**Clinical Decision Making and Pattern Recognition in Health Care: Classification**

In this report, the topic concept will be using Artificial Intelligence for Clinical Decision Making and Pattern Recognition in Healthcare. The specific type of algorithm used for such a task will be classification, which means deciding whether a particular label should be placed on the given input.

In terms of the analysis of relevant trends regarding clinical decision-making and pattern recognition in healthcare, there is abundant use of Machine Learning Classification that is applied in many areas of healthcare. According to Saltman(2022), Machine Learning can flag or label patients with heart disease to take preventive measures earlier than usual. Other examples include capturing MRIs in the field of radiology, and monitoring blood sugar levels from skin sensors. These examples use classification either from numerical data or imaging data, which shows the increasing use of Machine Learning Classification use in healthcare.

Regarding the associated opportunities and threats of the classification algorithm used in Clinical Decision Making and Pattern Recognition, there are many successes and pitfalls with the use of classification in healthcare. According to a study(Sutton et al, 2020), an advantage of classification was that it was used for imaging as diagnostic support for radiologists by ordering and helping radiologists run appropriate tests for their work. Furthermore, the study reported that the Virginia Mason Medical Center’s classification image ordering had selected more relevant tests to reduce the use of additional MRI and CT scanning, effectively reducing the resources and costs in healthcare. In addition to imaging, the study stated that the classification algorithm was capable of at most 93% accuracy in tumor grading and recurrence estimation for the urinary bladder and this algorithm was also attempted on the brain for tumor grading. The study then states that the use of the classification algorithm was used in other experiments such as ECG analysis, arterial blood gas interpretation, protein electrophoresis reports, etc. Apart from the advantages of the classification algorithm, there are some issues with the use of the classification algorithm in Clinical Decision Making and Pattern Recognition. For instance, it was said that the classification algorithm identified issues and supplied alerts to physicians, which commonly turned out to be an issue lacking in urgency for 95% of all alerts(Sutton et al, 2020). Apart from unimportant alerts, the classification algorithm served to identify accuracies of orders, which gave people the misconception of the ability to not check orders twice and a sense of over-reliance, immediately impacting a healthcare provider's skill in their tasks. Aside from over-reliance, the maintenance of training a new model with the classification algorithm due to new clinical knowledge that has to be implemented to improve usefulness will take time and prove to be difficult in handling the fast nature of medical practice.

As for the options for Cotiviti to explore as a strategic investment on this topic, I believe that Cotiviti could explore the option of an automated risk analysis system for Diabetic patients. According to the article by Saltman(2022), Type-2 Diabetic patients can be monitored using skin sensors that give information on their blood sugar levels. I believe that this example could be extended upon numerical data to help classify if a particular individual is at risk given more detailed information than just blood sugar levels or their skin. Specifically, there is information that is associated with diabetes such as glucose levels, measured blood pressure, insulin, Age, etc.

References

Saltman, A. (2022, April 14). Council post: Pattern recognition power: Three reasons AI will improve clinical care. *Forbes*. <https://www.forbes.com/councils/forbestechcouncil/2022/03/15/pattern-recognition-power-three-reasons-ai-will-improve-clinical-care/>

Sutton, R. T., Pincock, D., Baumgart, D. C., Sadowski, D. C., Fedorak, R. N., & Kroeker, K. I. (2020). An overview of clinical decision support systems: Benefits, risks, and strategies for Success. *Npj Digital Medicine*, *3*(1). <https://doi.org/10.1038/s41746-020-0221-y>