6° CONVEGNO NAZIONALE
M.I.A
MANIPULATIONS ITALIAN ACADEMY

Accademia Italiana di Manipolazioni Vertebrali

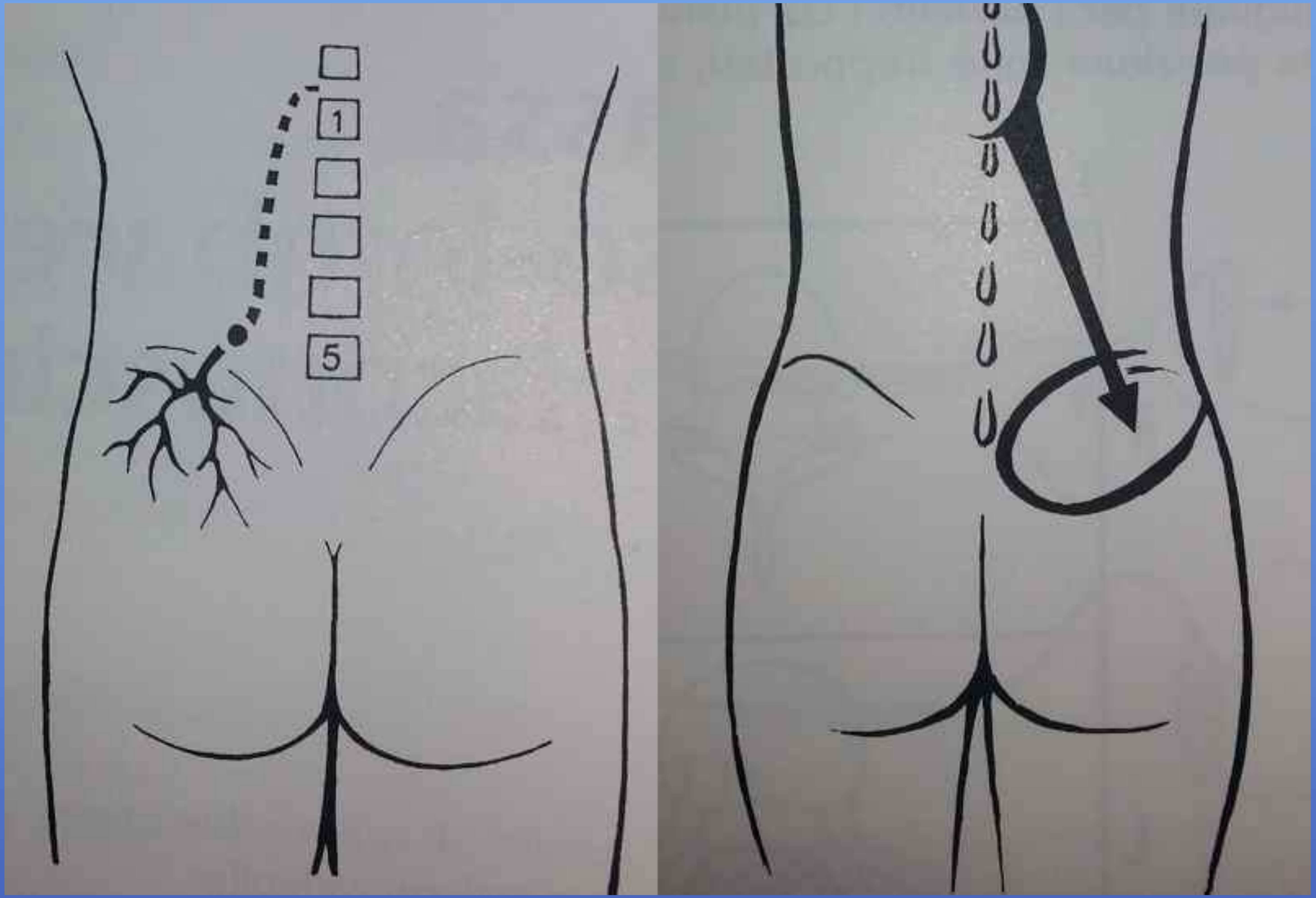
27 e 28 NOVEMBRE 2021

OLY HOTEL – VIALE DEL SANTUARIO REGINA DEGLI APOSTOLI 36 - ROMA

La Neuromodulazione Fasciale come proposta di approccio diagnostico e terapeutico in Medicina Manuale

Gianluca Bianco
Specialista in Medicina Interna
Istituto di Formazione in Agopuntura e Neuromodulazione
Research Lab of Posturology and Neuromodulation Sapienza Univ.

SINDROME DELLA CERNIERA DORSO-LOMBARE



Hindawi Publishing Corporation
Evidence-Based Complementary and Alternative Medicine Volume 2011, Article ID 240653, 7 pages doi:10.1093/ecam/nen088

Original Article

Forgotten Features of Head Zones and Their Relation to Diagnostically Relevant Acupuncture Points

Florian Beissner,[1,2] Christian Henke,[1,3] and Paul U. Unschuld[4]

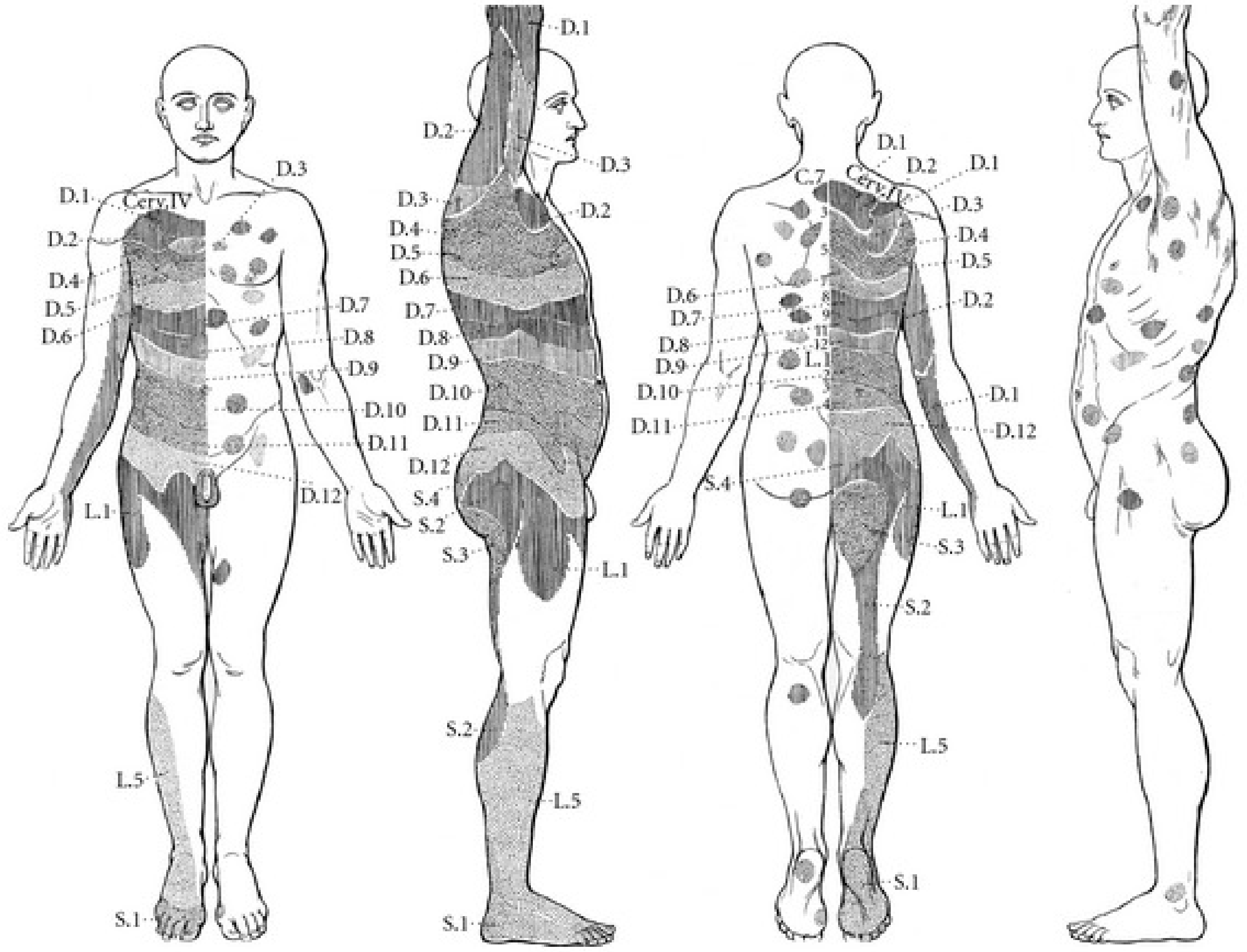


Figure 1: Original drawing from Head’s first paper showing Head zones together with maximum points (from [8, pages 131-132], by permission of Oxford University Press).

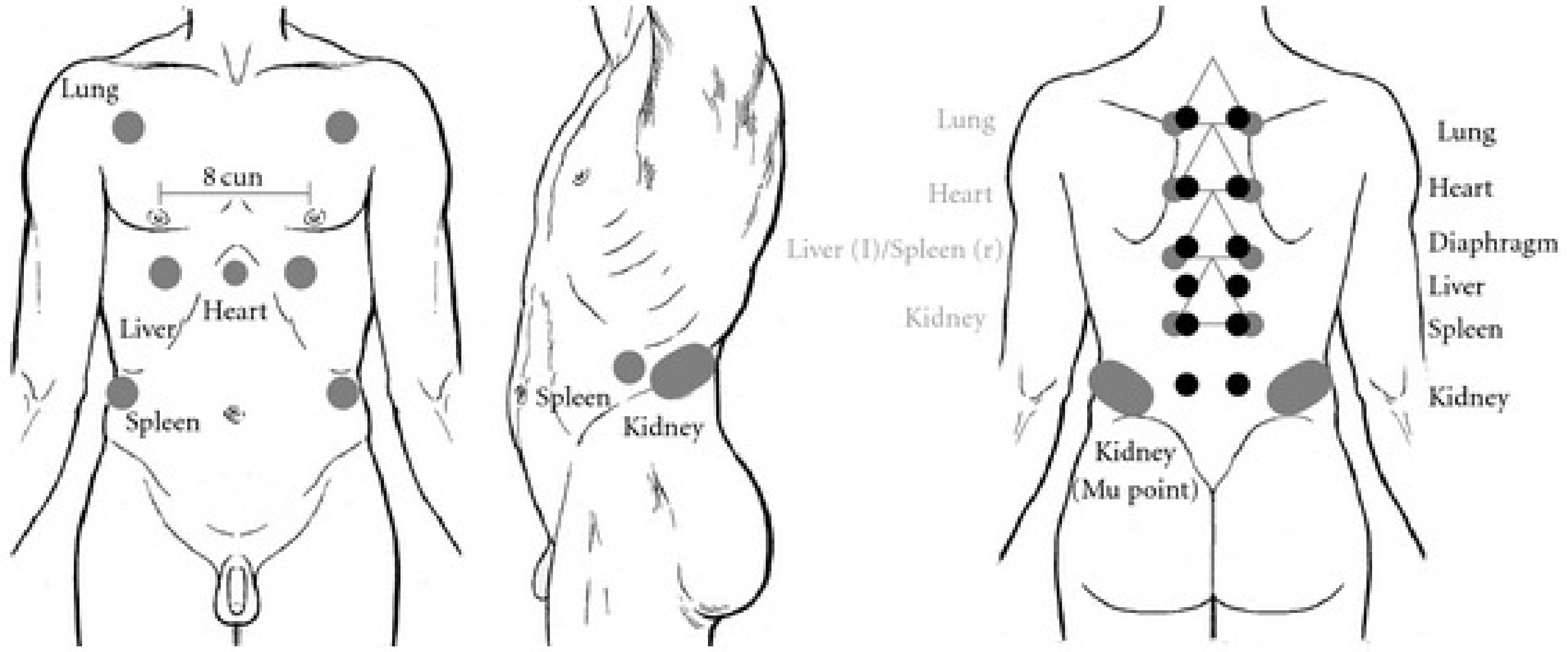


Figure 2: Locations of Mu and Shu points superimposed on a torso from Head’s paper [8, pages. 131-132], by permission of Oxford University Press. The Mu point locations are according to the Zhen Jiu Jia Yi Jing. For the Shu points gray indicates locations according to the Suwen, black according to the Lingshu.

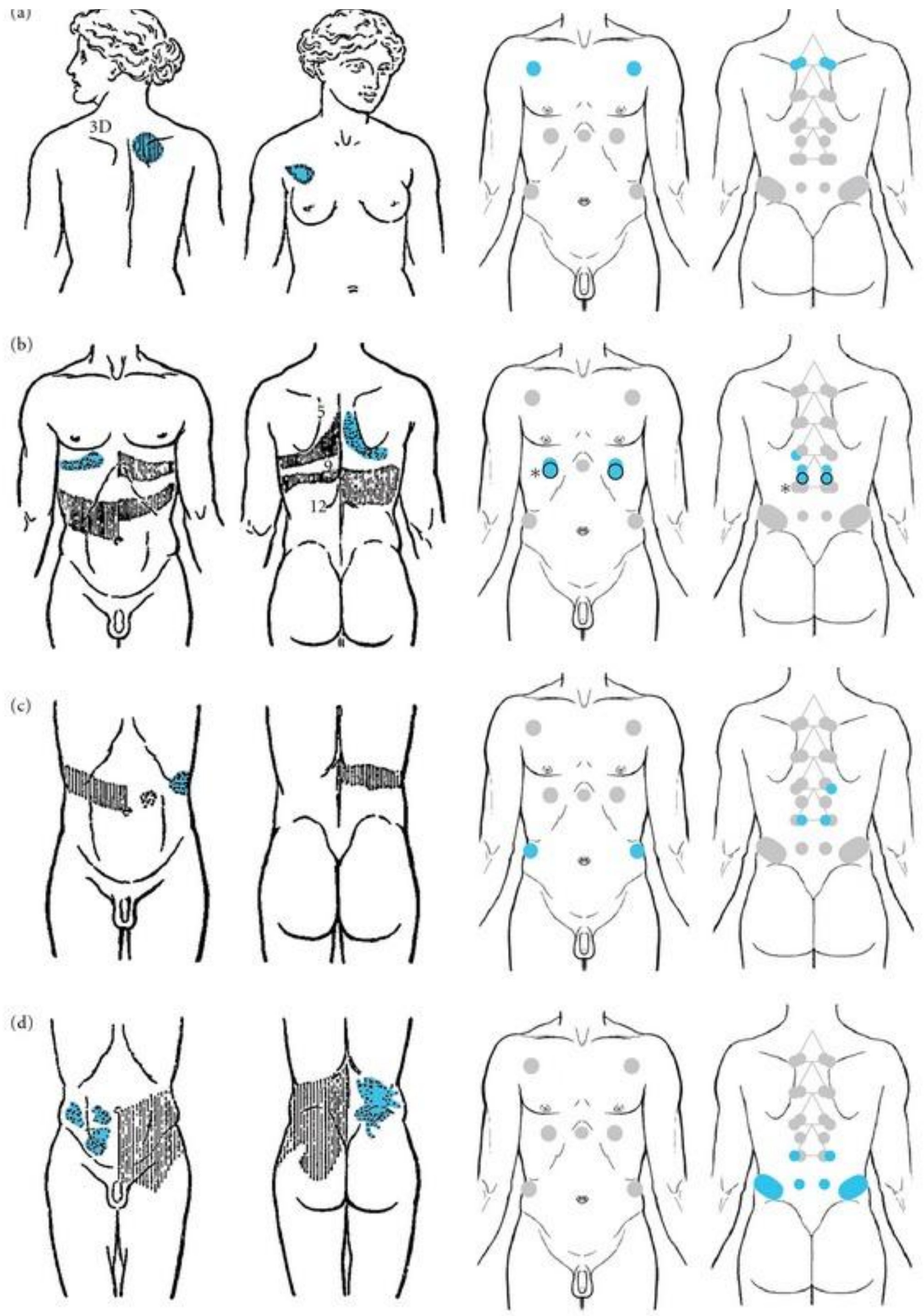


Figure 3: Comparison of four clinical cases from Head’s first paper showing their areas of cutaneous tenderness (left) with the corresponding Mu and Shu points from the viewpoint of Chinese medicine (right). The maximum points, Mu and Shu points are marked in blue. The patients depicted here all have a diseased organ: (a) Lung, (b) Liver, (c) Stomach, (d) Kidney/Ureter and were all taken from [8] (with permission of Oxford University Press).

Punti Shu e SNA

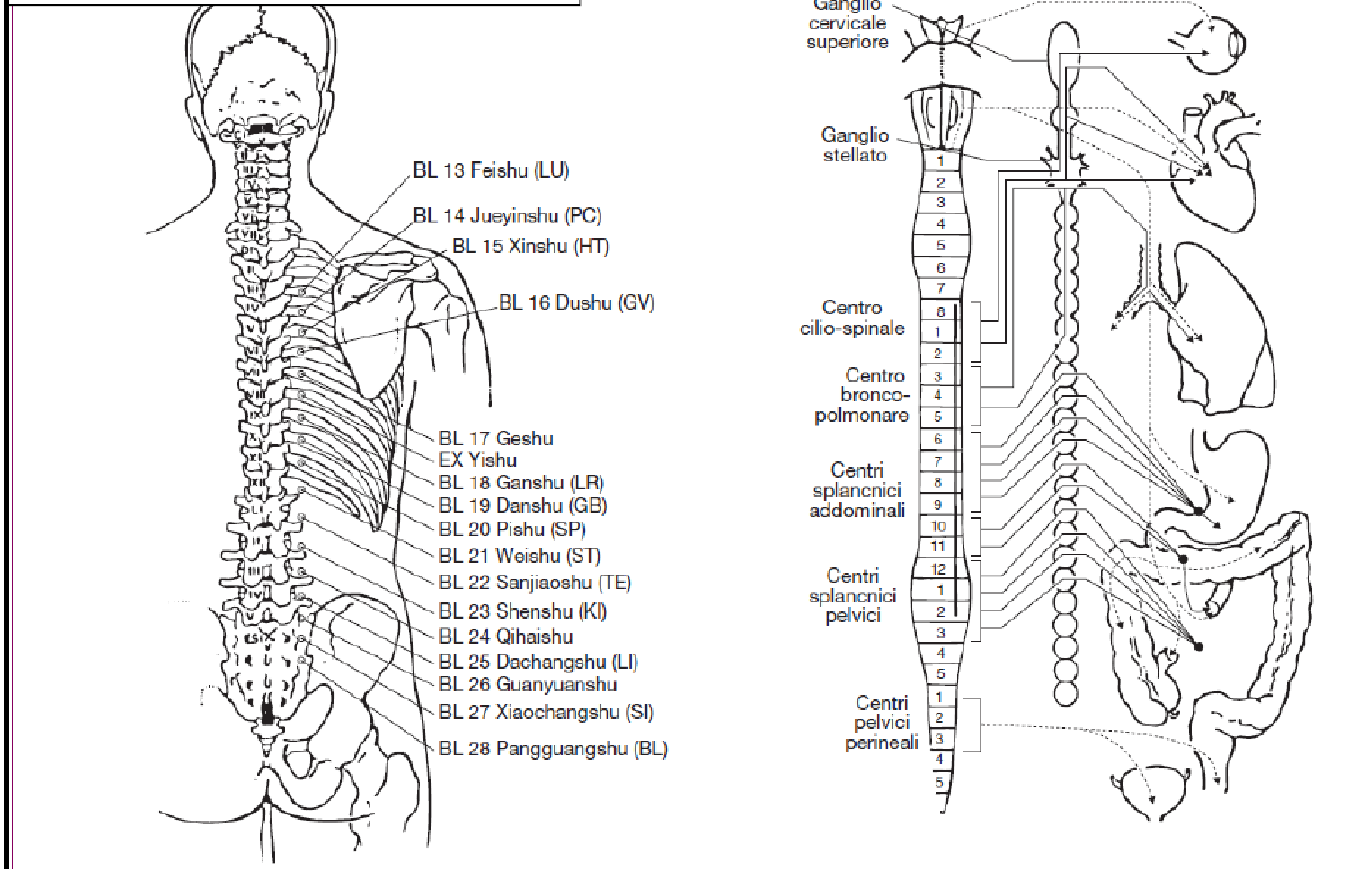


Fig. 16.6 *Punti Shu del dorso e loro relazioni con il Sistema Nervoso Autonomo*

MEDICAL ACUPUNCTURE
Volume 22, Number 4, 2010 # Mary Ann Liebert, Inc. DOI: 10.1089/acu.2010.0762
A Neurosegmental Perspective of the Classical Back Shu Points
Marco Antonio Helio da Silva, MD

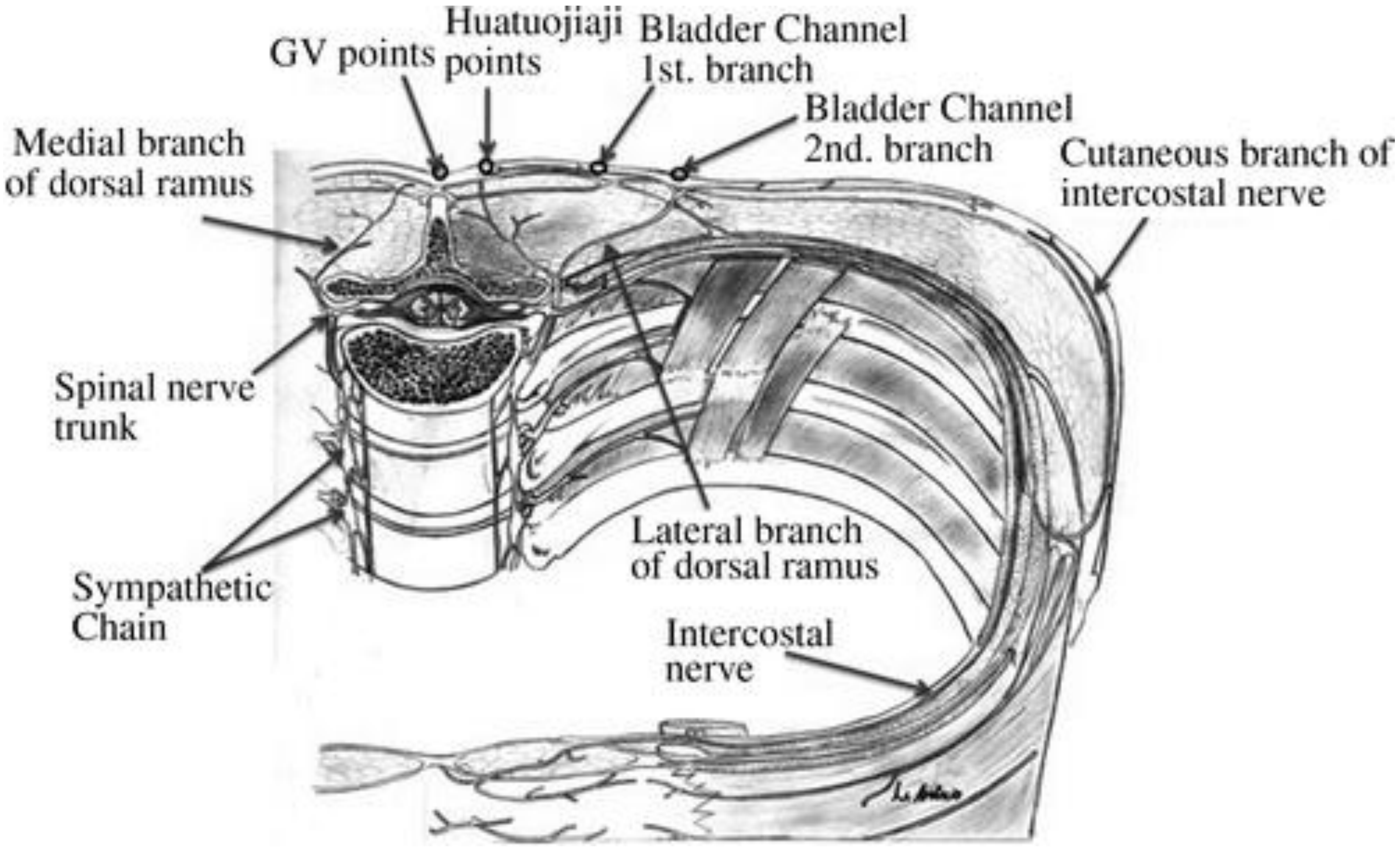


FIG. 2. Anatomical locations of the Back Shu points.

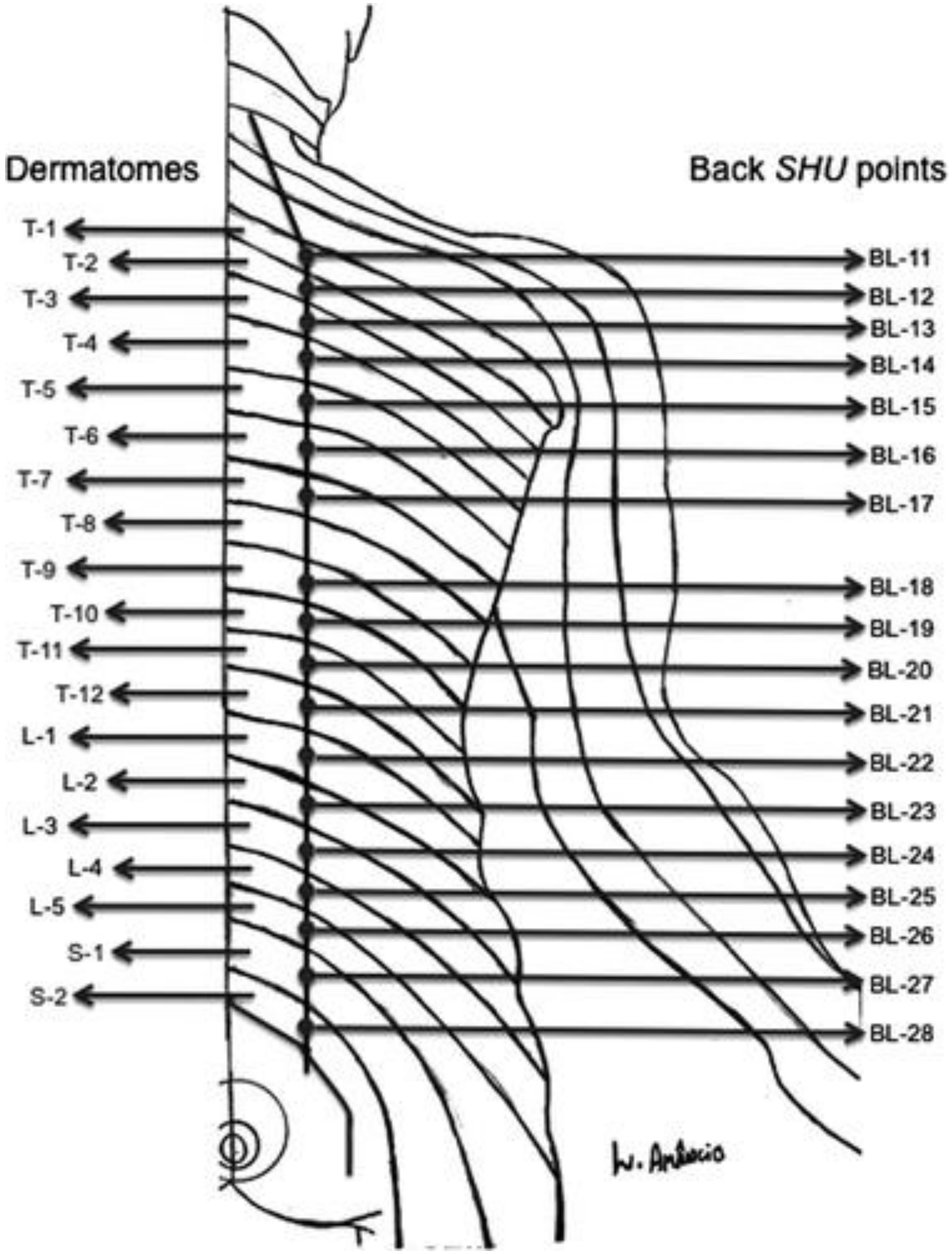
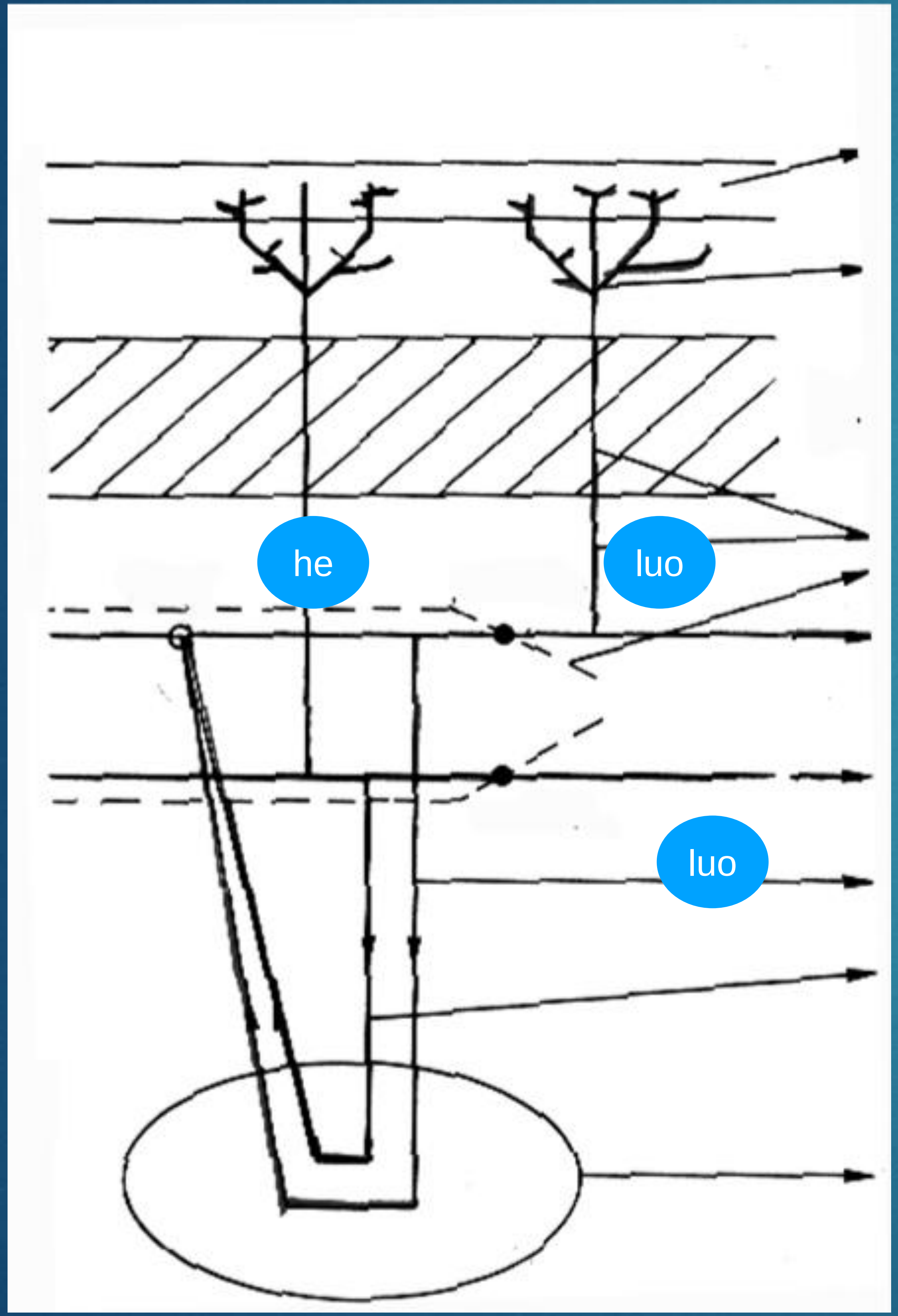


FIG. 1. Locations of the Back Shu points on the Bladder channel.

TEORIA DEI CANALI IN MEDICINA TRADIZIONALE CINESE

BIAO

LI



PIBU

SUNLUO

JINGJIN

LUOMAI

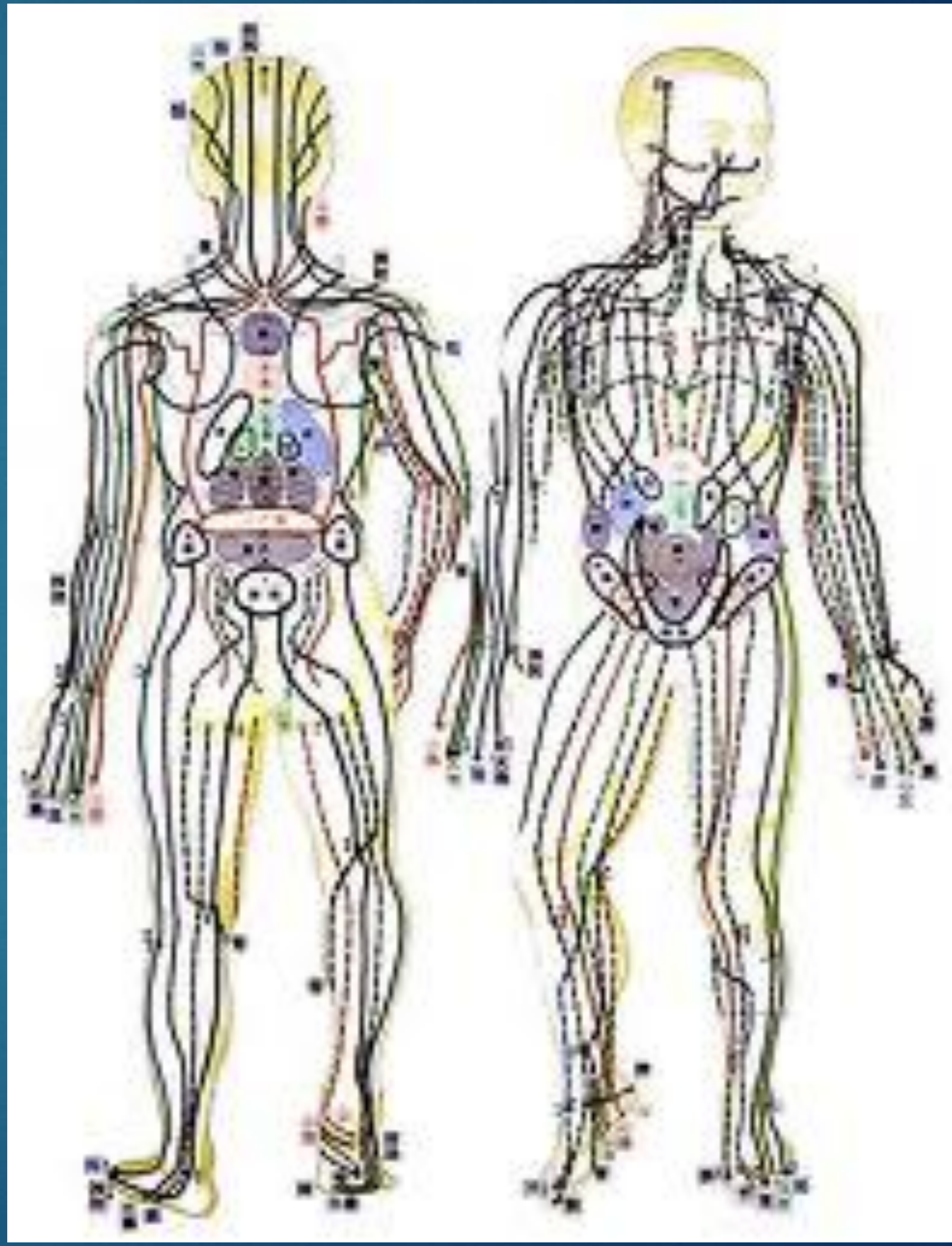
JING YANG

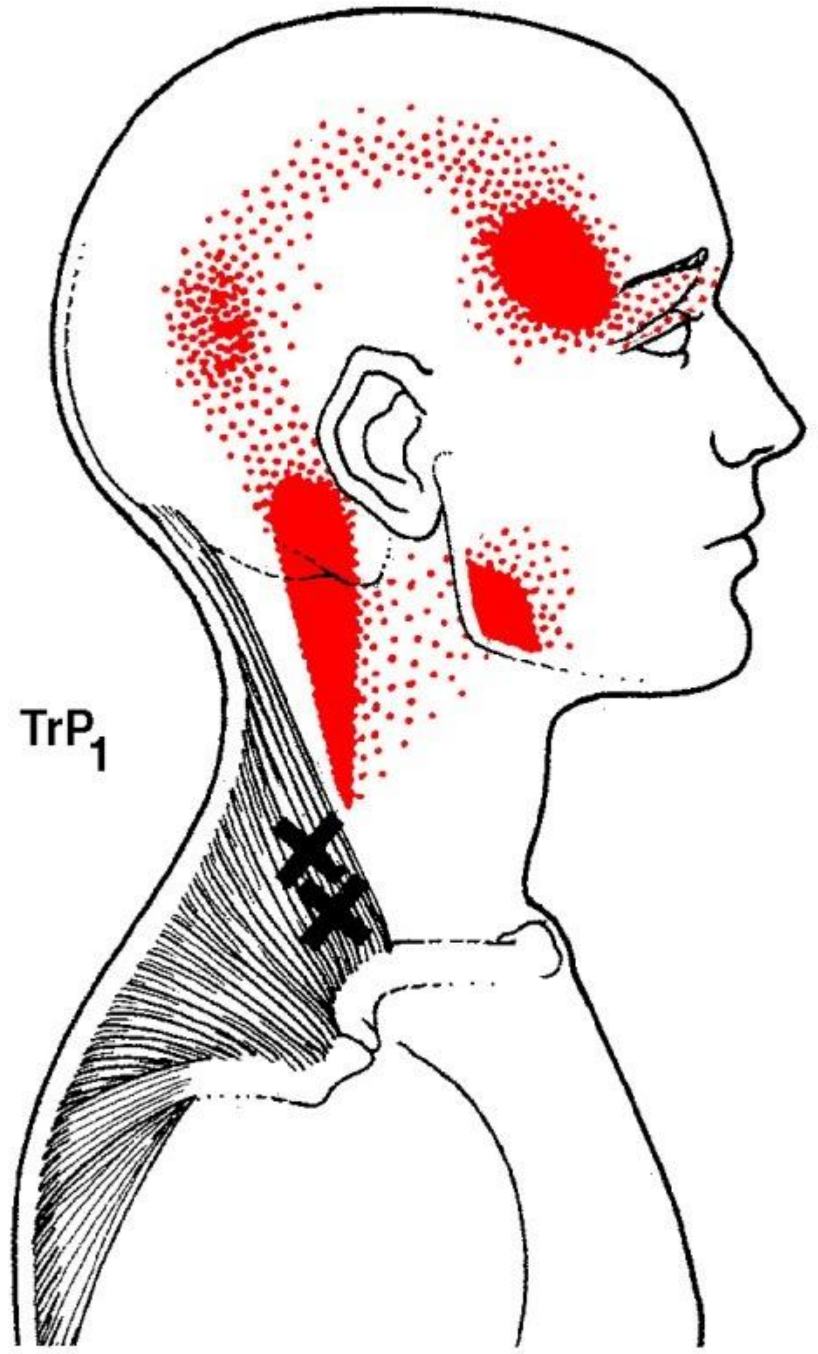
JING YIN

JINGBIE YANG

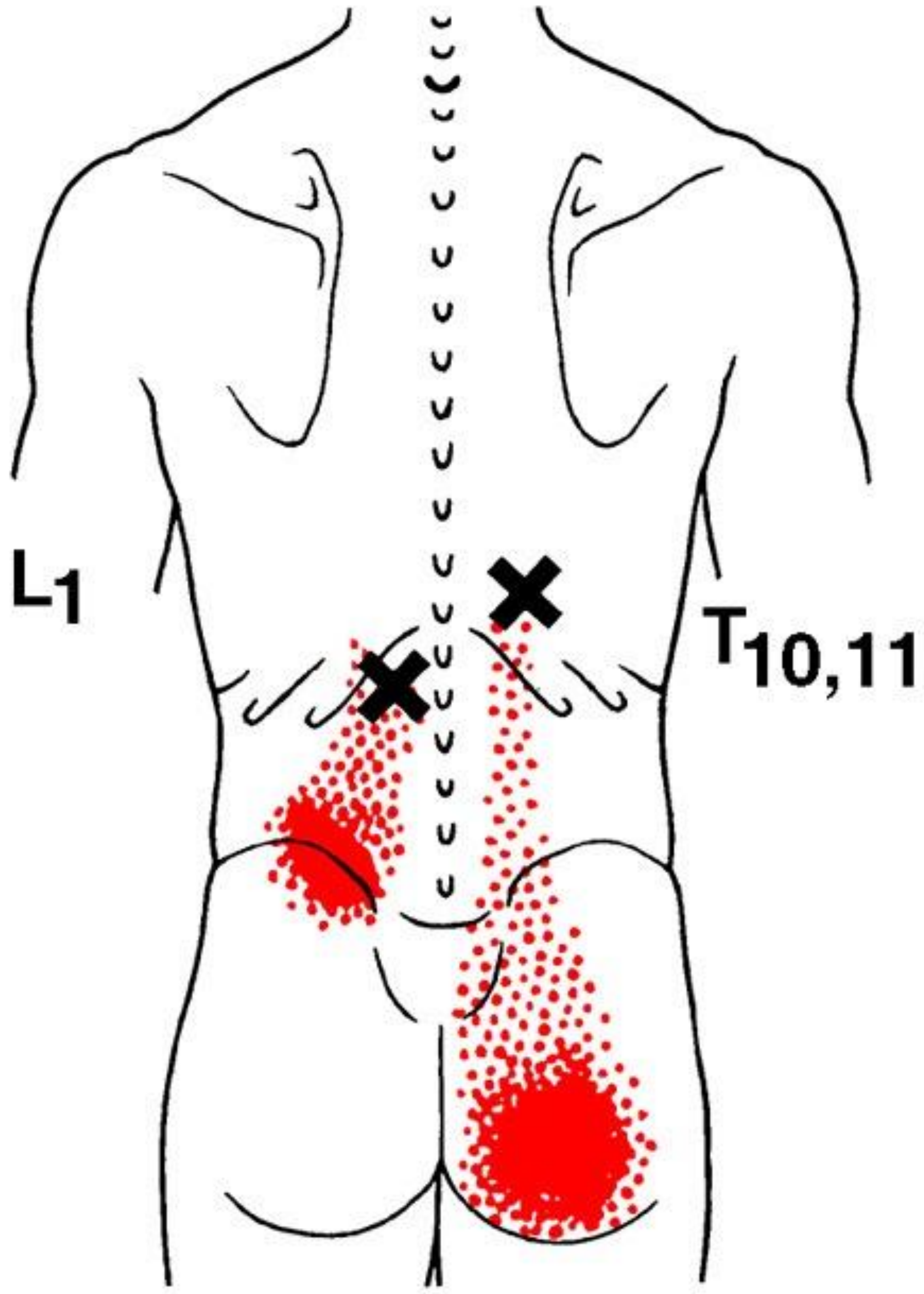
JINGBIE YIN

ZANGFU

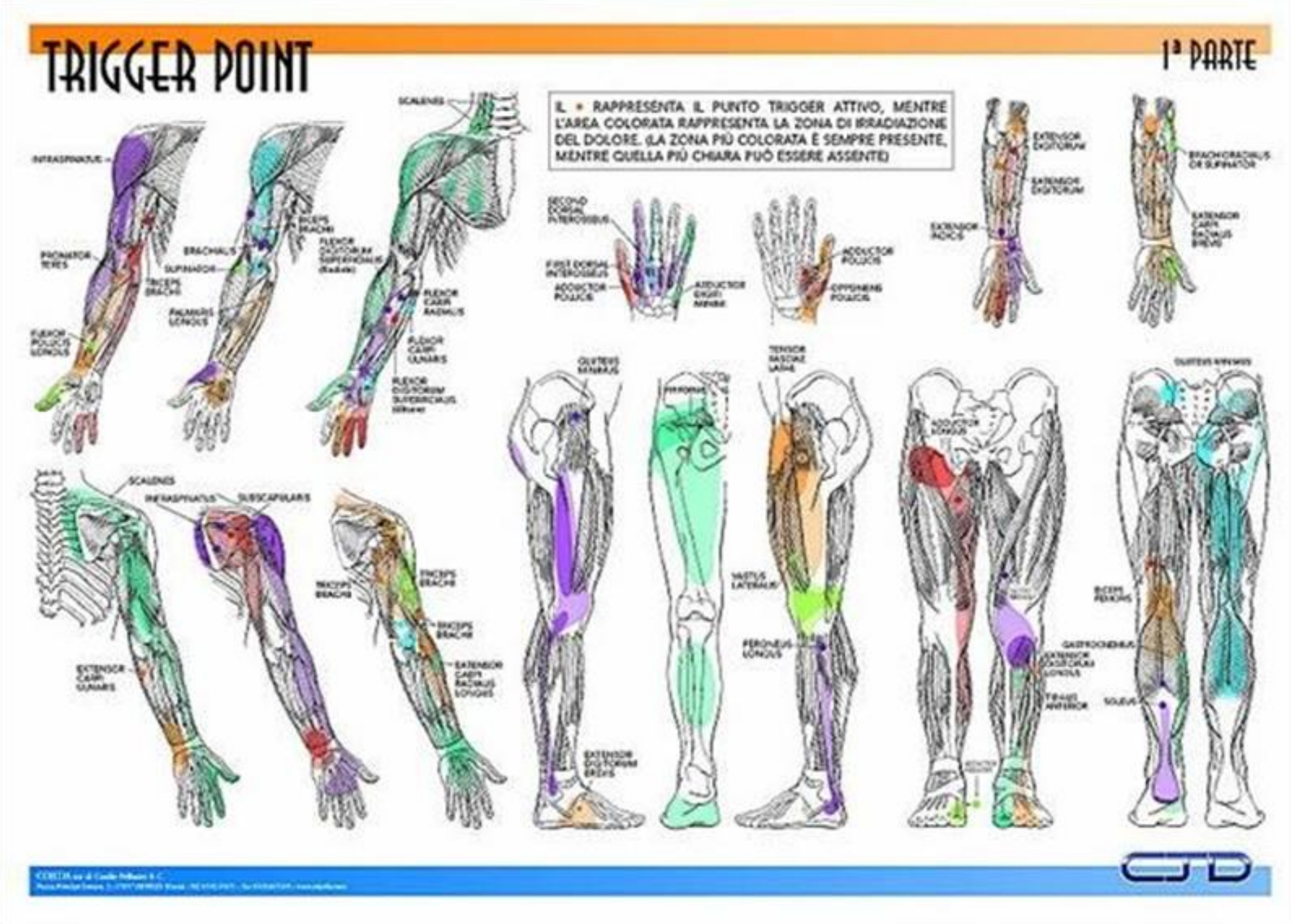




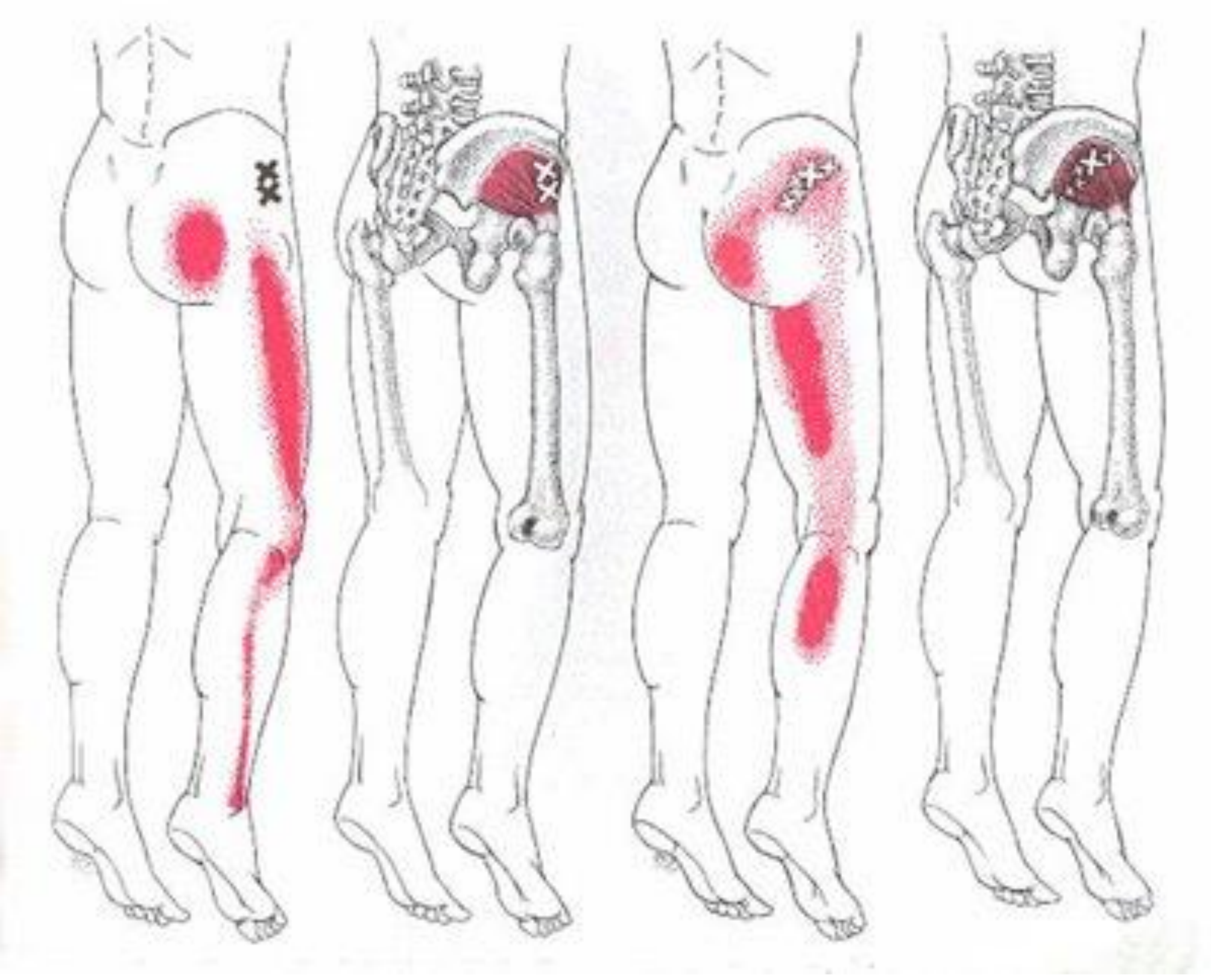
TrP1

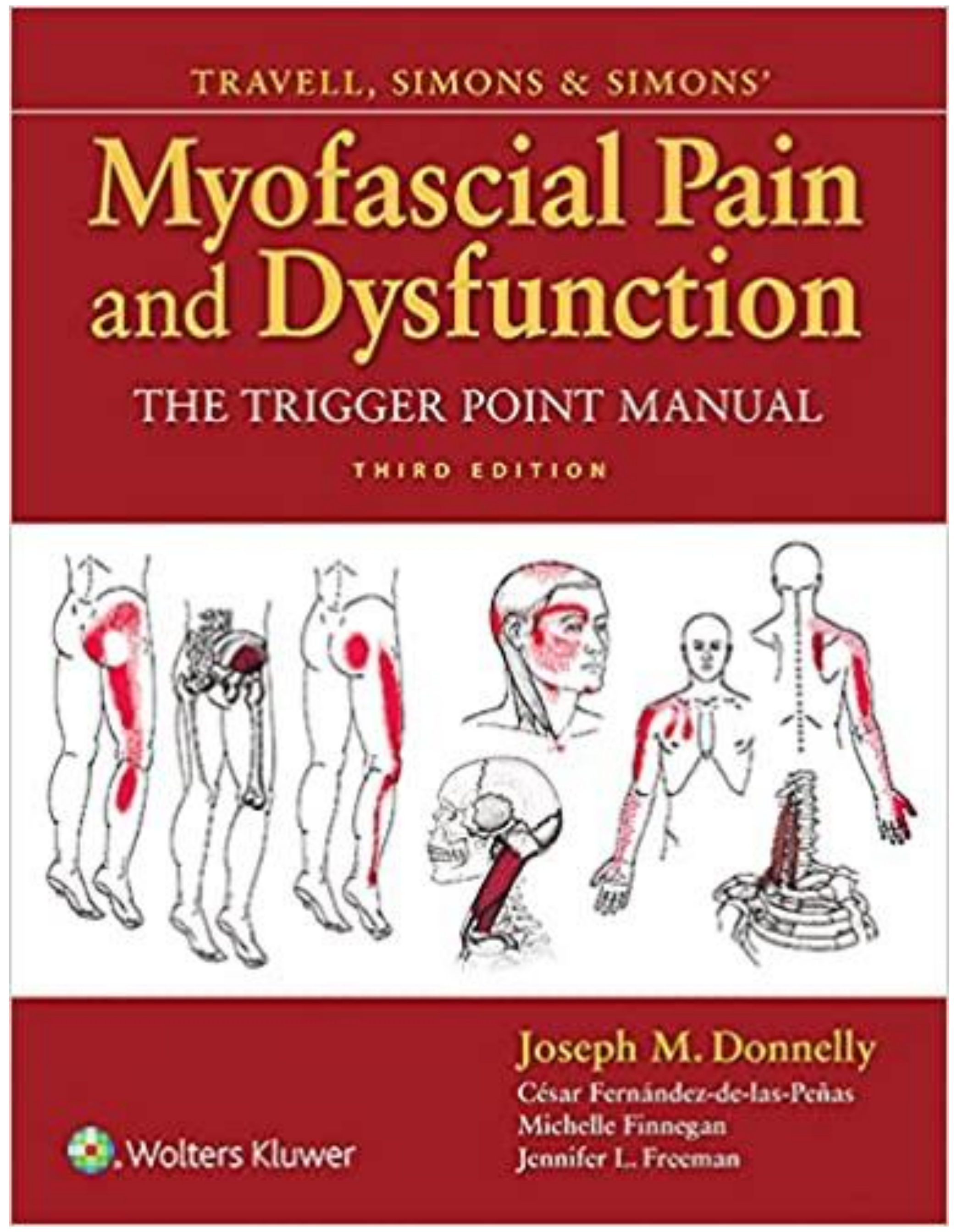


L1
T10,11



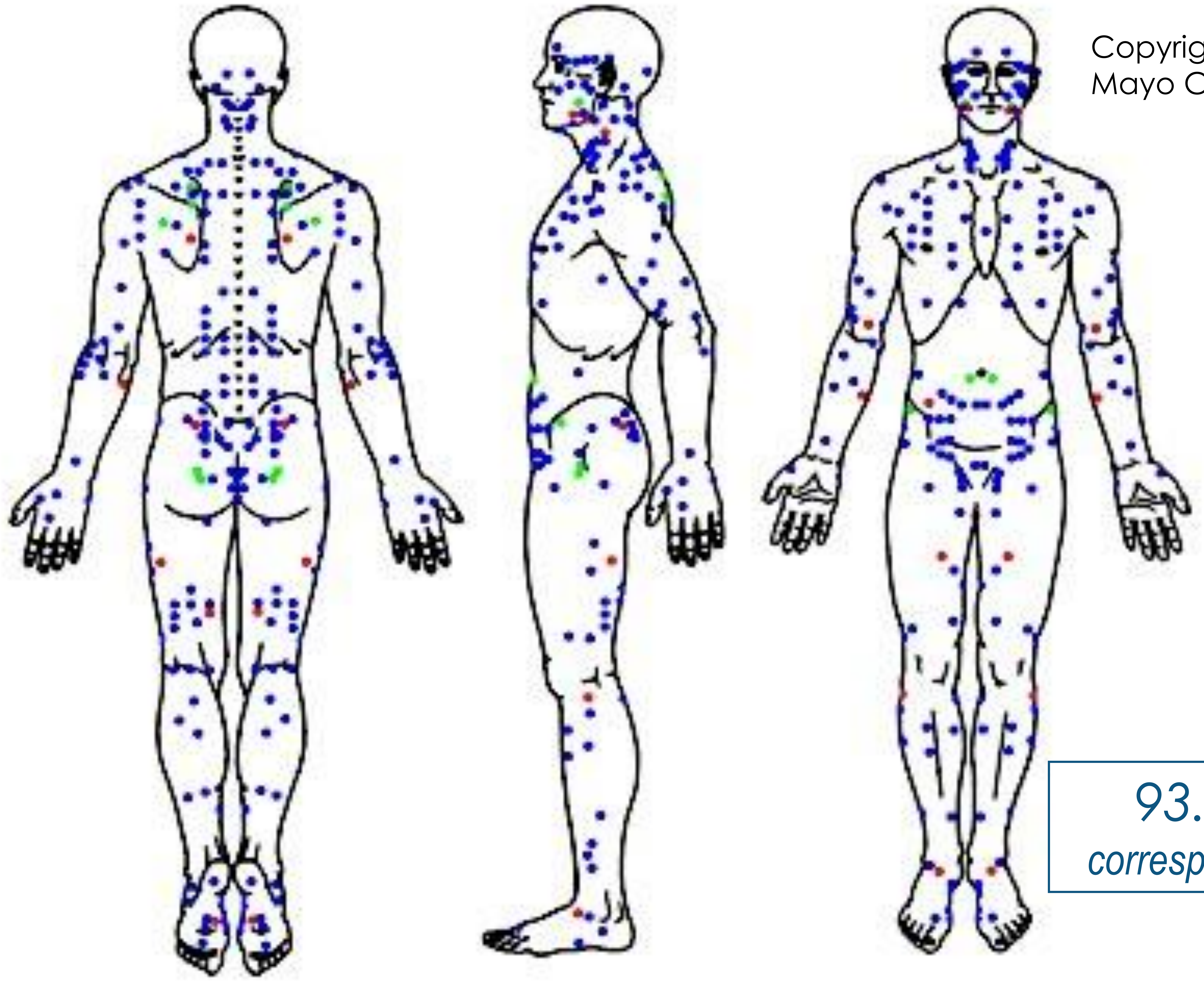
TRIGGER POINT
1ª PARTE





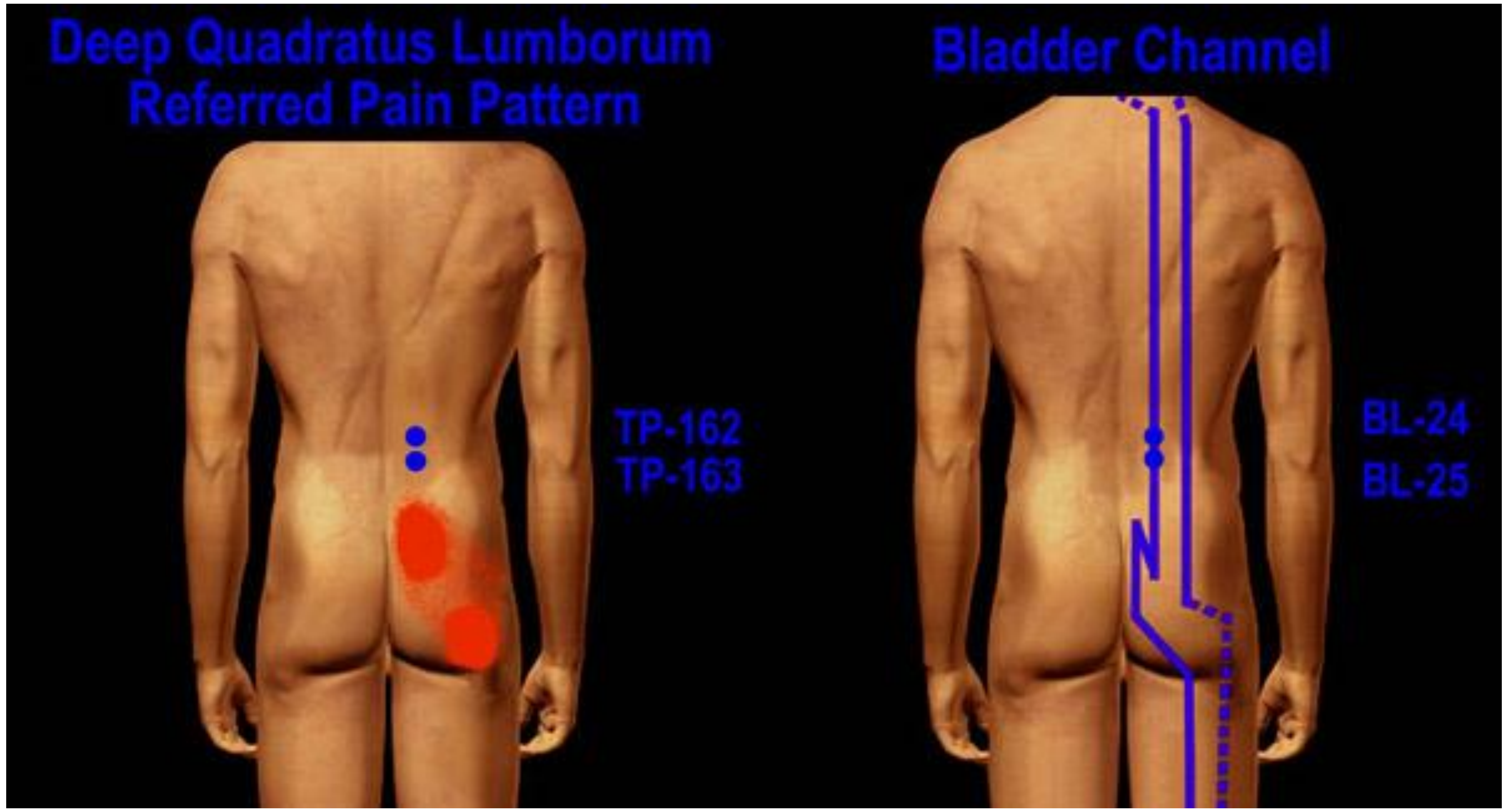
TRAVELL, SIMONS & SIMONS'
Myofascial Pain and Dysfunction
THE TRIGGER POINT MANUAL
THIRD EDITION
Joseph M. Donnelly
César Fernández-de-las-Peñas
Michelle Finnegan
Jennifer L. Freeman
Wolters Kluwer

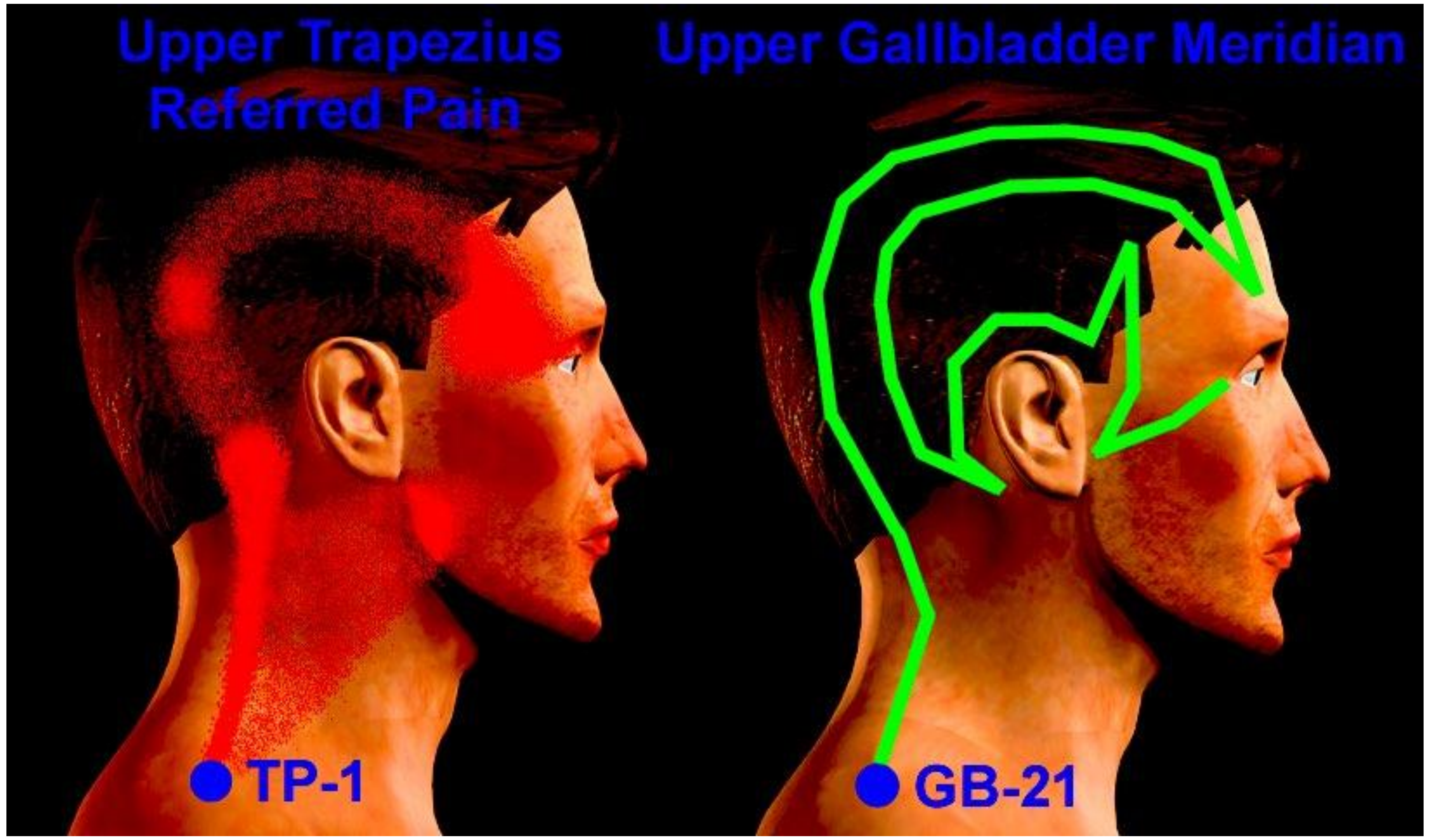
Acupuncture & Trigger Point Anatomic Correspondences

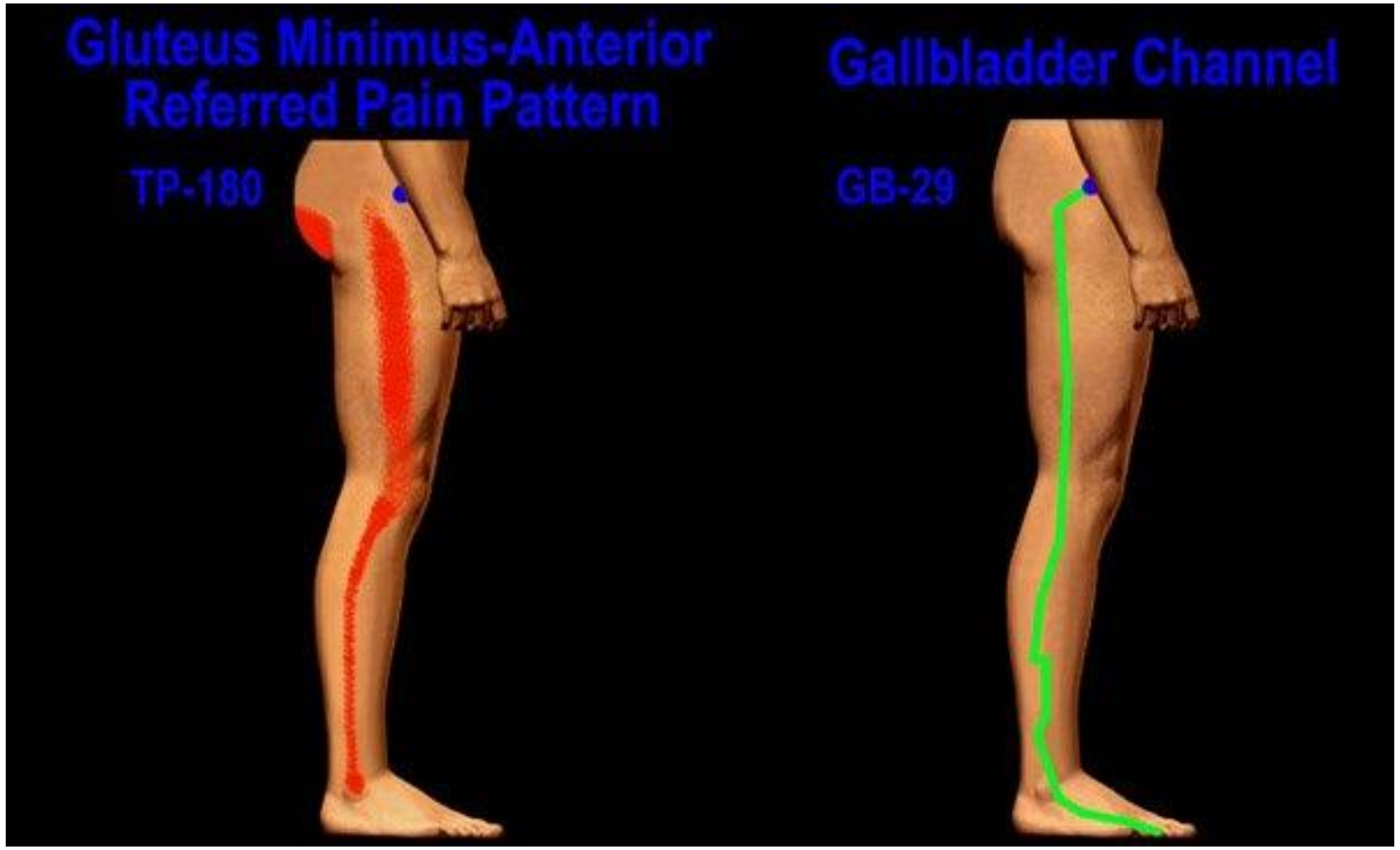


93.3%
correspond

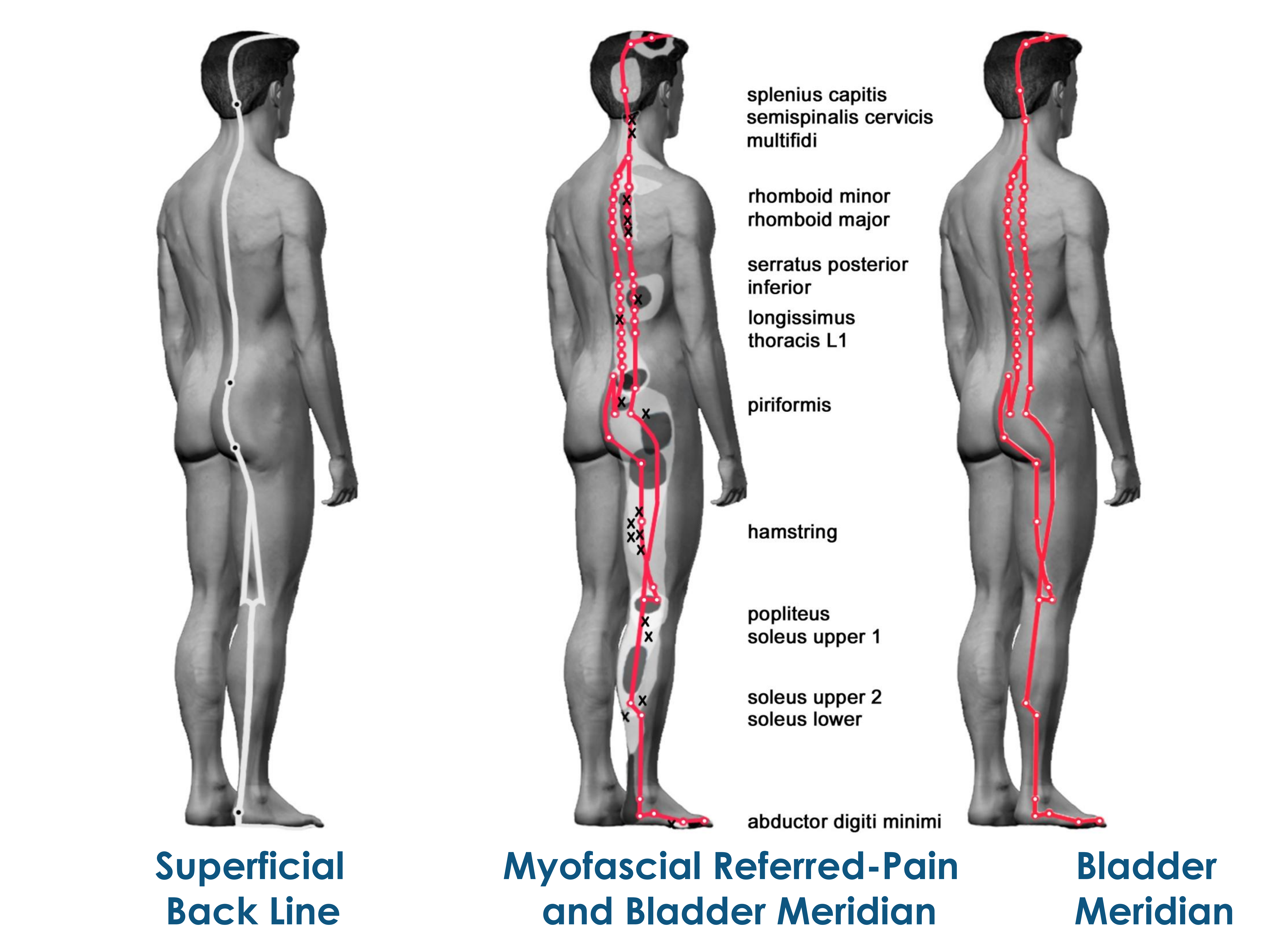
● = correlação anatômica ● = ponto interno ● = nenhuma correlação





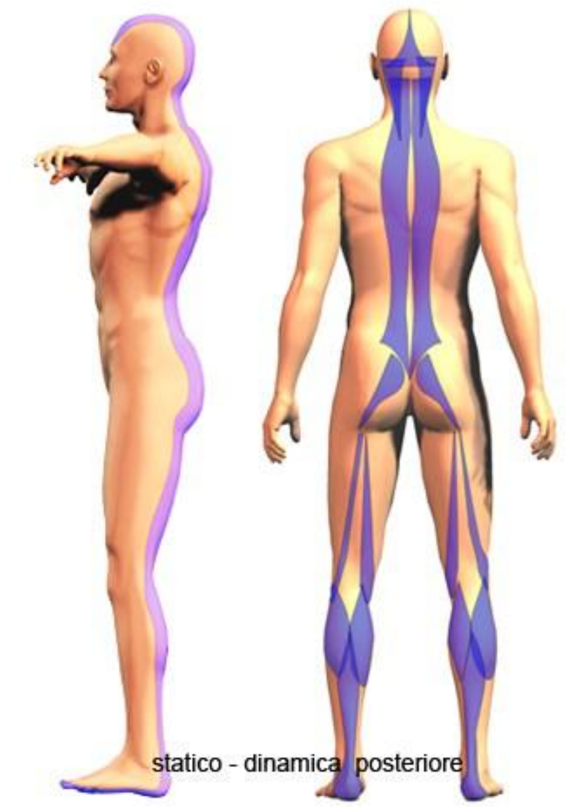


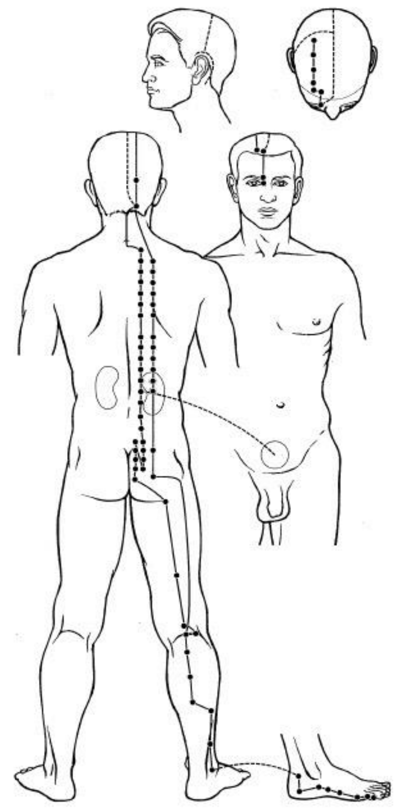
Dorsher P. And Bittencourt E. APTA CONFERENCE 2018



Dorsher P. And Bittencourt E. APTA CONFERENCE 2018

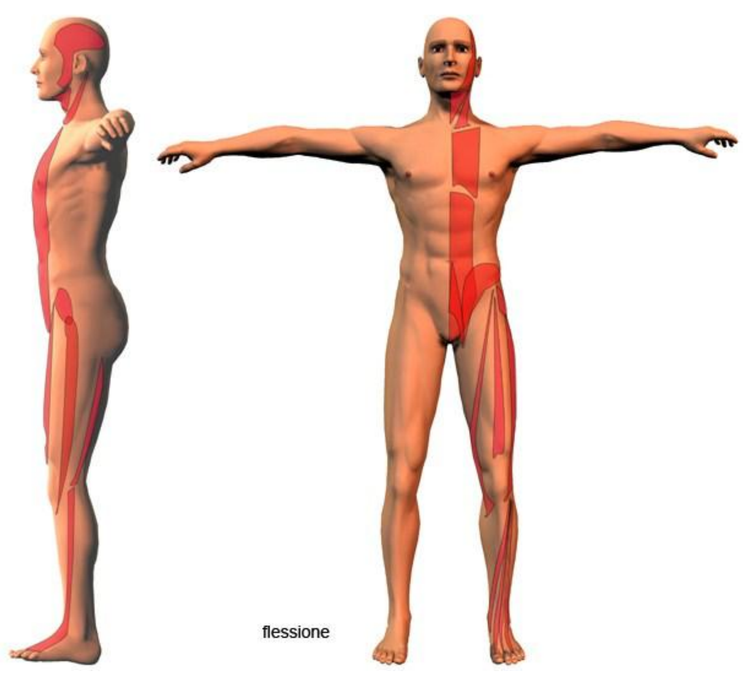
CORRISPONDENZE DI PUNTI E MERIDIANI MIOFASCIALI TRA ORIENTE E OCCIDENTE

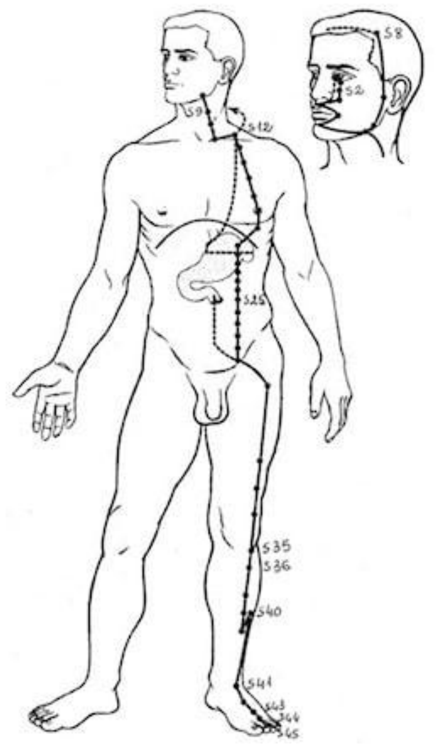


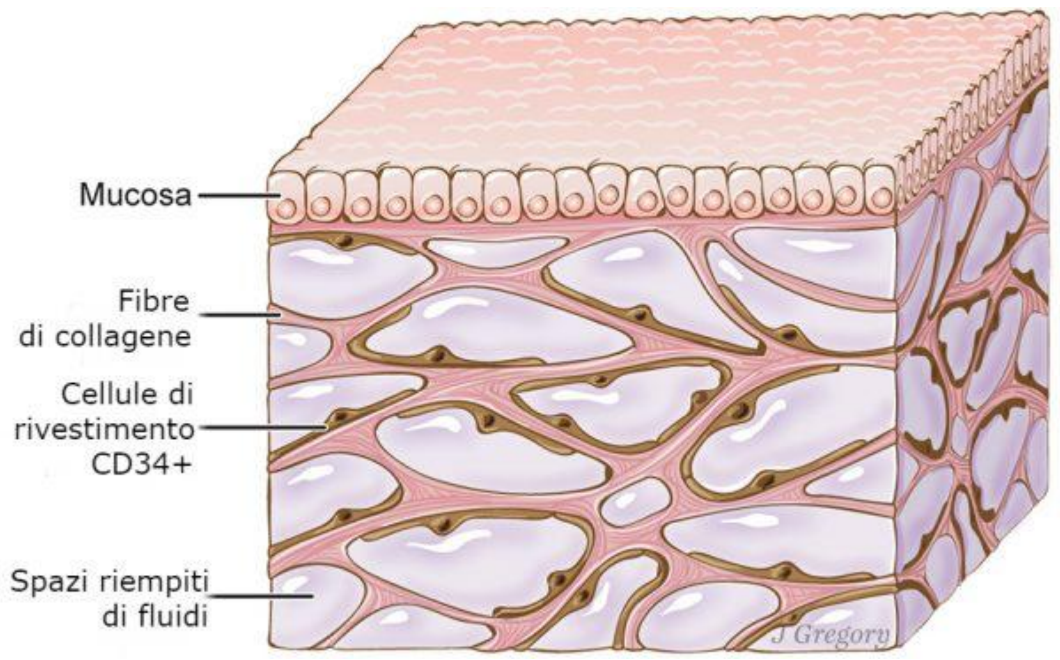


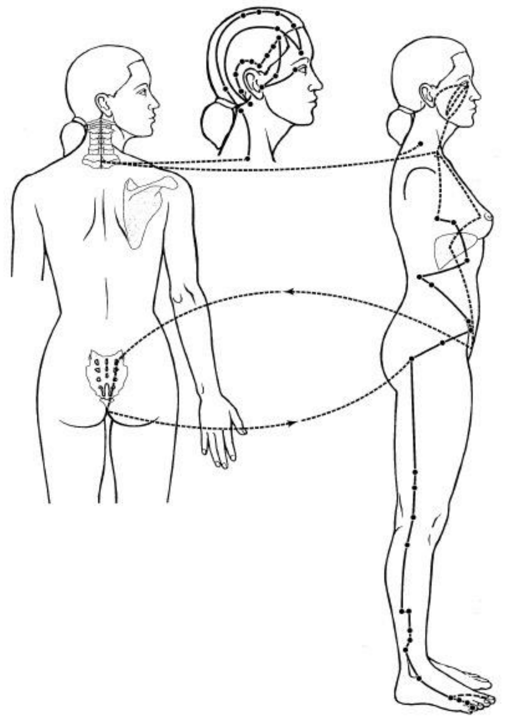
J Cell Physiol. 2006 Jun;207(3):767-74.
Subcutaneous tissue fibroblast cytoskeletal remodeling induced by acupuncture: evidence for a mechanotransduction-based mechanism.
Langevin HM1, Bouffard NA, Badger GJ, Churchill DL, Howe AK.

FASEB J. 2001 Oct;15(12):2275-82.
Mechanical signaling through connective tissue: a mechanism for the therapeutic effect of acupuncture.
Langevin HM1, Churchill DL, Cipolla MJ.









MEDICAL ACUPUNCTURE

Volume 21, Number 2, 2009 # Mary Ann Liebert, Inc. DOI: 10.1089=acu.2009.0631

Myofascial Meridians as Anatomical Evidence of Acupuncture Channels

Peter T. Dorsher, MD

Fascial neuromodulation

Eur J Transl Myol 29 (3): 195-201, 2019

Fascial neuromodulation: an emerging concept linking acupuncture, fasciology, osteopathy and neuroscience

Gianluca Bianco

Master Degree in Posturology, Department of Human Neurosciences, Sapienza University of

Rome, Italy

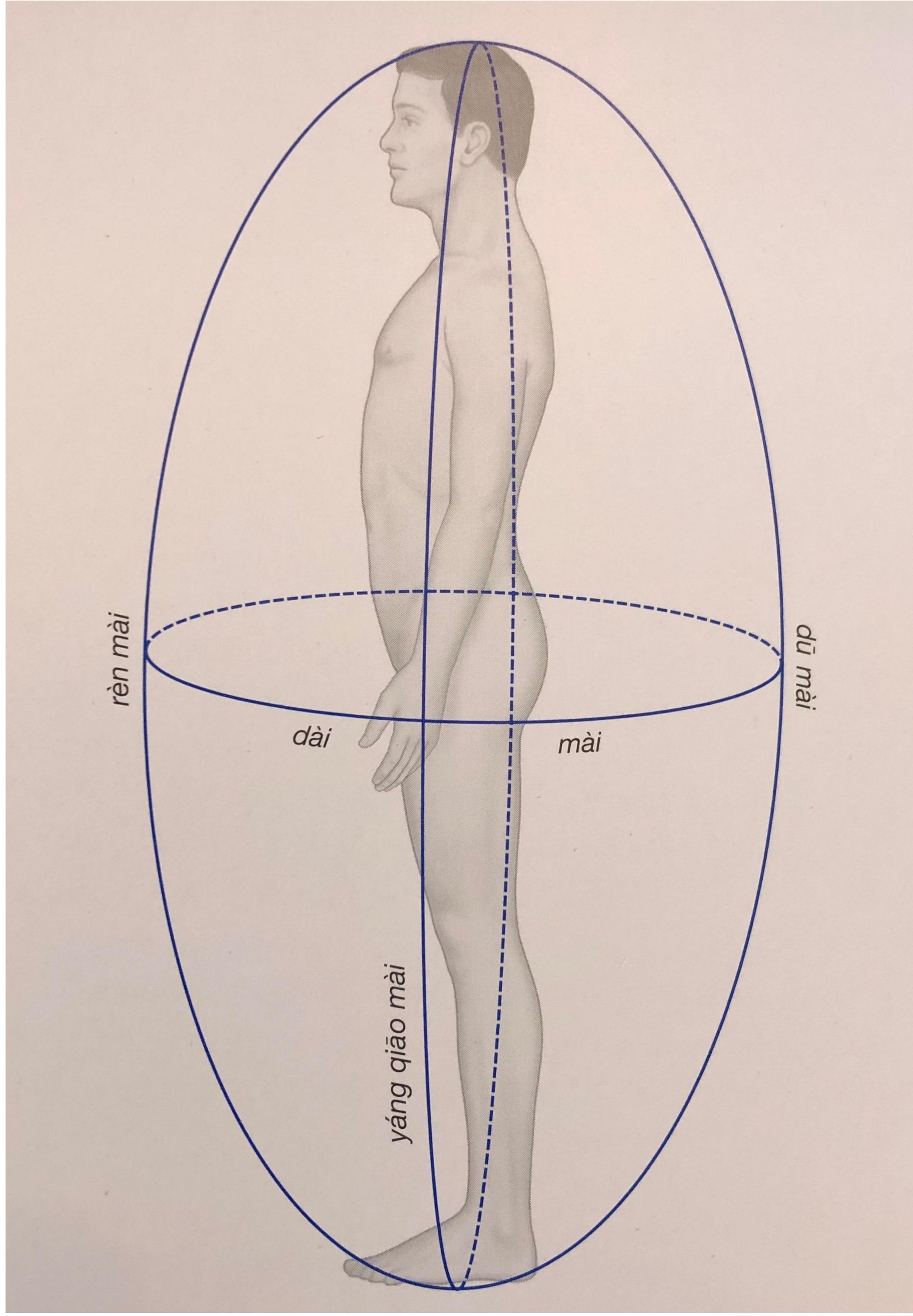
Abstract

According to Traditional Chinese Medicine “acupuncture is believed to restore the balance between Yin and Yang” and this can be understood in the Western medicine terminology as a “modulation of the equilibrium between parasympathetic and sympathetic activi

Key Words: acupuncture, neuromodulation, posturology, fascial system, osteopathy.

Eur J Transl Myol 29 (3): 195-201, 2019

LA POSTURA ED I TRE PIANI DELLO SPAZIO



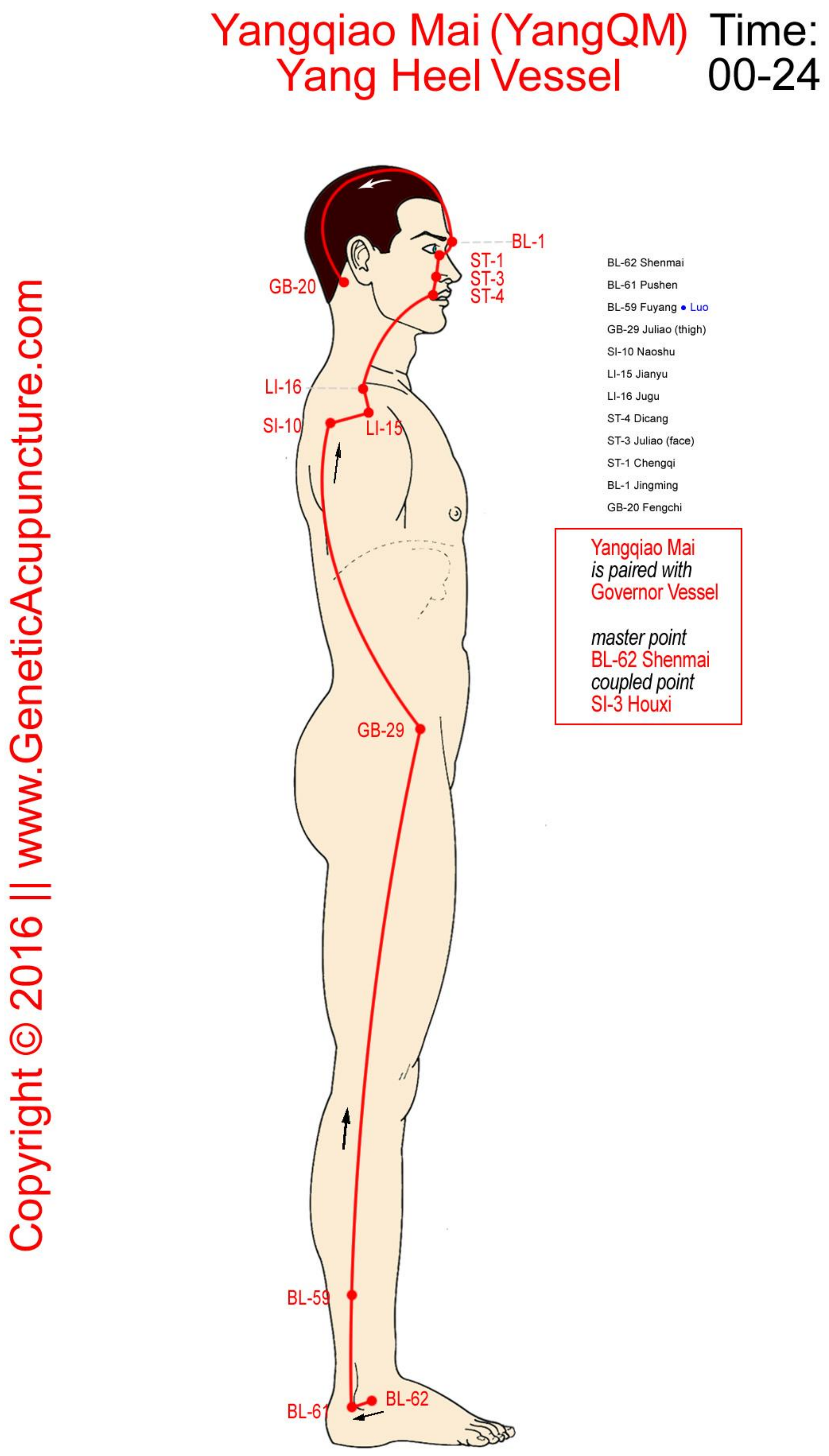
REN MAI + DU MAI
Riequilibria Yin e Yang e parte anteriore e posteriore del corpo

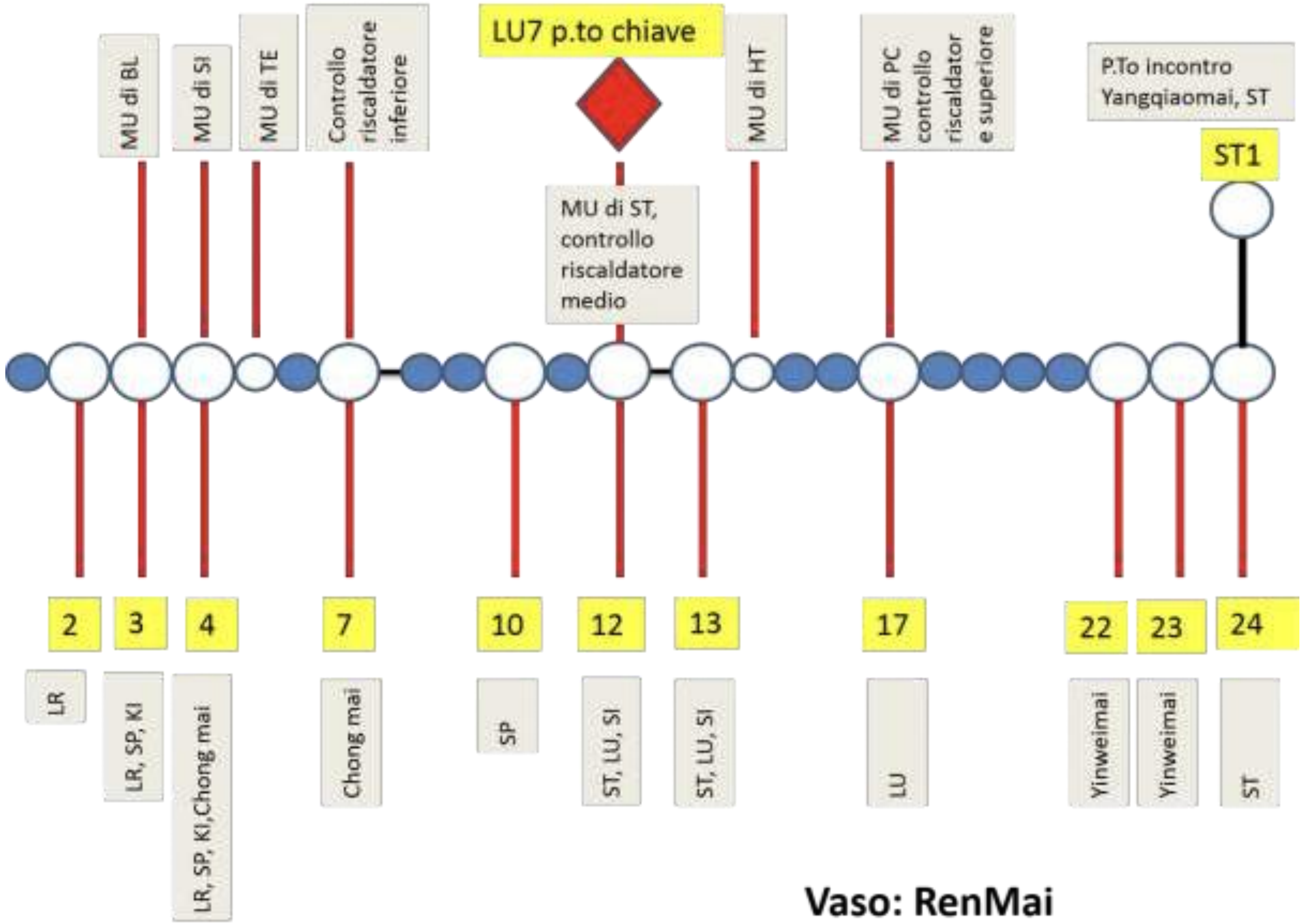
YINQIAO MAI + YANGQIAO MAI
Regola parte interna ed esterna della gamba

YINWEI MAI + YANGWEI MAI
Riequilibrano interno ed esterno e destra e sinistra nella parte superiore del corpo

CHONG MAI + DAI MAI
Regolano riproduzione e digestione

- BL62: abduttore del V dito fino al legamento astragalo-calcaneale laterale
- BL59: flessore lungo dell’alluce
- GB29: tensore della fascia lata/gluteo medio
- SI10: grande rotondo
- LI15: inserzione del m sottospinoso
- LI16: m sovraspinoso
- ST9: sternocleidomastoideo e fasce cervicali
- ST4, ST3: buccinatore e elevatore angolo bocca
- ST1: mm obliquo e retto inferiori
- BL1: retto mediale dell’occhio
- GB20: grande retto posteriore del capo





LU7 p.to chiave
MU di BL
MU di SI
MU di TE
Controllo riscaldatore inferiore
MU di ST, controllo riscaldatore medio
MU di HT
MU di PC controllo riscaldator e superiore
P.To incontro Yangqiaomai, ST
ST1
2
3
4
7
10
12
13
17
22
23
24
LR
LR, SP, KI
LR, SP, KI,Chong mai
Chong mai
SP
ST, LU, SI
ST, LU, SI
LU
Yinweimai
Yinweimai
ST

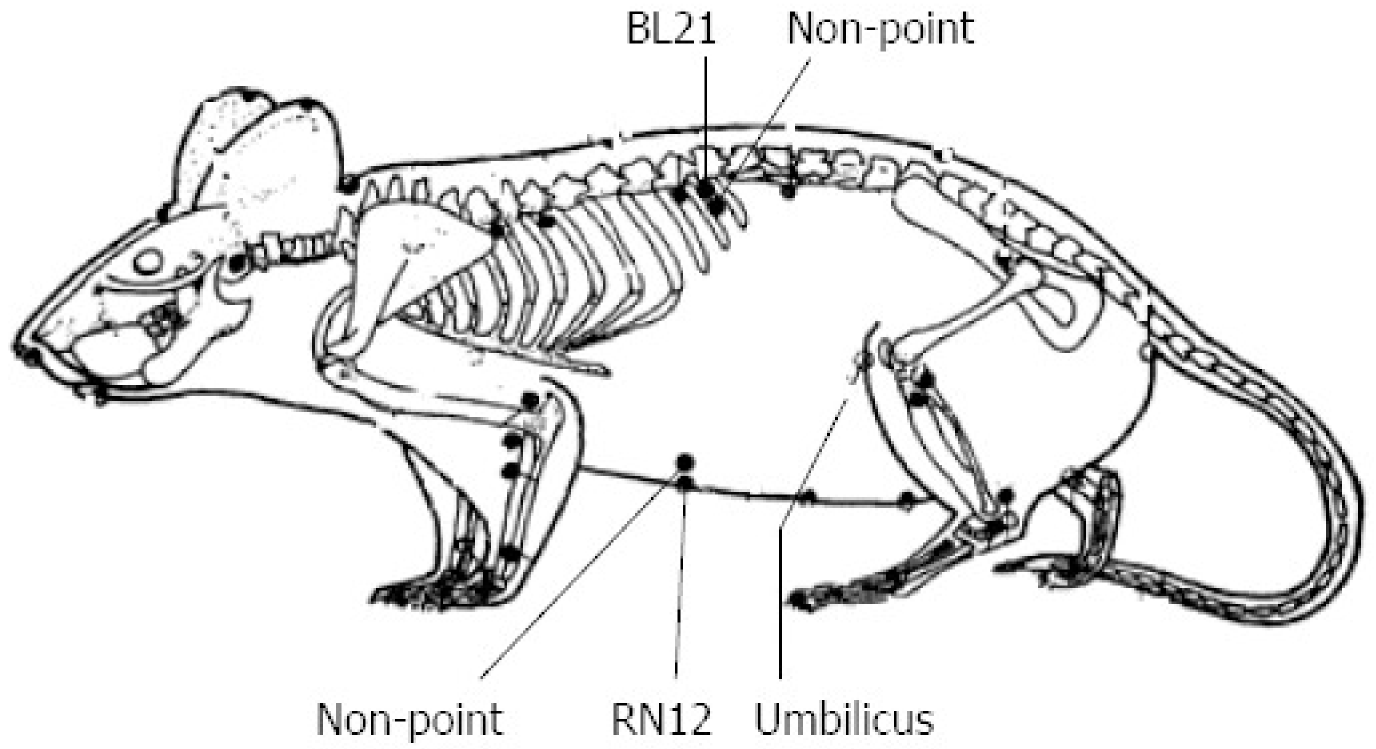
Vaso: RenMai

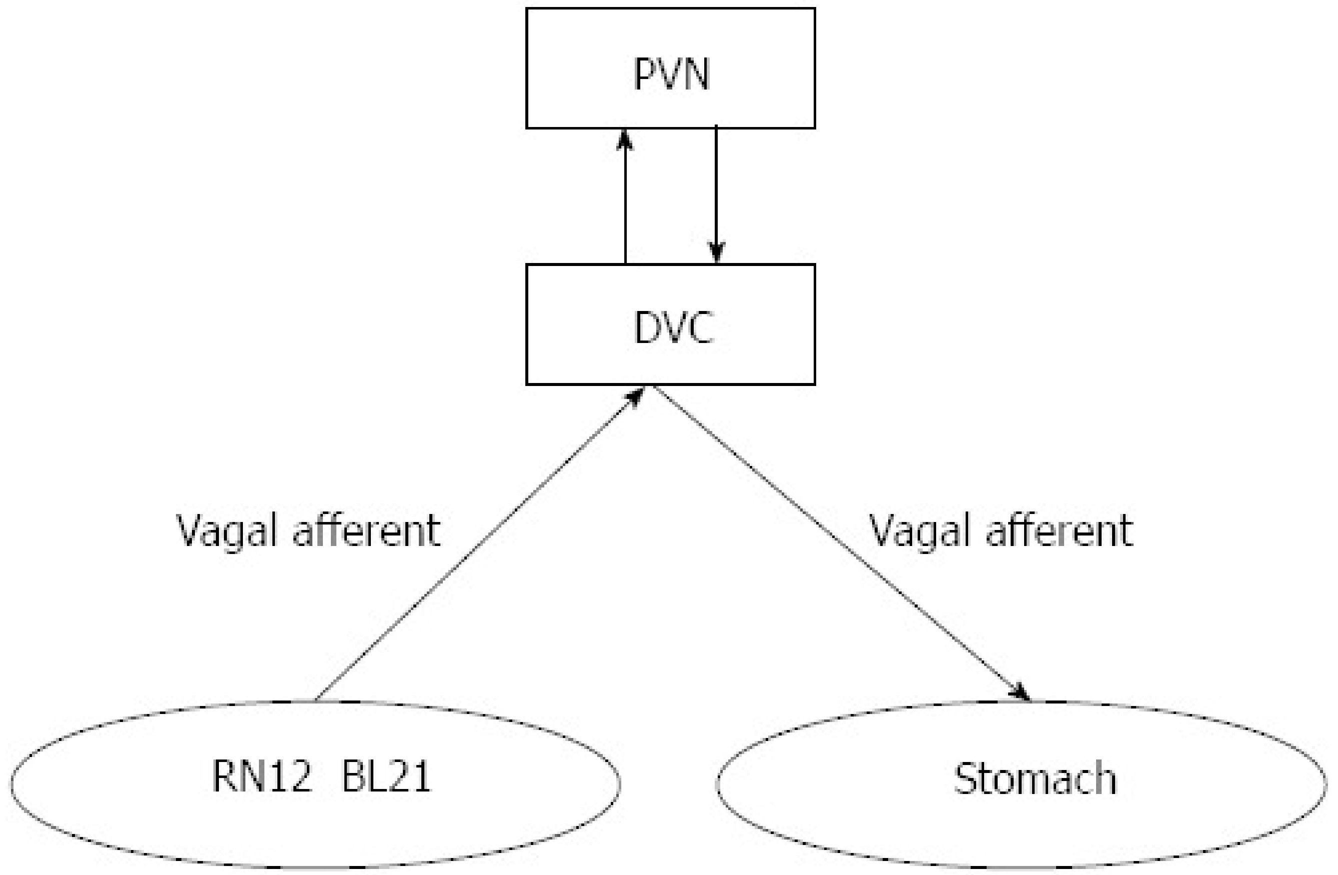
列缺
列缺取法

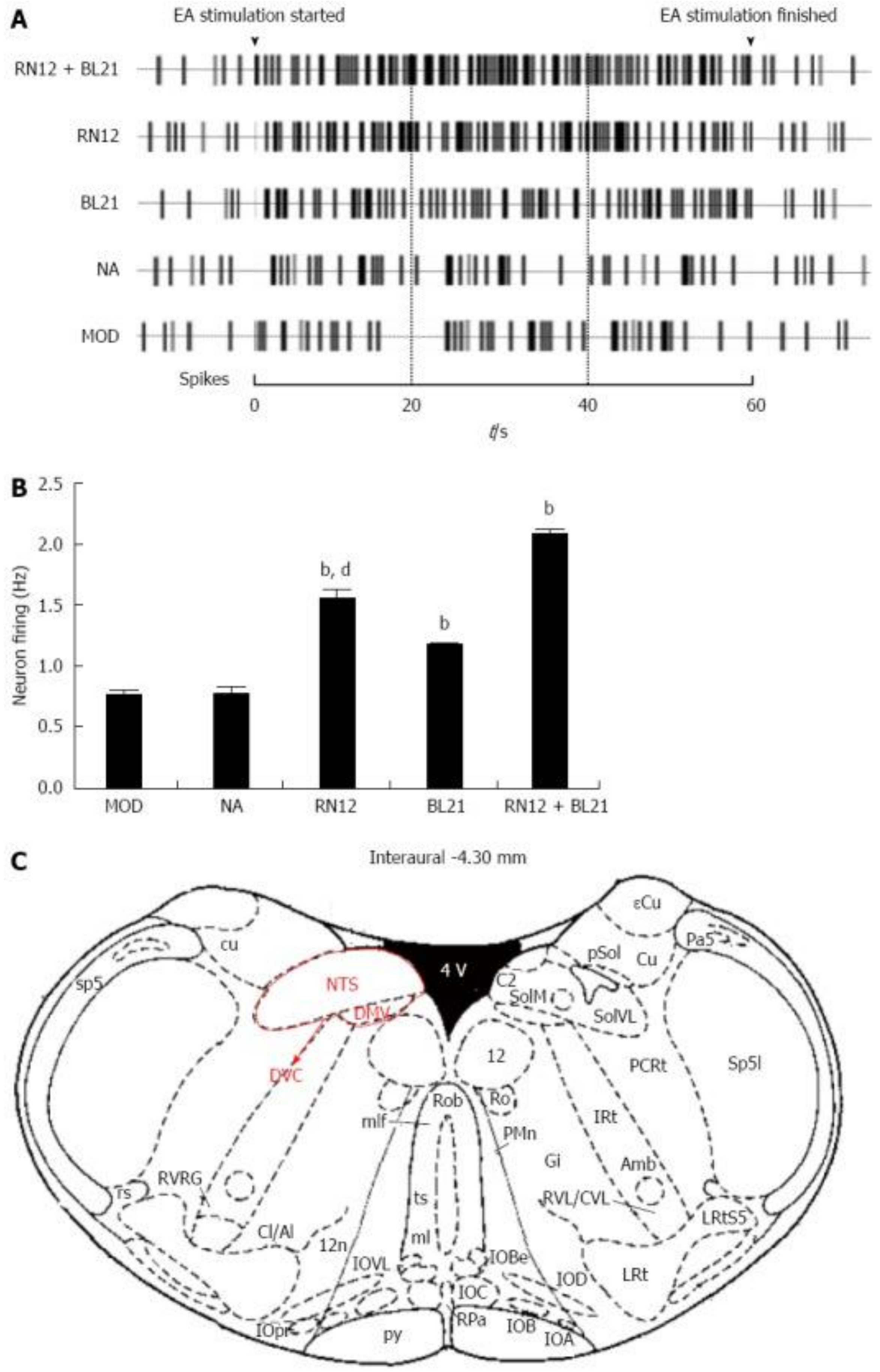
World J Gastroenterol 2015 December 28; 21(48): 13480-13489 ISSN 1007-9327 (print) ISSN 2219-2840 (online)

Neural mechanism of gastric motility regulation by electroacupuncture at RN12 and BL21: A paraventricular hypothalamic nucleus-dorsal vagal complex-vagus nerve- gastric channel pathway

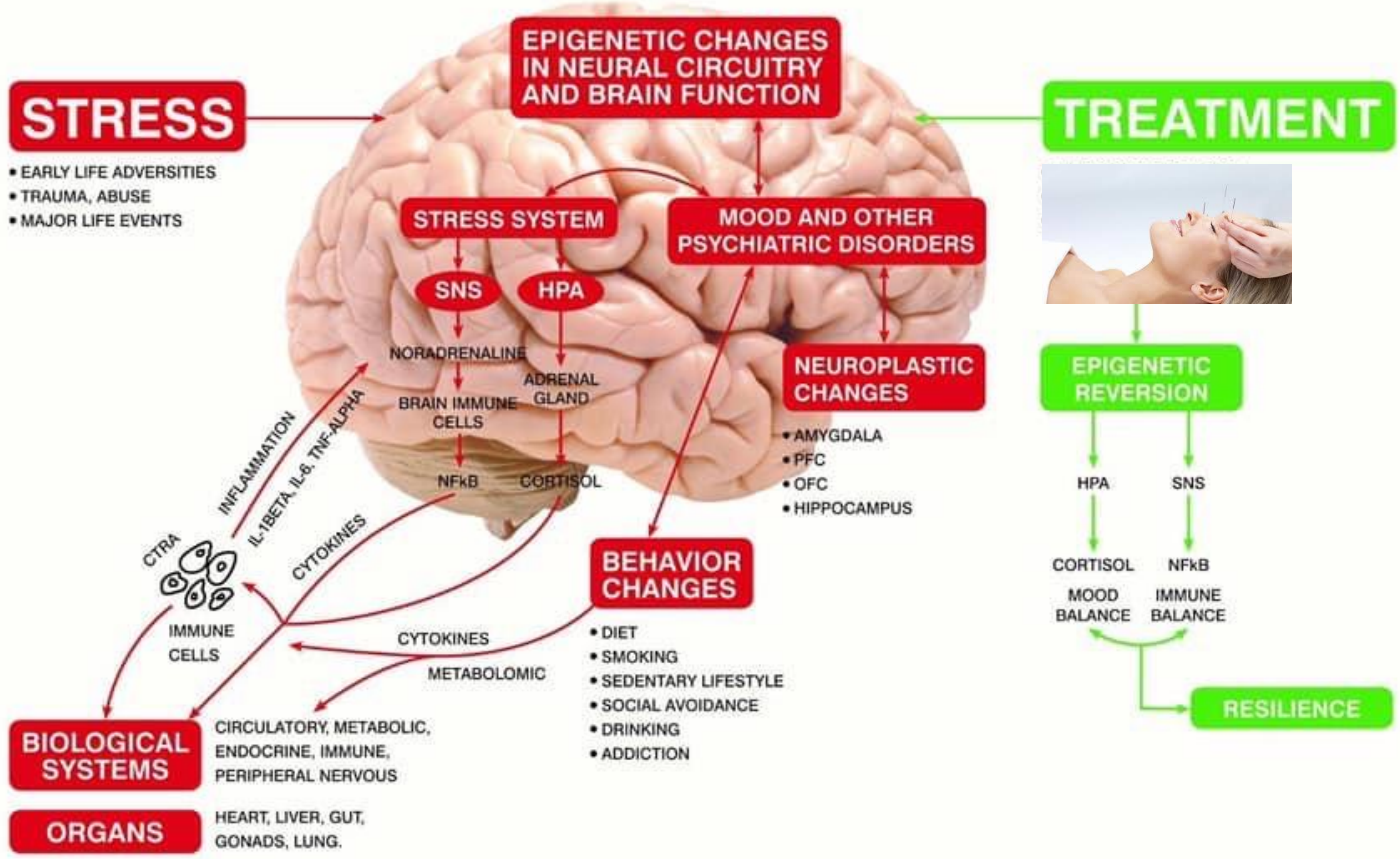
Hao Wang, Wen-Jian Liu, Guo-Ming Shen, Meng-Ting Zhang, Shun Huang, Ying He







“TARGETED CONVERGENCE HYPOTESIS”



Hum Brain Mapp. 2009 Apr;30(4):1196-206. doi: 10.1002/hbm.20583.

The salient characteristics of the central effects of acupuncture needling: limbic-paralimbic-neocortical network modulation.

Fang J1, Jin Z, Wang Y, Li K, Kong J, Nixon EE, Zeng Y, Ren Y, Tong H, Wang Y, Wang P, Hui KK.

Conf Proc IEEE Eng Med Biol Soc. 2005;5:4496-9.

Correlating acupuncture FMRI in the human brainstem with heart rate variability.

Napadow V1, Dhond RP, Purdon P, Kettner N, Makris N, Kwong KK, Hui KK.

Contents lists available at ScienceDirect

Autonomic Neuroscience: Basic and Clinical

journal homepage: www.elsevier.com/locate/autneu

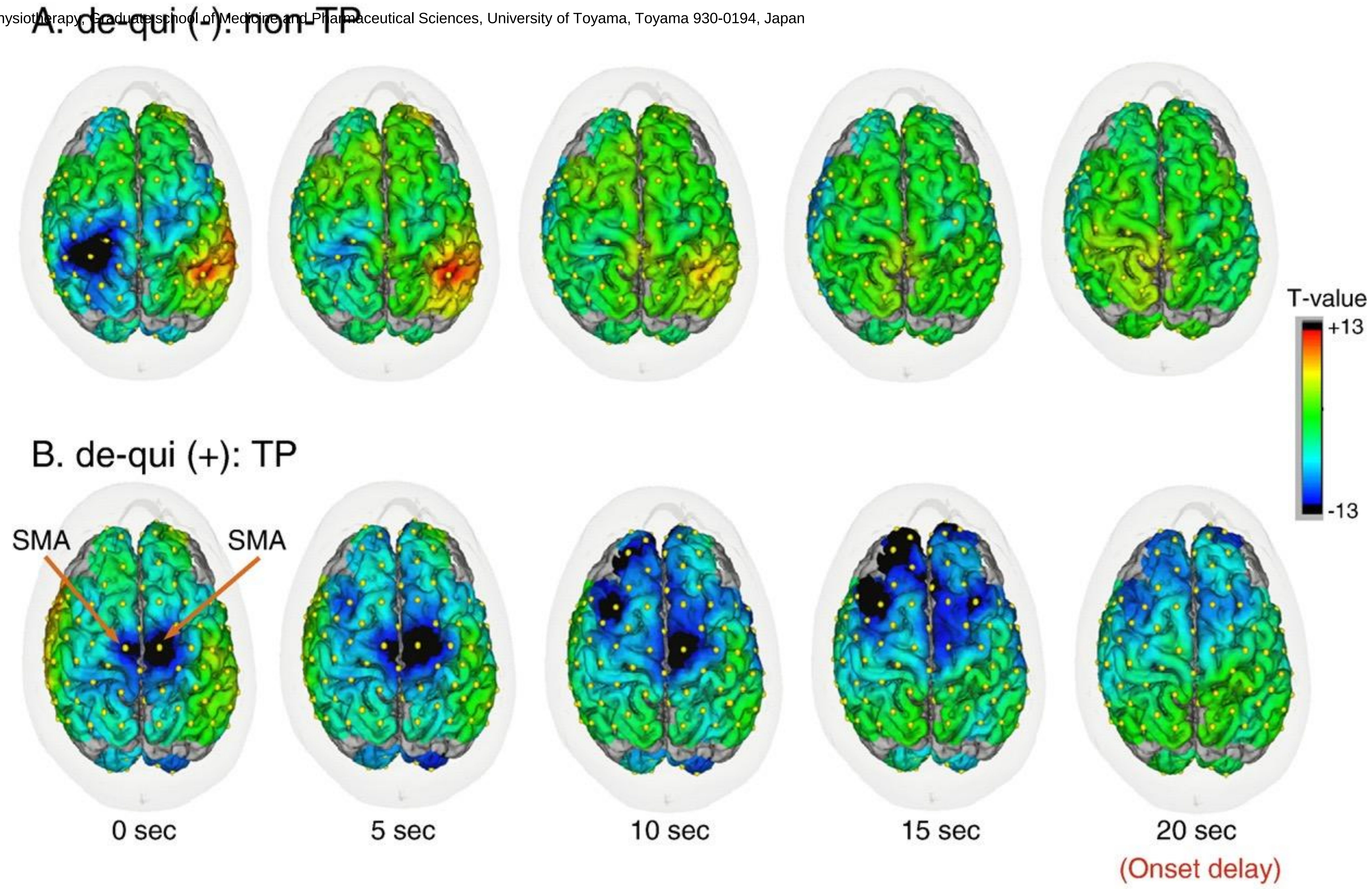
Review

Effects of acupuncture on the brain hemodynamics

Etsuro Hori [a], Kouich Takamoto [b], Susumu Urakawa [b], Taketoshi Ono [b], Hisao Nishijo [a,*]

[a] System Emotional Science, Graduate school of Medicine and Pharmaceutical Sciences, University of Toyama, Toyama 930-0194, Japan

[b] Department of Judo Neurophysiotherapy, Graduate school of Medicine and Pharmaceutical Sciences, University of Toyama, Toyama 930-0194, Japan

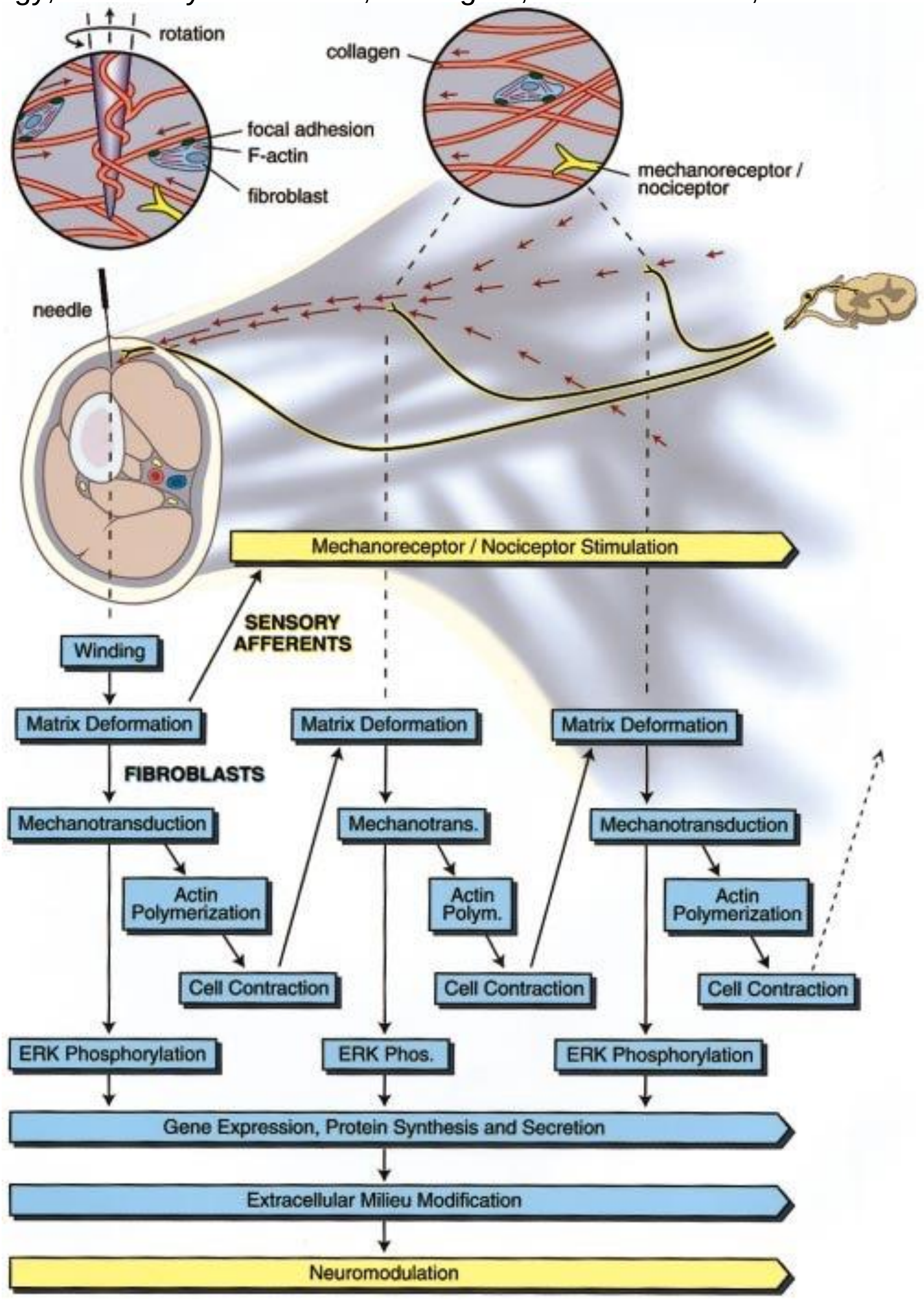


Mechanical signaling through connective tissue:

a mechanism for the therapeutic effect of acupuncture

HELENE M. LANGEVIN,[1] DAVID L. CHURCHILL, AND MARILYN J. CIPOLLA

Department of Neurology, University of Vermont, Burlington, Vermont 05405, USA



Journal of Clinical Medicine MDPI

Potential Nociceptive Role of the Thoracolumbar Fascia: A Scope Review Involving In Vivo and Ex Vivo Studies

Larissa Sinhorim,1,2 Mayane dos Santos Amorim,1,3 Maria Eugênia Ortiz,1,2 Edsel Balduino Bittencourt,1,4 Gianluca Bianco,1,5,6 Fabiana Cristina da Silva,7 Verônica Vargas Horewicz,1,2 Robert Schleip,8,9,* William R. Reed,10,11 Leidiane Mazzardo-Martins,12 and Daniel F. Martins1,2

Nociceptive innervation of the thoracolumbar fascia (TLF) has been investigated over the past few decades; however, these studies have not been compiled or collectively appraised. The purpose of this scoping review was to assess current knowledge regarding nociceptive innervation of the TLF to better inform future mechanistic and clinical TLF research targeting lower back pain (LBP) treatment. PubMed, ScienceDirect, Cochrane, and Embase databases were searched in January 2021 using relevant descriptors encompassing fascia and pain. Eligible studies satisfied the following: (a) published in English; (b) preclinical and clinical (in vivo and ex vivo) studies; (c) original data; (d) included quantification of at least one TLF nociceptive component. Two-phase screening procedures were conducted by a pair of independent reviewers, after which data were extracted and summarized from eligible studies. The search resulted in 257 articles of which 10 met the inclusion criteria. Studies showed histological evidence of nociceptive nerve fibers terminating in lower back fascia, suggesting a TLF contribution to LBP. Noxious chemical injection or electrical stimulation into fascia resulted in longer pain duration and higher pain intensities than injections into subcutaneous tissue or muscle. Pre-clinical and clinical research provides histological and functional evidence of nociceptive innervation of TLF. Additional knowledge of fascial neurological components could impact LBP treatment.

medicina

MDPI

Review

The Potential Mechanisms of High-Velocity, Low-Amplitude, Controlled Vertebral Thrusts on Neuroimmune Function: A Narrative Review

Heidi Haavik [1], Imran Khan Niazi [1,2,3,*], Nitika Kumari [1,2], Imran Amjad [1,4], Jenna Duehr [1] and Kelly Holt [1,*]

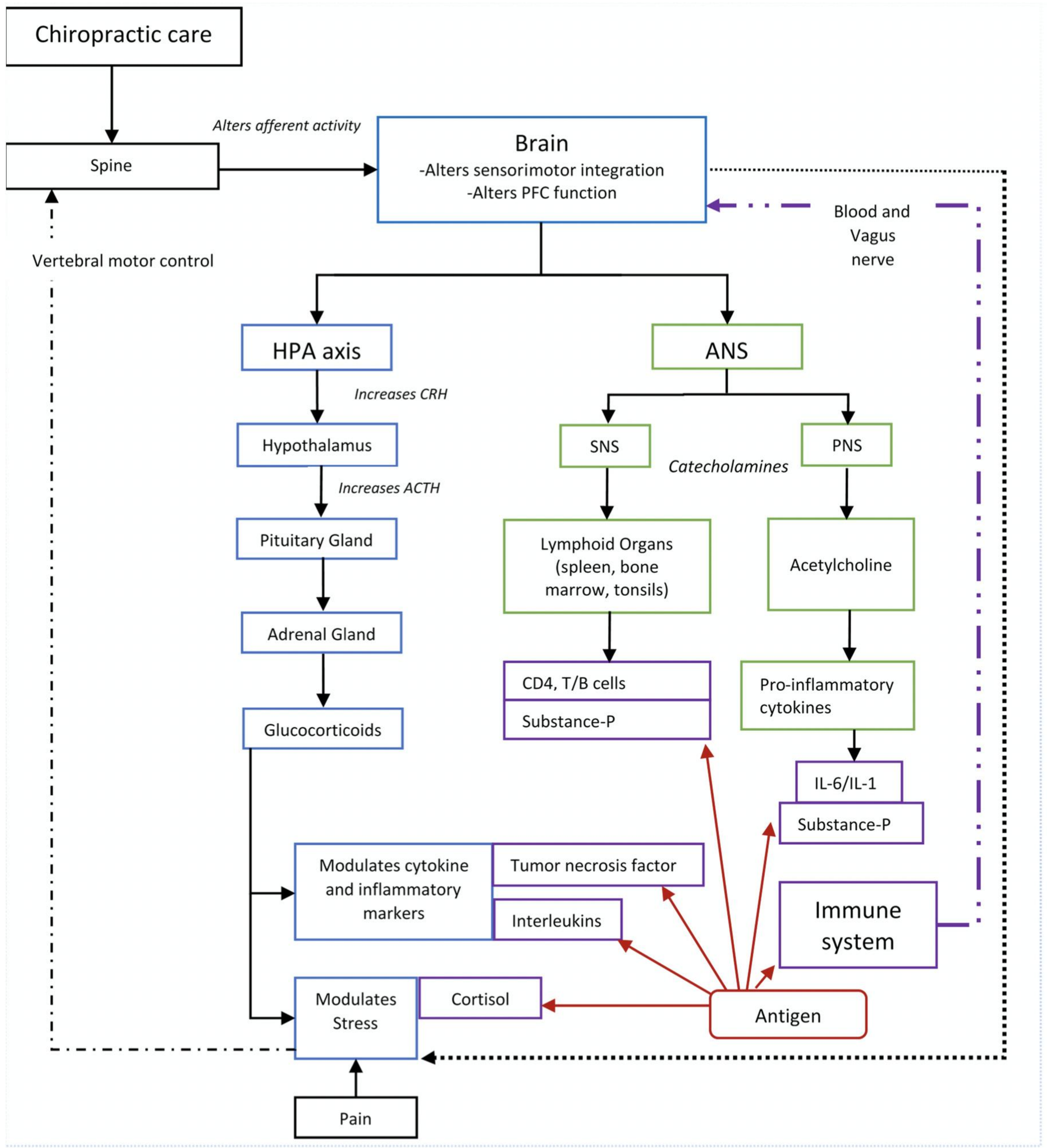


Figure 1. Illustration demonstrating the HVLA controlled vertebral thrust–immune system link. PFC: Prefrontal cortex, Figure 1. Illustration demonstrating the HVLA controlled vertebral thrust–immune system link. PFC: Prefrontal cortex,
HPA: Hypothalamus–pituitary–adrenal axis, ANS: Autonomic nervous system, SNS: Sympathetic nervous system, PNS:
HPA: Hypothalamus–pituitary–adrenal axis, ANS: Autonomic nervous system, SNS: Sympathetic nervous system, PNS:
Parasympathetic nervous system, CRH: Corticotrophin releasing hormone, ACTH: Adreno–corticotropic hormone, IL:
Parasympathetic nervous system, CRH: Corticotrophin releasing hormone, ACTH: Adreno–corticotropic hormone, IL: Interleukin.

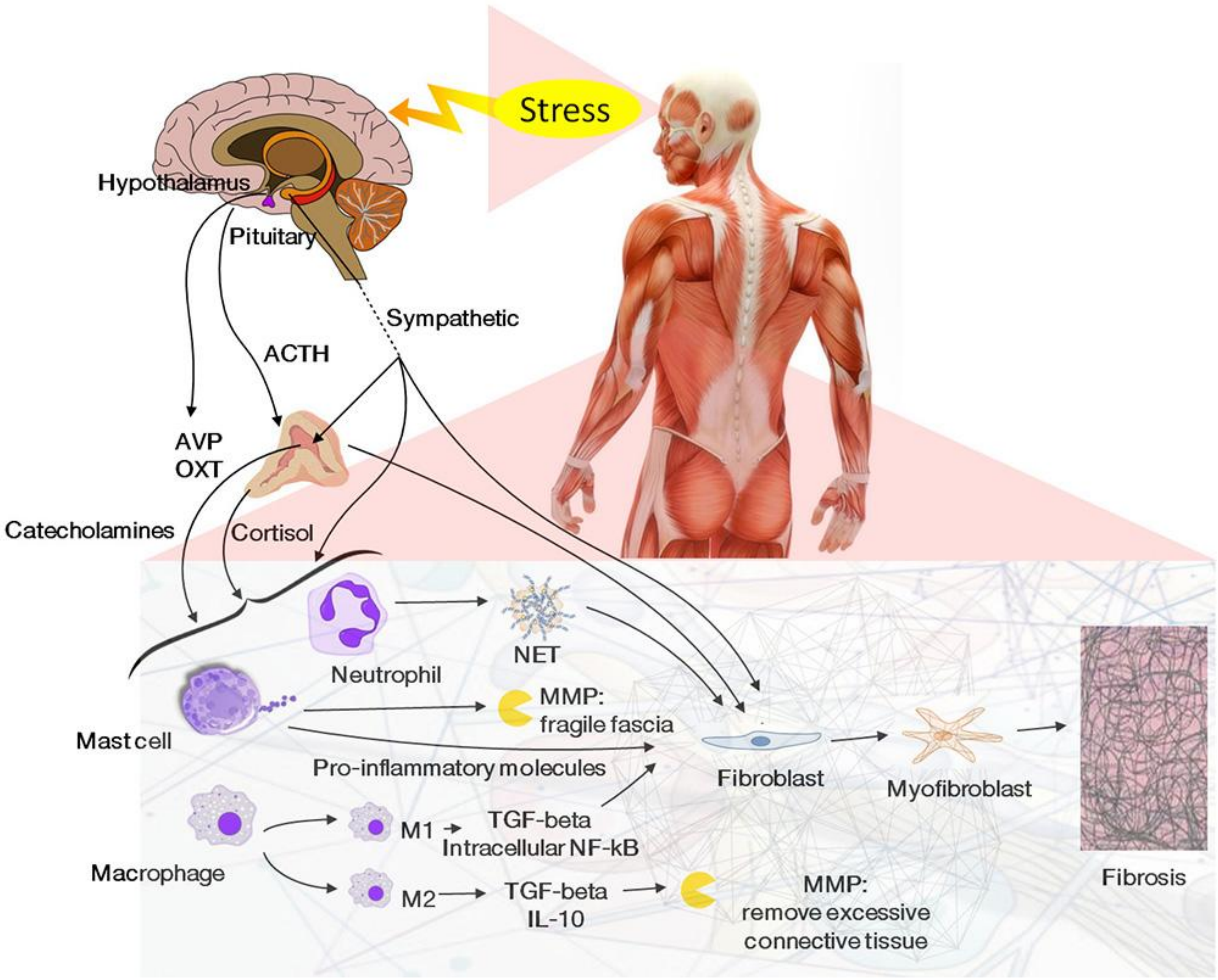
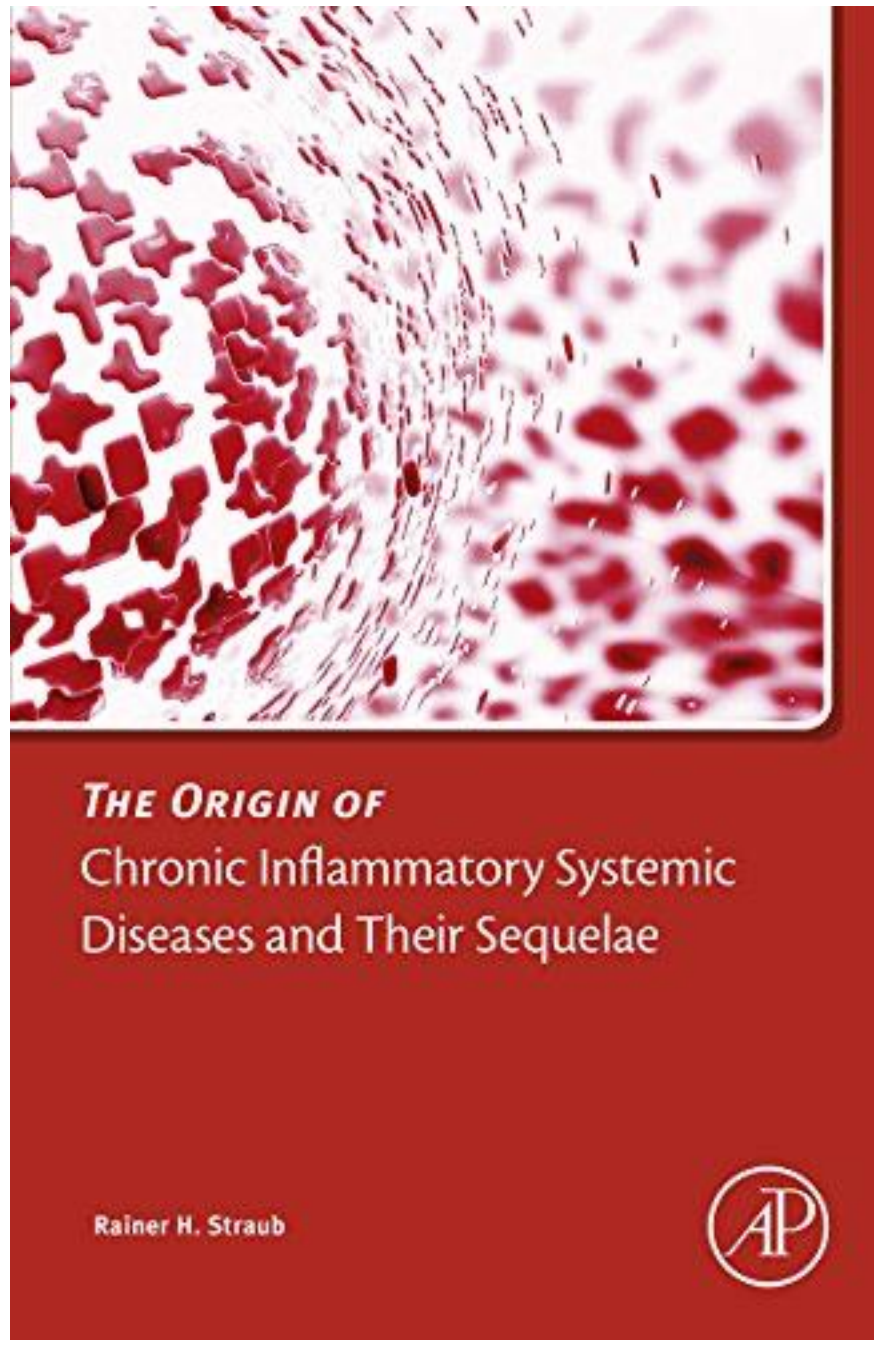


Figure 1. The relationship between stress axis, immune system, and fascia: the activation of the HPA axis stimulates the adrenals to release catecholamines and cortisol. These hormones, together with the activation of the sympathetic nervous system caused by stress, stimulate immune cells inside the fascia. Based on the intensity of the stimulus, macrophages, mast cells, and neutrophils release molecules that can influence the structure of the fascia.

[Impact of stress, immunity, and signals from endocrine and nervous system on fascia.]()
Barsotti N, **Chiera M**, Lanaro D, Fioranelli M.
Front Biosci (Elite Ed). 2021 Jan 1;13:1-36.
PMID: 33048774



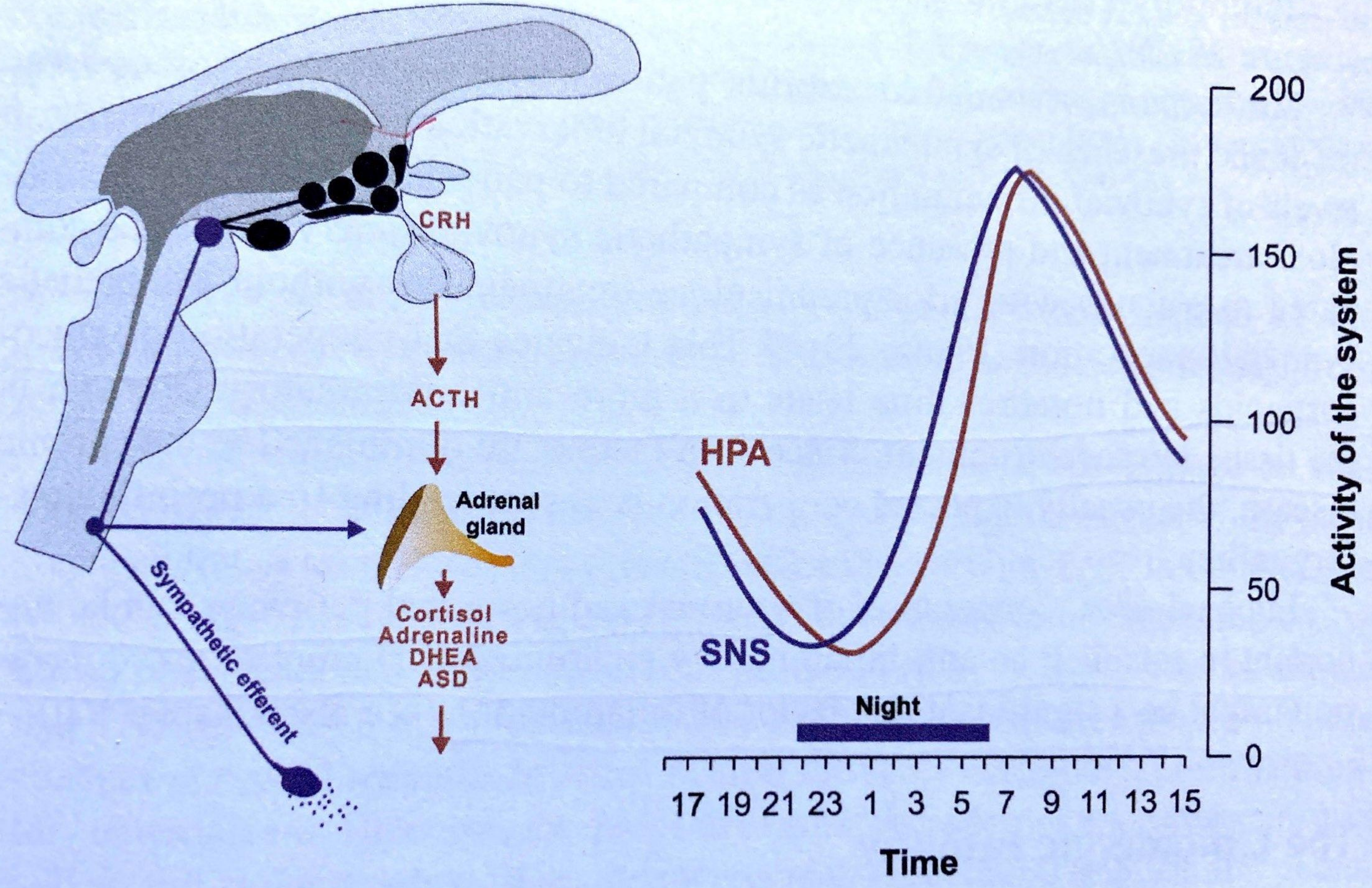


FIGURE 27 Simultaneous rise and fall of activity of the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS) under normal conditions. Both systems reach their maximum in the early morning hours. This would lead to cooperativity of the HPA axis and the sympathetic nervous system. ACTH, adrenocorticotropic hormone; ASD, androstenedione (adrenal androgen); CRH, corticotropin-releasing hormone; DHEA, dehydroepiandrosterone (adrenal androgen).

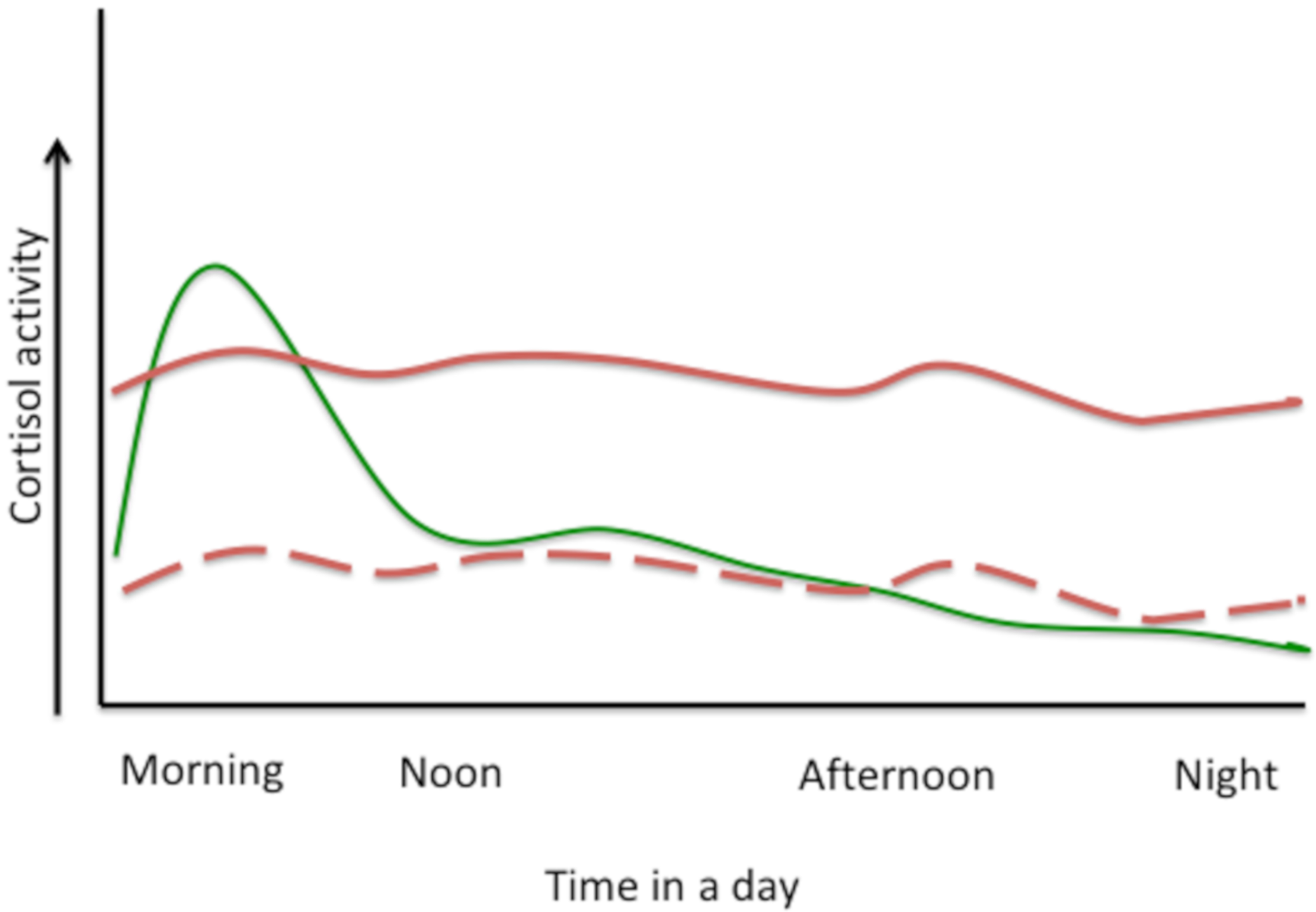
Review
Nutrients

2019 Mar 30;11(4):747. doi: 10.3390/nu11040747.

Osteosarcopenic Obesity: Current Knowledge, Revised Identification Criteria and Treatment Principles

Owen J Kelly [1], Jennifer C Gilman [2], Dario Boschiero [3], Jasminka Z Ilich [4]

PMID: 30935031 PMCID: PMC6520721 DOI: 10.3390/nu11040747



The inflammatory reflex

Kevin J. Tracey

Laboratory of Biomedical Science, North Shore-LIJ Research Institute, 350 Community Drive, Manhasset, New York 11030, USA

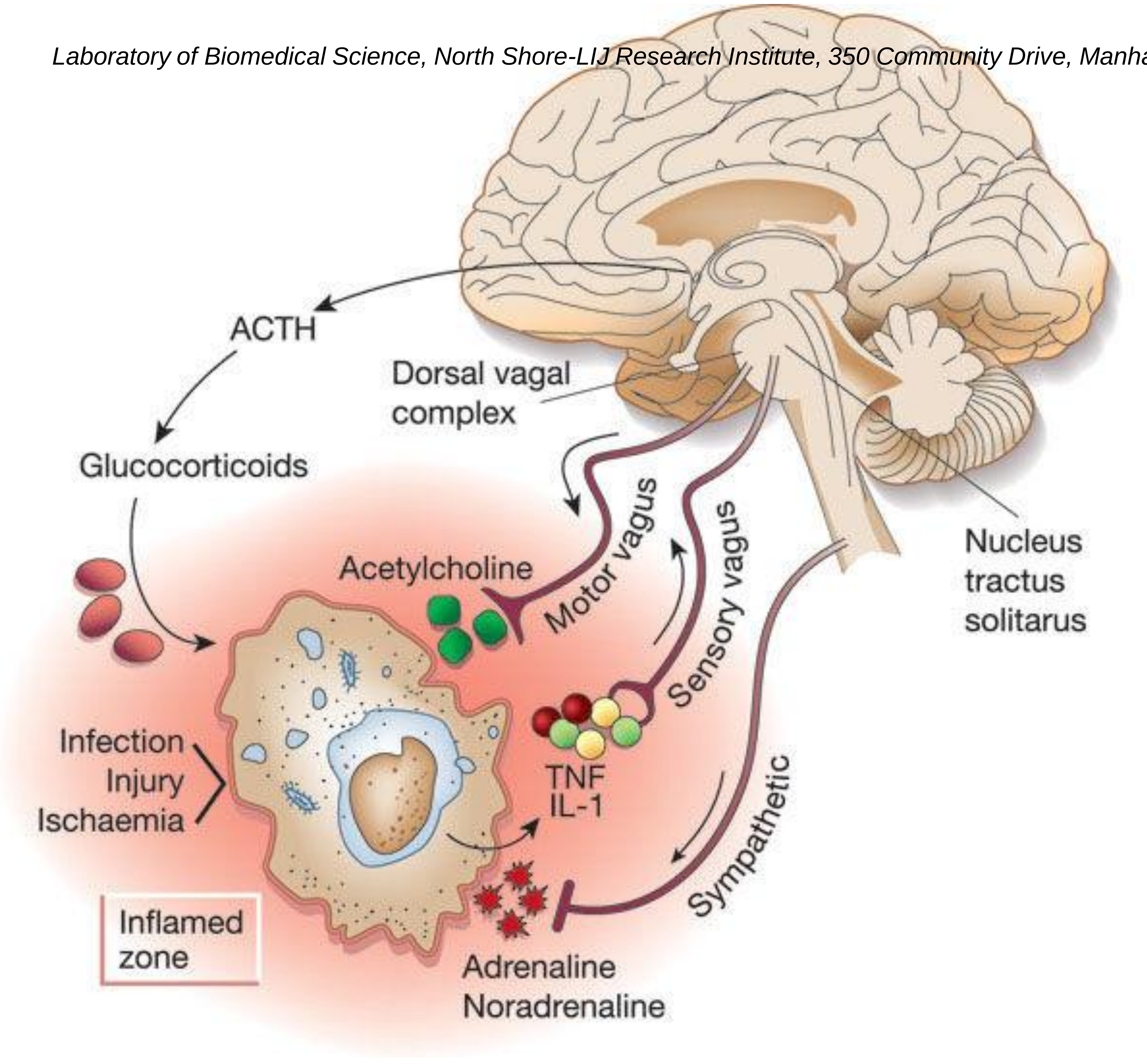
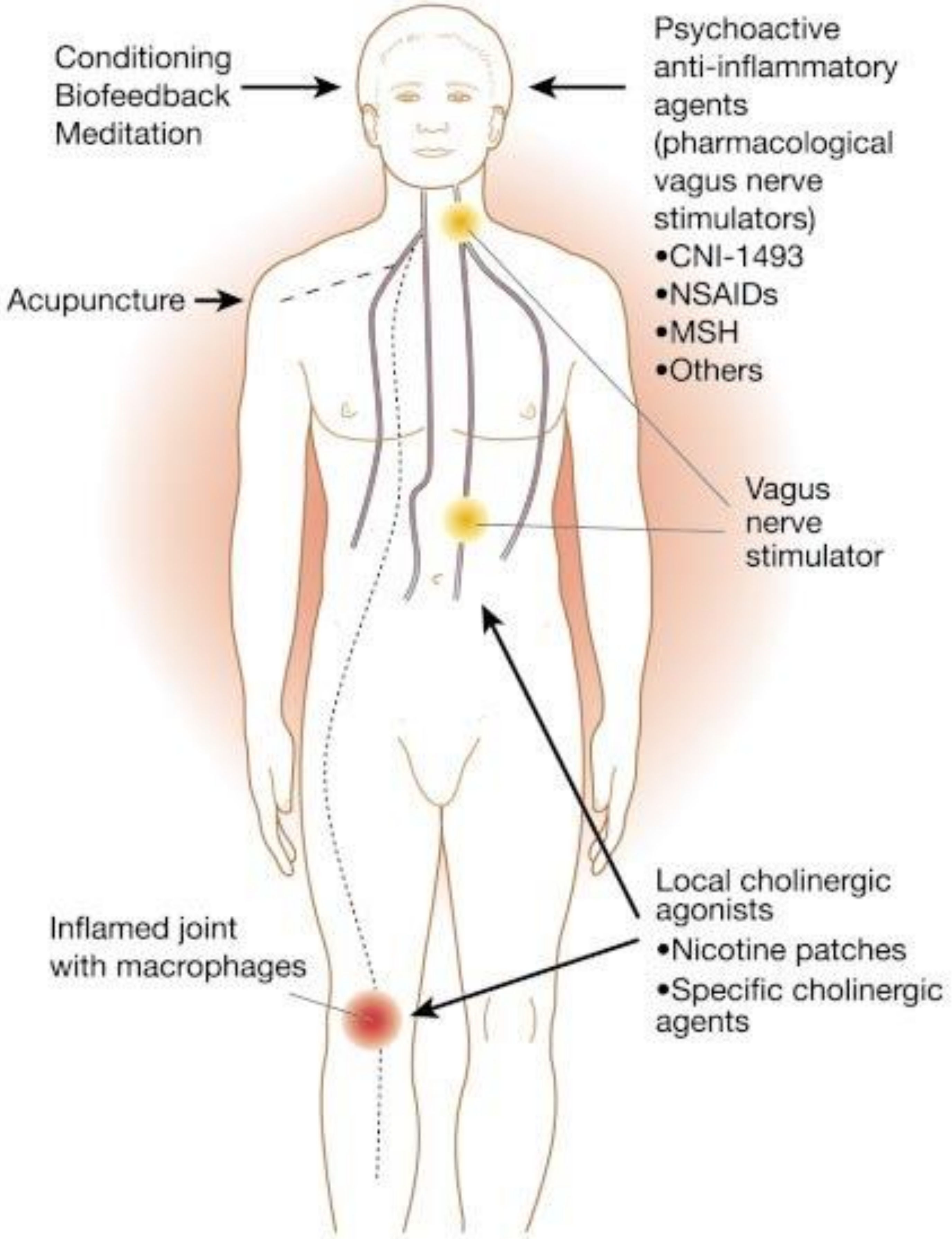


Figure 3 Wiring of the inflammatory reflex. Inflammatory products produced in damaged tissues activate afferent signals that are relayed to the nucleus tractus solitarius; subsequent activation of vagus efferent activity inhibits cytokine synthesis through the cholinergic anti-inflammatory pathway ('the inflammatory reflex'). Information can also be relayed to the hypothalamus and the dorsal vagal complex to stimulate the release of ACTH, thereby activating the humoral anti-inflammatory



Review

The Role of the Vagus Nerve in Fibromyalgia Syndrome

Daniel F Martins [1], Frederic J F Viseux [2], Daiana C Salm [3], Anny Caroline Avelino Ribeiro [4], Helen Kassiana Lopes da Silva [4], Lynsey A Seim [5], Edsel B Bittencourt [6], Gianluca Bianco [7], Ari Ojeda Ocampo Moré [8], William R Reed [9], Leidiane Mazzardo-Martins [10]

Abstract

Fibromyalgia (FM) syndrome is a common illness characterized by chronic widespread pain, sleep problems, fatigue, and cognitive difficulties. Dysfunctional neurotransmitter systems that influence the body's endogenous stress response systems are thought to underlie many of the major FM-related symptoms. A model of FM pathogenesis suggests biological and psychosocial variables interact to influence the genetic predisposition, but the precise mechanisms remain unclear. The Polyvagal Theory provides a theoretical framework from which to investigate potential biological mechanisms. The vagus nerve (VN) has anti-inflammatory properties via its afferent and efferent fibers. A low vagal tone (as assessed by low heart rate variability), has been observed in painful and inflammatory diseases, including FM, while the ventral branch of the VN is linked to emotional expression and social engagement. These anti-inflammatory and psychological (limbic system) properties of the VN may possess therapeutic potential in treating FM. This review paper summarizes the scientific literature regarding the potential role of the VN in transducing and/or therapeutically managing FM signs and symptoms.

Keywords: Autonomic Nervous System; Chronic Pain; Polyvagal Theory; Stress.

The Role of the Vagus Nerve in Fibromyalgia Syndrome

Daniel F Martins 1 , Frederic J F Viseux 2 , Daiana C Salm 3 , Anny Caroline Avelino Ribeiro 4 , Helen Kassiana Lopes da Silva 4 , Lynsey A Seim 5 , Edsel B Bittencourt 6 , G

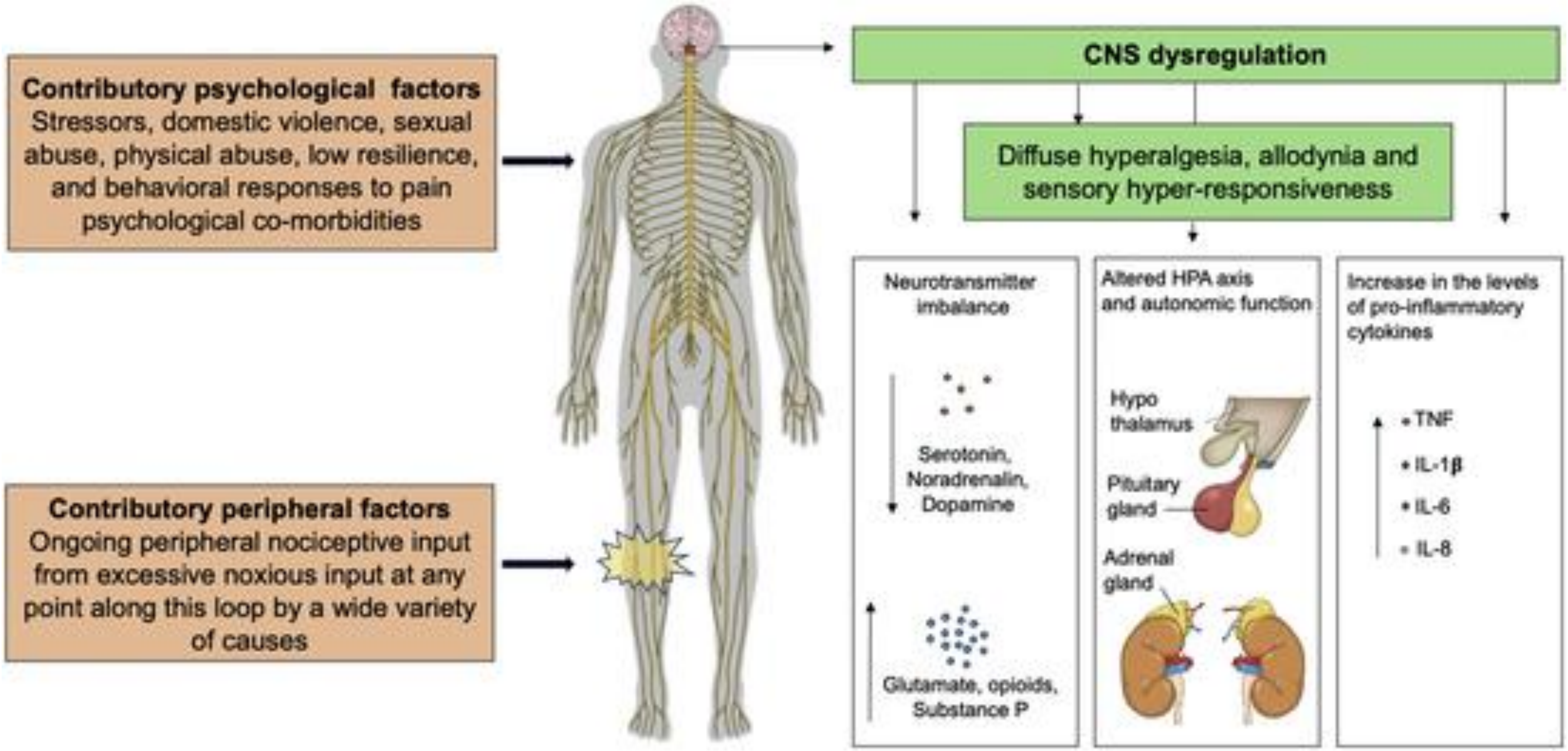


Fig. 1. Potential neuroendocrinologic and inflammatory model in fibromyalgia. hypothalamic–pituitary–adrenal (HPA) axis, GABA, γ-aminobutyric acid; central nervous system (CNS). TNF, Tumor necrosis factor; IL, interleukin. Adapted from Häuser et al. (2017).

The Role of the Vagus Nerve in Fibromyalgia Syndrome

Daniel F Martins 1 , Frederic J F Viseux 2 , Daiana C Salm 3 , Anny Caroline Avelino Ribeiro 4 , Helen Kassiana Lopes da Silva 4 , Lynsey A Seim 5 , Edsel B Bittencourt 6 , G

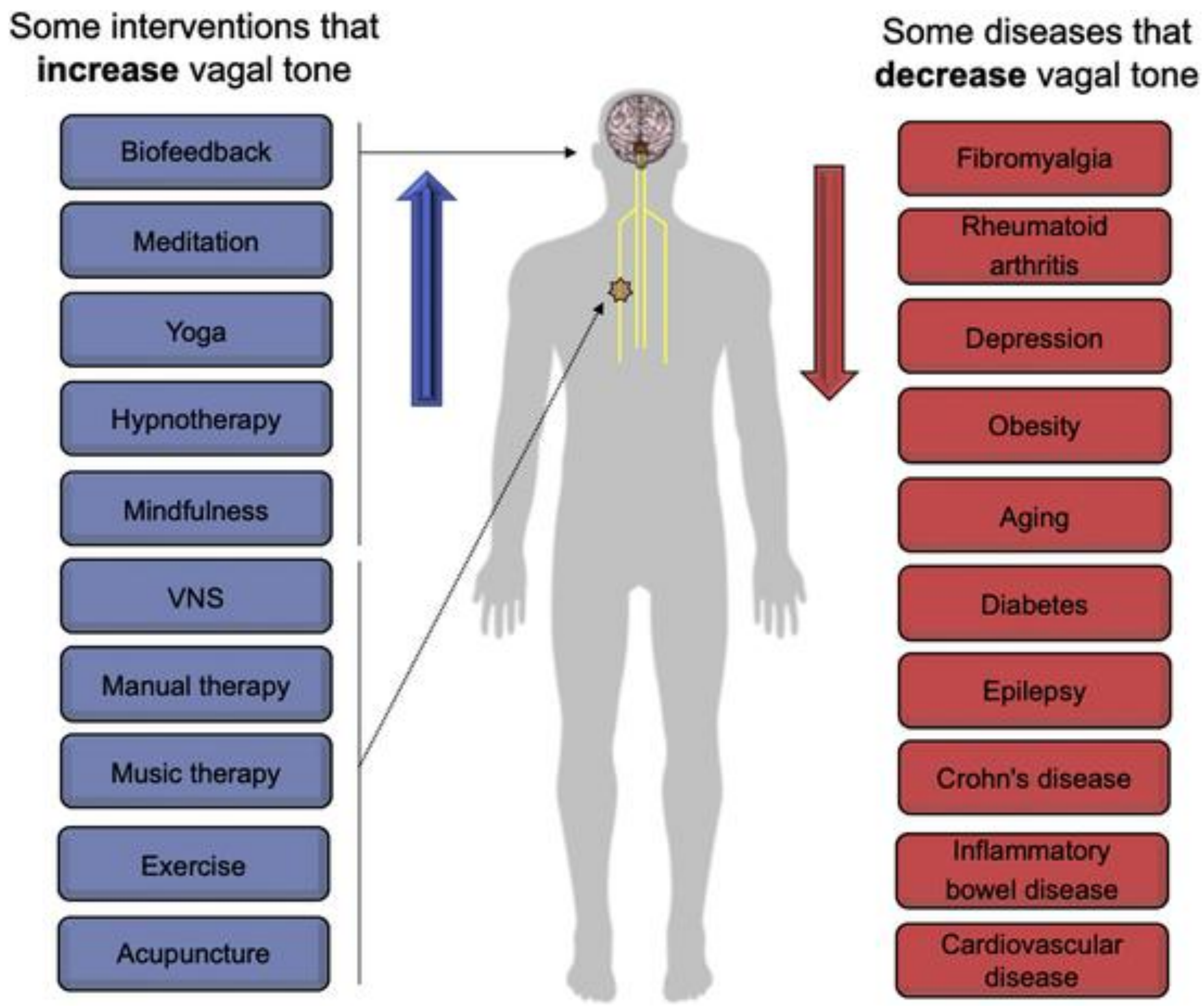


Fig. 3. Diseases and interventions that modify vagus nerve function. VNS, vagus nerve stimulation.

PPG - Autonomic Nervous System HRV [redacted] 09/11/2020 - 18:32

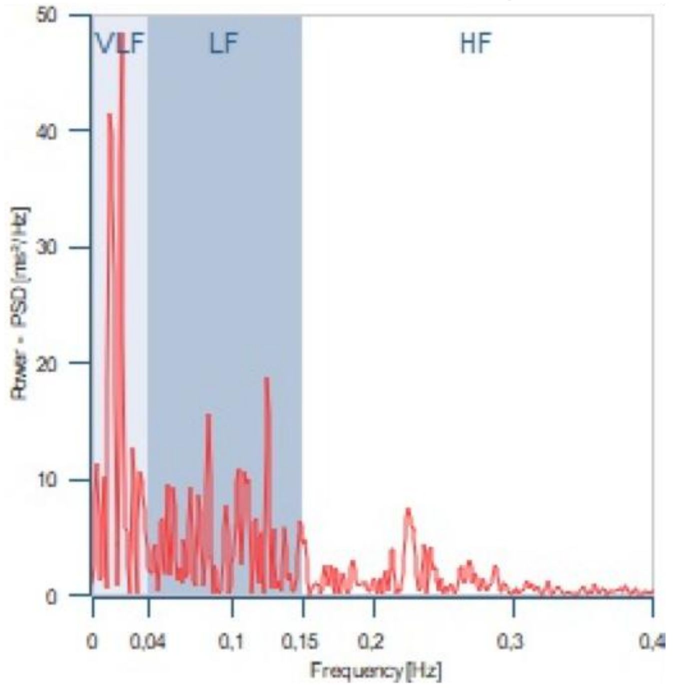
Dati generali

Paziente: [redacted]
Data di nascita: 09/02/1977
Età: 43
Sesso: F

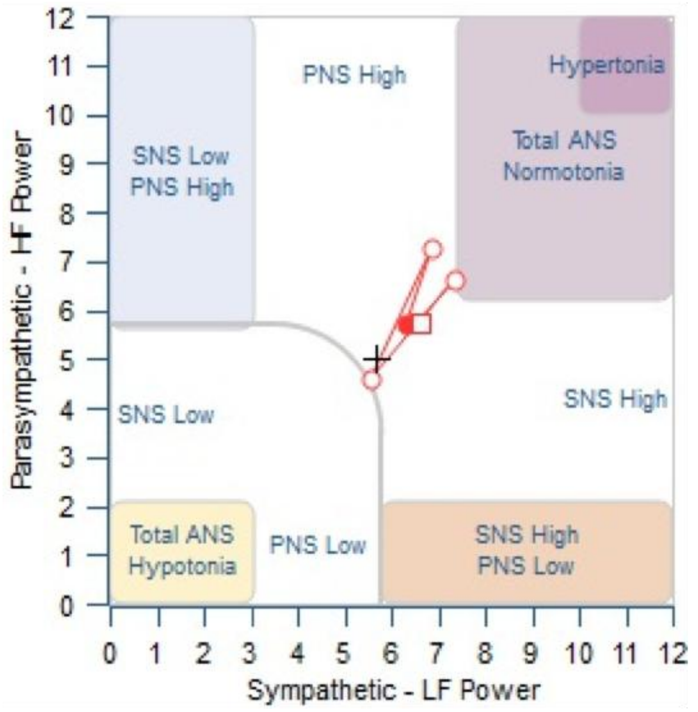
ANS test

			Norms	
Mean HR:	87.2	bpm	[46.9 - 84.8]	
SDNN:	38	ms	min 50 ms	
RMSSD:	22	ms	min 30 ms	
Total power:	7.27		min 8	
LF/VLF	0.99		min 1	
VLF power:	6.36		max 6.7	
LF power:	6.32		min 6.7	
HF power:	5.69		min 6.5	
SNS LF%:	65.2	%		
PNS HF%:	34.8	%		
THM freq:	ND	Hz	[0.08 - 0.12]	
THM power:	ND	ms²/Hz	min 500	

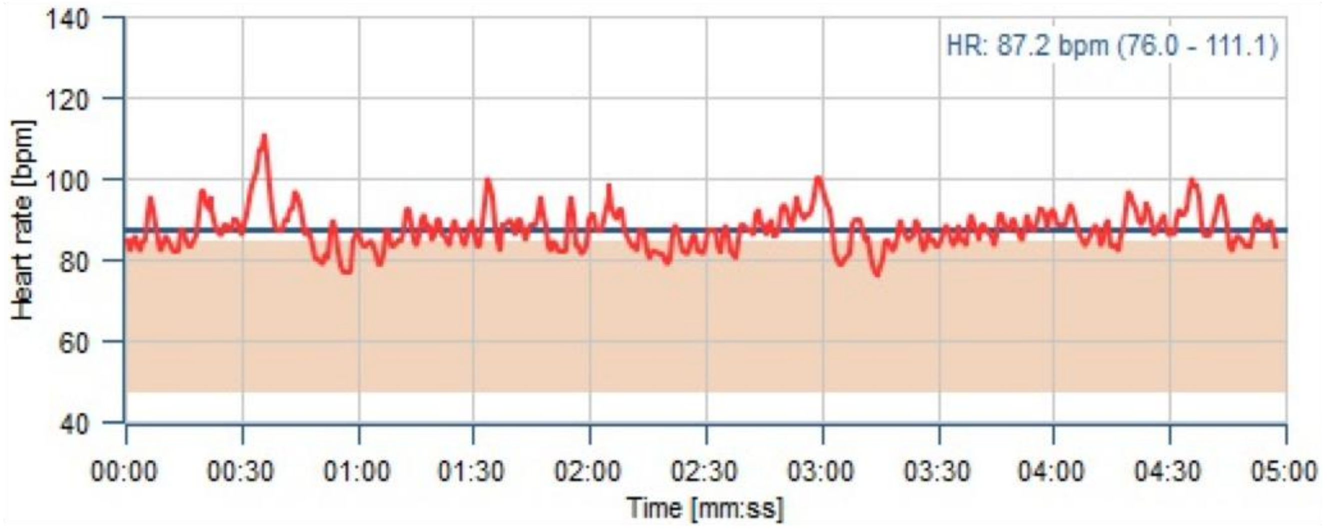
Power Spectral Density



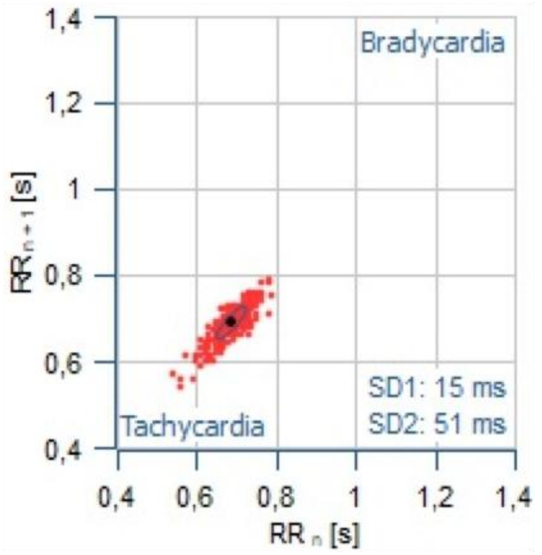
ANS Balance Power



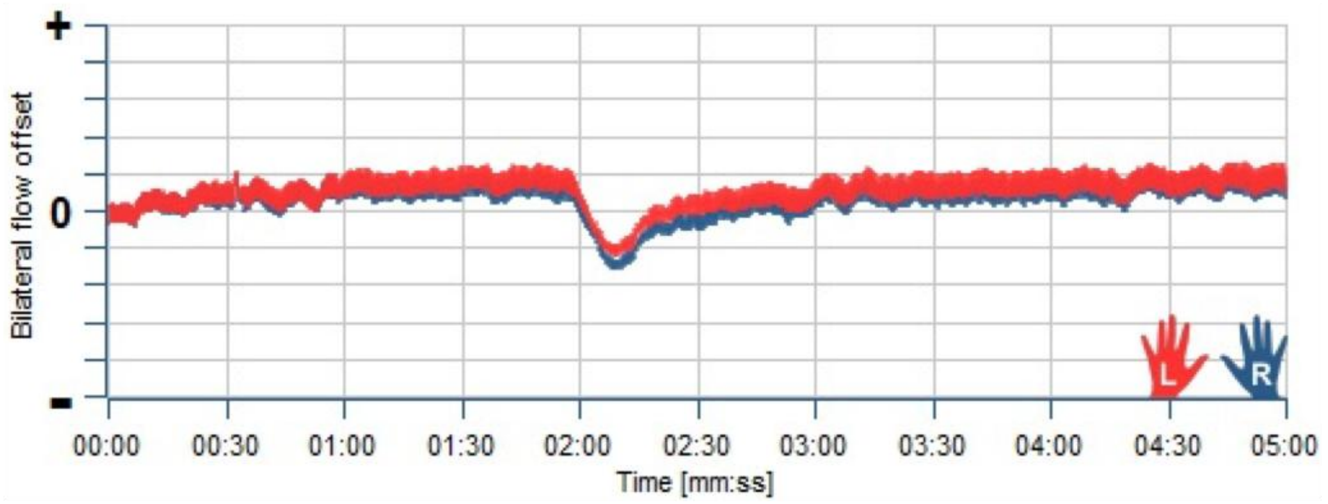
Heart rate



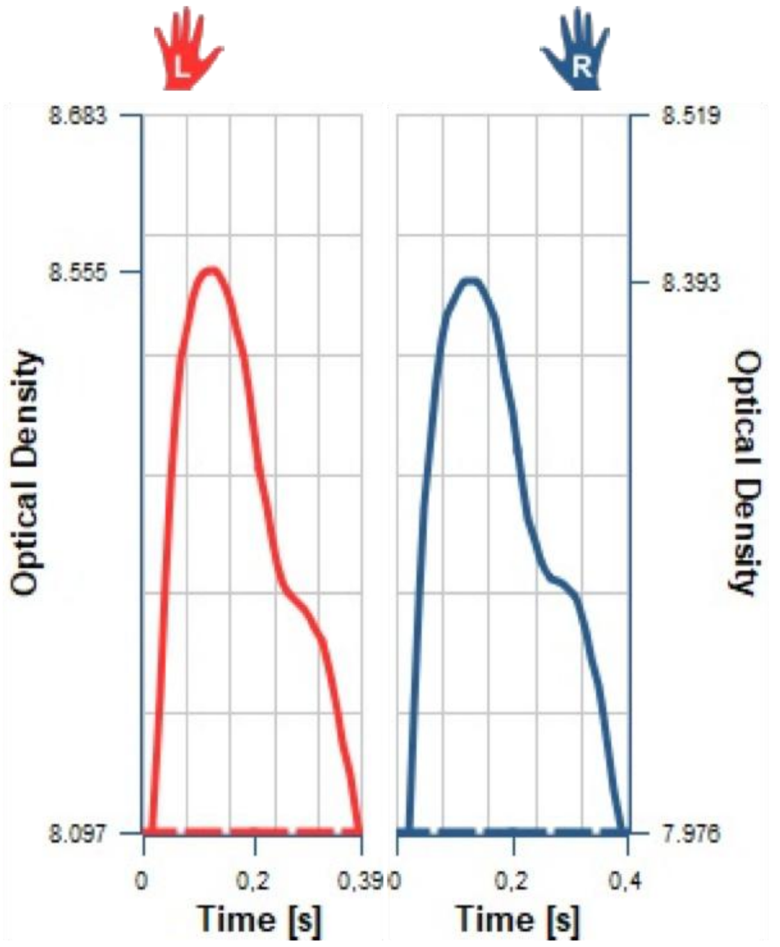
Scatter - Heart rate



Bilateral flow



Mean Pulse Wave



	RH	LH	
Bilat. Flow Gain (BFG):	974.1	931.0	min 300
Bilat. Flow Gain (BFG%):	51.1	48.9	norm [45-55]

Average spO_2 98
$spO_2 \geq 95\%$
spO_2 [91% - 95% [
$spO_2 < 91\%$

PPG - Autonomic Nervous System HRV [redacted] 09/11/2020 - 19:05

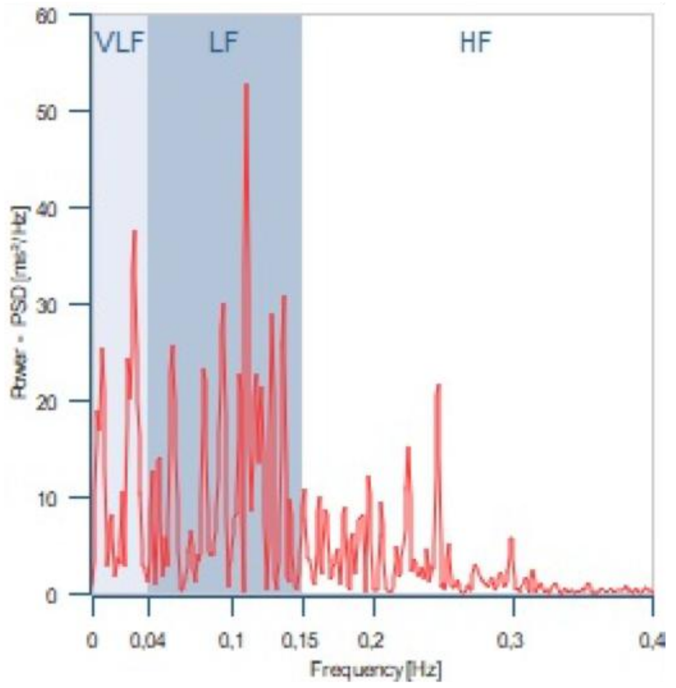
Dati generali

Paziente: [redacted]
Data di nascita: 09/02/1977
Età: 43
Sesso: F

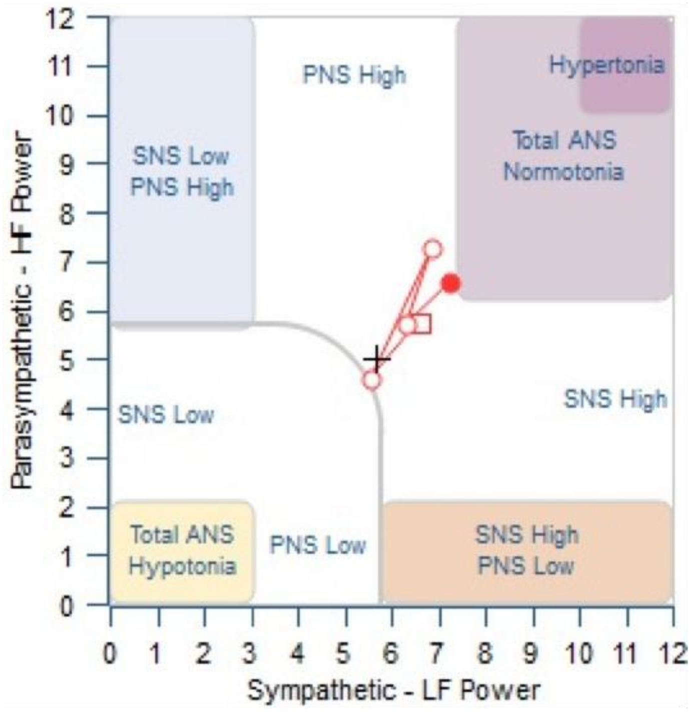
ANS test

			Norms	
Mean HR:	82.8	bpm	[46.9 - 84.8]	
SDNN:	52	ms	min 50 ms	
RMSSD:	33	ms	min 30 ms	
Total power:	7.89		min 8	
LF/VLF	1.14		min 1	
VLF power:	6.36		max 6.7	
LF power:	7.24		min 6.7	
HF power:	6.55		min 6.5	
SNS LF%:	66.7	%		
PNS HF%:	33.3	%		
THM freq:	0.11	Hz	[0.08 - 0.12]	
THM power:	53	ms²/Hz	min 500	

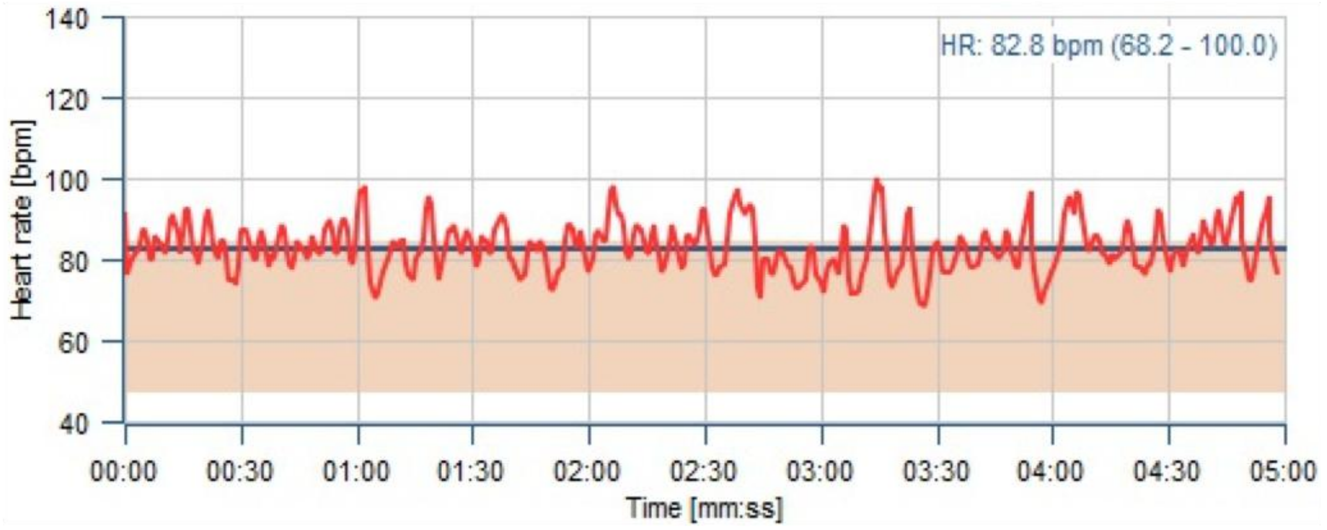
Power Spectral Density



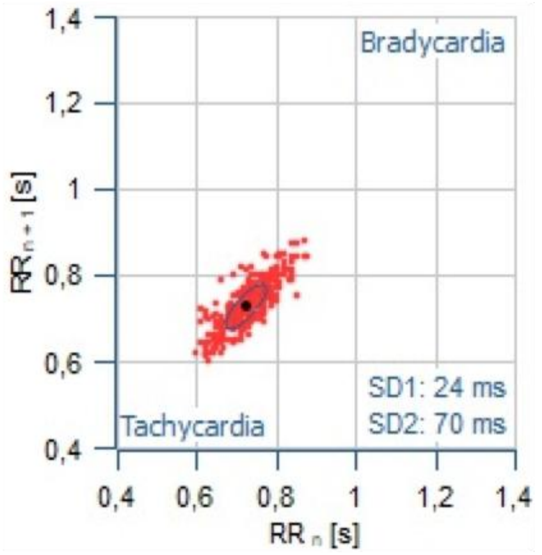
ANS Balance Power



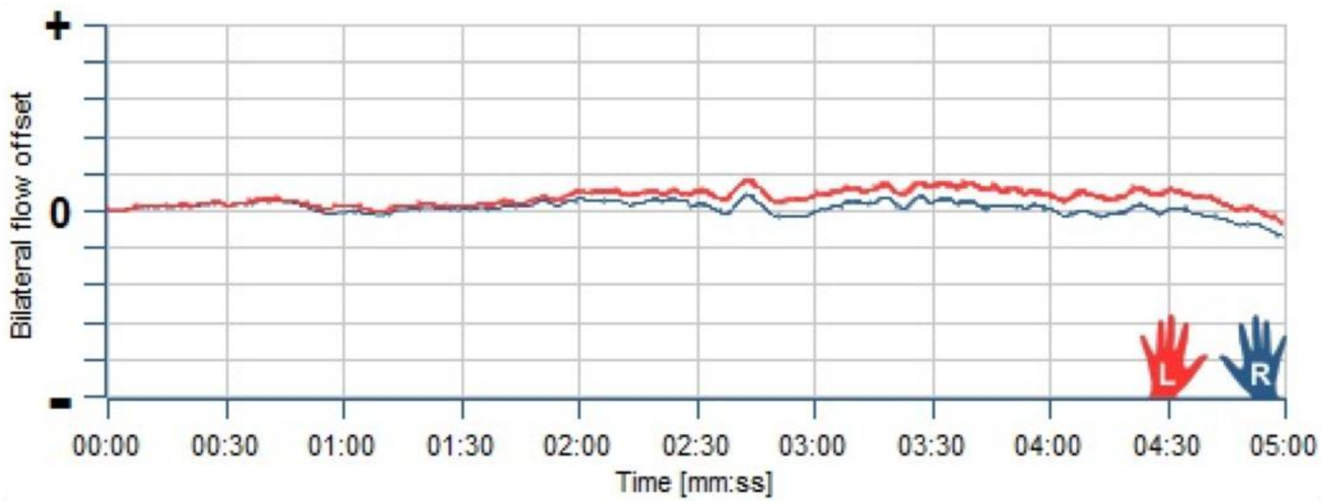
Heart rate



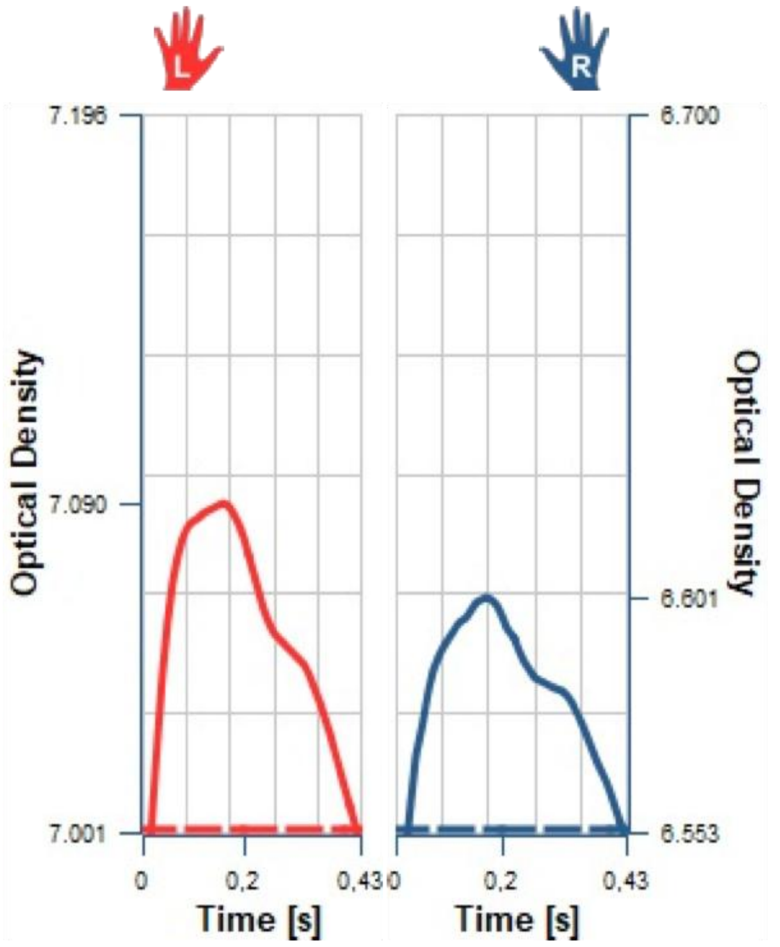
Scatter - Heart rate



Bilateral flow

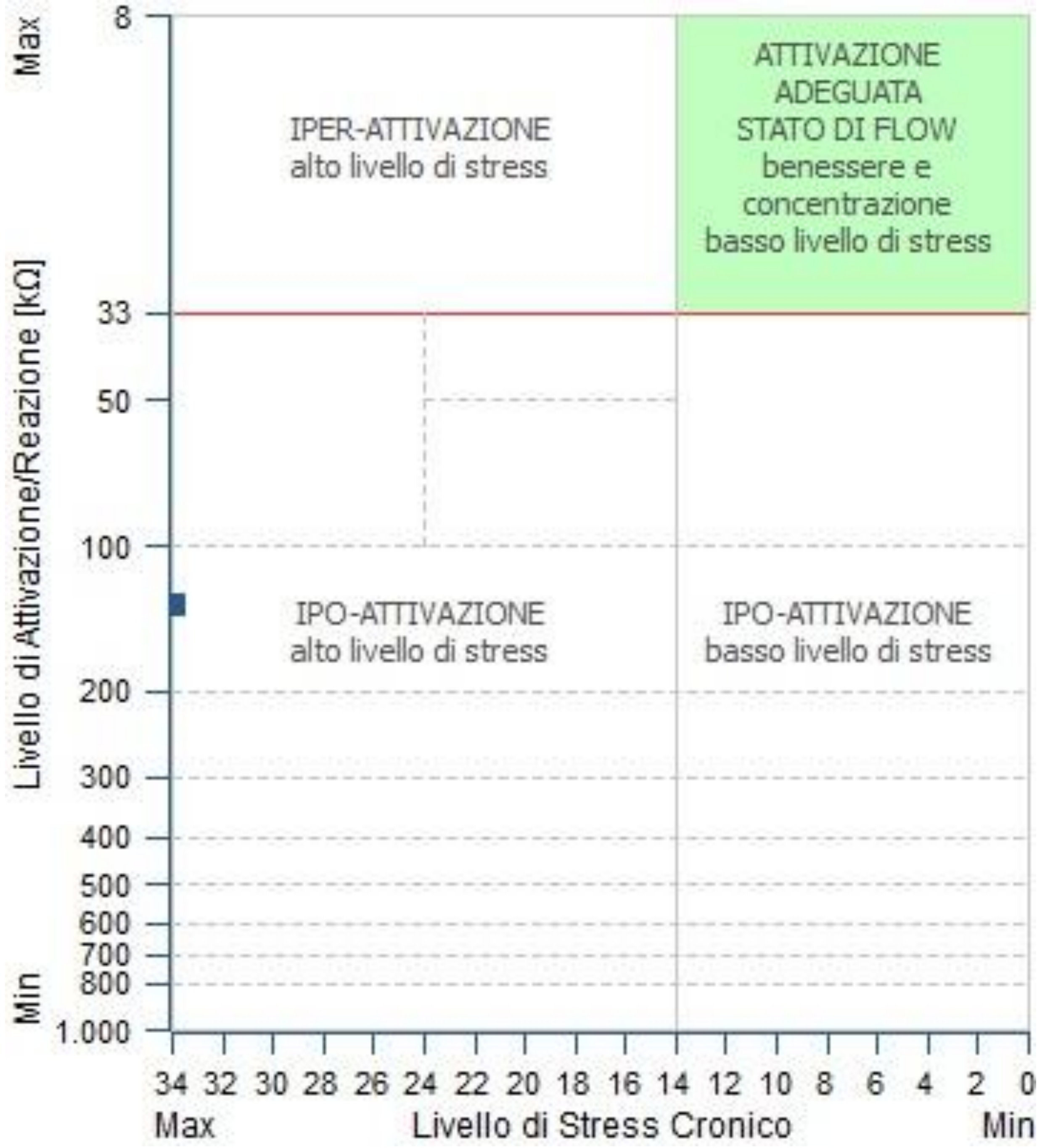


Mean Pulse Wave

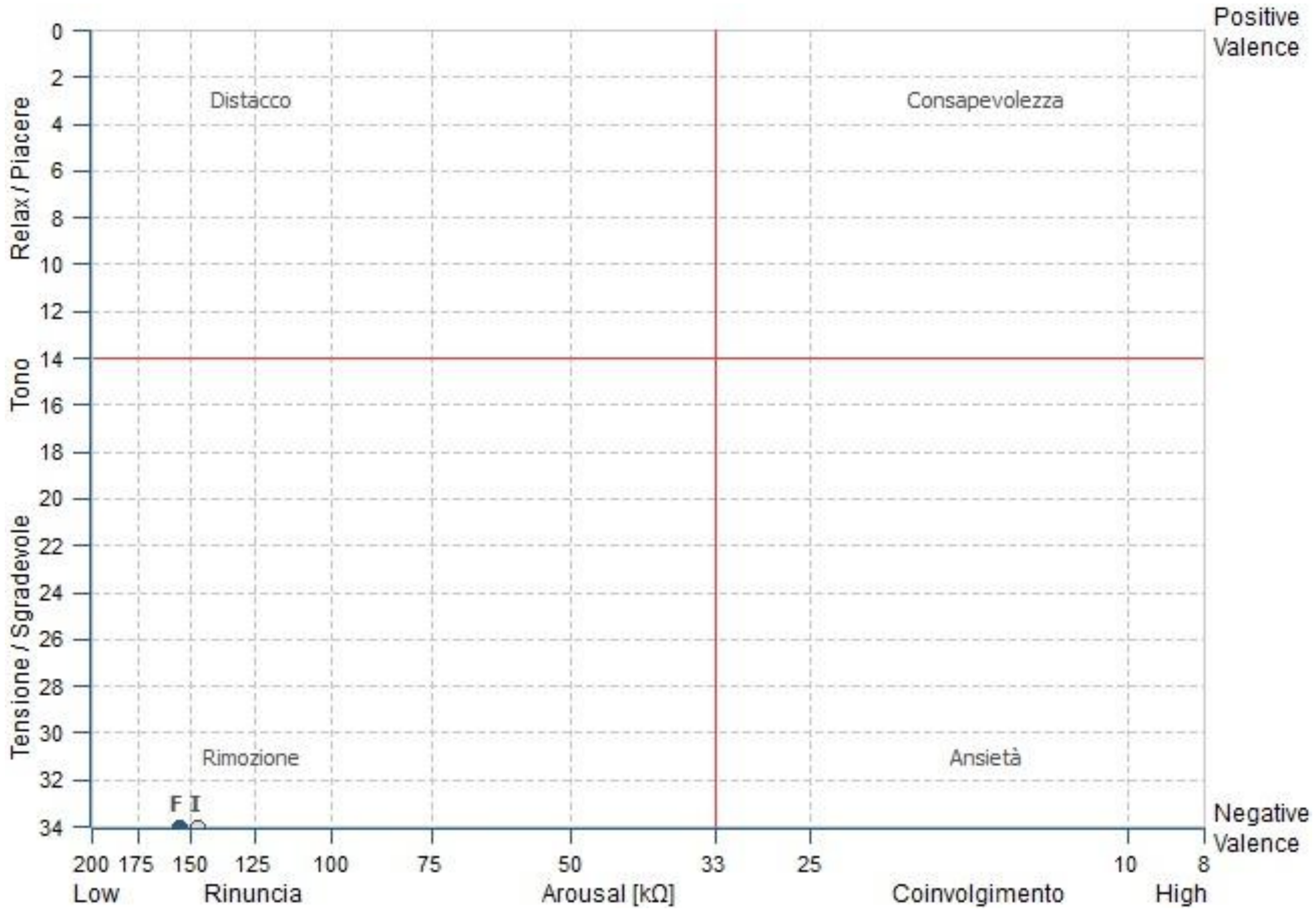


	RH	LH	
Bilat. Flow Gain (BFG):	193.0	108.3	min 300
Bilat. Flow Gain (BFG%):	64.1	35.9	norm [45-55]

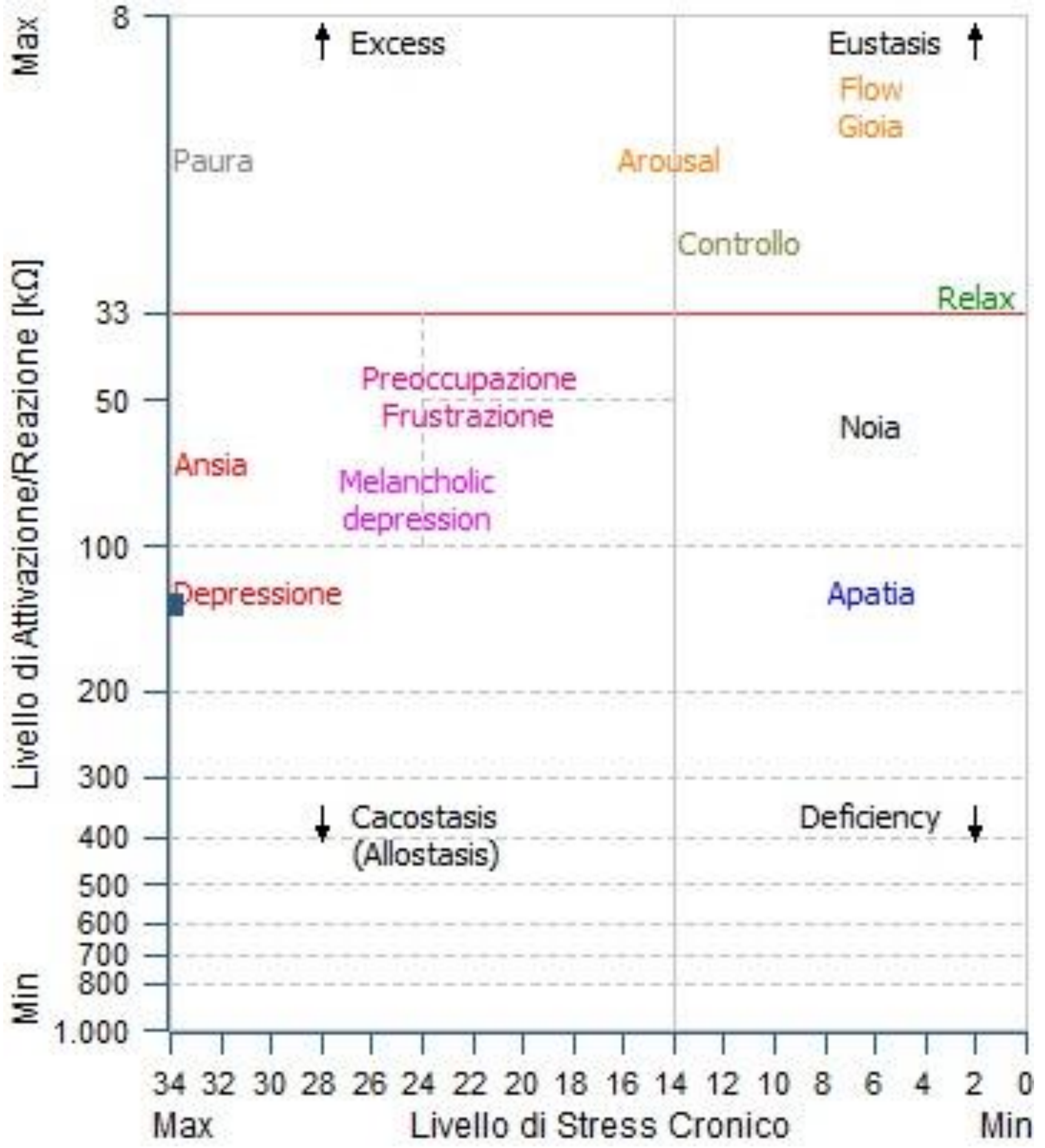
Average spO_2 100
$spO_2 \geq 95\%$
spO_2 [91% - 95% [
$spO_2 < 91\%$



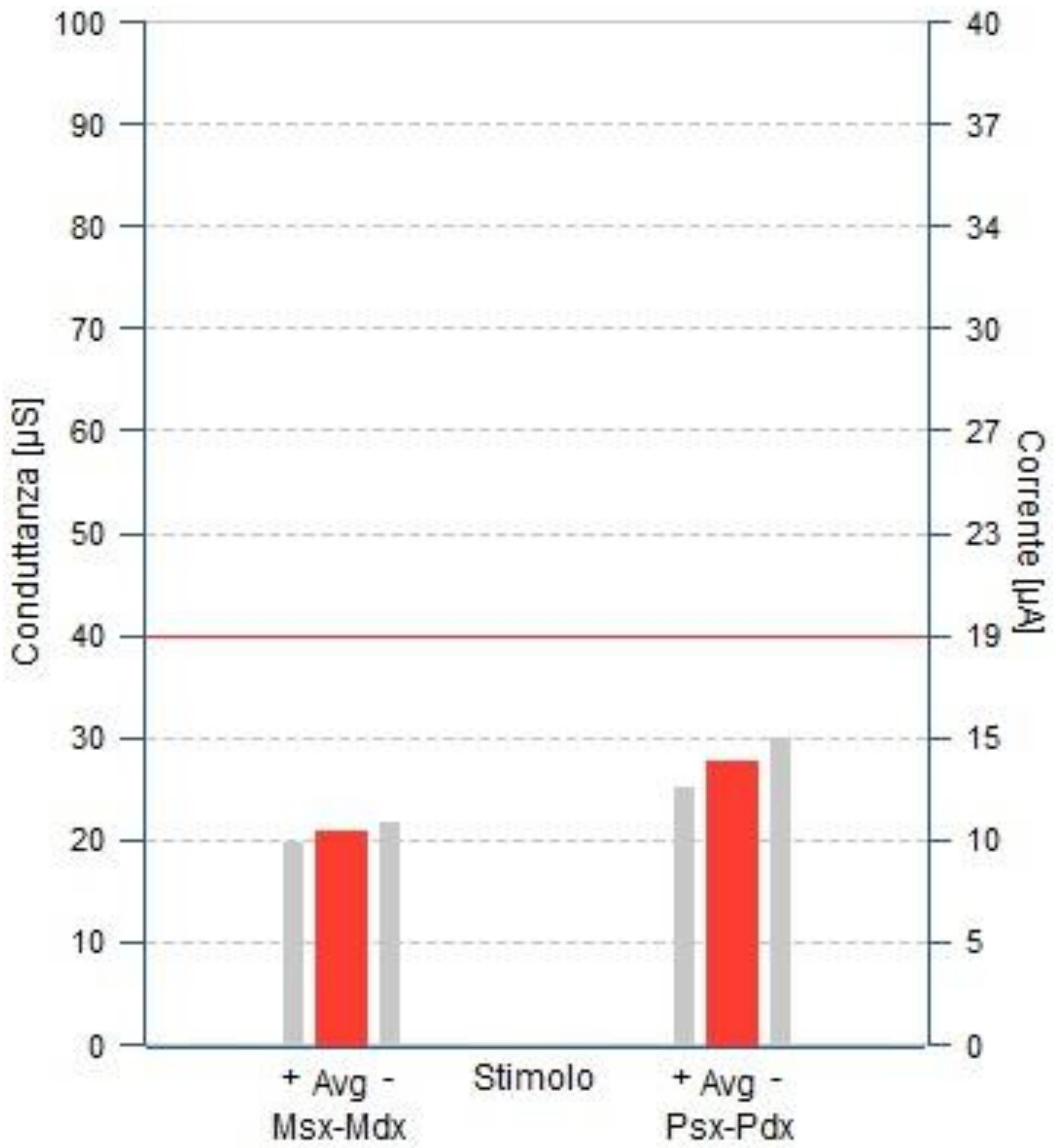
Max
Min
Livello di Attivazione/Reazione [kΩ]
IPER-ATTIVAZIONE
alto livello di stress
ATTIVAZIONE
ADEGUATA
STATO DI FLOW
benessere e
concentrazione
basso livello di stress
IPO-ATTIVAZIONE
alto livello di stress
IPO-ATTIVAZIONE
basso livello di stress
8 33 50 100 200 300 400 500 600 700 800 1.000
34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0
Max
Livello di Stress Cronico
Min



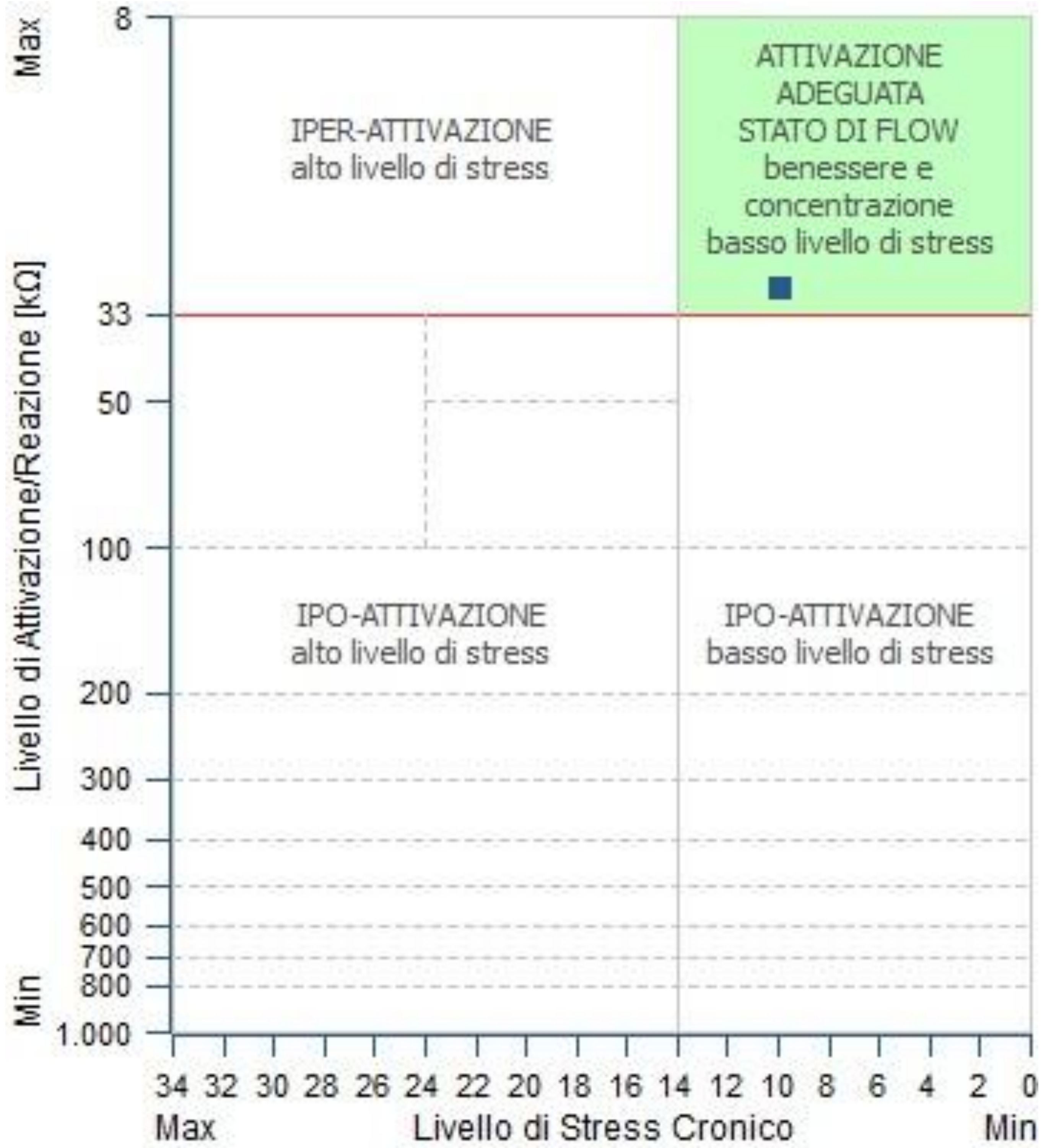
Positive
Valence
Negative
Valence
Relax / Piacere
Tono
Tensione / Sgradevole
Distacco
Consapevolezza
Rimozione
Ansietà
F I
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
200 175 150 125 100 75 50 33 25 10 8
Low
Rinuncia
Arousal [kΩ]
Coinvolgimento
High

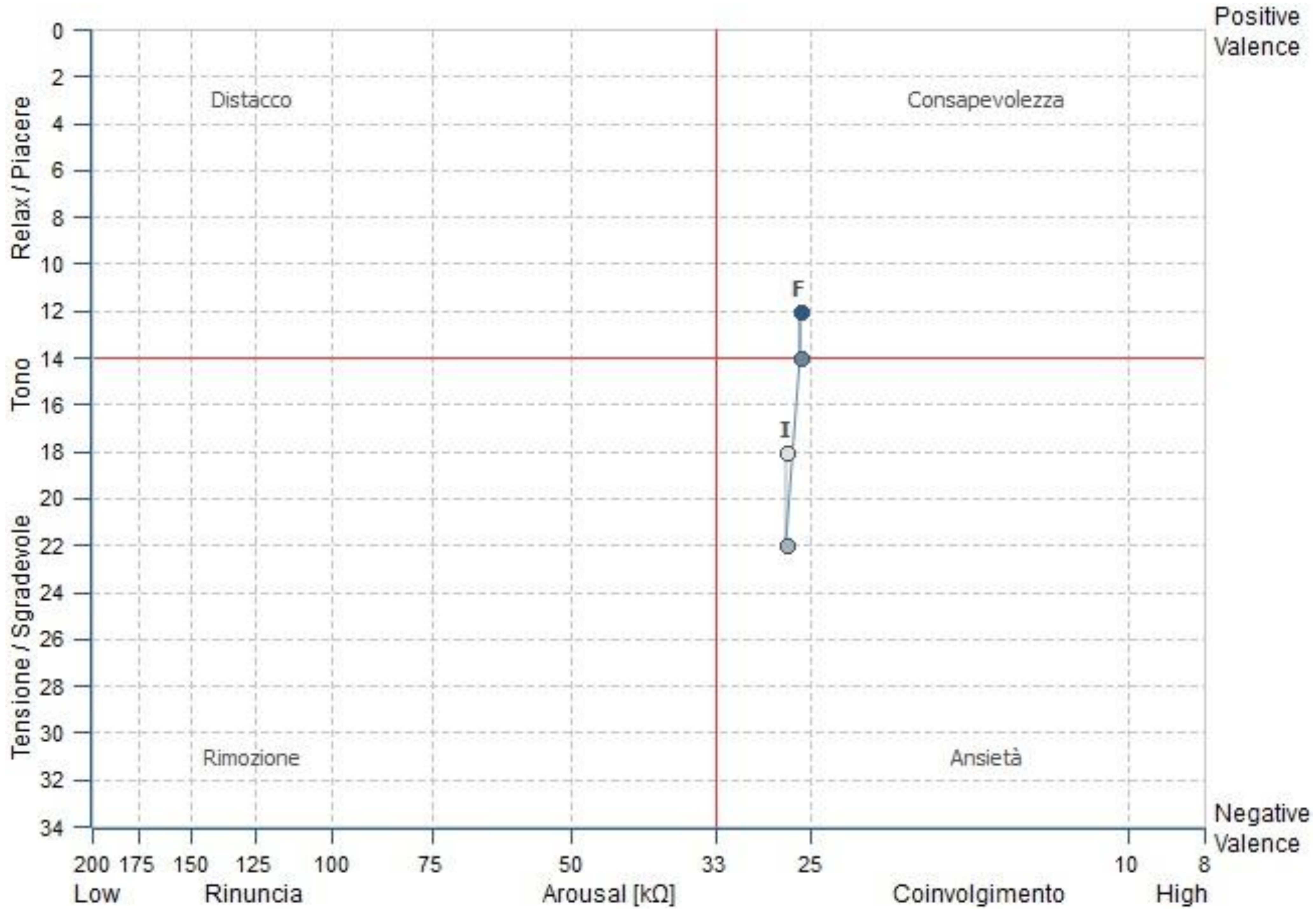


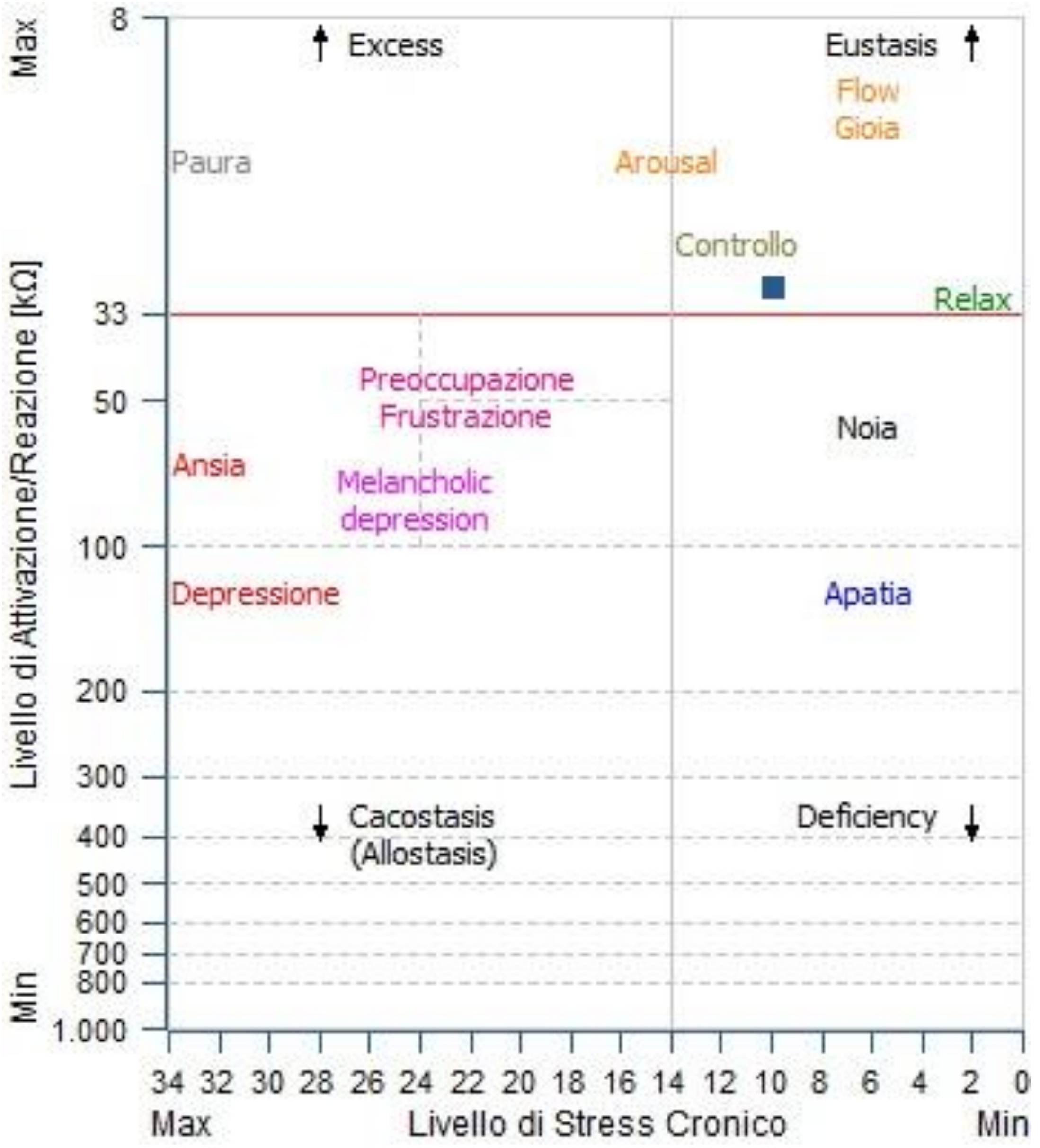
Max
Min
Livello di Attivazione/Reazione [kΩ]
Excess
Eustasis
Flow
Gioia
Paura
Arousal
Controllo
Relax
Preoccupazione
Frustrazione
Noia
Ansia
Melancholic
depression
Depressione
Apatia
Cacostasis
(Allostasis)
Deficiency
8 33 50 100 200 300 400 500 600 700 800 1.000
34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0
Max
Livello di Stress Cronico
Min

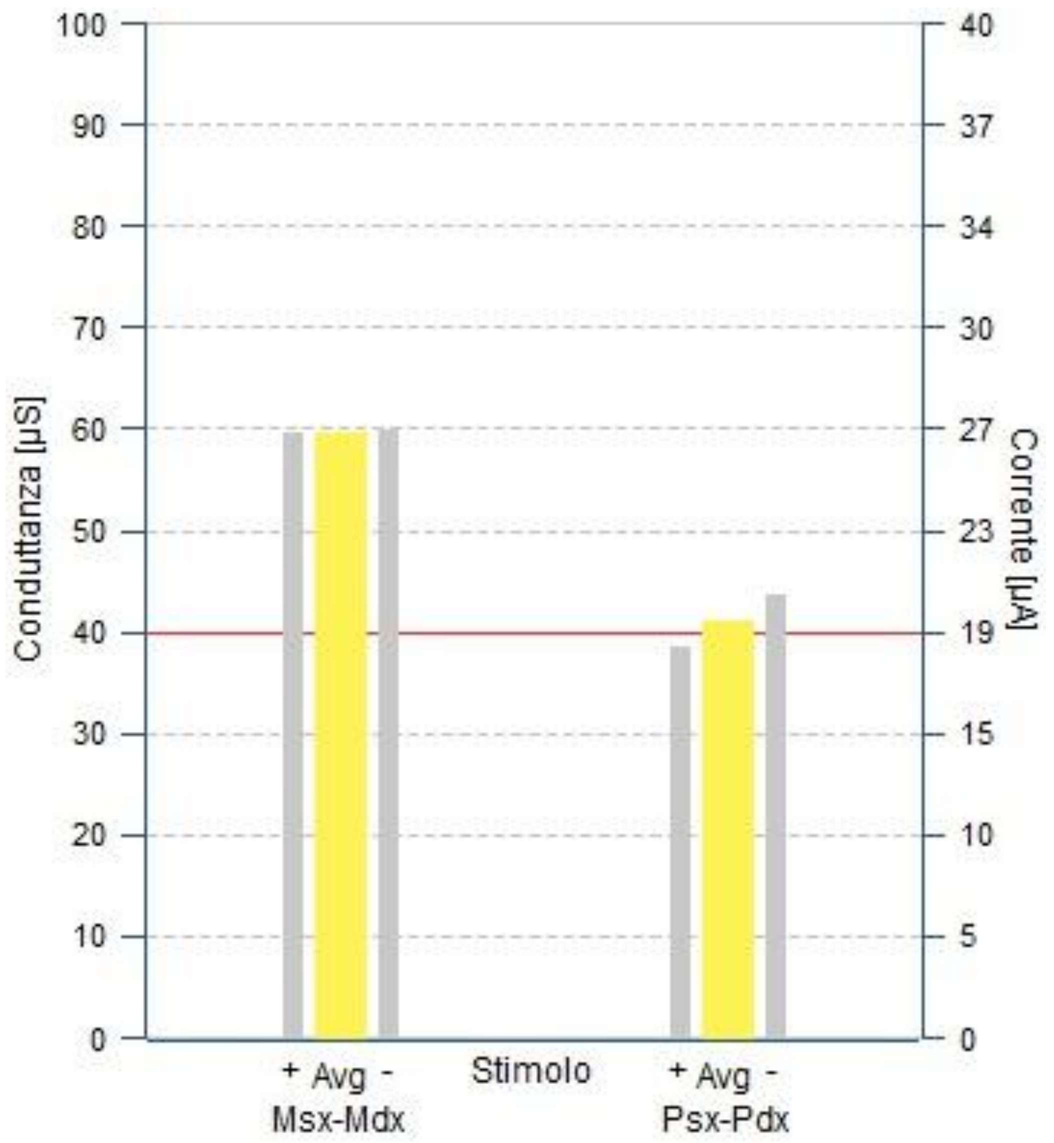


Conduttanza [µS]
Corrente [µA]
0 10 20 30 40 50 60 70 80 90 100
0 5 10 15 19 23 27 30 34 37 40
+ Avg -
Msx-Mdx
Stimolo
+ Avg -
Psx-Pdx


Max
Min
Livello di Attivazione/Reazione [kΩ]
IPER-ATTIVAZIONE
alto livello di stress
ATTIVAZIONE
ADEGUATA
STATO DI FLOW
benessere e
concentrazione
basso livello di stress
IPO-ATTIVAZIONE
alto livello di stress
IPO-ATTIVAZIONE
basso livello di stress
8
33
50
100
200
300
400
500
600
700
800
1.000
34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0
Max
Livello di Stress Cronico
Min


Positive
Valence
Negative
Valence
Relax / Piacere
Tono
Tensione / Sgradevole
Distacco
Consapevolezza
Rimozione
Ansietà
F
I
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
200 175 150 125 100 75 50 33 25 10 8
Low
Rinuncia
Arousal [kΩ]
Coinvolgimento
High


Max
Min
Livello di Attivazione/Reazione [kΩ]
Excess
Eustasis
Flow
Gioia
Paura
Arousal
Controllo
Relax
Preoccupazione
Frustrazione
Noia
Ansia
Melancholic
depression
Depressione
Apatia
Cacostasis
(Allostasis)
Deficiency
8
33
50
100
200
300
400
500
600
700
800
1.000
34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0
Max
Livello di Stress Cronico
Min


Conduttanza [µS]
Corrente [µA]
100
90
80
70
60
50
40
30
20
10
0
40
37
34
30
27
23
19
15
10
5
0
+ Avg -
Msx-Mdx
Stimolo
+ Avg -
Psx-Pdx

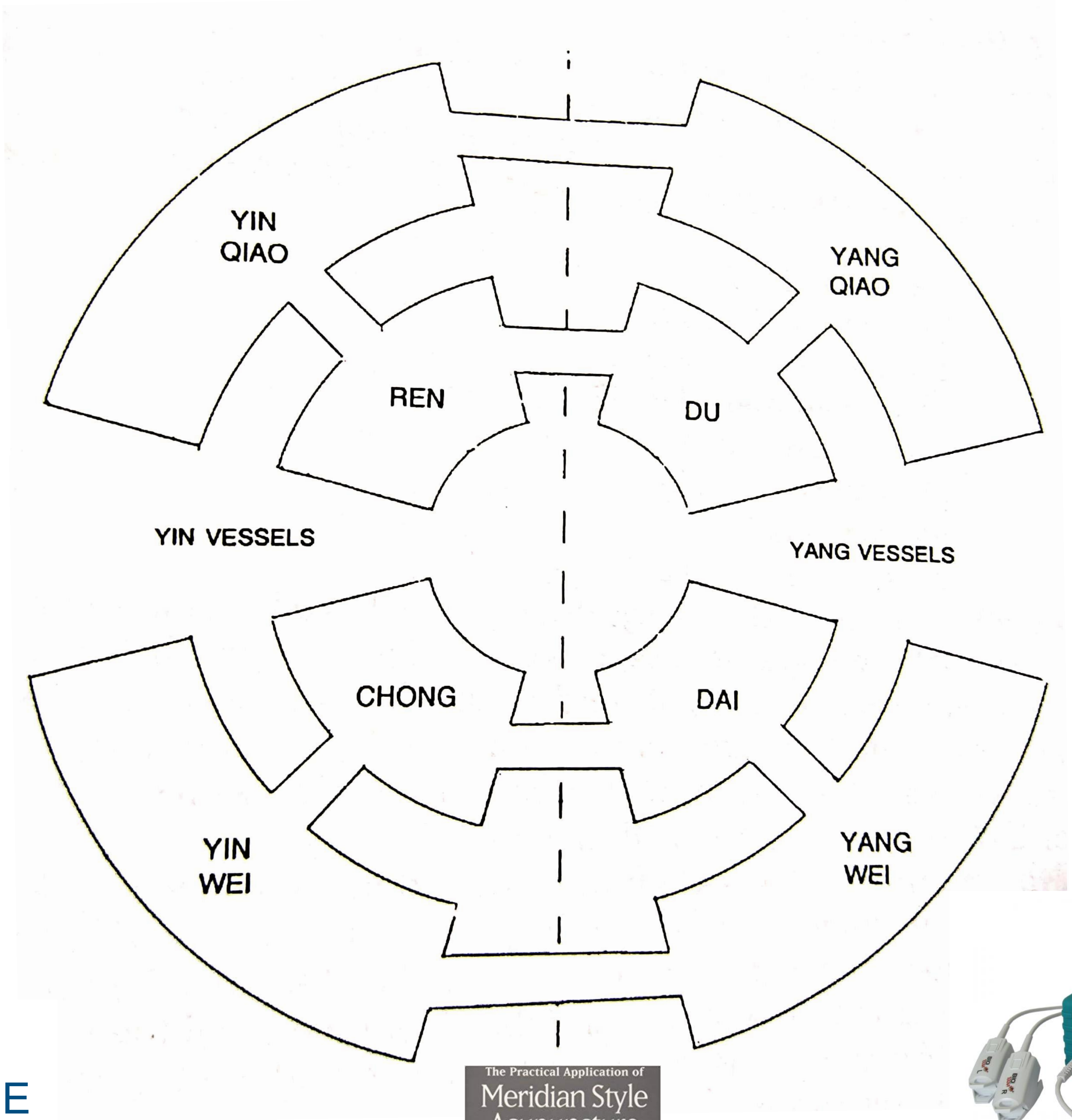
NEUROMODULAZIONE FASCIALE: DIAGNOSTICA CLINICA E STRUMENTALE

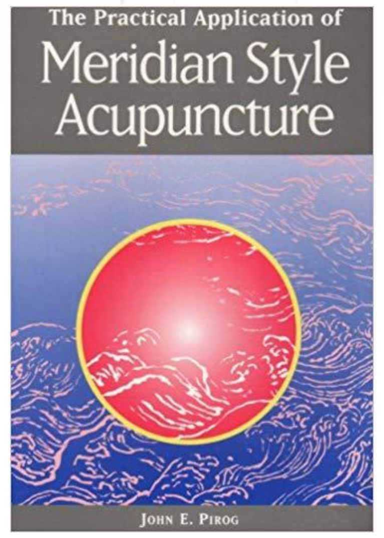
SAPIENZA UNIVERSITÀ DI ROMA

IFAN Istituto di Formazione in Agopuntura e Neuromodulazione

TEST DI AMPIEZZA DEL MOVIMENTO

ANALISI DELL’INFIAMMAZIONE E G.A.S.: TOMOGRAFIA ELETTROLITICA EXTRACELLULARE





TEST DI FORZA

PODOSCOPIA E STABILOMETRIA

TEST ANS PLETISMOGRAFIA HRV

BIA-ACC ASSE NEURO-ENDOCRINO ECM E COMPOSIZIONE CORPOREA