Internal Audit Department

Office of the Medical Examiner

Management of Examinations, Investigations, Evidence, and Information Technology

January 2016

Internal Audit Report Authorized by the Maricopa County Board of Supervisors

Report Highlights **Page**

Examinations 3

The Office of the Medical Examiner (OME) is strengthening their quality assurance program and developing a methodology to improve autopsy caseloads.

Death Investigations 5

OME will update policies and clarify policies for determining jurisdiction.

Evidence 7

OME will improve procedures for collecting, packaging, tracking, releasing, and storing evidence and medications.

Information Technology 11

OME will strengthen system controls.

301 W Jefferson
Suite 660
Phoenix, AZ 85003

maricopa.gov/internalaudit

602.506.1585

Ross L. Tate
County Auditor

Background

The Maricopa County Office of the Medical Examiner (OME) is the largest medical examiner's office in Arizona. The role of OME is to accurately determine the cause, manner, and circumstances of deaths that occur in Maricopa County. OME provides the following services to law enforcement, families, the medical community, and the public:

1. *Postmortem Examinations* – Conducts autopsies, certifies the cause of death, signs death certificates, prepares reports, and provides expert testimony in legal proceedings.
2. *Medical Death Investigations* – Prepares investigative reports, takes death scene photographs, and collects evidence at the death scene.
3. *Lab Services and Toxicology* – Provides drug analysis reports, test results, and expert witness testimony.
4. *Cremation Authorizations* – Provides authorizations so the public can legally cremate a person's remains.

Objectives

To determine that:

- The postmortem quality assurance process is adequate and aligns with national standards and office policy.
- Medical examiner credentials are current and valid.
- Legal jurisdiction (i.e., location and circumstances of death) determinations are appropriate and align with state statute, office policy, and industry standards.
- Medical death investigation reports and management statistical reports are accurate and complete.
- Procedures for collecting, maintaining, securing, tracking, and releasing evidence align with state statute, office policy, and industry standards.
- Information and data security procedures ensure the reliability, integrity, and confidentiality of information obtained during investigations, examinations, toxicology analyses, and histology analyses.

Scope

Our testing included operational reviews of OME activities related to postmortem examinations, medical death investigations, and related information technology (IT) functions. We also reviewed procedures on the retention and release of evidence.

	The audit period varied based on the audit test performed. In general, our work comprised of activities from July 2013 through June 2015. To achieve our objectives, we reviewed state statutes, state regulations, national standards, and County policies and procedures. We interviewed OME personnel, toured facilities, examined records, reports, and processes, and performed appropriate test work.
Standards	This audit was approved by the Board of Supervisors and was conducted in conformance with International Standards for the Professional Practice of Internal Auditing. The specific areas reviewed were selected through a formal risk-assessment process.
Auditors	Toni Sage, Audit Manager, CIA, CGAP, CRMA, MBA Scott Jarrett, Senior Auditor, CIA, CFE, CGAP Daniel Ng, Senior Auditor, MPA Moss Adams, LLP

This report is intended primarily for the information and use of the County Board of Supervisors, County leadership, and other County stakeholders. However, this report is a public record and its distribution is not limited.

We have reviewed this information with management from the Office of the Medical Examiner. The Action Plan was approved by David Boyer on January 25, 2016.

If you have any questions about this report, please contact Toni Sage, Internal Audit Manager, at 602-372-1004.

Audit Results

Issue #1: Postmortem Examinations – Quality Assurance

Observation: OME has established a quality assurance program to improve operations and ensure that the quality of investigations and examinations are consistent with office standards. This program (and OME policy) requires a monthly quality assurance review of cases from the prior year. A forensic pathologist is required to perform this review.

We examined 4 of 24 quality assurance reviews (102 cases) that occurred during FY14 and FY15. OME did not conduct the required managerial reviews, feedback, and corrective action plans. We also found that three of the four reviews did not include all of the cases for that day, as required.

Conclusion #1A: The quality assurance program needs improvement to comply with office policy and national standards.	
Recommendations	**OME Action Plan**
1A-1 Implement a quality assurance program that includes: a review by the Chief Medical Examiner, employee feedback, and corrective action plans for identified areas of concern.	Concur – completed Implemented new policy and procedures on 12/01/2015 that include all recommendations.
1A-2 Evaluate the quality assurance process to ensure it is adequate and adheres to National Association of Medical Examiners accreditation standards.	Concur – completed 12/01/2015

Issue #2: Postmortem Examinations – Licensing, Certifications, and Medical Education

Observation: State statute requires that postmortem examinations be performed by medically licensed pathologists that have completed a pathology residence and fellowship. We found that all pathologists that performed an autopsy in FY14 and FY15 were licensed pathologists.

Furthermore, the Arizona Medical Board and American Board of Pathology require continuing medical education be completed to maintain licensing and certification. We did not identify any discrepancies between continuing medical education hours

reported, and the educational records of 4 of the 12 pathologists who performed autopsies in FY15. However, OME does not monitor pathologists' compliance with continuing medical education requirements.

Conclusion #2A: Monitoring of state medical licensing requirements for forensic pathologists is adequate.	
Recommendation	**OME Action Plan**
None	N/A
Conclusion #2B: All forensic pathologists on staff are appropriately licensed and certified.	
Recommendation	**OME Action Plan**
None	N/A
Conclusion #2C: Tracking and monitoring of forensic pathologists' continuing medical education requirements should be improved.	
Recommendation	**OME Action Plan**
2C-1 Establish a process to ensure that forensic pathologists are meeting continuing medical education requirements.	Concur – Completed Implemented "Documentation and maintenance of medical licensure and board certifications" policy on 12/30/2015.

Issue #3: Postmortem Examinations – Caseload Rates

Observation: We found that autopsies and other examination workloads exceeded national standards. The National Association of Medical Examiners (NAME) establishes two caseload thresholds: a *recommended* maximum standard of 250 cases per pathologist per year, and a *required* maximum standard of 325 cases per pathologist per year. If OME exceeds 325 cases per pathologist per year, it cannot obtain NAME accreditation.

We reviewed OME's FY15 caseload and found that the average per pathologist was 341. Five of the ten pathologists handled more than 325 cases; one pathologist exceeded 400 cases. The high caseload was caused by staff vacancies. However, we compared FY15 budgeted pathologist positions with the FY15 caseload and found that, if fully staffed, each pathologist's annual caseload would be approximately 314 cases. The standards are unclear if the caseload rate calculation using budgeted positions satisfies NAME's accreditation standards.

We also verified the accuracy of reports OME uses to monitor pathologists' caseloads. We found that the reports were materially accurate; however, some cases were not included in the report calculation because case activation and transport dates were not always accurately entered into the case management system.

Conclusion #3A: Forensic pathologist caseloads may not meet limits recommended by national standards.	
Recommendation	**OME Action Plan**
3A-1 Devise a methodology to compare pathologist staffing levels with population growth trends and autopsy caseloads that aligns with goals and NAME caseload standards.	Concur – in progress Developed draft methodology in June, 2015; will formalize. Target Date: 06/01/2016
Conclusion #3B: Management reports used to monitor caseload rates are materially accurate, but completeness and accuracy of the reports can be improved.	
Recommendation	**OME Action Plan**
3B-1 Implement a review process of management reports to ensure that they are accurate and complete.	Concur – in progress Will develop QA review of management reports to be performed by management. Target Date: 06/01/2016

Issue #4: Medical Death Investigations – Policies and Procedures

Observation: OME conducts medical death investigations to determine whether to admit cases and to gather information and evidence that will be used during postmortem examinations. We reviewed OME's medical death investigation (MDI) policies and procedures and found that they closely aligned with Arizona Revised Statutes (A.R.S.) §11-591 and §11-593, which establish requirements for OME when responding to reported deaths. However, six MDI policies and procedures do not reflect current MDI practices. Furthermore, MDI policies and procedures do not detail or reference legal jurisdictions (i.e. location and circumstances of death) that must be investigated according to state statute.

Conclusion #4A: MDI policies align with state statute, but should reference legal jurisdictions as defined by statute.	
Recommendation	**OME Action Plan**
4A-1 Develop and finalize a policy and procedure that addresses and requires OME personnel to abide by the agency's jurisdictional responsibilities listed in A.R.S. §11-593.	Concur – completed Implemented "Case notification, acceptance and declining of cases" policy/procedures on 10/30/2015.
Conclusion #4B: MDI policies and procedures need to be updated to reflect current practices.	
Recommendation	**OME Action Plan**
4B-1 Update all MDI policies and procedures that need to be revised to reflect current practice. Retire policies and procedures that are no longer applicable to current practice.	Concur – in progress All outdated MDI policies and procedures were retired in 11/2015; all NAME required policies and procedures implemented by 12/31/2015. Additional processes that would benefit from formal policies and procedures are being evaluated and will be added to the OME policy/procedure manual as needed. Target Date: 06/30/2016

Issue #5: Medical Death Investigations – Determining Jurisdiction

Observation: State statute establishes conditions in which OME is required to certify the cause and manner of death. For example, a death occurring suddenly, from violence, in prison, etc. According to statute, OME can decline a case if the medical examiner is satisfied that a reported death is the result of natural causes and does not fall within OME's jurisdiction. For all other cases, OME is required to certify the cause of death and sign the death certificate. The certification of the cause of death can be determined either by death investigation, external examination, or autopsy, depending on the individual circumstances of each death.

We reviewed 50 cases and found that OME correctly determined legal jurisdiction for each case. When cases did not require an exam or were outside OME's jurisdiction, we verified that the pathologists' approvals occurred prior to the release of the body, as required by state statute.

Conclusion #5A: OME has established effective procedures to appropriately determine and document jurisdictional decisions.	
Recommendation	**OME Action Plan**
None	N/A
Conclusion #5B: OME's process for approving cases not requiring an exam is adequately documented.	
Recommendation	**OME Action Plan**
None	N/A

Issue #6: Evidence – Packaging, Tracking, and Release

Observation: State statute requires that evidence be available if requested by courts or law enforcement. We reviewed OME's current procedures for managing evidence to determine if procedures align with office policy. We found that OME has not adequately secured, tracked, maintained, and released evidence retained after autopsies. From a sample of 45 evidence items collected at a scene of death or an examination, we found that:

- 3 items listed as being retained by OME could not be located
- 24 items (held prior to March 2015) had no chain of custody logs (possession history document)
- 18 items were not sealed or packaged in accordance with office policy
- 1 item was missing its release paperwork (document that identifies who released the evidence and when it was released)
- 26 items had incomplete or inaccurate case management system records

Conclusion #6A: Procedures for managing evidence need to be improved.	
Recommendations	**OME Action Plan**
6A-1 Formalize evidence packaging, storing, tracking, and releasing policies; include authorization levels.	Concur – completed Implemented policies/procedures "Handling and documentation of items designated at evidence" on 12/1/2015.

Recommendations	OME Action Plan
6A-2 Establish and provide regular training to employees on how to properly package, seal, label, store, and release evidence.	Concur – in progress Forensic Technician (FT) Supervisor implemented a training program for FTs in 12/2015 that includes a documented competency evaluation. Similar program for Medical Examiners (MEs) in development. Target Date: 06/01/2016
6A-3 Document the process and results of searching for missing evidence items.	Concur – in progress In the process of cataloging all retained evidence prior to 2016, continuing search for missing items. Target Date: 06/01/2016
Conclusion #6B: Chain of custody process needs to be adequately documented; logs need to be retained.	
Recommendations	**OME Action Plan**
6B-1 Develop procedures to ensure chain of custody is documented and logs are retained.	Concur – Completed On a monthly basis all temporary custody forms are forwarded to records for storage based on retention requirements.
6B-2 Implement a management system for tracking chain of custody.	Concur – in progress Evaluating case management system that includes bar coding system for tracking of items and regular inventory. Will require funding. Target Date: 12/31/2016

Issue #7: Evidence – Inventories and Retention

Observation: State statute requires that collected evidence be released to the appropriate agency or legal representative within 30 days of completing exam findings. We found that OME had retained evidence beyond the 30-day limit for 31 of the 45 cases we selected. In some cases, OME had retained items for several years. Furthermore, OME disposed of evidence between FY05 and FY08, which statute prohibits without proper authorization (such as a court order). Performing regular inventories of retained evidence would improve accountability and promote statutory compliance.

Conclusion #7A: OME needs to strengthen evidence release procedures.	
Recommendations	**OME Action Plan**
7A-1 Establish policies and procedures to ensure evidence is released to the appropriate party within 30 days of completing exam findings.	Concur – completed Implemented "Handling and documentation of items designated as evidence" policy/procedure on 12/1/2015.
7A-2 Establish a policy defining the frequency and process of how evidence will be inventoried.	Concur – completed Implemented "Handling and documentation of items designated as evidence" policy/procedure on 12/1/2015
7A-3 Perform regular inventories to identify items that need to be released, and improve accountability over retained evidence.	Concur – completed Implemented "Handling and documentation of items designated as evidence" policy/procedure on 12/1/2015

Issue #8: Evidence – Storage and Security

Observation: OME has not adequately restricted access to its six evidence storage locations. OME stores evidence in six locations. Employees, volunteers, and/or visitors had unauthorized access to all locations except one. Three of the storage locations did not have a locking mechanism. We found OME used security cameras to monitor some of the storage areas. However, since routine inventories of evidence are not completed, cameras may not be effective in identifying who is responsible if evidence is found missing.

Conclusion #8A: Evidence storage security needs to be improved.	
Recommendations	**OME Action Plan**
8A-1 Establish secure evidence storage locations that restrict unauthorized access to evidence.	Concur – in progress Evaluating feasible locations that can be made badge-access and placed under camera surveillance (will require funding). Target Date: 06/30/2016

Recommendations	OME Action Plan
8A-2 Consider reorganizing and consolidating evidence storage locations to areas where access can be restricted based on job responsibilities.	Concur – in progress Evaluating feasible locations that can be made badge-access and placed under camera surveillance (will require funding). Target Date: 06/30/2016
8A-3 Perform periodic badge access reviews.	Concur – in progress Developing QA process to review and document badge audits. Target Date: 06/01/2016

Issue #9: Evidence – Medications

Observation: We reviewed OME's procedures for collecting, storing, and tracking medications to determine if procedures align with office policy. We selected 45 cases that included medication evidence, and were able to find all medications. However, OME could improve procedures for packaging medications in evidence bags and entering medication information into the case management system. We found 5 evidence bags that were becoming unsealed because they included too many medications. In 21 cases, one or more required case management system fields were not completed.

Conclusion #9A: Management of medication evidence is sufficient.	
Recommendation	**OME Action Plan**
None	N/A
Conclusion #9B: OME should improve procedures for packaging medications.	
Recommendation	**OME Action Plan**
9B-1 Establish medication packaging guidelines.	Concur – completed Implemented policy/procedures "Documentation of Medications and Controlled Substances" on 9/25/2015.

Conclusion #9C: OME should provide employee training to ensure medication evidence entry screens are complete.	
Recommendation	**OME Action Plan**
9C-1 Provide employee training on how to enter medication information into the case management system.	Concur – in progress Training and evaluation process in progress. Target Date: 02/01/2016

Issue #10: Information Technology – Data Entry Completeness and Accuracy

Observation: To determine if OME accurately and completely captures case information in its case management system, we compared system data with case files and other information sources. We found that:

- 28 of 45 cases had missing or incorrect dates or times
- 2 of 45 cases had missing or incorrect decedent information (e.g., gender, race)
- 21 of 90 cases lacked identification of the employee who took custody of or inventoried the evidence
- 26 of 45 cases had an inaccurate evidence collection and retention status

In addition, we identified some system logs (logs that track user actions) as being incomplete and/or missing.

Conclusion #10A: Data entry procedures and requirements should be improved.	
Recommendations	**OME Action Plan**
10A-1 Establish a formal procedure for entering information into the case management system.	Concur – in progress Developing formal procedure. Target Date: 06/30/2016

Recommendations	OME Action Plan
10A-2 Incorporate data validation checks within the case management system, where feasible.	Concur – in progress Developing QA process for case management database data validation. Target Date: 06/30/2016
Conclusion #10B: Audit logs should provide a complete, accurate, and reliable means for tracking user actions within the system.	
Recommendation	**OME Action Plan**
10B-1 Work with the Office of Enterprise Technology (OET) to identify the cause of the missing and incomplete audit logs.	Concur – completed

Issue #11: Information Technology – System Access

Observation: We reviewed user access to OME's shared network and the case management system and found that access privileges have not been defined. We also determined that the OME case management reporting site does not adequately restrict access rights. The lack of defined user access roles increases the risk of unauthorized access to the affected systems and unauthorized system modifications.

Conclusion #11A: OME user access permissions need to be strengthened; regular user access reviews should be performed.	
Recommendations	**OME Action Plan**
11A-1 Work with OET to establish appropriate, job-related, user access privileges for the case management system.	Concur – in progress OET will review all personnel who maintain access to the OME application and develop a role based matrix and system list, demonstrating access rights and privileges. OME will review the access rights and privileges and approve access based on review. Target Date: 06/30/2016

Recommendations	OME Action Plan
11A-2 Work with OET to implement network and application user access reviews. Include reviews of administrative access, and access to case management reports, to ensure access rights align with job responsibilities.	Concur – in progress OET will establish a review process and approach as part of its Identity and Access Management Strategy. Users identified through the OME access review process (per 11A-1), will be included in this strategy as it relates to the access rights tasks. Target Date: 06/30/2016

Issue #12: Information Technology – Application and System Updates

Observation: OME's case management system is several major releases behind the latest version. In addition, the servers hosting the case management system are running on an unsupported operating system. Outdated software and an unsupported operating system may contain security vulnerabilities that would be addressed by the vendor's current security patches.

Conclusion #12A: OME should ensure its case management system is updated and supported by the vendor.	
Recommendation	**OME Action Plan**
12A-1 Upgrade the case management system to the latest version supported by the vendor. Alternatively, evaluate the feasibility of a new system with the help of OET and the Office of Procurement Services.	Concur – in progress Contingent upon approved funding, the existing case management system will be upgraded. OET will assist with the implementation of an upgraded solution. Target Date: 06/30/2016

Conclusion #12B: Servers supporting the OME application should be running vendor-supported operating systems.	
Recommendation	**OME Action Plan**
12B-1 Work with OET to upgrade the server operating system to the latest version supported by the vendor.	Concur – in progress OET will provide an upgraded operating platform, pending implementation of an upgraded OME application. The upgraded operating system will be used to support the upgraded OME application. Target Date: 06/30/2016

Issue #13: Information Technology – Sensitive Data Transmission and Storage

Observation: We found that OME's case management system is configured to transmit sensitive data (e.g., decedent personal information, social security numbers, and birth dates) over the County's network without encryption. This configuration increases the possibility that sensitive data could be disclosed to unauthorized users.

Additionally, sensitive data (e.g., decedent personal identifiable information, death scene photographs, social security numbers, birth dates, and credit card information) stored in the case management system and shared network folders, is not protected by encryption controls. Without encryption, it may be possible for a malicious user (who is able to bypass other security controls) to extract potentially sensitive information from OME's systems.

We also determined that the development and test environments within the case management system include operational and production data, instead of generic simulated data. This practice unnecessarily provides systems developers, and others, access to sensitive data.

Conclusion #13A: Data stored and transmitted on the County's network that contains sensitive data should be adequately secured.	
Recommendations	**OME Action Plan**
13A-1 Work with OET to configure the case management application using secured protocol.	Concur – in progress Secured protocol will be implemented in conjunction with case management system upgrade. Target Date: 06/30/2016

Recommendations	OME Action Plan
13A-2 Work with OET to implement database-level encryption for databases that contain OME case management application data.	Concur – in progress Encryption options will be researched and deployed in conjunction with the implementation of the case management system. If encryption options are not compatible with new case management software, alternative security controls will be implemented that provide similar protection. Alternatives may include network monitoring controls, or the physical protections in place on the data center systems. Target Date: 06/30/2016
13A-3 Implement a document management system that will encrypt sensitive data, restrict access, and provide data access logging details. Consider using the County's OnBase system or include this feature as part of the case management system upgrade.	Concur – in progress OET will conduct a Data Loss Prevention Scan of the OME environment to identify whether or not sensitive or confidential information exists on the Sharepoint and shared drive assets. Pending the outcome of this scan, OET will recommend that OME mitigate any sensitive or confidential information identified to the OnBase platform, which maintains appropriate security controls for these data types. Target Date: 06/30/2016
Conclusion #13B: Developers should use test data rather than production data.	
Recommendation	**OME Action Plan**
13B-1 Work with OET to secure or remove production data used in development and testing.	Concur – in progress OET Advanced Services will establish a process to ensure that production information is not used within development and testing environments. Target Date: 06/30/2016

Issue #14: Information Technology – Data Backup and Restoration

Observation: In order to maintain system and data availability in the case of an outage, OET has configured backup jobs to run automatically at appropriate intervals for OME's case management system. Backup failure is actively monitored by either the database administrators for each of the reviewed systems or by the server infrastructure

administrators. However, backup restoration testing has not been performed to validate the reliability of the data.

Conclusion #14A: System backup procedures for reviewed applications are adequate.	
Recommendation	**OME Action Plan**
None	N/A
Conclusion #14B: System backup restoration tests need to be routinely performed.	
Recommendation	**OME Action Plan**
14B-1 Work with OET to ensure periodic data restorations are conducted as part of the backup process, as well as part of the disaster recovery program.	Concur – in progress In conjunction with the implementation of the new case management system, OET will ensure that system backups for the OME application are routinely tested. Target Date: 06/30/2016