

Introduction

- Rural patient population presents a **challenge for delivery of follow-up and continuity of care** to hospitals and healthcare systems.
- There are 30 specialists per 100,000 residents in rural areas vs. 263 specialists per 100,000 residents in urban areas.
- Patients in rural communities are located farther away from their medical providers, resulting in **longer travel and time off work**.
- Expanding healthcare access to rural areas is not a cost- and time-efficient solution as it requires up-front costs and long-term planning.
- Digital health is potential solution** to combat the widening disparity in access to healthcare.

Objectives

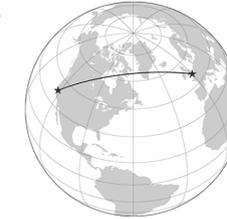
- The objective is to describe and **evaluate the impact of patients' geographic location on online patient engagement in rural orthopedic population**.

Study Population

- 980 patients who underwent total joint arthroplasty (either total knee or hip arthroplasty) were included.
- Patients were operated by multiple surgeons across one health system (*Geisinger Health, PA*).
- Patients were enrolled in the online rehabilitation platform offering multi-format (text, image, video) communication and video-based post-surgical education (*Force Therapeutics, NY*).
- Patients provided their 5-digit home zip codes upon enrollment.

Methods

- Patients were divided into 2 groups based on their geographical location from their hospitals ($\geq 15\text{km}$ vs. $< 15\text{km}$).
- Using the **patient-reported zip codes**, individual latitudes and longitudes were derived.
- Based on the coordinates, approximate distances were determined using the **Haversine Formula**, which calculates the great-circle distance between two points (shortest distance over the earth's surface; "as-the-crow-flies")



Results

- On average, patients lived approximately 25-30km away from their assigned hospitals. We see a high concentration around the hospitals. (Figure 1)
- 410 patients lived 15km or more from their hospitals while 570 patients lived within the 15km radius.** The baseline characteristics (Age, Body Mass Index) were not statistically different between the two groups. (Table 1)
- Remote patients had significantly higher **number of logins** ($p < 0.05$), **hourly sessions spent on the platform** ($p < 0.05$) and **post-op video views** ($p < 0.05$) compared to those living closer ($< 15\text{km}$) to their hospitals. (Table 1)
- Overall, patients residing 15km or more from their hospitals ("Remote patients") showed higher levels of engagement.**

	<15 km Group (N=410)	≥ 15 km Group (N=570)	P-Value
Avg Logins (Range)	10.1 (0-109)	13.5 (0-172)	$p < 0.05$
Avg Hourly Sessions (Range)	15.7 (0-221)	21.3 (0-415)	$p < 0.05$
Avg Post-op Video Views (Range)	18.8 (0-347)	25.2 (0-557)	$p < 0.05$

Table 1: Comparisons between groups

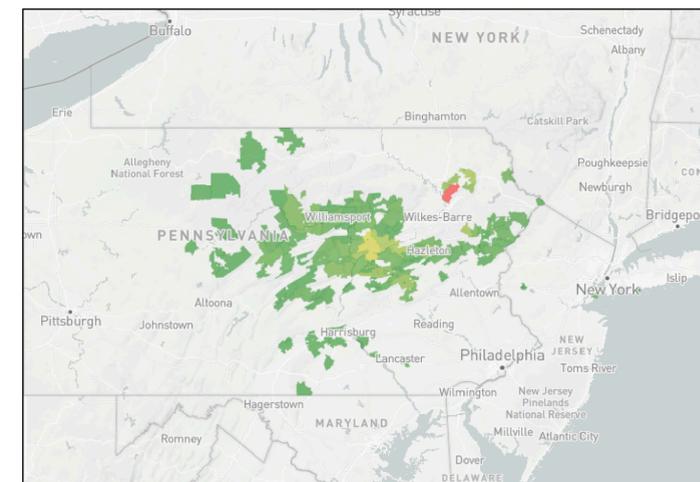


Figure 1: Map showing distribution of patients

Conclusion

- Remote patients tend to be more inclined to use an online platform for their post-surgical care.**
- This could indicate that **online platform could be a viable solution to reducing disparity in access to healthcare.**
- We should seek more ways to utilize digital help in addressing health equity for rural, underserved communities
- Key is to sustain rural patients' engagement via highly personalized interactions and content

References

- National Rural Health Association (NRHA). National Rural Health Snapshot Report (2017). Retrieved from: <https://www.ruralhealthweb.org/about-nrha/about-rural-health-care>
- Orton, M., Agarwal, S., Muhoza, P., Vasudevan, L., & Vu, A. (2018). Strengthening Delivery of Health Services Using Digital Devices. *Global health, science and practice*, S61–S71. doi:10.9745/GHSP-D-18-00229

Contact Details

- Seong Jin Kim, MPH
Force Therapeutics, New York NY
seong@forcetherapeutics.com
- Michael Suk, MD JD MPH MBA
Geisinger Medical Center, Danville PA
msuk@geisinger.edu