0:03
okay so welcome to the third third little mini course on the knee
0:09
um this one is going to go over conservative management um and essentially what we're going to do is we're going to go over
0:16
um various conservative management cases are types of types of conditions that we
0:22
treat regularly um unfortunately we can't spend a ton of time on like specific interventions for
0:30
these things just just because again this this is a video lecture so um
0:36
most of that type of education training will have to be done in the form of of
0:41
in-person um done together in the clinic uh so for the purpose of this course it's mostly
0:47
going to be going over conditions And discussing timelines and things we need
0:52
to refer out things like that um so one quick thing I wanted to go over
0:58
uh with regards to post-operative management something I kind of forgot to harp on as much I did go over it in the
1:06
post-operative management course but I wanted to touch on it specifically with the knee
1:12
um few few things to think about with the knee is that when when patients have
1:17
a knee surgery um like when when they have a knee surgery
1:23
whether it's elective or whether it's done for athletic purposes or whatever
1:29
the case is um the knee it's the knee specifically is a joint that tends to give people a
1:37
lot of anxiety when people think their knee is gone um there's a there there's usually a lot
1:42
more fear involved within with the knee um and then in the in it so so if someone
1:50
has an ACL surgery because they're injured in a soccer game for example um
1:56
we have to take into account the the psychological toll that that's going to have on the on the individual
2:04
um so you know a lot of times there are tears it's it's not uncommon to have tears with with patients after they've

2:11
had a ACL surge of meniscus surgery um anything like that um so we we do definitely need to
2:17
acknowledge the cycle the psychology that goes and goes into recovering from that
2:23
um for our elective procedures like our knee Replacements and the like
2:29
um we need to also keep in mind that the patients you know it is an elective
2:36
procedure and so the patients are essentially purchasing like they're they're purchasing
2:42
something and part of what they're purchasing is the post-op rehab part of
2:48
it um so we need to make sure that we're giving these people what you know
2:55
for lack of better terms giving them what they paid for um because they did choose willingly to
3:02
have their knee essentially amputated twice and and have a new component put in it's a very intensive procedure so
3:10
um just something to keep in mind that a lot of these patients when they have surgery whether it's elective or
3:15
non-elective um there's there's a lot of times going to be a lot of anxiety and not
3:21
necessarily knowing what to expect and I think we're in a really in a really cool
3:27
spot for what we do that we can fill in that gap of helping them know what to expect and give them a better idea of
3:35
what the outcome is going to look like and how how the journey is going to look and we have a unique ability because of
3:42
how much time we spend with people to be able to you know Rectify some of that
3:47
um so don't take that lightly it is important um from the psychological standpoint to
3:54
not Overlook it so with that being said we're going to move on to conservative management
3:59
okay so one thing we want to talk about is Oshkosh Slaughters disease so this
4:05
this is you know what we typically talk about it we we refer to it as an evulsion fracture of the tibia
4:12

tuberosity um I think a better term is tibial tuberosity apophysitis because it's not
4:17
all there's not always an evolution sometimes it's it's just like a stress reaction so physical exam is going to
4:24
reveal a tender enlargement of the tibial tuberosity radiographs might be normal or they might have an evulsion
4:31
um usually it's going to involve boys from the age of 12 to 14 girls from the age of 10 to 12. so
4:37
um puberty puberty aged kids and the reason for that is their bodies
4:43
are growing muscles are growing um sometimes the skeleton is elongating faster than the muscles are and there's
4:49
increased tension from the muscles pulling on the bones and so as the muscles maybe haven't strengthened
4:56
appropriately uh the bones the point where they're pulling on the bones has also not strengthened appropriately
5:03
so the treatment for us good Slaughter's disease um usually it it's going to be self-limiting so what that means is if
5:11
they're you know we use the example of soccer player alive if they're a soccer player and they have Oscar schlatters disease
5:16
um basically they don't need to stop playing they just need to stop when it
5:23
hurts so basically it there needs to be an understanding with the coaching staff that if they're if they're playing and
5:30
they're good let them play if it starts hurting they need to sit out and take a break until the pain till the pain goes
5:36
away or comes down enough to where it's it's not intense we want to avoid
5:42
vigorous stretching or over tensioning of the region as it can make it worse
5:48
um a compression wrap might help improve the pain and function something you know especially if they're athletes usually
5:54
we tend to see this in Athletic kids um patella taping might help to improve tracking which can decrease pain during

6:00
the activity um education with this condition is really going to be key we need to inform
6:08
the parents and the child that it's going to get better in six to eight weeks with appropriate unloading and
6:13
again unloading is a fancy way of saying activity modification if they're a soccer player and they normally play
6:19
three games on a weekend they need to understand that they might be playing 15
6:25
minutes of each game instead of the entire game of each game
6:31
um if they're Runner you know they might need to understand that they're whereas
6:37
they've been running 15 20 miles a week maybe they're running three to eight miles a week
6:45
um so things like that we need to unloading doesn't necessarily mean completely
6:51
offloading and like tractioning it just means taking some of the load of what
6:57
they've been doing off to a point where uh they're not they're not in significant pain
7:04
um they do need to understand that there's no need to stop the activity altogether um that's that's important
7:10
um it's important for them to know that they're not gonna damage anything by continuing as long as they keep within
7:16
the guidelines that being said sometimes it's hard to tell a kid you can't have
7:22
pain more than four out of ten um a kid doesn't a kid does not have most kids don't have pain so that
7:28
doesn't mean a whole lot to them um sometimes it's better to use the 24-hour 24-hour rule so you do something
7:36
and you try to stick within that four to ten I mean four out of ten pain range but then you have to follow up with the
7:42
kid 24 hours later and ask how are they feeling compared to the previous day or
7:47
you know taking note of whether they can participate the same way they did the previous day and if not then they

7:53
overdid it if if they're good 24 hours later then then they're most likely fine
7:58
so just kind of we need to understand that using the number like the zero to
8:04
ten pain guidelines for kids a lot of times is not overly helpful or effective
8:12
all right tendinopathy so um
8:17
it can be really difficult to actually determine a painful structure when someone's
8:24
hurting um especially with soft tissue soft tissues especially it can be difficult
8:30
just because there's so many different soft tissues when a patient points to a spot that hurts we know that there's a
8:36
whole bunch of different things there that can be causing the pain so that is true but
8:43
um there's they're subjective and objective indicators that that point to
8:48
a tendon problem not necessarily related to special tests so if there's a sudden
8:55
change in the loading pattern the type or intensity that that can be a
9:00
causative factor for attend a tendinopathy so what that might mean is maybe we have a we have a kid who is a
9:08
football player and as soon as the season ends they go straight into high jumping um with without any any real warm-up or
9:16
like in any weeks leading up to it to kind of get back into Plyometrics or maybe maybe they're not a football
9:21
player maybe it's something even and more innocuous maybe they're a cross-country athlete or something and they go into some sort of jumping
9:28
activity um without appropriate build up um
9:33
maybe they're a tennis player and they were playing 45 minutes three times a
9:40
week maybe now they're playing 60 minutes five days a week you know those are kind of things we look for that
9:46

could be that could be causative factors for tendinopathy compression or trauma over the tendon so
9:53
if uh if there's a garment pressing on a tendon that can cause that can cause an
9:58
issue direct trauma to the tendon um or even even sustained compression
10:05
like you know you see it in in you see it in women sometimes like who like to sleep on their side they'll get a
10:11
greater a grade of trochanter um tendinopathy for the like the glute
10:17
Mead um quinolone antibiotics which are like
10:22
things like Cipro and Levaquin those can be those can cause tendinopathies
10:28
throughout the body real real nasty tendon grafts we need to be on the lookout for for further tendon breakdown
10:36
um if the if the patient has pain with energy release or absorption so like
10:42
like plyometric type things um like contractile movements but more
10:48
explosive in nature tendons are going to hurt in a localized
10:53
and non-radiating manner sometimes with the shoulder rotator cuff those will radiate but
10:59
generally for the low extremity they're not going to radiate for athletes usually you're looking to see if they
11:04
have pain with the activity that makes them good so whatever whatever type of explosive or strong movement that they
11:11
need to be able to do that's what a lot of times what we're going to see tendon breakdown
11:17
so um there can definitely be overuse or
11:22
inappropriate addition of load um overuse you know I don't I don't love the term overuse but we do have to look
11:29
sometimes if there is truly like a volume issue like a like a big time
11:34
volume issue um that can that can lead to a tendon issue
11:40

um so yeah you know the football plan going right into high jumping middle-aged man going increasing his his
11:47
tennis amount um a distance Runner suddenly taking up sprinting without appropriate strength
11:53
training um those are kind of the questions we need to ask has anything changed in your training schedule your athletic schedule
11:59
did you just start a new sport did you just start a new hobby have you changed the way you sleep you know all these
12:05
questions we need to be looking for anything that's changed uh okay so common low extreme retaining
12:12
issues we're looking at uh quarter patellar tendon proximal hamstring distal hamstring Achilles proximal
12:18
adductor or glute Mead so tendon loading
12:25
tendon loading is really the key to resolving tendon issues and and loading
12:30
means everything ranging from unloading to a very heavy plyometric loading so
12:39
we always want to start with unloading so if someone has a real severe
12:45
Achilles is kind of the easiest to unload um because you can stick a heel lift in
12:51
their shoe and that takes some of the pressure off of the Achilles and just just as a tangent the reason that's
12:58
that's unloading is because the way the Achilles inserts it wraps around the the
13:05
calcaneus and the way it wraps around it you get compression from
13:11
the part of the calcaneus that it is wrapping around so when you put the foot more in plantar flexion it's it's
13:17
removing the compression off of the tendon um you know it's it's just it's kind of
13:23
tricky because tendons do like tension and if you move the foot into more dorsiflexion you do get more tension but
13:30
you also get more compression over over the tendon so with something like the
13:35

knee if it's a quad tendon issue they're not going to like sitting with the knee flexed for very long so unloading might
13:43
mean just not squatting as deep or changing the way you sit things like that
13:49
um but again if it's a quad tendon the more knee flexion you have the more tension you have on the quad tendon quad
13:56
10 the tendon is going to like tension tension is going to help it heal but the more you tension it the more compression
14:01
you're having you have it in it so um just a few things to think about
14:07
um okay so unloading that's going to be first you're going to unload um the you're going to unload when they're in severe enough pain that they
14:14
don't tolerate positions or basic movements um early loading that's when we're usually introducing light isometrics so
14:21
there's a fair amount of evidence basically stating that isometric loading to attendant can have a very powerful
14:28
analgesic effect as much as 50 percent um so that's that's that's pretty that's
14:34
pretty awesome if we're trying to treat somebody that we can have very very simple easy exercise that can reduce
14:41
pain by up to 50 percent um so early loading light asymmetrics
14:46
are going to be you know they're just pushing they're just giving any sort of isometric
14:52
exercise that they can tolerate at that point we're not really concerned with how hard
14:57
they're pushing moving on to Middle loading these are heavy heavy isometrics
15:03
and that's going to be near maximal you know you're looking usually around 80 percent mvic 70 to 80 percent
15:11
um and that's going to be like a sustained hold for up to 45 seconds at a
15:17
time um near the end of middle loading we're going to introduce concentric eccentric training
15:23
um late late loading we're doing heavy concentric eccentric so this phase is
15:29

going to look a lot more just like traditional strength and conditioning um and then we move on to Plyometrics
15:35
we're going to start general and eventually move to more sport specific movements and then from there we we
15:42
start returning to play so um tendon loading can take as long as you
15:49
know 12 to 16 weeks from start to finish but some sometimes
15:55
four weeks of that is going to be unloading and they might not be seeing us at that point they might just be
16:00
taking a break from whatever they were doing that caused the issue you know and
16:05
letting letting that initial severe pain subside because a really irritated tendon is going to be quite painful so
16:14
um yeah you know it can the Total Recovery can last 12 to 16 weeks but
16:21
um part of that is going to be unloading not all of our patients that have tendon issues are returning to a specific sport
16:28
a lot of our patients are really just trying to get back in the gym um and so you know they they might be
16:35
doing pretty good after six weeks or so so um but again the full recovery you're
16:40
look of attending enough you're really looking at more like 12 to 16 weeks
16:45
okay so isometric loading um Jill cook really has a lot of awesome
16:51
research on tendon loading um and she suggests five sets of 45 second
16:57
holds of a load that does not exceed 5 out of ten pain um so again you're going to start light
17:03
with whatever whatever you could tolerate and you're gonna progress to a load that's near maximal I'm gonna do this several times a day
17:09
for pain relief you can do SUB maximal isometrics as often as you need to
17:16
um but the dosage of the therapeutic exercise should be you know two to three
17:21

times a day of those heavy isometric loads the goal is going to be to perform this in a position of maximal tension
17:28
with minimal compression gradually reconditioning the tissues to positions
17:33
of Greater compression so we don't want to altogether avoid tendon compression
17:38
because because the tendon has to be able to withstand compression as well as tension just keep in mind for a more
17:44
irritated tendon they're going to prefer positions of more tension and less compression so as they get better we
17:52
want to change the position so for example um if they if we have a patient with a
17:57
with a quad tendon we might start them doing isometrics like heavy isometrics and a
18:06
single leg Spanish squat position maybe they only tolerate it with the knee Flex to about
18:12
45 degrees the goal would be as we're increasing load we're also increasing squat depth
18:19
so that we're increasing tension and gradually increasing the compression over the tendon that they can tolerate
18:26
okay concentric eccentric Sports pretty simple performed three times per week two to three times really two to three
18:32
times per week at a load that does not exceed 5 out of 10 pain we can use light
18:37
or heavy isometrics as pain relief on off days or as needed to to get pain
18:44
relief from that they might have that might have occurred due to the concentric eccentric loading
18:52
um we want to progress weight to a typical trading load that you would expect of a muscle we want to have a
19:00
three second concentric phase and a four second eccentric phase so that's the part that really does differentiate from
19:06
a traditional strength training program but it's not necessarily a bad thing because most of the evidence says that
19:12
to build muscle it's really all about time under retention anyway okay Supply metrics we don't want pain

19:21
um I mean paint I'm sorry pain is going to be expected to a certain degree in this phase we just need to educate them
19:27
that you know a certain amount of pain is is okay and and it's kind of it's a
19:32
it can be a sign of healing we just don't want that pain to go up too high um and then as with before we want to
19:39
use isometrics as pain relief as needed so example of this maybe we have a high
19:45
jumper they might start with something simple like a low amplitude movement like jumping rope
19:51
um and then we might progress to like single leg jumping rope and gradually increase to
19:57
um you know jumping with higher amplitude
20:03
okay so considerations things we need to keep in mind when treating tendinopathies
20:09
um we we don't want completely neglect mechanics um they're they're practitioners out
20:14
there who don't really do a ton of tendon loading they just they find the mechanical the movements
20:20
that relieve the pain off the tendon so if we're dealing with a patellar tendon or
20:26
quad tendon or something we're looking at how they're moving if they tow out and have a lot of knee valgus and you fix that and it takes away a lot of the
20:33
pain then that's your treatment and you just gradually continue strengthening and adding weight as the patients say
20:39
well that's kind of one school of thought um the tissue loading model is going to
20:45
be more of the like it's gonna focus a little more on
20:50
isolating the tissue that needs to be loaded um personally I think we need to do a little bit of both you know we want to
20:57
we want to address the mechanics but we still do definitely need to preferentially load the tissues because
21:03
because they're sick you know we need to we need to reinvigorate them and
21:09

reintroduce uh reintroduce stress so that they can become resilient again we
21:14
don't just want symptom modification we need to we need to make more resilient
21:21
tissue um so
21:26
we need to yeah like like kind of like I said if you if someone has a lot of knee valgus and toeing out ankle pronation
21:33
things like that we need to understand that that's going to change the way a tendon is loaded so as we talked about
21:40
with the patella the patella is being jerked all over the place by funky mechanics the same is going to be true
21:46
for for the tendon tendons like tension they don't love shear stress they don't
21:51
love compression so if the mechanics like if faulty mechanics are causing
21:57
shear stress in the tendon um that can be a catalyst for tendon breakdown
22:03
so again we don't want to just focus on the loading protocol we do want to make
22:09
sure that we're kind of cleaning up their movement a little bit as well especially especially if if it if it's
22:17
pain relieving you know if that can be a form of unloading by itself if we're changing the way they move to get them
22:24
out of pain in those early phases that can be a form of unloading and then allowing us to preferentially treat the
22:30
tissue without skyrocketing their pain okay so moving on to knee osteoarthritis
22:37
uh so um we're gonna focus on the knee but I included the information about the hip as well
22:43
um so with the knee uh this is a this is a cool little table that can give us a good indication of
22:50
whether or not someone has knee arthritis or not um pretty high specificity and
22:55
sensitivity so it is useful um we're looking to see if they have knee pain and at least three of the
23:03
following patient is over 50 if they have more than 30 minutes of morning stiffness crepitus bony tenderness bony

23:10
enlargement and no palpable warmth the no palpable warmth the reason that's
23:15
important is if they have palpable warmth that's that's an indication of something else going on like like a
23:20
um some form of acute inflammation um it could be anything from a cutely
23:26
torn ligament or meniscus all the way to rheumatoid arthritis which is going to
23:32
require different diagnosis Okay so
23:37
um a lot of this stuff I pulled from the clinical practice guidelines for for knee arthritis
23:43
um and these are this is just the list essentially of what is backed and what is not backed by
23:51
um most of the evidence out there so things that are backed by the evidence supervised exercise topical incense
23:58
that's like Voltaren or diclofenac oral NSAIDs or acetaminophen neuromuscular
24:04
control exercises patient education self-management programs canes braces steroid injections weight loss partial
24:12
meniscectomy um things that we should not be doing
24:18
um uh hyaluronic acid injections opioids shoe wedges and debridement surgeries
24:27
so we're going to kind of go through some of these things like the ones that are a little more pertinent to us
24:33
so manual therapy um manual therapy was not on this list because it was I'm like a mildly backed
24:41
intervention it wasn't it wasn't suggested against um it was just there's just not a ton of
24:46
evidence for long-term benefits and I think actually manual therapy was bumped down
24:53
on the list of things that are effective for osteoarthritis and it's not to say you can't make someone feel better with
24:59
manual therapy it's it's more um when you start looking over a course of
25:05

four to six weeks if it's done in isolation and not coupled with anything else you know it's not it's not it may
25:11
not really be doing a whole lot and I don't think that is a huge surprise to anyone
25:17
um but it is worth talking about um so yeah deficit of high quality evidence
25:22
the evidence that we do has does indicate improvements um from manual therapy and pain and
25:28
function okay other passive modalities that's looking like ultrasound tins
25:34
um exactly the same thing there's a deficit of high quality evidence that which we do have does indicate improvements in I'm sorry that should
25:41
not be manual therapy that should be from passive modalities um improvements from passive modalities
25:47
in in pain and function okay so uh with that being said does
25:53
manual therapy equal tins are they this are they interchangeable so I have a
25:59
fellowship in manual therapy and I think I'm required to say that they're not the
26:04
same thing um but manual therapy's best use is to improve
26:11
the performance of intolerance of an exercise that that's the best use of it
26:17
um modalities you know it's it's the same thing if we're using a modality to
26:22
directly impact how someone is performing with an exercise or how someone is is uh functionally performing
26:32
then then it's great you know um I think the problem is that a lot of
26:37
people misuse both things we got a lot of manual therapists out there who
26:42
basically want to act as chiropractors and put all their money on passive treatments and then we have a lot of
26:50
therapists out there who just slot modalities on people and convince
26:55
the patient that that's what's fixing them I would say both of those are equally bad whereas if you use manual therapy to
27:02

improve someone's ability to do an exercise immediately like as a pre-post test kind of thing
27:08
um or if you give somebody a TENS unit and you they're at that point able to squat
27:15
better and then you can gradually decrease how much tens they're using I would also put those kind of in equal
27:21
categories as far as the patient goes so um truly passive modalities
27:29
likely have very little place in a practice where our core is centered around getting people moving better if
27:36
an intervention is not aimed at directly impacting Mobility or progressing to a greater level of Independence and
27:42
function it most likely isn't worth a whole lot so again I don't think that's
27:48
all that shocking to think about but I think it the reason we're talking about it is is with respect to manual therapy
27:55
because in school we tend to put a whole lot of value on manual therapy and and it's true like manual therapy does have
28:01
its place we just need to make sure that we're using it right otherwise if we're not using it right then we're no better
28:07
than just using passive modalities so I'm on that same note consider the
28:14
following so if you have if someone therapist does knee and hip mobilizations because it's recommended
28:20
by the evidence um without actually using them to check
28:25
like to change someone's function uh that's very different than doing a hip and knee mobilization and then
28:33
directly addressing someone's movement so if if someone has knee pain with every step they take
28:39
and you watch them walk and they and then you you come to the conclusion that they lack hip extension so you mobilize
28:46
the hip and get their hip extension a little better in the moment then you have them go walk and then all of a sudden they're walking better then you

28:53
follow that up with hip extension exercises and then you do that and then they're they're their pain continues to
28:59
get better um that would be an appropriate use of manual therapy whereas if you just slap
29:05
them on the table do their manual therapy and then let them go about the rest of their exercises that's not very
29:11
good so that's kind of that's how we should be practicing
29:17
so exercise for osteoarthritis the end goal is going to be Progressive
29:23
loading so um most of what we learned in school had
29:29
to do with activity modification and a lot of times unfortunately the education School leaves leaves what we do there
29:36
you know you decrease height sit to stands do mini squats short R versus long arcs you know to decrease the the
29:43
pain it kind of takes the approach well we do need to exercise we just don't want to exercise in a way that's painful
29:49
without without addressing the fact that we need once those activities are no longer painful then we need to move to
29:55
something more aggressive it's kind of like we need to be Towing the line constantly
30:00
um so an example would be uh if a patient is doing 60 degree knee
30:06
Bend squats over the coming weeks that needs to be progressed to 70 and 80 degrees
30:13
um maybe if maybe someone does a four inch step up or step down and then we need to gradually progress that to a
30:20
more depth later we need to seek to find the movements or exercises that bother the patients
30:26
unload them to the point where they can tolerate and then gradually reload
30:33
so education is really really important for osteoarthritis this is kind of my
30:38
basic uh kind of I don't know if algorithm is the right word but kind of the checklist I go down when I'm when

30:45
I'm treating these people first you want to address their range of motion if they have range of motion limitations um you do want to address that and then
30:52
maybe teach them self modes and ways to check at the same at the same time
30:58
we do want to address movement impairments so um maybe we need to change your foot
31:03
posture during their sit to stand maybe we need to change their hip positions during tasks that are important to them
31:10
like if they're if they're standing and they're standing with hip and turn rotation that hurts then we need to address that or
31:16
um if they're if they're a golfer and their knee hurts when they swing and you know we might have to change the way
31:22
they Posh their hip um and then we need to start introducing
31:27
a load a load to the joints so um Total Gym and bike are really great places to
31:34
start because they're very low Prof they're low on the uh on how provocative they are
31:39
um but then those things need to gradually progress in intensity
31:46
um so you know the the things in that in that list like the all the items in
31:55
in this list these might not all be done on the same day you know we might just be doing a few of these on one day and
32:02
then kind of gradually moving from there um it's important to understand that
32:07
that's like the end goal is the progressive loading and sometimes it takes a number of weeks to where we get
32:13
to doing you know any significant loading sometimes it's been a like a week or two on
32:19
like move movement mechanics hopefully not hopefully we're doing some load early on it's just all you know every
32:24
patient's different um and vice versa sometimes a patient might be a motor [__] and they might
32:30
not really be able to make movement impairment adjustments early on like they might not really be able to follow

32:37
the instructions for foot posturing like that may take a long time and the the juice might not be worth the squeeze
32:42
there so sometimes with those patients we just need to get them moving first like we need to get them doing
32:48
um like us a low load repetitive movement like the bike or the total gym and then
32:55
they're going to feel like their working pain is going to start going down and then we can kind of build up and sometimes as people's pain decreases
33:03
um they become better at motor control so just another thing about
33:09
also we do want to keep form in mind that is important
33:14
so when we're treating these patients a few things to think about um we kind of touched on a few of these
33:20
but what is lack of a hip extension do in the knee joint
33:26
especially during gate what does lack of hip internal rotation do in Gate what
33:31
does lack of hip external rotation do in Gate or in a squat what is lack of dorsiflexion do in a squat so you know
33:39
all these things can impact the mechanics and the load on the knee and especially if we are following the
33:45
tissue loading model then there's a point where we have to consider these things hopefully we get to the point
33:50
where we're not as worried about the mechanics like as their their joints become more tolerant but early on when
33:56
we're trying to change their pain these things are worth considering
34:02
so when we start with loading for the knee and we want to start a low load High rep usually 20 to 30 percent one
34:10
rep max um that's going to usually equate to like a thousand repetitions so low
34:15
weight leg press or Total Gym cycling unloaded sit to stands pool squats resisted heel slides all those would be

34:22
a good starting place we want to gradually progress the load decrease the Reps work to gradually
34:29
achieve increased depth as well or increase range of motion however you want to think about it as their pain
34:34
allows so a common question is well am I going to make it worse you know they a lot of
34:40
people have this idea that squatting is bad or running is bad running is bad for the knees jumping is bad for the knees I
34:46
have arthritis I shouldn't be playing tennis anymore the doctor says I can't ever squat again um doctor says squatting is bad you know
34:53
all these things um at this point you know when they start asking these questions
34:59
we do need to educate them on the evidence that we have on cartilage conditioning and the effects of things
35:05
like squatting and recreational running on knee longevity there's a lot of evidence out there that says recreational Runners are the least
35:12
likely to develop knee arthritis and so there is there is
35:18
um this idea that we that our cartilage can be conditioned and if we overuse it
35:23
it can go bad and if we under use it it can go bad um so um we need to make sure we're telling
35:29
our patients that if they're doing the appropriate exercises and the
35:36
appropriate movements the appropriate loads they're not going to make they're not going to make it worse and even if
35:42
they do make it worse hopefully we've had the conversation about Imaging studies with them
35:47
um and that not all arthritis has to be painful and even though it does progress and it does continue to degenerate a lot
35:55
of people have these same conditions with no pain and so there is very good
36:01
chances that they can a go back to a state of not having pain and B even if
36:08
it does progress in severity of of the disease that they can still continue to not have pain

36:14
um so you know sometimes what I'll tell the patients when they do ask me this I'll tell them in a you know in a kind
36:20
loving way that they're asking the wrong question the question should not be is the arthritis going to progress because
36:26
arthritis is symptomatic exactly as often as it is asymptomatic
36:32
um the the correct question is can I do this without pain and that is
36:39
something that they have to see through the course of rehab and hopefully as they start with something low load and
36:45
they gradually progress the more and more and more load they they come to understand what their needs can tolerate
36:52
and and they come to see oh man my knee's not broken my knee can take this load and that's that's the end goal
37:00
so um this is this this is that study showing uh you know the chances of the chances of
37:06
knee arthritis from running you know competitive Runners obviously if you're running 100 miles per week
37:13
um yeah you're gonna wear your knees out a little quicker if you don't run at all if you're sedentary um you're also going to have increased
37:20
chance of arthritis recreational runners very very unlikely to develop
37:26
symptomatic arthritis I think part of that too is if you're a recreational Runner you're most likely you're living
37:32
a healthier lifestyle than a non-runner um
37:37
same thing with a competitive Runner competitive Runners they optimize their bodies and their habits for running
37:43
um but there's a lot of other things that are not super healthy about
37:49
competitive running so um this is a very useful educational point
37:55
for our patients okay HCL injuries ACL injuries can be contact or non-contact non-context is
38:03

usually going to involve pivoting femoral internotation tibia external rotation knee valgus knee hyperextension
38:10
um one of the most it's one of the most commonly injured large ligaments it is
38:16
important to acknowledge that we're still learning about the recovery process
38:21
so usually it's going to involve the heavy knee extensor torque or an excessive rotation of the tibia usually
38:28
this rotation is going to be external rotation or maybe a valgus force as well
38:33
so important to note the ACL is actually going to be tensioned with tibial intern
38:39
rotation so there's other you can tear the ACL in a multitude of different ways
38:45
um I think the big thing with tibial external rotation is that you get
38:51
anterior shearing of the tibia with external rotation of the tibia and that
38:57
creates more of like a shearing Force across the ACL okay so ACL injuries
39:04
um some things we're learning is that passive stability tests may not be the best indicator of function conservative
39:11
treatment return to sport likelihood is relatively is relatively low
39:18
um surgical treatment return to amateur and Elite Sports is relatively high so
39:23
89 percent of conservative cases still participate in active Lifestyles however so
39:30
um if you if you tear your ACL um and you don't have surgery
39:38
it's not as likely that you will return to a high level of sport uh not impossible there you know 10 20
39:45
that's still per that's still not bad um given given how severe uh we think of
39:52
ACL injuries being um but if people do stop their their
39:57
sport you know almost all people are still gonna participate in an active
40:03
lifestyle so good outcomes with conservative management are usually going to be associated with some form of activity

40:09
modification so return to Prior level of function of the unathletic population has equal
40:16
outcomes between surgery and conservative management so if they're not trying to return to a
40:22
sport um not as big of a not as big of a need for surgery
40:27
return to sport is highly linked to subjective reports of stability and quadriceps strength that to me is very
40:34
interesting so when we're looking at surgical versus conservative management for the ACL
40:41
we're looking at whether or not patients are going to be copers or non-copers
40:46
copers are likely to return to Prior level function without surgery non-copers or not
40:53
so this is this is a test that we can do with our patients to see classify them
40:59
as copers or not so there's a Time six meter hop there's a there's a knee
41:04
outcome survey it's a questionnaire they fill out Global rating score and uh how often
41:12
their knee gives away and and basically we're looking
41:18
to be for the for the top three we're looking to be above those numbers and we're not
41:24
looking to have any incidences of knee giving away um and if those are if those are true then they would go into the copper
41:31
category so there's a few take it takes things we can take away from this study
41:37
um those who are initially screened as copers had similar outcomes comparing
41:43
surgical to non-surgical um now another thing that we need to
41:49
understand is that people were tested and then they were
41:55
they were they went through 10 sessions of rehab and then they were tested again
42:00
and what they found is that after rehab nearly half of the non-copers converted
42:06
to copers um but there was but there's a is a small conversion of coper's two
42:13
non-copers but again if half of the people who were initially identified as non-copers

42:20
switch over that's pretty cool so after 10 sessions of rehab those who are
42:26
identified as copers were associated with an even greater success rate with conservative management so
42:34
um if you were Cooper before and then you went through rehab you were you were
42:40
gonna haven't even even higher outcome with more therapy after that so basically you
42:46
kind of if you do therapy if you do conservative management you're going to continue to improve regardless
42:52
um after 10 sessions of rehab those identified as non-copers had similarly poor outcomes with surgery and
42:59
conservative management so people who are non non-copers um they're in general they're not going to
43:06
do as well regardless of what what kind of management they have whether it's surgical or conservative
43:12
um so the takeaway from this is that regardless regardless of the case
43:19
they should be doing our patients should be doing conservative management first because
43:26
if you have if you're a non-coper and you go through therapy there's a there's
43:31
a 50 chance that you're going to convert to a coper anyway and not need surgery or if you're a non-copra and you go
43:39
through rehab and then you do have surgery you're going to have a better outcome versus if you just get lumped
43:45
into this non-coper and it's like okay well they're not a coper so they're going to have surgery well if you're non-coper your chances of success with
43:51
surgery are is not really much better than having it managed conservatively anyway
43:57
so there's a very very positive effect on the outcome in the end regardless of
44:03
which which route you have for management just by doing Rehab on the front end that's what that's what this
44:10

study really tells us is that patients should be doing therapy on the front end before going before any further decision
44:17
making it's like okay you tore a ligament before we make any decisions regardless of the stability tests and
44:23
anything else you need to do therapy first because there's a good chance that your psychology is going to be involved
44:29
and there's a good chance you're going to find out that you're a lot stronger than you thought you were
44:35
um and this is just this is the data that I kind of summarized in that last slide
44:41
okay so moving on to MCL injuries conservative management is going to be
44:46
king for MCL injuries so um surgical treatment is real is usually
44:52
only going to be even considered if someone has a symptomatic grade 3 injury that does not respond to conservative
44:58
treatment um another thing just a point I wanted to make is that casting for MCL injuries is
45:06
not supported I don't know if anybody's still doing that but that was one thing I came across is that casting is is uh
45:12
really bad um we want to as quickly as possible restore their range of motion without
45:17
restriction so um for grade one they're not going to use a brace uh for grade two injury they
45:24
might use a brace for three weeks grade three they might use a brace for six weeks you want to restore range of
45:29
motion as soon as possible we want them to weight bearing extension until they have quad control
45:36
um some studies out there show that grade two injuries can return to score as quickly as three weeks and grade one can
45:43
return as quickly as 10 days the same author found that conservative grade 3 injuries have a full recovery and 98
45:50
percent of cases compared to 74 percent of cases managed conserved surgically so
45:57

again conservative management of MCL injuries is the way to go people are they get better 98 of these people get
46:04
better that's that's a huge huge statistic that's that's better than just
46:09
about any other statistic out there for um anything we treat as physical therapist 98 that's that's massive
46:17
okay combined MCL and ACL injuries these are much more complicated um in most cases they let the MCL heal
46:24
like typically um and then they repair the ACL if necessary
46:30
so this is a chart that I found that surgeons use to determine whether or not
46:36
to do surgery on an MCL um the list this list basically it's
46:42
just a list of things that they look for that could indicate the need for surgery for an MCL
46:50
um and and again looking at looking at this list a lot of these things are really nasty like an open MCL injury
46:57
um yeah examination suggested from mlki that's a multi-ligament knee instability
47:04
multi ligaments the instability uh chronic symptomatic MCL injury despite
47:10
being treated conservatively for at least six weeks that's when we talk that's that's the main thing we talked about you fail concerned management for
47:16
six weeks I mean it's symptomatic they might do surgery um valgus malalignment a tibial Plateau
47:23
fracture large bone Evolution a lot of these things are really nasty that we would kind of assume would go with
47:30
surgery anyway so um just just something to think about the things they're looking for surgeons
47:36
don't want to treat insurgents don't want to operate on mcls um they want them to heal on their own
47:42
and Scar up so if a surge if a surgeon surgically repairs at MCL
47:48
um I mean as you know as long as there's not a malpractice issue going on then they they should they probably tried

47:54
everything else so for most cases MCL does not need to
48:00
be repaired surgically though there are certainly more severe cases that do require surgery surgery
48:05
um it's vitally important to acknowledge both the strengths and weaknesses of what we provide as PTS
48:11
okay so the LCL LCL is going to be the second rarest Sports Injury
48:17
um behind the PCO so grade one is no laxity grade two is going to be five to
48:24
ten millimeters of laxity um both of these are going to be managed conservatively grades three which is
48:31
going to be more than 10 millimeters of laxity these are usually going to be associated with a PCL or a postolateral
48:39
corner injury um and depending what we're dealing with sometimes that might be managed
48:44
surgically so LCL conservative management for grades one and two
48:51
um these are going to be non-weight-bearing for a week usually might be in a hinge brace for the next three to six weeks or whatever store
48:57
extension quad control return to sport is four weeks for grade one ten weeks
49:02
for grade two uh we need we need full range of motion lack of tenderness ligament uh tenderness of ligament and
49:09
lack of laxity though that's going to be our criteria for returning to sport
49:15
so grade three um isolated grade three injuries are very rare like I said those are going to
49:20
be usually associated with post lateral corner or PCL injury generally it's going to involve some form of
49:27
reconstruction um best outcomes are reported for for reconstruction
49:33
that's going to be non-weight-bearing for six weeks we want to restore the extension
49:39
um and then we want to avoid hamstring strengthening for four months after
49:44

which we can begin loading the hamstring up and kind of getting back into sports specific type therapy
49:51
all right post the lateral corner so this is this is where the LCL popularial
49:57
tendon and popliteofibular ligament come together so you know we're looking at this region
50:03
right here it's exactly what it sounds like it's the postolateral corner of the knee so this this is the fibula here
50:09
this is the popliteal tendon this is the popular fibular ligament and lco is you
50:16
can run them down here so this is another view of it um a ligament tendon ligament this
50:23
region is going to be post lateral corner so it provides rotary and lateral stability to the knee
50:31
um yeah so primary stabilizer of varus force so it's going to be a secondary stabilizer of lateral tibial rotation
50:40
um mostly in the 30 to 40 degree range it is going to be a small stabilizer of
50:46
tibial internal rotation and it might contribute a little bit to the anteroposterous stability
50:52
of the knee especially in full knee extension so isolated injuries of the post lateral
50:59
Corner are going to be rare with only 28 occurring in isolation usually they're
51:04
going to involve either an ACL injury or PCL injury we need to have a high
51:10
suspicion of this anytime we have a knee injury just because if they if it goes undetected and
51:17
something gets gets repaired but the post lateral corner is not addressed the outcomes are not going to be nearly as
51:24
good so um correct diagnosis is going to be key
51:31
it's going to require a good history physical examine Imaging um
51:37
the signs and symptoms of this are going to be pain and tenderness at the postal lateral Corner various instability
51:44
um give the knee giving way especially on stairs on the rotary and stability
51:49
are like pivoting things like that so better outcomes are going to be

51:55
associated with reconstruction best outcomes are going to be associate associated with reconstruction of the
52:02
um post-ladder corner and any cruciate ligament involved together rather than in a stage treatment so there was
52:08
there's some studies that look at doing repairing one then coming back and repairing the other they're saying that
52:13
they should repair both of them which again that's where that's where we come into play
52:19
um if we can do our job and pick up on these things it keeps them from having to go back in
52:25
later and operate on something else um failure rates range anywhere from 10 to 38 percent so you know not not a
52:33
outstanding failure rate so um I know this is a conservative
52:39
treatment uh part of the lecture but I'm including this here because because it kind of
52:45
belonged here um and we don't really manage these things conservatively but a lot of times we
52:52
pick up on these things in the conservative part of our job um so but anyway when we rehab these
52:59
post-op they're going to be non-weight-bearing for six weeks we want to limit flexion to 90 degrees for two
53:04
weeks progress is tolerated after um maybe begin stationary cycling around six weeks and begin weaning from the
53:11
crutches of six weeks once they're full weight bearing progress uh close can amount of change strengthening
53:17
um just like with the LCL we want to avoid isolated hamstring strengthening for four months running and speaking
53:25
agility work can commence after appropriate strength and power are achieved which is usually going to take
53:30
six months return to sport can happen between six to nine months depending on
53:36
the activity level um another thing if they had an ACL or PCL repair with this they're not going

53:43
to be returned to sport at six to nine months it's going to be longer than that um another thing
53:48
if you have avoided strengthening the hamstring until four months
53:54
um they're not going to have appropriate strength and power by the six month point so this is what the literature
54:01
says clinically it's most likely going to be a little bit different so what do we do when these patients
54:07
come in um in cases of acute injuries it's you it's going to be wise to consider MD
54:13
opinion like tell the surgeon about what we're seeing um especially think if these are direct
54:19
access patients or if it's a referral from a primary care physician Orthopedic Urgent Care or if something could have
54:25
been missed on the on the MD end you know maybe they diagnose the patient
54:31
with an ACL injury and maybe they didn't look into the post lateral Corner um we need to we need to screen for that
54:38
like we do need to screen for post lateral Corner when we get referrals because if they're planning on operating
54:45
they need to know about it before they operate any cases of instability shouldn't
54:51
involve this the doctor's input we just need to keep in mind our scope of practice
54:58
conservative cases should be monitored for improvements in stability and healing so if if we are going to manage
55:03
them conservatively we need to make sure their stability is getting better and then we need to communicate our
55:09
objective findings with the doctors especially in surgical cases
55:14
okay so post ladder Corner um why do we care
55:20
you know we kind of we thought we did to talk about this um
55:25
the PLC does need to be repaired if it's injured you know the conservative
55:31

treatment of it is not really a viable option at this point like we just don't know enough about the healing yet um
55:37
they don't seem to get these patients don't seem to get better without without surgical intervention
55:43
um they need to be repaired with any other cruciate ligament that's involved in the same surgery rather than in a
55:49
staged approach okay so uh we do need to have you know a
55:57
decent ability to perform ligament to stability testing and we'll
56:02
kind of get together and go over these in person but for now I think I think
56:07
it's good to kind of know what the tests do and what they're good for
56:13
um lockman's test is going to be good for ruling out pivot shift is going to be uh best for ruling in an ACL anterior
56:21
drawer uh doesn't have I mean it does have a specificity and sensitivity listed but
56:27
it doesn't have a great clinical value for ruling in or ruling out without
56:32
Imaging um sag sign can can be highly specific
56:38
for PCL injury um probably not the best at ruling it
56:43
out mcmurray's test has relatively good specificity with a moderate predictive
56:48
value MCL and LCL testing so that's your valgus and varus stress test they're
56:55
probably pretty good for ruling out not great for Rolling in the Dial Dial test that's going to be
57:02
post lateral Corner test it's not a great test but it's probably still worth doing just to see if there's a
57:08
significant difference between sides reverse pivot shift test
57:14
um has a relatively good positive predictive value okay so that's gonna that's gonna cover
57:22
that's gonna be it for our conservative management stuff hopefully that clears up
57:28
some things I know it's a lot of information so I would kind of go back

57:34
and review some of this stuff and continue continue to look at it but the big thing is to be aware of
57:41
what is handled best conservatively and what's handled best surgically and to
57:46
know our wheelhouse and be able to stand by it and um understand the evidence that is
57:52
backing both of them so that when patients ask us questions we can answer them honestly and confidently because
57:57
the more confident and honest we are with them the better buy-in that we'll have with them so that's the big thing
58:03
that's that's what a lot of this portion was for um kind of instilling confidence in what
58:09
we do not being afraid to load our patients up and um yeah so hopefully that helps reach out
58:16
with any questions