

Klinische diagnostiek
Lies / Quadriceps / Kuit

Wanneer mag ik weer?

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Patients thoughts

- Identity
 - What is it?
- Causes
 - How did I get it?
- Timeline
 - How long will it take?
- Consequences
 - What are these
- Curability & Controllability
 - Will I get better and who can do what ?

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What is it?

Dr Google may help / be wrong

"Felt like someone hit my calf, teared apart, must be a tennis leg (zweepslag)"

Rule out

3

Use it!

Placebo

Nocebo

Psychological factors such as **optimism, suggestibility and empathy** have been linked to placebo

Psychological factors such as **pessimism, anxiety and catastrophizing** have been linked to nocebo

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UNDER PROMISE
AND
OVER DELIVER
ALWAYS SET EXPECTATIONS
SO YOU CAN MEET AND EXCEED THEM

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Acute muscle injury guideline

Assists clinicians & patients **managing expectations** towards their recovery

Identifying "What it is" importantly derived from history taking

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History taking

Type of injury

Injury due to direct blow or hit

Muscle contusion

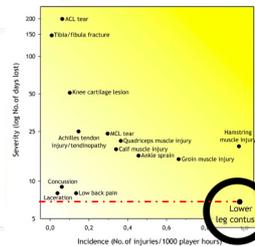
No contact

MTU under tension
Eccentric contraction

Muscle strain injury
Rupture / avulsion



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Why we should focus on the burden of injuries and illnesses, not just their incidence

Scatterplot and clinical outcome comparison of lower leg contusion (Contusion) anterior and posterior thigh muscle injury in male elite football players. Data from large study of 2019-2020 season.

Figure 1: Quantitative risk matrix in UEFA Champions League football based on data from the UEFA Elite Club Injury Study. Illustrating the relationship between the severity (consequence) and incidence (likelihood) of the 14 most commonly reported injury types. For each injury type, severity is shown as the average number of days lost from training and competition (log scale), while incidence is shown as the number of injuries per 1000 hours of total exposure (match and training combined) for each injury type.

Think 100-200 days
Mean 4 (28-5) days
Max 90 days



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Type of injury

Contusion

AKA "dead leg" / "ijsbeentje"

Direct force (collision impact) applied

← Shorter (<2wks) → **RTS**
(Data from upper leg, not groin/ calf)




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History taking

Calf Muscle Strain

Soleus injuries

Often accumulate, gradual symptoms

Steady state activities

Poorly localized



Gastroc injuries

Immediate with severe function loss

Acceleration, jump, sprint

Acute and frank pain

Clear injury site



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History taking

Quadriceps

Blocking a kick
Hitting the ground

Adductor Muscle Strain

Injury Mechanisms for 110 Athletes With Acute Groin Injuries

Injury Mechanism	Total (n = 110)	Football Kicks (n = 84)	Other Reports (n = 26)
Kicking	85 (33)	34 (40)	2 (8)
Change of direction	22 (20)	14 (17)	0 (0)
Stretch situations	19 (17)	14 (17)	0 (0)
Sprinting/running	10 (10)	11 (13)	0 (0)
Jumping	8 (7)	5 (6)	3 (12)
Other	9 (8)	6 (7)	3 (12)

*Data are presented as a (%).




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Clinical exam

Med

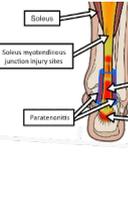
Soleus

Soleus myofascial junction injury sites

Pars interossea

Mid-portion (non-osteosar) Achilles tendinitis

Inferior Achilles tendinitis



Lat

Medial gastrocnemius

Lateral gastrocnemius

Gastrocnemius myofascial junction injury sites

Gastrocnemius spurs/tears



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Clinical exam

Diagnosis of Acute Groin Injuries
A Prospective Study of 110 Athletes

Location of Acute Groin Injuries on MRI and US Exam

	Clinical	MRI	US
Total examinations, n	130	105	95
Negative imaging result, n (%)	N/A	53 (23)	24 (35)
Injury location*	73 (60)	44 (66)	45 (62)
Adductor	—	30 (68)	31 (69)
Adductor longus	—	1 (2)	2 (5)
Adductor magnus	—	1 (2)	2 (5)
Adductor brevis	—	10 (17)	7 (16)
Psoas	—	10 (17)	11 (24)
Coccyx	—	1 (2)	2 (5)
Hip joint	28 (23)	14 (25)	15 (16)
Hamstring	—	2 (6)	10 (22)
Patella only	—	1 (2)	2 (5)
Hamstring and patella	—	0 (0)	1 (2)
Rectus femoris	25 (23)	12 (13)	13 (14)
Abdominal	11 (10)	5 (6)	4 (6)
Scapula	2 (6)	2 (4)	1 (1)
Multiple locations	52 (23)	27 (29)	40 (45)
Adductor and hip joint	12 (17)	7 (9)	5 (11)
Hamstring and rectus femoris	5 (7)	1 (1)	1 (2)
Rectus femoris and scapula	4 (4)	1 (1)	1 (1)
Adductor and abdominal	3 (3)	—	—
Adductor, abdominal, and hip joint	2 (2)	—	—
Hamstring and rectus femoris	2 (2)	—	—
Hamstring and abdominal	2 (2)	—	—
Hamstring and scapula	2 (2)	—	—
Adductor and scapula	—	1 (1)	—

2/3 is adductor injury
9/10 is longus
1/4 negative on imaging

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Clinical exam

Figure 2
A Clinical examination of the athlete with groin pain targeting presence of clinical entities. B Clinical examination of the athlete with groin pain targeting presence of clinical entities. C Clinical examination of the athlete with groin pain targeting presence of clinical entities.

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Clinical exam

Palpatory pain at bone (insertion) acute injury
75% of high bone insertion are avulsion

Structural change (dimple/gap) increases likelihood of avulsion or rupture
No gap doesn't rule out rupture

No pain at insertion likely rules out total rupture / avulsion

No insertional pain or gap : 2-4 wks
Insertional pain or gap: 4-11 wks

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Clinical exam

Palpatory pain Spina Iliaca Anterior Inferior +
Large loss of function (power output)

Consider Avulsion

Structural change (gap) increases likelihood of avulsion or rupture
No pain doesn't rule out rupture

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Not to forget

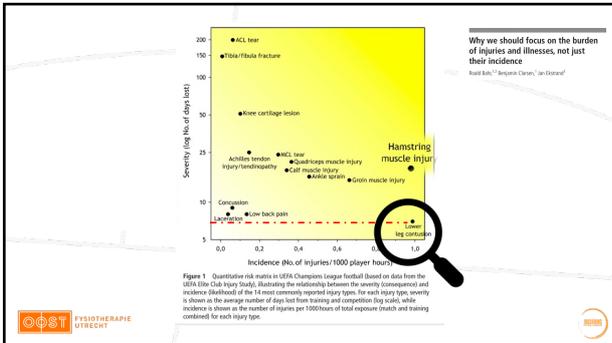
Apophysitis
Pain, often accumulates, gradual symptoms
But can have acute presentation
Growth related
Pain on symphysis

Courtesy: Adam Weir

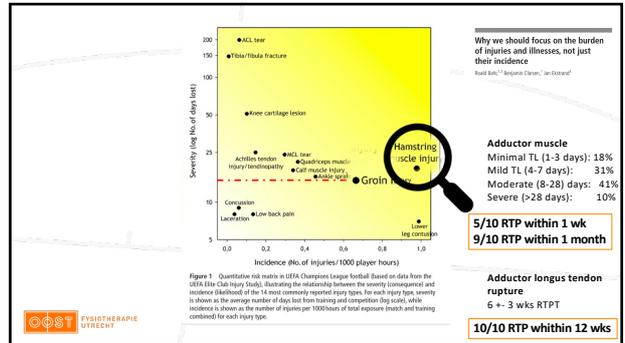
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Courtesy: Adam Weir

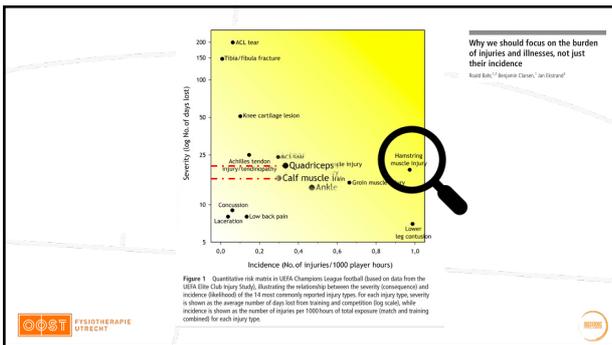
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Type of injury

Strain
 AKA "Verrekking/spierscheur"
 No direct impact from outside
 • AVULSION / TOTAL RUPTURE

RTS → Strain (>2wks)
 → Avulsion (-4 - 12 mos) - 1/5 no RTS

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Rest or?

- Pain level @ injury
- Early vs delayed start of rehab (EXERCISE)

63 (49-78) days, en 83 (65-97) days RTPT

60% thigh - hamstring
 40% calf

Early versus Delayed Rehabilitation after Acute Muscle Injury

A: Interval between injury and recovery (Return to Play)

B: Median No. of Days until Recovery

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RTPT

Prognosis

A combination of initial and follow-up physiotherapist examination predicts physician-determined time to return to play after hamstring injury, with no added value of MRI

How might it impact on clinical practice in the future?

- Strength difference mid range between direct post injury and 1 wk repeat visit
- Absolute strength of uninjured side
- Time to walk painfree
- Getting in / out of car / on bike for adductors

For calf and adductors and quads consider outer range

No risk

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RTP time prediction

- No RTPT prediction models exist for acute muscle injuries
- Contusions shorter (<2 wks) RTP than strains (usually 2-4 wks)
- Strains shorter RTP than avulsions (4wks - 1 year)
- Loading early as tolerated shorter RTP
- Decrease of pain and increase of strength on repeated assessment indicate shorter RTP (“witness of recovery”)



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