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Data Made Easy

New Tool Simplifies and Expands Cohort Searches

TRI Executive Program Manager Amy Jo Jenkins, M.S., and Arkansas Clinical Data Repository (AR-CDR) Director Ahmad Baghal, M.D., are leading big improvements to UAMS researchers' access to Big Data.

Tools should make life easier, and that applies to the tools researchers use accessing the Arkansas Clinical Data Repository (AR-CDR), formerly the UAMS Enterprise Data Warehouse.

The AR-CDR has been a pillar of UAMS' translational research infrastructure since its establishment in 2011 with support from the Translational Research Institute (TRI). In 2015, UAMS leadership made improving researcher access to the AR-CDR a priority with the creation of the AR-CDR work group, led by Charlotte Hobbs, M.D., Ph.D., executive associate dean for research in the College of Medicine. The work group also included representatives from UAMS Information Technology, TRI, and the Department of Biomedical Informatics.

TRI, through its Clinical and Translational Science Award (CTSA) Consortium activities, discovered TriNetX, a federated clinical data network of providers, including pharmaceutical companies and contract research organizations (CROs), as well as 21 CTSA institutions. TriNetX presented to the work group, and TRI Director Laura James, M.D., and TRI Executive Program Manager Amy

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Message from Dr. James

Dear Colleagues,

This issue of *The TRIbune* includes some exciting news for researchers who want to generate research questions using UAMS' clinical data. Recently the UAMS Enterprise Data Warehouse, established in 2011, was renamed the Arkansas Clinical Data Repository (AR-CDR) and was equipped with a user-friendly interface that will expand its access to more UAMS researchers.

The AR-CDR's new interface includes the UAMS Research Cohort Estimation Tool, which does not require specialized computer or database training. The tool provides aggregate patient diagnoses data categorized by ICD-10 codes. For example, an investigator's query can determine how many patients with diabetes were seen at UAMS along with the associated lab tests, medications, demographics and co-morbid conditions. This information would help plan future diabetes studies, including the placement of clinical trials at UAMS, provide information on future grant applications to support study feasibility and success, and/or lead to understanding of co-morbid conditions that impact the success of future studies.

In the near future we will create opportunities for querying external clinical databases as part of our membership in the federated network described in this newsletter. It is another exciting development that will be especially important for rare diseases research.

Additional information can also be found on our website at tri.uams.edu.

Sincerely,

Laura James, M.D.
TRI Director
UAMS Associate Vice Chancellor for Clinical and Translational Research

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Jo Jenkins, M.S., led the effort to make UAMS part of the federated network, integrating it with the AR-CDR.

Jenkins organized an onboarding team of 16 people from TRI, the Department of Biomedical Informatics and UAMS Information Technology for acquiring and installing the network's cohort estimation tool, establishing a security protocol, and training. "The work of our interdepartmental team was phenomenal," Jenkins said. "UAMS had the fastest onboarding in the network's history."

The collaboration began in September, providing all UAMS researchers with three significant benefits:

- It includes a user-friendly search tool for exploring the rich clinical data repository as a preliminary step in developing clinical research studies.
- It helps match investigators with industry sponsored clinical trials.
- It can link cohort data at multiple network sites in the future.

Another key change recommended by the work group is the addition of the AR-CDR's first director, Ahmad Baghal, M.D., who joined UAMS in October.

Baghal predicts the new search engine, the UAMS Research Cohort Estimation Tool, will be popular with researchers.

"We now have an intuitive cohort estimation tool; anybody can learn to use it in 10 minutes," he said.

Apples to Apples

The primary tool for research cohort identification has been i2b2 (Integrating Biology and the Bedside). While it remains a component of AR-CDR, it has moved to the background with the UAMS Research Cohort Estimation Tool offering a self-service capability that provides researchers with de-identified aggregates for a study cohort.

"A nice feature of the new cohort estimation tool is the future ability to expand a study cohort by including other collaborating institutions in a query search. The good thing about the tool is that data received from different institutions are mapped to a single, unified ontology," Baghal said.

Trial Run

Brad Martin, Ph.D., Pharm.D., gave the new system a trial run and came away impressed.

"Comparing the new query tool to the previous platform, i2b2, is kind of like comparing Windows to DOS," said Martin, a professor in the UAMS College of Pharmacy. "The cohort estimation tool allows for an intuitive approach to understanding patterns in the data warehouse. One of the most impressive features of the new platform is that it allows users to build temporality into the queries. For example, users can build queries that require a diagnosis before some drug exposure or vice versa, which is critical for research and quality improvement analyses."

The information researchers gather from their cohort estimation queries will help them determine whether to pursue additional, identifying data elements (e.g., demographics, procedures and diagnoses). To receive the identifiable data, researchers must seek IRB approval and submit a data request using the Request Services portal button on the TRI website (tri.uams.edu).

Additional information is also on the TRI website, including an online training tutorial. The Arkansas Clinical Data Repository (AR-CDR) page is in the main menu under Services, or simply type AR-CDR in the search field to find it. In addition, Baghal will meet with research groups for more specialized training.

New Clinical Trial Opportunities

Another powerful feature of UAMS' membership in the federated network is the abundance of new prospects for UAMS participation in industry sponsored clinical trials. The network serves as a matchmaker, helping the pharmaceutical industry identify researchers to conduct clinical trials.

"As members of the network, there are mutually beneficial opportunities for our researchers and the pharmaceutical industry looking for collaborators," James said.

Jenkins has served as the liaison to industry sponsors looking for sites to run their clinical trials. After receiving an inquiry, she attempts to find an interested investigator through the UAMS Service Line research liaisons or the Rockefeller Cancer Institute. She facilitates the required confidentiality agreements and works with the sponsor to get their trial placed at UAMS.

Since becoming part of the network, UAMS has received 22 inquiries about clinical trial opportunities. UAMS faculty are pursuing clinical trials in stem cell transplantation, cytomegalovirus infection, pain management, irritable bowel disease, renal disease, diabetes and prostate cancer.

"The network collaboration is helping UAMS faculty be at the front end of clinical trial opportunities as trials are being rolled out from pharmaceutical sponsors," James said. "It increases our visibility to the broader research industry, and that's good for UAMS and our patients."

TRIBUTARY

New Director Sees Data Warehouse Expanding Research Opportunities

Ahmad Baghal, M.D.

Ahmad Baghal, M.D., joined UAMS in October, becoming the first director of the 6-year-old Arkansas Clinical Data Repository (AR-CDR), formerly the UAMS Enterprise Data Warehouse.

His path to UAMS was made possible by blending medical and computer science knowledge. After his residency, the growing field of biomedical informatics caught his attention, and prior to joining UAMS, Baghal led the data warehouse at the University of Alabama, Birmingham.

"I felt that was a match made in heaven to combine my experience in computer sciences with medicine," said Baghal, who also completed public health and medical informatics fellowships at the Centers for Disease Control and Prevention and the University of Missouri, Columbia. "Now I'm enjoying the fruits of being both a clinician and an informatician."

He arrived at UAMS just after TRI had linked the AR-CDR to the federated clinical data network of providers called TriNetX. The network includes pharmaceutical companies and contract research organizations (CROs), including 21 NIH Clinical and Translational Science Award institutions.

Today, the Department of Biomedical Informatics assistant professor is eager to be helping researchers utilize Big Data through the AR-CDR.

For Baghal, the addition of the network's user-friendly UAMS Research Cohort Estimation Tool sets the stage for an exciting new phase of research.

"The AR-CDR is a valuable resource for research – both retrospective and prospective studies," he said. "A researcher can easily estimate a de-identified study cohort. In the near future, we will be able to expand a study cohort by including patient populations from other collaborating institutions."

Baghal is also expanding his team and adding new enhancements, such as genomics and natural language processing (NLP) capabilities. The genomics addition is a step toward personalized medicine, and leveraging NLP to extract knowledge from unstructured data will allow researchers to tap a rich data source.

TRI & me

Beatrice Boateng, Ph.D., Director, TRI Evaluation and Continuous Improvement; Associate Professor, Department of Pediatrics, UAMS College of Medicine; Director, Office of Education, Department of Pediatrics

Many UAMS researchers may be unaware that the Translational Research Institute (TRI) has integrated into almost all of UAMS' research processes. I am happy to report that awareness is rising, evidenced by increasing use of the TRI Services Portal, which is our researchers' gateway (via tri.uams.edu) to research services and a range of tools and expertise for conducting clinical and translational research.

Being the evaluator for TRI puts me in the middle of all the action. I have the opportunity to review TRI activities, engage stakeholders in interpreting data, and help develop strategies for improving research services, all with the goal of improving the health and well-being of Arkansans.

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Thank you for remembering to cite TRI in your publications resulting from studies that receive TRI support.