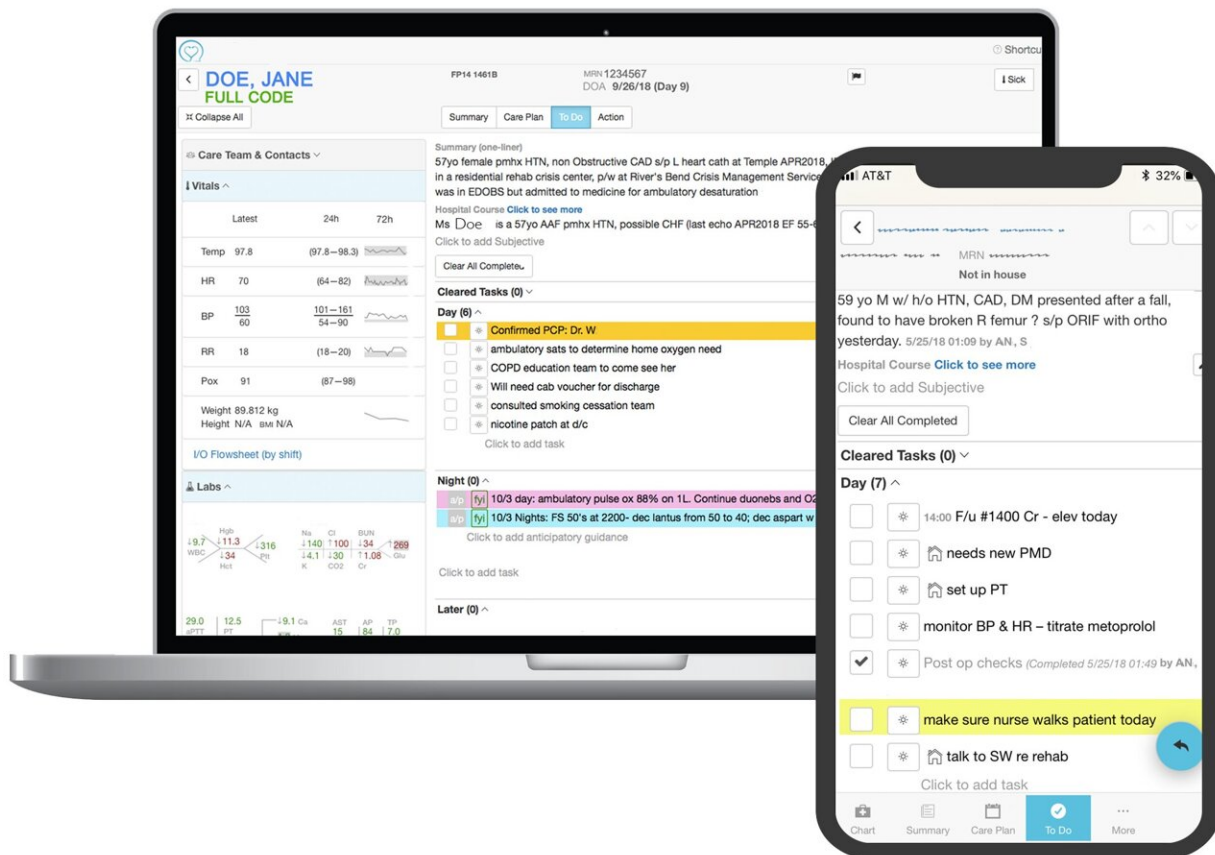# Study: Care orchestration system widely adopted, easy to use

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Screenshot of a sample page within CareAlign. Credit: CareAlign.

A doctor is ending a shift but her patient will be getting some blood draws later. She also hoped to have a pre-existing, chronic condition

assessed by a different doctor in another specialty, who won't be arriving for a few more hours. On top of those tasks, the doctor needs to pass along what she had discussed with the patient already. It's a lot to orchestrate. But she's already noted it all down in the digital workflow system on her phone, and, unlike the recent past, she can walk out of the hospital without a second thought, knowing everything is well taken care of.

In health care, efficiently coordinating care between teams like this has always been a challenge. But several years ago, Penn Medicine created the digital workflow system described above, now called CareAlign, that updates in real-time and provides space for collaborative care planning. A new study published in *Applied Clinical Informatics* assessing uptake of that tool found that the majority of providers are eager to use the system, with nine out of ten confidently using it in their daily work within a week of receiving the system.

"This demonstrates that there is a definite need for clinician-facing platforms that build on to the investment health systems have made in electronic health records to help clinicians be more efficient, improve communication and streamline documentation," said the study's senior author, Subha Airan-Javia, MD, founder and CEO of CareAlign, and an adjunct associate professor of Medicine in Penn's Perelman School of Medicine and a former associate chief medical information officer at Penn Medicine.

The new study—for which Jaqueline Soegaard Ballester, MD, a surgical resident at Penn Medicine, served as lead author—showed that not only did the vast majority of clinicians begin incorporating the digital care coordination system into their day-to-day within a week, but 94 percent of all available departments had voluntarily adopted it four years after its first large-scale roll-out.

The CareAlign system was created when the University of Pennsylvania Health System's chief medical information officer, C. William Hanson III, MD, asked Airan-Javia in 2014 to develop a digital system that would make the workflows around patient care easier and more efficient to manage. Even with the proliferation of electronic health records, pertinent information for care once a patient was handed off to a different shift or team could be relatively difficult to access. Often, work-arounds were created, which might include shared word processing documents, paper print-outs, or even handwritten notecards. These work-arounds were often not consistent across teams within the same hospital, much less across a health system.

Initially, the development team sought to create a tool that just addressed hand-off situations, but they were quickly informed by clinicians that a more expansive system handling overall care coordination, including digital rounding, was needed. That better visibility of vitals, labs and other data, paired with the ability to see—and collaboratively plan—what everyone on a patient's team was doing and when. It was designed to be "information-dense" but in a way that was easy to parse, according to Hanson.

To put it in different terms, patient treatment workflows had been like static, paper day planners, and Airan-Javia and her team, which included members of Penn Medicine's Information Services and the Center for Health Care Innovation, wanted to upgrade them into the minute-by-minute calendar found on smart-phones.

What was developed pulls real-time data from the electronic health records relevant to each patient's current care. It also supplies a space for providers to note and plan the next steps in care, whether they belonged to the same team or worked in a lab or totally different hospital. To make it maximally usable, the system was designed to be accessible on multiple platforms, whether it was a phone, tablet, or workstation

computer.

The first version, focusing on digital rounding was initially introduced in 2014. CareAlign in its full form was then implemented across inpatient services during the first six months of 2016 at Penn Medicine's three Philadelphia hospitals. As the health system transitioned to a new integrated EHR in 2017, the application usage remained stable and continues to be an important addition to the health technology stack for the health system.

For the current study of its use, the researchers analyzed usage metrics, surveys, and time-and-motion studies, among other sources of data. They found that once the workflow system was made available, 159 of a possible 169 primary inpatient services across Penn Medicine's city hospitals had voluntarily adopted it by 2020. Often the concern among health care workers when systems such as these are brought in is the time it may take to get comfortable enough with using them. But the study showed that more than a quarter of those who used the system integrated it into their typical workday after just a shift of learning it. Roughly 90 percent of users were using it regularly within a week.

"What we needed to do was create a workflow tool that was designed well enough that not only was it easy to use, but people would want to use it," said Roy Rosin, chief innovation officer in the Center for Health Care Innovation and a co-author on the research paper. "This can be hard in health care, where staff have so many priorities to attend to. But we believe that these numbers show that we succeeded."

The use of the workflow system also appeared to demonstrate increased engagement with patient data. A time-motion analysis showed that data was reviewed 50 percent more often by users equipped with the workflow system.

"One way to interpret this finding is that users of this system are now able to review data to satisfy clinical questions more often, whereas, before, the accessibility of data made it more challenging," Soegaard Ballester said. "Another interpretation is that with increasingly accessible data, more users are learning to incorporate this information into their work more often and in new ways. Increasing access to data may, in turn, help providers make more informed decisions and progress patient care more quickly."

A 2018 survey of users found that 81 percent felt that they felt their daily work would take more time without the digital workflow system, and 75 percent believed that CareAlign had helped them avoid making an error in care.

"Anything we can do to reduce clerical burden in healthcare is a step in the right direction," Soegaard Ballester said. "That frees up clinicians to dedicate more time to non-clerical tasks and/or care for more patients. This is especially important given the increasing rates of burnout in the medical profession and the challenges we are facing amid the COVID-19 pandemic."

Moving forward, the researchers hope to further assess how the use of CareAlign may reduce medical errors and potentially improve care overall. There is also a plan to introduce a CareAlign system for use among outpatient services.

"One of the biggest differences between outpatient care and inpatient care is time. When you are in an inpatient facility, time is measured on a shorter scale: Days, hours, minutes, sometimes even seconds," Airan-Javia said. "Once you switch to outpatient the time scales are bigger—days, weeks, months and longer. But the use of CareAlign is the same in both scenarios: Orchestrating care across many providers for one patient."

Provided by Perelman School of Medicine at the University of Pennsylvania