# Implementing Robotics in the Patient Care Environment

Presented to you by
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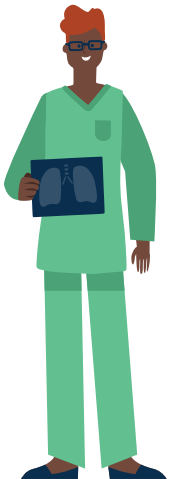
# What problems are being addressed?

# Background

- Nursing shortages:
  - Errors in patient care
  - Higher mortality rates
- High patient-to-nurse ratios have been found to correlate with:
  - Nurses experiencing burnout
  - Patients experiencing higher mortality rates



# Stressful Environment

- Nurses have to manage multiple patients
- Sense of urgency/time
- Patient isolation and uncertainty

# Pre-Existing Solutions

- MediBabble and Google translate fall short at providing adequate cultural context

- Additionally these solutions operate under the assumption that every nurse and patient has their own device and internet access

- AI tools operate with a much greater knowledge of language and allow for less information to get lost in translation

# Criterias used to consider audience

- Justice
- Equity
- Diversity
- Inclusion
- Accessibility

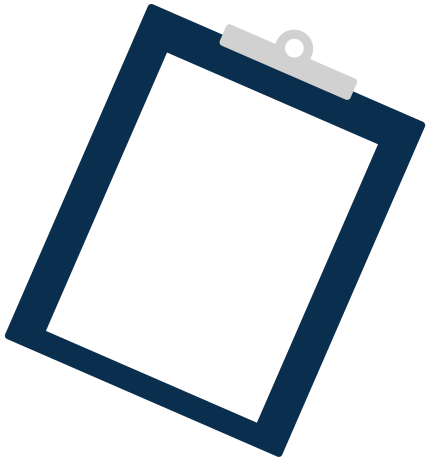
# Sustainability and Equity

- Reduce plastic usage through reuse of designated pill container
- Reducing costs for patients by minimizing medical errors
- Improving equity in medicine for non-native English speakers
- Better understanding of the patient's preferred diet
    - Less food waste

# Considerations for Users

- Barcodes make it easier for users
- Better accessibility to people with disabilities
- More future opportunities for employees by providing certified technical skills
- Stress reduction for both patients and nurses
- Relieving nurses from extra routine activities

# Demonstration



# Innovation

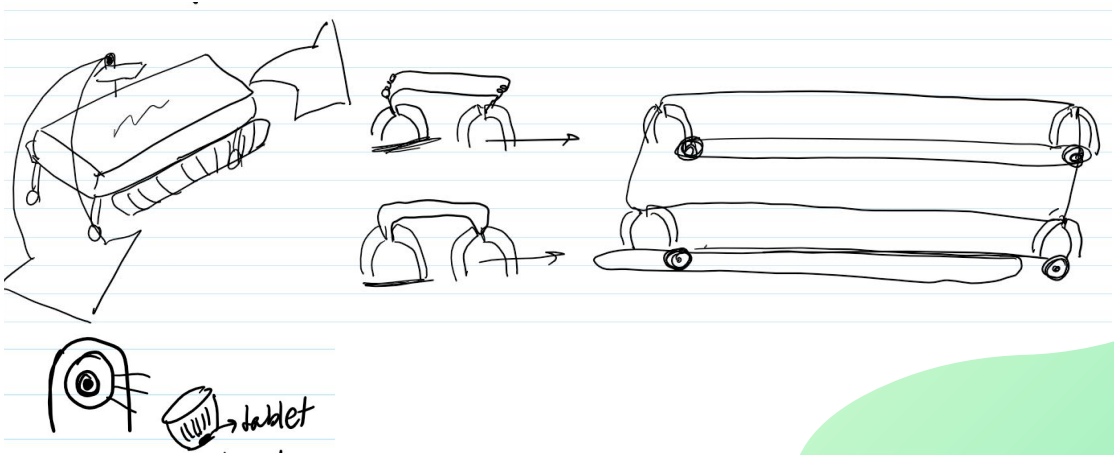
- This device utilizes pre-existing medical records with OpenAI and the cloud
- Language detection and translation through OpenAI

# Presentation visual and clear?

# Did we explore user experience?

# Design process, inspiration, ideation, implementation?

- We have noticed many issues through some of our personal exposure to nurses and patient care
- Nurses have to manage many patients at any time
- AI has more access to cultural context than other translation tools



# Development Challenges

- Learning to use API
- Rewriting program in entirely different language Java to Python
- Software Financial Constraints
- Combining multiple features into a file
- Creating front-end interface

# Financial Aspects and Business Plans

- Implementation of device requires electricity and internet
- Available in most hospitals already
- Not difficult to train staff on how to use

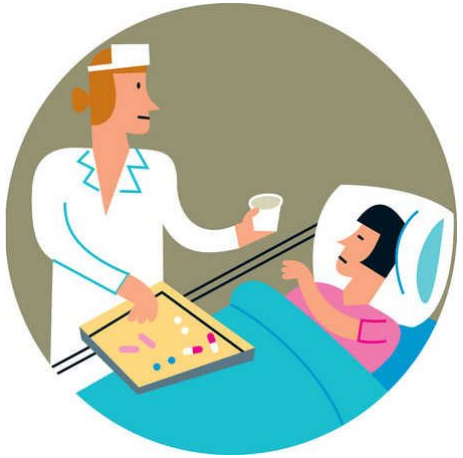
# Improvements to Routine Patient Care

- Communication
- Medication Delivery
- Patient Information Logging

# Communication

- Translation tools using OpenAI improve communication between patients and healthcare providers
- Familiarity with foreign brand names

# Medication Delivery

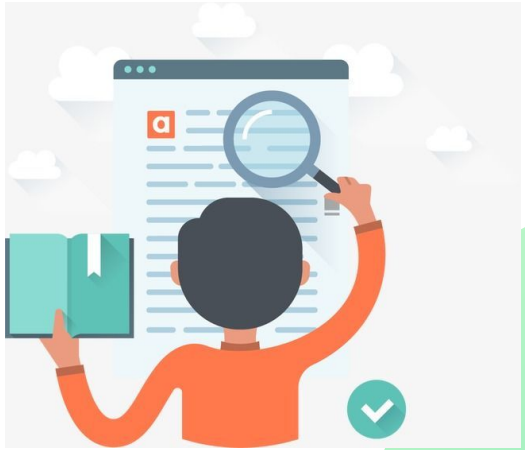


- Allows for patient's past medical history to be easily accessed
    - Will reduce human error on patient’s side

      → eliminates patient reported error
- Provides another barrier/failsafe to ensure restrictions are observed

# Patient Information Logging

- This device will allow for ease of tracking and monitoring doses
- Information can be communicated among nursing staff instantly
- This provides an additional verification of charts



# Equity for the System and Individual

- Ensures that patients get the care they need
    - Regardless of the languages they are able to speak and understand
- Reduces pre-existing medical errors due to miscommunication
- Equality of outcome through breaking language barriers

# Ethical Considerations

- We must be mindful that hospitals do not use the freed up resources as an excuse to lay-off nurses or medical interpreters

- Simplest design possible to allow for accessibility to wide audience and easy integration

- Program uses data from hospital medical records which must be kept confidential and not collected by other parties

# Thank you!

# Q & A

# References


- Al Shamsi, H., Almutairi, A. G., Al Mashrafi, S., & Al Kalbani, T. (2020). Implications of Language Barriers for Healthcare: A Systematic Review. *Oman Medical Journal*, *35*(2), e122. https://doi.org/10.5001/omj.2020.40
- Albrecht, U.-V., Behrends, M., Schmeer, R., Matthies, H. K., & von Jan, U. (2013). Usage of multilingual mobile translation applications in clinical settings. *JMIR mHealth and uHealth*, *1*(1), e4. https://doi.org/10.2196/mhealth.2268
- Haddad, L. M., Annamaraju, P., & Toney-Butler, T. J. (2024). Nursing Shortage. In *StatPearls*. StatPearls Publishing. http://www.ncbi.nlm.nih.gov/books/NBK493175/

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# links

OPEN AI:

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https://towardsdatascience.com/how-to-detect-and-translate-languages-for-nlp-project-dfd52af0c3b5

https://github.com/optimaize/language-detector