MULTICENTER OSTEOARTHRITIS STUDY

READING CENTER DATASET DESCRIPTION

V3GAITRITE

MAY 2022

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1. Dataset description and Analyst Notes

Dataset: V3GAITRITE.sas7bdat
Observations: 4060 records (2031 participants, 2 speed settings per participant)
Documentation:

- VariableGuide_V3GAITRITE.pdf
- Distributions_V3GAITRITE.pdf
- Operations manual chapter: 3O_GaitAssessment _v1.0pSept2021.pdf

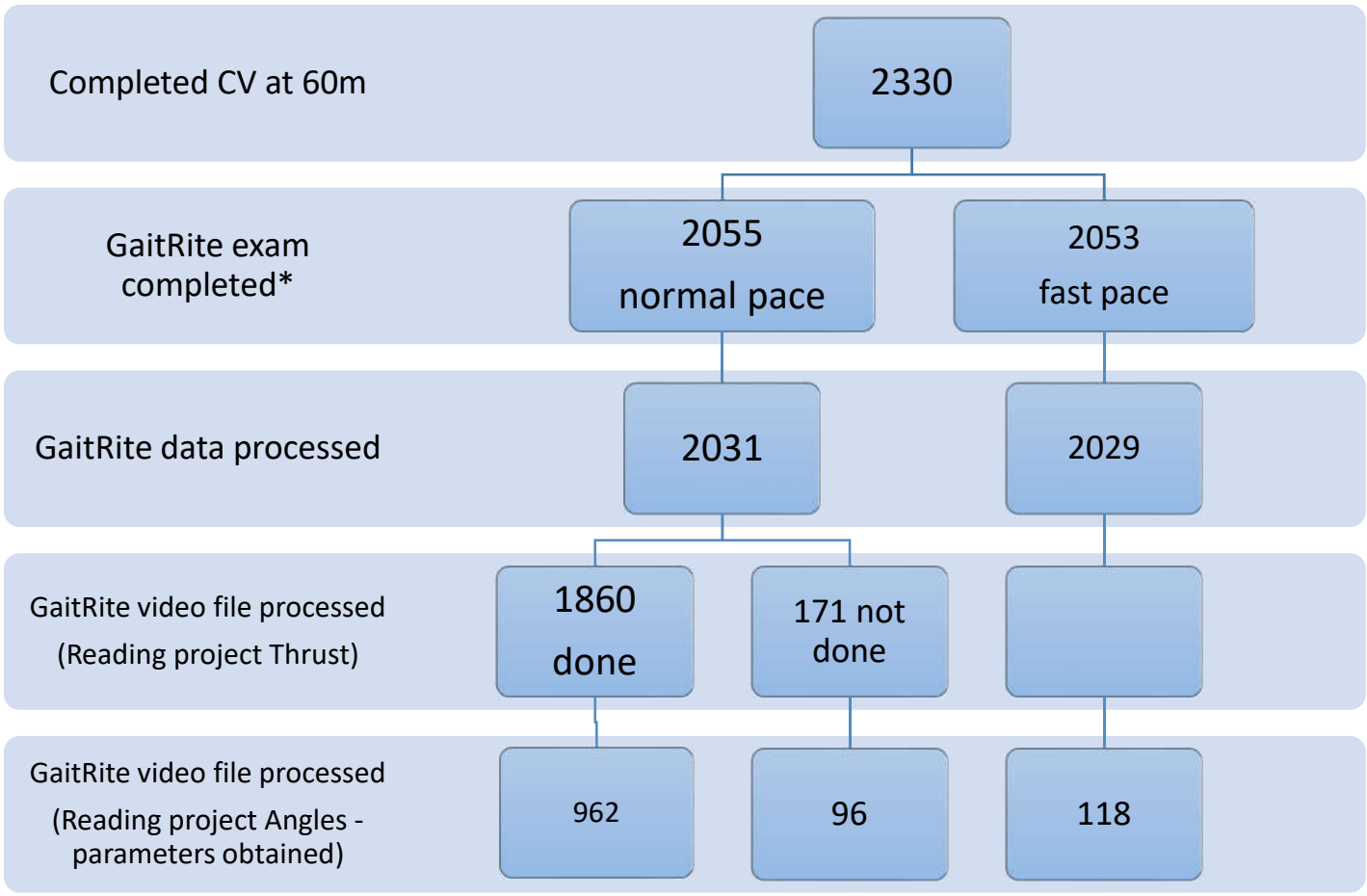
V3GAITRITE dataset contains 4060 records; two records per participant, one record per speed setting. GaitRite data collected during 60m clinic visit for all eligible participants who did not meet exam exclusion criteria in two speed settings: normal pace and fast pace.

Dataset structure:

- Variables #1 to #5 from the MOST tracking forms.
- Variables #6 to #97 – main reading parameters and summary gait characteristics performed by Reading Center (PI: Dr. D. Gross)
- Variables #98 and #100 to #105 – reading project Angles: various angle parameters from video file collected during Gait Rite exam
- Variables #99 and #106 to #119 – reading project Thrust: parameters from video collected during Gait Rite exam

Note: There were additional reading projects based on video collected during exam and completed in addition to the main exam data. Based on the study specific selection criteria and hypothesis, additional reading projects completed only on a sub-set of participants. For example, thrust readings done only on the normal pace.

2. FLOW CHART – GaitRite exam completion and reading status



*Summary report: reason exam was not completed, exclusion criteria:

	N participants	%
Gait Rite exam not done	**275**	**100%**
exclusion criteria met	166	60.4%
exclusion criteria not met - participant refused to complete exam	79	28.7%
exclusion criteria not collected - participant declined exam	30	10.9%
Exclusion criteria met	**166**	**100%**
Using walker or crutches	16	9.6%
Using cane more then 1/2 time when walking	77	46.4%
Using knee brace more then 1/2 time when walking	4	2.4%
Amputation of the lower extremity, other than toes	2	1.2%
Surgery/injury to legs/feet causing weight-bearing restrictions for over a week	32	19.3%
Difficulty walking or standing	5	3.0%
Unable to safely walk short distances	26	15.7%
Hospitalized in last 6 weeks for heart or lung condition	4	2.4%

3. References

For analytical information about the GaitRite measures, see:

- Webster KE, Wittwer JE, Feller JA. Validity of the GAITRite walkway system for the measurement of averaged and individual step parameters of gait. Gait Posture. 2005 Dec;22(4):317-21. Epub 2004 Dec 10. PMID: 16274913.

- Menz HB, Latt MD, Tiedemann A, Mun San Kwan M, Lord SR. Reliability of the GAITRite walkway system for the quantification of temporo-spatial parameters of gait in young and older people. Gait Posture. 2004 Aug;20(1):20-5. PMID: 15196515.

- Bilney B, Morris M, Webster K. Concurrent related validity of the GAITRite walkway system for quantification of the spatial and temporal parameters of gait. Gait Posture. 2003 Feb;17(1):68-74. PMID: 12535728.

Articles using MOST study

- Hart HF, Gross KD, Crossley KM, Barton CJ, Felson DT, Guermazi A, Roemer F, Segal NA, Lewis CE, Nevitt MC, Stefanik JJ. Step Rate and Worsening of Patellofemoral and Tibiofemoral Joint Osteoarthritis in Women and Men: The Multicenter Osteoarthritis Study.
  Arthritis Care Res (Hoboken). 2020 Jan;72(1):107-113. doi: 10.1002/acr.23864.
  PMID: 30821927; PMCID: PMC6717684.

- Wink AE, Gross KD, Brown CA, Lewis CE, Torner J, Nevitt MC, Tolstykh I, Sharma L, Felson DT. Association of varus knee thrust during walking with worsening WOMAC knee pain: A Prospective Cohort Study.
  Arthritis Care Res (Hoboken). 2019 Oct;71(10):1353-1359. doi: 10.1002/acr.23766. Epub 2019 Aug 19.
  PMCID: 6430708 https://www.ncbi.nlm.nih.gov/pubmed/30242985

- Wink AE, Gross KD, Brown CA, Guermazi A, Roemer F, Niu J, Torner J, Lewis CE, Nevitt MC, Tolstykh I, Sharma L, Felson DT. Varus thrust during walking and the risk of incident and worsening medial tibiofemoral MRI lesions: the Multicenter Osteoarthritis Study.
  Osteoarthritis Cartilage. 2017 Jun;25(6):839-845. doi: 10.1016/j.joca.2017.01.005. Epub 2017 Jan 16.
  PMCID: 5473434 https://www.ncbi.nlm.nih.gov/pubmed/?term=28104540

- Stefanik JJ, Gross KD, Guermazi A, Felson DT, Roemer FW, Niu J, Lynch JA, Segal NA, Lewis CE, Lewis CL. The relation of step length to MRI detected structural damage in the patellofemoral joint: The Multicenter Osteoarthritis Study.
  Arthritis Care Res (Hoboken). 2016 Jun;68(6):776-83. doi: 10.1002/acr.22738.
  PMCID: 4809780http://www.ncbi.nlm.nih.gov/pubmed/26413842

4. **Reading project 1: Angles**

Figure 1. TF angle and q-angle

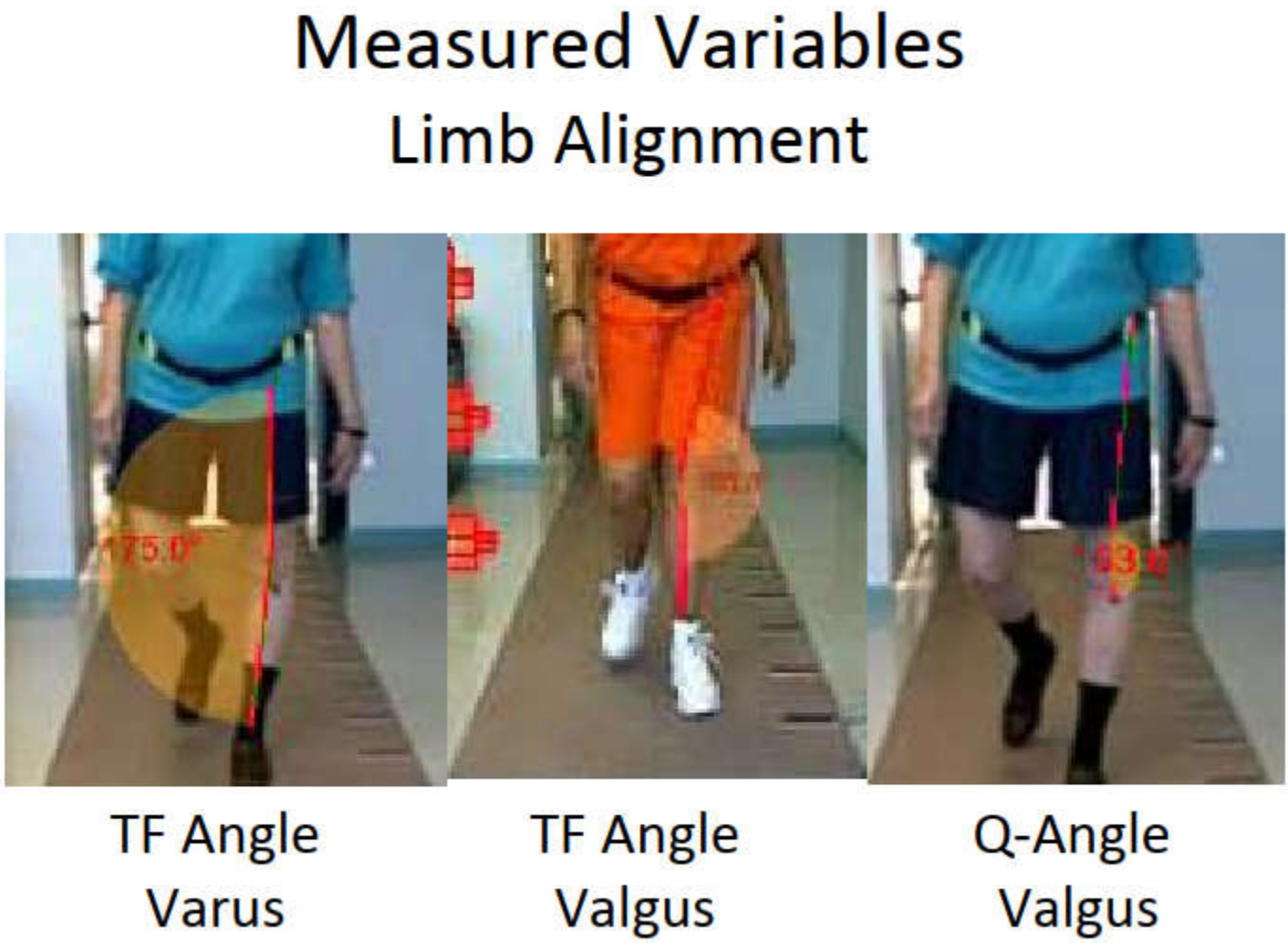
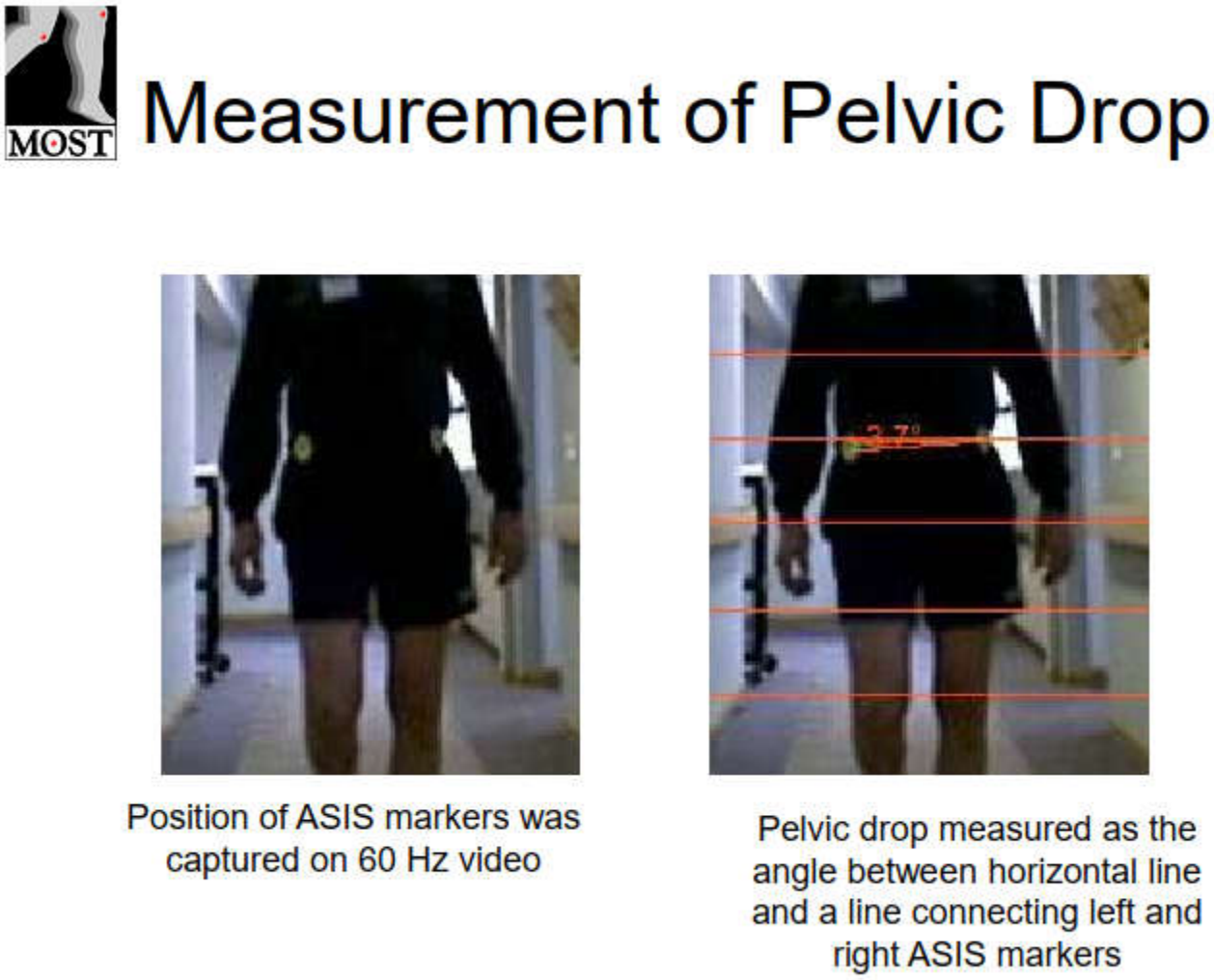


Figure 2. Pelvic drop.



5. Reading project 2: Thrust

Definition of Knee Thrust During Walking:
Thrust is a *visible* manifestation of excessive frontal plane knee motion that occurs abruptly (i.e., an abrupt change in frontal plane knee alignment) during the mid-stance phase of walking gait in either a varus (bow-leg) or valgus (knock-knee) direction. Varus and valgus knee thrust were assessed by a single reader from videos acquired during the GAITRite exam at the MOST 60-month clinic visit. The presence and frequency of varus or valgus thrust was determined during two trials of walking at a self-selected usual (aka, "normal") pace.

Possible Values for "Thrust_Var" and "Thrust_Val":

- **0: Thrust Definitely Absent**
  - No observable frontal plane motion.
- **1: Thrust Probably Absent**
  - Slight frontal plane motion without visible change in alignment, possible rotation (transverse plane motion) present. The absence of thrust cannot be determined with confidence.
- **2: Thrust Possibly Present**
  - Frontal plane motion is visible, but without a distinct change in alignment. The presence of thrust cannot be determined with confidence.
- **3: Thrust Definitely Present**
  - Frontal plane motion with a distinct and unmistakable change in alignment is present.

Possible Values for "Steps_Var" and "Steps_Val":

- 0: Thrust is absent.
- 1: Thrust present/possibly present on <50% of steps
- 2: Thrust present/possibly present on 50%-99% of steps
- 3: Thrust present/possibly present on 100% of steps