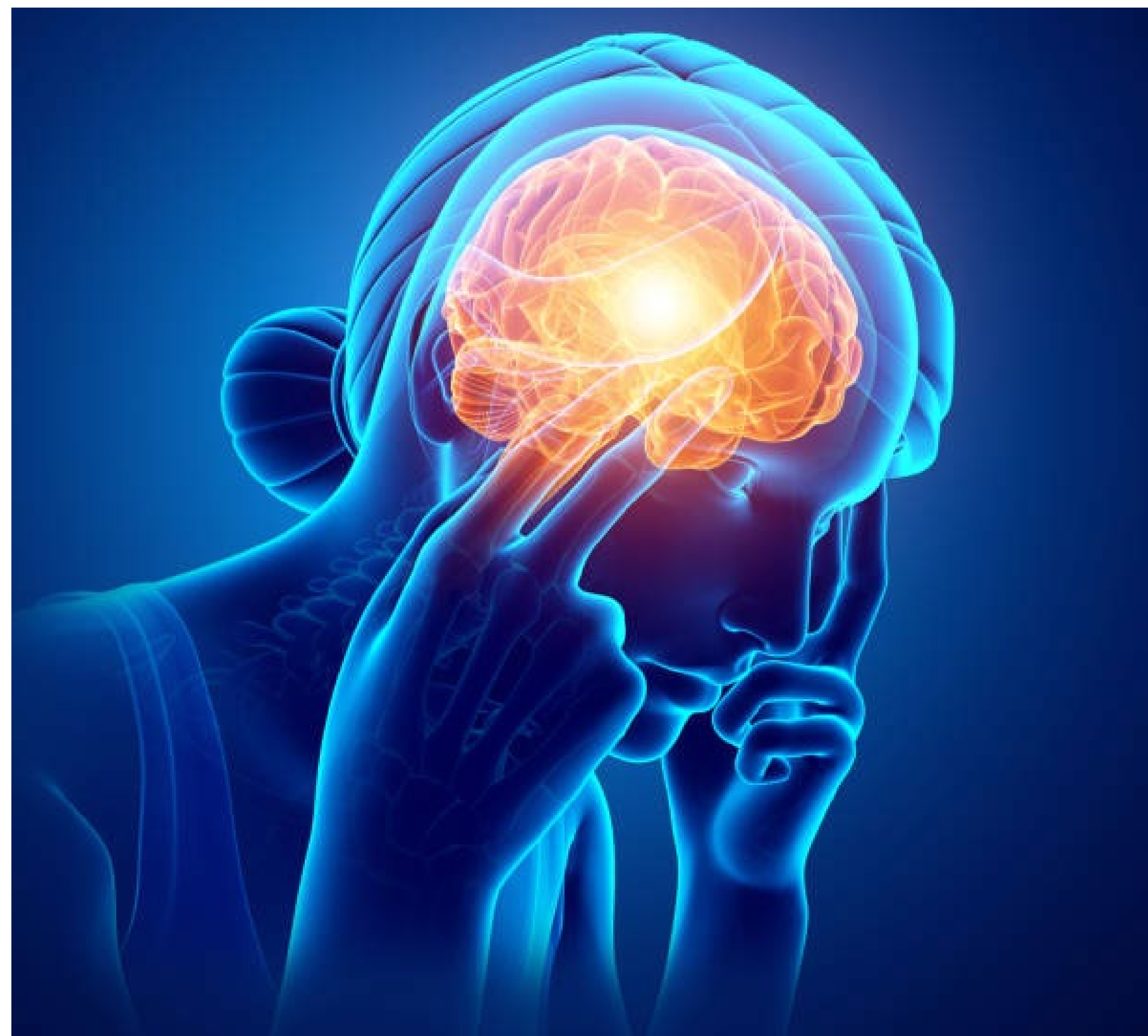


# Development of a Neural Network Model to Identify Abnormalities in Cervical X-Rays

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## Background

This study aims to investigate the potential for cervical issues as a cause of migraines by analyzing cervical x-ray images. We have collected x-ray data from two chiropractic offices, including a set of images from patients diagnosed with migraines and a set from the general population. Using machine learning and artificial intelligence techniques, we will train and test a model on this data to determine if it is possible to predict migraines with a statistically significant level of accuracy by identifying cervical issues on x-rays. The end goal of this research is to establish a causal relationship between cervical issues and migraines and provide a non-invasive and cost-effective means of migraine diagnosis and treatment, improving patient outcomes and reducing healthcare costs..



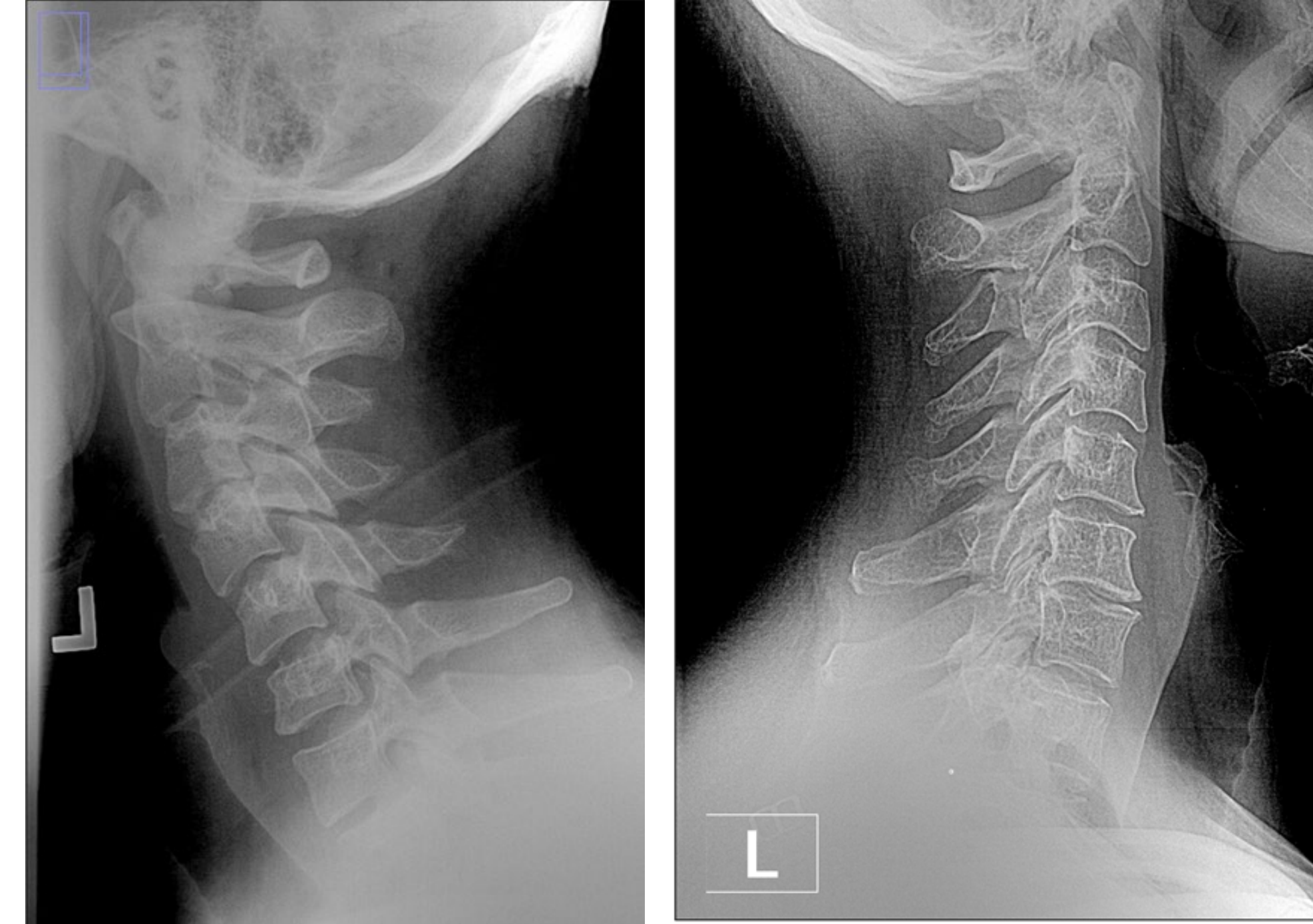
**Picture 1.** Stock image from iStockImages representing pain from a migraine.

Deidentified X-rays have been obtained from 226 individual patients of Migraine and Neuro Rehab.

## X-Ray Examples



**Figure 1.** Anterior-Posterior Open Mouth



**Figure 2.** Lateral Cervical Neutral



**Figure 3.** Lateral Cervical Extension



**Figure 4.** Lateral Cervical Flexion



**Figure 5.** Anterior Posterior Cervical

## X-Ray Examples Cont.



**Figure 6.** Left Posterior Oblique



**Figure 7.** Left Anterior Oblique



**Figure 8.** Right Posterior Oblique.



**Figure 9.** Right Anterior Oblique.