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*Editorial*

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# Data-Driven Medicine: The Promise and Potential of Clinical Decision Support Systems

**Saba Tariq[a*], Sundus Tariq[b]**

[a]*Professor, Department of Pharmacology & Therapeutics, University Medical & Dental College Faisalabad/ Post-doctoral Fellow, University of Birmingham, England, UK.*

[b]*Professor, Department of Physiology, University Medical & Dental College, The University of Faisalabad, Pakistan, Department of Physiology, International School of Medicine, Istanbul Medipol University, Research Institute for Health Sciences and Technologies (SABITA), Istanbul, Turkey.*

*Correspondence:*drsabatariq1@gmail.com*

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Patient safety is one of the most important factors involved in any health care policy. The idea of evidence-based medicine has emerged as the dominant paradigm in clinical practice, influencing our current understanding of medicine. Clinical decisions are based on accumulated scientific information in order to provide the best possible care, enhance patient outcomes, and save expenses [1].

Clinical trials often only address one disease at a time, producing recommendations that are only applicable to patients with one disorder and infrequently offering patients with numerous conditions clear direction or intricate measures. Large-scale clinical trials for novel medications or uncommon diseases cannot always be easily accessible due to the high cost and duration of these studies. Clinicians are forced to depend on their limited expertise when the available information is insufficient to offer guidance. Clinical decision support systems (CDSS) for medicine administration are the most efficient method of enhancing patient safety [2].

The clinical decision support tools can be broadly divided into two groups: (1) data-driven tools, which create practice-based evidence in real time using patient data; and (2) expert-based tools, which demand that experts incorporate practice-based evidence into algorithms that are then used in CDSSs. These two groups generate knowledge that should be helpful in making decisions for a patient of interest because it does not clearly exist outside of CDSSs. Data-driven tools can be further divided into two categories based on their analytical component: (1) visual, non-analytics-based tools and (2) analytics tools.

With the use of visual, non-analytics-based methods, patients can be characterised by the relevant criteria, aggregated based on a clinician-defined set of rules, and the resulting patient cohorts can be visually inspected. A doctor can be given individual patient data or aggregated data that has been aligned by timeline for comparison. The available visual, non-analytics-based tool currently present are "Patient-like-mine," "PatternFinder," "CareFlow," "ePEPS," "Composer," "CaVa".

Analytics tools combine patient data and compare patient cohorts using statistical methods. Data analysis generally enables not just learning from prior patient treatment but also accurately comparing patient outcomes and features. It can range from basic descriptive statistics to comparative effectiveness studies. The example of such analytical tools is "Melanoma Rapid Learning Utility," "Coco," "CDSSs for radiologists," "Visual Decision Linc," "DICON," "Green Button," "Care Pathway Workbench".

Expert-based CDSSs rely on a research team, typically a multidisciplinary clinical team, to combine data from many sources to create a knowledge base that includes suggestions based on evidence as well as local knowledge of past patient care and outcomes. These tools, like the conventional rule-based CDSSs, make use of an already-existing evidence knowledge base in addition to freshly created practice-based evidence that is exclusive to the tool. The expert based CDSS example includes "eviti," "Oncology Expert Advisor," "Via Oncology," "P4 Pathways," "e-bipolar," "Level I Pathways," "MayoExpert," "ROAD2H CDSSs". A CDSS must be effortlessly incorporated into the workflow, regardless of the design that is employed. Lastly, it is important to assess how these CDSSs affect patient outcomes, quality, and decision-making [3].

With the use of decision support systems and predictive analytics, CDSS is unquestionably changing patient care. Healthcare delivery is being revolutionised by CDSS, which offers personalised treatment plans, faster workflows, and early disease diagnosis. To fully utilize CDSS in improving patient outcomes, increasing the effectiveness of healthcare systems, and influencing the future of healthcare delivery, it will be necessary to solve obstacles and ethical issues as the area develops.

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