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Guidelines on the Diagnosis and Treatment of Active Charcot Neuro- osteoarthropathy in persons with diabetes mellitus





ACTIVE CHARCOT NEURO-OSTEOARTHROPATHY (CNO)





- This guideline focuses on **ACTIVE CNO** in persons with intact skin
- *Active Charcot neuro-osteoarthropathy*
 - Red, warm, swollen foot with osseous abnormalities on imaging
- *Remission*
 - Absence of inflammation, with or without deformity, and radiographic consolidation of fractures, if present, on plain X-ray.
 - Remission is synonymous with the ‘inactive’ stage of CNO.
- *Stage 0 active CNO*
 - Clinical signs of active CNO and normal plain X-rays.
 - Demonstrable osseous abnormalities present on MRI



- Clinical Question: In a person in whom active CNO is considered, what is the accuracy of clinical findings to diagnose active CNO?
- Always consider active CNO in persons with diabetes and neuropathy who present with acute inflammation (temperature, oedema, and/or redness) of the foot
 - (Best Practice Statement)
- Consider using infrared thermometry to measure and monitor skin temperature in comparison to the uninvolved side
 - (Conditional; Low)



- Clinical Question: Which imaging modalities have sufficient accuracy to render the diagnosis of active CNO?
- Obtain *bilateral x-rays* of the foot and ankle, preferably weight bearing
 - (Best Practice Statement)
- Obtain an *MRI* if plain radiographs are normal
 - (Conditional; Low)



- Clinical Question: Which offloading device should be used for active CNO and should this be accompanied with non-weight bearing advice?
- We recommend a *non-removable knee-high device* such as a total contact cast or a boot rendered irremovable
 - (Strong; Low).
- We suggest using *assistive devices* to reduce weight-bearing (Conditional; Low).



- Clinical Question: Can medical therapy in active CNO result in shorter time to remission and prevent complications?
- Do not use alendronate, pamidronate, zoledronate, calcitonin, parathyroid hormone, or methylprednisolone for active CNO
 - (Strong; Moderate).
- We suggest not to use denosumab in active CNO
 - (Conditional; Low).
- We suggest evaluating the need for vitamin D and calcium supplementation
 - (Conditional, Low)



- Clinical Question: Is therapeutic footwear preferred to conventional footwear to prevent re-activation after treatment of active CNO?
- Footwear and/or orthoses that best accommodate and support the shape of the foot are recommended after treatment for active CNO
 - (Strong; Moderate).
- Below the knee customised devices should be used for additional protection when deformity and/or joint instability is present
 - (Strong; Moderate).



- Clinical Question: Is reconstructive surgery associated with shorter time to remission and deformity prevention compared to no surgery?
- We suggest that surgical intervention should be considered in a person with *instability, deformity, high-risk of developing foot ulcer* or *pain* that cannot be sufficiently stabilised in a knee-high device
 - (Conditional; Low)



Future Research

- Diagnosis and Monitoring
- Offloading
- Weight-bearing
- Potential efficacy of denosumab and tumour necrosis factor inhibitors
- Risk factors and genetic markers for potential screening



Thank you to the Charcot Working Group

