Case Study: At-Home Falls Prevention Workshop #3

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| **Purpose:** Detect Emergency Department (ED) patients (aged 65+) who are at an elevated risk for an at-home fall event.  **Description**: Consider a snap-in module to the Epic Hyperspace software that uses AI to evaluate ED patients to determine if they are at an elevated risk for an at-home fall event. If the patient presenting to the ED is aged 65 or older, their electronic health record (EHR) data should be passed to a machine learning model that will evaluate their chances for an at-home fall event. If they are at an elevated risk (defined by some pre-determined threshold), alert the attending physician and give them the chance to refer patient for follow-up care at the organization’s “Mobility and Falls Clinic.” | Image source: https://madison.com/news/local/health-med-fit/clinic-addresses-falls-as-medical-condition-not-accidents/article\_c15251bd-b11a-5e91-8224-644e65e429b3.html |

Consider the following papers:

* <https://www.frontiersin.org/journals/digital-health/articles/10.3389/fdgth.2022.958663/full>
* <https://journals.lww.com/lww-medicalcare/abstract/2019/07000/training_and_interpreting_machine_learning.11.aspx>

(Note the second paper listed concerns more technical aspects of the project and is optional.)

Think about each of the following questions and provide a brief answer for each.

1. Is a machine learning solution appropriate for this application?
2. In what ways might a machine learning solution improve upon the current system? What would the machine learning algorithm need to do in order to be successful?
3. Apply the BLERP (Bandwidth, Latency, Economics, Reliability, Privacy) acronym to this situation to identify whether or not an edge AI solution is a possibility.

* **B**andwidth
* **L**atency
* **E**conomics
* **R**eliability
* **P**rivacy

1. Discuss any ethical issues that might be of importance in this situation. What technology considerations would need to be considered for this situation?
2. Discuss how you plan to complete the *Discovery* phase of development.

* Is the project feasible?
* Are there any potential risks?
* What will the data look like?
* What framework will be used, and how will progress be judged?
* What major milestones will you break your project into?

1. Discuss the use of **feedback loops** in the *Test and Iterate* phase. Why is the *Edge AI Development* model more appropriate than the *Classic AI Development* model?
2. What **metrics** make the most sense for evaluating this AI application? Might one be better or worse than the others?
3. Suppose the follow-up “Mobility and Falls Clinic” mentioned can only handle a fixed number of high-risk patients on a weekly basis. How might we tweak our algorithm and our metrics so that only those patients at highest risk are referred?