Red Flags
A review of the evidence

Laura Finucane

Consultant Physiotherapist

What I am going to talk about

- The challenge of identifying serious pathology
- The current evidence
- A framework for clinical practice

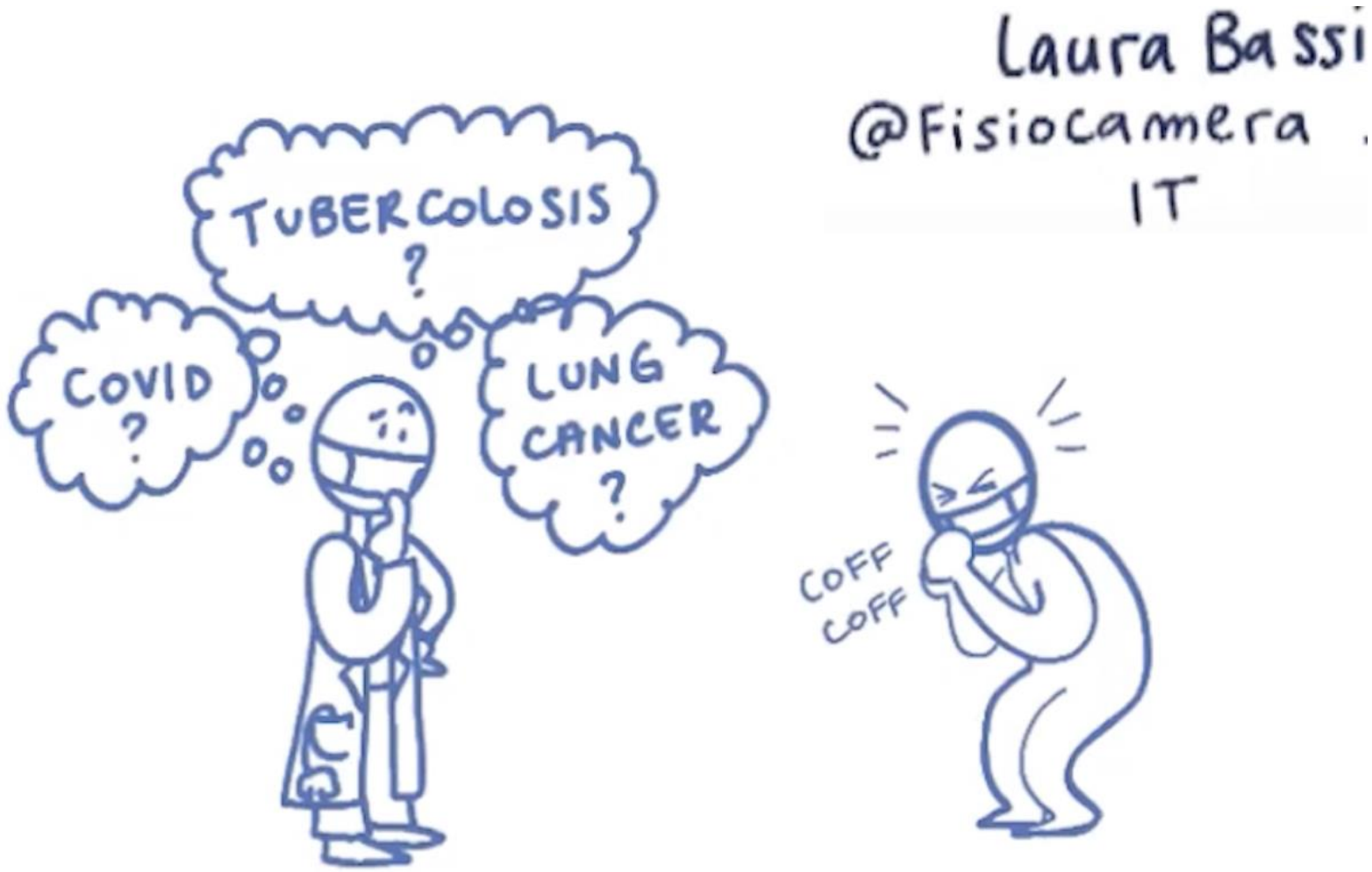
Medicine is a science of uncertainty and an art of probability.

Sir William Osler

Impact of Covid-19

- Biggest pandemic of our time
- Change in health provision real and perceived
- Change in health seeking behavior
- Late Presentation
- Increase in MSK serious pathology ?
- New serious pathology?

Cases during the pandemic



New serious pathologies?

What's the problem?

- No agreed definitions
- It's rare
- Poor diagnostic accuracy
- No consensus on which red flag for which serious pathology
- No agreed guidelines on when to act

(Downie et al 2013, Henschke et al 2013 Verhagen et al 2016)

Red flags have been called into Question!

Should we bother?

- “The formulaic use of a red flag of past history of cancer is too blunt an instrument to be used in routine practice without considering the type of cancer and how long ago it was diagnosed”.
  (Underwood 2009)

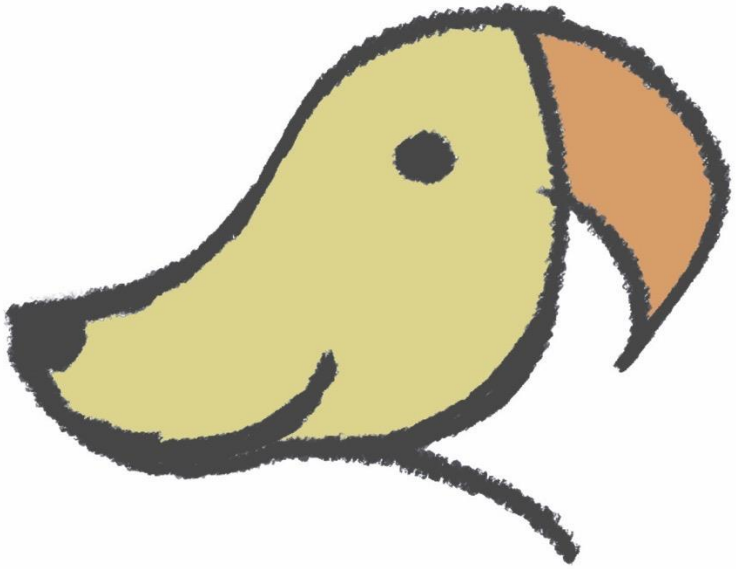
- *“…red flag screening is not consistent with best practice in LBP management*”. (Cook et al 2017)

- *“*While a positive response to a red flag question may indicate the presence of disease, a negative response to 1 or 2 red flag questions does not meaningfully decrease the likelihood of a red flag diagnosis”. (Premkumar et al 2018)

When does a red flag become a red flag?

Risk Factors and Clinical Features

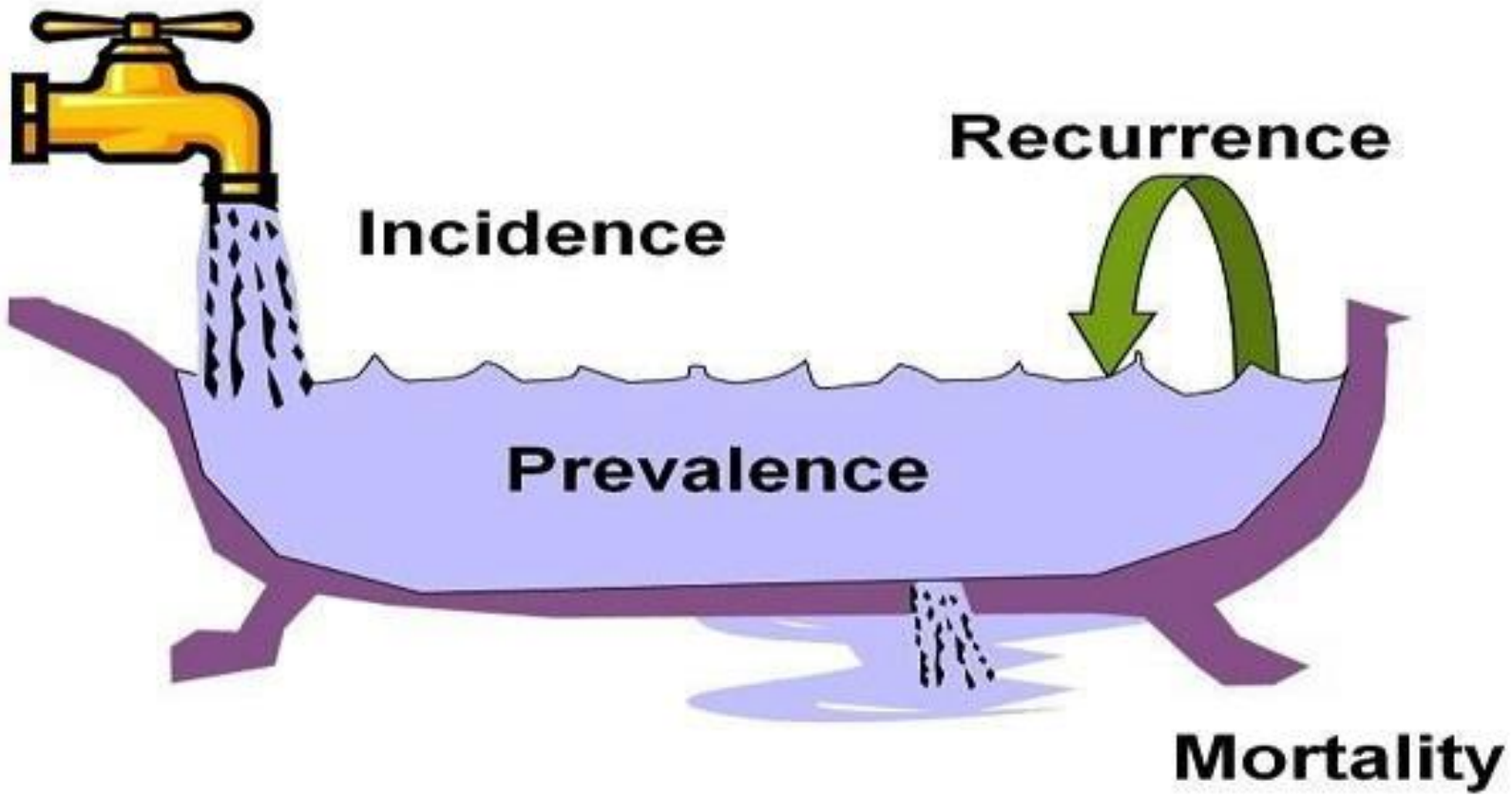
Is it a bird or a dog?



Woof !

Tweet!

it is rare!……..or is it?…….



RESEARCH ARTICLE

The prevalence of serious pathology in musculoskeletal physiotherapy patients – a nationwide register-based cohort study

Cecilie Budtz, Rikke Pilegaard Hansen, Janus Nikolaj Laust Thomsen, David Høyrup Christiansen

- Overall prevalence 2.30%
- Neoplasm 2.11%- malignancy 1.13%
- Fracture 0.13%

Diagnostic accuracy-The Elephant in the room

PAIN. 158(10):1860–1868, OCT 2017
DOI: 10.1097/j.pain.0000000000000998,
PMID: 28708761

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Most red flags for malignancy in low back pain guidelines lack empirical support: a systematic review

Arianne P. Verhagen; Aron Downie; Chris G. Maher; Bart W. Koes

- Identified 13 red flags associated with malignancy
- **PH Ca** and **strong clinical suspicion** have acceptable diagnostic accuracy

Consider trial of therapy- watch and see

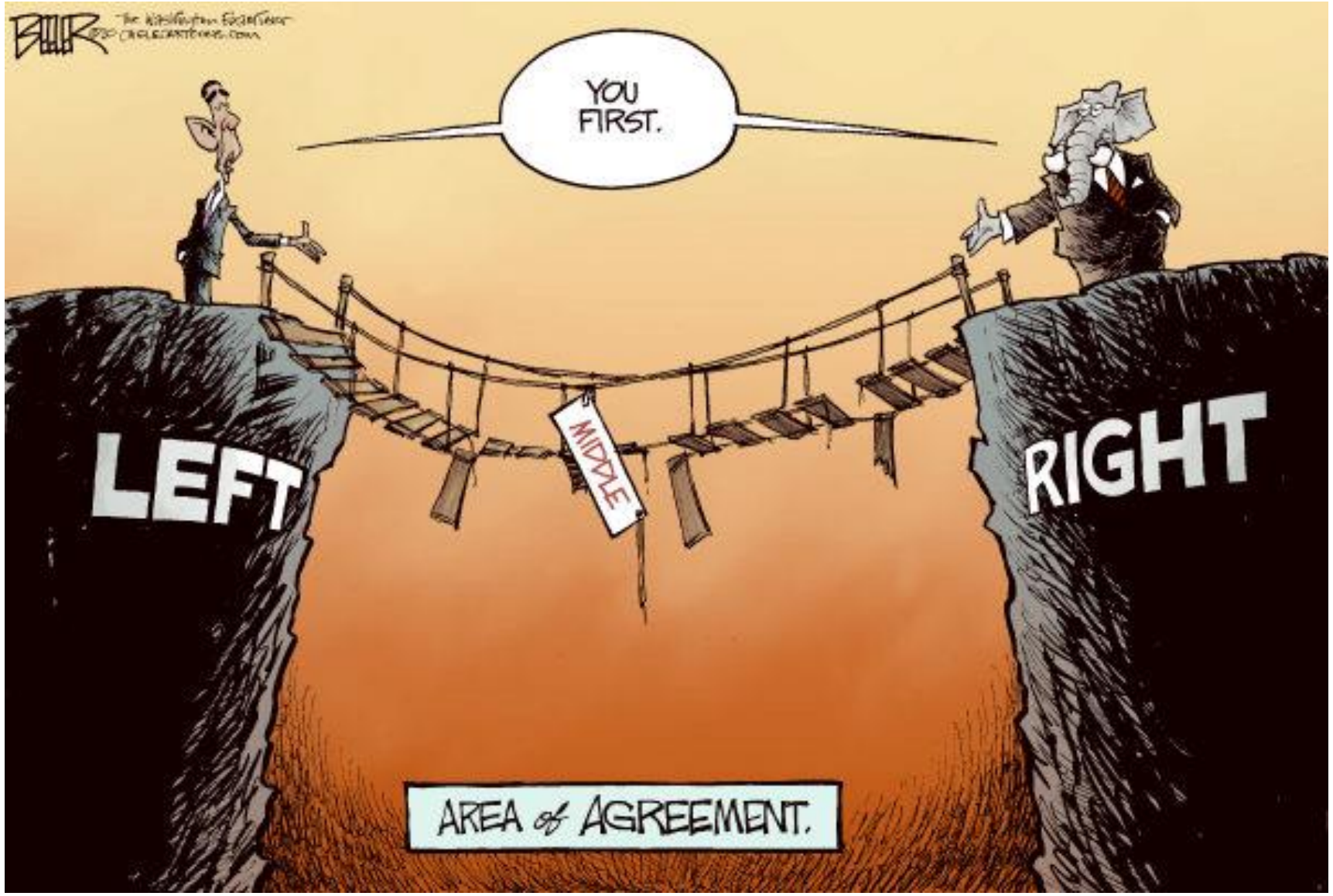
Develop a diagnostic (risk) model might result in better diagnostic accuracy

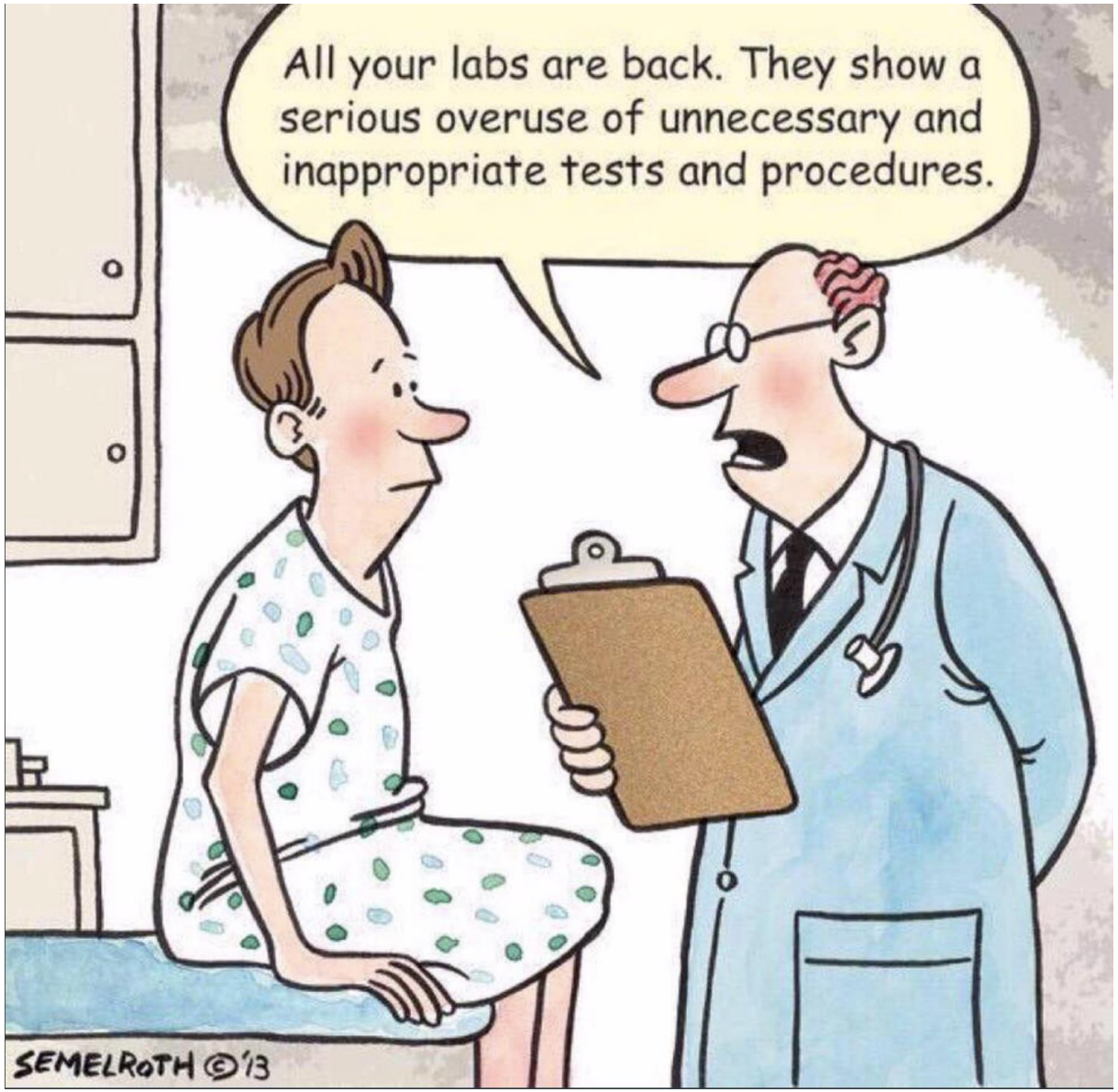
Strong Clinical Suspicion

- Asking the right questions
- Experience
- Curiosity
- Knowledge
- Context

= combination

Guidelines




All your labs are back. They show a serious overuse of unnecessary and inappropriate tests and procedures.
SEMELROTH ©'13

Where does that leave us?

- Agree definitions
- Stop relying on diagnostic accuracy
- consensus on which red flag for which serious pathology
- agree guidelines on when to act

An evidence informed clinical reasoning framework for clinicians in the face of serious pathology in the spine

Finucane, Selfe , Mercer, Greenhalgh, Downie, Pool, Boissonault, Beniuck, Leech

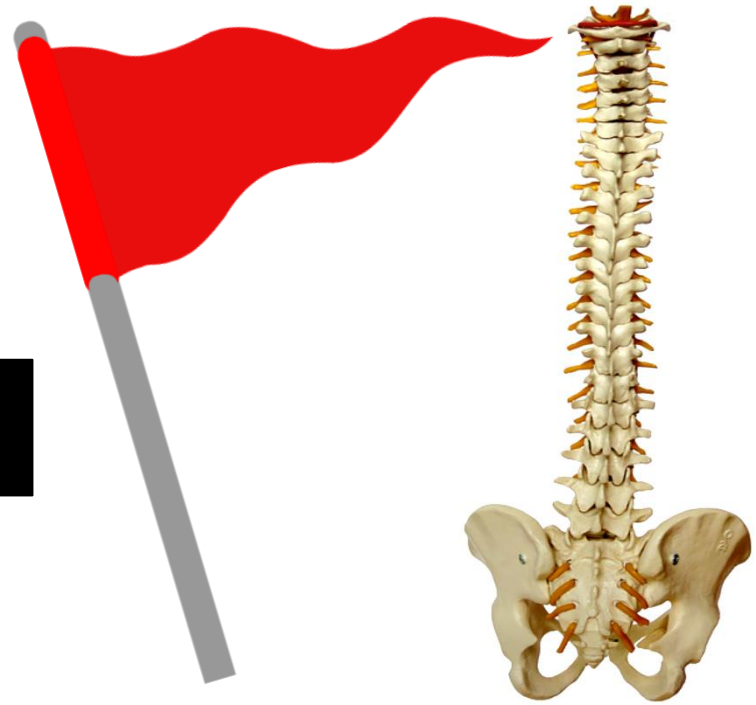
Phase 1-Systematic reviews
CES, malignancy, #, Infection

Phase 2
Consensus stage

Phase 3
drafting of framework

Phase 4
Peer Review

Phase 5
FRAMEWORK DEVELOPMENT



[POSITION STATEMENT]

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International Framework for Red Flags for Potential Serious Spinal Pathologies

Identifying serious pathology as the cause of a person's musculoskeletal presentation is complex. Red flags have historically been used to help clinicians identify serious spinal pathology, and the majority of guidelines recommend the use of red flags. However, guidelines are not consistent about which red flags should be considered when examining people seeking care for musculoskeletal disorders. This has led to confusion and inconsistency in the management of people when there is suspicion of serious pathology, and, in some cases, to unnecessary and worrying medical tests or false reassurance that there is no serious pathology.

We aim to provide clinicians with a more standardized and consistent approach to identifying people with potential serious spinal pathology. This framework has been developed by researchers and clinicians to provide a pragmatic approach for clinicians to screen for serious spinal pathology that can masquerade as musculoskeletal spinal conditions. The framework has been informed by available evidence and augmented by a formal consensus process that included academics and clinicians involved in the management of musculoskeletal conditions.

This framework aims to support a variety of health professionals, irrespective of experience, who provide care for people with musculoskeletal spinal conditions. Clinicians working in musculoskeletal services can play an important role in early identification of serious pathology, ensuring that people achieve the best possible outcome. The prevalence of serious pathology will vary depending on where in the clinical pathway the clinician has contact with the person. Spinal surgeons likely see more cases of serious pathology than general practitioners do, and physical therapists probably see a number in between, depending on where they are on their clinical pathway. Therapists working at an advanced-practice level are likely to see more serious pathology, as the populations they serve are likely to have more complex presentations.[86] Clinicians must consider the context within which red flags exist, and clinically reason the relevance of the information gathered to determine whether any action is required.

SYNOPSIS: The International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT) led the development of a framework to help clinicians assess and manage people who may have serious spinal pathology. While rare, serious spinal pathology can have devastating and life-changing or life-limiting consequences, and must be identified early and managed appropriately. Red flags (signs and symptoms that might raise suspicion of serious spinal pathology) have historically been used by clinicians to identify serious spinal pathology. Currently, there is an absence of high-quality evidence for the diagnostic accuracy of most red flags. This framework is intended to provide a clinical-reasoning pathway to clarify the role of red flags. *J Orthop Sports Phys Ther 2020;50(7):xxx-xxx. Epub 21 May 2020. doi:10.2519/jospt.2020.9971*

KEY WORDS: *cauda equina syndrome, clinical reasoning, malignancy, spinal fracture, spinal infection*

Person-Centered Care

Working with people with possible serious pathology can be challenging, and a collaborative approach is essential. A possible diagnosis of serious pathology can be extremely worrying for people in regard to their families and careers. People must be involved in decision making

TABLE 13 Risk Factors for Spinal Malignancy

Risk Factor/Level of Evidence	Context	Further Questions	Low Clinical Suspicion	High Clinical Suspicion
Past history of cancer High	Not all those cancers with a predilection to bone metastases will develop them. However, some will metastasize in the first 5 y of diagnosis, with 50% doing so 10-20 y later[44] Approximately 25% of people with MSCC have no known primary diagnosis[57]	Do you have any concerns about your symptoms? How long ago was the primary diagnosis made? How big was the primary tumor, and at which stage? Was there any lymph node involvement? Which treatment did you have?	Cancers with a predilection to bone metastases but in an early stage (1 or 2), with no lymph node involvement[62] Cancers that do not have a predilection to bone metastases (eg, ovarian cancer, melanoma[62])	Cancers that have a predilection to bone metastases (eg, breast, prostate, lung, kidney, and thyroid[10]) In breast cancer grade 3 or 4 (late stage), large tumors with lymph node involvement[62] In prostate cancer, a Gleason score of 9 or 10 (despite a PSA level greater than 50 ng/mL at diagnosis) is considered to be an aggressive cancer that is likely to spread more rapidly[4]

Abbreviations: MSCC, metastatic spinal cord compression; PSA, prostate-specific antigen.

TABLE 14 Symptoms of Spinal Malignancy

Symptoms (subjective)/ Level of Evidence	Context	Further Questions	Low Clinical Suspicion	High Clinical Suspicion
Severe pain that may become progressive and constant Low	MBD does not have a linear progression and is more likely to wax and wane, but in the later stages it becomes more constant and progressive. People may report escalating pain, which can increase when lying flat[79]	Are your symptoms getting better, the same, or worse? Do you have band-like pain?	The person presents with initial severe pain but reports improvement with treatment; it is important to continue to evaluate, as the person may be in a good phase	Subjective reports of progressively worsening symptoms, with possible features of band-like pain, and inability to lie flat
Night pain Low	Most people with back pain will suffer from night pain. People who report being woken on movement and subsequently are unable to get comfortable and go back to sleep are of less concern than those who describe an inability to get back to sleep due to the intensity of symptoms and who report having to get up to relieve the pain[25]	Does your pain wake you at night? What do you have to do to get back to sleep? Does your night pain occur in a particular position?	The person reports that he or she is able to get back to sleep following a change of position or after taking medication	People who report having to walk the floors or sit in a chair or lie on the floor, with minimal relief
Systemically unwell Low	These are often symptoms described in the late stages of the disease and may include fatigue, nausea, anorexia, and constipation, which are symptoms suggestive of hypercalcemia[24] Constipation is not necessarily a systemic complaint These could appear on their own or as a cluster of symptoms	Do you feel well? • If not, then explore the features of hypercalcemia • Establish whether these symptoms could be associated with other causes	Able to associate with another cause	May describe the features of hypercalcemia, such as fatigue, nausea, stomach pain, and fever. These also tend to be progressive in nature

TABLE 15 Signs of Spinal Malignancy

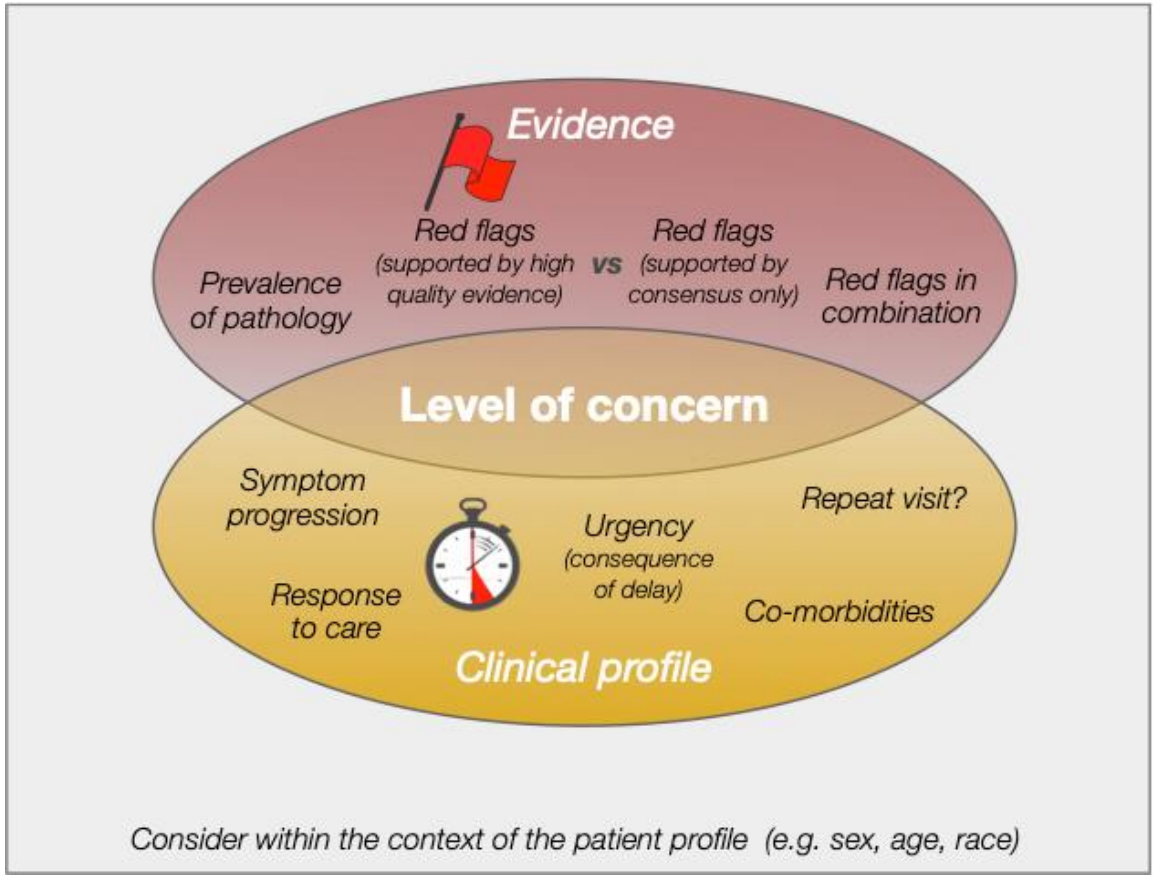
Signs (objective)/ Level of Evidence	Context	Physical Assessment	Low Clinical Suspicion	High Clinical Suspicion
Altered sensation from trunk down Low	People might report altered sensation that is nondermatomal and describe strange feelings in the legs (often a vague and nonspecific, difficult-to-describe sensation). People may report decreased mobility[79]	Neurological examination testing Sensation throughout the area described by the patient	Normal neurology and no objective change in sensation	Objective signs and reduced sensation
Neurological signs Low	People who present with a subjective complaint of neurological symptoms must have a full neurological examination	Neurological examination that may need to include the upper and/or lower limbs, including upper and lower motor neuron clinical tests	Localized spinal pain with no distal referral or limb symptoms	People with symptoms in the limbs and/or with coordination/gait disturbance, or changes to bladder/bowel activity
Spine tenderness Low	Sometimes, the spine can be tender on percussion. However, lack of tenderness does not rule out the possibility of metastases It is important to percuss the whole spine, as the area of pain reported may not be the area of metastasis	The clinician should palpate the spinous processes and may use percussion/vibration with a 128-Hz tuning fork to further examine spinal tenderness or reproduction of symptoms	No tenderness on palpation or percussion/vibration	Tenderness or reproduction of symptoms on palpation or percussion/vibration

TABLE 16 Initial Investigations for Spinal Malignancy

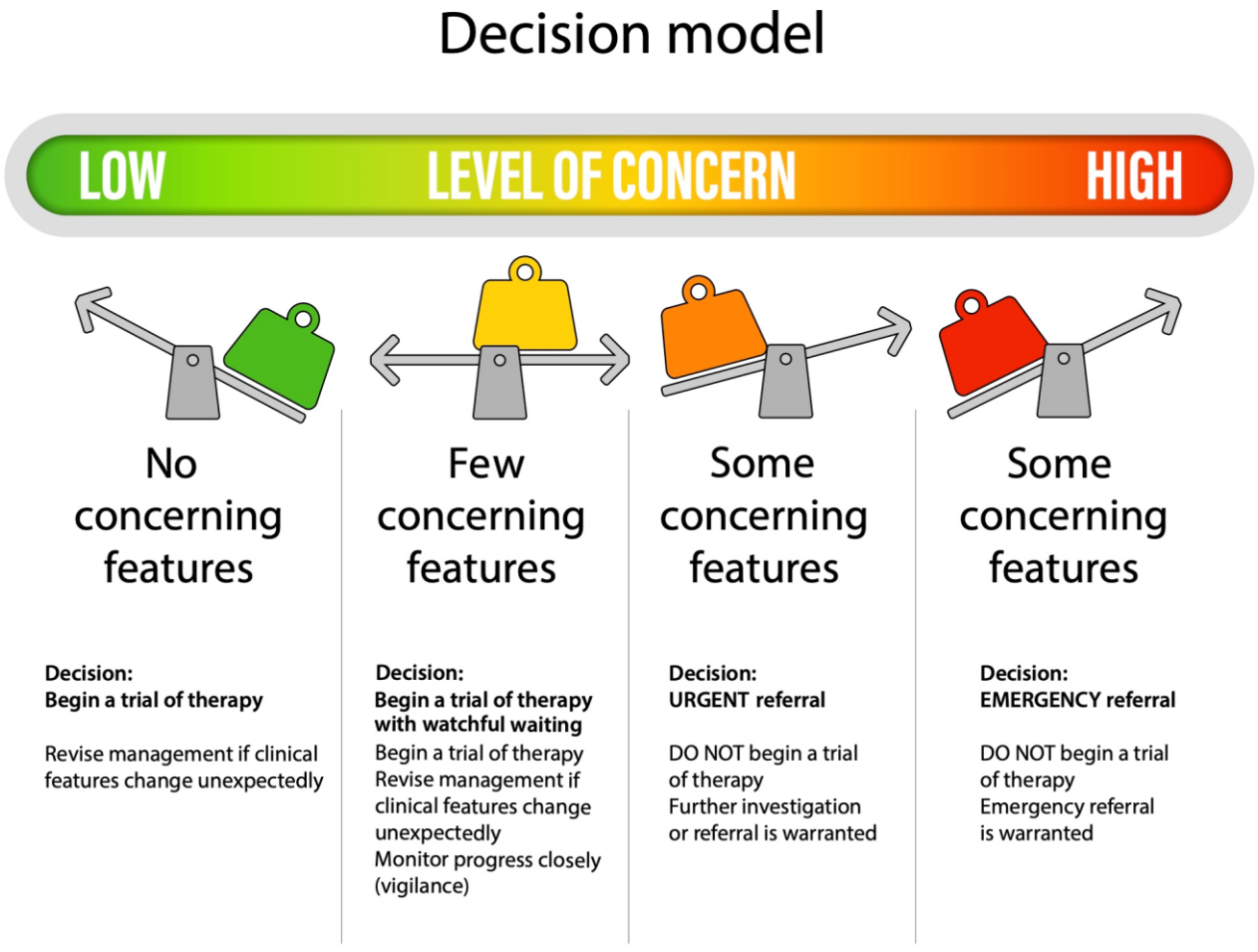
Modality	Context
MRI	MRI is the gold standard for diagnosing MBD[78] Because the sensory level does not always correspond to the level of metastases if MBD is suspected, MRI of the whole spine is required[46]
CT scan	If there are contraindications to MRI
Blood tests	There is no combination of inflammatory markers that can be used as a reliable rule-in or rule-out test strategy. The decision to test must be made in the context of other clinical findings[84]

Abbreviations: CT, computed tomography; MBD, metastatic bone disease; MRI, magnetic resonance imaging.

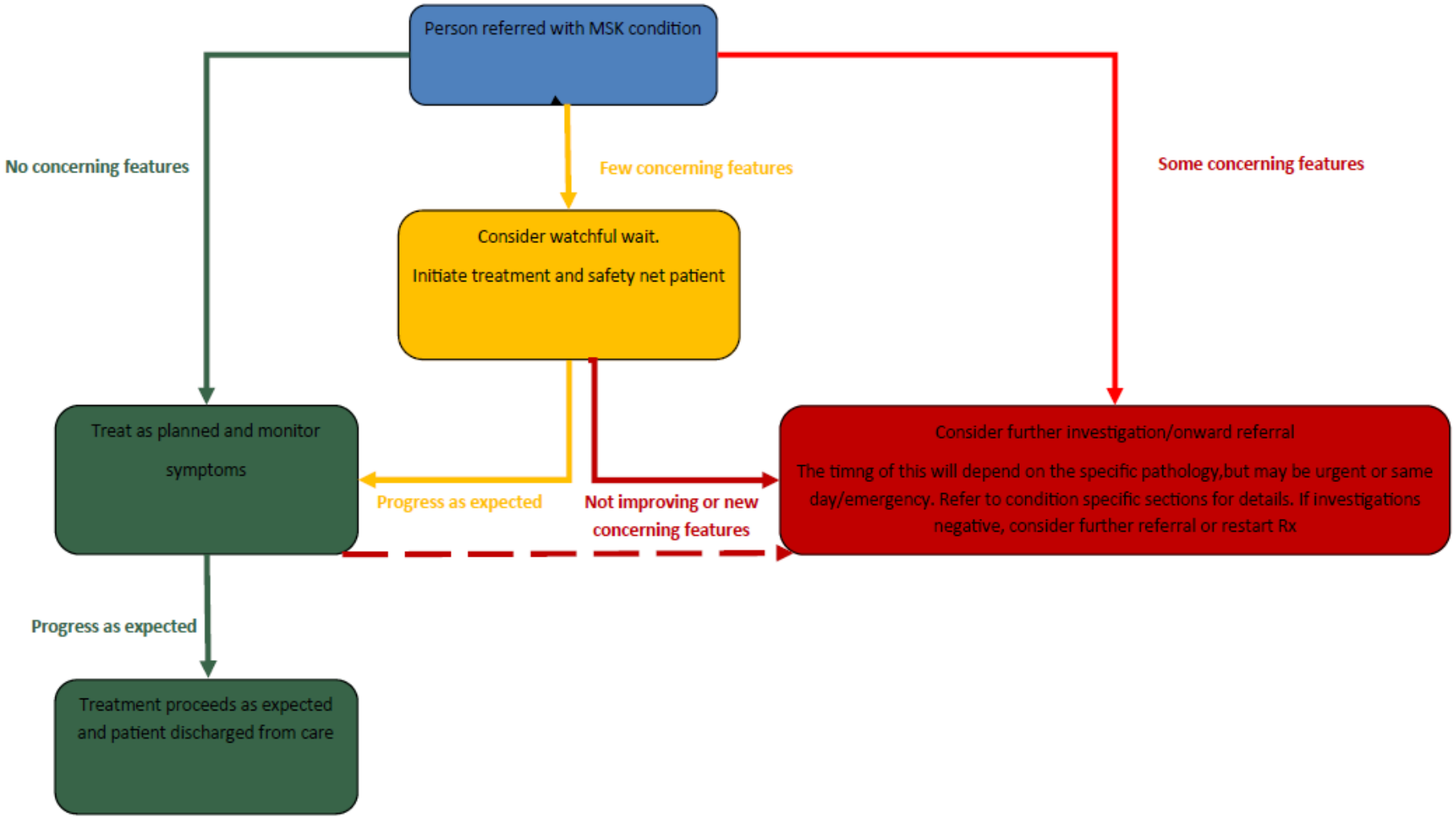
Determine the level of concern



Decide clinical action

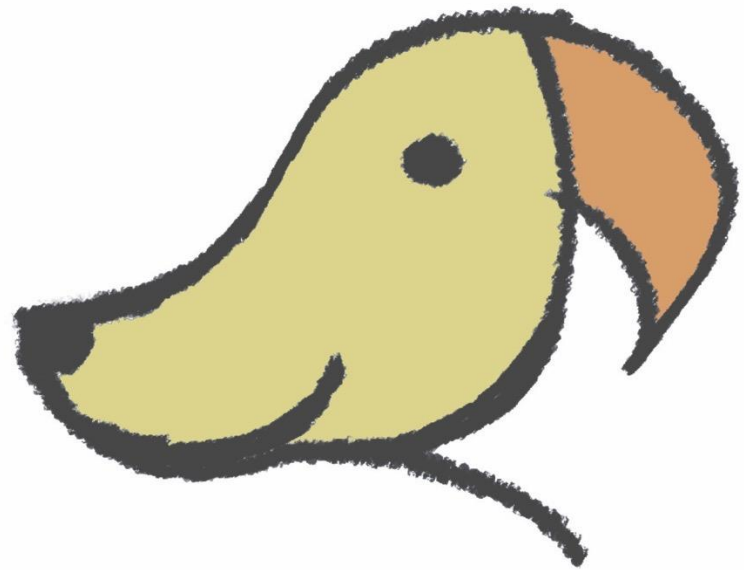


Pathway

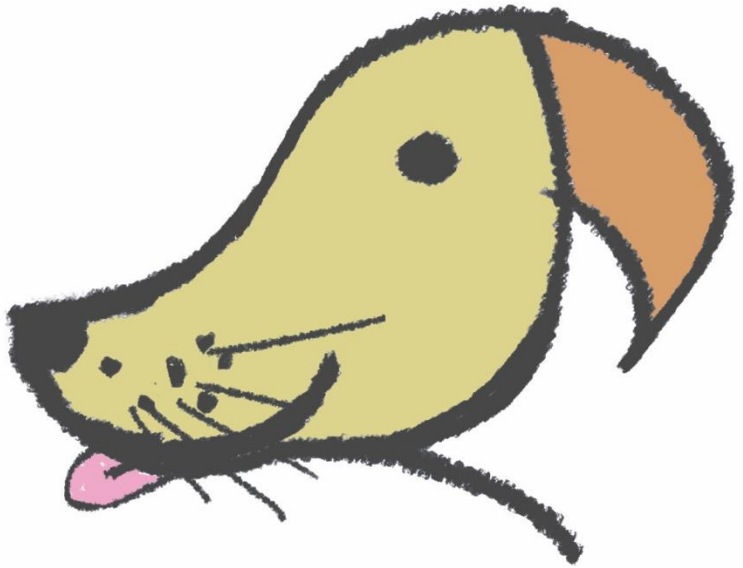

Person referred with MSK condition
No concerning features
Few concerning features
Some concerning features
Consider watchful wait.
Initiate treatment and safety net patient
Treat as planned and monitor symptoms
Progress as expected
Not improving or new concerning features
Consider further investigation/onward referral
The timng of this will depend on the specific pathology,but may be urgent or same day/emergency. Refer to condition specific sections for details. If investigations negative, consider further referral or restart Rx
Progress as expected
Treatment proceeds as expected and patient discharged from care

Clinical framework

- Ask the right questions
- Understanding of the risk factors
- Knowledge of serious pathology
- Use red flags
- Safety netting



Woof !



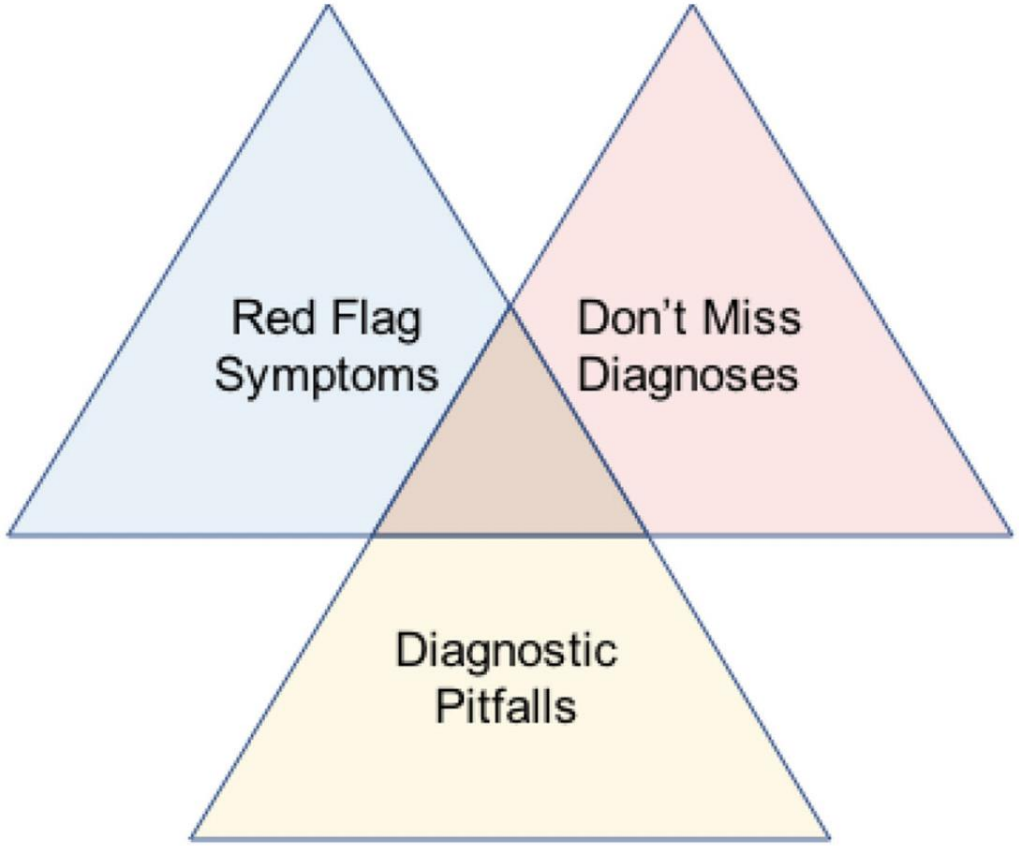
The daily challenge –managing diagnostic uncertainty

- Not cost effective to approach with NO RISK

- Too high a risk leads to missed cases, late diagnosis and possible avoidable death

Measuring and Improving Diagnostic Safety in Primary Care: Addressing the "Twin" Pandemics of Diagnostic Error and Clinician Burnout

Andrew P. J. Olson, MD[1], Mark Linzer, MD[2], and Gordon D. Schiff, MD[3]



Musculoskeletal Science and Practice

Volume 60, August 2022, 102558

Professional issue

Defensive medicine: A symptom of uncertainty?

Laura M. Finucane [a, b], Susan M. Greenhalgh [c, d], Christopher Mercer [e, g], James Selfe [d, f]

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Safety netting in the face of diagnostic uncertainty

- Communication of uncertainty
- Advice on what to look for
- The likely timeline of the possible condition
- How and where to seek help
- Planned follow up

Consequences of uncertainty

- Less tolerance leads to increase in diagnostic tests  
- Worries of litigation 
- Source of distress for clinician 👉 👉 👉 burnout 
- Source of distress for patients 

"I'll want to run a few tests on you, just to cover my ass."

Litigation 

- ~~Not~~ recognising red flags associated with non MSK pathology
- ~~Failure~~ to consider the pathology as a differential diagnosis
- ~~Poor~~ documentation
- ~~Not~~ safety netted when at risk
- ~~Failure~~ to examine and refer on appropriately

When to Safety net?

- When there is a diagnostic uncertainty and the differential diagnosis includes serious pathology that may progress rapidly
- The diagnosis is certain but carries a known risk of serious complications
- The patient (for reasons of age or comorbidity) has an increased risk of serious pathology

What about you?🙈🙉🙊

- Recognise how you deal with uncertainty
- Put strategies in place
- Be kind to yourself
- Reflect….
- mentorship

- Safety netting those at risk (Greenhalgh et al., 2020)
- Use time (watchful wait) to assist clinical reasoning.
- Develop a therapeutic alliance to empower patients
- Address patients concerns of whether something serious is causing their symptoms. (Hall et al., 2021).
- Explain the reason why tests are either requested or not requested (Darlow et al., 2017)
- Reflect and learn from serious cases.
- Amend practice as a consequence of learning
- Share learning in a supportive environment with colleagues

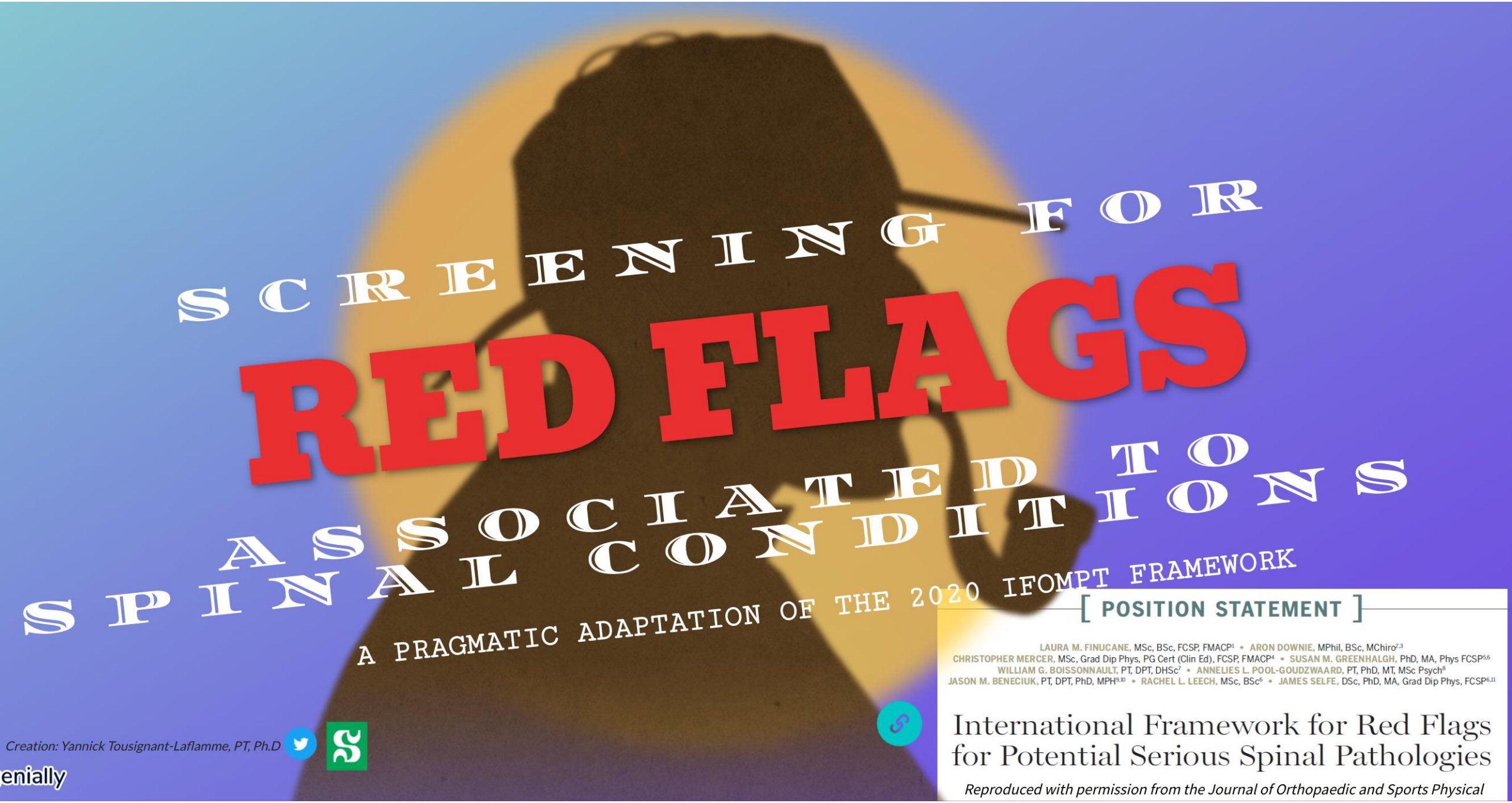
What we do know

- Serious pathology is Likely to increase
- Early identification is crucial
- Understanding a patients health status is important
- Understanding how a serious pathology behaves

We can make a huge difference to patients lives

Musculoskeletal Association of Chartered Physiotherapists

When should you seek URGENT HELP for your BACK PAIN?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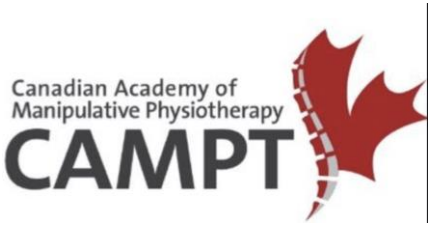

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