

# Application of machine learning methods in healthcare

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## SUMMARY

Artificial intelligence (AI) is a branch of Machine Learning (ML) that allows machines to learn from training data and predict the future. ML methods use mathematics, statistics, and computer science and are classified into parametric versus nonparametric or supervised versus unsupervised. In medicine and health, ML techniques have been applied to various tasks, including computer vision for detecting medical conditions, decision trees and random forests for identifying prognostic factors, support vector machines and natural language processing for recognising symptom severity. Researchers have used diverse sources such as clinical incident reports, social media activity, and feedback from doctors and patients. To apply machine learning, datasets must be imported and prepared, algorithms must be trained and tested, and algorithm performance must be assessed. Specific ML techniques include the K-nearest neighbour algorithm, shrinkage and selection operators, and elastic nets. ML has limitations, for example, the need for high-quality instructions for practical development in the medical context, dependence on data quality, and challenges related to generalizability over time. Privacy, quality control, explainability, and patient safety must also be considered. To address these challenges, acquiring skills in managing and analysing big data and developing a computer-like mindset is essential. Knowledge and skills in quantitative bias analysis and related techniques are becoming crucial in public health training, especially in epidemiology and biostatistics, as more integrated and complex data sets are used.

# Towards integrated healthcare: Putting the mouth back in the body

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## SUMMARY

This presentation explores the importance of integrated healthcare, specifically focusing on the integration of oral health into general healthcare. The oral-systemic connection is emphasized, highlighting the significant impact of oral health has on overall well-being. Integrated healthcare is defined as a holistic approach that considers the interconnectedness of various aspects of health. Successful integration efforts in other healthcare domains serve as examples, demonstrating improved patient outcomes and cost savings. However, achieving integrated healthcare faces challenges, such as interdisciplinary collaboration and patient education. Policy and advocacy play a crucial role in promoting integrated healthcare such as the National Oral Health Policy, programme guidelines across life course for maternal and child, adolescent, adult and elderly, clinical practice guidelines for managing non-communicable diseases and health conditions such as diabetes, cancer, tobacco, mental health, personal hygiene, among others through common risk factors approach. Various initiatives and organizations are working towards this goal, necessitating increased support and investment including the *Agenda Nasional Malaysia Sihat* (ANMS). Real-case studies showcase the benefits of integrated healthcare, including enhanced patient outcomes, reduced costs, and increased patient satisfaction. Recommendations are provided for healthcare providers, policymakers, and patients to support integrated healthcare. Next steps for implementing integrated healthcare models are discussed, emphasizing the importance of further research and collaboration in the field such as through particularly the healthcare system research and the National Health and Morbidity Surveys across life course. In conclusion, integrating oral health into general healthcare is vital for comprehensive patient care. The mouth is recognized as an integral part of the body, and by adopting an integrated approach, we can improve patient well-being and advocate for a more holistic and effective healthcare system.