Datasets Background Information

Looking for:

-strength metrics/variables as they relate to lower body injury risk

  -could be different by sport, by position

-want to document trends in strength

  -most valuable variables + most data (least NA) to demonstrate a trend, the best

  -track over time

<u>Incident Report</u>

Knee Codes

- KLV: Grade 1 MCL tear
- KLW: Grade 2 MCL tear knee
- KL3: Knee medial collateral ligament injury
- KL4: LCL strain/rupture
- KV1: Knee contusion/haematoma (extraarticular)
- KJX: Right Knee bone contusion
- KT1: Iliotibial band syndrome
- KT2: Patellar tendinopathy
- KTB: Lateral hamstring insertion tendonitis
- KTS: Medial hamstring insertion tendonitis/pes anserinus bursi
- KH1: Other soft tissue bruising/haematoma knee
- KCU: Patellofemoral osteochondral injury
- KC1: Knee articular cartilage damage
- KC2: Medial meniscal tear
- KC4: Osteochondrosis of knee
- KCP: Patellofemoral joint chondral pain
- KBP: Prepatellar bursitis
- KAP: Patellofemoral osteoarthritis
- KLA: ACL rupture
- KS1: Distal femoral stress fracture
- KHQ: Distal quadricep haematoma
- KU2: Patellar instability
- KZ1: Knee Pain/Injury Not otherwise specified

<u>Dynamo</u>

This is a small device that holds your ankle and for extension you push your foot away from yourself. For flexion you are laying on your back and pulling your foot down

- Only one observation with ankle data
- Good amount of hand observations

- anon_id, Date, Body.Region (Knee, only one ankle, Hand), Movement (almost all extension with one being flexion), Position (all seated except flexion being prone), Rep.Count, Max.Force.Newtons, Avg.Force.Newtons, Max.Impulse.Newton.Seconds, Avg.Impulse.Newton.Seconds, Max.Rate.Of.Force.Development.Newtons.Per.Second, Avg.Rate.Of.Force.Development.Newtons.Per.Second
  - All of these are created from the individual rep information so can probably just use these for each side
- Give no information: Test.Category, Max.Range.Of.Motion.Degrees, Avg.Range.Of.Motion.Degrees, Avg.Time.To.Peak.Force.Seconds (all 0 for every observation)
- What is Value.Percentage?
- Knee.Ex.Right.Side.Max.Force..N., Knee.Ex.Left.Side.Max.Force..N., Knee.Ex.Max.Force..N..Asymmetry, Knee.Ex.Right.Side.Avg.Force..N., Knee.Ex.Left.Side.Avg.Force..N., Knee.Ex.Avg.Force.Asymmetry, Knee.Ex.Right.Side.Max.Impulse..Ns., Knee.Ex.Left.Side.Max.Impulse..Ns., Knee.Ex.Max.Impulse.Asymmetry, Knee.Ex.Right.Side.Avg.Impulse..Ns., Knee.Ex.Left.Side.Avg.Impulse..Ns., Knee.Ex.Avg.Impulse.Asymmetry, Knee.Ex.Right.Side.Max.Rate.of.Force.Development..Ns., Knee.Ex.Left.Side.Max.Rate.of.Force.Development..Ns., Knee.Ex.Max.Rate.of.Force.Development.Asymmetry, Knee.Ex.Right.Side.Avg.Rate.of.Force.Development..Ns., Knee.Ex.Left.Side.Avg.Rate.of.Force.Development..Ns., Knee.Ex.Avg.Rate.of.Force.Development.Asymmetry
  - Other variables are from last observation
  - Excludes flexion data

Basketball only has knee extension data, with one knee flexion, and one ankle
WLAX has mostly knee extension, with one person having seated 60 degree, and some abduction and adduction data
- 3 of each adduction and abduction
Soccer only has one observation of knee extension; not in right form would have to take sum across columns with na.rm = TRUE
Volleyball has a lot of shoulder and hand observations and only 4 observations for the same player for knee extension

Forcedecks - will be by far hardest to clean
Contains positions for players
Test types WBB

- CMJ, IBSQT, HJ, DJ, ISOT, IMTP, SJ, SHLDISOT, SHLDISOY, SHLDISOI, SQT, ABCMJ, SLJ

Test types WLAX
- CMJ, HJ, IMTP, SLJ, SQT

Test types in WSOC
- SLJ, HJ, CMJ, SQT, IMTP, SLLAH, LAH

Test types in WVB
- IBSQT, CMJ, HJ, LAH, CMRJ, IMTP, SJ, ISOT, SHLDISOT, SHLDISOY, SHLDISOI, SQT, ISOSQT, ABCMJ

Top Forceframe Tests by Sport
Basketball: CMJ, HJ, IMTP
Soccer: CMJ, HJ, SLJ, IMTP
Lacrosse: CMJ, HJ, SLJ, IMTP
Volleyball: CMJ, IMTP, HJ
-ranked most to fewest observations

CMJ - countermovement jump, SLLAH - single leg land and hold, SJ - squat jump
- Max.Concentric.Peak.Force…BM, Max.Concentric.Force…N, Max.Eccentric.Force…BM, Max.Eccentric.Peak.Force.Left, Max.Eccentric.Peak.Force.Right, Max.Eccentric.Peak.Force.Left, Max.Eccentric.Peak.Force.Right, Max.Concentric.Peak.Force.Left, Max.Concentric.Peak.Force.Right, Relative.Eccentric.Power.Left..W.kg., Relative.Eccentric.Power.Right..W.kg., Relative.Concentric.Power.Left..W.kg., Relative.Concentric.Power.Right..W.kg., Relative.Concentric.Power.Bilateral,

Max.Concentric.Peak.Force…BM is Max.Concentric.Force…N / Athlete.Bodyweight..kg.

2752 observations in WBB
1940 observations in WLAX
3444 observations in WSOC
5333 observations in WVB

RFD=Rate of Force Development

WBB: 2004 CMJ, 32 ABCMJ, 424 HJ (Will need different variables selected), 14 DJ, 1 SLJ, 162 IMTP (Needs specific variables?), 13 ISOSQT, 4 SJ

HJ: Corrected.Standing.Weight..Kg., Mean.RSI..Flight.Contact.Time, Peak.Power..W., Active.Stiffness..N.m., Best.Average.Force..N., Best.Average.Force..Asym…N., Best.Time.to.Peak.Force..ms., Best.Contact.Time..ms., Best.Flight.Time..ms., Best.Impulse..N.s., Best.Peak.Force..N., Best.Peak.Force..Asym…N., Mean.Average.Force..N., Mean.Average.Force..Asym…N., Mean.Landing.RFD..N.s., Mean.Landing.RFD..Asym…N.s., Stiffness.Fatigue…., Stiffness.Fatigue..Asym….., lots of other fatigue variables, Max.Jump.Height..cm., MAX.Relative.Concentric.Peak.Power..W.kg.

IMTP: Forces at 50, 100, 150, 200 ms, Baseline.Force..N., Baseline.Force..Asym…N., Peak.Vertical.Force..N., Peak.Vertical.Force…BM..N.kg., Peak.Vertical.Force..Asym…N., RFD…50ms..N.s., RFD…50ms..Asym…N.s., RFD…100ms..N.s., RFD…100ms..Asym…N.s., RFD…150ms..N.s., RFD…150ms..Asym…N.s., RFD…200ms..N.s., RFD…200ms..Asym…N.s., Net.Peak.Vertical.Force..N.s, Net.Peak.Vertical.Force..Asym…N.s., Force.at.200ms…BM..N.kg., Absolute.Impulse.50ms..Ns., Absolute.Impulse.50ms..Asym…Ns., Absolute.Impulse.100ms..Ns., Absolute.Impulse.100ms..Asym…Ns., Absolute.Impulse.150ms..Ns., Absolute.Impulse.150ms..Asym…Ns., Absolute.Impulse.200ms..Ns., Absolute.Impulse.200ms..Asym…Ns.

Forcedecks_B %>%
  select(anon_id, Date, MEAN.Eccentric.Mean.Force.Left, MEAN.Eccentric.Mean.Force.Right, MEAN.Concentric.Mean.Force.Left, MEAN.Concentric.Mean.Force.Right, MEAN.Concentric.Mean.Force.Asym, MEAN.Peak.Landing.Force.Asym, MEAN.CMJ.Jump.Height, MEAN.Relative.Peak.Power, MEAN.CMJ.Concentric.Force, MEAN.Peak.Landing.Force.Left, MEAN.Peak.Landing.Force.Right) %>%
  na.omit()
Gives general information for 1390 observations, 40 players

MEAN.Eccentric.Mean.Force.Asym, MEAN.IMTP.Max.Peak.Vertical.Force, and MEAN.RSI could be useful too but missing a lot of data

Should focus on CMJ(countermovement jump)**, ABCMJ, HJ**(hop jump)**, DJ**(drop jump)**, SLJ**(single leg jump)**, IMTP**(isometric mid thigh pull)**, ISOSQT, SJ** (squat jump)