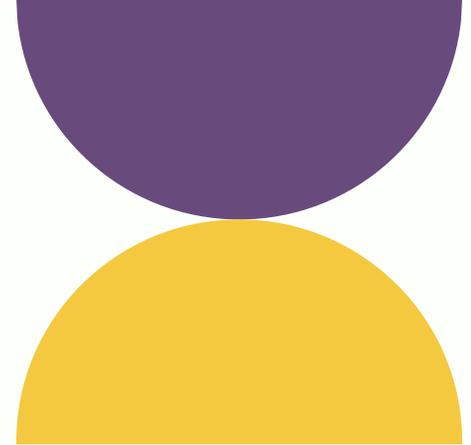


# About me: Amy Dara Hochberg



- **Profound hearing loss** since age 1 year – hearing aid (left ear)
- From New York – based in Barcelona
- PhD thesis: **written multilingual health communication** (UPF, TraDiLex)
- Research on **transcription apps and healthcare language accessibility**
- Designed accessible foreign-language learning methodology for the DHH (ACAPPS)
- Soon: **postdoctoral researcher** at GRIAL (UOC with ONCE-Investiga grant)

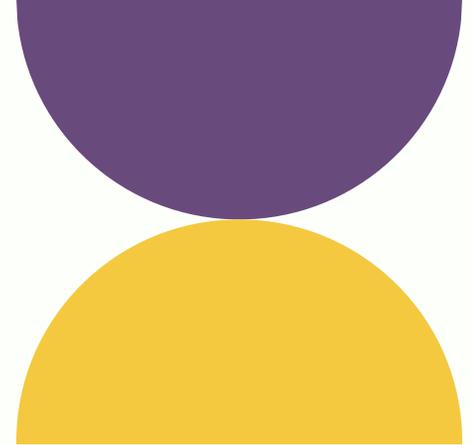
# Language accessibility in healthcare: Bridging barriers to inclusive care

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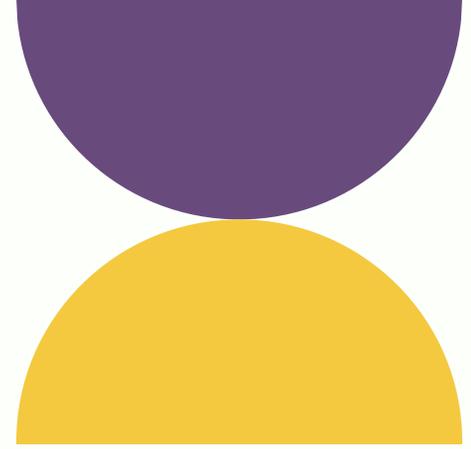
## Multilingual and sensory-accessible communication in healthcare

by

Amy Dara Hochberg



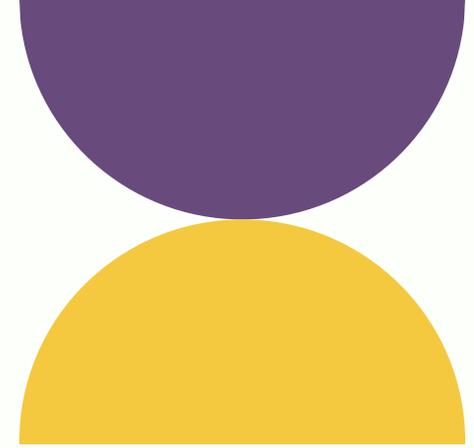
# Why accessibility matters in healthcare



- Communication underpins safety, consent, and adherence
- Barriers produce unequal outcomes
- Accessibility is an equity issue

Flores, 2006; Meuter et al., 2015

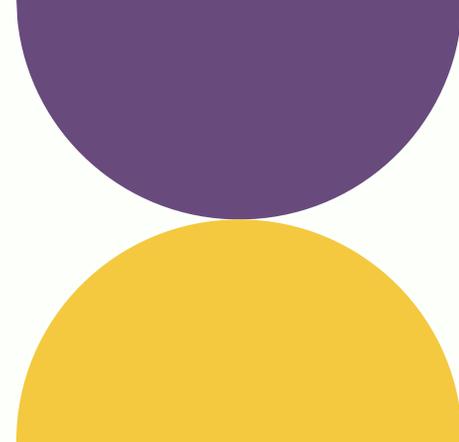
# Accessibility is multidimensional



- Not only physical access
- Linguistic, sensory, cognitive dimensions
- Language cuts across all care settings

# Who is excluded by current practices?

- Deaf and hard-of-hearing patients
- Multilingual patients
- Patients with limited health literacy
- Users of inaccessible digital platforms



# Existing forms of communication accessibility in healthcare

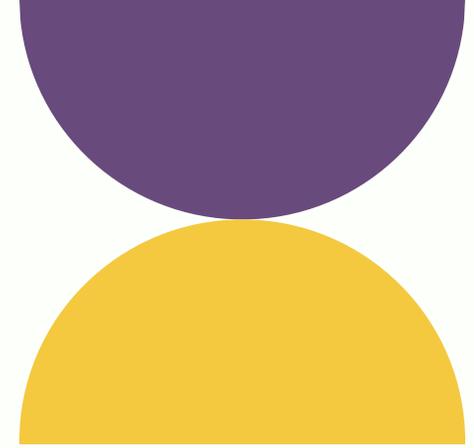
## For deaf and hard-of-hearing patients

- Sign language interpreters (on-site / video remote)
- Real-time captioning (CART, ASR-based apps)
- Written summaries and discharge instructions
- Visual and text-based alerts

## For patients who do not speak the local language

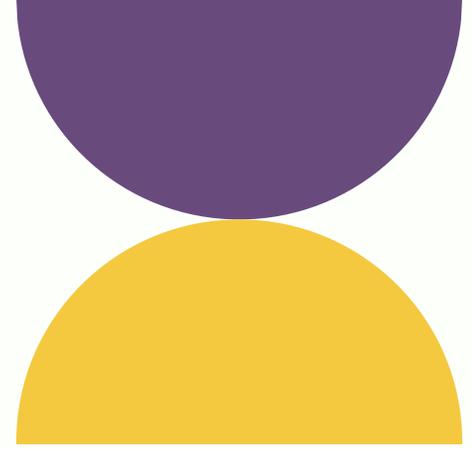
- Professional medical interpreters
- Telephone and video interpreting services
- Translated written materials
- Cultural mediators and bilingual staff

# Common communication barriers



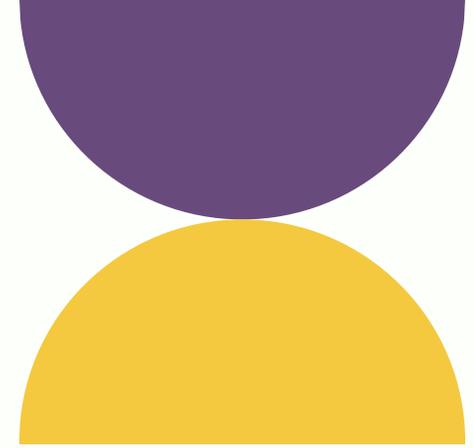
- Spoken-language dominance
- Ad hoc solutions
- Time pressure and automation

# Why these solutions don't always work in practice



- Not always available when needed
- Often treated as temporary or optional
- Quality affected by time pressure
- Digital tools focus on speed, not comprehension
- Patients adapt more than systems do

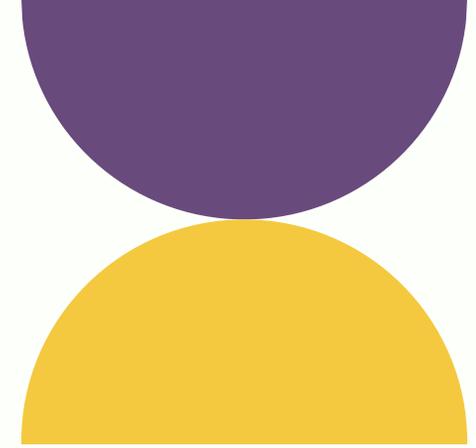
# Digital health: promise and risk



- Telehealth and patient portals
- Increased reach and flexibility
- Accessibility often missing by design

Henni, et al., 2022; Higashi, et al., 2025; Valdez, et al., 2020

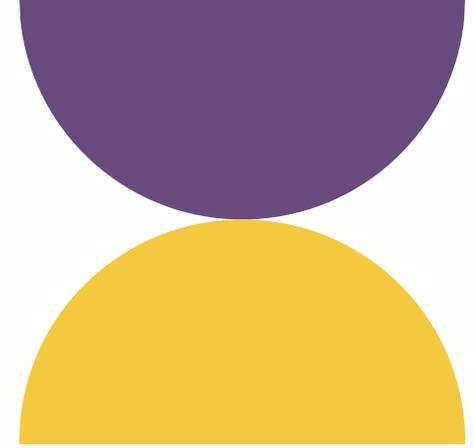
# Why “accurate” is not enough



- Accuracy ≠ accessibility
- Segmentation, clarity, usability matter
- User-centred design is essential

Ahmed, et al., 2025; Leroy, et al., 2010

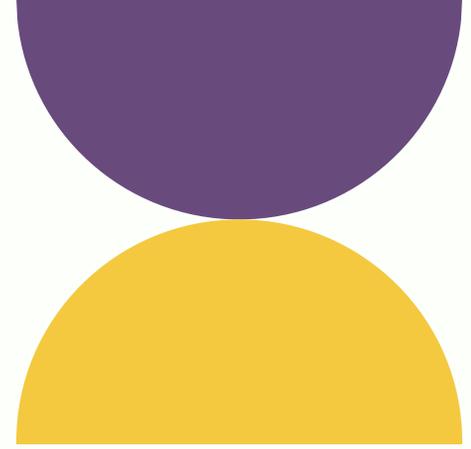
# From access to understanding



- Access  $\neq$  comprehension
- Structure, clarity, and cognitive load matter
- Language accessibility benefits many groups

Stableford & Mettger, 2007; McNamara & Magliano, 2009; Sheridan et al., 2011

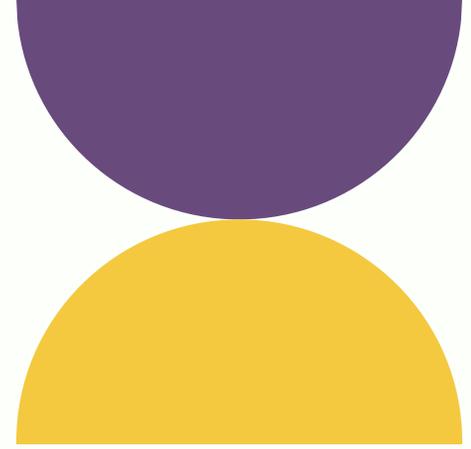
# When Real-Time Transcription Fails in Healthcare



- Long, unsegmented text streams
- Missing punctuation and turn-taking
- High density of medical terminology
- Loss of critical meaning (negation, condition, or dosage)

Hodgson & Coiera (2016); Miner, et al (2020)

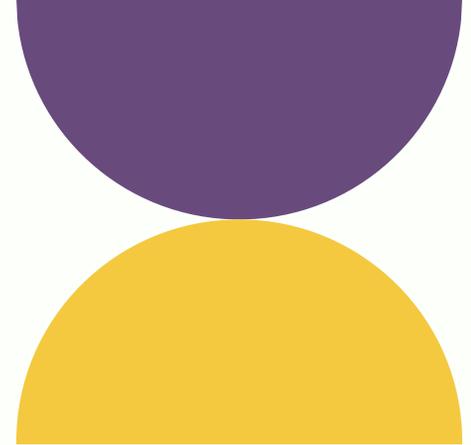
# Textual Accessibility as Patient Safety



- Misunderstanding affects consent
- Impacts adherence and follow-up
- Accessible text reduces clinical risk

Hodgson & Coiera, 2016; van Buchem et al., 2021

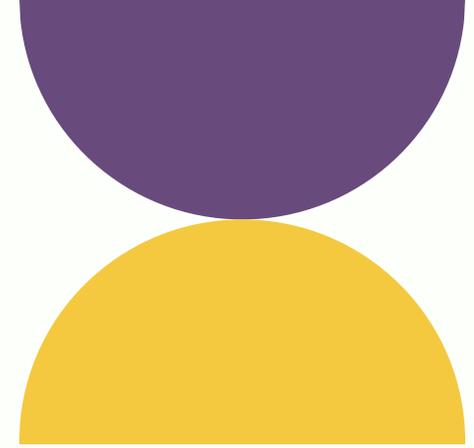
# Multilingual Contexts Multiply the Risk



- ASR errors increase with non-native speech
- Literal translations reduce clarity
- Cultural expectations shape understanding

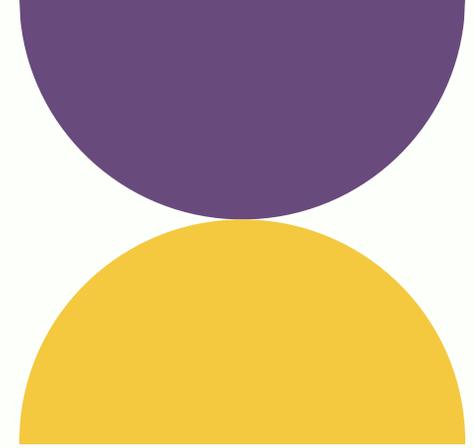
Koenecke et al., 2020; Nittas et al., 2024; Zolnoori et al., 2024

# My postdoctoral research (brief)



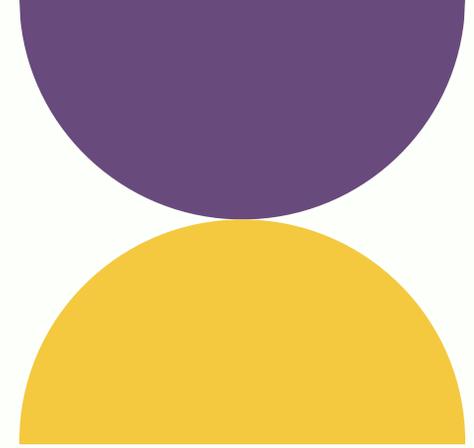
- Evaluating speech-to-text tools in healthcare
- Focus on accessibility and user experience
- Multilingual contexts

# Implications for inclusive healthcare



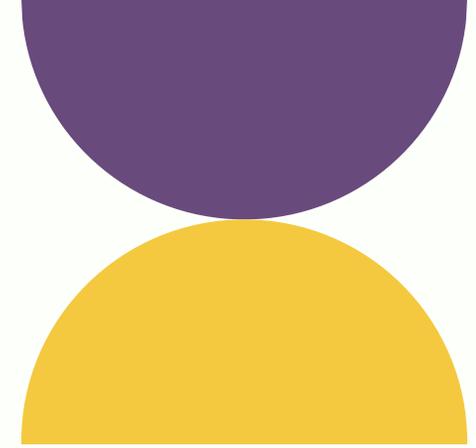
- Improved safety and trust
- Reduced inequalities
- Need for evidence-based guidelines

# Towards inclusive systems



- Accessibility by design
- Interdisciplinary collaboration
- Patient perspectives central

# Conclusion



- Language accessibility is core to equity
- Communication shapes outcomes

Thank you

# References 1 of 4

- Ahmed, A., Leroy, G., Kauchak, D., Barai, P., Harber, P., & Rains, S. (2025). *Parallel corpus analysis of text and audio comprehension to evaluate readability formula effectiveness: Quantitative analysis*. *Journal of Medical Internet Research*, 27, e69772. <https://doi.org/10.2196/69772>
- Flores, G. (2006). Language barriers to health care in the United States. *New England Journal of Medicine*, 355(3), 229–231. <https://doi.org/10.1056/NEJMp058316>
- Henni, S.H., Maurud, S., Fuglerud, K.S., Moen, A. (2022). The experiences, needs and barriers of people with impairments related to usability and accessibility of digital health solutions, levels of involvement in the design process and strategies for participatory and universal design: a scoping review. *BMC Public Health* 22(35). <https://doi.org/10.1186/s12889-021-12393-1>
- Higashi, R. T., Thakur, B., Repasky, E. C., Casillas, A., Steitz, B. D., Hogan, T. P., Lehmann, C. U., Peterson, E. D., Navar, A. M., & Turer, R. W. (2025). *Digital health technology use among Spanish speakers in the US: A scoping review*. *JAMA Network Open*, 8(5), e2510386. <https://doi.org/10.1001/jamanetworkopen.2025.10386>
- Hodgson, T., & Coiera, E. (2016). Risks and benefits of speech recognition for clinical documentation: A systematic review. *Journal of the American Medical Informatics Association*, 23(1), e169–e179. <https://doi.org/10.1093/jamia/ocv152>

# References 2 of 4

- Koenecke, A., Nam, A., Lake, E., Nudell, J., Quartey, M., Mengesha, Z., Toups, C., Rickford, J. R., Jurafsky, D., & Goel, S. (2020). Racial disparities in automated speech recognition. *Proceedings of the National Academy of Sciences*, 117(14), 7684–7689. <https://doi.org/10.1073/pnas.1915768117>
- Leroy, G., Helmreich, S., & Cowie, J. R. (2010). *The influence of text characteristics on perceived and actual difficulty of health information*. *International Journal of Medical Informatics*, 79(6), 438–449. <https://doi.org/10.1016/j.ijmedinf.2010.02.002>
- Meuter, R. F. I., Gallois, C., Segalowitz, N. S., Ryder, A. G., & Hocking, J. (2015). Overcoming language barriers in healthcare: A protocol for investigating safe and effective communication when patients or clinicians use a second language. *BMC Health Services Research*, 15, 371. <https://doi.org/10.1186/s12913-015-1024-8>
- McNamara, D. S., & Magliano, J. (2009). Toward a comprehensive model of comprehension. *Psychology of Learning and Motivation*, 51, 297–384. [https://doi.org/10.1016/S0079-7421\(09\)51009-2](https://doi.org/10.1016/S0079-7421(09)51009-2)
- Miner, A. S., Milstein, A., Schueller, S. M., Hegde, R., Mangurian, C., & Linos, E. (2020). Assessing the accuracy of automatic speech recognition for psychotherapy: A case for domain-specific evaluation metrics. **NPJ Digital Medicine**, 3(1), 85. <https://doi.org/10.1038/s41746-020-0285-8>

# References 3 of 4

Nittas, V., Daniore, P., Chavez, S. J., Wray, T. B., Wang, Y., & Wangenheim, F. (2024). Challenges in implementing cultural adaptations of digital health interventions. *Communications Medicine*, 4, 4. <https://doi.org/10.1038/s43856-023-00426-2>

Rivas Velarde, M., Jagoe, C., & Cuculick, J. (2022). Video relay interpretation and overcoming barriers in health care for deaf users: Scoping review. *Journal of Medical Internet Research*, 24(6), e32439. <https://doi.org/10.2196/32439>

Saura, R. (2025, juny). *Dades sobre la població amb sordesa: Recull de dades d'institucions públiques, recerca científica i estadístiques oficials*. Federació ACAPPS. [https://acapps.org/web/wp-content/uploads/2025/12/Dades-sordesa\\_2025.pdf](https://acapps.org/web/wp-content/uploads/2025/12/Dades-sordesa_2025.pdf)

Sheridan, S. L., Halpern, D. J., Viera, A. J., Berkman, N. D., Donahue, K. E., & Crotty, K. (2011). Interventions for individuals with low health literacy: A systematic review. *Journal of Health Communication*, 16(Suppl 3), 30–54. <https://doi.org/10.1080/10810730.2011.604391>

Stableford, S., & Mettger, W. (2007). Plain language: A strategic response to the health literacy challenge. *Journal of Public Health Policy*, 28(1), 71–93. <http://doi.org/10.1057/palgrave.jphp.3200102>

# References 4 of 4

- Tannenbaum-Baruchi, C., Feder-Bubis, P., & Aharonson-Daniel, L. (2025). Communication barriers to optimal access to emergency rooms according to deaf and hard-of-hearing patients and health care workers: A mixed-methods study. *Academic Emergency Medicine*, 32(2), 246-259. <https://doi.org/10.1111/acem.15037>
- Valdez, R. S., Rogers, C. C., Claypool, H., Triesmann, L., Frye, O., Wellbeloved-Stone, C., & Kushalnagar, P. (2020). *Ensuring full participation of people with disabilities in an era of telehealth*. *Journal of the American Medical Informatics Association*, 28(2), 389–392. <https://doi.org/10.1093/jamia/ocaa297>
- van Buchem, M. M., Boosman, H., Bauer, M. P., van den Berg, L. M., Blijleven, V., van der Palen, J., van Goor, H., & Eslami, S. (2021). The digital scribe in clinical practice: A scoping review and research agenda. *NPJ Digital Medicine*, 4, 57. <https://doi.org/10.1038/s41746-021-00432-5>
- Zolnoori, M., Vergez, C., Hanson, S., Pathak, J., & Mazoure, B. (2024). Decoding disparities: Evaluating automatic speech recognition system performance in transcribing Black and White patient verbal communication with nurses in home healthcare. *JAMIA Open*, 7(4), ooae130. <https://doi.org/10.1093/jamiaopen/ooae130>