

ABrailleAbility: An Effective Alternative to Traditional Medication Taking Assistance Tools for the Blind & Visually Impaired – Elvin Nguyen

For millions of blind and visually impaired (BVI) individuals, safely taking medication remains a critical challenge. A National Library of Medicine study found that 74% of BVI participants struggled with recognizing specific drug information on labels, and about 20% took the wrong drug or dosage at the incorrect time. Existing aids, such as audio readers or punchers, are costly, difficult to mass distribute, and hard to customize, leaving many without effective solutions.

To address this problem, I created ABrailleAbility — an eco-friendly, customizable Braille medication label made from PLA+ plastic derived from sugarcane and cornstarch. The label displays all essential prescription details including dosage, drug name, and supports multiple languages (English, French, Mandarin, Spanish, Arabic) with adjustable Braille sizes to meet diverse literacy and tactile needs. Designed using Creality Print and produced on a budget-friendly 3D printer, the Braille dots are translated from text via a Braille translator and integrated into the label, enabling scalable, low-cost production suited for global distribution.

To validate its effectiveness, 14 fully blind participants—including individuals from the CNIB foundation—read aloud three label sizes. Testing showed only 2 single-interpretation errors across 42 readings, resulting in an overall interpretation accuracy of 95.2%. Feedback highlighted the labels' clarity, tactile distinctiveness, and ease of use. With proven accuracy, strong user endorsement, environmental sustainability, and affordability, ABrailleAbility is poised for implementation in pharmacies and healthcare facilities worldwide, advancing safe, independent medication management for BVI individuals.

1. Canadian National Institute for the Blind. (n.d.). *Blindness*. CNIB Foundation.
Retrieved from <https://www.cnib.ca/en/sight-loss-info/blindness?region=ab#:~:text=Today%2C%20an%20estimated%20500%2C00%20Canadians,and%20its%20impact%20on%20people>.
2. Brestovački Svitlica, B., Radovanović, A., Obrenov, L., & Hromiš, S. (2025). Experiences of visually impaired individuals in self-administering prescription medications: A cross-sectional study. *Journal of Advanced Nursing*, 12, 23743735251304697. <https://pubmed.ncbi.nlm.nih.gov/40955765/>
3. Canadian National Institute for the Blind. (n.d.). *Blindness in Canada*. CNIB.
Retrieved from <https://www.cnib.ca/en/sight-loss-info/blindness/blindness-canada?region=ab>
4. Zhi-Han, L., Hui-Yin, Y., & Makmor-Bakry, M. (2017). Medication-handling challenges among visually impaired population. *Archives of Pharmacy Practice*, 8(1), 8–14. Retrieved from <https://archivepp.com/storage/models/article/4OaOalUEuOGEqxXObxQaxAehbKb3mlO4ZZA9gAyszvgX5JGfrbi8eiiM6JB5/medicationhandling-challenges-among-visually-impaired-population.pdf>
5. McDiarmid, Carrly. *Print Material Accessibility in Canada, 2023*. Statistics Canada, 3 Oct. 2023. Retrieved from <https://www150.statcan.gc.ca/n1/pub/89-654-x/89-654-x2023003-eng.htm>.