Red Flags & Metastatic Spinal Cord Compression (MSCC)

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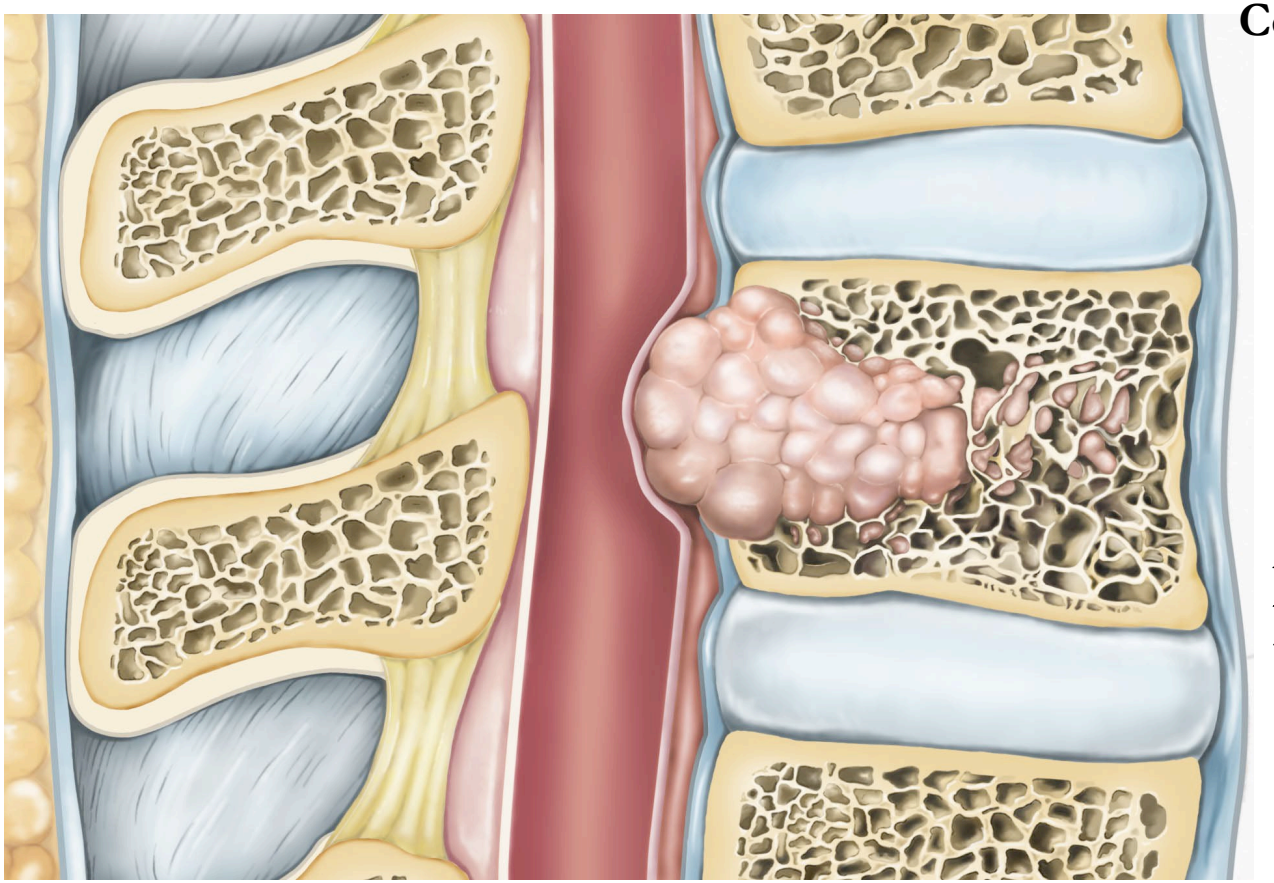
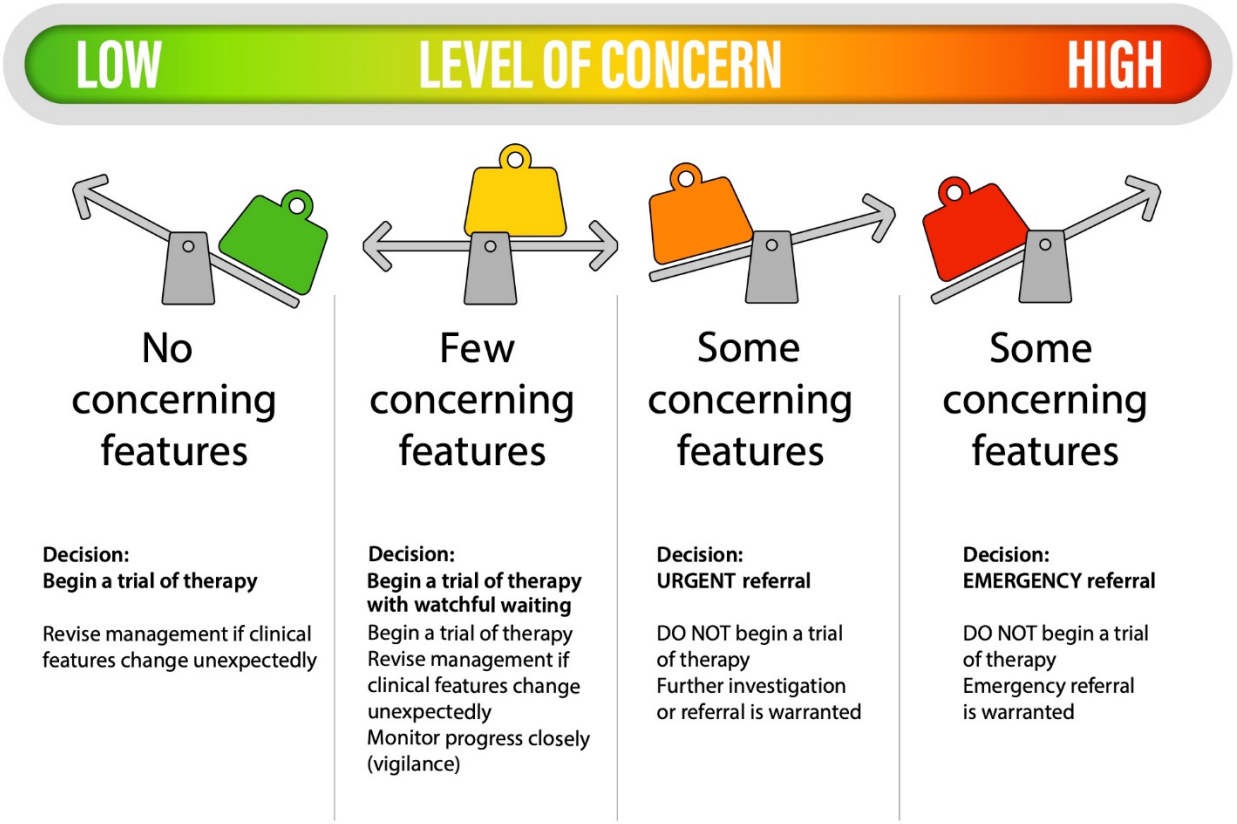


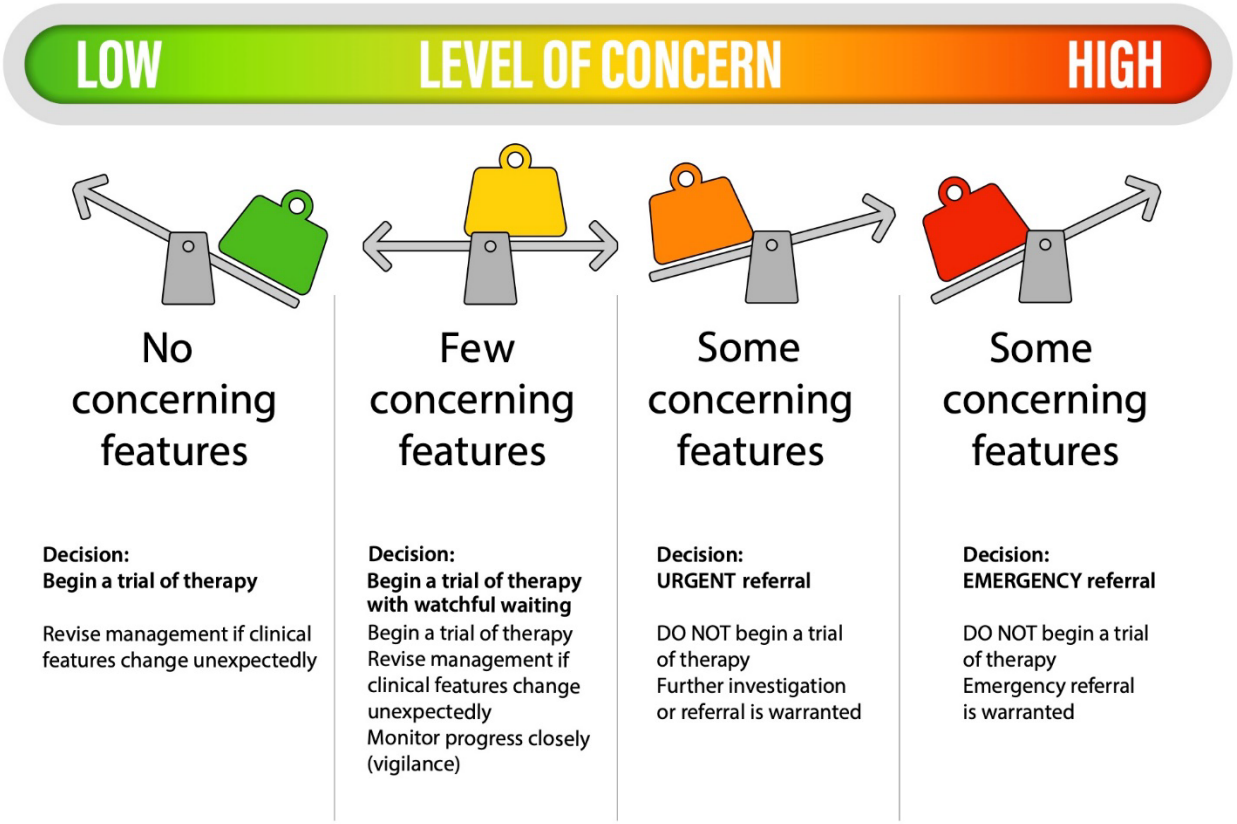
Acknowledge
Lena Richards, MSCC
Network Co-ordinator ,
The Christie FT

Decision model



- The skeletal system is the third most common site of metastases after the lung and liver
- Pain is the most common presentation of primary and metastatic lesions
- The chance that an elderly patient (60–79 years old) is affected by bony metastases is four times higher in men and three times higher in women than a middle- aged patient (40–59 years old)

Decision model



- Incidence of MSCC is 80 cases per million annually which equates to 4000 cases each year in England and Wales

- MSCC is an oncology emergency that requires early diagnosis and treatment to secure the best outcome

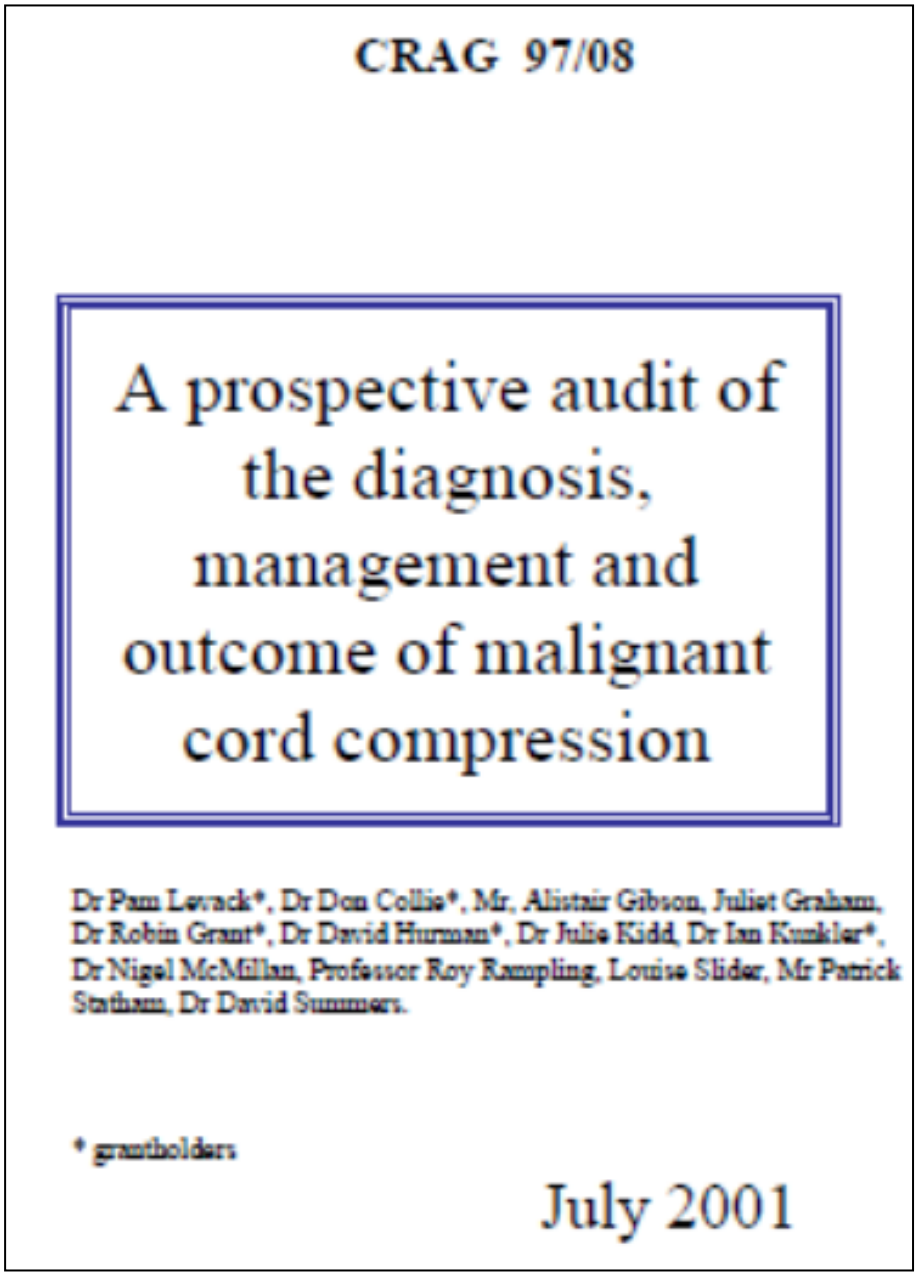
CRAG Audit report Scotland 2001

3 main findings:

- Lack of recognition of the early symptoms of MSCC
- Absence of an efficient referral pathway
- Lack of awareness of the most appropriate method of investigation

Recommendation:

- Guideline for early diagnosis of MSCC (West of Scotland guidelines, Feb ‘07, updated Oct ’13)



CRAG 97/08

A prospective audit of the diagnosis, management and outcome of malignant cord compression

Dr Pam Levack*, Dr Don Collie*, Mr. Alistair Gibson, Juliet Graham, Dr Robin Grant*, Dr David Hurman*, Dr Julie Kidd, Dr Ian Kunkler*, Dr Nigel McMillan, Professor Roy Rampling, Louise Slider, Mr Patrick Statham, Dr David Summers.

* grantholders

July 2001

The challenge: Improve Outcomes

Best outcomes with early diagnosis: treatment before paralysis, but:

- Patients can present anywhere

FCP/Primary/Secondary care

- Patients need urgent diagnosis

Whole Spine MRI, CT Scan

- Treatment in specialist centers

Specialist surgery or XRT

- Delayed presentation: sociodemographic, male, age, Covid-19

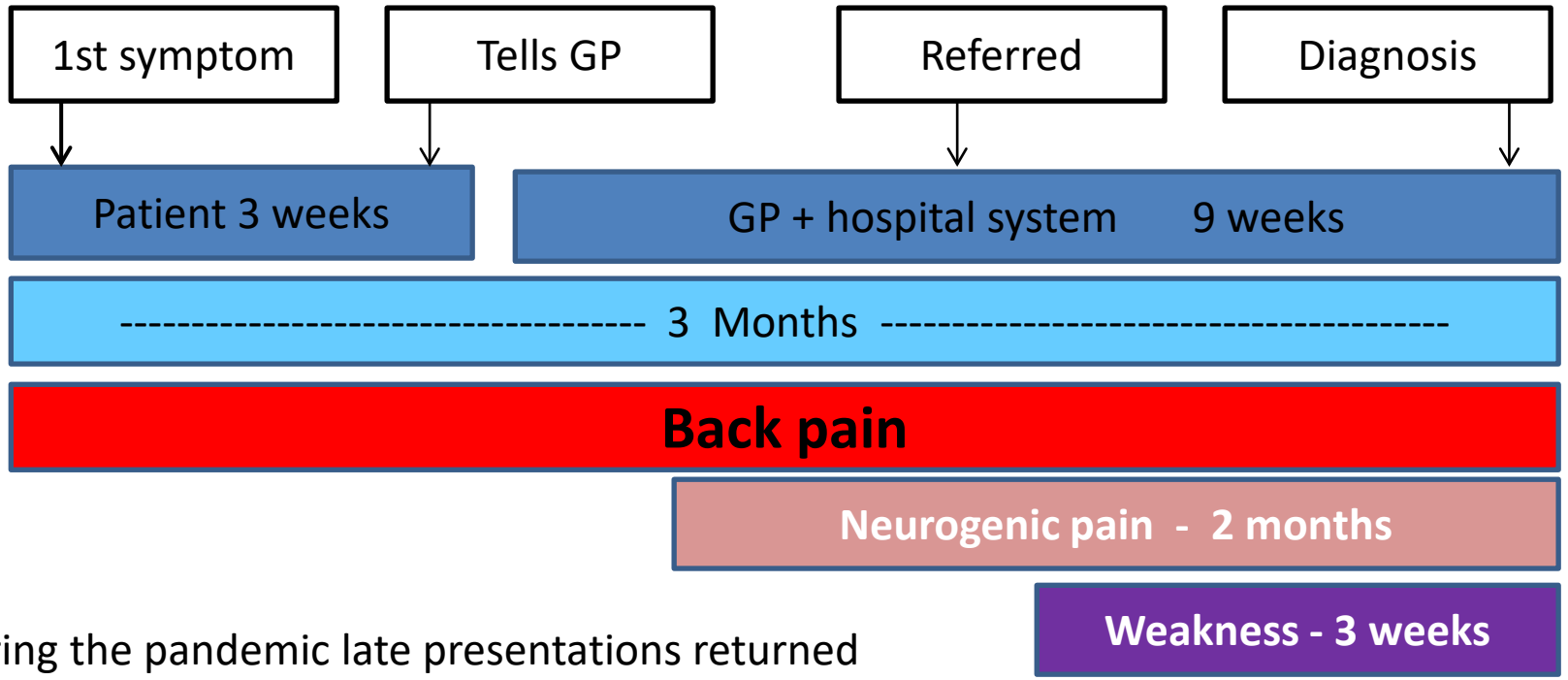
Covid-19 Challenge

- Pandemic resulted in a significant decline in the numbers of cancer diagnosis
- Cancers with potential window to be cured will be missed
- Modelling estimate changes in future death rates; 9.5% increase in deaths from breast cancer up to 5 years from diagnosis and 5.3% increase in lung cancer deaths
- Concern is that cancer rates will increase to numbers seen many years ago

(Vose, 2020. Delay in Cancer Screening and Diagnosis During the COVID-19 Pandemic:What is the Cost,? Oncology,)

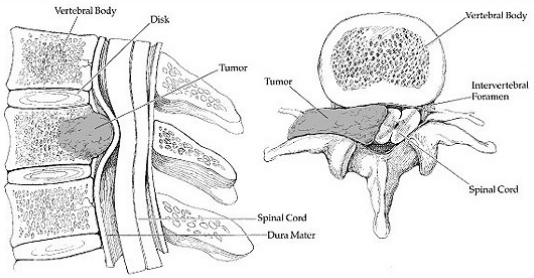
MSCC; background and future???

- CRAG report, 2001 (Scotland)
-
- From onset of symptoms to referral 3 months
- 48% of patients were unable to walk at diagnosis



- During the pandemic late presentations returned

Definition



*…compression of the dural sac and its contents (spinal cord +/or cauda equina) by an extradural tumour mass. The minimum radiological evidence, is **indentation of the theca** at the level of clinical features'…*

(Loblaw and Laperriere, 1998)

- Early diagnosis and treatment is essential to prevent neurological damage, maintain stability, improve outcome and quality of life

MSCC- the Oncological Emergency!!

- In **25%** (30% post pandemic?)of MSCC cases, cord compression was the first presenting symptom of malignancy

- **5-10%** of patients with confirmed malignant disease progress to MSCC. Risk increases with disease duration

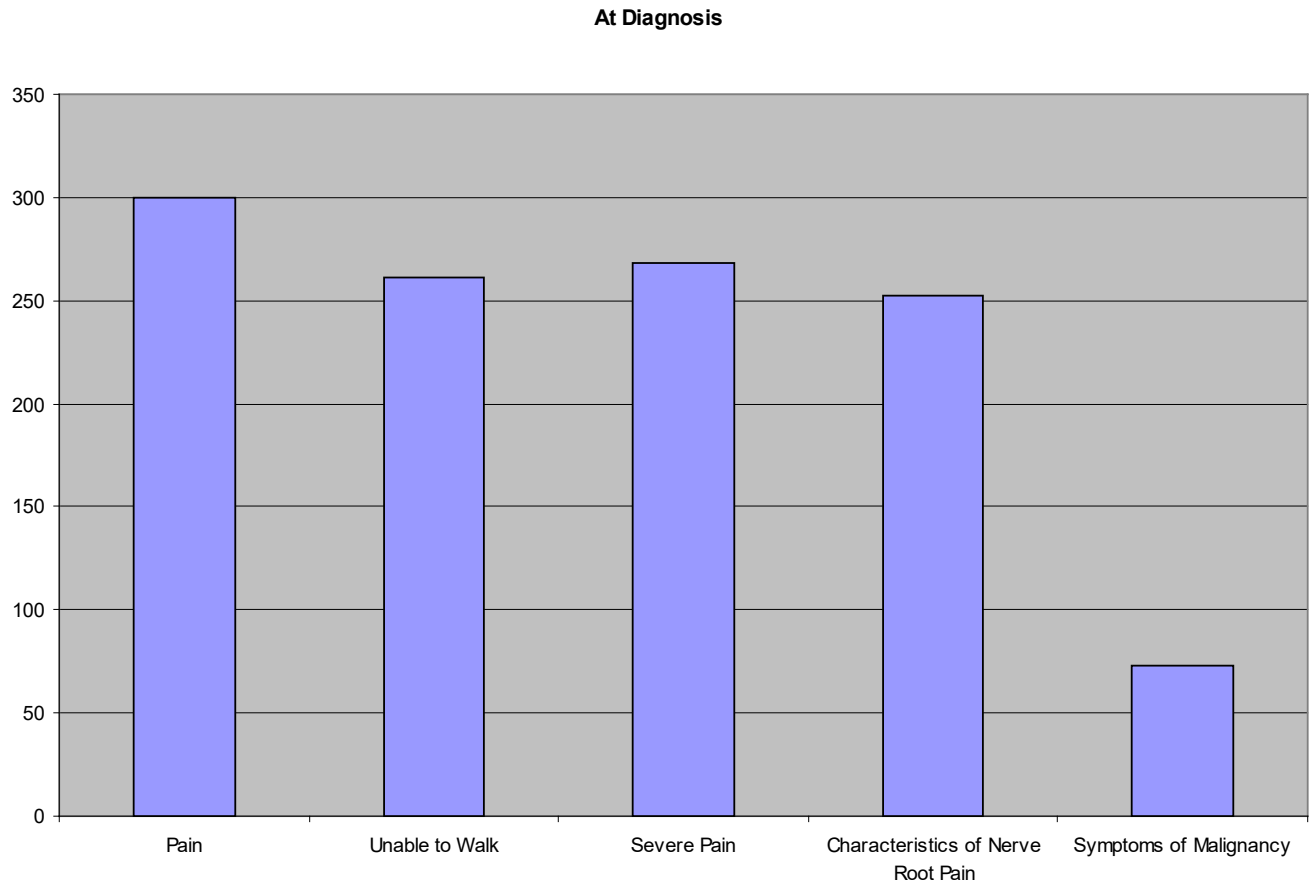
Paraplegia

- Paraplegia has been identified as increasing the risk of earlier than expected death in MSCC patients (Patchell et al, 2005, Levack et al, 2001)
- 85% are as a consequence of vertebral collapse
- Sudden onset MSCC worse functional prognosis than gradual

Difficulty with Signs and symptoms??

- Limb weakness can be difficult to detect even when subjective report exists
- Sensory damage is not necessarily indicative of degree or level of spinal damage
- Bladder and bowel dysfunction, signs of significant autonomic nerve damage occurs late in MSCC disease process

Symptoms at Diagnosis



Levack et al, 2002

Late Diagnosis

(Routes to diagnosis for cancer – determining the patient journey using multiple routine data set. Ellis-Brookes, 2012)

- Cancer survival in the UK falls below Europe
- Lower survival rate in the first year after diagnosis due to late diagnosis C0VID-19
- 1/3rd cancer diagnosis made in A&E in over 70s
- In all ages ¼ are diagnoses through A&E

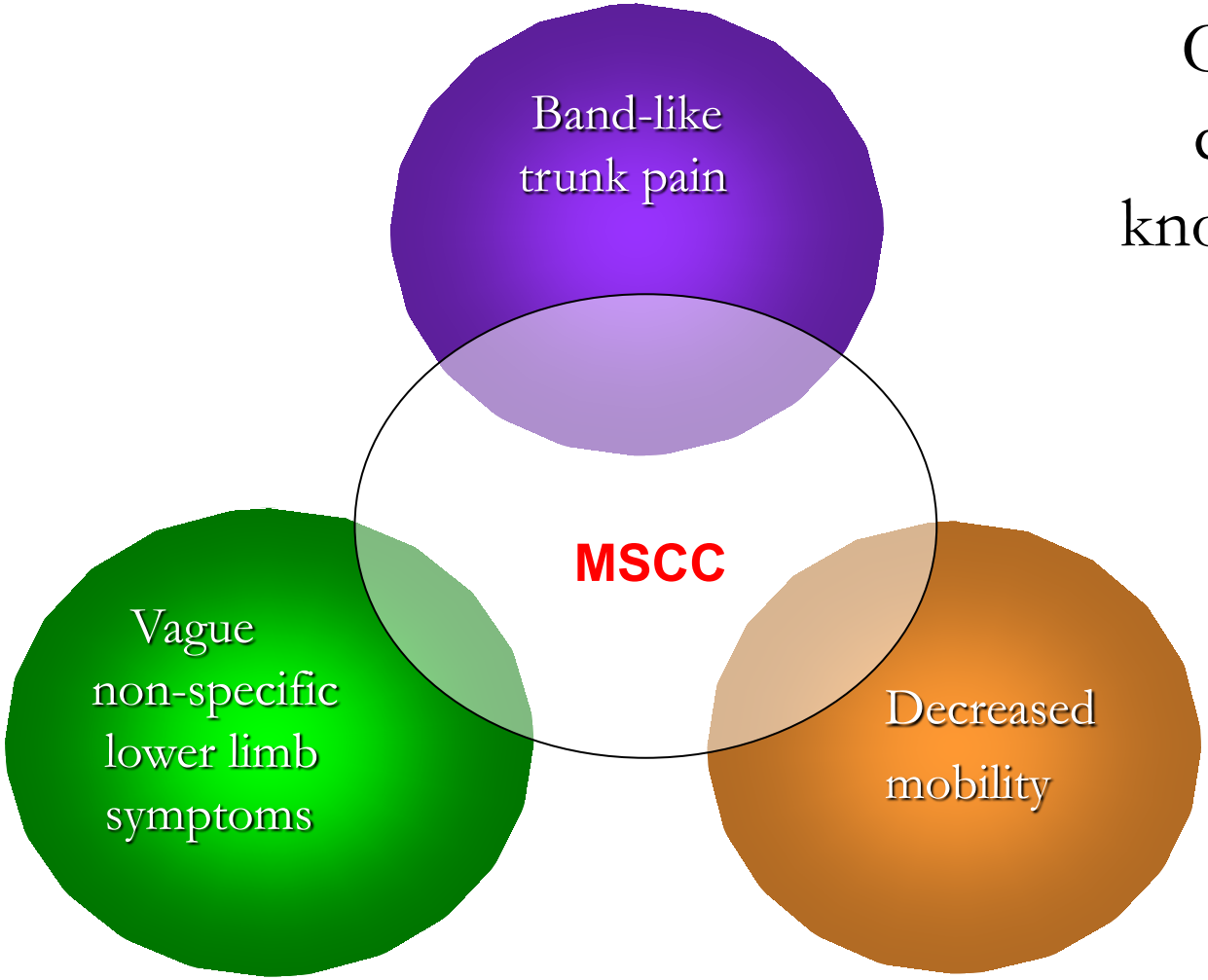
Developing an early alert system for metastatic spinal cord compression (MSCC)

A multitude of Red Flags: **None specific to MSCC**

The diagnostic problem of MSCC

- Expert knowledge of MSCC was in professional silos
- Patients present to a variety of non-specialist practitioners within 3 weeks of the onset of Back Pain
- 23% of MSCC cases initially present with no primary diagnosis or signs of cancer

What did the experts say?



Clinicians did confirm well known Red Flags

St Catherine's hospice care

Collaboration

- Recognition of a problem at both ends of the clinical pathway for MSCC
- Christies NHS Foundation Trust (European Cancer Centre) MSCC Guidelines (2007)
- *NICE Guidelines November, 2008*

Royal Bolton Healthcare NHS
NHS Foundation Trust

uclan
University of Central Lancashire

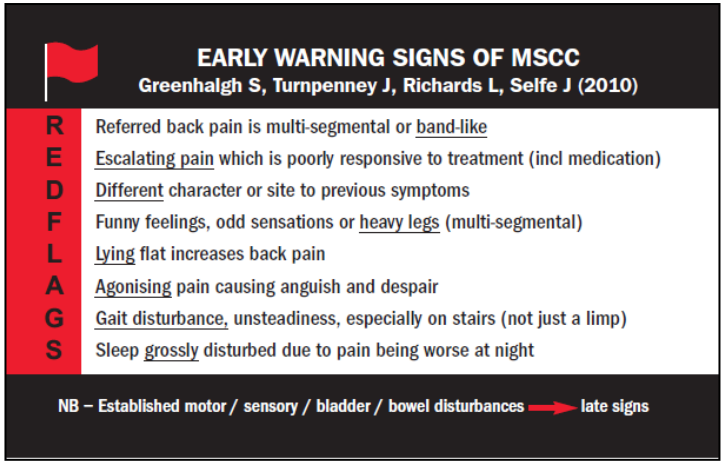
Greater Manchester and Cheshire NHS
Cancer Network

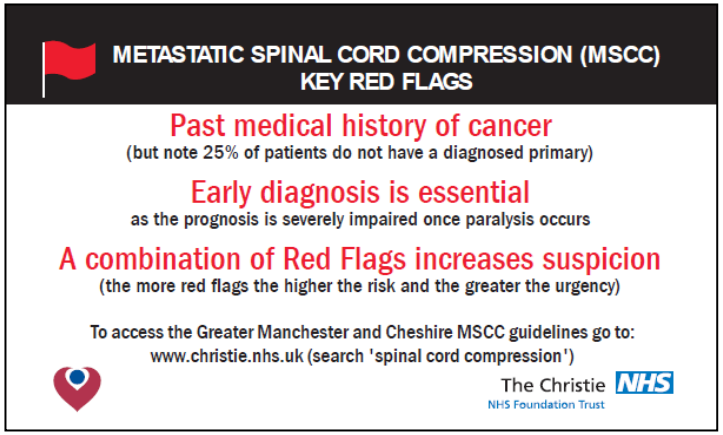
The Christie
TOWARDS A FUTURE WITHOUT CANCER

- **A user friendly list of MSCC Red Flags was required for front-line clinicians**
- **Face to face discussion alongside wider peer review**

Red Flags

94% patients complain of back pain as their first symptom of MSCC





Cards available on request

Referred or BAND LIKE pain
Escalating Pain: Poor response to treatment
Different character or site than previous

Funny or 'odd sensations' or 'heavy legs'
Lying flat increases pain
Agonising or severe back pain
Gait disturbance: Unsteady, stairs difficult
Sleep disturbance with night pain

Established Motor/Sensory/Bladder/Bowel disturbances are LATE SIGNS = poor functional outcome and survival.

Ref: [Turnpenney J, Greenhalgh S, Richards L, Crabtree A, Selfe J, (2013) Developing an early alert system for metastatic spinal cord compression. Primary Health Care Research & Development].

National Institute for Clinical Excellence MSCC Guidelines[1]

Key priorities:

1. Service configuration and urgency of treatment – **have a single point of contact for access to the MSCC coordinator to advise clinicians and coordinate the care pathway**
2. Early detection
3. Imaging
4. Treatment of spinal metastases and MSCC
5. Supportive care and rehabilitation

[1] NICE 2008, reviewed Feb 2014 (no new evidence that affect recommendations, next review Feb 2019)

Assessment

GAIN
GUIDELINES AND AUDIT IMPLEMENTATION NETWORK

4 cardinal signs and symptoms of MSCC

- Pain
- Sensory Dysfunction
- Motor Dysfunction
- Bladder and Bowel Dysfunction

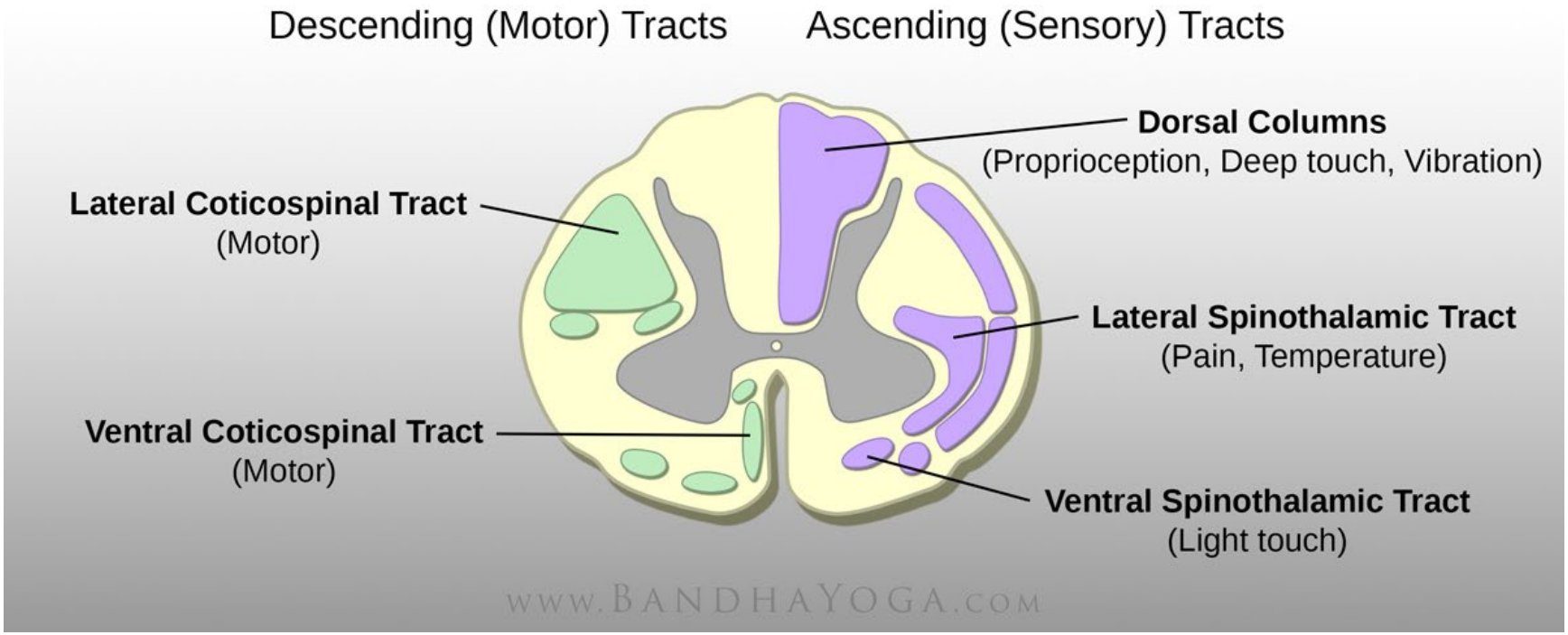
Pain

- Location, behaviour and type of pain (body chart)
- Description of pain (e.g. band like)
- Severity / intensity (VAS)
- Aggravating/easing factors
- Night pain
- Current medication

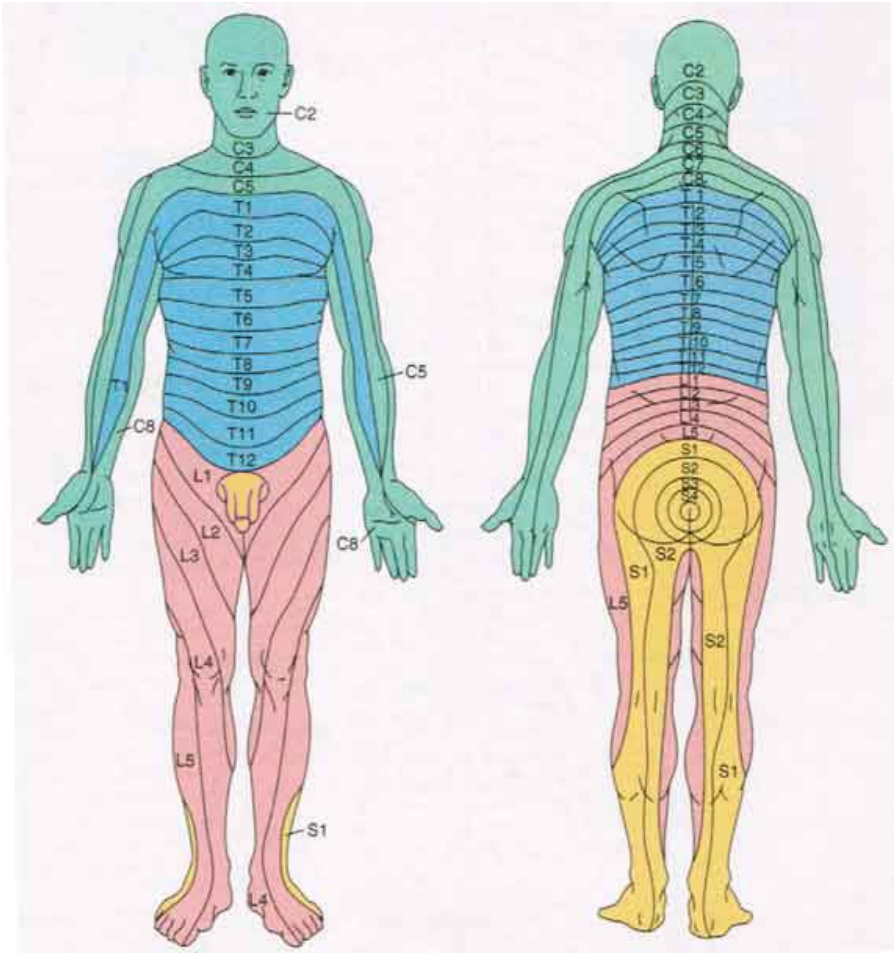
Neurology
sensory and motor function
Sensation and Proprioception

- Light touch sensation
- Sharp / blunt or pin-prick sensation
- Joint proprioception.
- Co-ordination

Sensation and Proprioception



DERMATOMES


C2
C3
C4
C5
T1
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T6
T10
L5
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S2
S2
S1
L5
S2
S1

Neurology
Motor function

- **Muscle power:** Oxford classification

- **Muscle tone**: flaccidity or spasticity:Modified Ashworth Score of Spasticity

Muscle Strength:Oxford Scale

Score	Muscle Response
5	Normal power
4+	Submaximal movement against resistance
4	Moderate movement against resistance
4-	Slight movement against resistance
3	Movement against gravity but not against resistance
2	Movement with gravity eliminated
1	Flicker of movement
0	No movement

Muscle Tone: Ashworth Scale

The Ashworth Scale		
Score	Ashworth Scale (1964)	Modified Ashworth Scale Bohannon & Smyth
0 (0)	No increase in tone	No increase in muscle tone
1 (1)	Slight increase in tone giving a catch when the limb was moved in flexion or extension	Slight increase in muscle tone, manifested by a catch and release or by minimal resistance at the end of the range of motion when the affected part(s) is moved in flexion or extension
1+ (2)		Slight increase in muscle tone, manifested by a catch, followed by minimal resistance throughout the remainder (less than half) of the ROM (range of movement)
2 (3)	More marked increase in tone but limb easily flexed	More marked increase in muscle tone through most of the ROM, but affected part(s) easily moved
3 (4)	Considerable increase in tone - passive movement difficult	Considerable increase in muscle tone passive movement difficult
4 (5)	Limb rigid in flexion or extension	Affected part(s) rigid in flexion or extension

Upper Limb Neurological Assessment

Courtesy of Velindre Cancer Centre / South Wales Cancer Network

Muscle Strength	R /5	L /5	Dermatomes (light touch)	R	L
Shoulder elevation (C3)					
Shoulder depression (C4)					
Shoulder abduction (C5)					
Elbow flexion (C6)					
Elbow extension (C7)					
Thumb extension (C8)					
Finger abduction (T1)					

Upper Limb Neurological Assessment

Co-ordination (thumb-fingers)	**R**	**L**

Proprioception (thumb position)	**R**	**L**

Date: _____

Physiotherapist: _____

Lower Limb Neurological Assessment

Courtesy of Velindre Cancer Centre / South Wales Cancer Network

Muscle Strength	R /5	L /5	Dermatomes (light touch)	R	L
Hip flexion (L2)					
Hip abduction (L4-S1)					
Hip adduction (L2-4)					
Knee flexion (L5-S1)					
Knee extension (L3)					
Ankle P.flexion (L5,S1)					
Ankle D.flexion (L4)					
Big toe extension (L4,5)					

Lower Limb Neurological Assessment

Co-ordination (heel to shin)	R	L

Proprioception (big toe position)	R	L

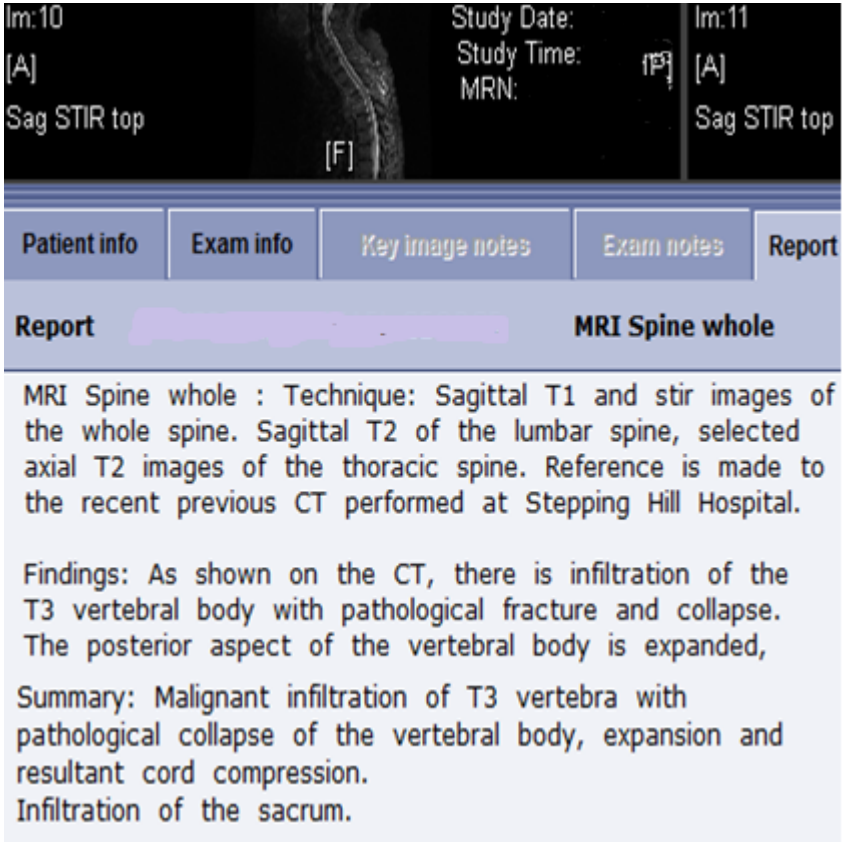
Date: _____

Physiotherapist: _____

Neurological Reflex tests

- Biceps (C6), Triceps (C7), Brachioradialis (C5,6)
- Knee Jerk (L3,4), Ankle jerk (L5,S1)
- Plantar response and Hoffmans

MRI Spine whole with urgent reporting



Prevalence and prognosis

- Prostate
- Lung
- Breast

50%

- Haematological
- Gastrointestinal
- Others (sarcoma, thyroid, melanoma

Thoracic 70%

Lumbar 20%

Cervical 10%

(Multiple sites 30%)

Prognosis:

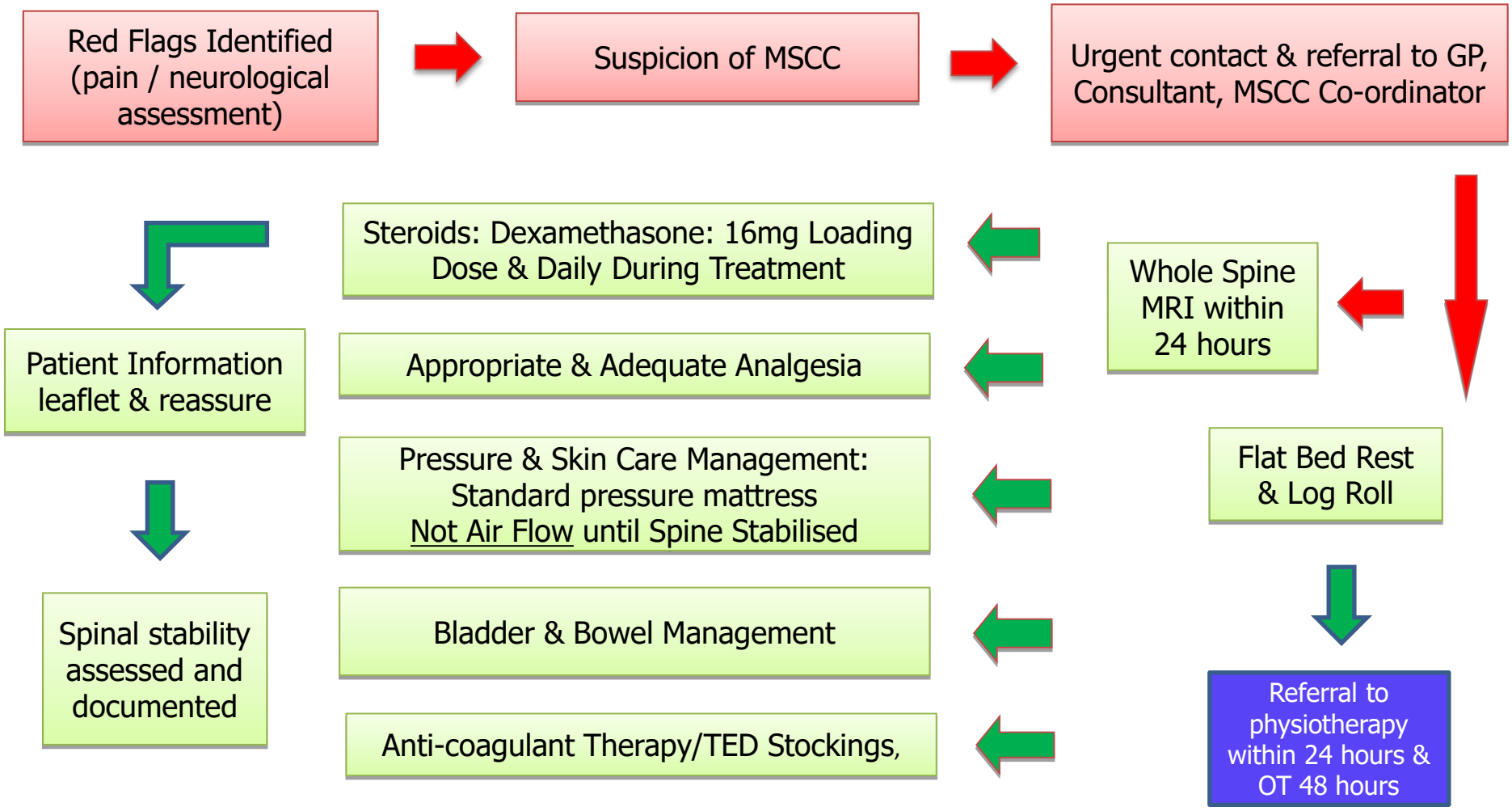
Patients who present with paralysis - unlikely to ever walk again

Median survival 2-3 months

Surgical candidates median 377 days (13.5 months approx). NB important to identify surgical candidates

Poor prognosis; Lung, Pancreas, upper GI, Sarcoma

Management of suspected MSCC



WHO PERFORMANCE STATUS

Grade	Explanation of activity
0	Fully active, able to carry on all pre-disease performance without restriction
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work
2	Ambulatory and capable of all selfcare but unable to carry out any work activities. Up and about more than 50% of waking hours
3	Capable of only limited selfcare, confined to bed or chair more than 50% of waking hours
4	Completely disabled. Cannot carry on any selfcare. Totally confined to bed or chair
5	Dead

Stability of the Spine

- Instability may be suspected if:
  - Severe pain at site of lesion, ↑on movement (mechanical pain)
  - Worsening neurology (↑P&N and/or weakness)
  - 3 column theory
  - Collapse of vertebral bodies to less than 50% of original height
  - Structural deformity, e.g. kyphosis / subluxation
  - Lesions in occipito-cervical region

Table 1. SINS

SINS Component	Score
Location	
Junctional (occiput-C2, C7-T2, T11-L1, L5-S1)	3
Mobile spine (C3-C6, L2-L4)	2
Semirigid (T3-T10)	1
Rigid (S2-S5)	0
Pain*	
Yes	3
Occasional pain but not mechanical	1
Pain-free lesion	0
Bone lesion	
Lytic	2
Mixed (lytic/blastic)	1
Blastic	0
Radiographic spinal alignment	
Subluxation/translation present	4
De novo deformity (kyphosis/scoliosis)	2
Normal alignment	0
Vertebral body collapse	
> 50% collapse	3
< 50% collapse	2
No collapse with > 50% body involved	1
None of the above	0
Posterolateral involvement of spinal elements†	
Bilateral	3
Unilateral	1
None of the above	0

NOTE. Data adapted.[14]
Abbreviation: SINS, Spinal Instability Neoplastic Score.
*Pain improvement with recumbency and/or pain with movement/loading of spine.
†Facet, pedicle, or costovertebral joint fracture or replacement with tumor.

The SINS has six components each scoring 0-3; total scoring ranges from 0 to 18.

- A score of 0 to 6 is a stable spine
- 7 to 12 indicates impending instability
- 13 to 18 indicates an unstable spine.

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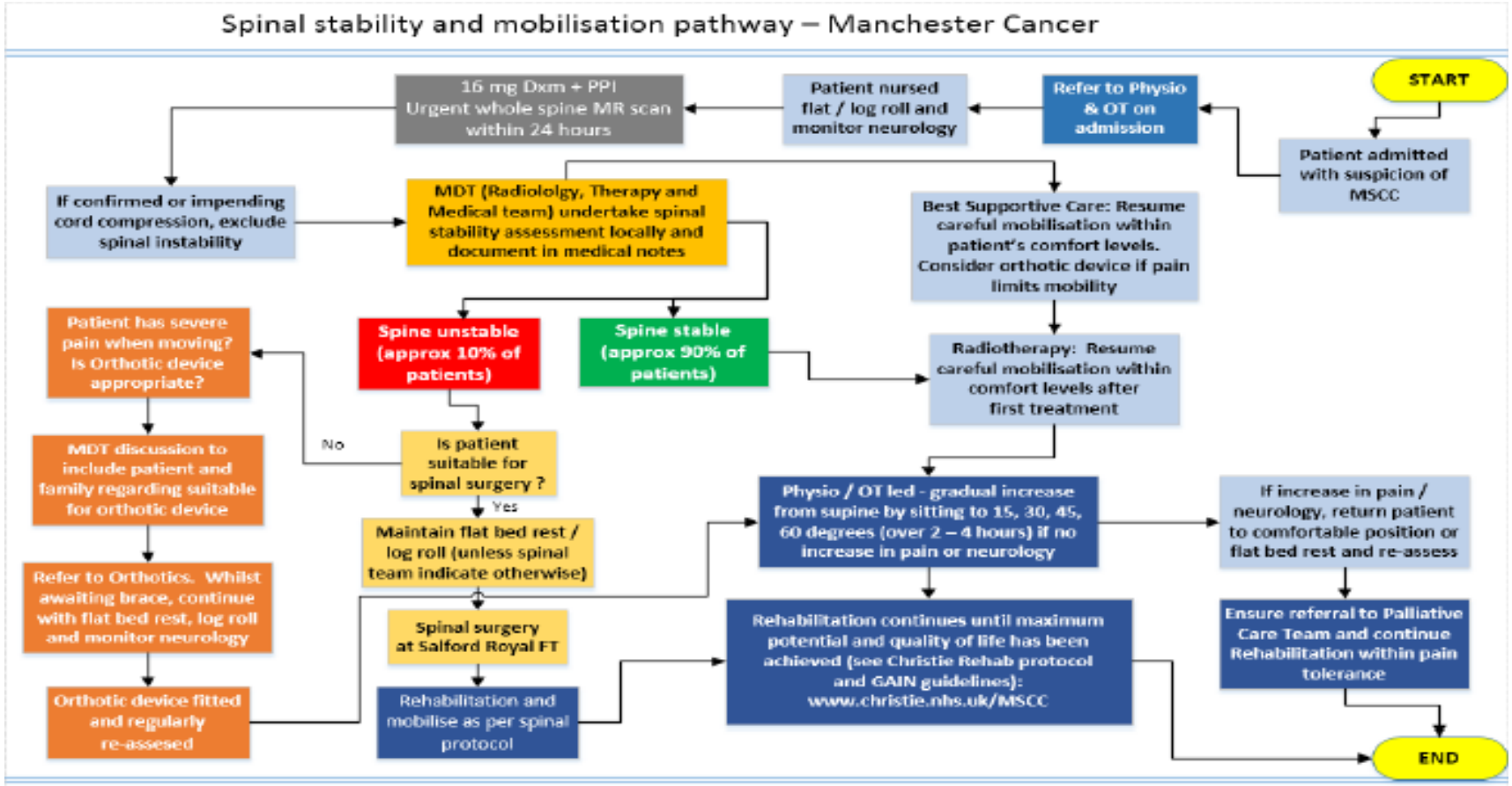
GUIDELINES FOR ASSESSMENT OF SPINAL STABILITY

THE CHRISTIE, GREATER MANCHESTER & CHESHIRE



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Treatment options

- Steroids: high dose Dexamethasone 16 mg
- Surgery: SCC is presentation of disease, unstable spine, previous radiotherapy to same level, limited vertebrae involved, good performance status
- Radiotherapy: within 24 hours, pain relief in 87% / prevent further neurological progression, single or fractionated Rx
- Chemotherapy: only for chemo-sensitive tumours, e.g. NH lymphoma, germ-cell tumours
- Best supportive care: e.g. terminal stages

  or paralysis > 48 hrs

Rehabilitation

"The aim of rehabilitation is to improve quality of life, maintain or increase functional independence, prolong life by preventing complications and return the patient to the community wherever possible."

- Referral to Physio within 24 hrs, OT 48 hrs
- Baseline assessment of neurological status, pain and function
- Fitting of braces (collars, thoraco-lumbar supports)
- Information / support (breaking bad news)
- Timely discussion with MDT re 'stability' & document

BestMSK Health Collaborative

High impact restoration strategy

16th July 2021 version 1

NHS England and NHS Improvement

Emergency Condition recommendations

Recommendation #12:
Guidance re urgent and emergency MSK conditions requiring onward referral to be widely shared with primary care practitioners

Pre-hospital

Recommendation #13:
All systems to have standard processes in place for the recognition and onward referral of patients with suspected:

i. Cauda Equina Syndrome (CES)
ii. Giant Cell Arteritis (GCA) in collaboration with eye care
iii. Metastatic cord compression
iv. Spinal infection
v. Septic arthritis

Hospital

Post hospital

Recommendation #14:
Fast track pathways in place to provide timely diagnostics, hospital management, and post hospital support for patients with of

i. Cauda Equina Syndrome
ii. Giant Cell Arteritis in collaboration with eye care
iii. Metastatic cord compression
iv. Spinal infection
v. Septic arthritis

Emergency conditions

The following serious pathologies must be dealt with on the day as an emergency. Pathways for emergency referral have changed in many areas: please keep updated about changes in the local system.

Metastatic spinal cord compression (MSCC): MSCC occurs as a consequence of metastatic bone disease in the spine. It can lead to irreversible neurological damage. Symptoms can include spine pain with band-like referral, escalating pain and gait disturbance. This link outlines the symptoms to look out for: https://www.christie.nhs.uk/media/1125/legacymedia-1201-mscc-service_education_mscc-resources_red-flag-card.pdf

Manchester Cancer MSCC webpage

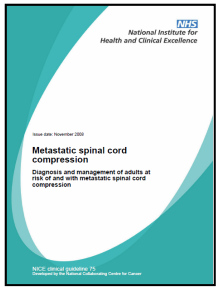
MSCC webpage:

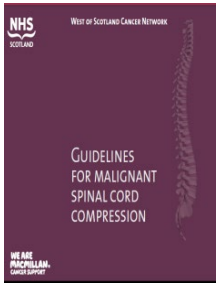
www.christie.nhs.uk/MSCC

- or type '**spinal cord compression**' in the search tool

National resources:

- West of Scotland MSCC guidelines (2007)
- NICE MSCC guidelines
- NICE MSCC Pathway / Quality Standards





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Greater Manchester **Cancer**
Academy

Module 1

Red flags and early diagnosis

START

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Safety netting; a key to early presentation

Musculoskeletal Science and Practice 48 (2020) 102179

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Professional issue

Safety netting; best practice in the face of uncertainty

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ABSTRACT

Safety netting is a recognised General Practitioner (GP) diagnostic strategy often used in the face of uncertainty to help ensure that a patient with unresolved or worsening symptoms knows when and how to access further advice. It is an important way of reducing clinical risk. In the context of the COVID-19 pandemic and the rapid move to mainly remote consultations within the musculoskeletal field, safety netting is an important strategy to embed within all consultations. Only those presenting with potentially serious conditions are offered face to face consultations. Screening for Red Flags and any indication of a serious cause of symptoms is always first line in any consultation, however, clinical presentations are not always black and white with patients falling into a clear diagnostic category. With patients minds more focussed on COVID-19 symptoms this can be problematic. With the additional ramifications of public health social restrictions, onward management can be a conundrum. Many people with risk factors of serious pathology are also as a consequence, vulnerable to contracting COVID-19. In situations of uncertain clinical presentations, to avoid unnecessary social contact, safety netting can help to monitor symptoms over time until the clinical context becomes more certain. Embedding safety netting within physiotherapy best practice could be a silver lining in this pandemic black cloud.

1. Introduction

The COVID-19 pandemic is arguably one of the greatest global public health challenges of our time with many countries worldwide imposing a reduction in social exposure (Vrdoljak et al., 2020). Priorities and activity in the workplace have fundamentally changed during the pandemic, not least the rapid move within the musculoskeletal field to remote consultations. Across the world, physiotherapy associations have developed guidance on remote service delivery options, including advice on telephone and video consultations in musculoskeletal practice (WCPT, 2020. CSP, 2020). The recommendation is that once a triage decision has taken place the majority of consultations should be conducted remotely, with few if any face to face. Yet despite COVID-19 the time frames of emergency and urgent management for musculoskeletal conditions remain the same; therefore communication skills have never been more important than now.

At a time when social distancing is of paramount importance, monitoring remotely over time is an essential diagnostic tool. Watchful waiting (Cook et al., 2018) allows symptoms to be safely monitored for any change that may cause concern. Working 'closely' with patients in a netting approach needs to be developed more strongly within physiotherapy generally and it also needs to be firmly embedded in remote consultations to provide appropriate assurances. Safety netting is an already well-established General Practitioner (GP) diagnostic strategy which ensures that patients can be monitored over time until their symptoms resolve or become more florid (Evans et al., 2018).

Viewpoint; Safety netting was introduced by the influential work of Roger Neighbour in 1987. Neighbour, a GP and medical educator, considered no patient to be safe unless the consultation includes safety netting (Neighbour, 2005). Although now firmly embedded within GP training, safety netting is not necessarily considered a core physiotherapy skill within the consultation.

Musculoskeletal physiotherapists have a very important role to play as the COVID-19 pandemic does not eliminate the development of other serious conditions. The focus of all consultations should encompass the exclusion of potential serious pathology and when necessary, signpost to appropriate services via the emergency or urgent care pathway (NHS, 2020). Whilst this is common sense, clinical reasoning is not always straight forward and patients do not always fall into clear diagnostic categories (Comer et al., 2019); remote consultations can sometimes

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In summary

- Clinical partnerships working across boundaries essential
- Don’t underestimate watchful wait as a tool in early stages
- Bespoke local pathway to facilitate evidence based management in a timely manner
- Early diagnosis not easy. RED FLAG clinical cards helpful. Safety net known patients at risk working with patients as partners

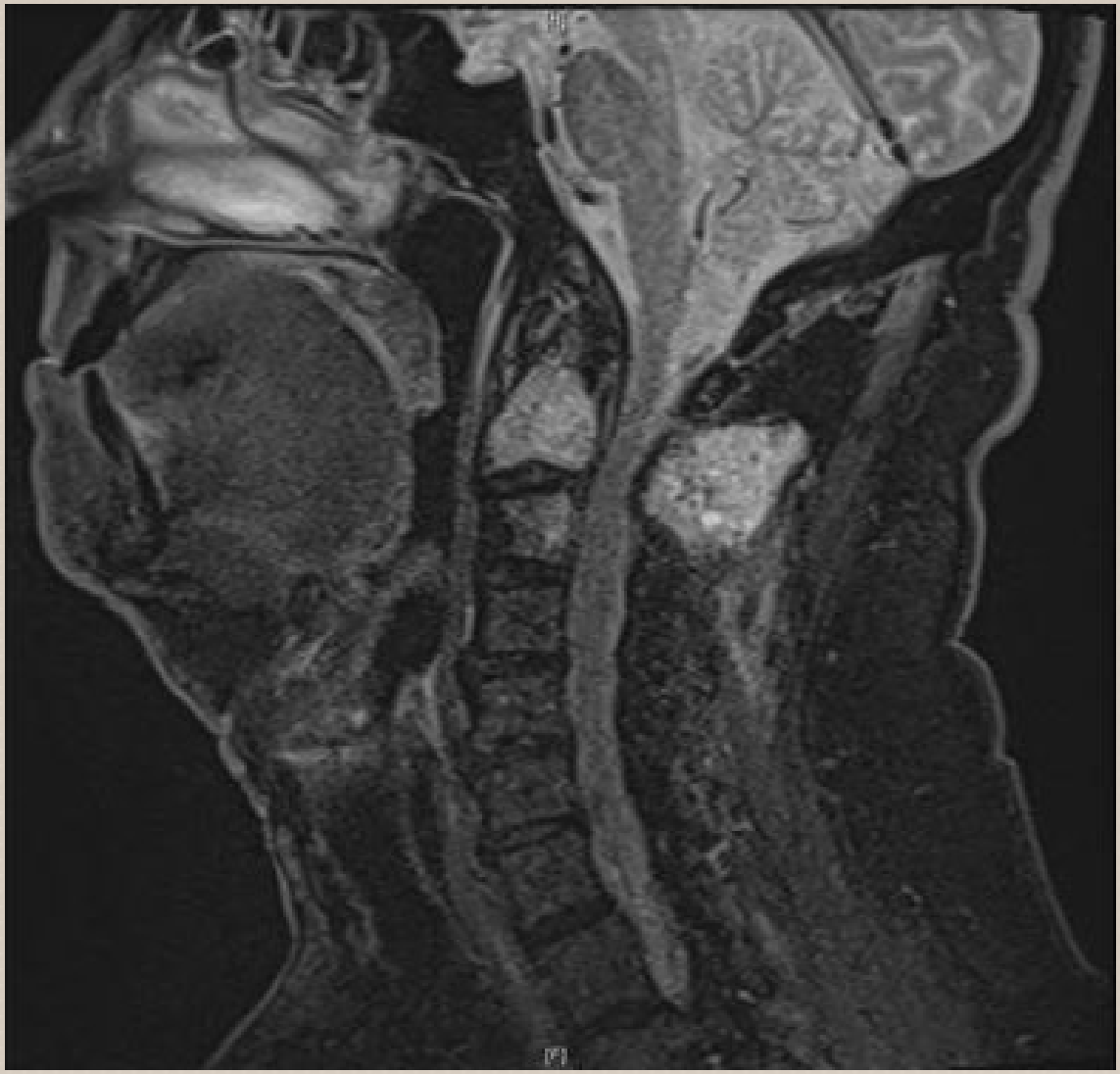
Presents

Case Study 1
Referred with LBP ……..

- Age 75yrs
- Fall from standing.
- Deteriorating neck pain
- Bilateral parasthesia tip of all 5 digits both hands exacerbated by neck flexion.
- Other than flexion, cervical spine movement rigid.
- Neurologically intact upper and lower limbs.

- Unable to support weight of the head lying to sitting
- Previous H/O Prostate cancer-PSA 10, Gleason 6, 3 years earlier
- Lower risk of Mets

Referred with LBP …….



MRI

- At C2/3, there is a large aggressive lesion right side of the C2 vertical body and involving the posterior element.
- the right side of C3 vertebral body and posterior element. The aggressive lesion is surrounding the spinal canal and causing moderate spinal canal stenosis. Normal signal of the spinal cord.

- Conclusion :

Metastatic spinal disease with abnormal marrow signal throughout the spine and a large lesion seen mainly at **C2, C3 and L3.**

Case study 2

- 61 yrs old
- Previous h/o bladder cancer
- New onset back and leg pain
- Weakness in legs and gait disturbance
- Sleep significantly affected
- Wide based gait observed

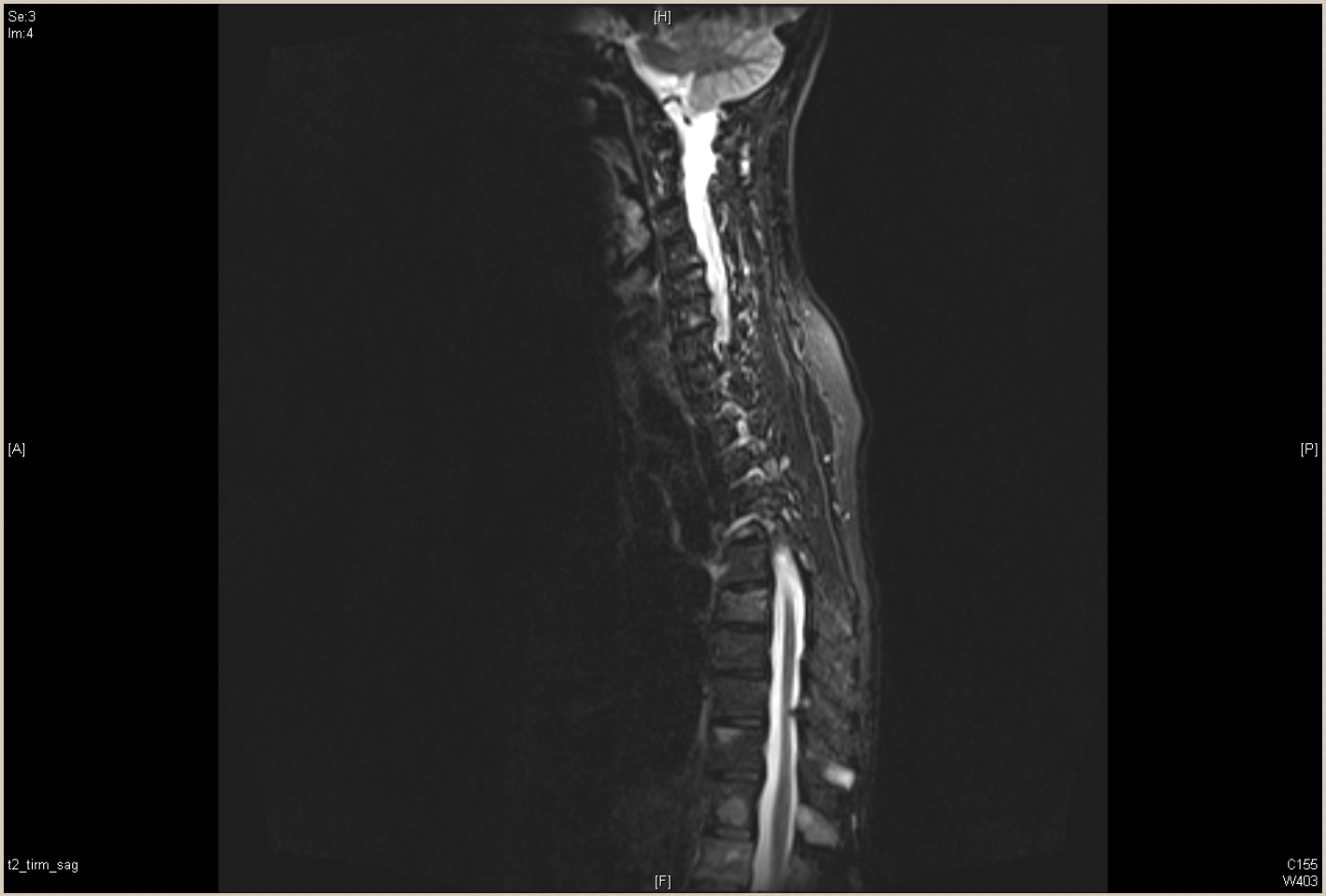

Se:2
Im:8
[H]
[A]

- MSCC

- Primary in lung!!!!

Case study 3

- 59 yr old lady
- Previous h/o breast cancer treated with surgery and chemotherapy 6 years previously
- Presented with exacerbation of chronic low back pain
- Different???
- Band-like ‘incidence’ pain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W403

- Metastatic deposits at T5, T6, T7, T10, T11 vertebral bodies

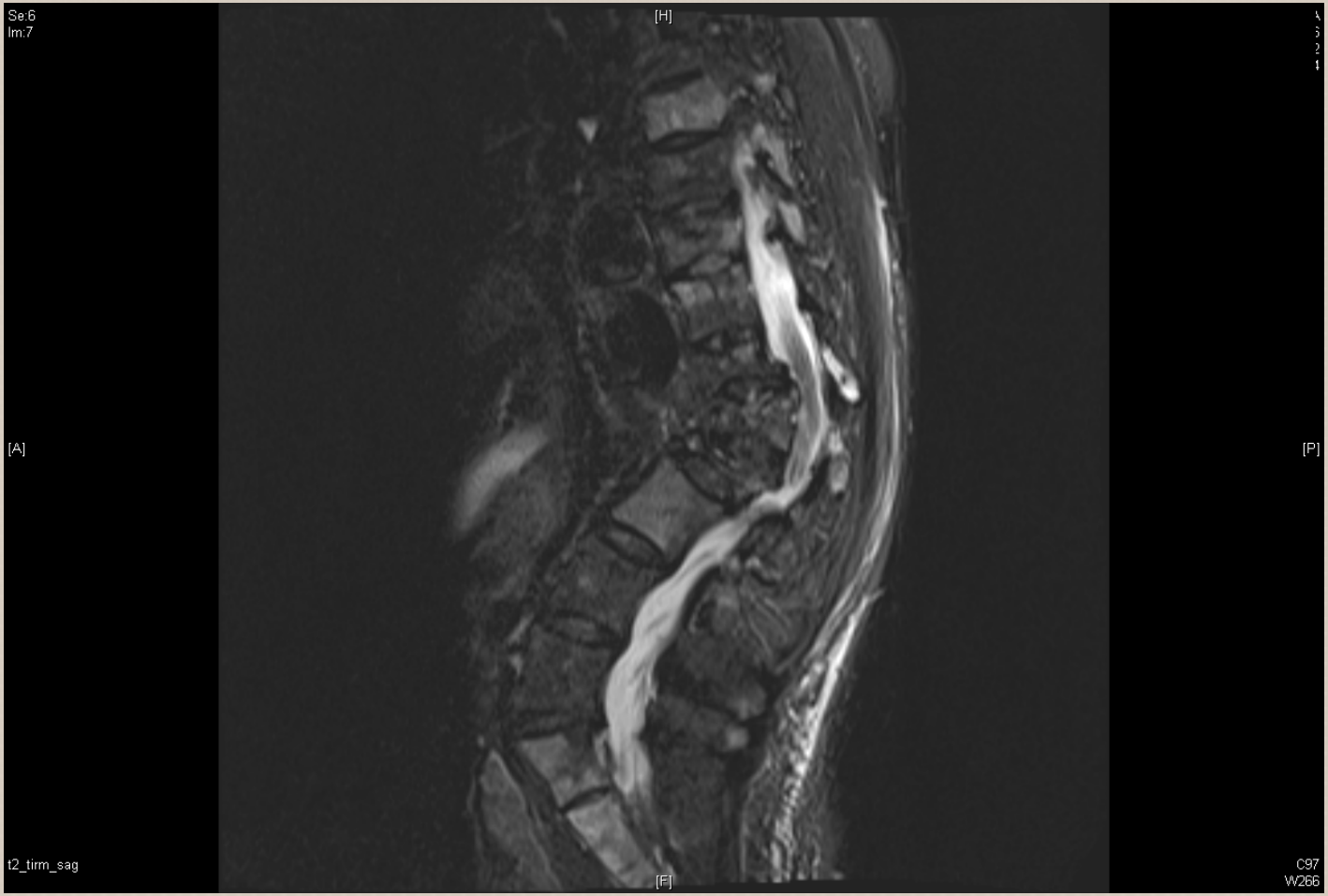
  The spinous process of T10 vertebral body also shows metastatic deposit.

  The T11 vertebral body shows metastatic deposits also at posterior elements bilaterally predominantly on left side.

  T12 vertebral body is diffusely infiltrated by metastatic deposits and its posterior elements predominantly on left side.

  The L1 vertebral body infiltrated by metastatic deposits predominantly along its right half and involving bilateral pedicles.

  Metastatic infiltrative deposits also seen at L2, L3, L4, L5 and sacral vertebrae as well.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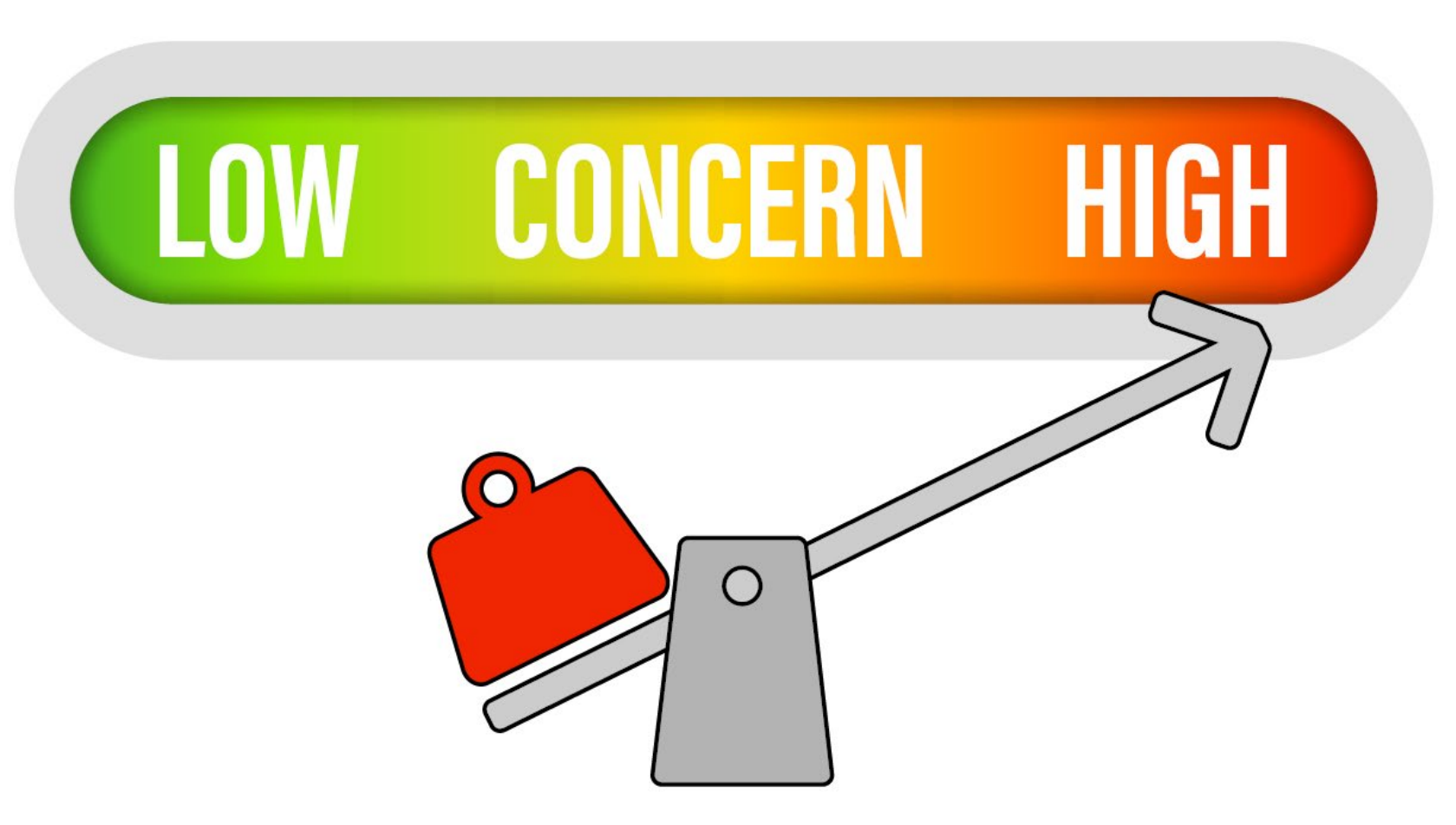
Case 4-
Remote consultation

- 67yr old man
- Still working, normally fit and well
- Smokes 10 day
- Long history of episodic back pain
- 8 week history-different
- Bloods and x-ray normal
- Waking at night with pain
- One week h/o legs feeling weaker
- Band of parasthesia bilaterally around 10^{th} rib

What next?

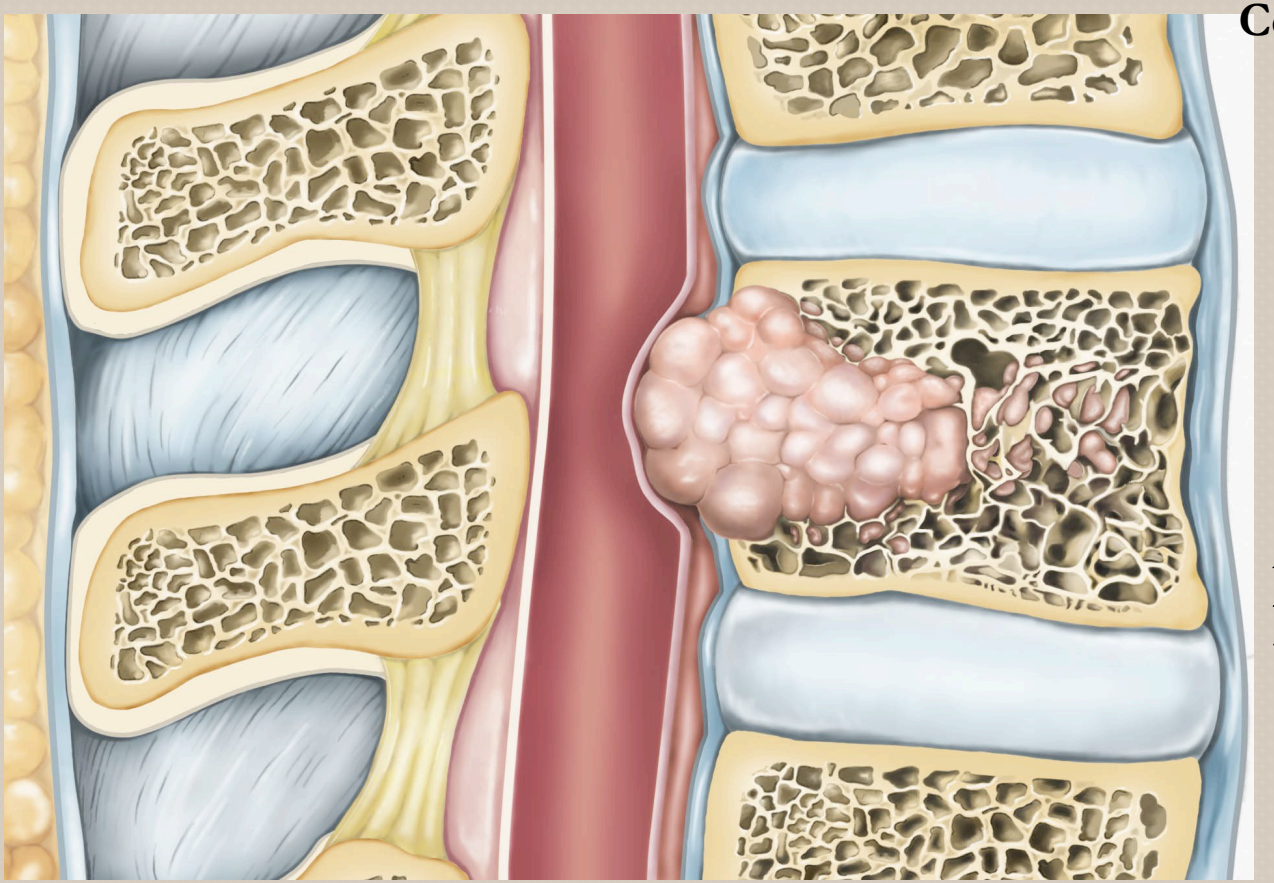


- Patient requires emergency (same day) investigation

- Whole spine MRI;

Multiple metastatic lesions visible throughout the spine with cord compression at T10

Thank you for listening



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