

# IMPROVING CLINICAL NAVIGATION FOR PEOPLE WITH VISUAL IMPAIRMENTS: INSIGHTS FROM REAL-WORLD SCENARIOS

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## BACKGROUND:

People with visual impairments (PVI) frequently visit optometry and ophthalmology clinics, yet it remains challenging for them to navigate (1). These challenges significantly impact their independence and safety (2). Factors such as poor lighting, contrast, inaccessible signage, and other forms of inadequate spatial cues can compromise the independence and safety of PVI (3). This study is aimed at identifying task-specific environmental features that facilitate or hinder navigation for PVI within clinical settings.

## METHODS

Adults with visual impairments were recruited to participate in a simulated optometry visit at the Lethbridge Layton Mackay vision rehabilitation center. The visit consisted of eight sequential navigation tasks: entering the building, reaching reception, using stairs or elevators, locating a chair, finding the appointment room, visiting an optical shop, exploring a low vision boutique, and exiting the building. Each participant wore Pupil Labs Neon glasses to record the scene from a first-person view and were recorded with a GoPro by a member of the research team to examine participant behavior. Time, distance and success rate of each task were examined from the video recordings. After each task, researchers asked questions about the information required to successfully perform each task, which was recorded on the Lime survey platform for thematic and descriptive analyses.

## RESULTS:

Fifteen adults (30-73 yo) with diverse vision statuses (8 blind, 7 low vision) completed the 8 navigation tasks. Navigation performance and feedback revealed task-dependent needs. When entering, participants emphasized the importance of knowing door types (n=12) and avoiding obstacles such as pillars or stairs (46%) for safe entry. At the reception, ambient audio (e.g., music, radio) and high-contrast signage enhanced orientation. Participants (n=11) preferred stairs with uniform lighting and elevators with illuminated, tactile, and voice-activated controls. In waiting areas and appointment rooms, human guidance (n=10) and clear spatial layout were critical, while optical shops and boutiques required improved lighting and accessible payment systems (n=13). Participants (n=4) expressed concern that many healthcare professionals lacked training in proper human guiding techniques, often resulting in experiences that felt more like being pulled or dragged rather than being gently guided.



Figure 2. Showing distance travelled by blind participants (right) and low vision participants (left) to enter through the door and find the receptionist

## CONCLUSIONS:

Designing vision-friendly clinics requires integrating multisensory and contextual cues (visual, tactile, and auditory), alongside properly trained human assistance. These findings provide evidence-based recommendations for lighting, signage, and spatial organization to promote accessibility, independence, and safety for visually impaired patients in eye-care settings.

## REFERENCE

1. P. R. Puri, A. Coutaller, F. Gwade, S. S. Kabore, D. Annan, and J. P. Nemargut, "Perspectives From Canadian People With Visual Impairments in Everyday Environments Outside the Home: Qualitative Insights for Assistive Technology Development," *JMIR Rehabil Assist Technol*, vol. 12, pp. e73380–e73380, Jul. 2025, doi: 10.2196/73380.
2. R. Saur, M. B. Hansen, A. Jansen, and T. Heir, "Visually impaired individuals, safety perceptions and traumatic events: a qualitative study of hazards, reactions and coping," *Disabil Rehabil*, vol. 39, no. 7, pp. 691–696, 2017, doi: 10.3109/09638288.2016.1161836
3. K. Papadopoulos, E. Koustriava, and L. Kartasidou, "The Impact of Residual Vision in Spatial Skills of Individuals With Visual Impairments," *J Spec Educ*, vol. 45, pp. 118–127, Aug. 2011, doi: 10.1177/0022466909354339.



Figure 1. First floor (left) and third floor (right). Green line shows the route to the appointment room; red line shows the return route.

Icon	Key Observations	Design Recommendations
	Only 54% succeeded independently Participants appreciate knowing door type and avoiding obstacles like stairs/pillars in front.	1. Use high-contrast doors, tactile ground cues 2. Keep entry path obstacle-free. 3. Automatic or push doors preferred.
	62% success Participants relied on auditory cues.	1. Add ambient audio cues (radio/music), 2. Verbal greetings, 3. High-contrast signage, and 4. Consistent lighting at reception.
	85% success with help; Preferred stairs with uniform lighting, disliked dim elevators.	1. Ensure well-lit stairs 2. High-contrast handrails, 3. Tactile indicators 4. Voice announcements in elevators.
	85% success; needed info about empty chairs and layout.	1. Keep clear walking paths, 2. Use contrasting furniture, 3. Consistent lighting, 4. Tactile markers near seating.
	31% success; high confusion.	1. Provide guides trained in vision-assistance techniques, 2. Audio signage,
	Required human help; overwhelmed by layout.	1. Simplify layout, 2. Provide guided paths 3. Verbal assistance for frame selection.
	54% success; difficulty with payments and orientation.	1. Implement accessible payment terminals, 2. Verbal product labeling, and 3. Clear aisle design.
	100% success; preferred on-command guidance.	1. Use consistent exit cues—clear signage, 2. High luminance 3. Directional floor textures.