

STRENGTH TRAINING AND CONDITIONING: WOMEN'S ARTISTIC GYMNASTICS



Physical demands

- Complex sport; different type of movements
- Strength -> explosive
- Flexibility
- Balance
- Speed
- Coördination
- Elegance

Floor routine: 90 sec

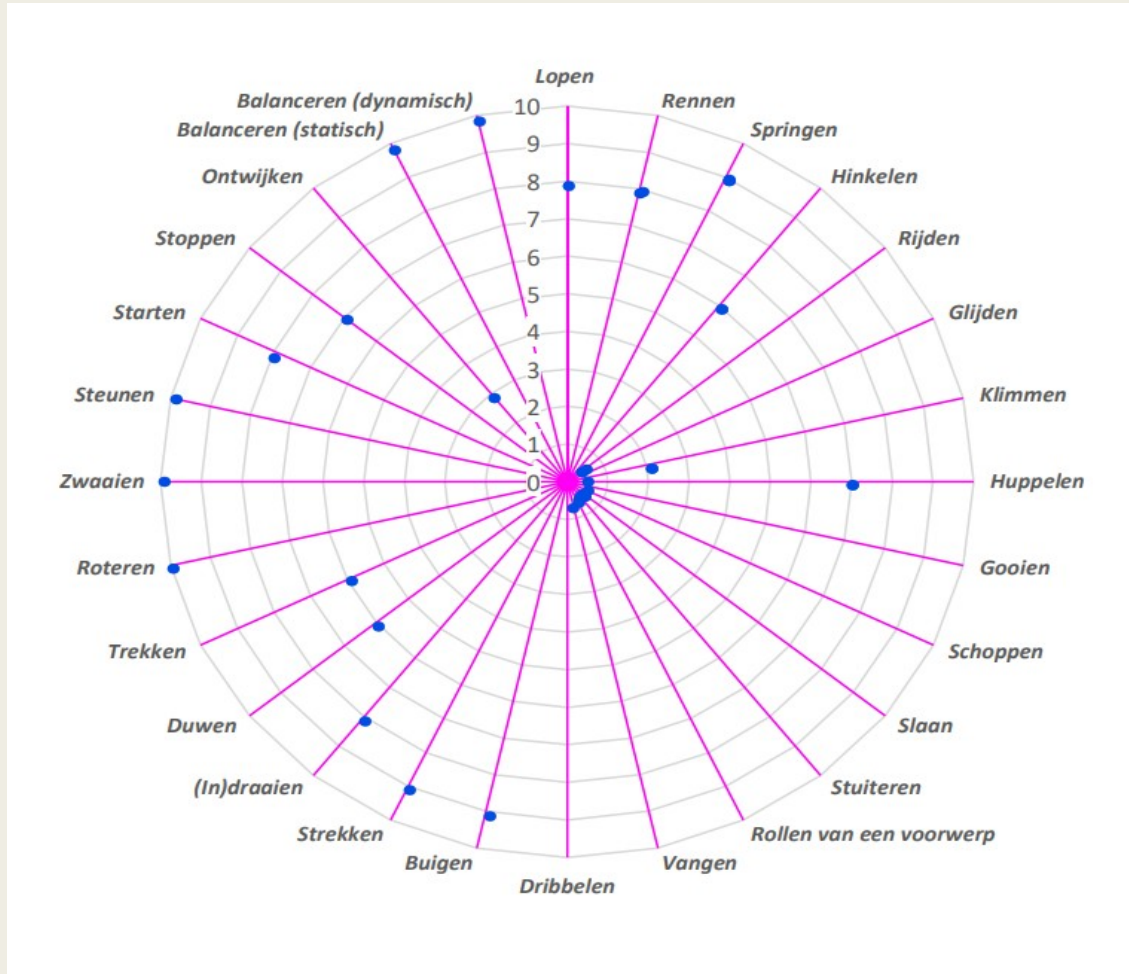
Beam routine: max. 90 sec.

Uneven bars routine: +- 30-45 sec, no time limit

Vault: max. 25m sprint



Movements

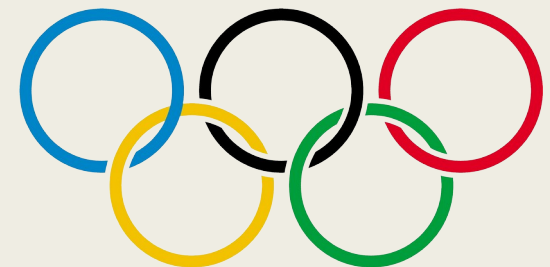


- Lopen = walking
- Rennen = running
- Springen = jumping
- Hinkelen = hopscots
- Rijden = to ride
- Glijden = sliding
- Klimmen = climbing
- Huppelen = skipping
- Gooien = to throw
- Schoppen = to kick
- Slaan = to hit
- Stuiteren = bouncing
- Rollen van een voorwerp = rolling an object
- Vangen = to catch
- Dribbelen = dribbling
- Buigen = bowing
- Strekken = straightening
- (in) draaien = (in) turning
- Duwen = to push
- Trekken = to pull
- Roteren = rotating
- zwaaien = swinging
- steunen = leaning/pressing
- starten = to start
- ontwijken = to dodge/avoid
- balanceren (statisch) = static balance
- balanceren (dynamisch) = dynamic balance

Jan Willem Teunissen, Fundamental movement skills

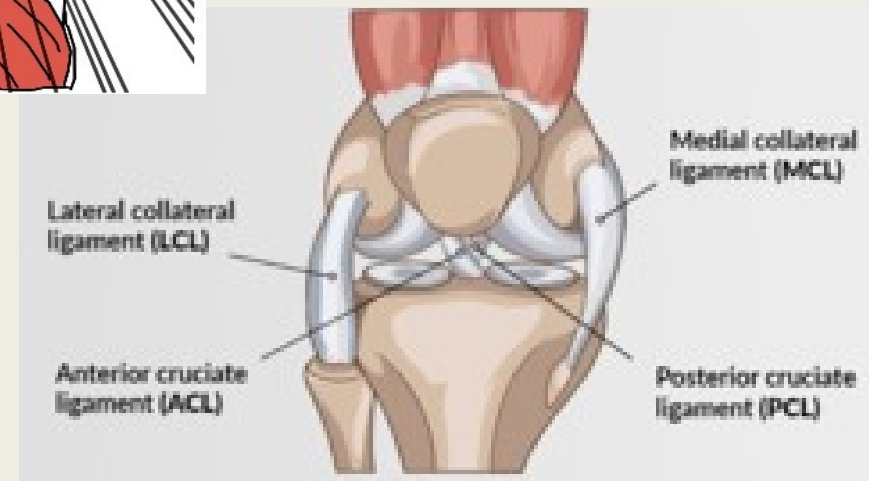
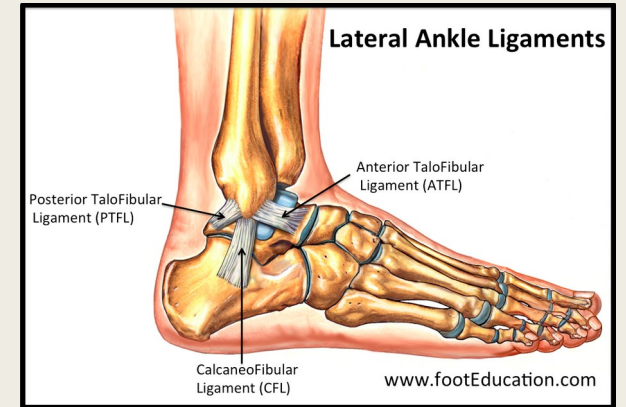
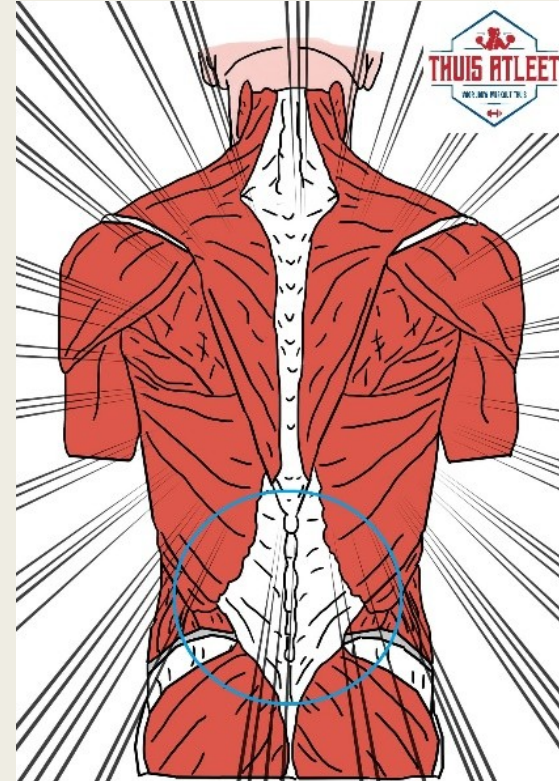
Preparation in off-season/ comp. period

- No frequent competitions
- Olympics: from the age of 16
- Off-season:
 - *Learning new elements*
 - *Improvement of elements*
 - *Making routines*
 - *Gaining strength*
- Competition period:
 - *Repeating full routines*
 - *Getting confident in routines*
 - *Competition condition*
 - *Finishing touches*
 - *No new strength exercises*



Frequent injuries

- Ankle sprain/ ligament torn
- Lower back issues
- Knee injurie
-
-
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Thomas, R. E., & Thomas, B. C. (2018). A Systematic review of injuries in Gymnastics. *The Physician and Sportsmedicine*, 47(1), 96–121.
<https://doi.org/10.1080/00913847.2018.1527646>

Important movements

■ Strength of trunk musculature

vertebral column gets effectively supported so the pressure on the lower back is less (Durall et al., 2009)

■ Core stability

Important to stabilise the correct posture, and avoids overload of the lower back (Sweeny et al., 2009).

■ Mobility and strength of hamstrings

Hip twitch is a common form of movement in gymnastics, which needs strength and flexibility. If the hamstrings get tense or contract with a small ROM, they will pull on lower back (muscles and joints), which will increase the risk of injuries if not trained properly. (Davis et al., 2005).

■ Focus on weaker parts of athletes body

Every athlete is different and need to give attention to their weaknesses to avoid injuries or treat it.

Durall, C. J., Udermann, B. E., Johansen, D. R., Gibson, B. L., Reineke, D. M., & Reuteman, P. (2009). The effects of preseason trunk muscle training on Low-Back Pain occurrence in Women Collegiate Gymnasts. *The Journal of Strength and Conditioning Research*, 23(1), 86–92. <https://doi.org/10.1519/jsc.0b013e31818b93ac>

Davis, D., Ashby, P. E., Mccale, K. L., Mcquain, J. A., & Wine, J. M. (2005). The effectiveness of 3 stretching techniques on hamstring flexibility using consistent stretching parameters. *The Journal of Strength and Conditioning Research*, 19(1), 27. <https://doi.org/10.1519/14273.1>

Sweeny, E. A., Daoud, A. K., Potter, M. N., Ritchie, L., & Howell, D. R. (2019, 1 September). Association Between Flexibility and Low Back Pain in Female Adolescent Gymnasts. *Clinical Journal of Sport Medicine*. Geraadpleegd op 07-04-2022, van <https://doi.org/10.1097/jsm.0000000000000660>

Training

- “repetition without repetition” - 3D (R. Ranganathan, et al., 2020)
- Use of “GYM Aware” – measures explosiveness of strenght movement e.g. squats.
- Bi lateral (heavy weight) vs uni lateral
- Stability exercises
- Use of aquabags, restistant bands, bosubal, swiss ball etc.
- Sprints
- Dance/ballet classes



Ranganathan, Lee, M., & Newell, K. M. (2020). Repetition without repetition: Challenges in understanding behavioral flexibility in motor skill. *Frontiers in Psychology, 11*. <https://doi.org/10.3389/fpsyg.2020.02018>

Example of training:

Uni lateral training:

Warming-up:

- standing on 1 leg , arm high reaching, then the other
- passé double hop
- standing hip opener on relevé
- traight legs front kicks with resistance band on ankles
- resistance band on wrist, plank walking to as flat as possible
- resistance band on feet, walking on toes then on heels
- sideways to wall turning for side back stretch

First circuit: 4 rounds, 3 work sets:

- Split machine: SL lunge 3-3
- Hops 1 leg, hands on high resistance band, 5th jump as high as possible + landing
- Trapbar uneven weight, deadlift to relevé 3-3
- Slide push ups 2-2
- Foamroller & bodypump stang side plank balance 2-2

Second circuit: 3 rounds

- Bootybuilder + small resistance band, 4x neutral, 4x rep. Without rept.
- Hamstring machine, 2x 3 punches with aqua bag
- Turkish get up with aquabag to relevé

