AI-Pathway Companion

Enabling AI-powered clinical decision support in prostate cancer care

Case study: University of Missouri Health Care

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Challenges in prostate cancer care

Caring for patients with prostate cancer is a complex long-term endeavour that has become even more challenging during the pandemic. Clinical decision support tools like the Siemens Healthineers AI-Pathway Companion Prostate Cancer[1] can improve operational efficiencies, reduce unwarranted variation, and enhance patient-provider interaction – given that they are implemented jointly by clinicians, IT departments, and an industry partner with the right clinical background and a long-term commitment.

Prostate cancer is a common and often chronic disease that can be very tricky to deal with, even for the most experienced clinicians. "Our patients are not uniform, and there is a lot of heterogeneity to the disease," says Dr. Mark Wakefield[2], professor of surgery/urology and associate CMO at University of Missouri Health Care. Some patients have a very aggressive form of the disease requiring immediate therapy. Other prostate cancers develop much more slowly. In these patients, surveillance is a prominent feature of care, and timing and modality of imaging have to be chosen wisely in order to keep up with disease progression.

Among the specific challenges of prostate cancer care, according to Dr. Wakefield[2], is misdiagnosis due to a lack of relevant medical information. In addition, 75%[3] of clinical practice guidelines lack the necessary tools for accurate risk stratification, and 26%[4] of oncology treatment plans are inappropriate, one reason for this being non-adherence to guidelines, which is associated with a 29%[5] increase in patient complications. Furthermore, as in many other cancers, various new therapies are coming to the market. This means that prostate cancer care will become increasingly personalized and thus even more complex in the years to come.

Better adherence, less variation in quality of care

Given this background, University of Missouri Health Care has been partnering with Siemens Healthineers to introduce AI-powered clinical decision support (CDS) in prostate cancer care. An excellent idea, according to Dr. Wakefield[2]: "CDS is especially valuable in areas where new information comes on top of classic knowledge." His colleague Bryan Bliven[6], CIO at University of Missouri Health Care, fully agrees: "CDS tools help to provide access to relevant patient information. They increase adherence to evidence-based guidelines, risk stratification and treatment. And they can stimulate provider-patient discussions about appropriate care."

Dr. Wakefield[2] gives several examples for where on the prostate cancer patient journey AI-powered CDS tools like the Siemens Healthineers AI-Pathway Companion Prostate Cancer[1] are particularly valuable. Helping to choose the best diagnostic modality at different stages of the disease is an area in which the urologist sees an important role for CDS. Risk assessment is another of these areas, as is choosing the proper therapeutic pathway once the diagnosis is reached. When it comes to therapy, Dr. Wakefield[2] sees great potential in AI-powered CDS to help with more rapid decisions based not only on personal experience, but also on the experience of others and on guidelines: "There are many novel therapies that can improve survival and decrease symptoms, but it can be difficult to decide on the proper sequence. AI-powered CDS has great potential to help us on that," he says.

Success factor one: Let clinicians take the lead

In the end, CDS is about quality and efficiency: "At Missouri University Health Care, we have been working hard on improving our quality, but also on being good stewards of financial resources. A key question for us is: How do we decrease unwarranted variation and maintain high quality care that is economically sustainable?" For Dr. Wakefield[2], an AI-powered CDS tool that provides relevant information at the point of care is part of the answer. But it needs to be done in a way that creates trust, not reluctance: "No clinician likes to be told what to do," he says.

So how can CDS be successfully implemented? Above all, it is a team effort that requires close cooperation between IT staff and medical experts. According to Dr. Wakefield[2], for CDS to be successful a clinical champion has to be identified who can envision the benefit for the patient and for the provider. From his perspective as a CIO, Bliven[6] would even go a step further: "Once you have determined the 'why' of implementing, CDS really needs to be clinician-led and IT-enabled."

Success factor two: Partnering

The second important success factor for CDS implementation relates to complexity. CDS isn't a new topic. But in the past, many well-intentioned implementations weren't sustainable: tools were created for individual institutions. Some worked well for a while but became irrelevant over time with changing evidence or evolving data. Technical interoperability adds additional complexity, especially in the age of AI-powered CDS that draws on vast amounts of data from different sources.

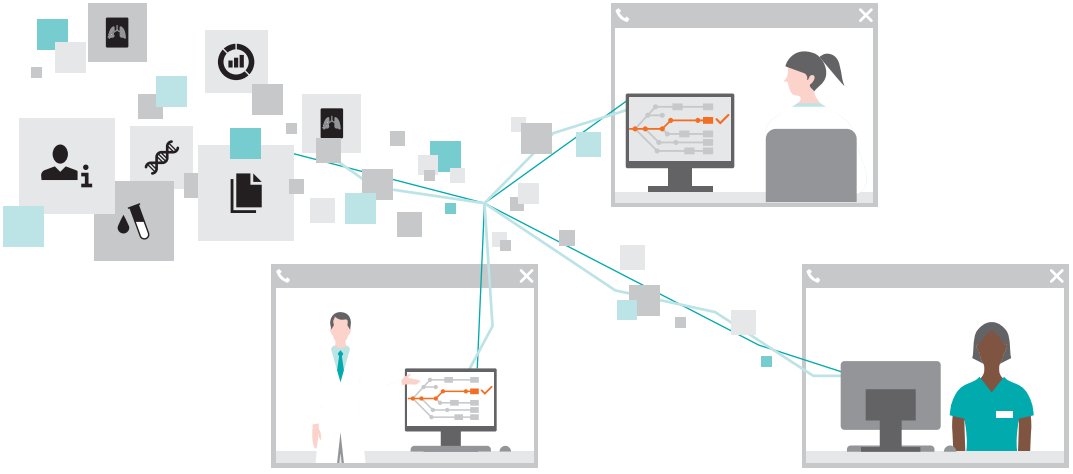
This is why partnering with organizations like Siemens Healthineers on AI-powered decision support is critically important. It is true, says Bliven[6], that much of the data that the CDS tool works with comes from within the organization. But keeping algorithms, external knowledge bases, and technology up-to-date puts too much strain on medical institutions: "We are counting on our partners to help us carry that load – and hopefully lift it for other organizations, too."

Overall, Bliven[6] recommends a holistic change management approach to implementing CDS. After letting a clinical leader define the goals of the CDS, a close look at the IT architecture is necessary to clarify what kind of data sources need to be integrated and what interoperability framework should be in place. Relevant stakeholders in the institution should be identified early on to build trust and to pave the way for widespread adoption. Finally, a dedicated technology organization should be chosen as a partner. And this, according to Bliven[6], is not necessarily the vendor of the electronic medical record: "In the US, 75% of health systems are currently looking outside of their EMR system for precision oncology software."

Shared decision-making (not only) during the pandemic

Dr. Wakefield[2] is convinced that in the future, it will be impossible to imagine hospital care without CDS. According to the CMO, tools like the Siemens Healthineers AI-Pathway Companion[7] could be helpful for other types of cancer, too, but also for non-oncological fields like neurology, rheumatology, immunology, and cardiology. He also thinks that the availability of state-of-the-art CDS tools could influence the willingness of healthcare payers to reimburse certain types of diagnostic examinations or therapies.

CDS is proving very beneficial in the telecare scenarios that have become much more common during the global pandemic. On a provider-to-provider level, the AI-Pathway Companion Prostate Cancer[1] can be used for multidisciplinary rounds that usually take place per videoconferencing. Having a tool that makes patient data from various sources accessible can speed up both the preparation procedure and the discussions with patients. There is also a role for AI-powered CDS in patient-provider interaction. By bringing together all relevant information and by visualizing individual risk and care pathways, informed decision-making is made possible in a way that would hardly be possible without such a tool. “Giving patients objective data on, for example, risk of recurrence, makes well-informed shared decision-making much easier,” says Dr. Wakefield[2]. “Prostate cancer is an area where this is critically important for the patient’s wellbeing and satisfaction with the therapy.”



[1] AI-Pathway Companion consists of several products that are (medical) devices in their own right, and products under development. AI-Pathway Companion is not commercially available in all countries. Future availability cannot be ensured. AI-Pathway Companion Prostate Cancer VA10B/VCA10A supports prostate cancer adenocarcinoma cases only.

[2] Dr. Wakefield is employed by an institution that receives financial support from Siemens Healthineers for collaborations.

[3] The Health Management Academy Survey, 2017. https://academynet.com/sites/default/files/syapse_precisionmedicine_quantitativesurvey.pdf

[4] DOI: 10.1200/jco.2013.31.15_suppl.6515 Journal of Clinical Oncology 31, no. 15_suppl (May 20, 2013) 6515-6515

[5] https://www.ajmc.com/journals/issue/2018/2018-vol24-n8/choosing-wisely-clinical-decision-support-adherence-and-associated-inpatient-outcomes

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The statements by Siemens Healthineers' customers described herein are based on results that were achieved in the customer's unique setting. Because there is no "typical" hospital or laboratory and many variables exist (e.g., hospital size, samples mix, case mix, level of IT and/or automation adoption) there can be no guarantee that other customers will achieve the same results.

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