FORENSIC KENTUCKY STATE POLICE LABORATORIES

Focus on Forensics

MAY 2022

SPECIAL POINTS OF INTEREST:

- **Optimizing efficiency with workflow changes at KSP laboratories**
- **Rapid Response to KY Tornado Disaster**
- **Direct to DNA – a new workflow to improve turnaround of sexual assault kits**

INSIDE THIS ISSUE:

KSP Laboratories Update Workflows to Optimize Efficiency: the 3 Key Changes to Know

The Kentucky State Police Forensic Laboratories continue to earnestly work on reducing backlogs and turnaround times by implementing efficiency initiatives wherever possible, without sacrificing the scientific integrity and quality of our work. Since the last newsletter, we have implemented three critical changes to pursue that goal: a revised KSP-26 form, reassignment of sexual assault kit processing among our laboratories for Direct-to-DNA analysis, and receipt of friction ridge (latent print) evidence at Central Laboratory. While all three are relatively simple workflow changes, we believe they will pay off in the long run with a more efficient process that reduces wait time for laboratory results.

Revised KSP-26

The KSP Request for Evidence Examination form (KSP-26) has been extensively revised to capture additional, pertinent information about submissions to the forensic laboratories upfront. In the past, it was often necessary for laboratory staff to reach out via phone or email to gather critical case or sample information before evidence could be analyzed. This created a delay in the time evidence was received and able to be processed. Additionally, evidence needing analysis from multiple sections (i.e. Firearms and Latent Prints) was not always easily identified. This caused delays when the evidence was queued for testing in one section, and staff later realized that it needed to be sent to a different team first. Collecting this important information upfront can significantly reduce these delays, and case analysis can begin much more quickly. Checkboxes and helpful notes were also added to remind evidence submitters of necessary items to submit (i.e. suspect standards and elimination standards) before evidence analysis can begin. Finally, an instruction sheet was created to assist submitting officers in completing the new form. Work is ongoing to integrate the new KSP-26 version within KYOPS.

Beginning this Fall, all laboratory submissions should be accompanied by a completed KSP-26 on the new, official form. You can find the new form and the instruction sheet on the Forensic Laboratories page of the Kentucky State Police website on the Forensic Laboratory System's Manuals & Forms page. (https://kentuckystatepolice.org/forensic-laboratory-system/).

Sexual Assault Kits to Central Lab

The KSP Laboratories are implementing a new workflow for analyzing sexual assault kits called "Direct-to-DNA". The most probative samples in a sexual assault kit will skip the traditional serology step and move directly to DNA analysis in this new workflow. This modification has the potential to save weeks or even months of wait time without sacrificing the quality of testing.

To maximize the efficiency of this workflow, the analysis of all sexual assault kits will occur at the Central Laboratory in Frankfort, effective April 1 of this year. Agencies are not required to travel to Central Laboratory to submit sexual assault kits for analysis if they usually use a different laboratory. Sexual assault kits may still be submitted at all laboratory locations. Laboratory staff will transport the kits to the Central Laboratory for analysis and then return them to the original

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Rapid Response to KY Tornado Disaster

On the evening of December 10, 2021, Kentucky was one of the states affected by the deadliest tornado outbreak on record for the month of December. Among the towns that were hit hardest by the storms was Mayfield, where the Mayfield Consumer Products candle factory was levelled by a tornado. As the news was breaking the next morning, the Kentucky State Police was asked to respond with Rapid DNA technology. When the candle factory collapsed, there were over 100 people inside the factory and no one knew how many people had gotten out. The storm knocked out cell phone towers and internet, so local hospitals had no way to track or communicate to authorities whether they had treated anyone from the factory. Due to the concern that there were dozens of individuals still in the building, the KSP team prepared for multiple casualties needing identification.

The afternoon of December 11, eight DNA analysts from KSP Central Laboratory and two KSP troopers loaded up the equipment and supplies necessary for Rapid DNA and headed to Mayfield. The goal of this team was to process any recovered victim samples as well as DNA from family members for comparison. The team was faced with multiple challenges that included even reaching the disaster site. Power lines were down across the interstate so the teams had to reroute to back roads. Most areas of the county were without power, so it was difficult to find a location to set up the DNA instruments. Other obstacles that the team faced during the disaster response included interrupted cell service, which made communication between personnel at different locations difficult. Due to local residents being displaced from their homes and a large influx of law enforcement personnel, the lodging available to team members was nearly an hour away from the response operations. The Cooperative Extension office in Graves County was the law enforcement staging area and was the site chosen for the KSP lab team to set up the Rapid instruments as it had the working resources available.

On Sunday, the team divided their resources to work on recovery efforts for the candle factory. Three analysts went to the family assistance center that had been established at His House ministries. The medical examiner had representatives at the center who met with families and then sent them to the analysts for DNA collection. Two other analysts went to the Medical Examiner's office in Madisonville to attend the autopsies of collapse victims. The ME personnel collected DNA samples from the victims which were then taken to the KSP Western Laboratory to be analyzed on the Rapid instruments.

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laboratory for release back to the submitting agency. Agencies preferring to submit sexual assault evidence directly to the Central Laboratory in Frankfort are welcome to do so, but it is not required. We are excited about the backlog reduction potential of this new workflow but are also seeking to make it as seamless a transition for submitting agencies as possible.

Friction ridge (latent print) evidence to Central Lab

In the Spring of 2020, the Friction Ridge section (also known as "AFIS" and "latent prints") officially became part of the Central Laboratory. While the unit is still physically located on Louisville Road, we have worked diligently to integrate the section into the operations and workflows of the Central Lab. The friction ridge analysts are also working hard to prepare for accreditation to ISO 17025 standards next year.

To continue optimizing the flow of evidence through the laboratory system, latent print evidence is now being accepted at the Central Laboratory on Sower Blvd, instead of the Friction Ridge location on Louisville Road. This will allow the laboratory to coordinate the transfer of evidence more efficiently when it requires analysis by multiple sections. Latent print evidence will be transferred by laboratory staff to the Louisville Road location for testing, and returned to Central Laboratory upon completion for release to the submitting agency. Storing the evidence in one place will also assist investigating agencies with a single drop-off and pickup location in Frankfort. Agencies needing to submit latent print evidence are welcome to do so by calling the Central Laboratory at 502-564-5230 to schedule an appointment.

Direct to DNA - Moving Forward to Faster Turnaround Times

Sexual assault kits submitted to the Kentucky State Police Forensic Laboratories will now undergo a new workflow called "Direct to DNA". A Direct to DNA workflow is designed to provide DNA results on the most probative evidence in significantly decreased time by eliminating serology and going directly to DNA analysis. The results are reduced forensic biology backlogs and faster DNA results to criminal justice stakeholders.

So why transition to Direct to DNA? The traditional workflow for submitted sexual assault kits included serological screening to determine body fluid(s) present in the sample. Recent advances in DNA technology have shown that serological analysis can be bypassed with the most probative samples of a case sent directly to DNA analysis. Thus, there is a reduced analytical time from start to finish for a case, and there is more targeted testing on the most probative evidence. Some studies have also shown that low-level DNA may be identified in samples that were previously of insufficient quantity to be identified through serology. This allows for the potential generation of DNA profiles from evidence that would have previously never progressed beyond serological analysis. The Direct to DNA workflow is accepted by the scientific community and is integral in the high throughput processing that is necessary to effectively address sexual assault kit backlogs in laboratories. Beyond the omitted serological step, evidentiary samples will be analyzed with the same techniques and quality assurance processes as before, so the scientific reliability of testing is just as robust.

The effect that the Direct to DNA approach will have on cases is positive. This change is expected to cut months from the current wait time for sexual assault case testing, and law enforcement can expect to receive laboratory reports on evidence submitted in suspected sexual assault cases faster. The reports will have one change, however, and that is they will no longer identify the specific bodily fluid present. The reports will still describe the evidence item and provide the normal information of whether DNA is present and any comparisons made. If the identification of a specific bodily fluid is necessary due to the circumstances of the case, the laboratory should be contacted upon receipt of the report to discuss follow-up serological testing.

This transition is one way the KSP Forensic Laboratories continue to provide the highest quality scientific testing for criminal justice stakeholders. The goal of the Direct to DNA approach is that significant improvements to turnaround times and backlogs will be made without sacrificing the quality or scientific integrity of evidentiary analysis.

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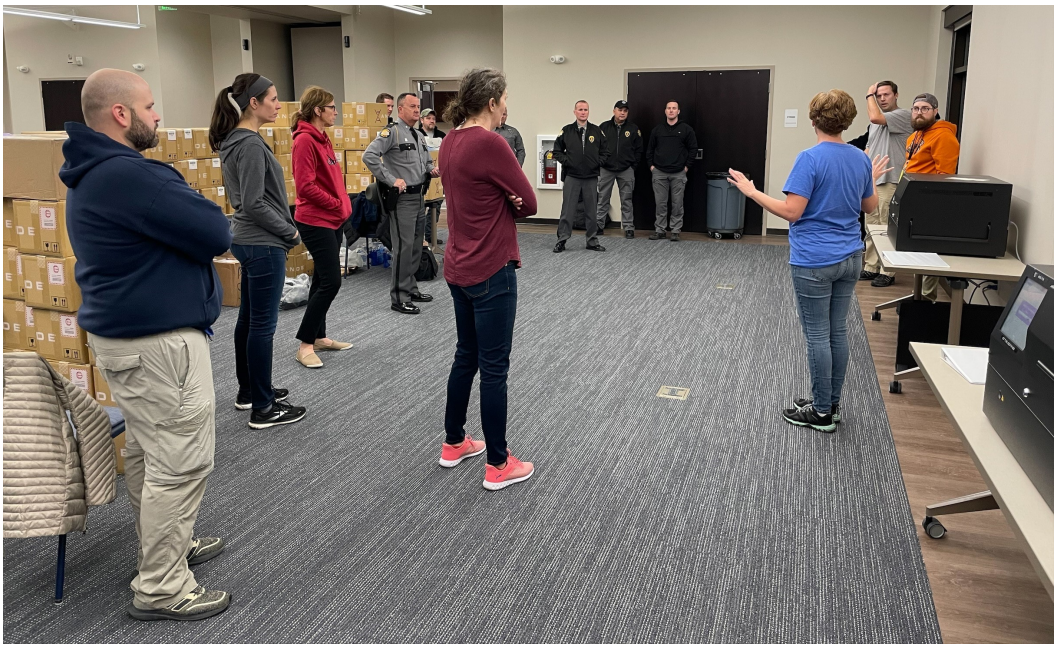
As time passed, authorities learned that the majority of the 100+ people who were thought to be victims of the collapse were safe. Ultimately, it was determined eight people were killed in the factory collapse. DNA was processed for seven of the victims, and one was identified through Rapid DNA. Lab personnel was on site for the next two days to ensure that no other services were required prior to their return to Frankfort.

Bowling Green was another town that had been hit by a large tornado, and there were many people missing in the initial days following the storms. Arrangements were being made for team members to respond to that location along with Mayfield; however, the majority of the victims were located in the following days. There was only one individual not accounted for when the lab team completed the work in Mayfield so they were not dispatched to Bowling Green.

Rapid DNA is a new technology to the laboratory, and the aftermath of the tornadoes highlighted a need for a mass disaster response plan. No policies or plans had been established, so the personnel responding to the candle factory had to develop and adapt the plan on site. Currently the KSP lab is developing a mass disaster response plan to allow lab personnel to respond as efficiently as possible in the event of a future mass casualty. The plan will allow agencies statewide to be aware of the capabilities of the laboratory in such a situation. There are currently 14 Rapid DNA instruments throughout the state, so laboratory personnel will be able to respond quickly to a future disaster regardless of where the event might take place. Further training is also being conducted, so there will be close to 30 personnel trained to respond and operate Rapid DNA instruments in future response efforts.



Trace Evidence Collection App

The Outreach Task Group of OSAC's Trace Materials Subcommittee, in collaboration with the National Institute of Standards and Technology (NIST) and the Forensic Technology Center of Excellence (FTCoE) have developed a Trace Evidence Collection App to assist crime scene teams and law enforcement officers with the recognition, collection, and preservation of trace evidence.

The mobile app, launched in November 2021, is intended to accompany Trace Materials Crime Scene Investigation Guide. The guide was created by the Outreach Task Group of OSAC's Trace Materials Subcommittee with input from other OSAC subcommittees. This task group consisted of members of the trace evidence and crime scene communities and was formed to create a practical, quick reference guide for crime scene teams to use for the recognition, collection, and preservation of trace evidence.

Members of OSAC and NIST approached FTCoE with the idea of adapting the content from the Trace Materials Crime Scene Investigation Guide into a mobile application, so the guide could be easily accessible and utilized by users in the field, specifically crime scene investigators at the local, state, and federal levels. Using this app in conjunction with the KSP Laboratory's Physical Evidence Collection Guide is a useful tool for officers in the field for the collection and preservation of crime scene evidence.
The Trace Evidence Collection App is available to download for both Apple iOS and Google Android devices and contains:

- The entirety of the Trace Materials Crime Scene Investigation Guide, including information on types of trace evidence commonly encountered by crime scene investigators.
- A range of images and videos to provide further detail and instruction to the user for evidence collection techniques.
- Interactive checklists providing best practice approaches for processing specific crime scene types.
- A dynamic backend foundation that allows for rapid and seamless updating of the application's content, so the mobile app can maintain the same version control as the Trace Materials Crime Scene Investigation Guide.

To download the Trace Evidence Collection App, scan the QR code on an Apple or Android device:

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We want to hear from you!

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https://www.surveymonkey.com/r/KSPLAB

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Do you have topics you would like to see in future editions? Do you have questions you would like to see addressed? Please contact danielle.jensen@ky.gov with comments or suggestions.