

# Utilizing Home-Based Telerehabilitation to Improve Patient Access Following Orthopedic Surgery

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Health Determinants, Genomics, Technology, and Disease - Session A

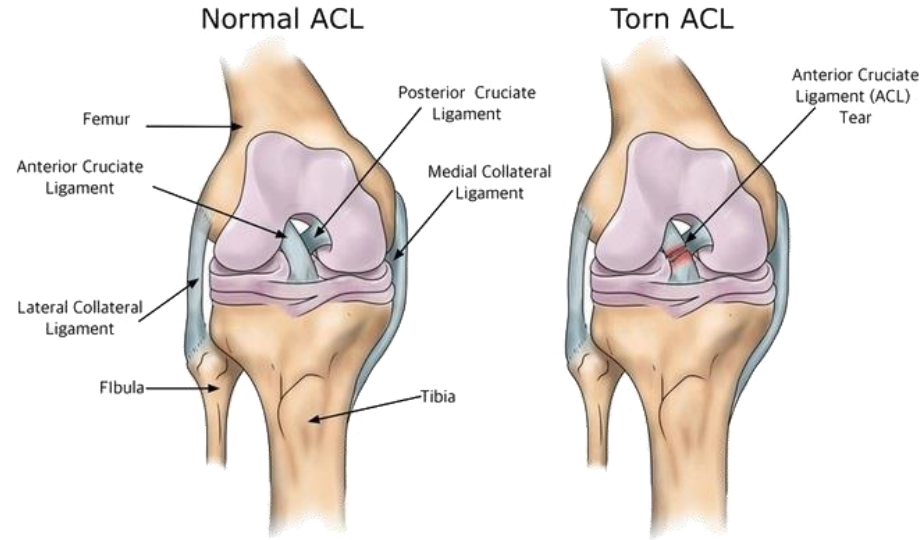


# Disclosures

- The authors have no conflicts of interest to disclose

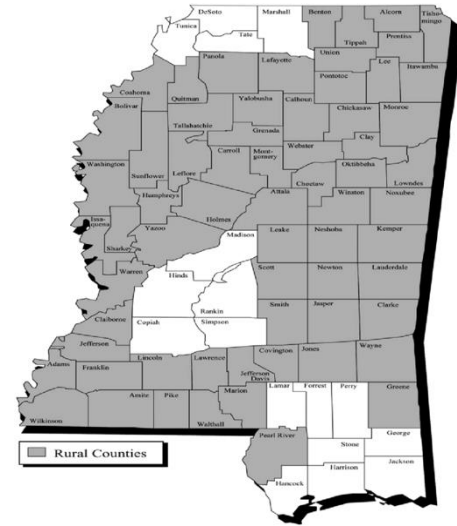
# Epidemiology

- ~120,000-200,000 new ACL tears annually
- 2-8x higher rate in females
- ACL tears affect knee function
- No consensus on number of ACLRs (ACL reconstruction)
  - Estimates range from ~60,000-400,000 annually
- ACL tears are increasingly treated operatively



# Background

- Preoperative and early postoperative rehabilitation improve outcomes
- 9-12 month recovery process
- Supervised rehabilitation has been shown to be more effective
- Individuals living in rural areas are less likely to utilize physical therapy
- 65 of the 82 counties in Mississippi are considered rural areas
- 54.4% of Mississippi's population is rural

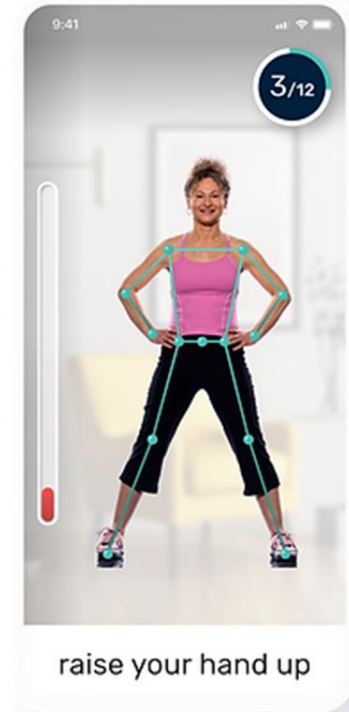
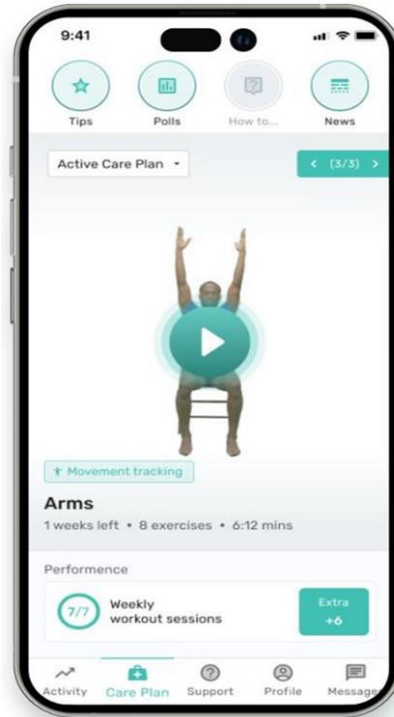


# Objective

- Research question: Is a telehealth rehabilitation application a feasible method to increase patient access to healthcare prior to and following ACLR?
- Specific aims
  - Assess feasibility of using the WizeCare application to increase patient access to healthcare prior to and immediately following ACLR
  - Assess patient satisfaction with WizeCare telehealth services
  - Assess provider satisfaction with WizeCare telehealth services
  - Pilot test this project on an adult population prior to enrolling both adult and pediatric populations

# WizeCare

- Created in 2019
- HIPAA-compliant
- Remote provider visits
- Patient portal and clinician portal
- MoveAI™



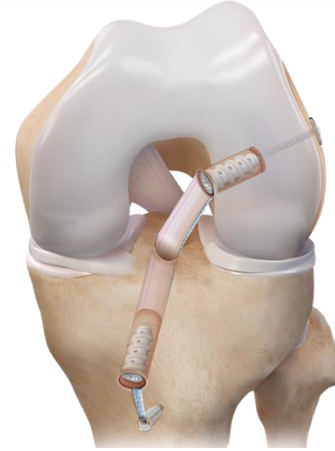
# Clinical Significance

- Growing area of literature showing:
  - Increasing acceptance
  - Telerehabilitation effective in a hybrid-care model
  - Telemedicine is a cost-effective platform for rehabilitation
  - No significant difference in patient satisfaction
  - Some improved PROMs and PREMs



# Methods

- One arm feasibility study
- Anticipated sample n=20 patients
- Inclusion criteria
  - Surgical candidate for ACLR
  - 13 years of age or older
- Exclusion criteria
  - Visual impairment greater than 20/200 with the use of corrective lenses
  - Lack of consistent access to a phone with data capabilities
  - Patients who should not participate in physical therapy
  - Patients can be excluded at any time if the physical therapist determines the patient is not an appropriate candidate for telerehabilitation



# Methods, Cont'd

- Up to 10 participating licensed physical therapists
- Data collection
  - Patient and provider post-session surveys
  - Home program and scheduled visit compliance rate
  - Healthcare information in keeping with standard of care physical therapy practices
- Feasibility criteria will be analyzed to determine whether telerehabilitation is an effective modality to improve physical therapy access for rural patients

# Results

- 20 patients have been enrolled
- 3 providers have been enrolled
- Data collection is ongoing



# Limitations

## **Study Design Limitations:**

- One arm feasibility study
- Only enrolling patients undergoing ACLR

## **Implementation Limitations:**

Can be difficult to perform markerless motion capture on post operative patients

Poor data capabilities can limit communication

Telehealth does not eliminate patients missed visits

# Acknowledgments

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# References

1. Brophy RH, Lowry KJ. American Academy of Orthopaedic Surgeons Clinical Practice Guideline Summary: Management of Anterior Cruciate Ligament Injuries. *J Am Acad Orthop Surg.* 2023 Jun 1;31(11):531-537. doi: 10.5435/JAAOS-D-22-01020. Epub 2023 Jan 18. PMID: 36727995; PMCID: PMC10168113.
2. Bergstein VE, Ahiarakwe U, Haft M, Fox H, Best MJ. Decreasing Incidence of Anterior Cruciate Ligament Tears and Increasing Utilization of Anterior Cruciate Ligament Reconstruction in the United States From 2010 to 2020. *Arthroscopy.* 2025 Jun;41(6):1912-1918.e1. doi: 10.1016/j.arthro.2024.08.018. Epub 2024 Aug 28. PMID: 39214428.
3. Mall NA, Chalmers PN, Moric M, Tanaka MJ, Cole BJ, Bach BR Jr, Paletta GA Jr. Incidence and trends of anterior cruciate ligament reconstruction in the United States. *Am J Sports Med.* 2014 Oct;42(10):2363-70. doi: 10.1177/0363546514542796. Epub 2014 Aug 1. PMID: 25086064.
4. Kaeding CC, Léger-St-Jean B, Magnussen RA. Epidemiology and Diagnosis of Anterior Cruciate Ligament Injuries. *Clin Sports Med.* 2017 Jan;36(1):1-8. doi: 10.1016/j.csm.2016.08.001. Epub 2016 Oct 4. PMID: 27871652.
5. Evans J, Mabrouk A, Nielson JL. Anterior Cruciate Ligament Knee Injury. [Updated 2023 Nov 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK499848/>
6. Petterson SC, Buckmire MC, Giordano AO. Recovery Stages After Anterior Cruciate Ligament Reconstruction. *Arthroscopy.* 2025 Nov;41(11):4393-4395. doi: 10.1016/j.arthro.2025.08.001. PMID: 41314701.
7. Glattko KE, Tummala SV, Chhabra A. Anterior Cruciate Ligament Reconstruction Recovery and Rehabilitation: A Systematic Review. *J Bone Joint Surg Am.* 2022 Apr 20;104(8):739-754. doi: 10.2106/JBJS.21.00688. Epub 2021 Dec 21. PMID: 34932514.
8. McLaughlin KH. The influence of rurality on self-reported physical therapy utilization among patients with severe chronic back pain in the United States. *J Rural Health.* 2025 Jan;41(1):e12923. doi: 10.1111/jrh.12923. PMID: 39835344.
9. 1. III.B. Overview of the State - Mississippi - 2021. (n.d.). Mississippi - 2019 - III.B. overview of the State. Retrieved January 15, 2026, from [https://mchb.tvisdata.hrsa.gov/Narratives/Overview/9a62acf8-1ab6-4e9a-b92f-9037110117e7#:~:text=The%20residents%20of%20Mississippi%20are,and%20Services%20Administration%20\(HRSA\).](https://mchb.tvisdata.hrsa.gov/Narratives/Overview/9a62acf8-1ab6-4e9a-b92f-9037110117e7#:~:text=The%20residents%20of%20Mississippi%20are,and%20Services%20Administration%20(HRSA).)
10. 1. Rural Health. (n.d.). Rural Health | Mississippi State University Extension Service. Retrieved January 15, 2026, from <https://extension.msstate.edu/food-and-health/rural-health>

# References, Cont'd

1. (N.d.). Explore rural population in Mississippi | ahr. Retrieved January 15, 2026, from [https://www.americashealthrankings.org/explore/measures/pct\\_rural\\_b/MS](https://www.americashealthrankings.org/explore/measures/pct_rural_b/MS)
2. Wizecare Home: Ai Powered Online Physical Rehabilitation. Wizecare. (n.d.). <https://www.wizecare.com/>
3. Ouendi N, Wallard L, Dervaux B, Pudlo P, Avril E. Use of telerehabilitation by clinicians: barriers and levers to its adoption in clinics. *Disabil Rehabil Assist Technol*. 2025 Dec 4:1-17. doi: 10.1080/17483107.2025.2598014. Epub ahead of print. PMID: 41342475.
4. McLaughlin KH, Minick KI, Fritz JM, Tannahill N, Spar A, Feinsilver M, Weber M, Opoku E, Adams J, Skolasky RL. Physical Therapists' Perceptions of Telerehabilitation for Patients with Musculoskeletal Conditions in the Post-Pandemic World. *Telemed J E Health*. 2025 Nov 25. doi: 10.1177/15305627251387174. Epub ahead of print. PMID: 41174924.
5. Phuphanich ME, Sinha KR, Truong M, Pham QG. Telemedicine for Musculoskeletal Rehabilitation and Orthopedic Postoperative Rehabilitation. *Phys Med Rehabil Clin N Am*. 2021 May;32(2): 319-353. doi: 10.1016/j.pmr.2020.12.004. Epub 2021 Feb 15. PMID: 33814061.
6. Wang Y, Liu X, Wu Q, Zhu Q, Zhang M. Impact of Telerehabilitation on Rehabilitation Efficacy and Patient Satisfaction After Knee Surgery: Systematic Review and Meta-Analysis of Randomized Controlled Trials. *J Med Internet Res*. 2025 Dec 19;27:e76844. doi: 10.2196/76844. PMID: 41423944; PMCID: PMC12716415.
7. Barger S, Castellini G, Vitale JA, Guida S, Banfi G, Gianola S, Pennestrì F. Effectiveness of Telemedicine for Musculoskeletal Disorders: Umbrella Review. *J Med Internet Res*. 2024 Feb 2;26:e50090. doi: 10.2196/50090. PMID: 38306156; PMCID: PMC10873802.

Images sourced from:

1. <https://www.atlantaboneandjoint.com/acltear.html>
2. Davidson, Latrena. (2013). Correlates of Voluntary Human Immunodeficiency Virus (HIV) Testing Among African American Adults in Rural Mississippi. 10.13140/RG.2.2.10151.78247.
3. <https://www.wizecare.com/platform>
4. <https://www.arthrex.com/knee/acl-reconstruction>
5. <https://www.wizecare.com/resources/page/2>
6. <https://telehealth.hhs.gov/>
7. <https://www.datahash.com/using-first-party-data-for-practical-insights/>

# Questions?