AN APPROACH TO KNEE PAIN: THE ROLE OF MRI/ARTHROSCOPY

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Thompson Community Based CPD Program

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Conflicts of Interest

- None

Objectives

- Develop an approach to knee pain (acute or chronic)
- Understand the role of MRI in the assessment of knee pain
- Understand the role of arthroscopy with respect to meniscal pathology
- Review the common conservative treatment options for knee pain

So, does my patient need an MRI or a knee scope?

No…

So, does my patient need an MRI or a knee scope?

No

Maybe

Yes

Yes – true mechanical locking

- Loose body, large bucket handle tear
- Uncommon

No – degenerative, no mechanical symptoms

- Typically patients over 50
- Often no specific traumatic event

Maybe – most start off here

- Often middle aged patients
- May or may not relate to specific injury
  - Acute or Chronic
  - +/- mechanical symptoms

How do we figure out which group a patient fits in?

~~MRI~~

Adelani et al, JAAOS 2015

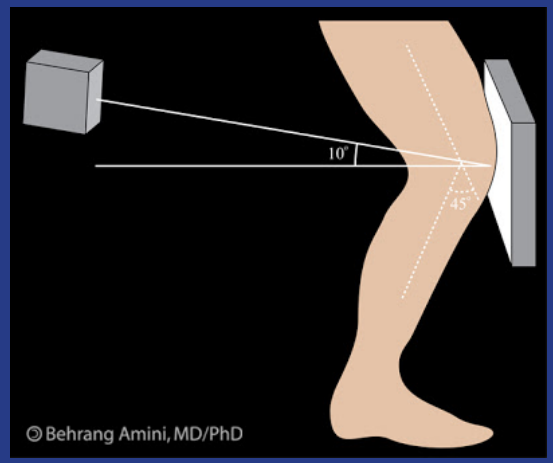
- The Use of MRI in Evaluating Knee Pain in Patients Aged 40 Years and Older
  - Single center, 599 patients enrolled (age range 40 to 81 with average of 51)
  - documented the presence of pre-referral MRI/x-ray, results of weight-bearing x-rays, treatment recommendations and the impact of any pre-referral imaging
  - Of the 599, 130 (22%) had pre-referral MRI and 76 of those (58%) had x-rays as well, with only 17 (13%) being weight bearing views

Adelani et al, JAAOS 2015

- Patients with pre-referral MRI only
  - MRI did NOT contribute to specialist treatment recommendations in 63% of cases
- Patients with weight bearing x-rays that identified joint space loss >50%
  - MRI did NOT contribute to specialist treatment recommendations in 95% of cases

Radiographs

- Xray is very helpful for initial evaluation in undifferentiated knee pain, especially when degenerative change is suspected
  - Make sure to order weight bearing views
  - Bonus points for ordering Rosenberg views



How ELSE do we figure out which group a patient fits in?

A physical exam that includes the following positive findings:

- McMurray
- Thessaly
- Apley Grind
- Joint line tenderness 

Be cautious with reliance on these tests as sensitivity/specificity is quite variable

Benjamin et al, BMJ 2015

- Meta-analysis of nine studies reviewing sensitivity and specificity of tests for diagnosis of meniscal tears
  - McMurray
    - Sensitivity 61% (45-74%), Specificity 84% (69-92%)
  - Thessaly
    - Sensitivity 75% (53-89%), Specificity 87% (65-95%)
  - Apley Grind – not included in study (insufficient data)
    - Other studies have shown similar range to Thessaly
  - Joint line tenderness
    - Sensitivity 83% (73-90%), Specificity 83% (61-94%)

What about the history?

- Typically will provide the most useful information for diagnosis and decision making
  - Patient age
  - Acute vs chronic
  - Traumatic vs insidious
    - Rotational injury, varus/valgus force, ”pop” felt/heard
  - Previous knee injuries/surgeries
  - Mechanical symptoms (clicking, catching, locking)
  - Knee “giving out”
    - True instability vs pseudo-instability (weakness/pain)
  - Swelling

What's the big deal? Why is all of this important?

We know the meniscus has a poor blood supply and if torn it likely will not heal, so logically it must need to be debrided regardless of etiology in order for the patient to improve…right?

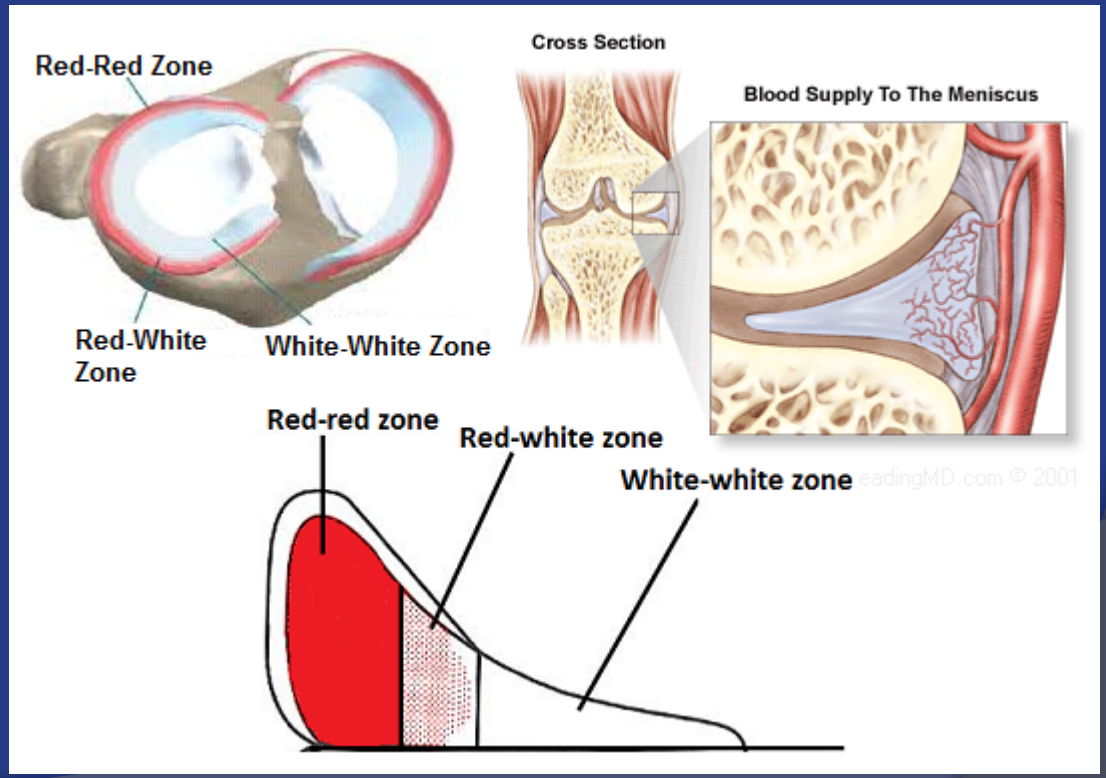
Not necessarily!

Khan et al, CMAJ 2014 CA

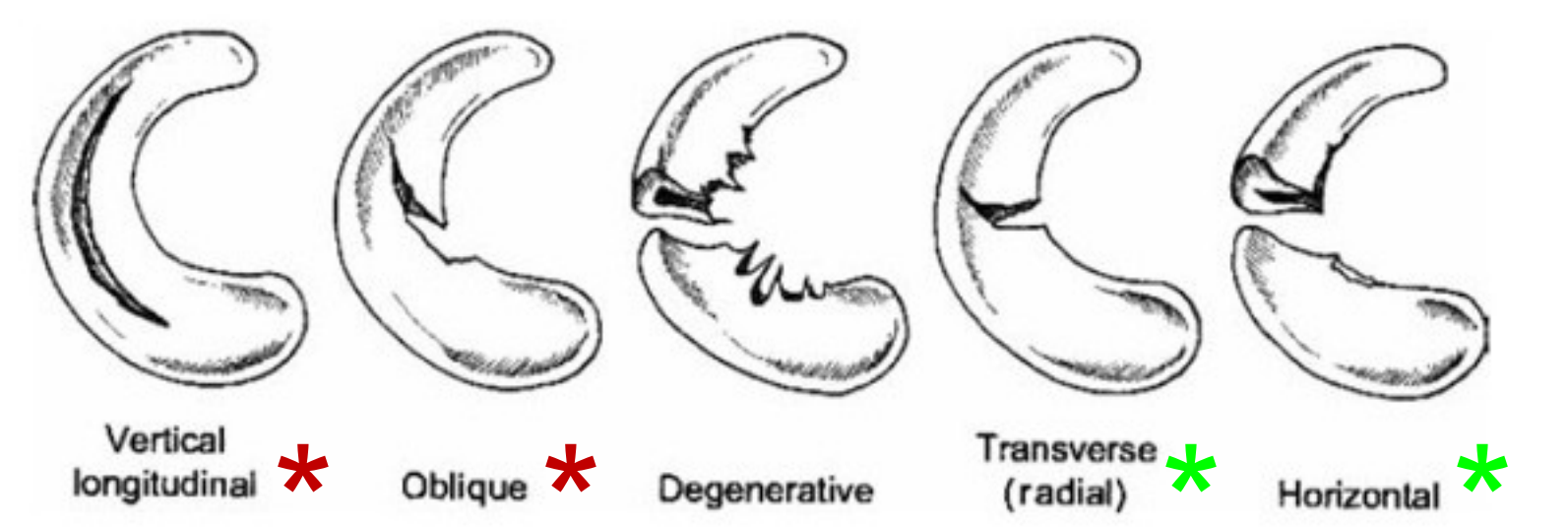
- Systematic review and meta-analysis of 7 RCTs
  - Degenerative meniscal tears with mild or no associated OA
  - Looked at outcomes of pain and function
  - Compared short term (6 month) and long term (2 year) data
- Concluded there is moderate evidence to suggest arthroscopic debridement has no statistically significant difference in pain or function in both the short and long term compared to conservative treatment

How can that be?!

- Depends on a few factors that relate to pathoanatomy of meniscal tears
- Stable vs unstable tears
  - Peripheral vs rim
    - Red zone more likely to heal
  - Large or small
    - Larger more likely to displace
  - Direction of tear
    - Oblique/longitudinal more likely to displace



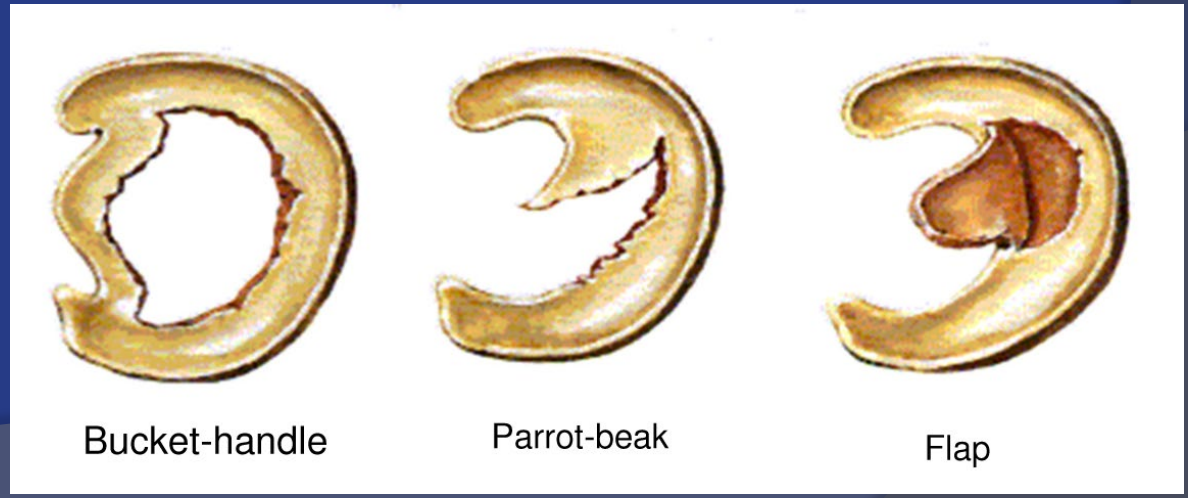
Meniscal Tear Classification



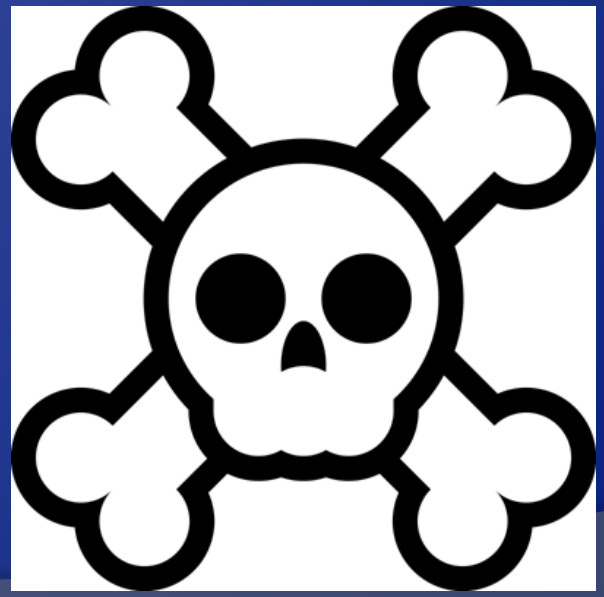
Degenerative also called multidirectional or complex

Acute/unstable

Degenerative/stable



What's so bad about knee scopes anyway?

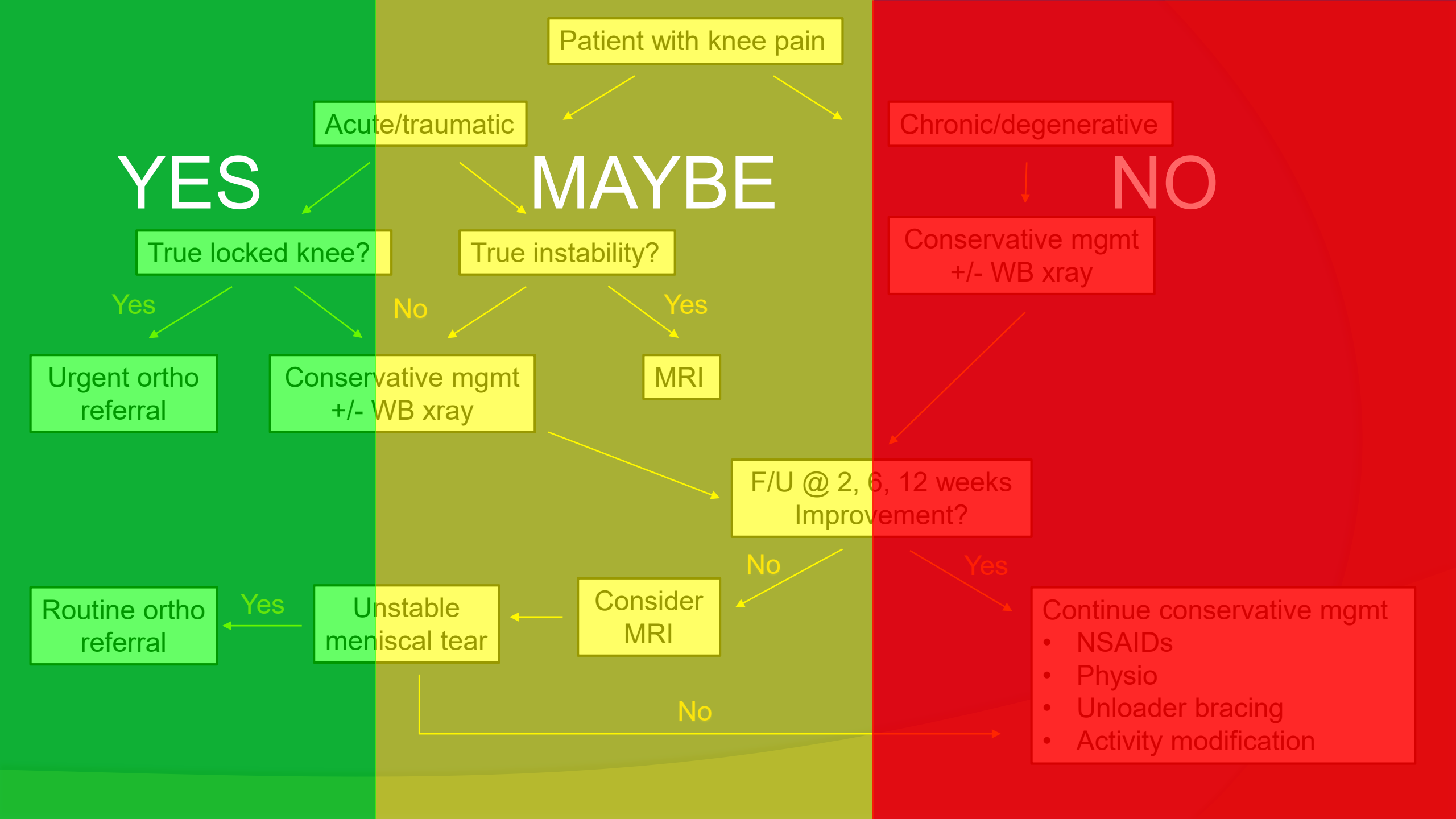


- Nothing, when used in the appropriate context, but…
- In debriding the tear, inevitably some undamaged meniscus must be trimmed to recreate a relatively smooth edge on the rim (white zone)
  - Relative large chance of tearing through this tissue again
  - Less meniscal tissue → less contact area → uneven distribution of forces in knee→ increased cartilage wear
  - Papalia et al, BMB 2011 – systematic review, min 5 year f/u
    - 39.6% develop OA in operative knee vs 6.9% contralateral knee

Bottom line:

Patient outcome is the same if they have arthroscopy or not, but less meniscal tissue in the knee leads to faster progression towards OA

Putting it all together


Patient with knee pain
Acute/traumatic
Chronic/degenerative
YES
MAYBE
NO
True locked knee?
True instability?
Conservative mgmt
+/- WB xray
Yes
No
Yes
Urgent ortho
referral
Conservative mgmt
+/- WB xray
MRI
F/U @ 2, 6, 12 weeks
Improvement?
No
Yes
Routine ortho
referral
Yes
Unstable
meniscal tear
Consider
MRI
Continue conservative mgmt
• NSAIDs
• Physio
• Unloader bracing
• Activity modification
No

Conservative Management

- Lifestyle modification
  - Reduce high-impact activities in favor of low-impact
- Physiotherapy
  - Subacute/chronic knee pain results in involuntary guarding of the joint
  - Decreased quadriceps tone, increased hamstring tone
    - This is why patients describe their knee “buckling” or ”giving out” intermittently
  - ROM/strengthening exercises to correct imbalance

Conservative Management

- Oral or topical analgesics
  - Typically most effective for acute pain, less so with chronic
- Unloader bracing
  - Only in the setting of unicompartmental pathology as it relies on transferring force from the pathologic compartment to the contralateral compartment
  - Covered by MB Health for osteoarthritis, chondromalacia and meniscal tears
  - Evidence lacking to support efficacy

Conservative Management

- Intraarticular injection
  - Corticosteroid
    - Typically effective for 3 to 6 months
    - Most beneficial for acute flare up of pain, taking effect in a few days
      - As such, can allow for more effective participation in physiotherapy program
    - Some evidence to suggest thinning of cartilage with repeat injections
    - Limited evidence supporting efficacy beyond 4 weeks
  - Platelet-Rich Plasma
    - Very limited evidence that shows benefit of PRP
    - Not many places offer it, typically very expensive

Conservative Management

- Intraarticular injection
  - Hyaluronic Acid
    - Primary indication is in younger patients (30s to 50s) with mild to moderate osteoarthritis or chondromalacia
    - Not indicated for meniscal tears
    - Fairly expensive ($300-600 per injection)
    - Generally lasts 6 to 12 months
    - Limited unbiased evidence that supports usage of it, most of the favorable studies are heavily industry funded

QUESTIONS?