



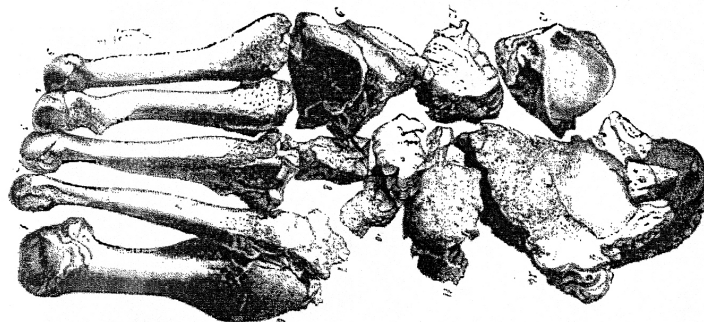
VIII CONGRESSO
NAZIONALE
PIEDE DIABETICO
INTERASSOCIATIVO SID-AMD

Focus sul piede nella
gestione del diabete

ROMA, 18-20 GIUGNO 2026

HOTEL NH VILLA CARPEGNA

CHARCOT ACUTO: COME RICONOSCERLO E TRATTARLO



Squelette d'un pied ataxique : 1, 2, 3, 4, 5, métatarsiens ; 6, 7, premier et deuxième cunéiformes soudés aux métatarsiens correspondants ; 8, fragment osseux paraissant être le troisième cunéiforme ; 9, cuboïde ; 10, 11, deux fragments du scaphoïde ; 12, 13, b. h. et corps de l'astragale ; 14, calcaneum.



Gruppo
MultiMedica
Passione, ricerca e innovazione per la salute

Enrico Brocco
U.O.C. Piede Diabetico
IRCCS
MULTIMEDICA
Sesto San Giovanni (MI)

Il dr. Enrico Brocco dichiara di aver ricevuto negli ultimi due anni compensi o finanziamenti dalle seguenti Aziende Farmaceutiche e/o Diagnostiche:

- Cybion
- B-Braun
- Emod

Dichiara altresì il proprio impegno ad astenersi, nell'ambito dell'evento, dal nominare, in qualsivoglia modo o forma, aziende farmaceutiche e/o denominazione commerciale e di non fare pubblicità di qualsiasi tipo relativamente a specifici prodotti di interesse sanitario (farmaci, strumenti, dispositivi medico-chirurgici, ecc.).

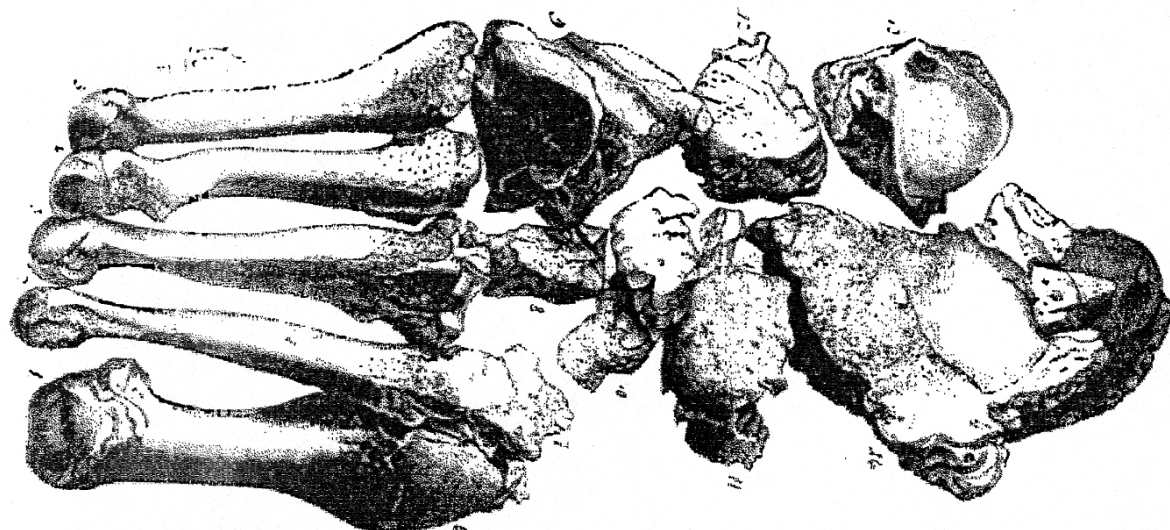


La Osteo-artropatia neuropatica di Charcot (CNO) del piede e della caviglia è un processo clinico ad evoluzione deformante e distruttiva delle articolazioni sottoposte a carico che può indurre marcata instabilità, lesioni ricorrenti e recidivanti, amputazioni minori e maggiori.

Già descritta come “artrite neuropatica” nel 1703 da Musgrave, ma definitivamente classificata da Charcot nel 1868, essa è stata associata con numerose patologie inducenti neuropatia (Lebbra, Siringomielia, esposizione a tossici, artrite reumatoide, sclerosi multipla). Tuttavia le due cause più frequentemente riconosciute alla base della CNO negli ultimi 50-60 anni sono state il diabete mellito e l'esotossicosi alcolica.

Armstrong et al 2002; Frykberg 2006; Sanders and Frykberg 2007





Squelette d'un pied ataxique : 1, 2, 3, 4, 5, métatarsiens ; 6, 7, premier et deuxième cunéiformes soudés aux métatarsiens correspondants ; 8, fragment osseux paraissant être le troisième cunéiforme ; 9, cuboïde ; 10, 11, deux fragments du scaphoïde ; 12, 13, b. b. et corps de l'astragale ; 14, calcaneum.



Charcot J-M, Fere C. Affections osseuses et articulaires du pied chez les tabétiques (Pied tabétique). Archives de Neurologie 1883;6:305–319 [in French]

EPIDEMIOLOGIA

La stima di prevalenza della CNO è molto ampia, variando dallo 0,08 % al 13 % a seconda che venga considerata una popolazione diabetica generale o una popolazione afferente a Centri qualificati per la diagnosi.

Leggera prevalenza nel DMT1 rispetto al DMT2

Molto spesso da occhi non esperti la CNO può essere confusa con osteomielite, infezione acuta dei tessuti molli, gotta, artrite, frattura, neoplasia o trombosi venosa.

Frykberg et al, 2008; Petrova et al, 2004



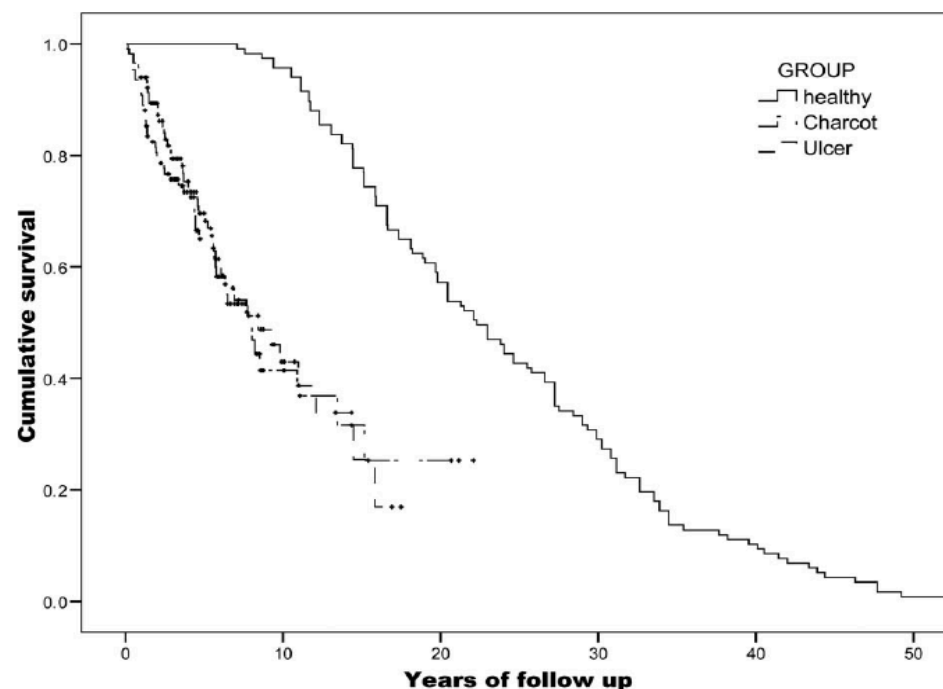
Mortality Associated With Acute Charcot Foot and Neuropathic Foot Ulceration

JULIETTE VAN BAAL, MSC^{1,2}
RICHARD HUBBARD, MD³

FRAN GAME, FRCP¹
WILLIAM JEFFCOATE, MRCP¹

Diabetes Care 33:1086–1089, 2010

Charcot foot and neuropathic foot ulceration



Kaplan-Meier survival curve cohort 1980–2007 versus an age- and sex-matched British population.



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PATOGENESI

Requisito fondamentale per lo sviluppo di CNO è la presenza di neuropatia periferica, posto che la CNO non insorge in soggetti esenti da neuropatia.

NEUROPATIA SENSITIVO-MOTORIA

Ridotta sensibilità induce non percezione di microtraumatismi

Effetto trigger per la risposta infiammatoria locale

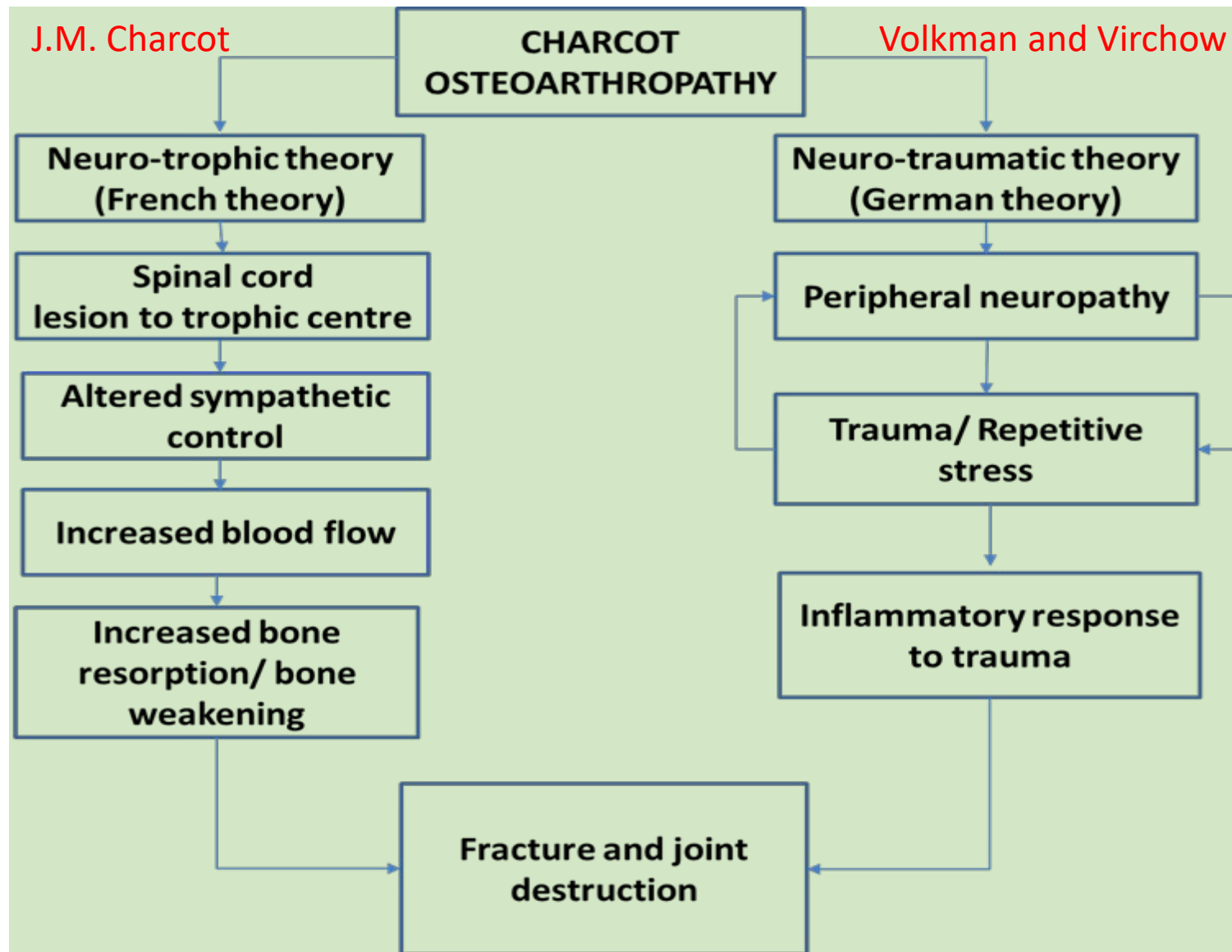
Aumentati livelli di citochine

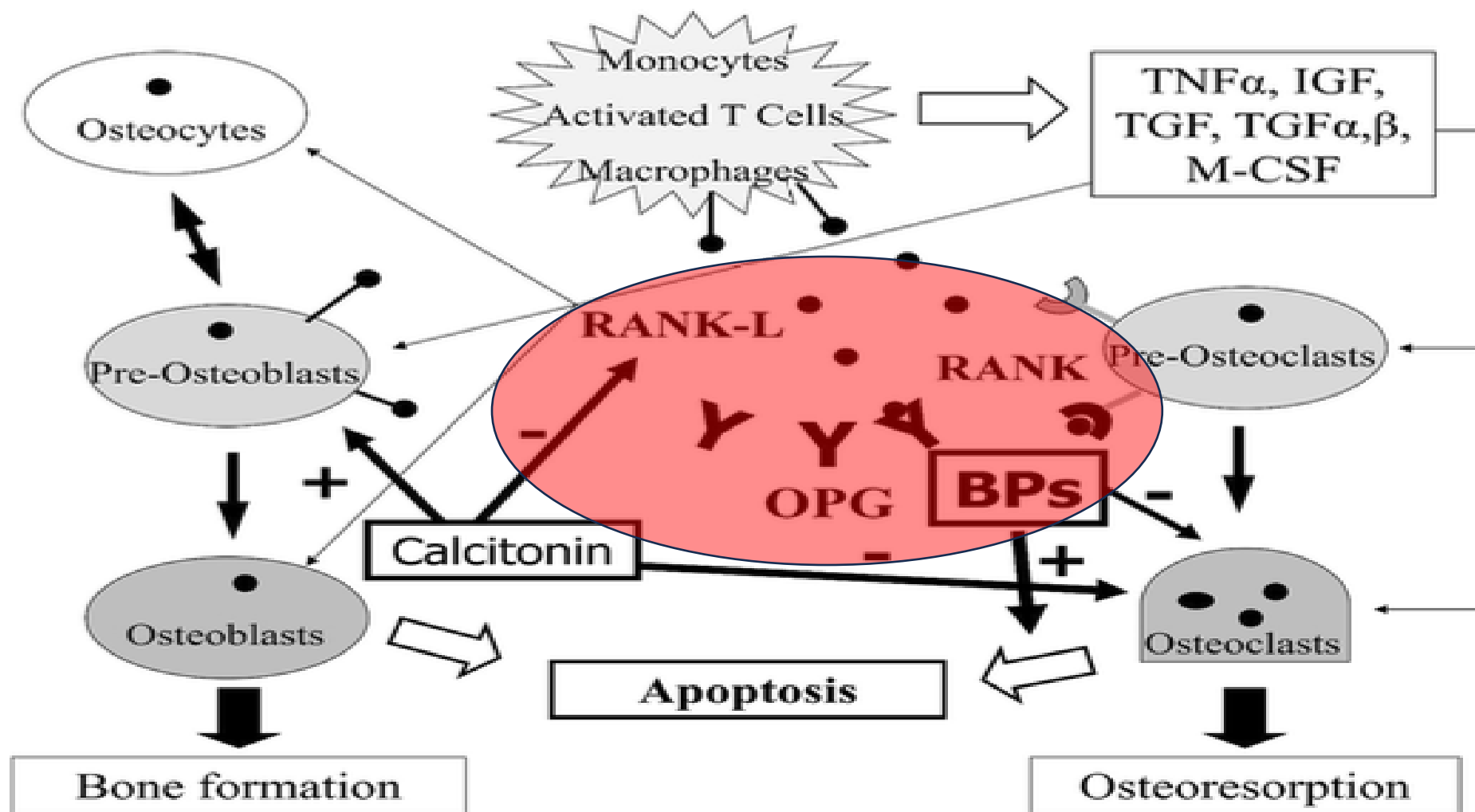
NEUROPATIA AUTONOMICA

Aumento dei flussi ematici periferici attraverso l'apertura degli shunts artero-venosi

Aumentato turnover osseo e osteopenia







PATOGENESI

Alterazione critica della normale risposta riparativa a «traumatismi» nel contesto di un pre-esistente danno neurologico.

Jeffcoate W, Game F. Diabetes Care. 2022;45(7):1691–7.



CLASSIFICAZIONE

Modified Eichenholtz stages^a

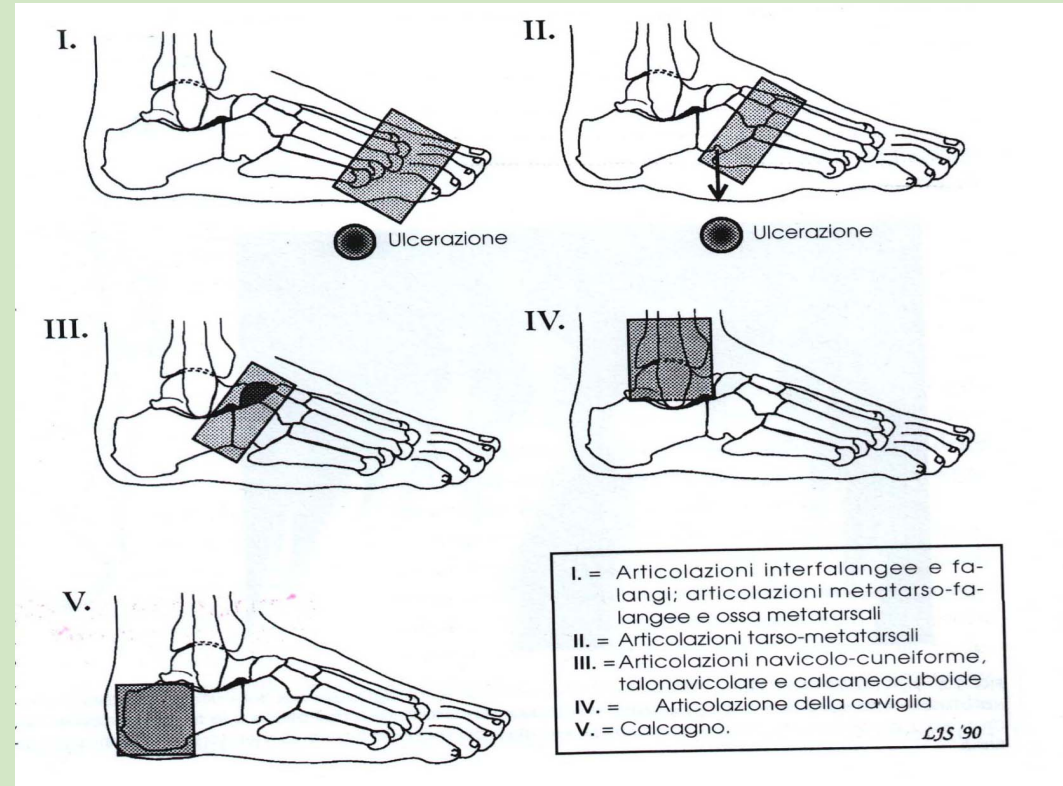
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3	Remodeling	Marked decrease or absence of warmth, swelling, and redness; physically enlarged fixed (“healing”) deformity; radiographic appearance of remodeled and new bone formation, decreased sclerosis, and/or possible gross residual deformity

Eichenholz SN. Charcot joints, 1966

Shibata T et al. JBJS 1990; 72, 749-56



CLASSIFICAZIONE



Sanders L, Frykberg R.

DIAGNOSI

DIAGNOSI

SOSPETTARLO!!!

Di fronte ad un soggetto diabetico, con neuropatia ed edema monolaterale, prima che ad una distorsione, ad una trombosi venosa profonda o alla gotta

**PENSA CHE POSSA ESSERE UNO
CHARCOT**



DIAGNOSI

ESAME OBIETTIVO

Confrontando i due arti osserva

Edema

Eritema

Gradiente termico (se $> 2^{\circ}\text{C}$, clinicamente
rilevante)

Deformità







DIAGNOSI

RADIOGRAFIA STANDARD

- Deformità e Crolli articolari
 - Osteolisi
- Fratture/frammenti



DIAGNOSI RMN



DIAGNOSI RMN

- **Alterazioni precoci come lesioni sottocondrali**
 - **Edema osseo midollare**

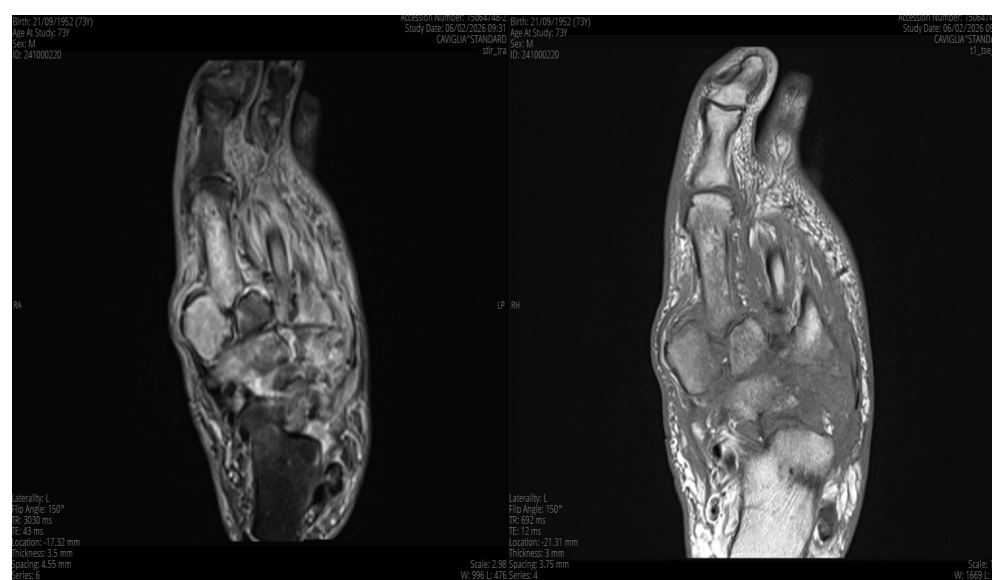
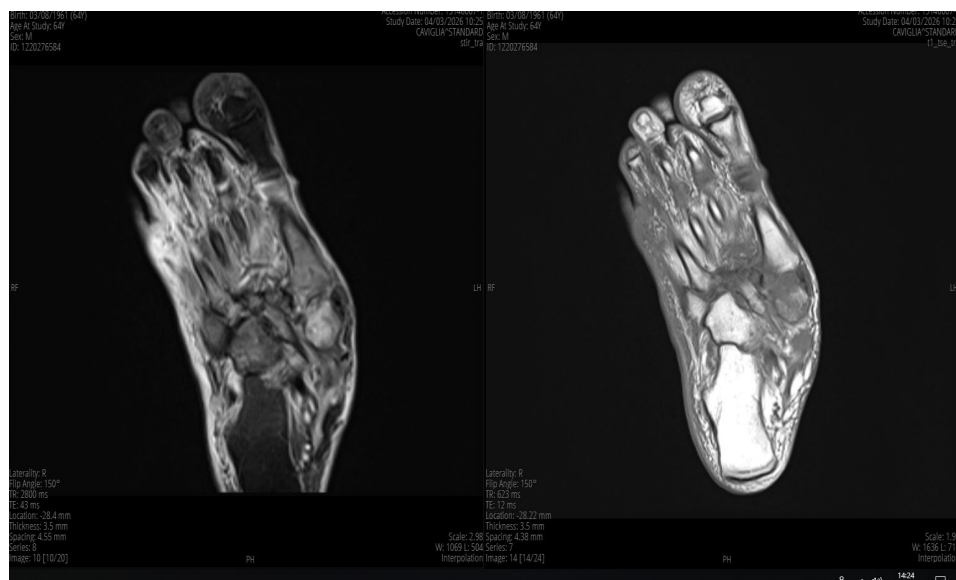
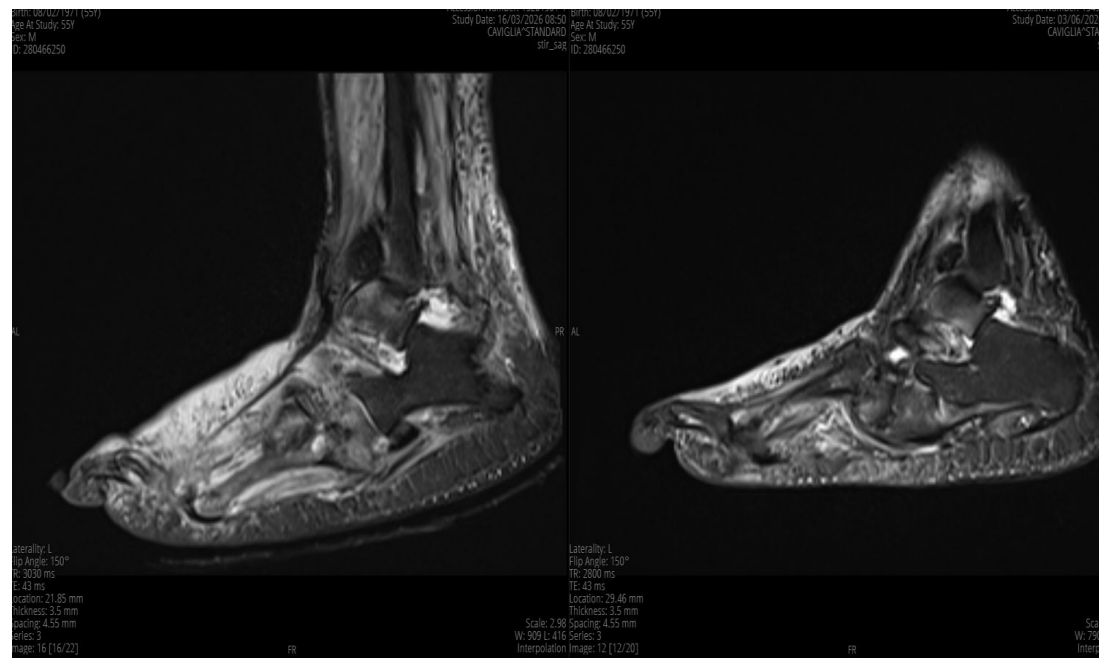
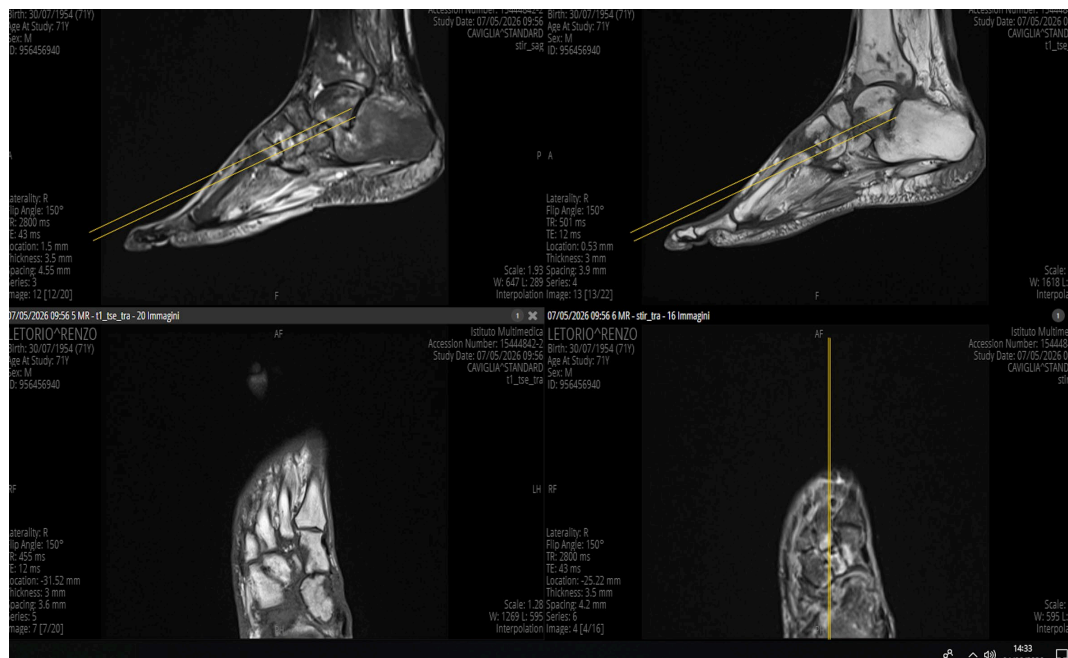


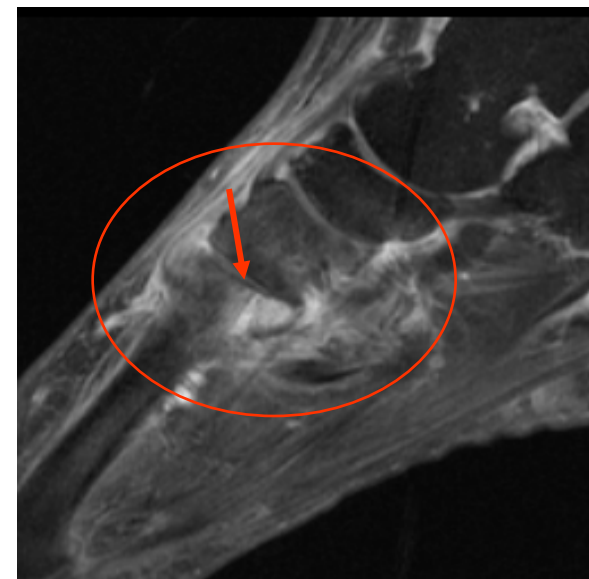
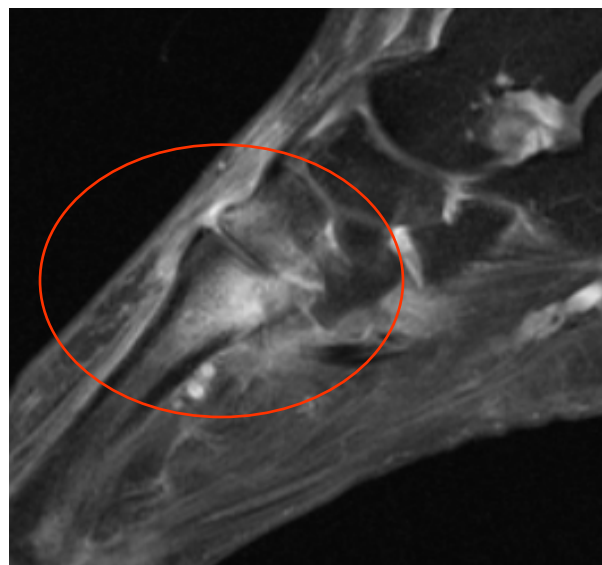
DIAGNOSI RMN

- **Alterazioni precoci come lesioni sottocondrali**
 - **Edema osseo midollare**

**Richiede conoscenza della patologia da parte del Radiologo
e occhio esperto**



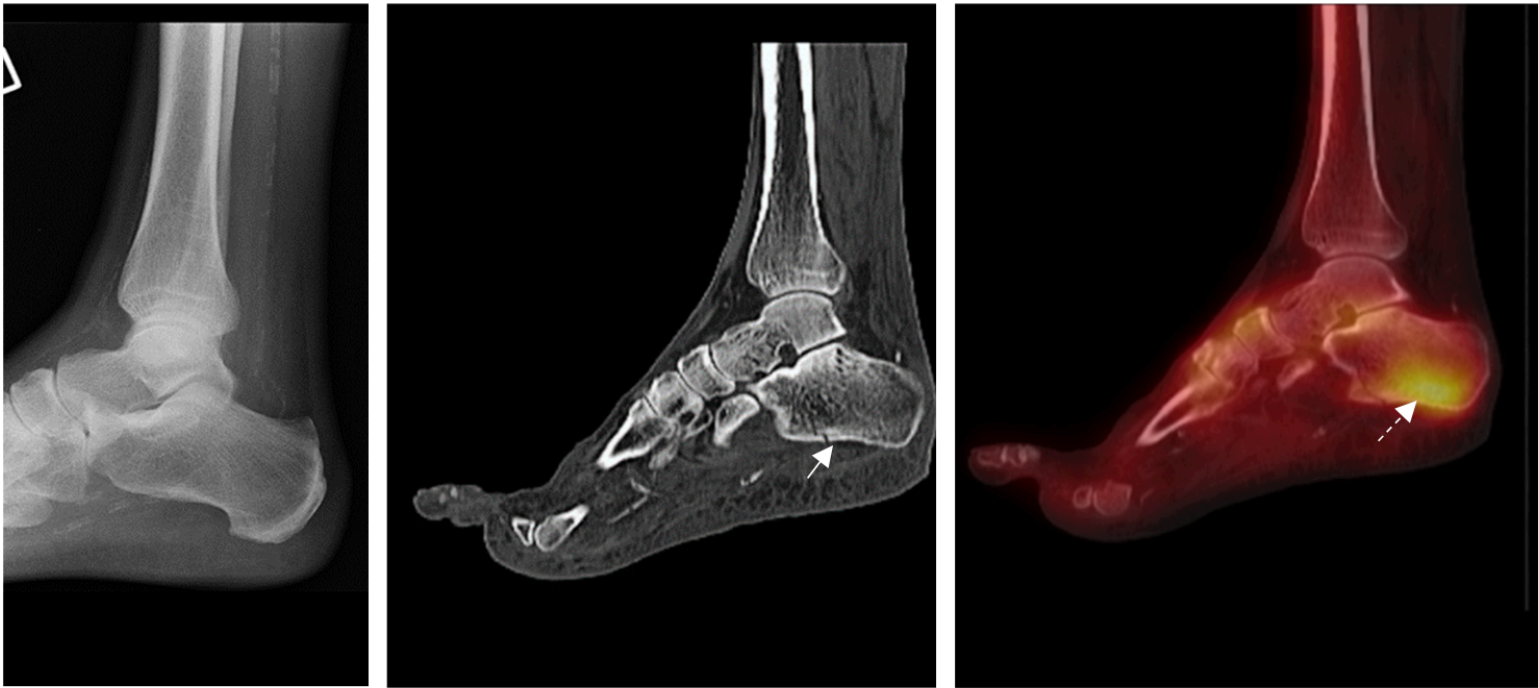
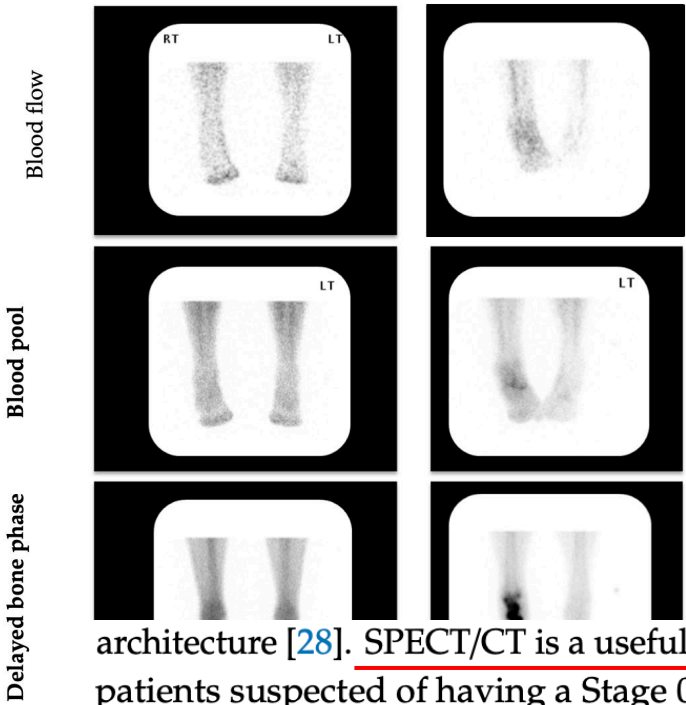




The Role of Bone Scintigraphy with SPECT/CT in the Characterization and Early Diagnosis of Stage 0 Charcot Neuroarthropathy

Raju Ahluwalia ^{1,2,*}, Ahmad Bilal ¹, Nina Petrova ^{2,3}, Krishna Boddhu ¹, Chris Manu ², Prashanth Vas ^{2,3}, Maureen Bates ², Ben Corcoran ⁴, Ines Reichert ^{1,2}, Nicola Mulholland ⁴, Venu Kavarthapu ^{1,2}, Gill Vivian ^{4,†} and Michael Edmonds ^{2,3,†}

J. Clin. Med. 2020, 9, 4123; doi:10.3390/jcm9124123



architecture [28]. SPECT/CT is a useful functional and structural imaging modality in the evaluation of patients suspected of having a Stage 0 Charcot foot. It has identified increased blood flow and bony changes that may be the initial events in Charcot pathophysiology and also aids the early diagnosis of CN in patients presenting with a hot swollen foot. SPECT/CT demonstrates that, even in Stage 0 Charcot foot, there is distinct bone pathology, predominantly fracture, which demands appropriate urgent treatment. If SPECT/CT is not easily available, then CT alone could be carried out as it may identify 59% of the bony lesions.

(c) of a patient presenting with a unilateral hot foot Neuroarthropathy (CN). (a) Lateral foot/CT image showing vascular calcification; (b) CT shows a fracture line in the calcaneum; (c) increased uptake within the calcaneum (correlation between Single Photon Emission Computed Tomography (SPECT) and CT fusion imaging).

Diagnosis and treatment of active charcot neuro-
osteoarthropathy in persons with diabetes mellitus:
A systematic review

Katherine M. Raspovic¹ | Nicolaas C. Schaper² | Catherine Gooday³ |
Arun Bal⁴ | Robert Bem⁵ | Avneesh Chhabra⁶ | Mary Hastings⁷ |
Crystal Holmes⁸ | Nina L. Petrova⁹ | Maria Gala Santini Araujo¹⁰ |
Eric Senneville¹¹ | Dane K. Wukich¹

Diabetes Metab Res Rev. 2023;e3653.

DIAGNOSTICA DI
LABORATORIO

	DM + CN	DM - CN	CONTROLLI NO DM
PCR	↑	p=0,045	p=0,005
Fosfatasi Alcalina	==	==	p=0,006

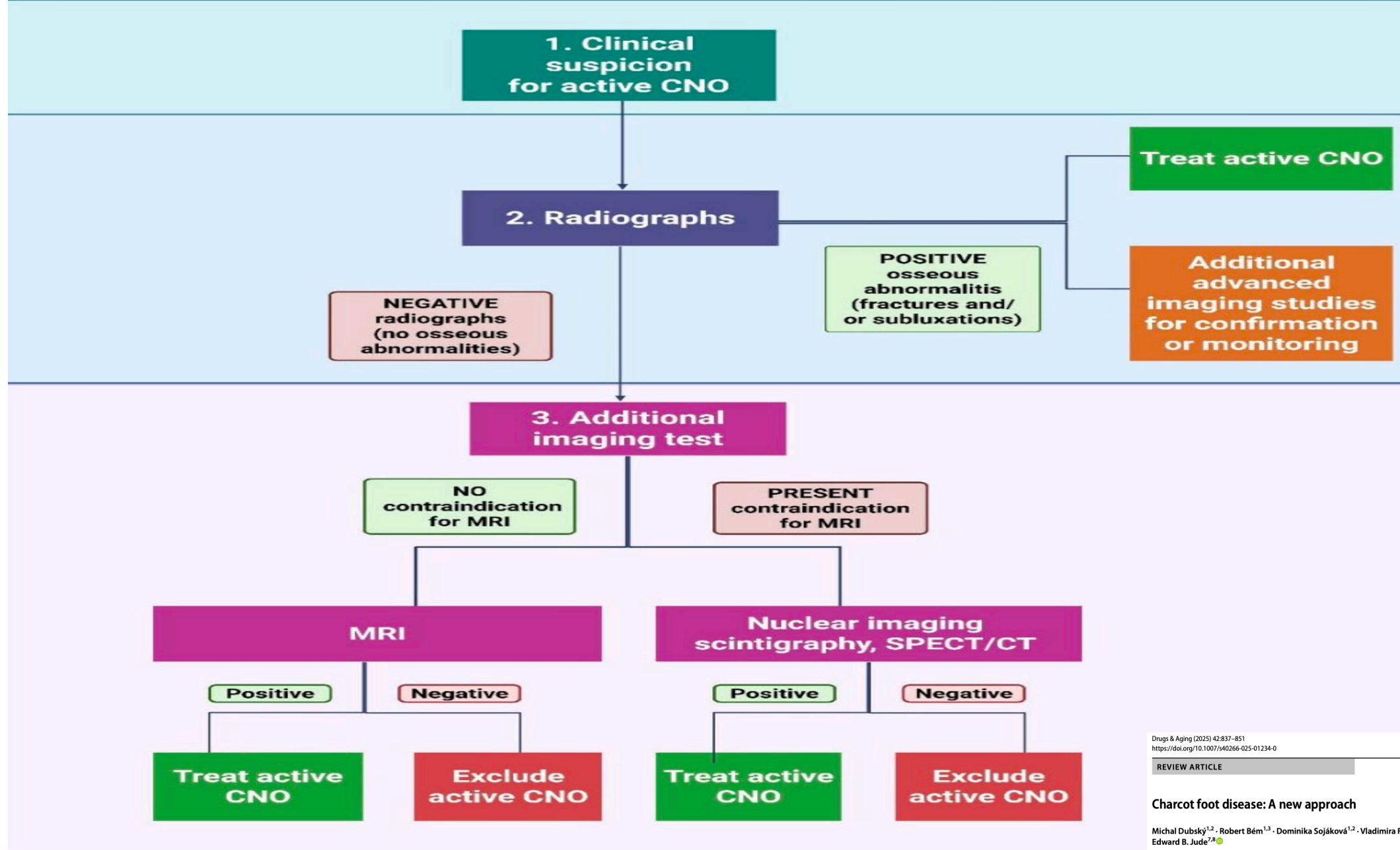
Petrova, 2005

	DM + CN	DM + NEUROPATIA	CONTROLLI NO DM
PCR	↑	p=0,044	p=0,012
VES	↑	p=0,001	p=0,001

Folestad, 2015

Non è stata identificata una evidenza riguardo all’accuratezza diagnostica di PCR, VES e fosfatasi alcalina osso-specifica quando sono state confrontate con diagnostiche di imaging in soggetti con piede di Charcot acuto.

I dati disponibili suggeriscono che tali test di laboratorio hanno scarso valore aggiuntivo nel diagnosticare o escludere il piede di Charcot acuto.



Drugs & Aging (2025) 42:837–851
<https://doi.org/10.1007/s40266-025-01234-0>

REVIEW ARTICLE

Charcot foot disease: A new approach

Michal Dubský^{1,2} · Robert Bém^{1,3} · Dominika Sojákova^{1,2} · Vladimíra Fejfarová^{1,3} · Michael Hughes^{4,5,6} · Edward B. Jude^{7,8}



TERAPIA

TERAPIA

- Terapia medica
- Terapia conservativa di stabilizzazione
- Terapia chirurgica



TERAPIA MEDICA

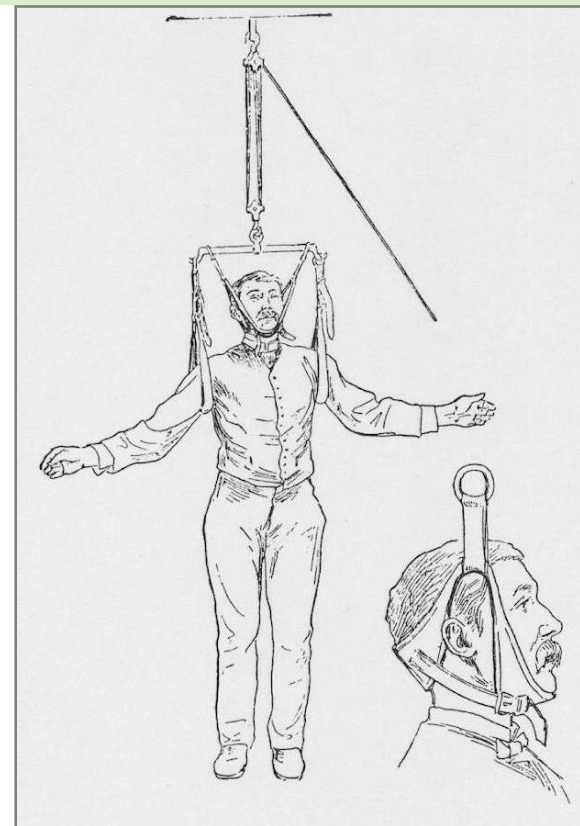
Table 3 Drugs trialled to treat Charcot foot

Drug/class	Study/year	N (patients)	Study design	Key findings	Limitations
Pamidronate (Bisphosphonates)	Jude et al., 2001	39	Double-blind RCT	Reduction in bone turnover markers and symptoms; no change in skin temperature	No effect on time to remission; surrogate outcomes only
Alendronate (Bisphosphonates)	Pitocco et al., 2005	20	RCT	Reduced BTMs, improved foot mineralisation, no significant clinical benefit	Small sample size; no functional outcomes; unblinded
Zoledronate (Bisphosphonates)	Pakarinen et al., 2011	35	Double-blind RCT	Zoledronate prolonged immobilisation time; no improvement in remission	Remission criteria varied; relapse rates not reduced
Zoledronate (Bisphosphonates)	Das et al., 2021	36	RCT, 3-arm study	Increased BMC; no difference in remission time versus placebo	Underpowered for long-term outcomes; limited clinical relevance
Calcitonin (intranasal) (Calcium metabolism modifier)	Bem et al., 2006	32	RCT	Reduced BTMs (ICTP, BALP); no effect on temperature or remission	Short follow-up; no placebo; renal impairment in cohort
Denosumab (RANK ligand inhibitor)	Busch-Westbroek et al., 2018	22	Controlled trial with retrospective controls	Shorter remission and fracture healing time versus historical controls	Non-randomised control; unclear CNO diagnostic criteria
Denosumab (RANK ligand inhibitor)	Lasschuit et al., 2024	24	Phase II RCT, open-label	Preserved calcaneal bone quality (Stiffness Index); 92% versus 67% temperature resolution (NS)	Small sample; open-label; temperature resolution not statistically significant
Methylprednisolone (Synthetic glucocorticoid)	Das et al., 2021	11	RCT arm (3-arm study)	Prolonged immobilisation; decreased BMD	Negative impact; not suitable for routine use
Recombinant parathormone (Calcium metabolism modifier)	Petrova et al., 2021	48	Double-blind RCT	Did not reduce time to resolution or enhance fracture healing of CN	Annual recruitment was slower than anticipated. During the second year of the trial, there was unprecedented global shortage of the investigational medicinal product.

TERAPIA CONSERVATIVA DI STABILIZZAZIONE



Trattamento dello Charcot in fase acuta



Off-Loading





Trattamento fase acuta

PRINCIPI

Attendere la riduzione dell'edema acuto

TOTAL CONTACT CAST (NWB-PWB-FWB)

- Ridurre il gonfiore e l'edema
- Ricreare stabilità ossea
- Proteggere le parti molli dall'ulcerazione
(6 settimane-12 mesi in rapporto alla sede e l'evoluzione)



deSouza, L JBJS, 2008



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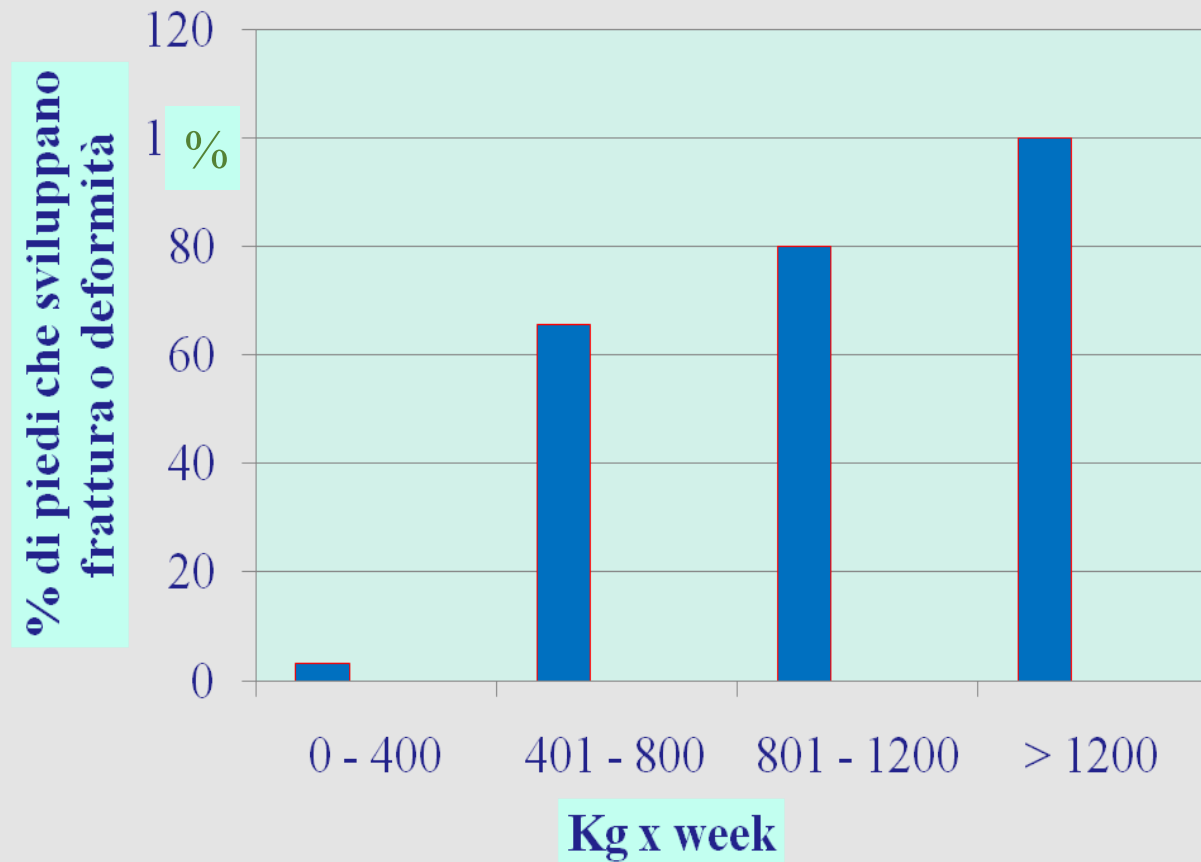
Sanders, Frykberg 1991, 2007

11. Laughlin RT, Calhoun JH, Mader JT. The diabetic foot. *J Am Acad Orthop Surg.* 1995;3:218-25.
 12. Clohisy DR, Thompson RC Jr. Fractures associated with neuropathic arthropathy in adults who have juvenile-onset diabetes. *J Bone Joint Surg Am.* 1988;70:1192-200.
 13. Conti SF. Total contact casting. *Instr Course Lect.* 1999;48:305-15.
 14. Myerson MS, Alvarez RG, Brodsky JW, Johnson JE. Symposium: neuroarthropathy of the foot. *Contemp Orthop.* 1993;26:43-64.
 15. Myerson MS. Evaluation of diabetic neuroarthropathy guides treatment. *Biomechanics.* 1999;6:37-46.
 16. Alpert SW, Koval KJ, Zuckerman JD. Neuropathic arthropathy: review of current knowledge. *J Am Acad Orthop Surg.* 1996;4:100-8.
 17. Schon LC, Easley ME, Weinfeld SB. Charcot neuropathy of the foot and ankle. *Clin Orthop Relat Res.* 1998;349:116-31.
 18. Pinzur MS, Sage R, Stuck R, Kaminsky S, Zmuda A. A treatment algorithm for neuropathic (Charcot) midfoot deformity. *Foot Ankle.* 1993;14:189-97.
 19. Fabrin J, Larsen K, Holstein PE. Long-term follow-up in diabetic Charcot feet with spontaneous onset. *Diabetes Care.* 2000;23:796-800.
 20. Miller SD. Careful patient management dictates Charcot outcomes. *Biomechanics.* 2002;9:47-52.
 21. Slovenkai MP. Diagnosis and management of Charcot foot. *Biomechanics.* 1997;4:53-7.
- Leo J. de Souza *J Bone Joint Surg Am.* 2008;90:754-759.

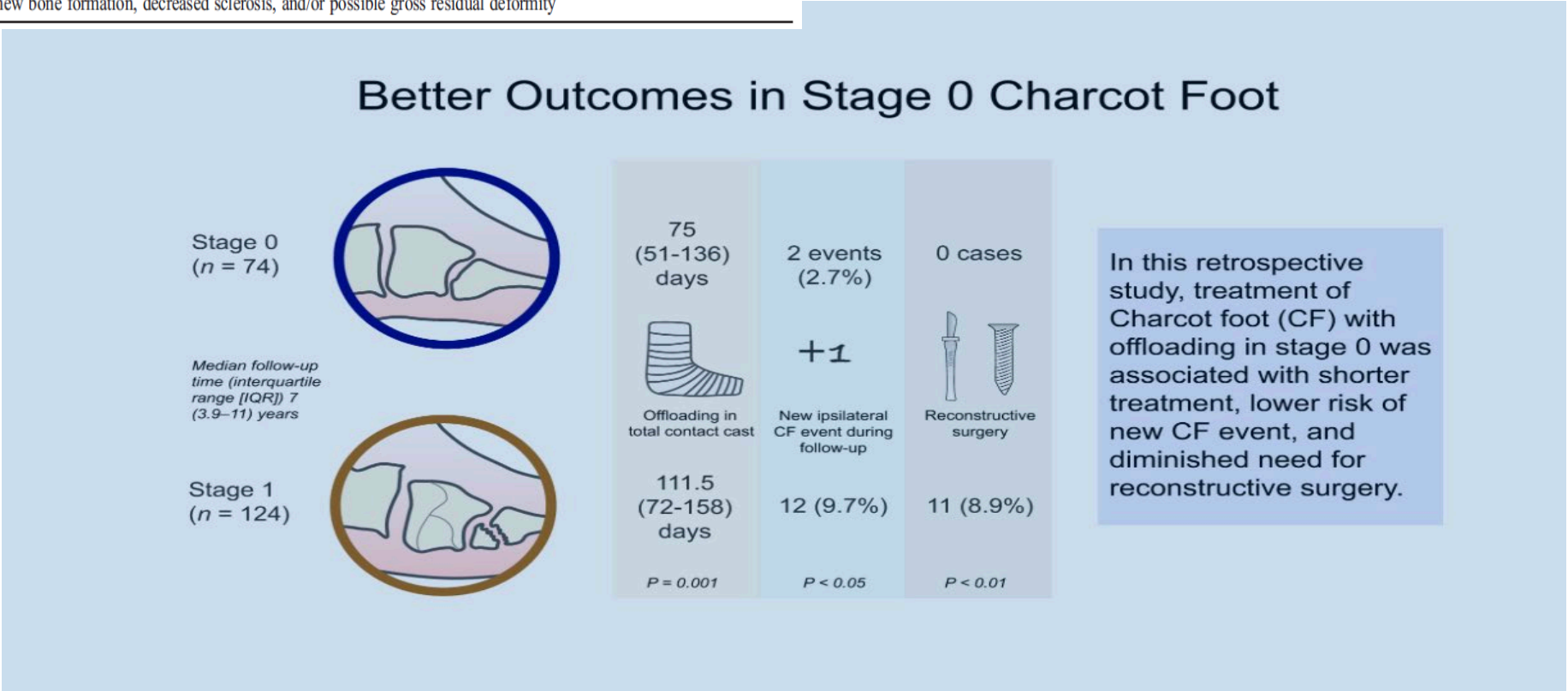


Weight-Bearing Intensity Produces Charcot Deformity in Injured Neuropathic Feet in Diabetes

Kimmerle, Chantelau, Exp Clin Endocrinol Diabetes, 2007



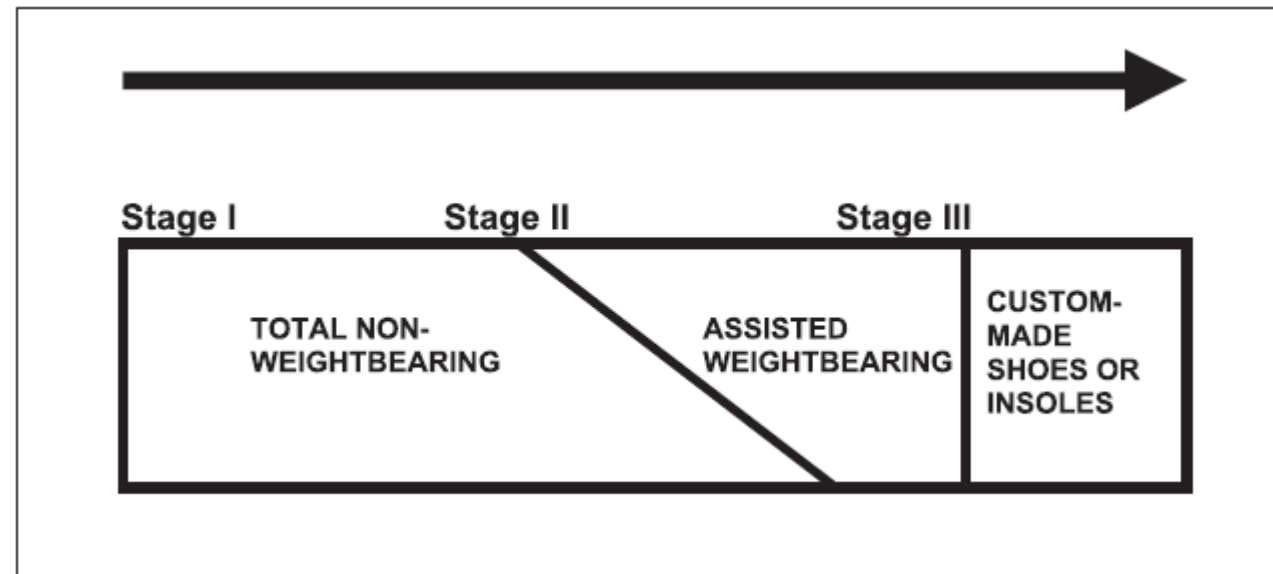
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Diabetes Care. 2023;47(2):252-258. doi:10.2337/dc23-1063

Modified Eichenholtz stages^a

Stage	Phase	Description
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RESEARCH

Open Access



Duration of total contact casting for resolution of acute Charcot foot: a retrospective cohort study

Danielle A. Griffiths¹ and Michelle R. Kaminski^{2,3*} 



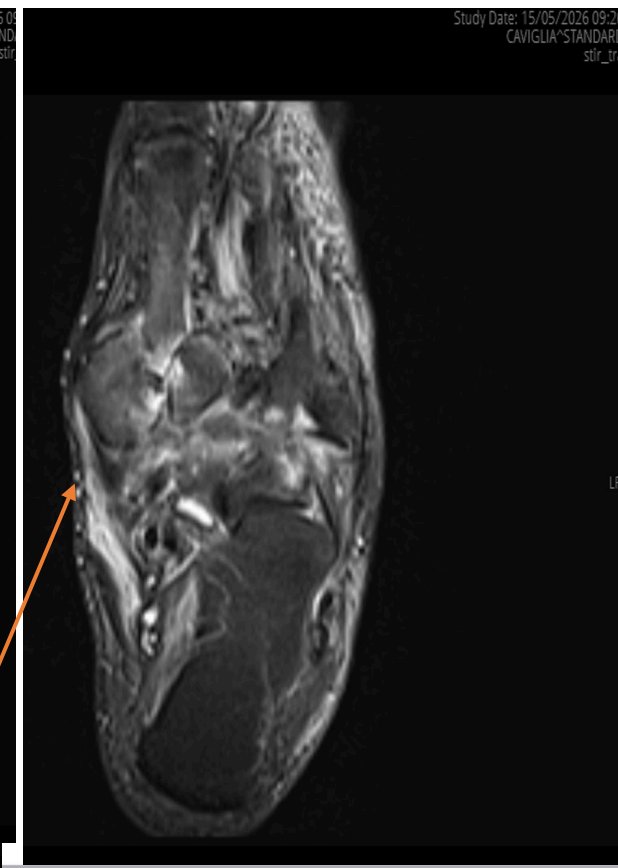
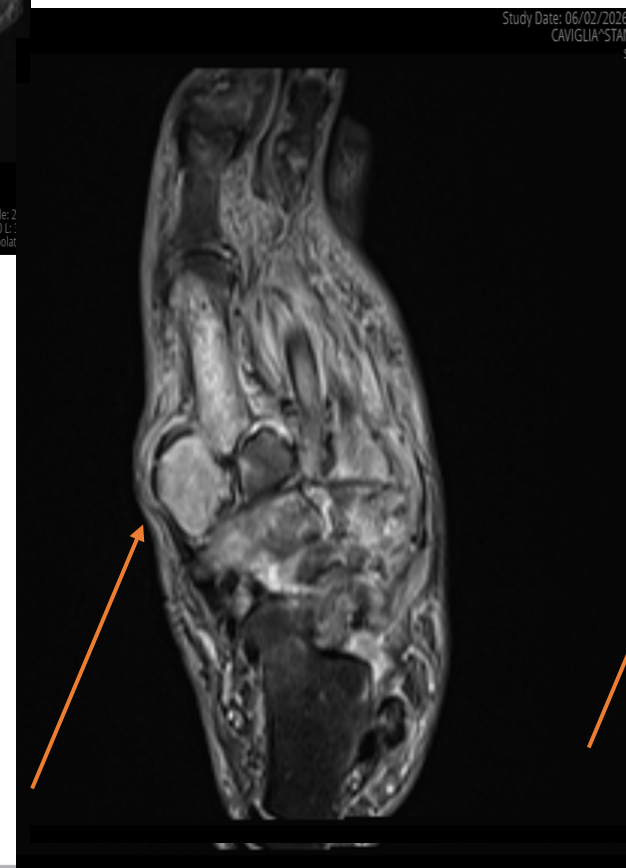
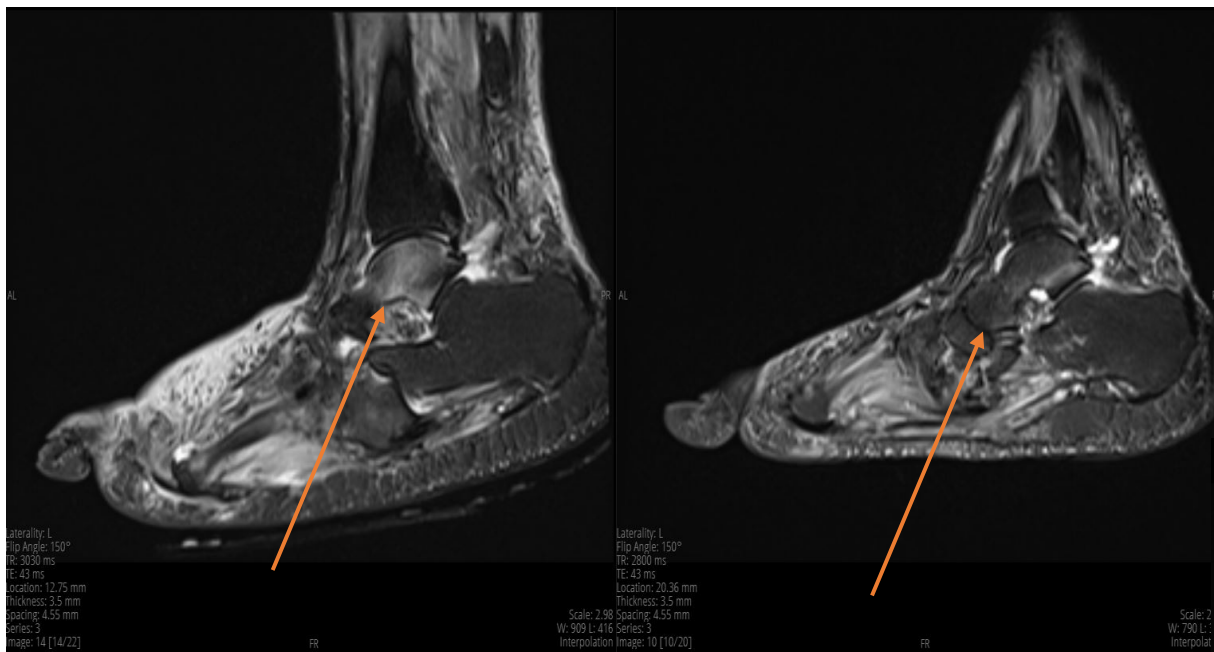
Fig. 1 Application of total contact cast. (A) Felt padding ('D-filler') is placed under medial longitudinal arch (except in cases of severe 'rockerbottom' deformity). (B) Cotton tube bandage is applied to protect lower limb and foot. (C) Silicone strips are applied over bony prominences. (D) Plaster of paris inner layer is applied. (E) Fibreglass outer layer is applied. Participant photographs printed with permission

La durata del trattamento TCC è stata valutata in alcuni studi, con risultati eterogenei:

- United Kingdom: 9 – 12 mesi
- US, Europa, Asia-Pacific Countries: 3-9 mesi

Questo studio australiano ha valutato retrospettivamente (2012-2015) la durata del trattamento TCC nell'area metropolitana di Melbourne in 27 soggetti con diagnosi di Charcot stadio 0-1 di Eickenholtz-Shibata, osservando una durata mediana di **4,3 mesi (2,7 – 7,8)**, considerando come durata il numero di giorni compresi tra la prima applicazione di TCC e la sospensione del trattamento per guarigione dello stato acuto.

Purtroppo, anche in questo studio si segnala una errata diagnosi iniziale nel 63% dei soggetti.



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INDICAZIONI AL TRATTAMENTO CHIRURGICO NEL PIEDE DI CHARCOT

- Esostosi con elevato rischio di ulcerazione nonostante il trattamento

Le procedure chirurgiche sono raccomandate ogni qual volta siano falliti tutti i tentativi conservativi di prevenire le lesioni

articolare

- Lesioni recidivanti
- Lesioni con osteomielite



Il timing ottimale per il trattamento chirurgico del piede di Charcot è molto discusso.

Classicamente si consiglia di non intervenire chirurgicamente durante la fase infiammatoria acuta Eichenholtz-Shibata 0-1, pensando all'approccio chirurgico, ove necessario, soltanto una volta raggiunta la fase di coalescenza Eichenholtz-Shibata 2-3.

Tan CY et al. Foot Ankle Orthop 2024; 29(9): 4



TERAPIA CHIRURGICA NELLA FASE ACUTA

Alcuni ricercatori però considerano l'intervento chirurgico in fase acuta come un modo per evitare la progressione delle deformità: il trattamento chirurgico precoce di stabilizzazione eseguito entro le 4.1 settimane dall'insorgenza dei sintomi non evidenzierebbe progressione verso fratture se confrontato con un intervento eseguito entro un periodo medio di 6.8 settimane in cui si osserverebbe progressione dei danni e necessità di re-intervento.



REVIEW ARTICLE

[A literature-based guide to the conservative and surgical management of the acute Charcot foot and ankle](#)

Valerie L. Schade, DPM, FACFAS, FACFAOM and
Charles A. Andersen, MD, FACS*

Vascular/Endovascular Surgery, Madigan Army Medical Center, Tacoma, WA, USA

GO
Action



VIII CONGRESSO NAZIONALE PIEDE DIABETICO

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ROMA, 18-20 GIUGNO 2026
HOTEL NH VILLA CARPEGNA

REVIEW ARTICLE

WILEY

Charcot neuroarthropathy in persons with diabetes: It's time for a paradigm shift in our thinking

Dane K. Wukich¹  | Robert G. Frykberg²  | Venu Kavarthapu^{3,4,5}

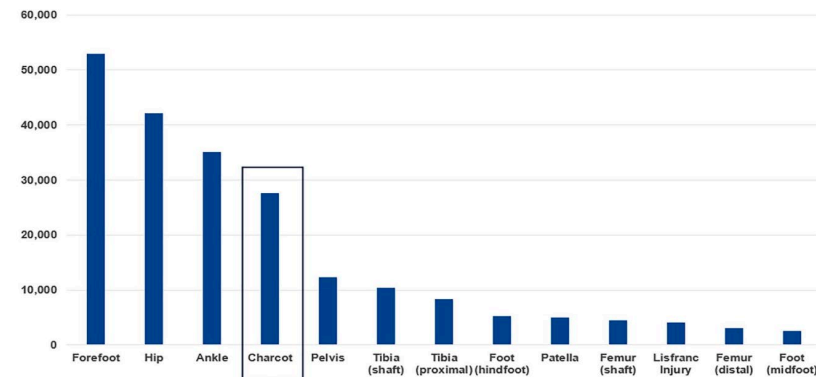


FIGURE 1 This figure illustrates the rates of lower extremity fractures in patients with diabetes.

In persons with diabetes, the number of new cases of CNO per year is higher than many primary malignancies, many de novo bone metastases, and lower extremity fractures except for fractures of the forefoot, hip, and ankle. Although adequately powered comparative studies have yet to be published, intervention during the active phase of CNO has the potential to reduce the likelihood of permanent deformity. Active CNO is a disease which ranges from normal radiographs to abnormal radiographs, and once radiographic changes are noted, intra and extra-articular osseous fractures, joint subluxa-

tion, and joint dislocation are typically seen. Realignment arthrodesis during the active stage, after an initial period of offloading and swelling reduction, stabilises the foot and mitigates the acute inflammatory response to lessen osteoclastogenesis and promote healing. Consider treating active CNO like any other intra-articular fracture, dislocation, or fracture dislocation elsewhere in the skeleton. Delaying intervention until the inactive stage of resolution with associated deformity makes surgical intervention more difficult.

Methods of fixation, whether internal, external, or hybrid, have greatly improved over the past half century, and greatly enhance our ability to stabilise these injuries. Preventing deformity associated with CNO will prevent foot ulcers, infection, and amputation.

Ideally, a prospective, randomized study comparing early surgery during the active stage of CNO and standardized offloading treatment should be performed to better substantiate our recommended approach. This study would likely require the inclusion of multiple experienced centres which represent the international experience of those who treat active CNO.

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DOI: 10.1002/jbm.b.3754

REVIEW ARTICLE

WILEY

Charcot neuroarthropathy in persons with diabetes: It's time for a paradigm shift in our thinking

Dane K. Wukich¹ | Robert G. Frykberg² | Venu Kavarthapu^{3,4,5}





DIABETIC
FOOT & ANKLE

CO
action

REVIEW ARTICLE
A literature-based guide to the conservative and surgical
management of the acute Charcot foot and ankle

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VIII CONGRESSO NAZIONALE PIEDE DIABETICO
Focus sul piede nella gestione del diabete

INTERASSOCIATIVO SID-AMD

ROMA, 18-20 GIUGNO 2026
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Alcune recenti ricerche hanno confrontato gli esiti della chirurgia eseguita in fase di stabilizzazione rispetto alla chirurgia eseguita in fase acuta (amputazioni, necessità di re-intervento, fallimento dell'artrodesi)

	Eichenholtz-Shibata 2-3	Eichenholtz-Shibata 0-1	p
Amputazione	10,5%	12,3%	0.04
Re-intervento	31,2%	50%	< 0.001

Bitton RR et al. . Foot Ankle Orthop 2024;9 (4)

Tan CY et al. Foot Ankle Orthop 2024; 29(9): 4



**I buoni ragionamenti sono
più forti di due mani robuste**

Sofocle



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Charcot neuro-osteoarthropathy: a review of key concepts and an evidence-based surgical management algorithm

Miltiadis Argyropoulos¹, William Wynell-Mayow^{1,2*}, Oscar Johnson¹, Radwane Faroug¹, Karanjeev Singh Johal¹, Rupinderbir Singh Deol¹, Atef Hakmi¹ and Simon Mordecai¹

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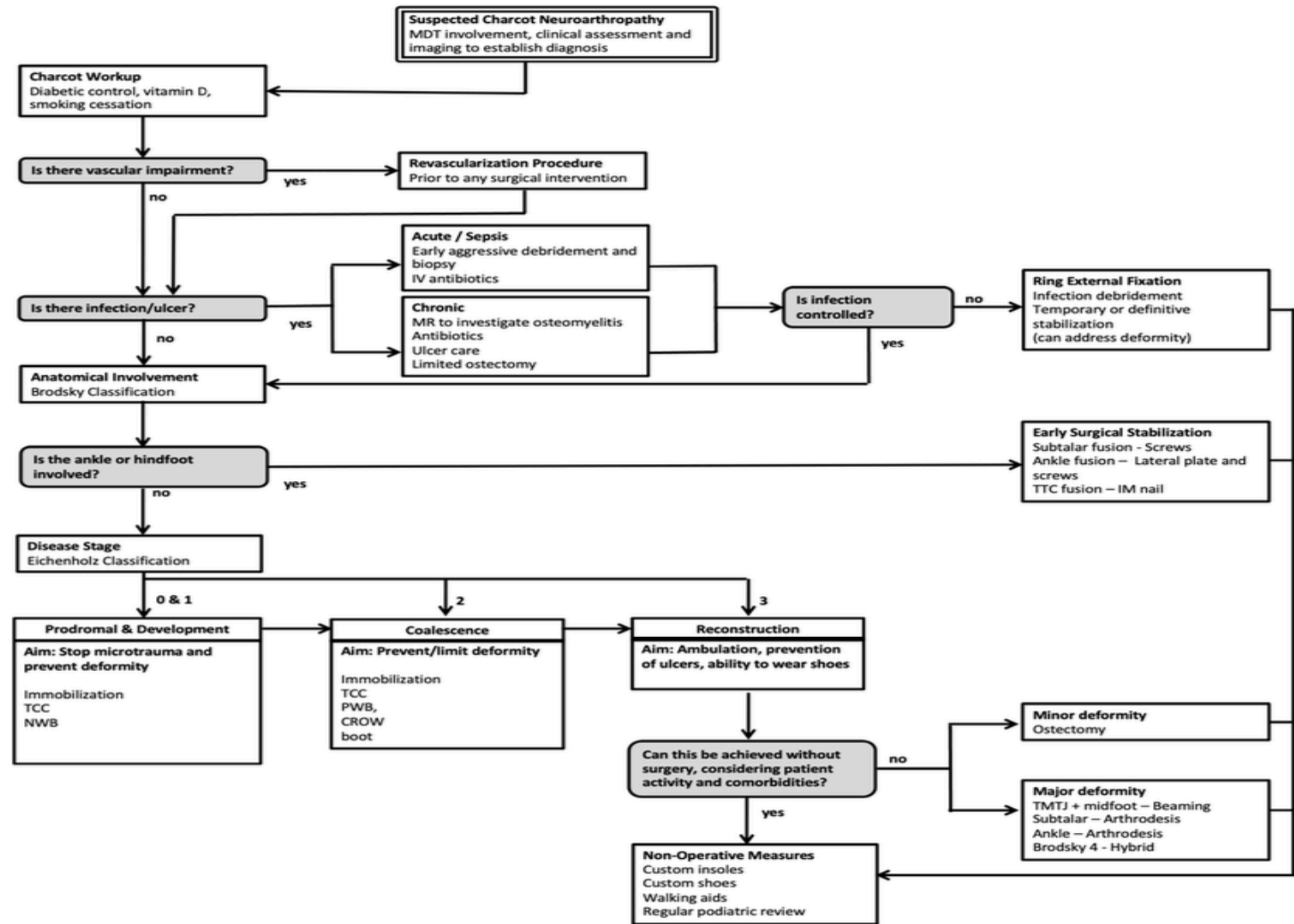
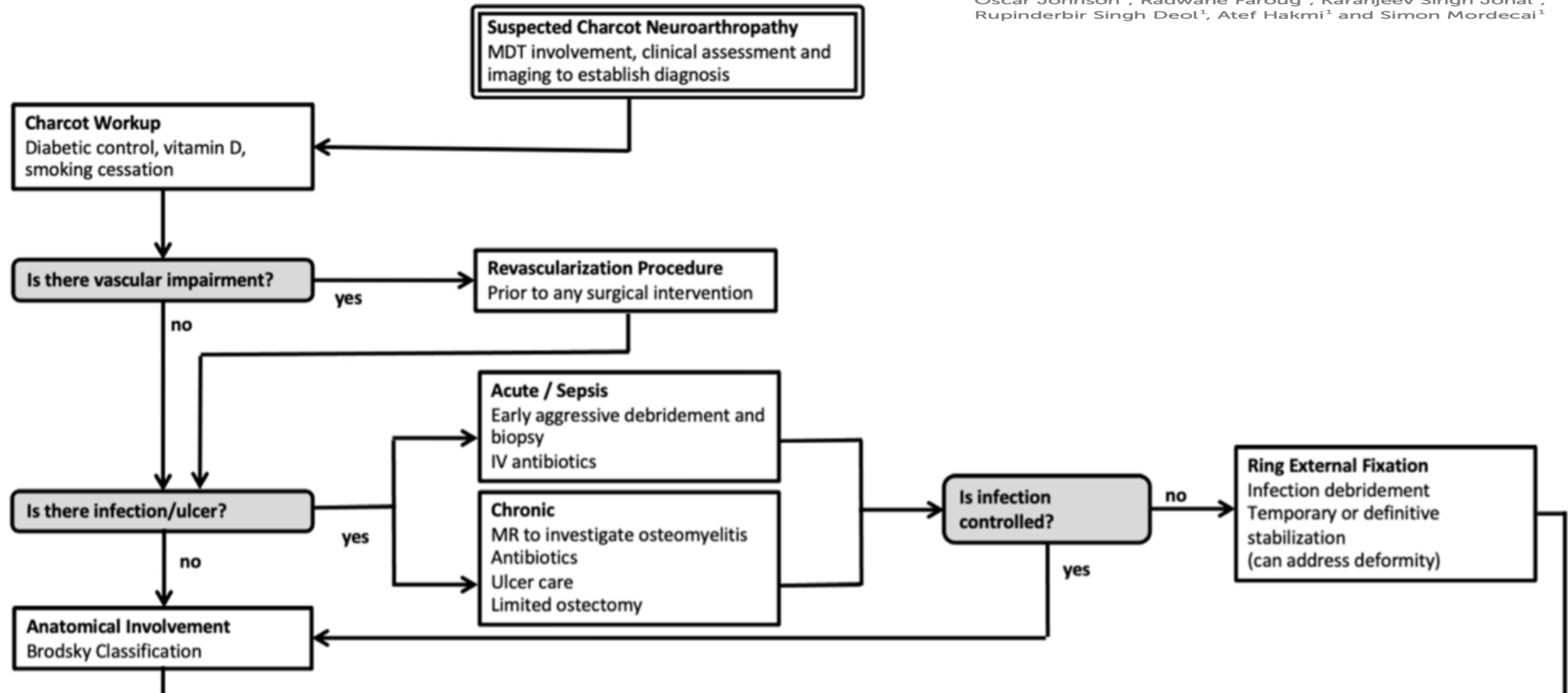
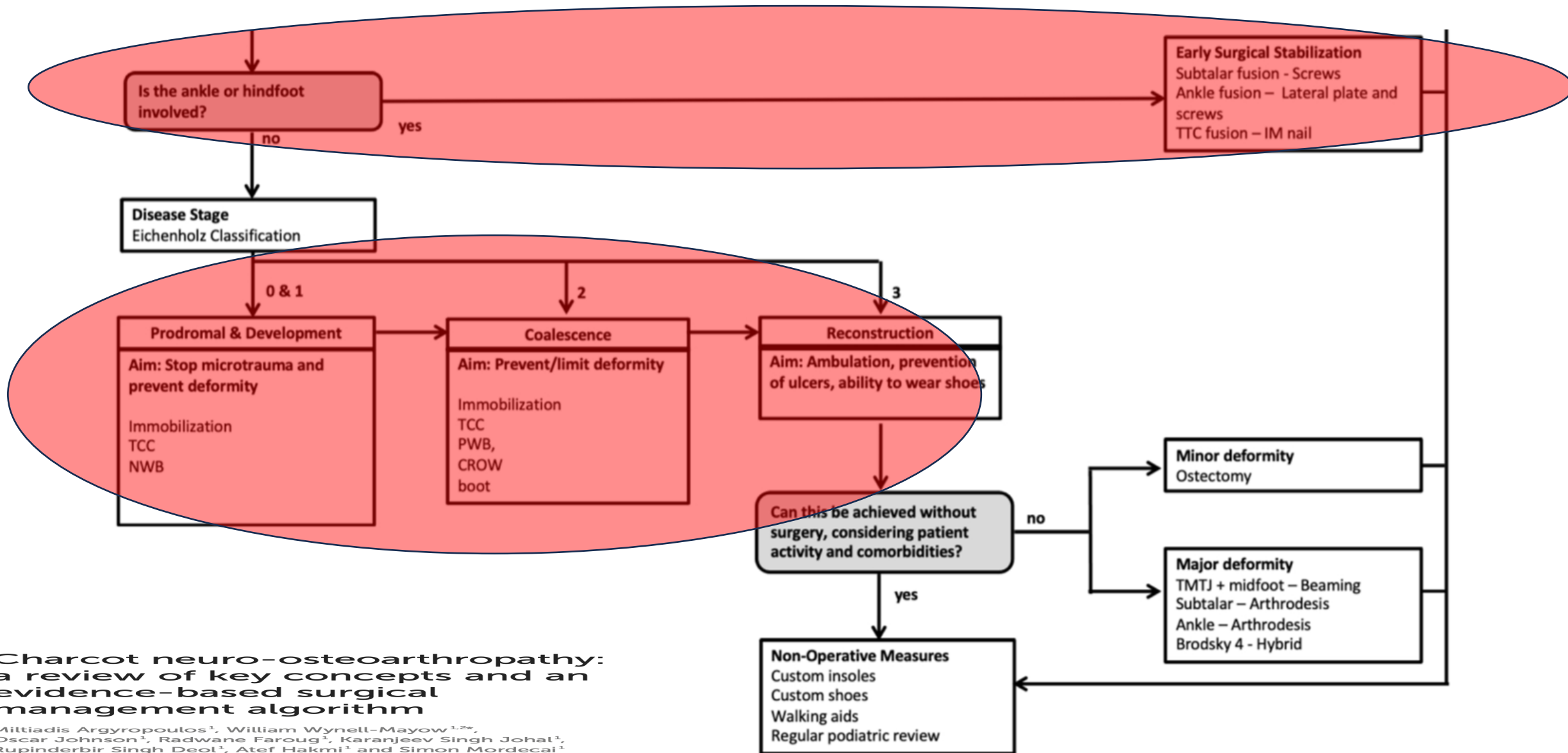


FIGURE 1
Evidence-based surgical algorithm proposed for the management of Charcot Neuroarthropathy (CNO).

Charcot neuro-osteoarthropathy: a review of key concepts and an evidence-based surgical management algorithm

Miltiadis Argyropoulos¹, William Wynell-Mayow^{1,2*}, Oscar Johnson¹, Radwane Faroug¹, Karanjeet Singh Johal¹, Rupinderbir Singh Deol¹, Atef Hakmi¹ and Simon Mordecai¹











LIST OF RECOMMENDATIONS

DIAGNOSIS

1. Always consider active Charcot neuro-osteoarthropathy in a person with diabetes mellitus, neuropathy and intact skin when there are clinical findings of an increase in temperature, oedema, and/or redness of the foot, compared to the contralateral foot. Best Practice Statement.
2. Consider using infrared thermometry to measure skin temperature of the feet in a person with diabetes mellitus and suspected Charcot neuro-osteoarthropathy with intact skin, using a standardised approach to the measurement of temperatures to allow for more accurate comparison over time. (GRADE recommendation: Conditional; Certainty of the evidence: Low)
3. When using infrared thermometry to measure skin temperature of the feet in a person with diabetes mellitus and suspected active Charcot neuro-osteoarthropathy with intact skin, consider calculating temperature difference between both legs, using the highest temperature on the affected foot or ankle in comparison with the same anatomic point on the contralateral extremity. (Conditional; Low)
4. In a person with diabetes mellitus with bilateral active Charcot neuro-osteoarthropathy (CNO) and intact skin or with unilateral CNO and intact skin in the absence of the contralateral limb, ascending temperature gradients (toe-knee) may be useful for comparison over time. Best Practice Statement.
5. Initiate knee high immobilization/offloading promptly while further diagnostic studies are performed to confirm or rule out active Charcot neuro-osteoarthropathy (CNO) when active CNO is suspected in a person with diabetes mellitus and intact skin. (Strong; Low)
6. Perform plain X-ray of the foot and ankle in a person with diabetes mellitus and suspected active Charcot neuro-osteoarthropathy. Ideally, bilateral plain X-rays should be performed, if possible, for comparison purposes. Best Practice Statement.
7. Perform X-rays that include the anteroposterior (AP), medial oblique, and lateral projections in a person with diabetes mellitus and suspected active Charcot neuro-osteoarthropathy. The ankle and foot views should include the AP, mortise, and lateral projections. Ideally, standing (also known as "weight-bearing") radiographs should be performed. If a patient is not able to bear weight on their feet, non-weight-bearing radiographs are an alternative, but may not demonstrate malalignments that are more apparent in the standing position. Best Practice Statement.
8. Perform Magnetic Resonance Imaging in a person with diabetes mellitus and suspected active Charcot neuro-osteoarthropathy with normal appearance of the plain X-rays to diagnose or exclude the disease and its activity. (Strong; Moderate)
9. If Magnetic Resonance Imaging is unavailable or is contraindicated in a person with diabetes mellitus and suspected active Charcot neuro-osteoarthropathy, consider a nuclear imaging scan (scintigraphy), CT (computed tomography) scan, or SPECT-CT (Single Photon Emission Computed Tomography) to support the diagnosis of active Charcot neuro-osteoarthropathy. (Conditional; Low)
10. We suggest not using C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), white blood count, alkaline phosphatase, or other blood tests in a person with diabetes mellitus and suspected active Charcot neuro-osteoarthropathy with intact skin to diagnose or exclude the disease. (Conditional; Low)





IDENTIFICATION OF REMISSION

11. Consider measurement of skin temperature of the affected and unaffected limb with serial examinations to monitor disease activity in a person with diabetes mellitus and active Charcot neuro-osteoarthropathy with intact skin. (Conditional; Low)
12. We suggest not using soft tissue oedema alone to determine when active Charcot neuro-osteoarthropathy is in remission. (Conditional; Low)
13. We suggest that the findings of temperature measurement, clinical oedema, and imaging should all be considered when concluding that active Charcot neuro-osteoarthropathy is in remission. (Conditional; Low)
14. We suggest that frequency of appointments for assessing disease activity in active Charcot neuro-osteoarthropathy should depend on specific factors such as fluctuation in oedema volume, co-morbidities, the risks associated with treatment and recovery, access to assistance with home treatment needs, and a person's progress and recovery. (Conditional; Low)





TREATMENT

15. Use a non-removable knee-high device to immobilise and offload the foot to promote remission of the disease, and prevention or progression of deformity in a person with active Charcot neuro-osteoarthropathy and intact skin. (Strong; Low)
16. Consider using a total contact cast in the treatment of active Charcot neuro-osteoarthropathy with intact skin in a person with diabetes mellitus. A knee-high walker rendered non-removable can be considered as a second choice in order to immobilise and offload the foot. (Conditional; Low)
17. A removable knee-high device worn at all times can be considered as the third treatment choice in a person with diabetes mellitus, active Charcot neuro-osteoarthropathy and intact skin of the foot for whom a non-removable knee-high offloading device is contraindicated or not tolerated. (Conditional; Low)
18. We suggest not to use a below the ankle offloading device (e.g. surgical shoe, postoperative sandal, custom moulded shoe, or slipper cast) in the treatment of active Charcot neuro-osteoarthropathy and intact skin, given the inadequate immobilisation of the diseased bone and joints, and limited off-loading capacity. (Conditional; Low)
19. Treatment with a knee-high offloading device should be considered as soon as possible once the diagnosis of active Charcot neuro-osteoarthropathy is considered. (Strong; Low)
20. In a person with active Charcot neuro-osteoarthropathy who is being treated with a knee-high device, we suggest using assistive devices to reduce weight-bearing on the affected limb. (Conditional; Low)

21. Do not use alendronate, pamidronate, zoledronate, calcitonin, PTH, or methylprednisolone as treatment for active Charcot neuro-osteoarthropathy in a person with diabetes mellitus and intact skin. (Strong; Moderate)
22. We suggest not to use denosumab as treatment for active Charcot neuro-osteoarthropathy in a person with diabetes mellitus and intact skin. (Conditional; Low)
23. We suggest to evaluate the need for vitamin D and calcium supplementation in a person with diabetes mellitus and active Charcot neuro-osteoarthropathy with intact skin during the phase of fracture healing, in doses according to (inter)national guidelines on supplementation in persons at risk for vitamin D deficiency and/or those with insufficient calcium intake. (Conditional; Low)
24. In a person with active Charcot neuro-osteoarthropathy and intact skin, and with instability of foot and ankle joints, and/or deformity with a high-risk of developing ulcer in the offloading device, or pain that cannot be sufficiently stabilized in a total contact cast or a non-removable knee-high device, we suggest that surgical intervention should be considered. (Conditional; Low)

PREVENTION OF RE-ACTIVATION

25. Footwear and/or orthoses that best accommodate and support the shape of the foot/feet and ankle to help prevent re-activation of Charcot neuro-osteoarthropathy (CNO) are recommended in a person with diabetes mellitus, intact skin, treated for active CNO with an off-loading device and who is now in remission. (Strong; Moderate)
26. When deformity and/or joint instability is present, in order to optimise plantar pressure distribution, below the knee customized devices should be used for additional protection in a person with diabetes mellitus, intact skin, treated for active Charcot neuro-osteoarthropathy who is now in remission. (Strong; Moderate)





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