



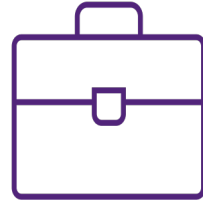
Diffuse Idiopathic Skeletal Hyperostosis: DISHing up the dirt

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The Case



Family Medical Centre
1 GP lane, Brown Snake. 4000



Dear Physiotherapist,

RE: M*** W****, DOB: 12/04/1959, 65 Sesame Street, Brown Snake**

Please see Mr White, aged 64 years, with Left sided Lower back pain for the past 3 months. He has no red flags.

Please find attached management plan, a list of problems and prescribed medications.

Evidence level: V

Past medical history:

- *DISH: since 2015*
- *HTN*
- *Hyperlipidaemia*
- *BMI - 29*
- *Ex-smoker – 10 year ago*

Medications: Amlodipine, Atorvastatin

Management plan:

- *3 x Physiotherapy sessions*

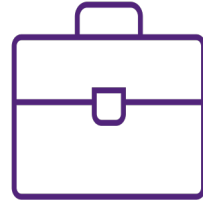
I look forward to hearing back about your progress,

Dr J. Zoidberg

General Practitioner

Family Medical Centre

The Case



CRYSTAL DEPOSITION DISEASES

New developments in our understanding of DISH (diffuse idiopathic skeletal hyperostosis)

Sarzi-Puttini, Piercarlo; Atzeni, Fabiola

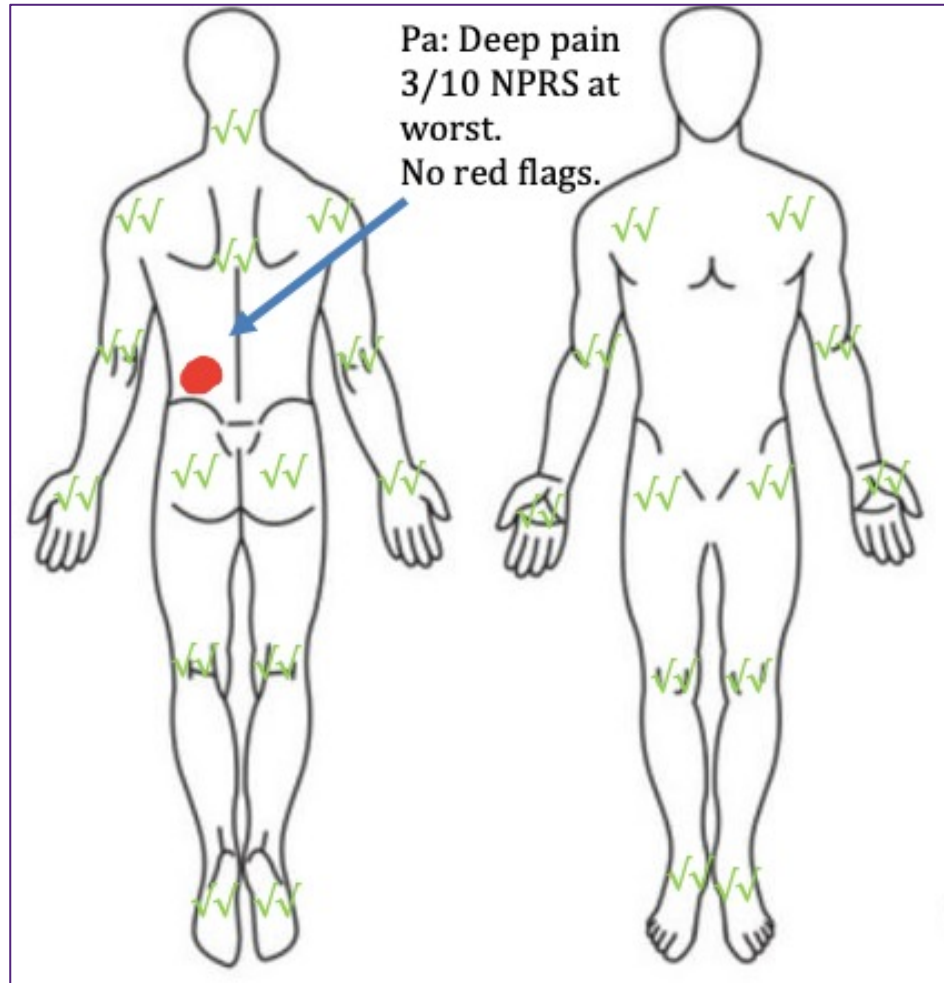
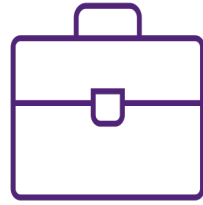
[Author Information](#) 

Current Opinion in Rheumatology 16(3):p 287-292, May 2004.

- Ossification of Anterior Longitudinal Ligament (ALL)
- Symptoms: stiffness and decreased range of motion
- Peripheral entheses: patella ligaments and Achilles tendon

(Sarzi-Puttini & Atzeni, et al, 2004) Level V

The Case



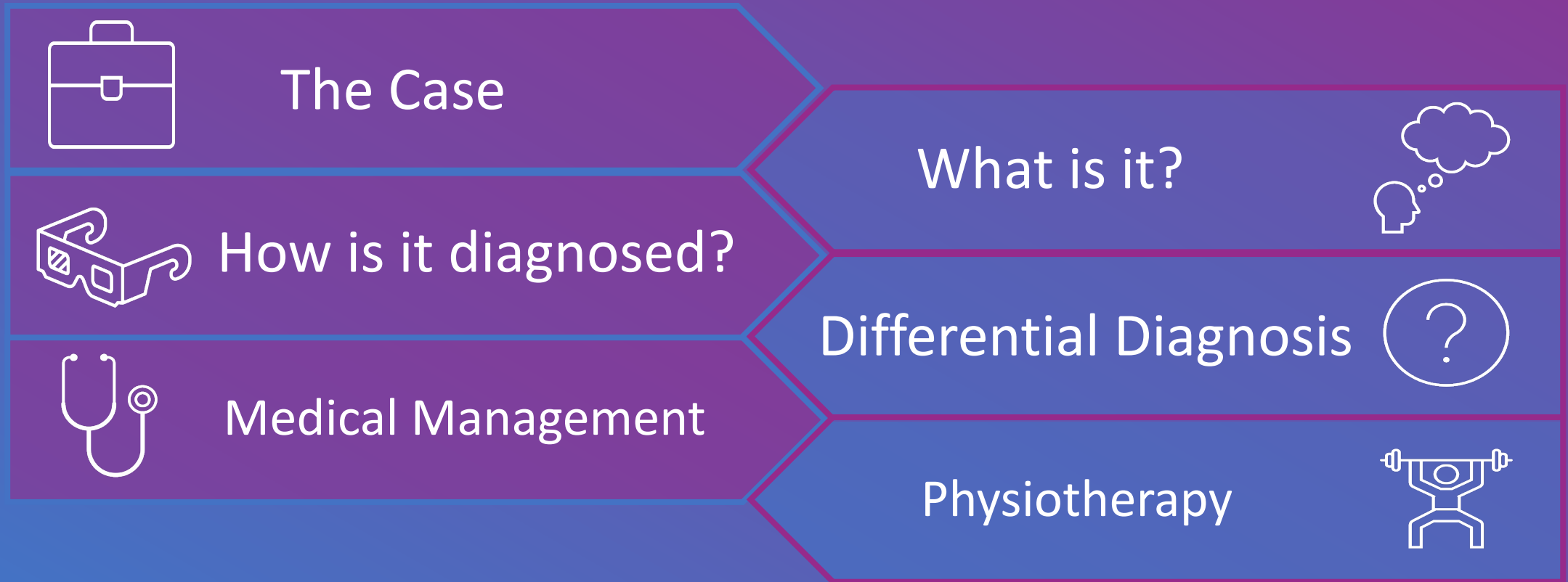
64y.o. male presents with 3/12 history
Left sided lower back pain

Goals: Wants exercises to improve
lumbar pain

Multidirectional Lumbar movement
impairment

Limited motor assessment due to
stiffness

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What is it?



- 19th century – first documentations; 1950 was termed Ankylosing Hyperostosis
- Also known as Forestiers Disease
- Early stage – inflammatory component (Pariente, et al, 2023) Level: IIb
- Common in elderly males; prevalence of 2.9%-42% (Kuperus, et al, 2017) Level: IIIa

(Sarzi-Puttini & Atzeni, 2004) Level: V

Diffuse Idiopathic Skeletal Hyperostosis (DISH)

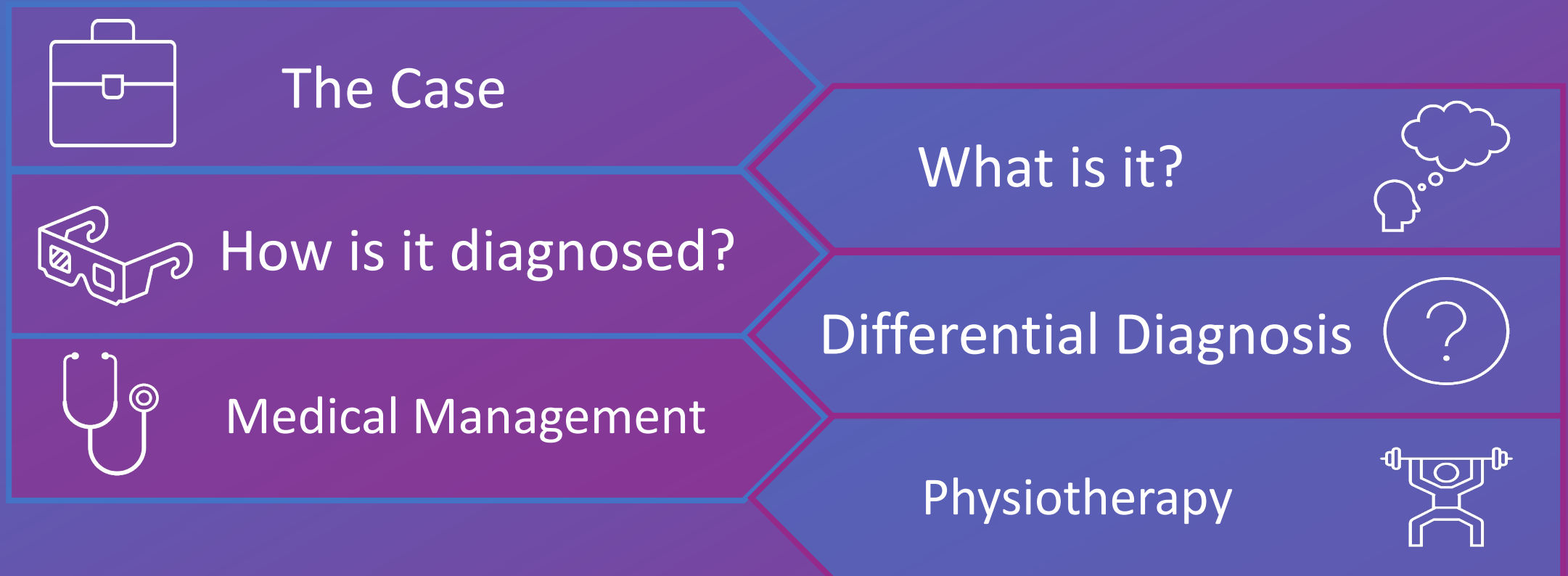


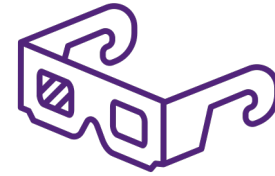
Lumbar spine



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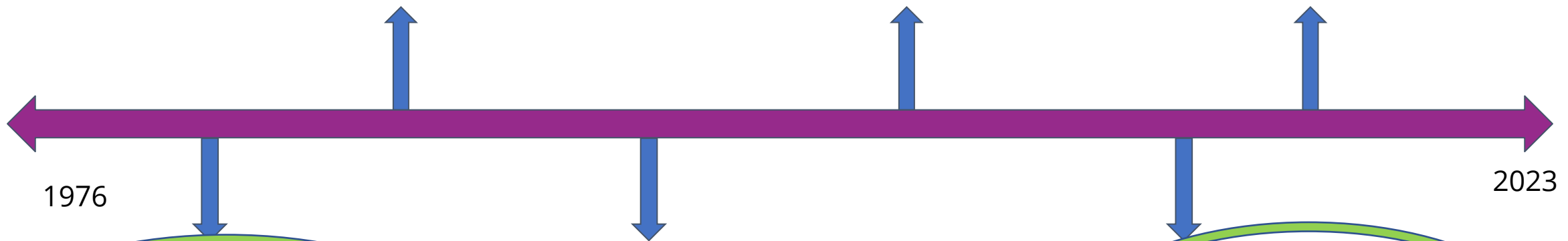


Classification of DISH – a timeline

Mata, et al, 1998. Level IV
Spine, Lower limb and upper limb
measures for DISH

Kuperus, et al, 2017. Level IIIa
Limitations of classification criteria.
Dichotomous approach.

Misaki, et al, 2022. Level IIIc
XR with Mata score of 3 levels =
Strong indication of DISH



1976

2023

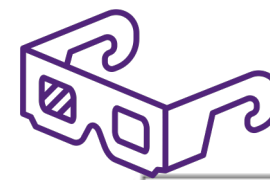
Resnick and Niwayama Criteria, 1976

Level: IV. *

- 4 or more continuous vertebral level ossification
- Preservation of IV disc
- SIJ and apophyseal normal

Mader, et al, 2013. Level IIIa
Use of Resnick criteria and
cadaveric studies. No clinical or
lab tests.

Kuperus, et al 2019. Level IIb
New early DISH classification.
CT.



How is it diagnosed? – Early-phase

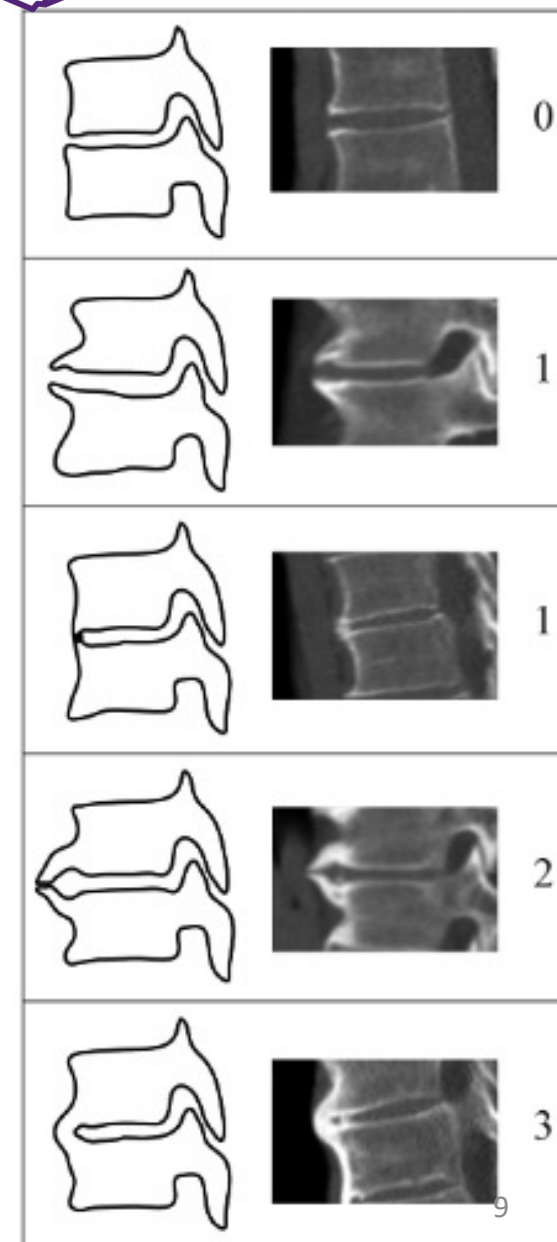
Criteria for Early-Phase Diffuse Idiopathic Skeletal Hyperostosis: Development and Validation

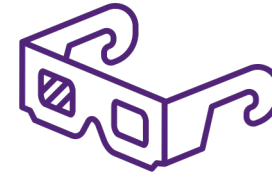
Jonneke S. Kuperus, PhD • Sytse F. Oudkerk, MD • Wouter Foppen, PhD • Firdaus A. Mohamed Hoesein, PhD • Willem Paul Gielis, MD • Job Waalwijk, MSc • Elizabeth A. Regan, PhD • David A. Lynch, PhD • F. Cumbur Oner, PhD • Pim A. de Jong, PhD • Jorrit-Jan Verlaan, PhD

Early DISH vs no DISH: CT (Kuperus, et al, 2019) Level IIb

- Retrospective cohort study of 1367 males
- sensitivity: 96% (99 of 103 participants; 95% confidence interval [CI])
- specificity was 83% (1695 of 2034 participants; 95% CI)

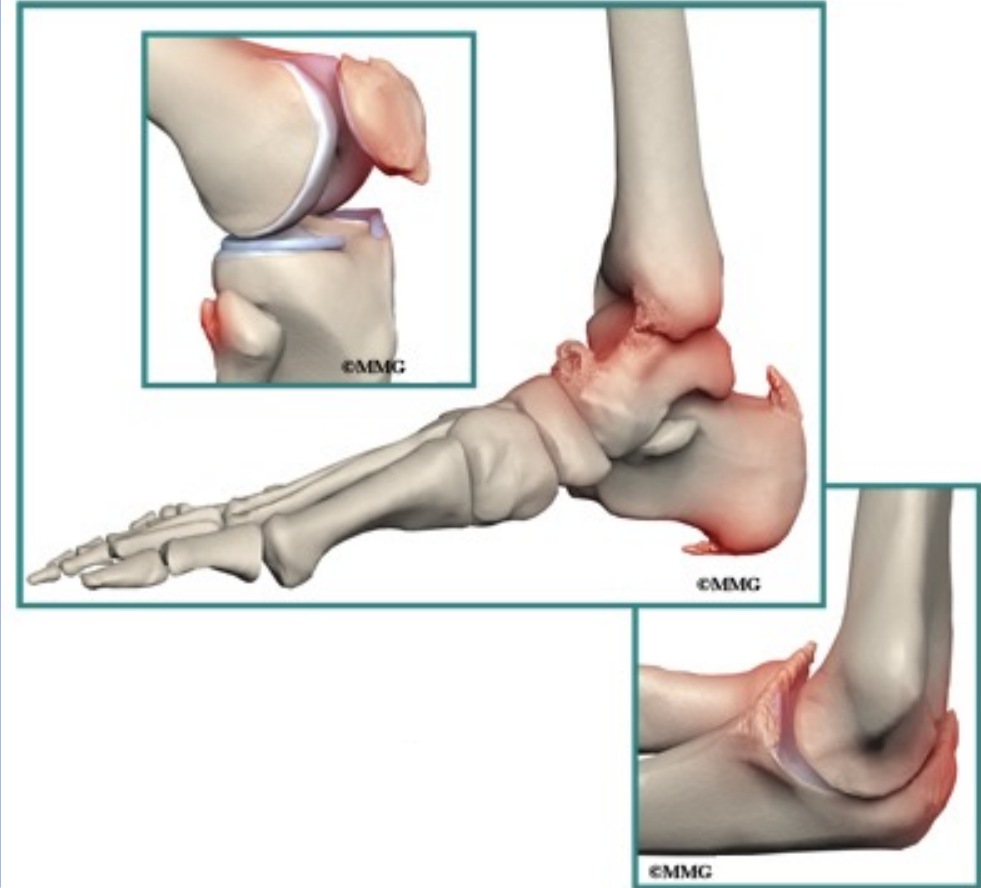
Progression of DISH over 5 years is more prevalent in younger population (Mirakami, Et al, 2021) Level IIb





Clinical features

- **Pain**
- Restrictive lung disease
- Dysphagia
- Upper airway obstruction
- **Skeletal stiffness**
- Foot and ankle manifestations – 70%
- (Belanger, et al, 2001) Level: IIIa



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Risk factors

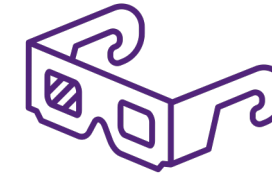
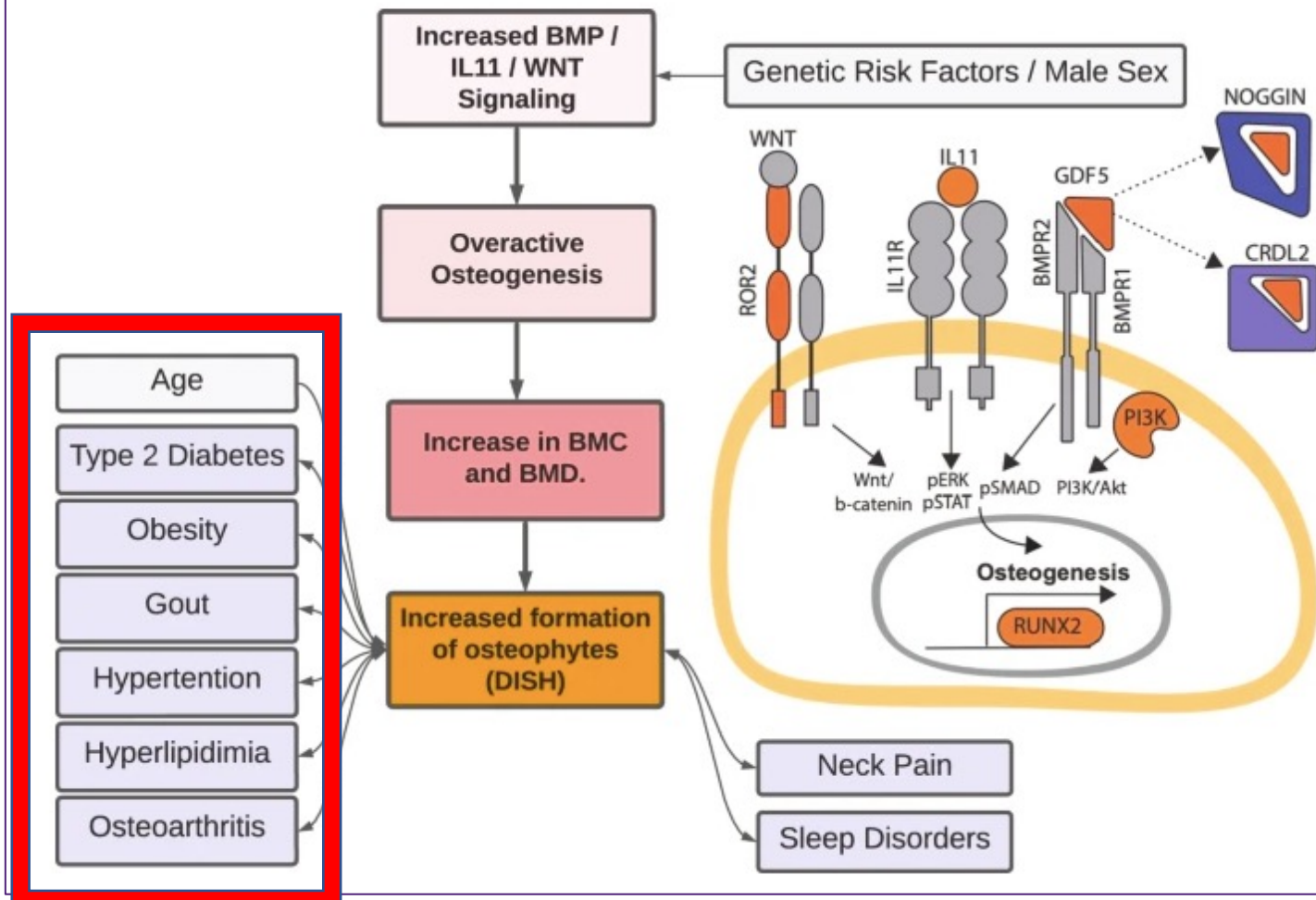
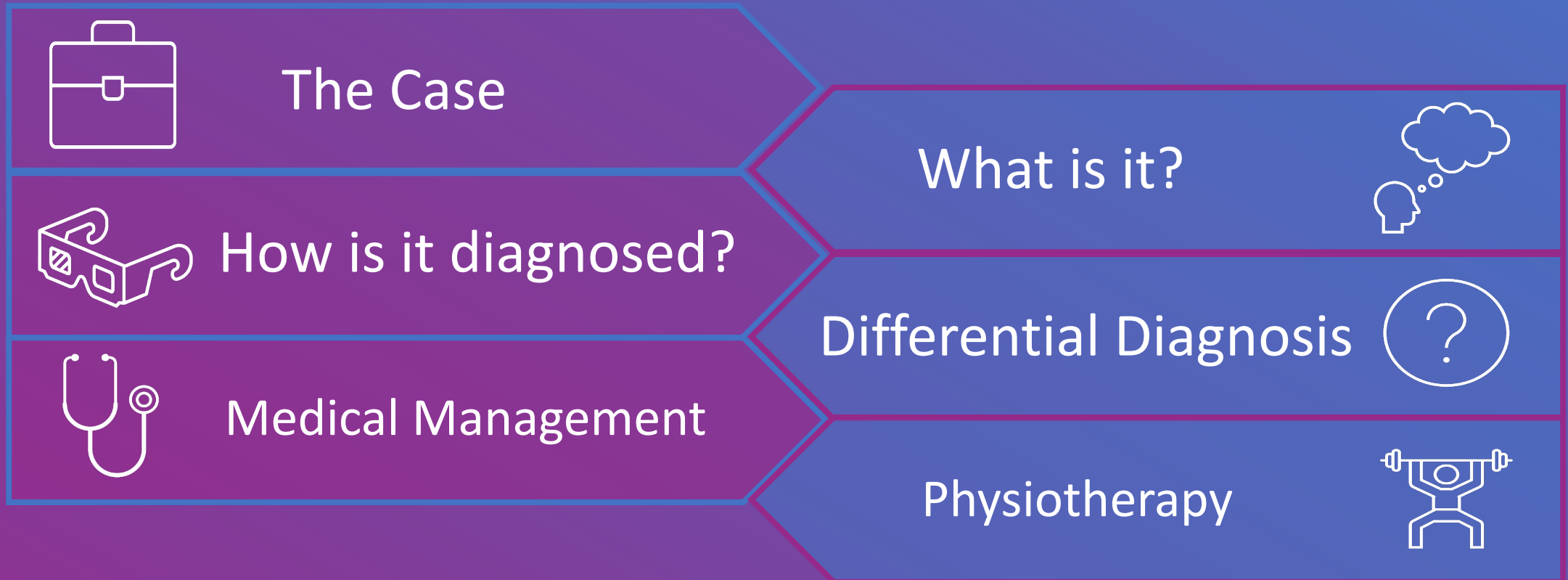


Fig. 6: Overview of genetic and environmental risk factors associated with development of DISH.



(Sethi, et al, 2023) Level IIb

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DDx – Ankylosing Spondylitis & Spondylosis

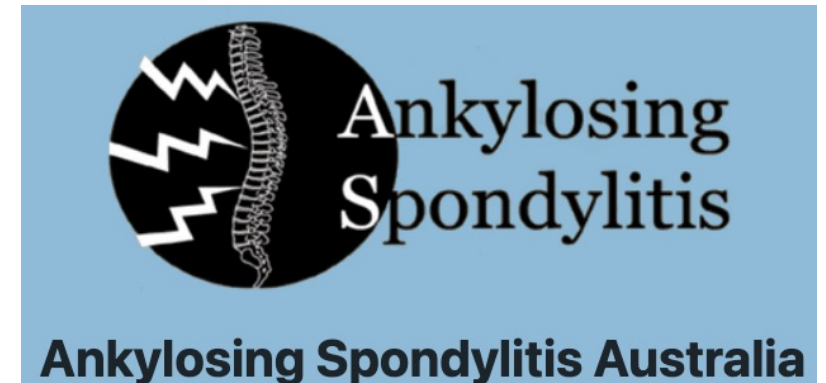


Ankylosing Spondylitis

- SIJ fusion more common in AS
- 63% of DISH - some SIJ fusion
- DISH - anterior or posterior bony bridging of SIJ
- (Takahashi, et al, 2023) Level: III

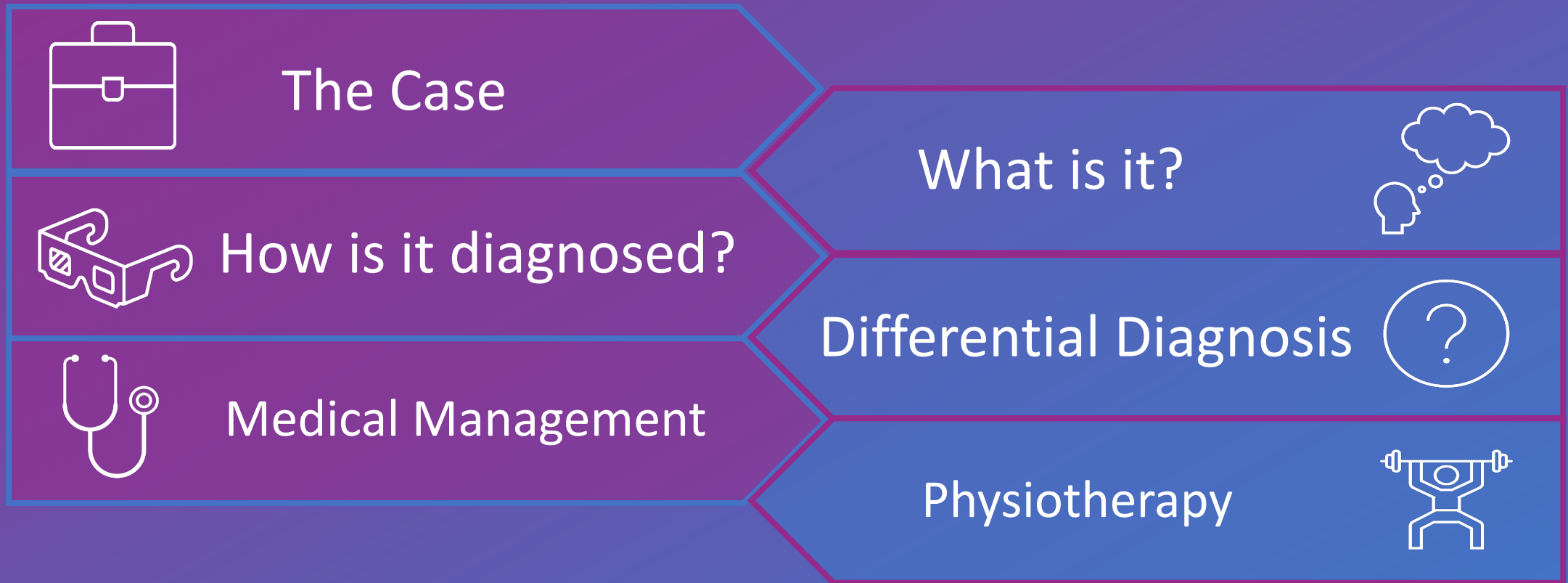
Spondylosis

- Involves cartilage and discs
- Osteophytes are transverse
- More common in Cervical and lumbar lower segments
- (Mader, et al, 2013) Level: IIIa



Retrieved from: <https://asaustralia.org/>

DISHing up the dirt





Medical management

Goals for management

- **Reduce pain and stiffness** – NSAIDs, CSI and heat
- **Manage metabolic conditions**
- Prevent **progression or complications**
- Routine OA management for DISH (Mader, et al, 2017) Level: V

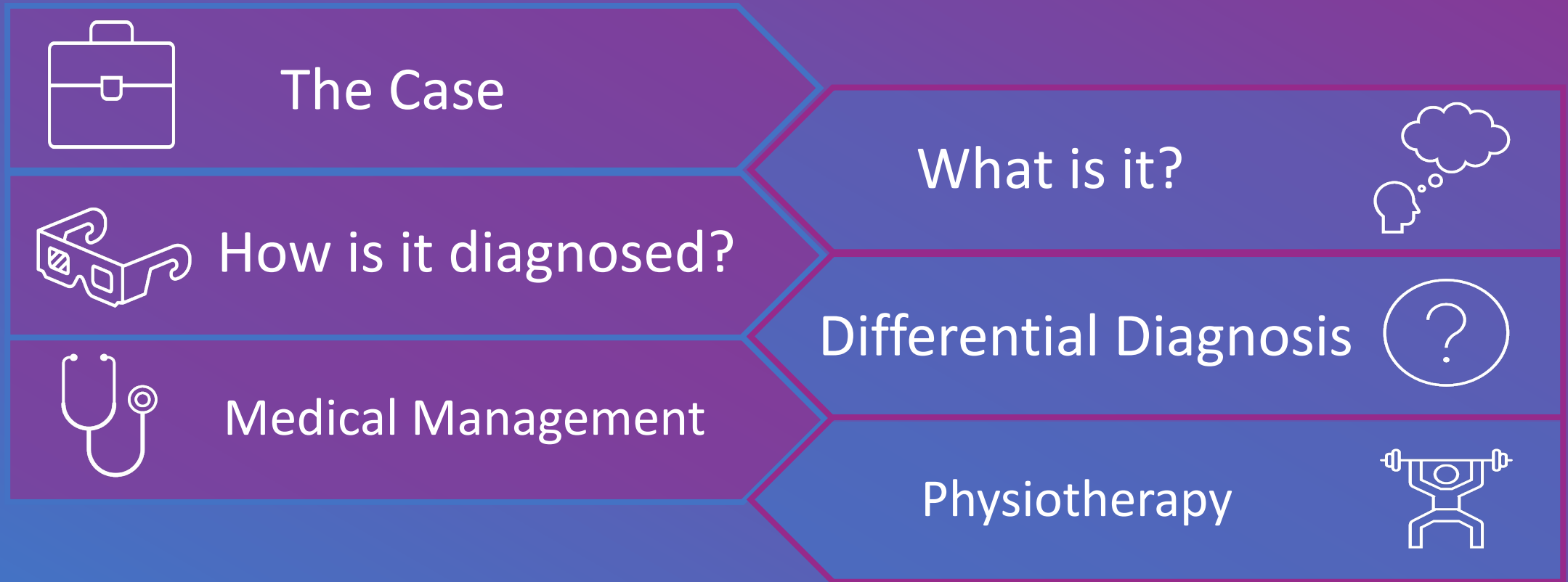
Surgical intervention

- Removal of Cervical osteophytes (Harlianto, et al, 2022) Level: IIIa
- Post THR heterotopic bone + lumbar fusion (Otsuki, et al, 2015) Level: IIa



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Physiotherapy – Physical Examination



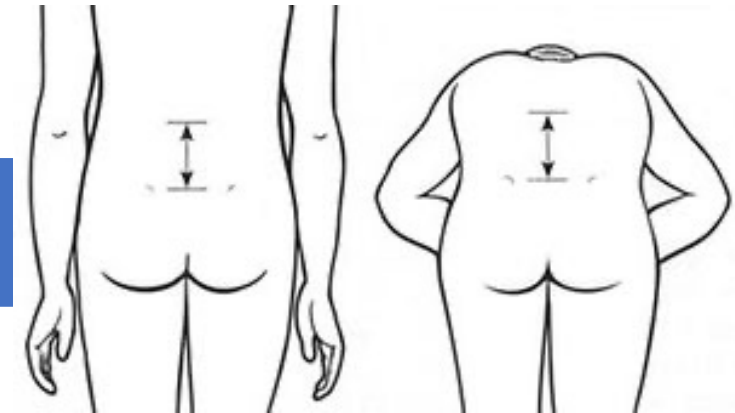
Outcome measures

- Neck pain and disability scale
- Quebec Back Pain Disability Scale*
- BASFI: Bath Ankylosing Spondylitis Functional Index *

Physical Examination

- Schober test*
- Finger-to-floor distance
- Lumbar lateral flexion*
- Chest expansion
- Occiput-to-wall distance
- Flexion and extension of the cervical spine*

(Olivieri, et al, 2007) Level IIIb





Physiotherapy – Exercise case study

- Quebec Disability index: 84/100 VAS 8/10
- 6 weeks: 30 sessions of 45-60 minutes
- Heat packs, resistance, aerobic and flexibility training

- Outcomes @ 3 months: Quebec 41/100, VAS 2/10
- Intensive follow-up at great expense
- (Patel & Patel 2020) Level IV





Physiotherapy management - Exercise

Exercise effect on back pain, spinal ROM and disability (n=15)

Intervention: 8 weeks with 14 supervised sessions, home based until 24 weeks

All physical measures improved VAS, spinal measures and BASFI

Schober test significantly improved (p=0.02)

24 weeks: 53% increased flexibility – 6 reported pain reduction



(Al Herz, et al, 2007) Level: IV

Dirt DISHed – the cleaning continues

- Consider the classification of DISH when interpreting studies –Resnick, 1976
 - Early phases of DISH are not reflected in radiology and literature... yet
- Physiotherapy intervention evidence is limited
- Consider function, impairments, goals, weight, local and systemic inflammation
 - Mobility, resistance and aerobic training
 - No current evidence for manual therapy in DISH



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