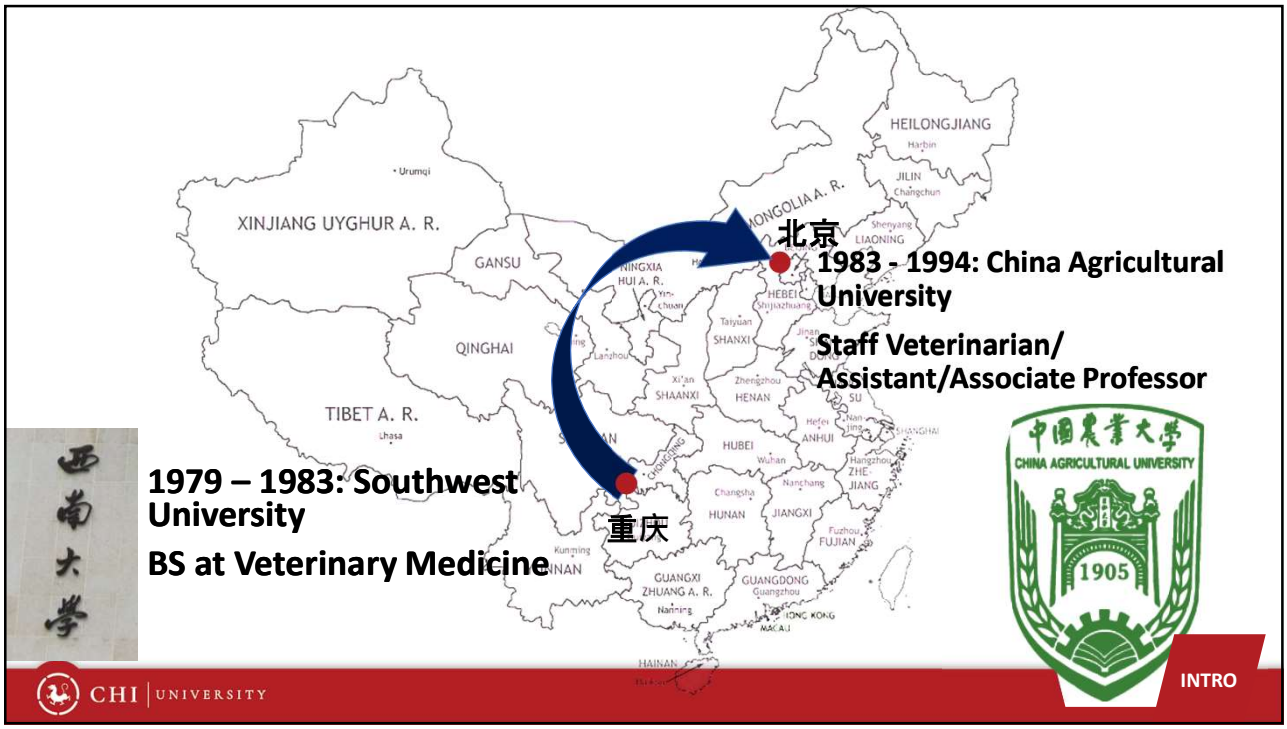
Objectives

- Learn evidence-based clinical applications of acupuncture in horses
- Learn top 7 acupuncture points in horses
- Learn how to use acupuncture point to diagnose lameness in horses

このプレゼンテーションの目的

- 科学的根拠に基づいた馬への鍼治療の臨床応用を学ぶ
- 経穴を使って馬の跛行を診断する方法を学ぶ
- 馬のトップ7の経穴を学ぶ

2


北京
1983 - 1994: China Agricultural University
Staff Veterinarian/ Assistant/Associate Professor
1979 – 1983: Southwest University
BS at Veterinary Medicine
重庆
CHINA AGRICULTURAL UNIVERSITY
1905
INTRO
CHI | UNIVERSITY

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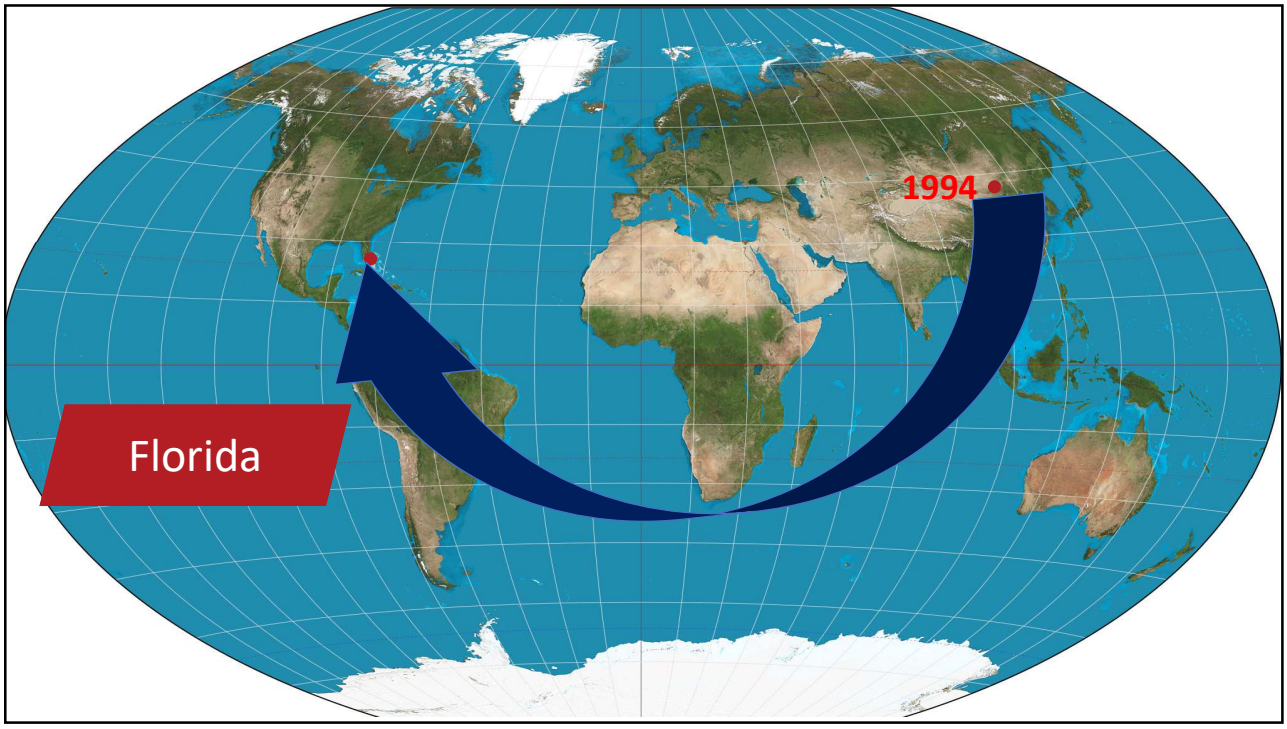
1994
Florida

4

5

- Built the first Acupuncture Service in the Veterinary Medical Schools of USA in 1999
- 1999年に米国の獣医学部に初の鍼治療サービスを設立

6

3年シーズン(1998年):

- ミッドアメリカントリプルクラウン（中西部での3レース）
- を獲得 50年ぶりに三冠馬となった！

3-year season (1998):

- Won the Mid-American **Triple Crown** (3 races in the Mid-West)
- **The first horse** in **50 years** to win this Triple Crown!

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4-year-old season

- **Medical history**
  - Did not win a single race in 1999
  - Very Poor performance due to lameness
  - 4-month rest with medical treatments
    - But, **still lame**
- **Referred** to
  - the Large Animal Hospital, University of Florida

- **病歴**
  - 1999年は1勝もできなかった
  - 跛行のためパフォーマンスが非常に悪い
  - 治療を伴う4か月の休養
    - でも、まだダサい
- **参照した**
  - フロリダ大学大型動物病院

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UF Vet School-LAH Service (July 15, 1999)

- **Physical Exam**
  - Lameness at both left front and rear right limbs
    - Left front limb 3/5
    - Right rear limb 1/5
  - Very painful to palpation over back & left shoulder muscles

- **身体検査**
  - 左前肢と右後肢の跛行
    - 左前肢 3/5
    - 右後肢 1/5
  - 背中と左肩の筋肉を触診すると非常に痛い

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UF Vet School (July 15, 1999)

- **Nuclear scintigraphy and radiography** at the back and stifles/hocks/hind feet
  - Normal limits
- **MRI** at the neck and left front limb
  - No abnormal findings
- **Blood work** including CBC/Liver/Kidney Panels
  - No abnormal findings
- **Endoscopy** at GI and respiratory tracts
  - Normal
- **CSF fluid analysis**
  - No evidence of sepsis or neoplasia
  - No cytologic evidence of disease
  - EPM (-)

- 背中と膝関節/飛節/後足の核シンチグラフィーとレントゲン撮影
  - 通常の限界
- 首と左前肢のMRI: 異常所見なし
- CBC/肝臓/腎臓パネルを含む血液検査：異常所見なし
- 消化管および気道の内視鏡検査：普通
- 髄液分析/敗血症や腫瘍の証拠はない/細胞学的に病気の証拠がない
- EPM (-)

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UF Large Animal Surgery Service (July 15, 1999)

- **Diagnosis**
  - Left front limb Lameness 3/5 (Open)
  - Right Rear Lameness 1/5 (Open)

- 診断
  - 左前肢の跛行 3/5 (不確かな)
  - 右後部跛行 1/5 (不確かな)

Recommendations:
Acupuncture Service

- 推奨事項:
  - 鍼治療サービスを

11

What's your Diagnosis for this HG?

あなたの診断は何ですか?

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- **July 16, 1999 (1st Acupuncture visit)**

- **Main Medical History**
  - Very easily tired, exercise intolerance
  - Have Not been able to be trained for 4 months
  - **Left front limb lameness** (3/5)
  - Right rear limb lameness (1/5)
- **Western Diagnostic Images: No abnormal Findings**
  - ***Non- Diagnostic Lameness***

- **病歴**
  - 跛行のためパフォーマンスが非常に悪い
  - 治療を伴う4か月の休養
    - でも、まだダサい
  - 左前肢と右後肢の跛行
    - 左前肢 3/5 + 右後肢 1/5
- **西洋医学の診断画像**
  - 異常所見なし
  - 診断不能な跛行

HG: 4-year-old
Thoroughbred, colt

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Outline 概要

- **Can acupuncture be used for diagnosis in horses?**
- **Acupuncture for pain and poor performance**
- **Acupuncture on stem cells in horses**
- **Other evidenced-base clinical applications of Acupuncture**

- **馬の診断に鍼治療を使用できますか?**
- 痛みやパフォーマンスの低下に対する鍼治療
- 馬の幹細胞に対する鍼治療
- その他の科学的根拠に基づいた鍼治療の臨床応用

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- **Diagnostic Acupuncture points**
  - Sensitivity Test on Acupuncture Points
    - Palpation
    - Scanning

診断経穴

経穴の感度テスト

触診

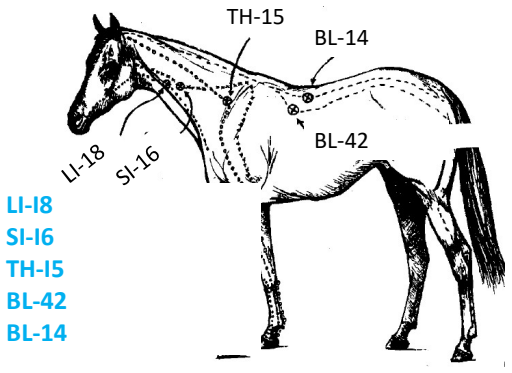
走査

15

McCormick, 1996
Journal of Equine Veterinary Science

- **327 Thoroughbred racehorses**
  - lameness or routine evaluation
- **Tested**
  - sensitivity of 5 acupoints

- サラブレッド競走馬 327 頭
  - 跛行または日常的評価
- テスト済み
  - 5つの経穴の感度



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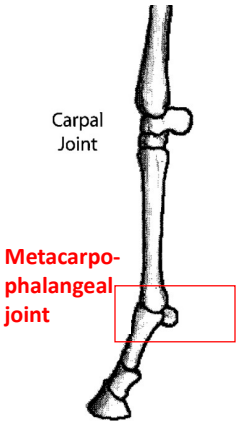
McCormick, 1996

- **Out of 327 horses**
  - 176 (54%) indicated the **metacarpophalangeal joint (MPJ) or fetlock pathology** using acupuncture diagnosis

- Of 176 MPJP horses
  - 176 (100%) had sensitive **LI-18**
  - 158 (90%) had sensitive **SI-16**

- 327頭の馬のうち
  - 176（54%）が鍼診断により中手指節関節または球節の病理 (MPJP) を示した

- **MPJP馬176頭中**
  - 176 (100%) が敏感な**経穴 LI-18** を持っていました
  - 158（90%）が敏感な**経穴SI-16**を持っていた



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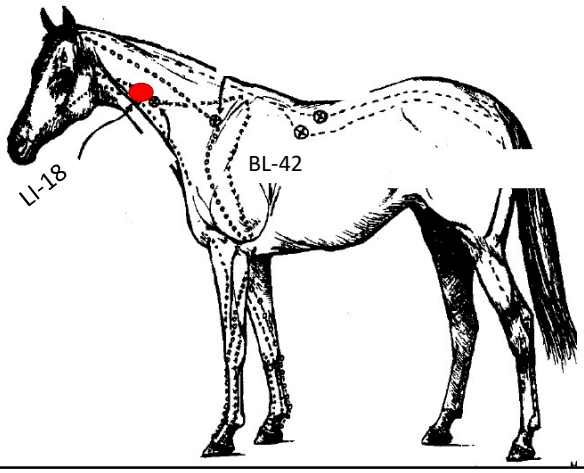
McCormick , 1997

- **Foot lameness** with conventional diagnosis

- Sensitivity at **LI-18** was found
  - 24/29 (83%) laminitis
  - 23/30 (77%) chronic heel lameness
  - 31/45 (69%) acute heel lameness

- 従来の診断による足の跛行

- **経穴LI-18** の感度が判
  - 24/29 (83%) 蹄葉炎
  - 23/30 (77%) 慢性のかかとの跛
  - 31/45 (69%) 急性のかかとの跛行



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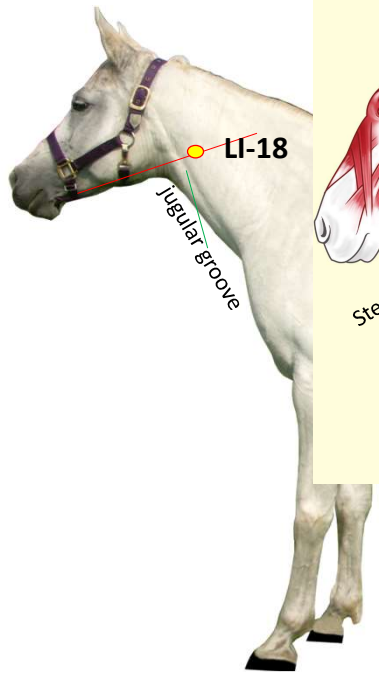

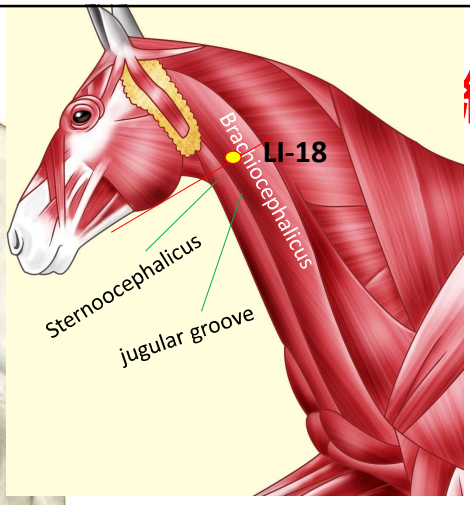

経穴 LI-18

- On the ventral aspect of the brachiocephalic muscle
- At the level of C2-C3
- Dorsal to the jugular groove.

- 腕頭筋の腹側について
- C2～C3レベル
- 頸動脈溝の背側

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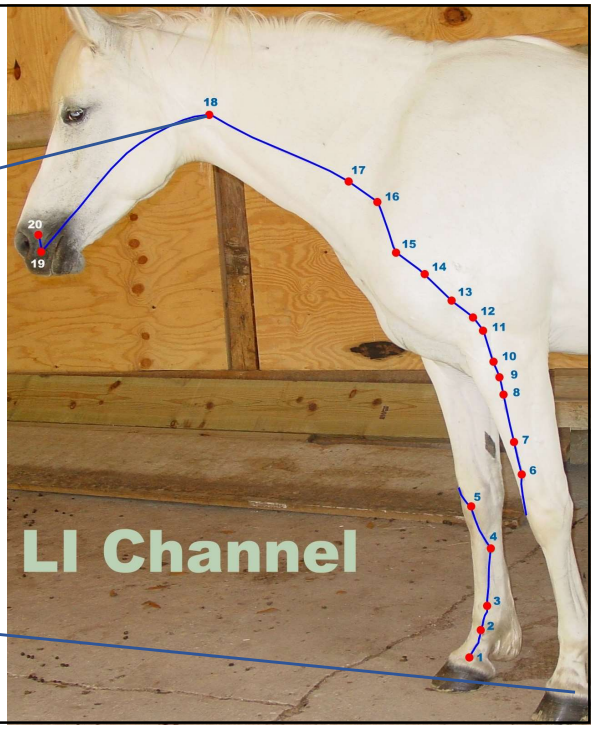
Sensitivity at **LI-18**

Pain in the foot/heel



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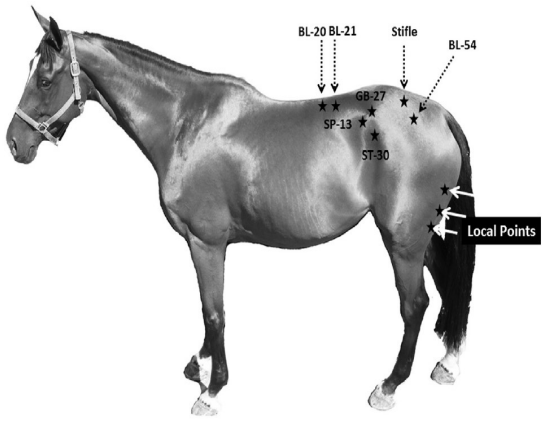
Michelotto et al, 2014

- **The diagnostic points for stifle syndrome**
  - BL-20, BL-21
  - Local stifle points
    - BL-37, 38, 39
  - GB-27, SP-13
  - ST-30
  - The sacral stifle point
    - BL-32



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Michelotto etal, 2014

810 horses

↓ **Acupuncture sensitivity on palpation**

86 horses with stifle syndrome via acupuncture diagnosis

↓ **Randomly selected**

- **22 horses**

ultrasonography and/or radiography

↓

- **21 (95.5%) of stifle lesions**

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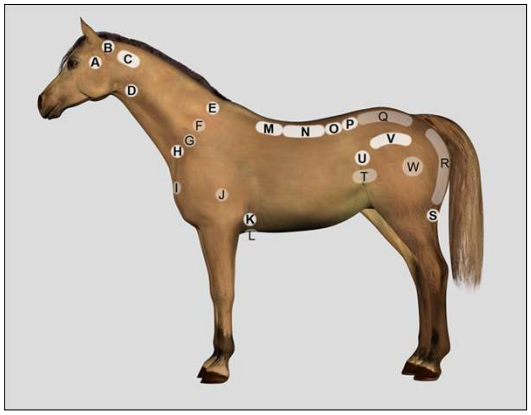
- **102 client-owned horses**
  - reduced performance or lameness
- First
  - Acupoint sensitivity (screening scan)
    - positive or
    - negative
- Then
  - Evaluated for lameness
    - Lame or
    - sound

Jeune etal, 2014



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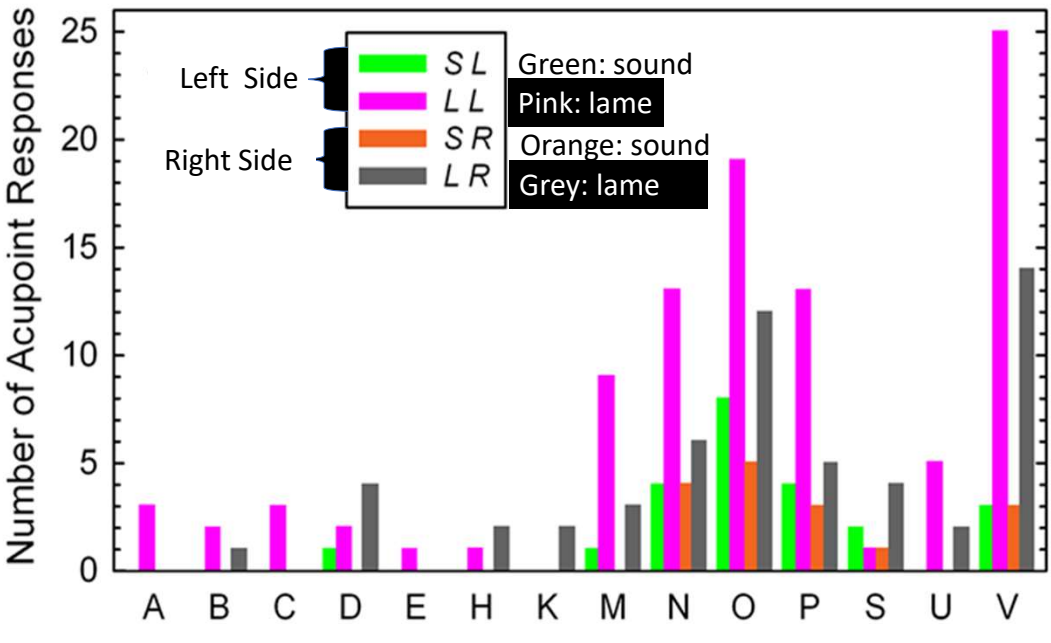

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Jeune et al, 2014

- **Sound horses**
  - 40/51 (78.4%) horses had a negative Acupuncture Scan
  - 11/51 (21.6%) had a positive Acupuncture Scan
- **Lame horses**
  - 9/51 (17.6%) horses had a negative Acupuncture Scan
  - 42/51 (82.4%) had a positive Acupuncture Scan ($p<0.001$)
- **Acupuncture Scanning**
  - Significant correlations between the positive sensitivity of Acupuncture Scan and the lameness in horses.

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Acupuncture Scanning (palpation)

26

- Shaker, 14 Year old QH G
- **Used for the Barrel Racing**
- **Main Complaints**
  - ***Poor performance***
  - ***Right front limb lameness***: 2/5 on trot
- **Conventional diagnostics**
  - Diagnostic images of foot, fetlock, carpus: No abnormal findings
  - Nerve block: No abnormal findings

- **14歳のクォーターホース、去勢馬**
  - バレルレーシングに使用
- 主な苦情
  - 業績不振
  - 右前肢の跛行：速歩で2/5
- 足部、球節、手根部の画像診断：異常所見なし
- 神経ブロック：異常所見なし

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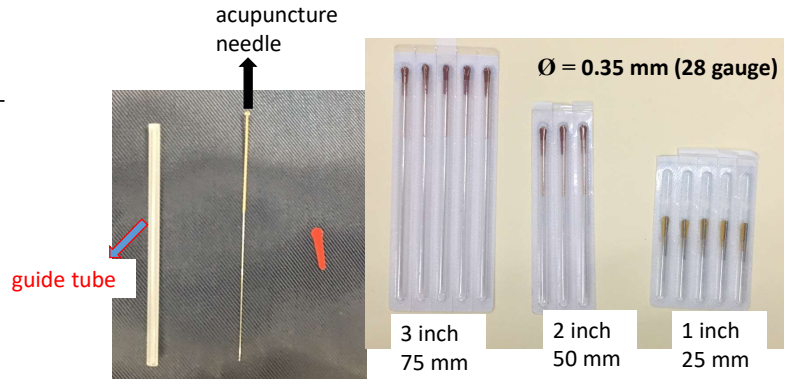
Equine Acupuncture 馬の鍼治療

- **Acupuncture needles** 鍼

- **To Use** acupuncture needle guide tube a*s a* ***Scanner***

- 鍼ガイドチューブの使い方
  - スキャナーとして



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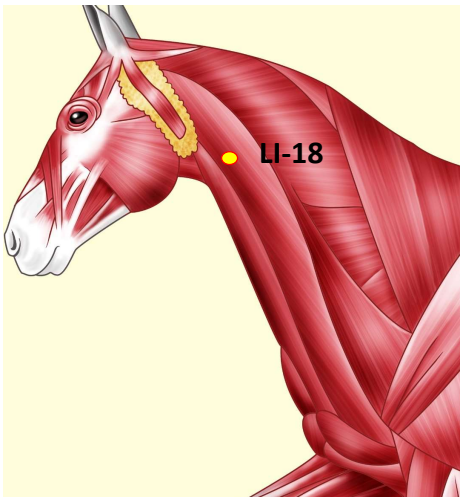
Acupuncture scanning

- Sensitivity
  - Right LI-18: 4+
  - Right BL-14: 3+
  - Right PC-1: 3+



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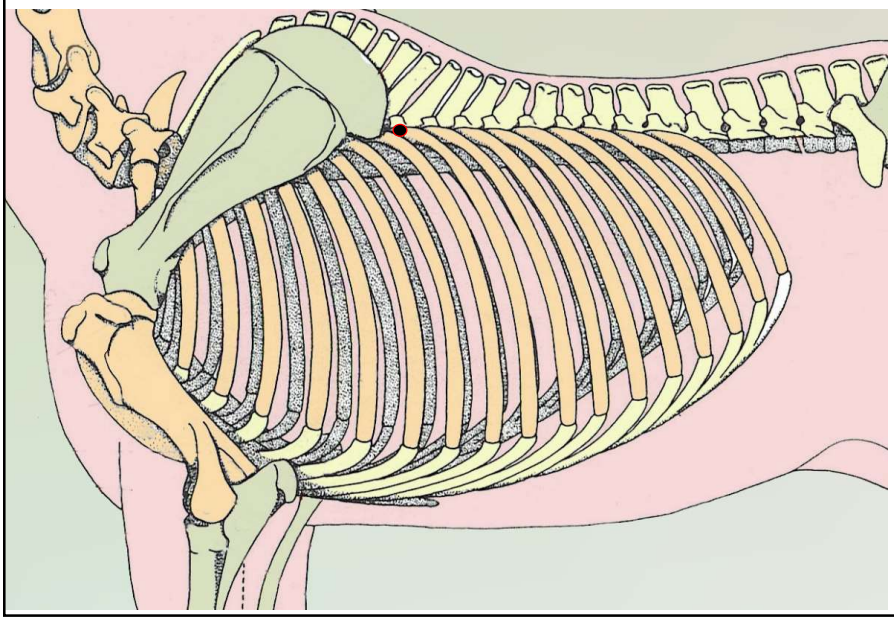
BL-14: 3 cun lateral to the dorsal midline, in the iliocostal muscle groove, in the 9th intercostal space



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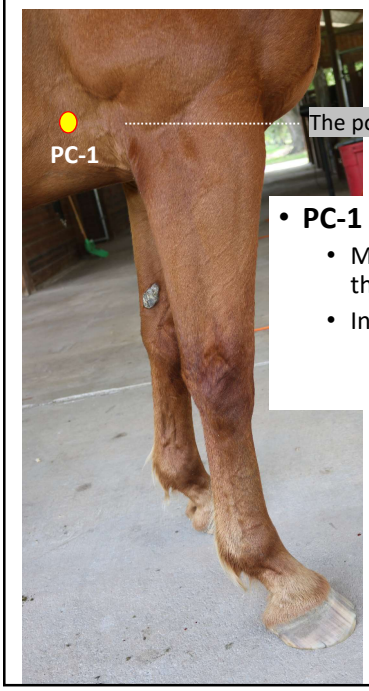
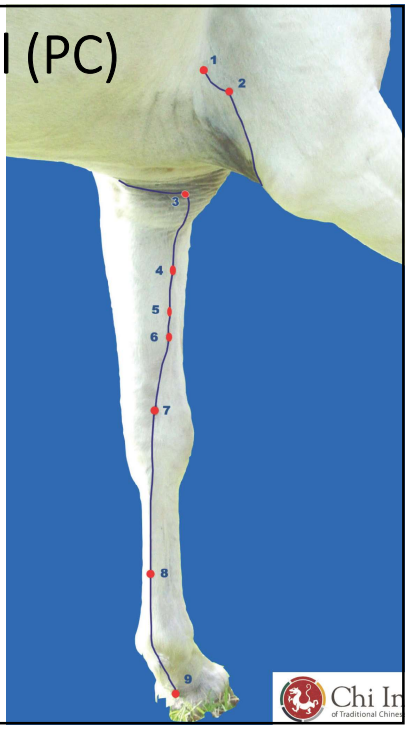
Pericardium Channel (PC)



- **PC-1**
  - Medial to, and at the level of, the point of the elbow
  - In the fifth intercostal space



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Acupuncture scanning

- Right LI-18: 4+
- Right BL-14: 3+
- Right PC-1: 3+

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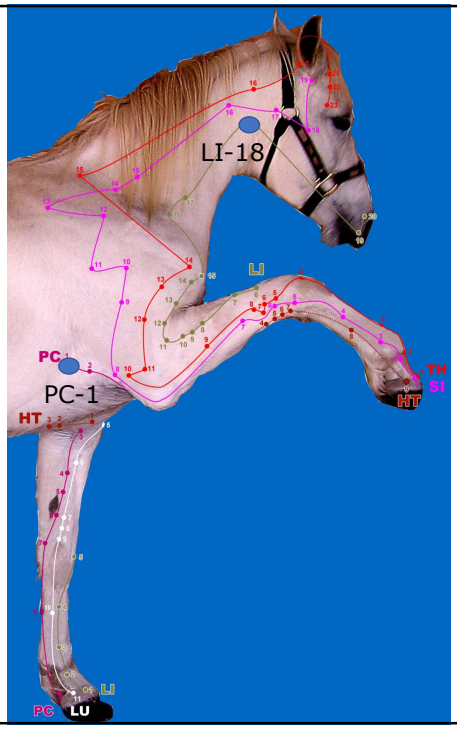

LI-18 and PC-1 (+++)

Pain in front foot

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- Five Acupuncture Needles for forelimb foot pain
  - PC-9
  - Qian-ti-men (medial and lateral
  - SI-3
  - LI-3

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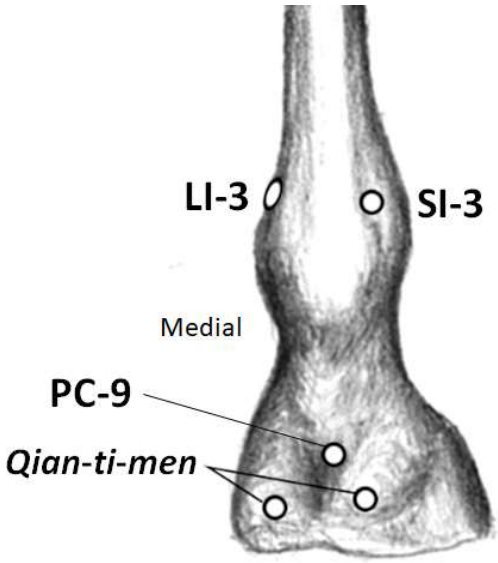
- Five Acupuncture Needles for forelimb foot pain
  - PC-9
  - Qian-ti-men (medial and lateral
  - SI-3
  - LI-3



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- Sensitivity @ pre-needling
  - Right LI-18: 4+
  - Right BL-14: 3+
  - Right PC-1: 3+
- Sensitivity @ post-needling
  - Right LI-18: -
  - Right BL-14: -
  - Right PC-1: -

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- **July 16, 1999 (1st Acupuncture visit)**
  - **病歴**
    - 跛行のためパフォーマンスが非常に悪い
    - 治療を伴う4か月の休養
      - でも、まだダサい
    - 左前肢と右後肢の跛行
      - 左前肢 3/5 + 右後肢 1/5
  - **西洋医学の診断画像**
    - 異常所見なし
    - 診断不能な跛行
  - **Palpation on acupuncture point (Scanning)**
  - 経穴の触診 (スキャン)

HG: 4-year-old
Thoroughbred, colt

•4歳, サラブレッド, コルト

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July 16 (1st TCVM visit)

Palpation on acupuncture point (Scanning)
Left LI-18/PC-1: 4+
Left BL-13/14/15/27: 3+
Left LI-16/17: 3+
Left LI-15, TH-14, SI-9/10: 5+

HG: 4-year-old
Thoroughbred, colt

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TCVM Diagnosis
1) Left front foot Pain (Qi Stagnation)
2) Left neck/shoulder Pain (Qi Stagnation)

- 中獣医診断
  - 1)左前足の痛み（気の停滞）
  - 2) 左首・肩の痛み（気の滞り）

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TCVM Diagnosis: Qi Stagnation at Left neck/shoulder/front foot

First acupuncture: July 16, 1999

2nd acupuncture: July 23, 1999
Acupoint sensitivity improved
3rd acupuncture: July 30, 1999
Clinically sound
4th acupuncture August 27, 1999
Return the normal training

Won the prestigious “Bowling Green” Handicap race ($500,000) at Belmont Park, NY

Won $300,000 “Sword Dancer” Stakes race at Saratoga Springs, NY

Finished third in another $500,000 race at Belmont Park

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Clinical Application of Equine Acupuncture

馬鍼の臨床応用

- Diagnosis
  - Lameness
  - Sports Medicine
  - Performance Issues
- Treatment
  - Pain management
  - Soft tissue injury
    - Muscle
    - Myofascial
    - Tendon/ligament
  - Others

- 診断
  - 跛行
  - スポーツ医学
  - パフォーマンスの問題
- 治療
  - 痛みの管理
  - 軟組織損傷
    - 筋
    - 筋膜
    - 腱/靭帯
  - その他

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Acupuncture for Pain Management

- Pain Threshold

痛みの閾値

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Pain Threshold　痛みの閾値

- **Responses to (noxious stimulus)**
  - heat
  - electricity
  - pinprick
  - pinch

- 有害な刺激に対する反応
  - 熱
  - 電気
  - ピンを刺す
  - ピンチ

Pain Threshold
痛みの閾値

Analgesia
鎮痛

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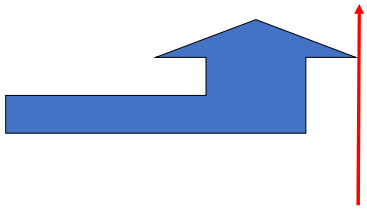
Acupuncture

鍼刺激



Pain Threshold
痛みの閾値

•Acupuncture analgia

•鍼による鎮痛

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- **Hoof withdrawal reflex latency (HWRL)**
  - the time (seconds) between lamp illumination and withdrawal of the hoof

- **蹄引っ込め反射潜時 (HWRL)**
  - ランプ点灯から蹄が抜けるまでの時間（秒）

- JD Harkins DVM PhD and T Tobin DVM, PhD
  - **University of Kentucky**
  - Department of Veterinary Science
  - Lexington, USA

  - All aspects of Equine Pharmacology, Therapeutics and Toxicology

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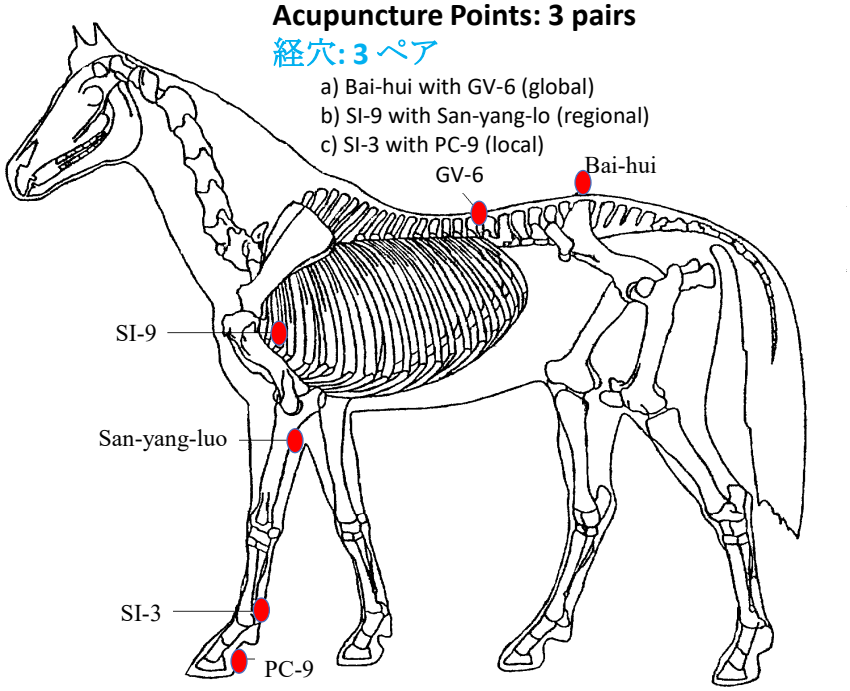
Acupuncture Points: 3 pairs

経穴: 3 ペア

a) Bai-hui with GV-6 (global)
b) SI-9 with San-yang-lo (regional)
c) SI-3 with PC-9 (local)



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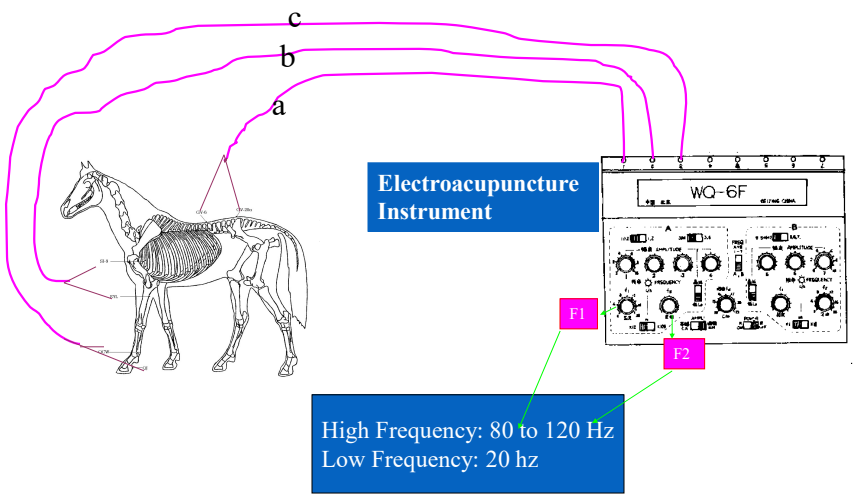

Electro-acupuncture treatment

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- **Acupuncture Group I:** global High Frequency (80-120 Hz) EAP
- **Acupuncture Group II:** local + regional High frequency EAP
- **Acupuncture Group III:** low frequency (20 Hz) EAP
- **Acupuncture Group IV:** local high frequency EAP
- **Positive control group (PCG):** 2cc of 0.5 % bupivacaine HCL Sq injected into @ lateral palmar nerve
- **Negative control group (NCG):** 2 cc of saline subcutaneously injected into the same area

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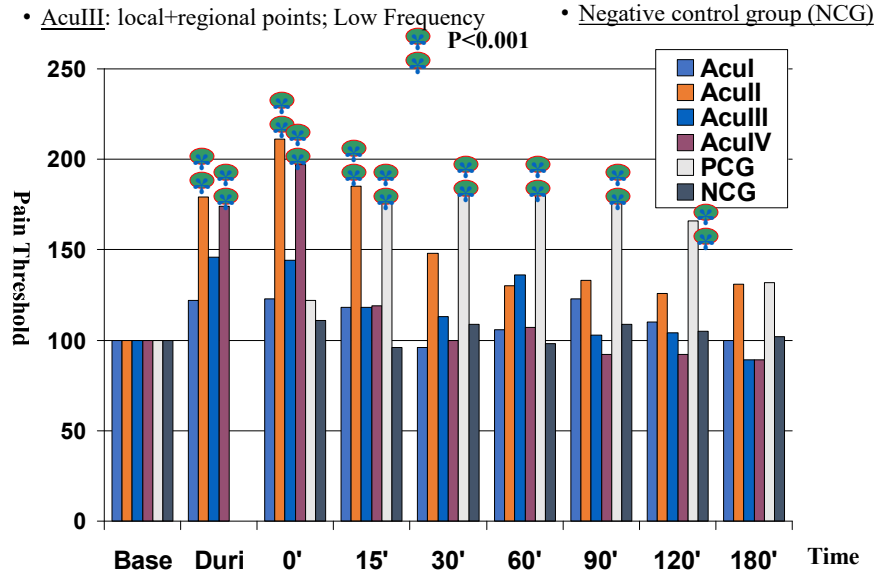
Subjects and groups in pain threshold trial

Groups	# of horses	# of horses		# of horses (years)			treatment
		male	female	<6	6-9	>9	
AcuI	8	2	6	2	2	4	EA at 4 acupoints with freq of 80-120 Hz
AcuII	8	2	6	3	3	2	EA at 4 acupoints with freq of 80-120 Hz
AcuIII	4	0	4	2	1	1	EA at 4 acupoints with freq of 20 Hz
AcuIV	4	0	4	1	0	4	EA at 2 points with freq of 80-120 Hz
PCG	5	2	3	0	2	3	Bupivacaine injection
NCG	5	1	4	2	2	1	Saline injection

49

% Change in HWRL in **left limb** in horses

- AcuI: Global points; High Frequency
- **AcuII:** local+regional points; High Frequency
- AcuIII: local+regional points; Low Frequency
- **AcuIV:** local points; High Frequency
- **Positive control group** (PCG)
- Negative control group (NCG)

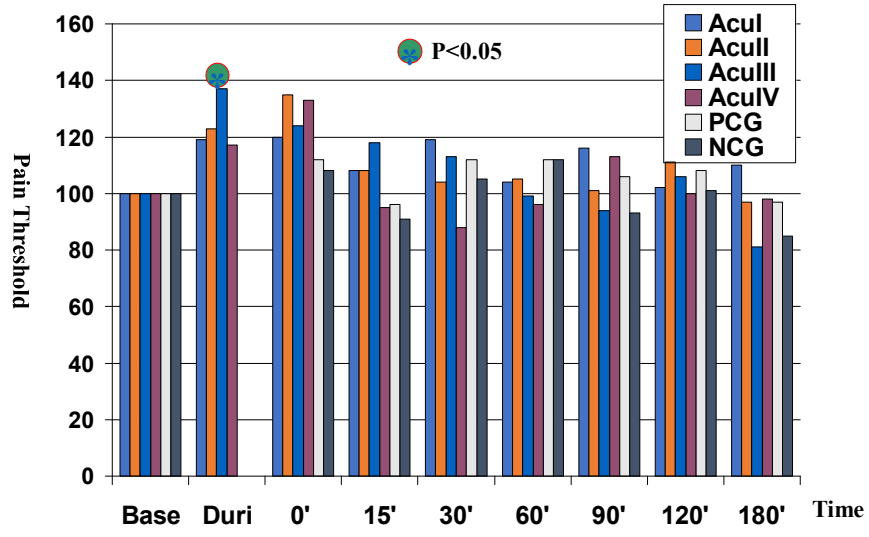


50

- **The high frequency of 80-120 Hz Electro-acupuncture is**
  - better for electro-acupuncture analgesic effect in the local lesion (foot).

51

- **AcuIII: low frequency**



% change in HWRL in **right limb** in horses

52

- **Low frequency (20 Hz) Electro-acupuncture** induced a
  - stronger analgesia in other body areas than the local areas which was close to acupoints.
- **Clinical Application of Electro-acupuncture**
  - High frequency for the local pain
  - Lower frequency for the whole body pain management

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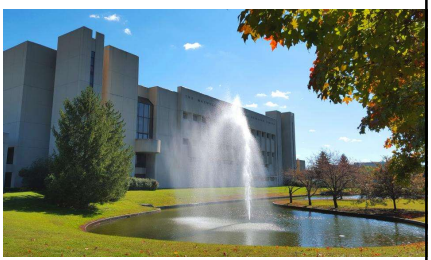
Journal of Equine Vet Sci, (12):591-599, 2001

INFLUENCE OF ELECTRO-ACUPUNCTURE ON PAIN THRESHOLD IN HORSES AND ITS MODE OF ACTION

Huisheng Xie, DVM PhD[1]; Edgar A. Ott, PhD[2]; J. D. Harkins, DVM, PhD[3]; T. Tobin, DVM, PhD[3]; Patrick T. Colahan, DVM[1]; Marty Johnson, MS[1]

- Acknowledgement
  - Drs Harkins and Tobin, and his team
    - University of Kentucky
  - Dr. Ed Ott and his team
    - University of Florida



Gluck Equine Research Center

54

Skarda RT, Muir WW.
College of Veterinary Medicine, The Ohio State University
American Journal Veterinary Research 2003; 64:137–144.

- **Controlled rectal distention:** noxious stimulus
  - Insertion of a balloon (pressures of < or = 220 mm Hg)
  - Measured nociceptive rectal pain threshold

- **Three groups (N=8 mares)**
  - Saline (0.9% NaCl)
    - solution (0.01 mL/kg, IV)
  - Butorphanol tartrate
    - 0.1 mg/kg, IV
    -
  - 2 hours of Electro-acupuncture (EA)
    - Acupoints BL-21, 25, and 27
    - Bai-hui and ST-36

55

- **Both Butorphanol and Electro-acupuncture (EA)**
  - provided **statistically** **equal analgesia** to induced rectal stimuli (balloon pressure)

- **EA and Butorphanol**
  - may provide useful rectal analgesia in horses

- **EA is safer**
  - EA produces produced minimal cardiovascular and respiratory changes
  - Butorphanol produced
    - moderate significant increases in heart and respiratory rates, arterial blood pressure,
    - and decreases in arterial oxygen tension

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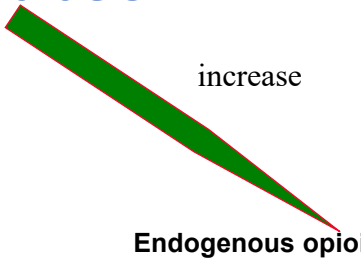
Acupuncture Stimulation



increase

Endogenous opioids including β -endorphin, Serotonin, other neurotransmitters

- Horses: Skarda etal, 2002; Xie etal, 2001; McCarthy etal, 1993
- Dogs: Groppetti etal, 2011
- Others: Karatay etal 2018, Malizia etal, 1979

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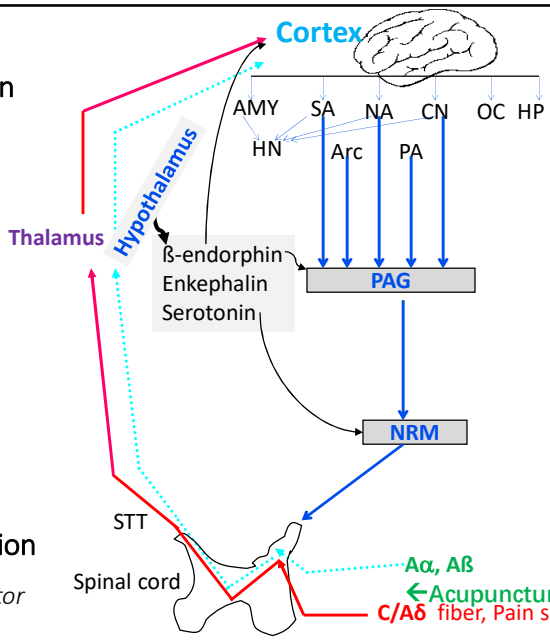
2.Modulation

Limbic system/Cortex



Amy: nucleus amygdala
Arc: arcuate nucleus
CN: caudate nucleus
HN: habenular neuclus
HP: hippocampus
NRM: neuclei raphe magnus
OC: occipital cortex
PA: preoptic area
SA: septal area
PAG: periaqueductal gray
STT: spinothalamic tract

3. Descending pain control system

1.Transmission

From nociceptor to brain

Acupuncture point stimulation

痛觉上行传递
Pain ascending system

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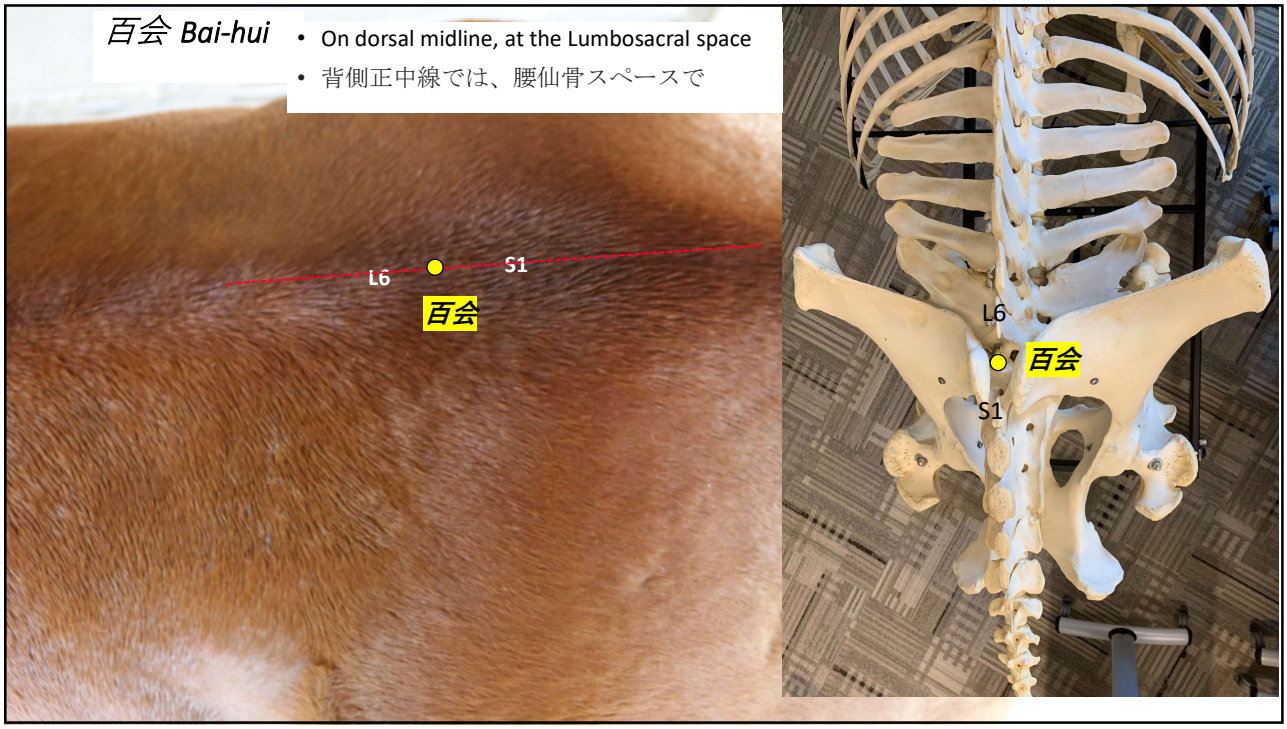
Let's have fun!

- **Practice Acupuncture in Horses**
  - Top 7 Acupoints
  - Dry-needling acupuncture technique
- **How to locate an acupuncture point**
  - Anatomic structures (Bones, Muscles, Muscular grooves etc)
  - Cun

- 馬に鍼治療を行う
  - トップ7の経穴
  - 乾式鍼治療法
- 経穴の見つけ方
  - 解剖学的構造（骨、筋肉、溝など）
  - クン

59



60

寸 *Cun*

- **Acupuncture unit**
  - to measure the body and locate each point.
- **Measurement for the Body/Trunk**
  - 1st Tail vertebral
  - Last Rib
  - Hand

- **鍼ユニット身体を測る**
  - それぞれの経穴を特定します。
- **体幹の計測**
  - 第1尾椎骨
  - 最後の肋骨
  - 手

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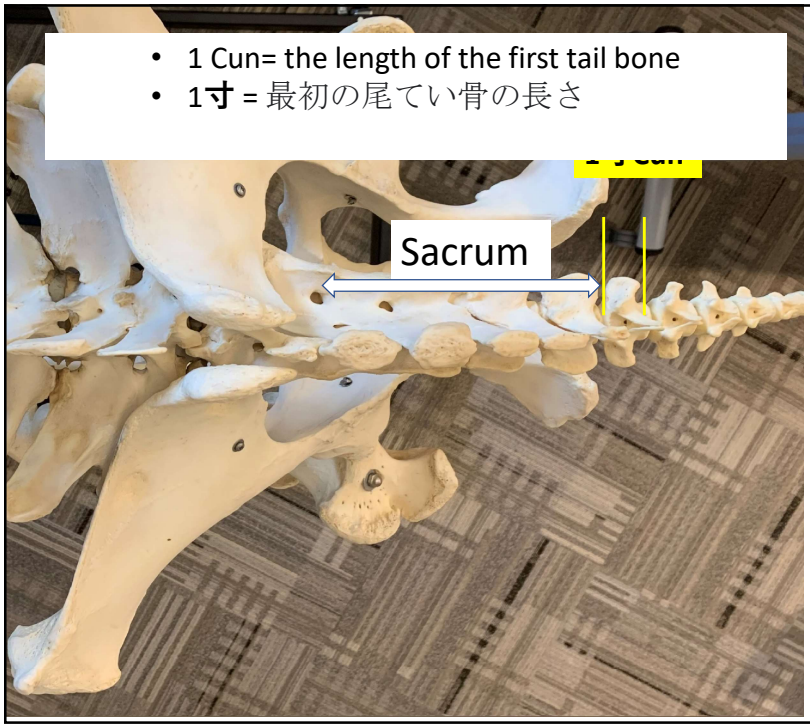
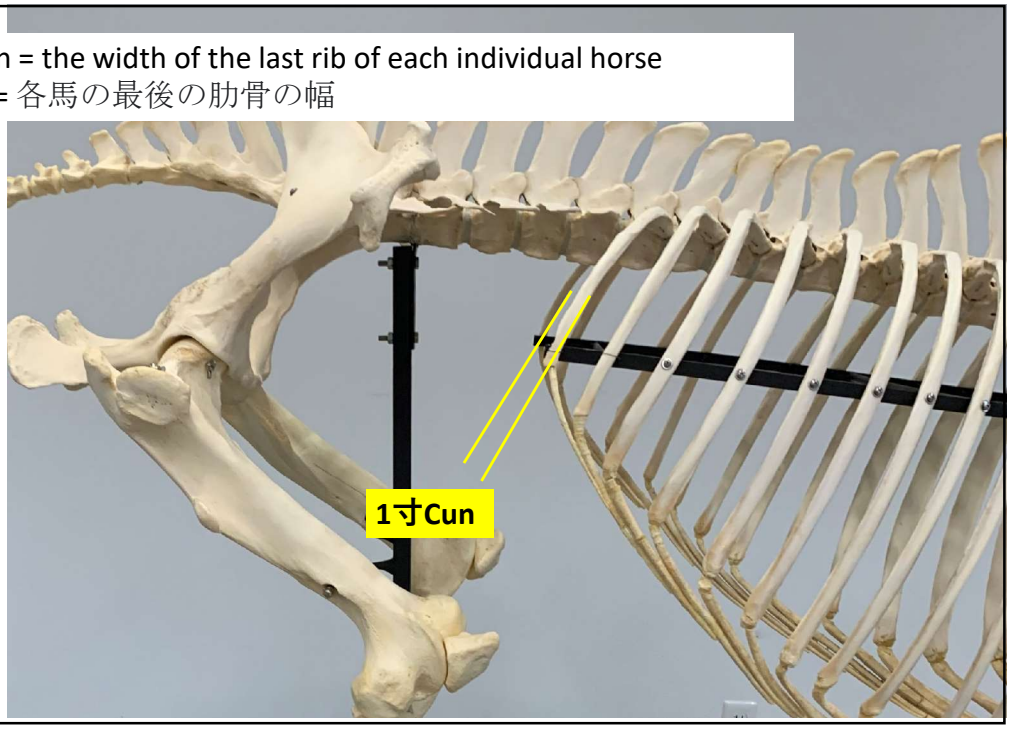


62

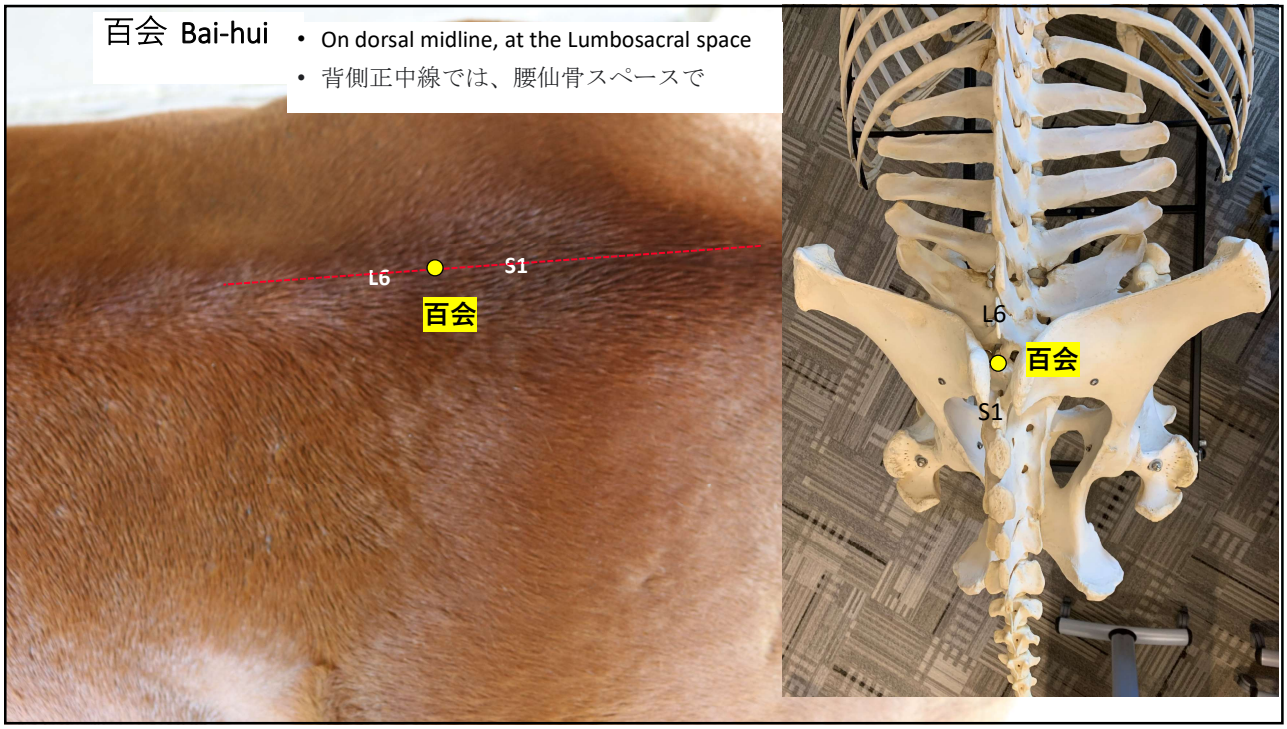
- 1Cun = the width of the last rib of each individual horse
- 1寸= 各馬の最後の肋骨の幅



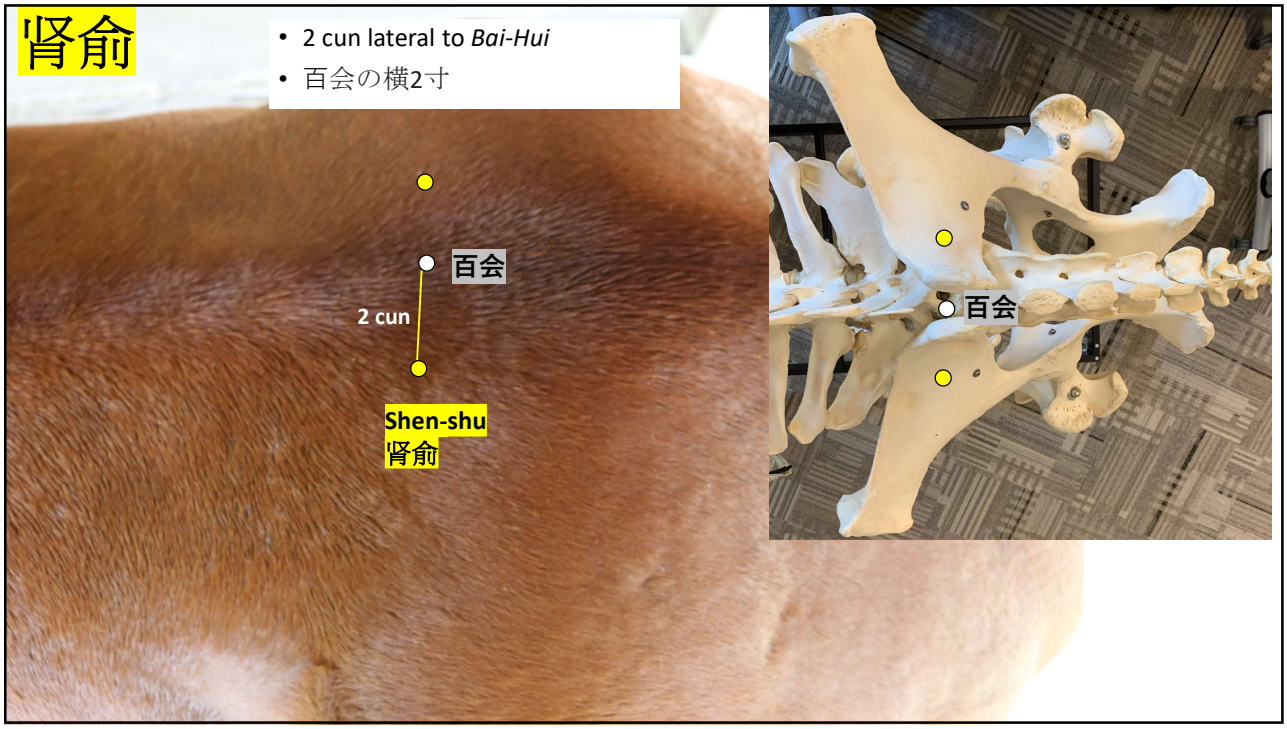
63

- 1Cun= the width of practitioner's 2 fingers (Index and Middle)
  1寸 = 施術者の2本の指（人差し指と中指）の幅

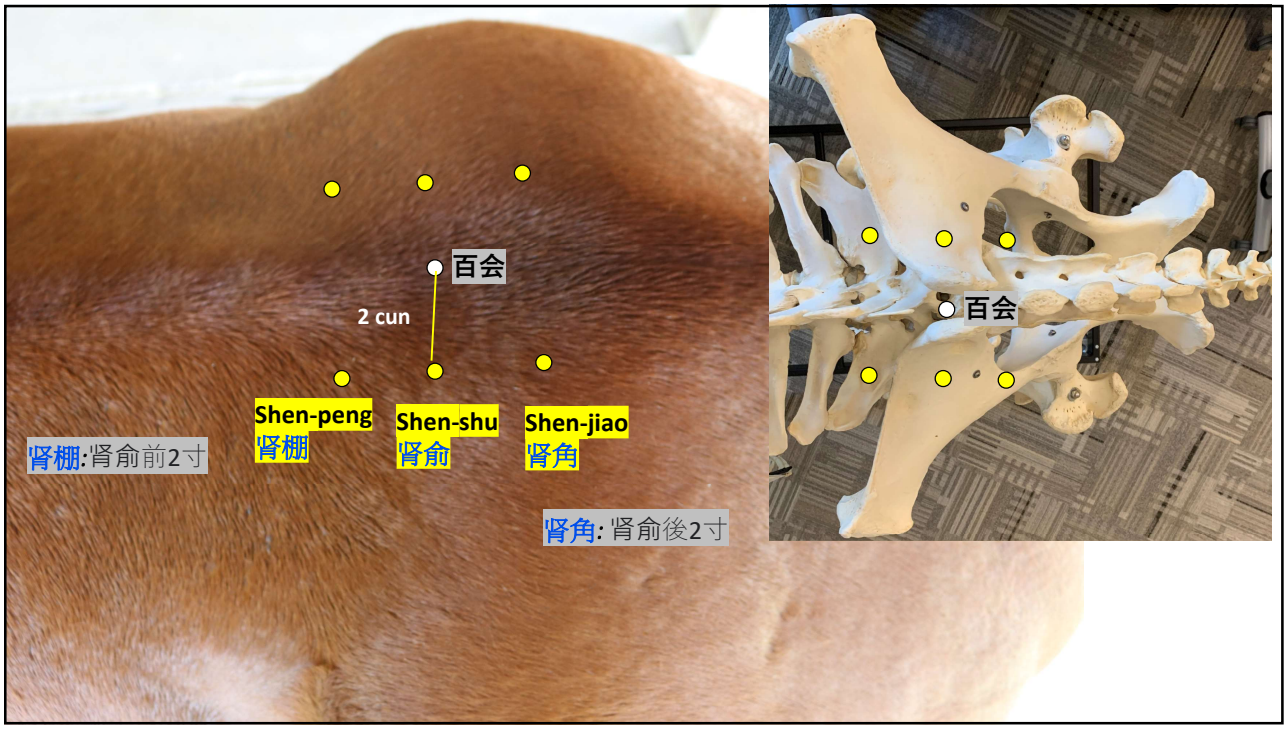
64


百会 Bai-hui
• On dorsal midline, at the Lumbosacral space
• 背側正中線では、腰仙骨スペースで
L6
S1
百会
L6
百会
S1

65


腎俞
• 2 cun lateral to *Bai-Hui*
• 百会の横2寸
百会
2 cun
Shen-shu
腎俞
百会

66


百会
2 cun
Shen-peng
腎棚
Shen-shu
腎俞
Shen-jiao
腎角
腎棚:腎俞前2寸
腎角: 腎俞後2寸
百会

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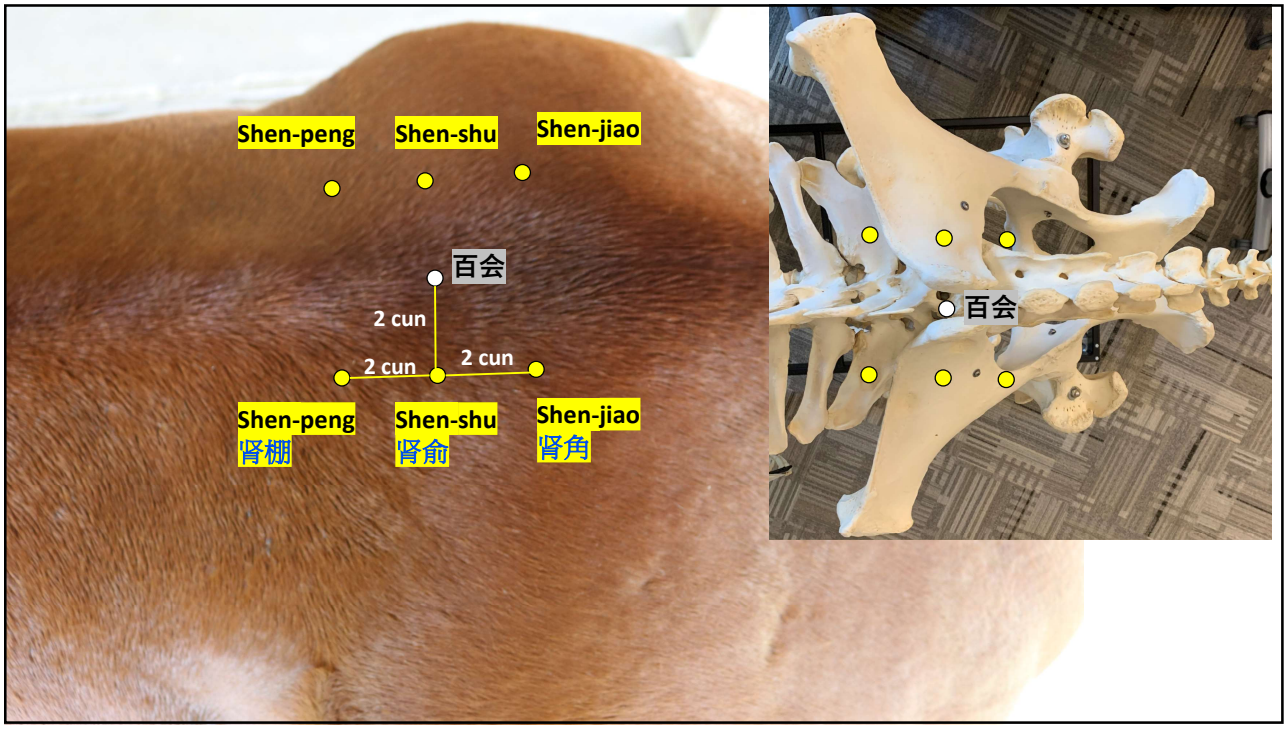
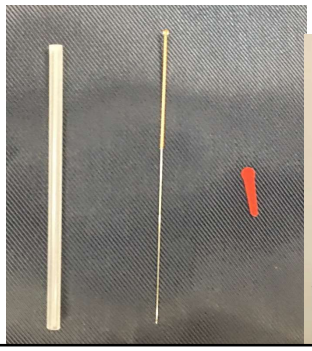

Shen-peng
Shen-shu
Shen-jiao
百会
2 cun
2 cun
2 cun
Shen-peng
腎棚
Shen-shu
腎俞
Shen-jiao
腎角
百会

68

- **Commonly used acupuncture needles in Equine Practice**
  - **Ø = 0.35 mm (28 gauge)**
  - Length
    - 1 inch (25 mm)
    - 2 inches (50 mm)
    - 3 inches (75 mm)



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Mechanisms of Acupuncture Effects

- **Analgesia Effects**
  - **Release of neurotransmitters including endorphin/enkephalin/serotonin**
    - Calming
  - **Myofascial release**
    - Relieve muscle pain and spasm
- **Promote self-healing mechanism**
  - **release of stem cells**
    - Fasten healing
  - **Increase local circulation**
    - Have anti-inflammatory effect and fasten healing

- **鎮痛効果**
  - 筋膜リリース
  - 筋肉痛を和らげ、けいれんを和らげます
- **自己修復メカニズムを**
  - 促進する幹細胞の放出
  - 治癒を早める
  - 循環を増やす
  - 抗炎症作用がある

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Electroacupuncture on Stem cell Mobilization in Horses

馬の幹細胞動員に対する電気鍼療法

- **Maria Grant, MD**
- **Huisheng Xie, DVM PhD**

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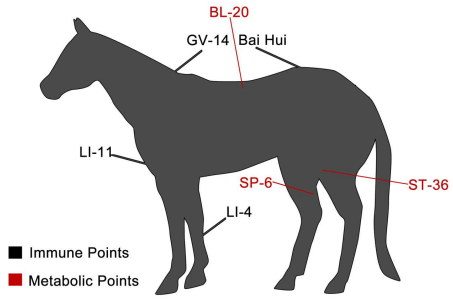
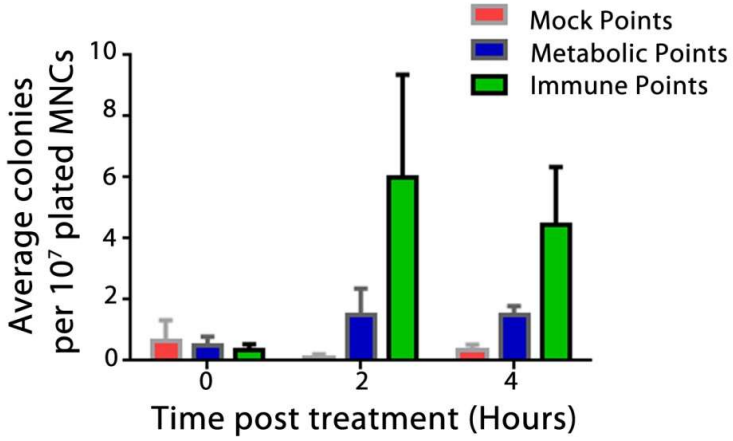


- **Immune Group**
  - Bai-hui + GV-14
  - Left LI-4 + left LI-11
  - Right LI-4 + Right LI-11
- **Metabolism Group**
  - BL-20, bilateral
  - Left SP-6 + Left ST-36
  - Right SP-6 + Right ST-36



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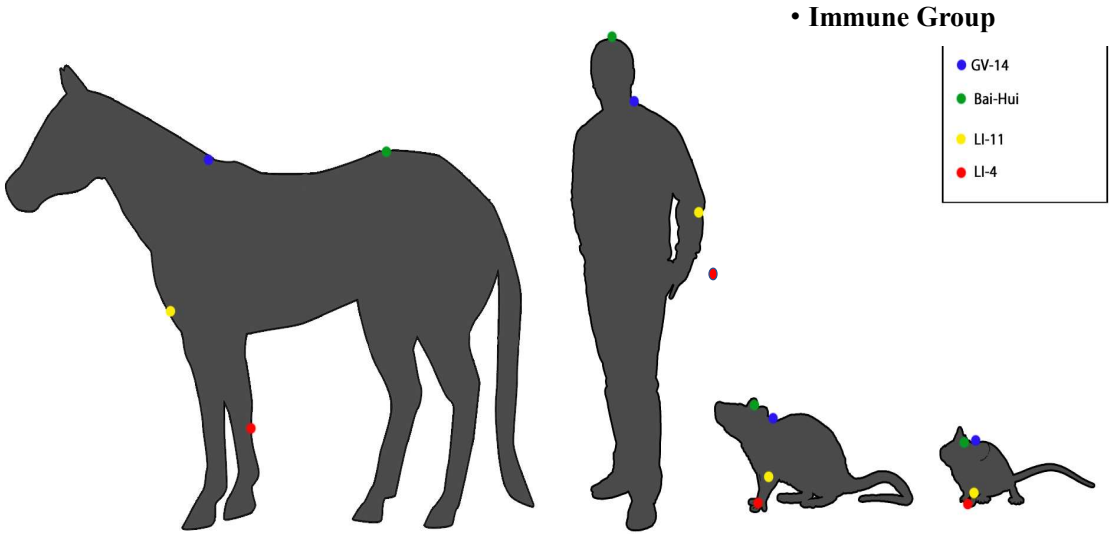
Mesenchymal Stem Cells
間葉系幹細胞 (MSC)



73

- Electroacupuncture Promotes Central Nervous System-Dependent Release of **Mesenchymal Stem Cells (MSC)**
- **STEM CELLS. 35:1303–1315, 2017**
- Salazar TE, Richardson MR, Beli E, Ripsch MS, George J, Kim Y, Duan Y, Moldovan L, Yan Y, Bhatwadekar A, Jadhav V, Smith JA, McGorray S, Bertone AL, Traktuev DO, March KL, Colon-Perez LM, Avin KG, Sims E, Mund JA, Case J, Deng X, Kim MS, McDavitt B, Boulton ME, Thinschmidt J, Li Calzi S, Fitz SD, Fuchs RK, Warden SJ, McKinley T, Shekhar A, Febo M, Johnson PL, Chang LJ, Gao Z, Kolonin MG, Lai S, Ma J, Dong X, White FA, **Xie H, Yoder MC, Grant MB**.

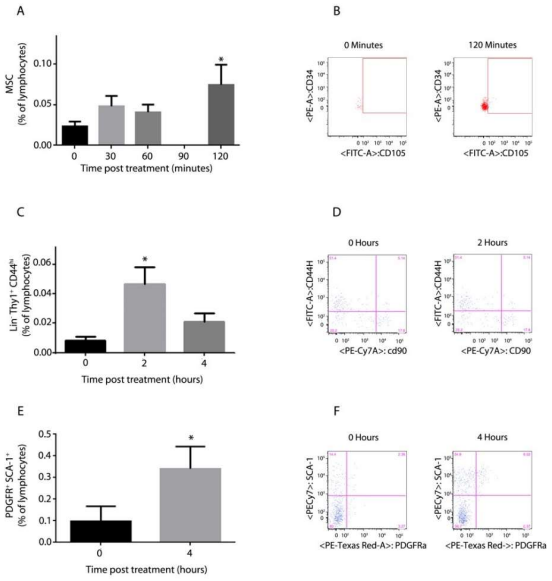
74

- After Electro-acupuncture stimulation,
  - MSC increase in peripheral circulation of humans, rats and mice

Human

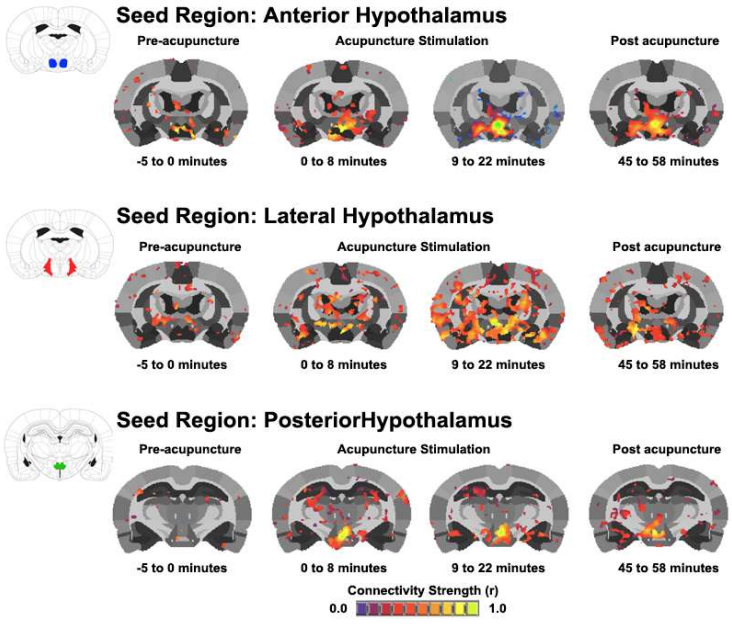
Rat

Mouse



75

fMRI during administration of EA demonstrates marked activation of the hypothalamic centers of the brain



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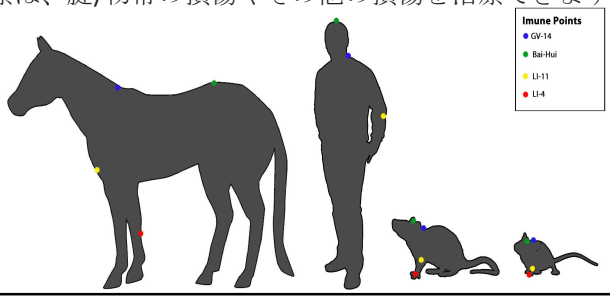
Summary/Conclusions

- **Stimulation using electro-acupuncture (EA)** of LI-4, LI-11, GV-14 and Bai-hui in humans, horses, and rodents
  - results in mobilization of MSC into systemic circulation.
- **MSC origin of the EA-mobilized cells**
  - was supported by their ability to enhance arterialization of blood vessels in vivo.
- **Electro-acupuncture can treat**
  - Tendon/ligament injury
  - Other injuries

- ヒト、馬、齧歯動物における電気鍼刺激は、MSC を体循環に動員します。
- 電気鍼刺激動員幹細胞のMSC起源は、生体内で血管の動脈硬化を促進する能力によって裏付けられました。
- 電気鍼治療は、腱/靭帯の損傷やその他の損傷を治療できます。



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Clinical Trials

- Foot Pain, Laminitis and Navicular Disease
- Back pain
- Neurological Disorders

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Pain model in horses

- **Clinical Lame Horses**
  - Laminitis
  - Or other cases
- **Experimental Lameness**

Pressure against sole → **Lame Horses**

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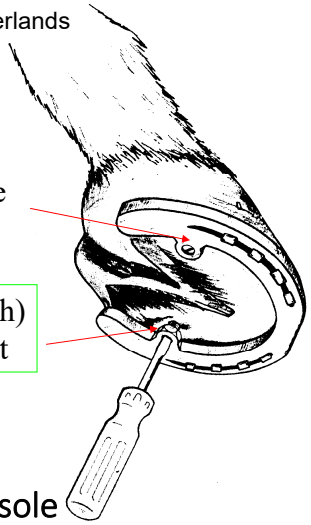
Dr. Merkens etal (1984)

University of Utrecht, The Netherlands



Pressure against hoof sole induced by turning the adjustable screw

80

Lameness grading score

Modified on the basis of Dr. Steiss et al (1989) and AAEP

Standing
Walking
Trotting

Degree: 0 to 3

0: No lameness
1: Slight lameness
2: Moderate lameness
3: Severe Lameness

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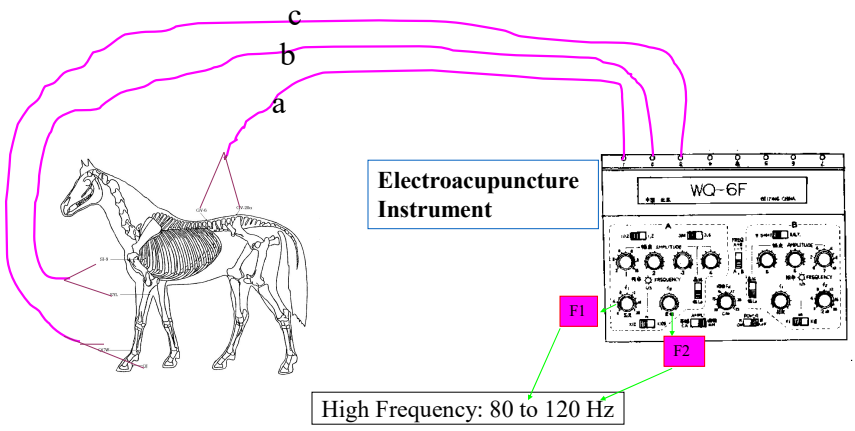
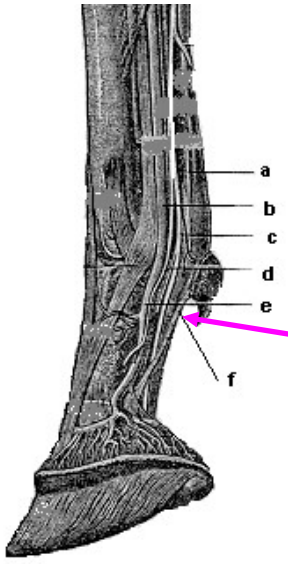


Electro-acupuncture treatment

82



--a Lumbricalis muscle

--b Dorsal digital nerve

--c Volar digital nerve

--d Digital artery

--e Digital vein

Bupivacaine
Saline

83

Lameness scores of the left front limb in horses

Groups	# of horses	Lameness score (Mean ± s.e.)	
		Pre-tightening	Post-tightening
Acupuncture	6	0.2 ± 0.2 $^{a\,1}$	2.7 ± 0.2 $^{c\,1}$
Bupivacaine injection	6	0.3 ± 0.2 $^{a\,1}$	2.7 ± 0.2 $^{b\,1}$
Saline injection	6	0.3 ± 0.2 $^{a\,1}$	2.6 ± 0.1 $^{b\,1}$

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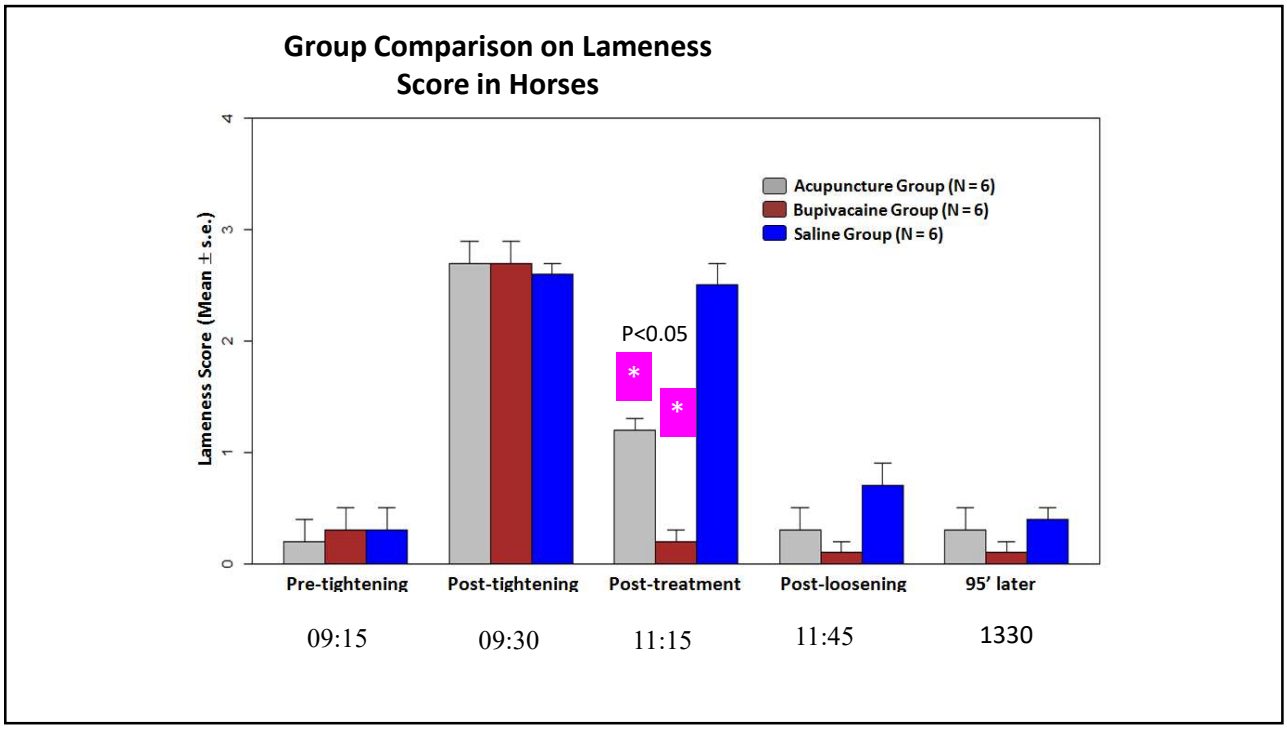
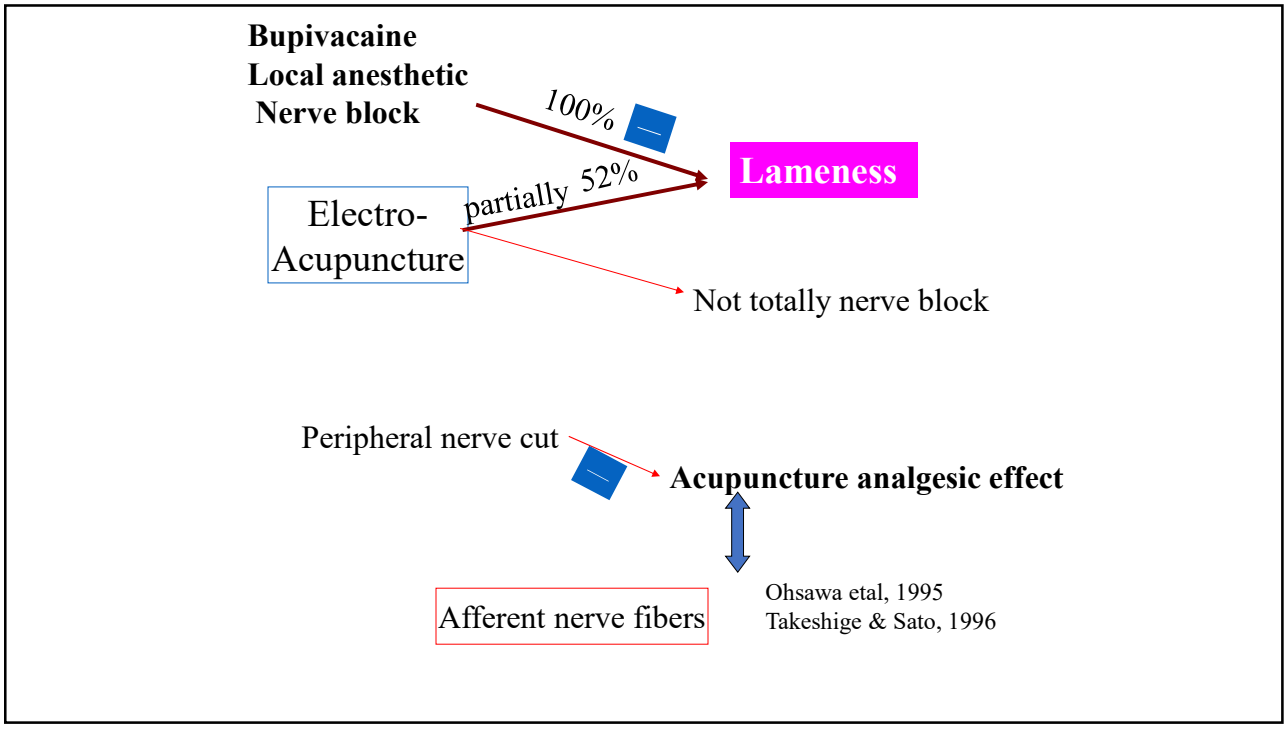

Group Comparison on Lameness Score in Horses
Lameness Score (Mean ± s.e.)
0
1
2
3
4
Acupuncture Group (N = 6)
Bupivacaine Group (N = 6)
Saline Group (N = 6)
P<0.05
*
*
Pre-tightening
Post-tightening
Post-treatment
Post-loosening
95' later
09:15
09:30
11:15
11:45
1330

85


Bupivacaine
Local anesthetic
Nerve block
100%
Lameness
Electro-
Acupuncture
partially
52%
Not totally nerve block
Peripheral nerve cut
Acupuncture analgesic effect
Afferent nerve fibers
Ohsawa etal, 1995
Takeshige & Sato, 1996

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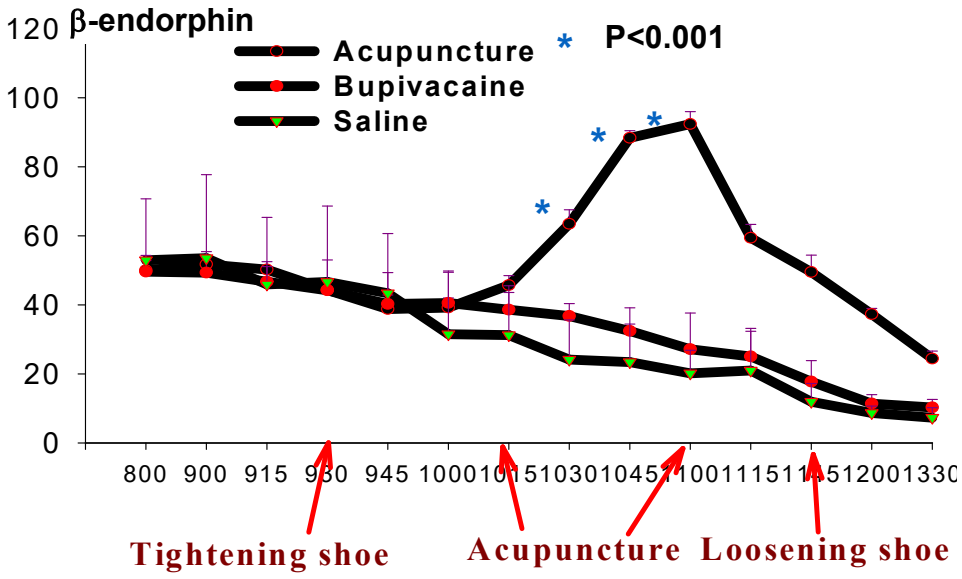

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- **EA significantly**
  - reduced the lameness score, and simultaneously increased the plasma β-endorphin concentration.
- **These results indicate that**
  - the release of β-endorphin may be the pathway in which acupuncture relieves experimental pain.

Xie H, Ott EA, Collahan P. The effectiveness of electro-acupuncture on experimental lameness in horses. *American Journal of Traditional Chinese Veterinary Medicine* 2009;4:17-29.

88

- **Faramarzi B**, Lee D, May K, Dong F. Response
- College of Veterinary Medicine, Western University of Health, California
- *Canadian Veterinary Journal* 2017;58:823-827

- 12 adult horses with chronic laminitis
  - Referring veterinarians had confirmed a diagnosis *via* clinical examination and radiography
- Lameness level was objectively evaluated
  - inertial sensor-based lameness evaluation system (Lameness Locator)
  - AAEP scoring before the 1st, 1 week after the 2nd acupuncture treatment

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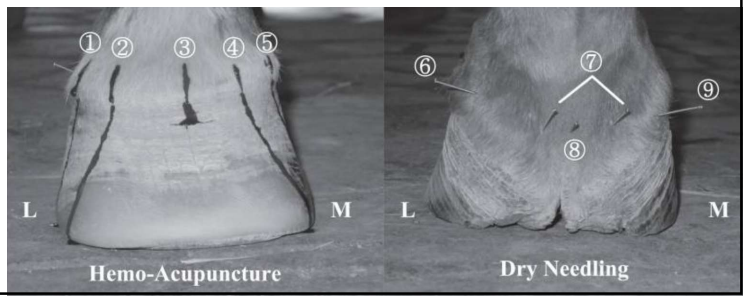
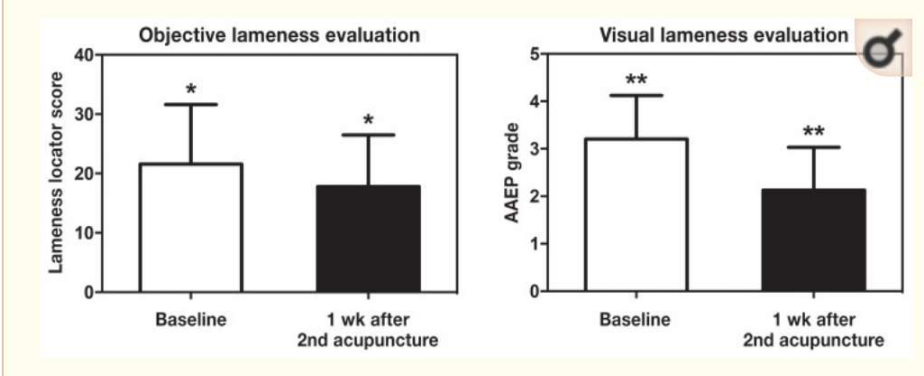
- **Faramarzi etal, 2017**

- Each horse
  - received 2 treatments one week apart
- The points were treated using
  - dry needling (DN)
  - hemo-acupuncture (HA)
  - aqua-acupuncture
  - Points depending on the nature of the problem and the location of the acupuncture points treated.



90

- **Faramarzi etal, 2017**



- **This clinical trial**
  - supports using acupuncture, along with other treatment options, in treating chronic equine laminitis.

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Back Pain in Horses

92

ACUPUNCTURE & ELECTRO-THERAPEUTICS RES., INT. J., Vol. 9, pp. 57-70, 1984

0360-1293/84 $3.00 + .00

ACUPUNCTURE FOR TREATMENT OF CHRONIC BACK PAIN IN THE HORSE

by

Alan M. Klide, VMD

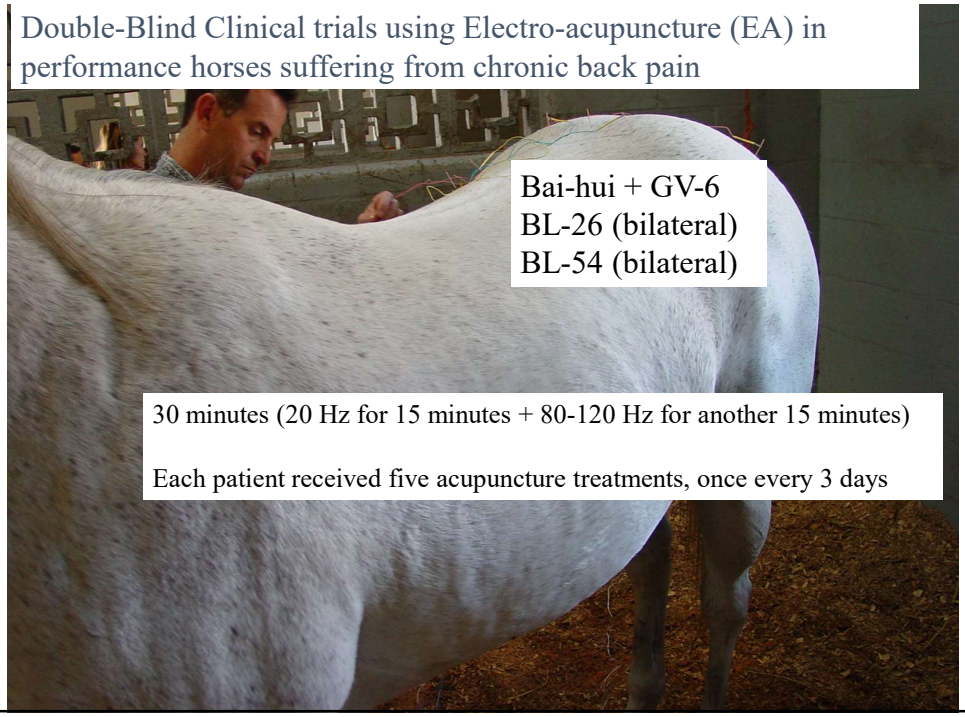
93

Klide, 1984

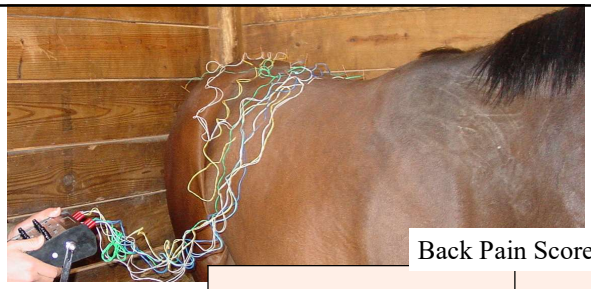
	# of horses	%
Compete	8	53.33
Perform normally	5	33.33
No Change	2	13.34
TOTAL	15	100

94

Double-Blind Clinical trials using Electro-acupuncture (EA) in performance horses suffering from chronic back pain



95



Back Pain Score Card for Horses

Behavioral responses	Pain Scores (Degree)			
	0	1	2	3
Response to pressing on back				
Straight movement				
Circling movement				
Moving backwards				
Cooperation with trainer				
Absence of training or work				

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Groups	# of horses	Thoracolumbar pain score								P value
		Base	Treatment					Follow-up (days)		
			1st	2nd	3rd	4th	5th	7 days	14 days	
Electro-Acp	8	6.0±0.6 a1	5.8±1.0 a 1	3.4±0.7 b 1	2.1±0.6 b,c 2	0.9±0.6 c 2	0.8±0.6 c 2	0.8±0.6 c 2	0.8±0.6 c 2	0.001
Bute	8	6.2±0.2 a 1	6.1±0.3 a 1	6.0±0.3 a 1	6.1±0.3 a 1	6.0±0.3a 1	6.0±0.3 a 1	6.0±0.3 a 1	5.9±0.3 a 1	0.999
Saline	4	5.9±0.3 a 1	5.9±0.3 a 1	5.9±0.3 a 1	5.5 ±0.2 a 1	5.4±0.1 a 1	5.3±0.1 a 1	5.5±0.2 a 1	5.5±0.2 a 1	0.535
P value		0.986	0.940	0.05	0.001	0.001	0.001	0.001	0.001	

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- Results indicated
  - three sessions of EA treatment successfully relieved signs of back pain in horses and
  - the analgesic effect induced by EA lasted at least 2 weeks.
- In this study
  - oral medication with phenylbutazone in control group did not effectively relieve the signs of back pain.

Xie H, Colahan PT, Ott EA. Evaluation of electroacupuncture treatment of horses with signs of chronic thoracolumbar pain. Jour of the Amer Vet MedAssoc 2005; 227 (2): 281-286

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Rungsri et al. 2009

- **Twenty-three horses with chronic back pain were divided into**
  - control (N=7)
  - treatment (N=16) groups

- **Objective measurements of pain threshold levels**
  - obtained with a pressure algometer

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Rungsri et al. 2009

- Electro-acupuncture (EA) is
  - an effective treatment for sport horses with chronic back pain

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Neurological Conditions

- Laryngeal hemiplegia

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Electroacupuncture for the Treatment of Equine Laryngeal Hemiplegia
M-S. KIM, H. XIE

- Thoroughbred horses (n=18)
  - Males (n=11) and females (n=7)
  - The mean horse age was 1.4 years
- All horses had endoscopic examinations
  - by independent (blinded) equine practitioners after 1 or 2 days after the last EA treatment.

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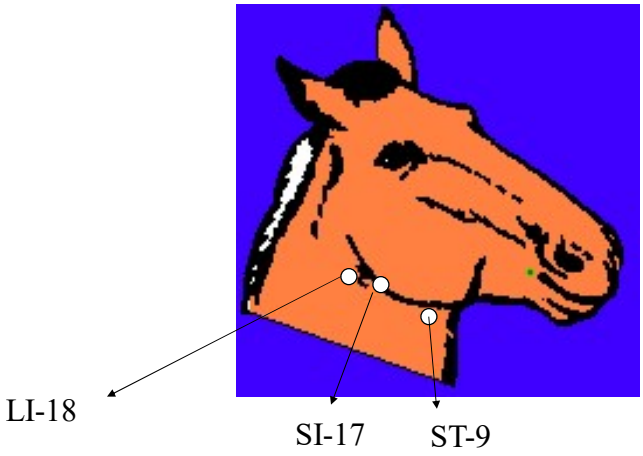
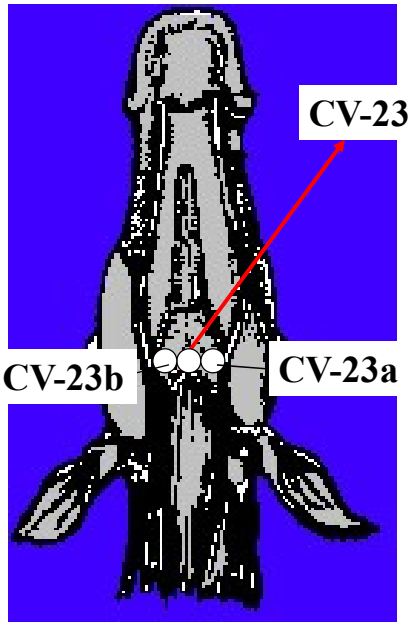
- Electroacupuncture was performed
  - once per week for a total of 3 to 7 times
  - depending on the severity of hemiplegia
  - The EA treatment used 20 Hz for 10 minutes, then at 80 to 120 Hz for 10 minutes





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Case #	Age (year)	Sex	Degree before Acp	Degree after Acp	# of Acp sessions
1	1.8	Female	IIIa	IIb	6
2	1.5	Male	IIIa	IIa	5
3	1.2	Female	IIb	Normal	4
4	1.5	Male	IIIb	IIa	7
5	1	Male	IIb	Normal	4
6	2	Male	IIb	Normal	3
7	2	Male	IIb	Normal	4
8	1	Male	IIa	Normal	4
9	1	Female	IIab	Normal	3
10	2	Male	IIb	Normal	4
11	2	Female	IIa	Normal	7
12	1	Female	IIab	Normal	6
13	1	Female	IIb	IIa	7
14	1	Male	IIb	Ib	5
15	1	Male	IIab	Normal	7
16	2	Male	IIa	Normal	3
17	2	Female	IIIa	Normal	5
18	1	Male	IIab	Normal	5

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Results

- The endoscopic grades of laryngeal hemiplegia had improved in all 18 horses
  - 13 horses (72.2%) to normal
  - 5 horses (27.8% to a better grade
- Electro-acupuncture
  - Can be a good treatment for laryngeal hemiplegia in young horses.

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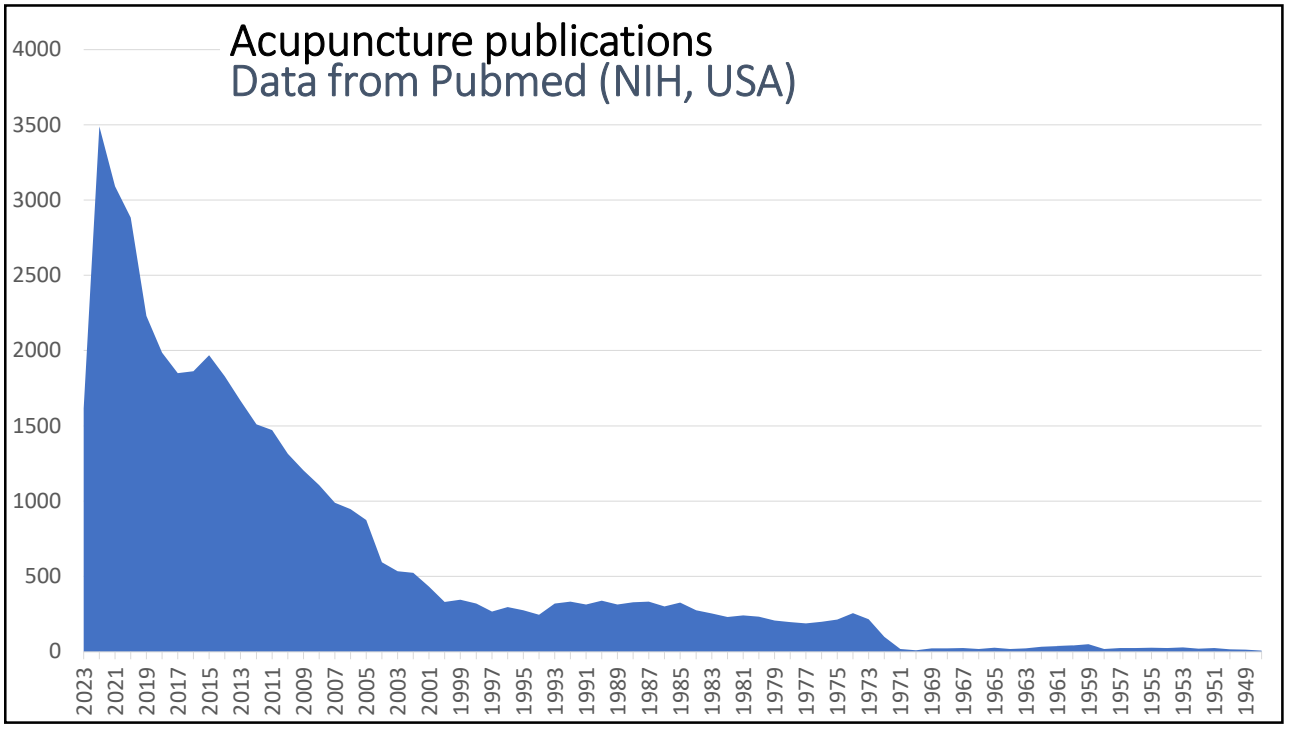

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CONCLUSION

- Acupoint sensitivity on palpation
  - **useful for the assessment of lameness** along with conventional diagnostics
- Acupuncture stimulation, especially electro-acupuncture
  - can **release 5-HT, β-endorphin**
  - can **mobilize the stem cells**
- Acupuncture has been shown to be effective in the treatment of
  - **Poor performance and pain management**
    - Back pain
    - Neck pain
    - Foot pain
    - Shoulder pain
    - Hip pain
  - **Laryngeal hemiplegia**

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CHI | UNIVERSITY 特別奨学金

- **US $4,000 *Scholarship* available for veterinary medical school students and faculty members to take the Certified Veterinary Acupuncture (CVA) course**
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  - Equine Acupuncture (145 hours)
  - Mixed Practice Acupuncture (180 hours)

- **獣医学部の学生および院生が利用できる承認鍼灸獣医師資格 (CVA) の取得の為の 4,000 ドルの奨学金**
  - 詳細については、shen@chiu.edu に電子メールで奨学金をリクエストしてください。
- **ウェットラボを含む基本コースの詳細：**
  - 小動物専門**コース** (150 時間)
  - 馬専門**コース** (145 時間)
  - 小動物及び馬の混合**コース** (180 時間)

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