

## **Group 1 Report**

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The goal of this analysis was to identify factors that contribute to a patient's wait time between visits during their journey. A patient's journey consists of all visits related to a specific diagnosis. Our data tracks patients' journeys including visits, diagnosis, demographics, and additional clinical information. Ultimately, our analysis will help us see how the system can be adjusted to better meet patient needs.

We first grouped each patient's journey (i.e. unique patient and diagnosis) and found the average time between visits. Encounters labeled as well-visits or without labeled diagnoses were excluded, as they do not represent follow-up for an ongoing condition. Each journey was then placed into a diagnosis group--a slightly broader category of diagnosis. For example, ankle fracture and wrist fracture count as different diagnoses for a patient's journey but would count as the same diagnosis group.

Different diagnosis groups were expected to have vastly different wait times, since different diagnoses require different specialists or different tests. The patient's responsiveness can also play a role in their own wait times. So, for the rest of our analysis, we controlled for the different diagnoses wait times. This was done by calculating the difference between a patient's wait time and the average wait time for patients in a similar diagnosis group. To further corroborate this path of analysis, a mixed effects model was fit, with diagnosis chapters (the broadest categorization of diagnoses) as a fixed effect and patient key as a random effect. Further analyses of variance were conducted and revealed that chapter and patient key were significant as fixed and random effects, respectively. Therefore, there is a significant difference in wait times across diagnosis chapters, as we expected.

The proportions of each diagnosis chapter that are admitted to the emergency department or inpatient care were also compared to their average days between visits. We identified a potential gap in preventive or follow-up care for mental and behavioral disorders, as these patients had both relatively infrequent appointments and higher severe care utilization.

Additionally, we looked at how the age of patients affects their wait time. A negative relationship between birth year and wait time was found. In general, the younger the patient, the shorter their wait time is expected to be.

A choropleth with deviation from average wait time for each census block revealed that there was no significance in wait times for patients located closer to SVH's hub in Topeka, Kansas. Rurality also did not appear to affect wait times for patients.

We evaluated wait time vs patient response using their MyChart Status. We found that there is no evidence to suggest that patient wait times are shorter for patients who are more responsive or active on MyChart. This could be a positive result, since SVH does not want to provide worse care simply if patients are not responsive.

Our findings suggest that diagnosis group and age are significant factors that contribute to wait times between visits in a patient's journey, while location and responsiveness are insignificant. The insignificant factors can prove that patients are getting unbiased care in those areas, and the significant factors can be examined more to determine if there are better ways to meet patient needs.

## References

- AFC Urgent Care. “*Urgent Care 101: Understanding Wait Times and How to Make Your Visit a Breeze.*” <https://www.afcurgentcare.com/ladera-ranch/blog/urgent-care-101-understanding-wait-times-and-how-to-make-your-visit-a-breeze/>.
- U.S. Centers for Medicare & Medicaid Services. (2024, October 1). *ICD-10-CM guidelines FY25 October 1 2024*. Centers for Medicare & Medicaid Services. <https://www.cms.gov/files/document/fy-2025-icd-10-cm-coding-guidelines.pdf>