



NETIMIS

CASE STUDY

The Simulation of Giant Cell Arteritis Patient Care Pathway

Client: The TARGET Consortium

Overview

This case study has been completed as part of a University of Leeds undergraduate project in collaboration with The MRC TARGET Consortium and X-Lab Ltd. X-Lab's simulation software, NETIMIS, has been used to simulate and model the Giant Cell Arteritis (GCA) patient care pathway to enable an understanding of the current challenges and inefficiencies involved with GCA diagnosis. This will then facilitate exploration of innovative solutions that can be adopted to allow for a more effective diagnosis pathway.

The TARGET (Treatment According to Response in Giant Cell Arteritis) Consortium is a partnership that was formed upon receiving an award of a Partnership Grant from the Medical Research Council (MRC) of £1.2M. TARGET's primary aim is to create an in-depth understanding of GCA pathogenesis to help reduce steroid toxicity and therefore improve outcomes for patients with GCA.

About GCA

Giant Cell Arteritis is a rare chronic inflammatory condition of blood vessels (vasculitis) that affects large and medium sized arteries around the head and neck. Remodelling of the blood vessel walls following inflammation reduces blood flow, and thus preventing the distribution of oxygen, which causes the patients to suffer from symptoms such as: headaches and tenderness of the scalp, jaw aches and chewing problems, and vision impairment.

Challenges

Almost all patients with suspected GCA are patients over the age of 50 years old, with the majority of those patients being in their 70s and 80s and females being twice as likely to be affected over male patients. Due to the rarity of this disease and the age group of the patients, the symptoms they display can often be mistaken for the natural health deterioration associated with later life or other, more common, illnesses. In cases like these, if GCA is not diagnosed quickly and left untreated, it can lead to vision loss, blindness or, in the worst cases, death. For this reason, patients are treated with steroids as soon as the diagnosis is considered.

This creates other challenges: since many of the tests used to diagnose GCA can return to normal with steroid treatment, steroids therefore significantly impact the sensitivity of the diagnosis. It is essential that diagnostic tests are performed within a few days of starting treatment.

How NETIMIS Helped

NETIMIS proved to be a simple and effective tool for modelling the patient care pathways. The models created were very useful in enabling an in-depth understanding of the process with the aid of visuals which helped determine inefficiencies and ways in which pathways could be improved.

The models were created through investigating how GCA is currently diagnosed in Leeds from the perspective of consultants involved at different stages of the clinical pathway. Several iterations of the current state process were created and shared with the stakeholders until the model was completed, met the requirements for improvement and presented the most accurate pathway compared to real-life patient care pathways. This tool enabled all stakeholders of the project to engage and understand what takes place within their hospitals.

Conclusion

The work completed as part of this project can be used as a baseline for conducting further research on the GCA diagnostic pathway. The models proved effective for communication amongst project stakeholders and created an in-depth understanding of the processes at play. They can also be used to model the pathway in other centres, to allow for a more in-depth comparative study. To conclude, NETIMIS simulations are an effective method for conducting analysis to improve a business case for reorganisation of clinical services to optimise clinical diagnostic and management pathways.