

## Cervical spine master class.

### Introduction:

The aim of this clinical note is to support the discussion of the two live sessions on 3<sup>rd</sup> of April and 10<sup>th</sup> of April 2020 on primephysiouk Facebook page. To access the live sessions please visit primephysiouk facebook page ([click here](#))

The live facebook sessions will explore management of cervical spine from different perspectives and allow the audience to ask questions and interact with the tutors.

You can still watch the live sessions any time, so not to worry if you are reading this article after live session dates.

As you read through the note you will find TASKS that I really recommend you engage with, these tasks will help your understanding of the topic and may fill some gaps in your knowledge. As an adult learner it is always important that you set some learning objectives before and after the completion of this short course.  
I hope you enjoy reading and working on these notes.

**The main themes of this clinical notes are as follow:**

- 1- Setting the scene**
- 2- Classification system**
- 3- Red flags**
- 4- Treatment based classification**
- 5- Subjective examination**
- 6- Physical examination**
- 7- Case study**
- 8- Appendix**
- 9- Link to [practical videos](#)**
- 10- References and recommended reading**

## Setting the scene:

Setting the right terminology is crucial to help the discussion of these clinical notes. In the following text the focus will be on the term **Cervicobrachial pain**.

It is **defined** as pain present on the upper quadrant associated with cervical spine pain (Jull et al., 2008).

Pain and symptoms in the upper quadrant can be referred to:

- The upper limb from somatic structures
  - Somatic structures include neck muscles (Leffler et al., 2003),
  - Zygapophyseal joints (Fukui et al., 1996)
  - Intervertebral discs (Slipman et al., 2005).
- Radiate to the upper limb through neuropathic mechanisms.
  - Radiating arm pain is commonly derived from the nerve root or trunk (Carette and Fehlings, 2005).

Cervicobrachial pain has been estimated to be more frequent than neck pain in isolation (Daffner et al., 2003). It constitutes 32 % ,over a period of 4.9 years, of patients presenting with cervical spine pain disorders Radhakrishnan et al. (1994). Due to the persistency and recurrence it impacts patient's mental and physical health as well as adding high cost for societies and health care. (Daffner et al., 2003) (Karjalainen et al., 2006).

# Clinical Notes

## Classification Process:

### First Level of Classification:

Classification approach begins with a comprehensive review of:

Patients medical history  
Review of current general health and specific systems.

### General Health questions include:

Fatigue  
Malaise  
Loss of weight weakness  
Unexplained weight loss  
Any of the 5 Ds (Dizziness- diplopia-dysarthria-dysphagia-drop attacks)  
Any of all of the 3Ns (Nausea-Night pain nystagmus)  
Change in cognition  
Chills-sweats or fever

### Red Flags screening:

Red flags. As simple definition of red flags is signs or symptoms that may indicate the need for:

Further investigation (scanning -Blood Test-Sonography).  
e.g. patient with history of trauma

Referral for general practitioner or medical consultation  
Signs of visceral involvement or non-mechanical origin of symptoms  
Immediate referral for accident and emergency  
e.g. sign of instability following trauma- clear signs of infection- clear signs of severe myelopathy.

### Task:

**Which systems/organs can refer symptoms to the following areas:**

- **Right shoulder**
- **Left arm**
- **Occiput**

**Clinical examples with guidance for decision making:**

Referral for medical consultation and or further screening is required in the following scenarios:

Car traffic collision  
Blunt trauma  
Axial or compressive force  
**Spinal Fracture**

Unexplained weight loss  
History of cancer  
Loss of appetite  
Night pain & or sweating  
Constant persistent pain  
**Inflammatory**  
**Carcinogenic origin**

History of Trauma (not a must)  
Positive cranial nerve testing  
One of the 5 Ds and 3 Ns  
Any of the above plus non  
mechanical nature of symptoms  
**Cervical arterial dysfunction**  
**(CAD)**

**Subjective examination:** Intolerance to prolonged static postures

Fatigue and inability to hold head up  
Better with external support (hands or collar)  
Frequent need to self-manipulate  
Shaking or Lack of control  
Frequent episodes of acute attacks  
Sharp pain with sudden movement

**Physical examination :**Positive Alar and transvers ligament instability tests  
(Cook 2005)

**Spinal Fracture**

Bilateral sensory disturbance  
Gait or balance disturbance  
Upper limb motor weakness  
Positive Babinski sign  
Diminished reflexes

**Cervical myelopathy**

**Task:**

- **Revise the anatomy and mechanics of Alar and transverse ligaments**
- **Visit YouTube and watch at least three different ways for Alar and transverse ligament testing.**

### Once you have completed the screening of red flags

Identification of Yellow Flags will follow. Yellow flags are defined as group of signs and symptoms, usually related to psycho-social factors that may indicate poor prognosis or high likelihood of recurrence. Examples:

**Fear Avoidance** (Avoiding movement due to fear of pain -movement may cause damage to my tissues)

**Work stress**

**Beliefs** (I have got a disc bulge and surgery is required-Disc problems are not treatable-manipulation and passive treatment is the only option for me)

**Task:**

- **Would you think of other examples of Yellow flags?**

### Second Level of Classification:

Once red flags are ruled out and Yellow flags are considered (how?) the next stage is to classify the patient based on the key impairment and matching the symptoms and dysfunction to a selected intervention.

**Remember: Classification system that does not guide your treatment is not clinically relevant, to be honest it is useless.**

Therefore, a treatment-based classification (Fritz and Brennan 2007) will be followed in this discussion. In this classification system patient signs and symptoms obtained from subjective and physical examination using a clinical algorithm.

### Screening of Red and Yellow Flags

**No red flags Yes** → Refer for medical consultation or further investigation

**No** → Progress to Classification process.

## Classification Process:

### A-Mechanism of injury is motor traffic accident

**Yes** → Duration of symptoms is more than 30 days **Yes** → VAS is more than 7 or Neck disability index is more than 52 **Yes** → Pain Control

*Pain control:*

May include one or more of the following medication- low grade mobilization- soft tissue release- Active ROM and general exercises

### B-Are there any signs of Nerve root compression or symptoms are distal to the elbow?

**Yes** → Centralization strategies

*Examples of Centralization strategies:*

Cervical spine movement that may centralize the symptoms if performed repeatedly. e.g. Retraction or extension (McKenzie and May 2003)

Mobilization strategies e.g. lateral glide

Median nerve neural gliding (winner et al 2003)

Mobilization strategies directed to cervical and thoracic spine (Cleland 2007)

### C-Is the patient's chief complaint being mainly headache with neck pain?

**Yes** → Does any neck movement affect the headache (Decrease or increase) **Yes** → Cervicogenic headache. Use mobilization strategies e.g. Upper cervical spine sustained or oscillatory Poster anterior mobilization- Activation of deep neck flexors. (Jull et al 2002)

N.B Make sure you exclude signs of migraine.

**No** → Non cervicogenic headache → Refer for medical consultation

### D-Are the patient symptoms does not involve any of the above?

**Yes** → Mobility, exercise and conditioning e.g. Neck muscle activation (Bronfront 2001) (Falla et al 2014)- general exercises- Thoracic spine mobility

## Task:

- **How the pressure dynamometer could be used in assessment and rehabilitation of deep neck flexors?**
- **Think of different self-mobilization strategies to increase cervical and thoracic rotation and extension?**

## Subjective examination:

Below is an example of main subjective examination questions that clinician must ask.

“In subjective examination ask as much as you can, and you will get similar amount of confusion” (Saad 2018). Subjective examination must be specific and focused. In addition to knowing basic necessary information like location of history of symptoms and past medical history, Ideally the subjective examination process, patient interview, **aims to:**

- 1- Establish a therapeutic relationship with new patients.

Friendly and informal approach provides status of ease and comfort and encourage the patient to be open, clear and specific in his answers. Consequently, that will help the clinician to get the most out of the interview.

- 2- To get clear understanding of the mechanism of injury 'if possible'.

But remember that mechanism of injury is not always indicative of the injured structure, so ,do investigate the injury mechanism but do not really make decisions solely based on it.

- 3- Understand “ What the patient wants”.

Understanding patient's treatment objectives help the clinician to tailor and design a personalized management plan to fulfill the patient objectives. Specific objectives are one of the key factors to develop better patient compliance and satisfaction.

- 4- Get details of symptoms behavior

Severity, irritability and nature of symptoms or what we call SIN factors are originally driven from Geoff Maitland (1974), severity and irritability of symptoms are used as outcomes measures, guide the physical examination and treatment selection process. e.g. imagine patient with sever and highly irritable knee pain, applying any knee testing is less likely to provide much information today.

Nature of symptoms occasionally provide information to guide the differential diagnosis process e.g. sharp shooting pain, pins and needles and numbness could be indicative of neural pain, however, dull and diffuse pain at the end of ROM might indicate atherogenic or capsular origin of symptoms. While knowing the nature of symptoms is always helpful to help shaping a clinical picture of the problem, however, patients are not always capable of providing clear description of symptoms particularly in acute stages. Again, it is recommended that clinicians do not always rely solely on patient description of nature of symptoms, look at the whole picture not just at the small detail.

Easing and Aggravating factors must be explored well in this section as it guides your specific selection of what must/should be included in physical examination section, guides differential diagnosis process and treatment strategies.

Therapist Name:

[www.omtae.org](http://www.omtae.org)

(OMTC 2018)

Assessment Sheet



**Subjective examination**

Social history: Job

Functional activities:

Main problem

Why You're here today:

**Symptoms behaviour:**

S (severity):

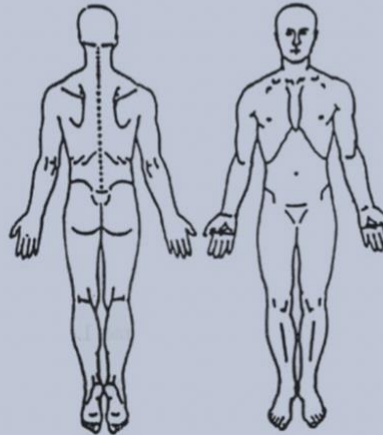
I (Irritability):

N (Nature):

Aggravating factors:

Easing factors:

24-hour pattern: AM: PM: Night:



**Special Questions:**

Dysphagia	Dizziness	Drop attacks	Diplopia	Dysarthria	Nystagmus	Nausea
Night pain	Night sweating	History of Cancer	Sudden weight loss	Loss of appetite	History of Trauma	Saddle anaesthesia

**History of current problem:**

Present:

.....  
 .....  
 .....

Past

.....  
 .....

Medical:

.....  
 .....

Based on the information gathering section what are the aims of the physical examination you willing to apply today:

.....  
 .....



## Physical examination

### Upper quadrant Must physical examination procedures include:

#### 1- AROM and PROM testing for cervical and thoracic spine

- This is a must for all groups of patients it provides overview of general mobility status, identify any atherogenic involvement and occasionally can identify a preferred direction that may centralize and/or decrease the symptoms and/or increase the cervical mobility.

#### 2- Repeated movement testing

- To confirm if the patient problem is mechanical or not



#### 3- Neuro dynamic tension testing.

Mainly median nerve but other neural tension tests would be involved based on symptoms referral and location of peripheral symptoms.



#### 4- Deep neck flexors activity testing

#### 5- Neurological examination: Dermatome and myotome and reflexes testing:

- Particularly if the patient he referred symptoms or reported motor weakens of the upper or lower limbs.

#### 6- Self-reported measures (see appendix)

- **VAS:** score 0-10 - Used Every session
- **Patient specific functional scale (PSFS):** score 0-10 – Used Weekly
- **Neck disability index (NDI):** Score 0-50 Used at initial consultation and discharge
- **Fear avoidance beliefs questionnaire (FABQ):** 0-24 Physical activity subscale Used at initial consultation and discharge

### Case study:

**You have read the following referral letter. Mrs. Sarah (the patient) is waiting in the clinic reception.**

1-Get ready with the most important questions that you must consider in subjective examination today

2-Is there any sign of red flag?

3-If all clear and you decided to go ahead with physical examination. What physical examination procedures you must apply today?

Dear Physiotherapist,

Re: Mrs Sarah 48 years old

- Active Problems: Neck Pain, anxiety, history of shoulder pain
- Passive Problems: left sided mastectomy 4 years ago.
- Investigations: Bloods normal.

This lady complains of gradually worsening right sided neck pain. It started 6 months ago for no apparent reason. She is getting worried that her pain is caused by something serious. Rotation to her left side increases the pain and she now tries to avoid turning her neck to that side.

Previous physiotherapy for her neck and shoulder pain (four months ago) was unsuccessful, although the patient reports that her right-sided shoulder pain had decreased considerably following the physiotherapy treatment (mobilisations). I think her shoulder problem was unrelated to her neck problem.

She is otherwise in good health. The oncologists review her six monthly and her latest bone-scan was clear. Her ESR is within normal range.

Thank you for seeing her.

## Appendices

### Appendix 1:

#### Supporting evidence for treatment approaches:

#### Synthesis of results as stated by Salt et al (2011)

#### ***A systematic literature review on the effectiveness of non-invasive therapy for cervicobrachial painq Emma Salt a,\*, Chris Wright b , Sue Kelly b , Allison Dean***

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#### **General physiotherapy**

There was no evidence to support that general physiotherapy was more beneficial than comparators (such as use of collar) in reducing pain post-intervention, or at longer-term follow-ups (Persson et al., 1997; Persson and Lilja, 2001; Kuijper et al., 2009). Regarding function, participants who received physiotherapy performed significantly better ( $p < 0.05$ ) on three of the twelve aspects of the Disability Rating Index (walking, sitting for a long time and heavy work) at fifteen weeks compared to those wearing a collar (Persson and Lilja, 2001). Sitting for a long time remained improved at one year ( $p < 0.05$ ). Kuijper et al. (2009) found a non-significant improvement in NDI for participants receiving physiotherapy compared to a 'no-specific treatment' comparator ( $p \approx 0.090$ ). Regarding disability, participants who received physiotherapy had improved scores on the Sickness Impact Profile compared to collar use at 15 week follow-up ( $p < 0.05$ ), but not at one year ( $p > 0.05$ ) (Persson et al., 1997). General physiotherapy did not improve psychological or psychosocial well-being ( $p > 0.05$ ) (Persson and Lilja, 2001).

#### **Traction**

There were no statistically significant differences between groups for participants receiving traction (either intermittent or sustained) compared to placebo traction in terms of pain, function or disability post-intervention or at follow-up (Klaber Moffett et al., 1990; Young et al., 2009). Potential for change using sustained traction was seen (Klaber Moffett et al., 1990).

#### **Manual therapy and exercise**

The meta-analysis found a trend that manual therapy and exercise was favourable in reducing pain post-intervention. Both Walker et al. (2008) and Ragonese (2009) found reduced pain at three weeks following the commencement of manual therapy and exercise. Significant between-group differences were only found in Ragonese's study ( $p < 0.01$ ). Walker et al.'s (2008) follow-ups at 6 weeks and one year found a statistically significant reduction in pain from baseline for the manual therapy and exercise group ( $p < 0.005$ ) (unlike the minimal intervention comparator;  $p \approx 0.08$ ), however between-group differences were not sufficient to reach statistical significance ( $p \approx 0.21$ ). Some studies focused on evaluating specific forms of manual therapy. Allison et al. (2002) found significant improvements in pain at 8 weeks, for participants receiving neural-biased manual therapy (cervical lateral glide and shoulder girdle

oscillation) compared to those receiving articular-biased treatments (glenohumeral and thoracic mobilisation) ( $p \approx 0.03$ ). Coppieters et al. (2003) focused on the lateral glide specifically. They found, unlike the ultrasound comparator, the lateral glide intervention resulted in a significantly improved pain response to a 'neural tissue provocation test' test for the upper limb immediately post intervention ( $p < 0.0003$ ). Howe et al. (1983) found cervical manipulation to significantly reduce neck pain immediately post-intervention compared to control ( $p < 0.001$ ), however there were variable responses to upper limb pain ( $p < 0.02$  in the shoulder;  $p \approx 1.97$  in the arm/hand). No significant improvements were found at one week follow-up. Two participants in the manipulation group also had facet joint injection (lidocaine and hydrocortisone) to "allow the manipulation to be carried out". It was not reported whether participants who received injections made any significant improvement compared to those who did not. Both injection therapy and cervical manipulation have documented risk factors. Adverse events were not reported. Regarding function and disability, Ragonese (2009) found a significant improvement at three-week follow-up on NDI scores for participants who had received manual therapy and exercise compared to those who received either manual therapy or exercise. No other studies replicated these findings.

**Behavioral therapy** Bernaards et al. (2007) evaluated whether behavioural changes towards working style with or without engagement in physical tasks would be more effective than 'usual care'. The level and type of intervention in 'usual care' was not specified. There were no significant between-group differences on any measure post-intervention. At one-year follow-up, the group receiving the working style behavioural change without the physical task engagement, improved significantly compared to the 'usual care' group for pain ( $p < 0.05$ ). However, as acknowledged by the authors, differences were small.

## Appendix 2

### Outcome measures

#### NECK PAIN DISABILITY INDEX QUESTIONNAIRE

**PLEASE READ:** This questionnaire is designed to enable us to understand how much your neck pain has affected your ability to manage your everyday activities. Please answer each section by circling the ONE CHOICE that most applies to you. We realize that you may feel that more than one statement may relate to you, but **PLEASE JUST CIRCLE THE ONE. CHOICE WHICH MOST CLOSELY DESCRIBES YOUR PROBLEM RIGHT NOW.**

<p><b>SECTION 1 - Pain Intensity</b></p> <p>A I have no pain at the moment.            B The pain is very mild at the moment.            C The pain is moderate at the moment.            D The pain is fairly severe at the moment.            E The pain is very severe at the moment.            F The pain is the worst imaginable at the moment.</p>	<p><b>SECTION 6 - Concentration</b></p> <p>A I can concentrate fully when I want to with no difficulty.            B I can concentrate fully when I want to with slight difficulty.            C I have a fair degree of difficulty in concentrating when I want to.            D I have a lot of difficulty in concentrating when I want to.            E I have a great deal of difficulty in concentrating when I want to.            F I cannot concentrate at all.</p>
<p><b>SECTION 2 - Personal Care (Washing, Dressing, etc.)</b></p> <p>A I can look after myself normally without causing extra pain.            B I can look after myself normally, but it causes extra pain.            C It is painful to look after myself and I am slow and careful.            D I need some help, but manage most of my personal care.            E I need help every day in most aspects of self care.            F I do not get dressed, I wash with difficulty and stay in bed.</p>	<p><b>SECTION 7 - Work</b></p> <p>A I can do as much work as I want to.            B I can only do my usual work, but no more.            C I can do most of my usual work, but no more.            D I cannot do my usual work.            E I can hardly do any work at all.            F I cannot do any work at all.</p>
<p><b>SECTION 3 - Lifting</b></p> <p>A I can lift heavy weights without extra pain.            B I can lift heavy weights, but it gives extra pain.            C Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, for example, on a table.            D Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.            E I can lift very light weights.            F I cannot lift or carry anything at all.</p>	<p><b>SECTION 8 - Driving</b></p> <p>A I can drive my car without any neck pain.            B I can drive my car as long as I want with slight pain in my neck.            C I can drive my car as long as I want with moderate pain in my neck.            D I cannot drive my car as long as I want because of moderate pain in my neck.            E I can hardly drive at all because of severe pain in my neck.            F I cannot drive my car at all.</p>
<p><b>SECTION 4 - Reading</b></p> <p>A I can read as much as I want to with no pain in my neck.            B I can read as much as I want to with slight pain in my neck.            C I can read as much as I want to with moderate pain in my neck.            D I cannot read as much as I want because of moderate pain in my neck.            E I cannot read as much as I want because of severe pain in my neck.            F I cannot read at all.</p>	<p><b>SECTION 9 - Sleeping</b></p> <p>A I have no trouble sleeping.            B My sleep is slightly disturbed (less than 1 hour sleepless).            C My sleep is mildly disturbed (1-2 hours sleepless).            D My sleep is moderately disturbed (2-3 hours sleepless).            E My sleep is greatly disturbed (3-5 hours sleepless).            F My sleep is completely disturbed (5-7 hours)</p>
<p><b>SECTION 5 - Headaches</b></p> <p>A I have no headaches at all.            B I have slight headaches which come infrequently.            C I have moderate headaches which come infrequently.            D I have moderate headaches which come frequently.            E I have severe headaches which come frequently.            F I have headaches almost all the time.</p>	<p><b>SECTION 10 - Recreation</b></p> <p>A I am able to engage in all of my recreational activities with no neck pain at all.            B I am able to engage in all of my recreational activities with some pain in my neck.            C I am able to engage in most, but not all of my recreational activities because of pain in my neck.            D I am able to engage in a few of my recreational activities because of pain in my neck.            E I can hardly do any recreational activities because of pain in my neck.            F I cannot do any recreational activities at all.</p>

**COMMENTS:** \_\_\_\_\_

**NAME:** \_\_\_\_\_ **DATE:** \_\_\_\_\_ **SCORE:** \_\_\_\_\_

## FEAR AVOIDANCE BELIEFS QUESTIONNAIRE (FABQ)

**Purpose:** The FABQ was developed by Waddell to investigate fear-avoidance beliefs among LBP patients in the clinical setting.<sup>3</sup> This survey can help predict those that have a high pain avoidance behavior. Clinically, these people may need to be supervised more than those that confront their pain.

**Scoring:** The FABQ consists of 2 subscales, which are reflected in the division of the outcome form into 2 separate sections. The first subscale (items 1-5) is the Physical Activity subscale (FABQPA), and the second subscale (items 6-16) is the Work subscale (FABQW). Interestingly, not all items contribute to the score for each subscale; however the patient should still complete all items as these items were included when the reliability and validity of the scale was initially established. A low FABQW score (less than 19) was one of 5 variables in a clinical prediction rule that increased the probability of success from SI region manipulation in individuals with low back pain.<sup>1</sup> Each subscale is graded separately by summing the responses respective scale items (0 – 6 for each item); for scoring purposes, only 4 of the physical activity scale items are scored (24 possible points) and only 7 of the work items (42 possible points). The method to score each subscale is outlined below. (Note: It is extremely important to ensure all items are completed, as there is no procedure to adjust for incomplete items.)

**Scoring the Physical Activity subscale (FABQPA)**

Sum items 2, 3, 4, and 5 (the score circled by the patient for these items).

**Scoring the Work subscale (FABQW)**

Sum items 6, 7, 9, 10, 11, 12, and 15.

**Measurement Characteristics:** The FABQ has been demonstrated to be valid and reliable in a chronic LBP population<sup>3</sup> and appears to be a useful screening tool for identifying acute LBP patients who will not return to work by 4wks.<sup>2</sup>

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

Here are some of the things which other patients have told us about their pain. For each statement please circle any number from 0 to 6 to say how much physical activities such as bending, lifting, walking or driving affect or would affect your back pain.

	COMPLETELY DISAGREE		UNSURE			COMPLETELY AGREE	
1. My pain was caused by physical activity	0	1	2	3	4	5	6
2. Physical activity makes my pain worse	0	1	2	3	4	5	6
3. Physical activity might harm my back	0	1	2	3	4	5	6
4. I should not do physical activities which (might) make my pain worse	0	1	2	3	4	5	6
5. I cannot do physical activities which (might) make my pain worse	0	1	2	3	4	5	6

## Appendix 3

### [Link to Videos](#)

**This link will open a new window.**

**Please scroll down for cervical spine related practical videos.**

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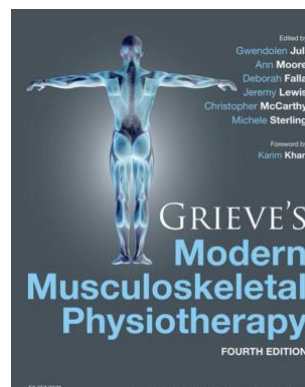
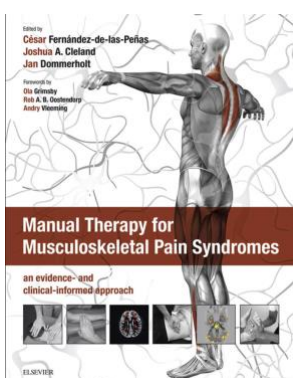
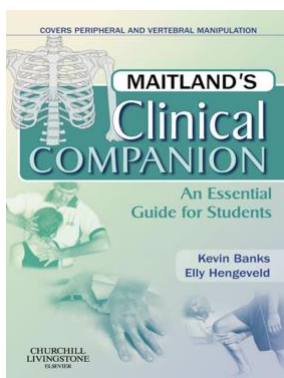
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