



BroadBranch Advisors

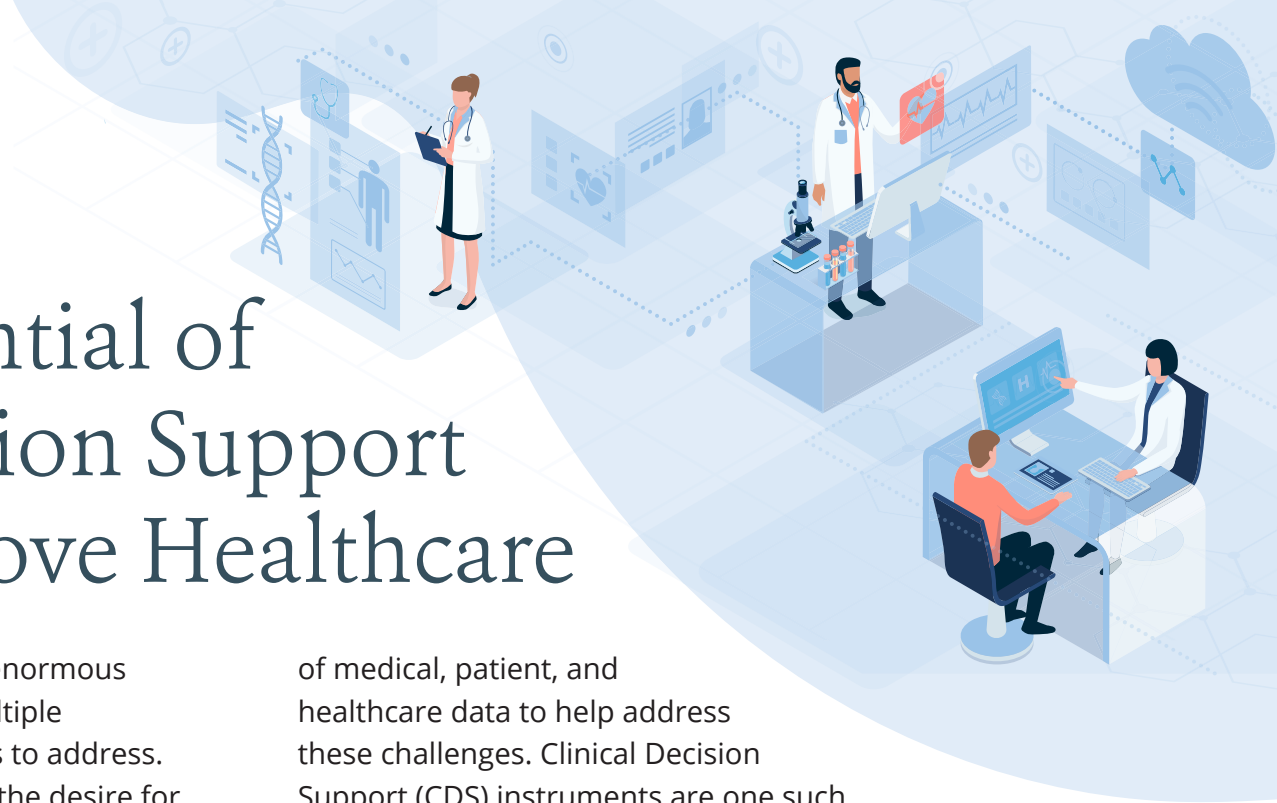
The Vast Potential of Clinical Decision Support Tools to Improve Healthcare

Medicine is currently faced with a set of enormous challenges that require support from multiple stakeholders and innovative technologies to address. Inequitable patient access to healthcare, the desire for improved patient outcomes, and the exponential growth of medical knowledge are a few of these challenges. However, the world of medicine demonstrated during the recent pandemic that it is capable of rapid and massive change when necessary. Stakeholders are increasingly searching for technologies that harness massive amounts

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of medical, patient, and healthcare data to help address these challenges. Clinical Decision Support (CDS) instruments are one such tool — computerized algorithms that filter evidence-based medical information and personal data, synthesized to facilitate clinical decision making at the point-of-care.

In 1950, the 'doubling time' for the expansion of medical knowledge was estimated to be 50 years. In 1980 Peter Densen, MD reported that this doubling time had shortened to approximately 7 years. In 2010, the doubling time was estimated to be 3.5 years, and by 2020 it was believed to be less than 75 days. CDS tools have been created to enable healthcare providers to access this enormous and quickly changing body of knowledge to obtain accurate disease and drug information at the point-of-care.





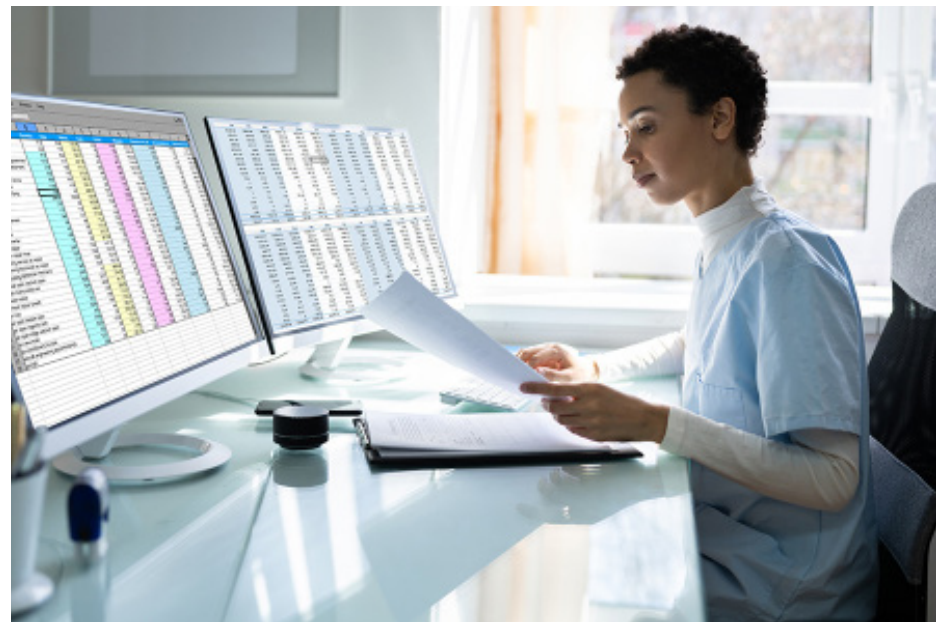
Provider Needs

Healthcare providers have been slow to adopt these tools to date. A national study of internal medicine specialists by S.R. Tunis et al. showed that the majority of providers believed clinical guidelines underpinning CDS tools are convenient educational resources intended to improve quality of care and decrease healthcare costs. However, a majority also believed that guidelines are biased, oversimplified, and challenge physician autonomy. In order to overcome these barriers, CDS tools of the future will need to work to be perceived as more credible to providers by referencing expert, unbiased, and transparent sources of information. Recommendations should incorporate specific, actionable interventions in priority order that grades the strength of the evidence provided. These tools need to be presented intuitively without the need for additional mouse clicks or computer windows. The overuse of alerts for less critical recommendations should be limited lest they cause “provider alert fatigue”. To combat this, some CDS tools should allow clinicians to create their own specialty-specific, high-priority and low-priority flags that provide the proper level of alerting to decrease errors and improve patient outcomes.

In addition to provider skepticism, many healthcare service providers lack the

infrastructural capacity to acquire, integrate and implement CDS tools efficiently, deterring their adoption. A recent study by MuleSoft found only 46% of IT decision-makers at health systems were able to complete all of the projects asked of them in the last 12 months. If IT teams are struggling to maintain normal business operations, the adoption of additional tools will require further investment not just in the tools but in the staff and technology to support their implementation.

Lack of EHR interoperability between healthcare systems has also hindered widespread adoption of CDS tools. Building technical interoperability, however, will better enable CDS tools to be integrated and utilized in the





provider workflow. Primary care visits, urgent care assessments, medication lists, payer information, and other information touchpoints will be seamlessly accessible within the provider's EHR workflow to facilitate optimal care delivery.

Market Innovation

As patients take a greater role in managing their health, they are pursuing new technologies that can monitor various health indicators. All of these new technologies create an enormous amount of data that could be used by AI or ML tools for future CDS development. In addition, CDS tools are also being used to analyze and manage 'big data' created by the growth of genomic sequencing.



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This is particularly true in the field of oncology, where the sequencing of the human genome in the early 2000s precipitated an explosion of cancer diagnostics and new therapeutic options. As oncology rapidly becomes more complex, high-quality CDS tools are in greater demand for precise cancer diagnosis and staging and personalized therapeutic combinations. CancerLinQ, a subsidiary of the American Society of Clinical Oncology, is creating CDS tools that will enable an oncologist to match a patient's data to similar cancer patients among six million recorded cases and glean insights about appropriate additional testing and the range of outcomes.

Consequences for Market Players

As medicine shifts from managing illnesses to promoting wellness, and from population medicine to patient-centered medicine, it is also shifting from fee-for-service reimbursement to value-based care (VBC) models. VBC reimburses medical providers for



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desired health outcomes, rather than for the provision of health services. VBC rewards providers' use of evidence-based medicine, supported by CDS tools, plus educational materials that empower patients to partner in their own health, to produce quality health outcomes and lower overall costs. With the growth of VBC, healthcare stakeholders are incentivized to measure proven clinical outcomes and achieve lower care variation, creating a new opportunity to leverage CDS to achieve these goals.

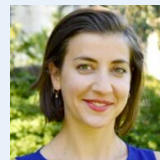
Hospitals, medical providers, regulatory agencies, healthcare payers, and patients have all been critical in

driving the implementation of CDS tools. The onset of the pandemic revealed the technological capabilities and resilience of healthcare systems, and their ability to innovate and adapt to new technology. Thoughtful medical collaborations, new healthcare strategies, and further development of user-friendly CDS tools that improve outcomes will play a significant role in merging 'big' medical data with patient-generated health data and providing high-quality, cost-effective healthcare over the next decade.



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