3.1. Quality Matters: Establishing a Quality Management System at the Belize NFSS

Ebony Lyall-Nicholas, Assistant Director – Forensic Laboratory, NFSS

Abstract:

In the global forensic community, establishing a quality management system with the ultimate goal of becoming fully accredited has never been described as an easy task. At the Belize National Forensic Science Service, this endeavor has been no different. With new leadership and a renewed fervor for quality and the associated benefits of meeting international standards for forensic science service providers, the NFSS embarked on a freshly charted journey towards accreditation in mid-2018. This involves efforts at establishing a department-wide quality management system which would be in conformance to the ISO/IEC 17020 and 17025 standards. Along this road to accreditation, the NFSS has relied on the support of local and international partners who share the vision of a strengthened criminal justice system which relies on sound forensic scientific evidence.

This presentation aims to enlighten the audience on the NFSS journey so far in establishing its Quality Management System. It will highlight the early history and measures taken previously, the renewed department goals, challenges being overcome including changes in organizational awareness and culture, accomplishments so far, and the next steps to be taken with regards to realization of this vision for overall improvement.

Learning objectives:

By the end of this presentation, participants will be able to:

1. Discuss the roadmap to accreditation embarked upon by the NFSS
2. Describe relatable challenges being faced by NFSS in the implementation of a Quality Management System
3. Discuss the future aspirations of the NFSS from a quality perspective
Title:
From Hand Delivery to Courier Service: Streamlining the Outsourcing of DNA Cases in Belize

Learning Objectives:
By the end of the presentation, participants will be able to:

1. Understand how cases are evaluated for DNA Evidence
2. State the benefits of using accredited forensic DNA Laboratories
3. Recognize the impact of DNA evidence in the Justice System of Belize
4. Understand why the transition from hand delivery to courier service was made
5. Identify the advantages of the courier system

Abstract:
In 2011, a fatal home invasion occurred at a private residence in Belize. The suspects gained entry by breaking a glass door. Exhibits with potential DNA evidence that could provide a link to the suspects were recovered from the scene and submitted to the Belize National Forensic Science Service (BNFSS) for analysis. However, BNFSS lacked the capabilities for in-country DNA Analysis and cases like this one with potential DNA evidence had to be outsourced. In the past, this required items to be hand-delivered to a reference laboratory abroad. Today, more and more cases are being outsourced as there continues to be a demand for the use of DNA evidence by the Justice System in Belize.

This presentation will look at the developments made in outsourcing of DNA cases within the past 10 years, and will discuss the system currently in place by which the BNFSS handles such cases until the time comes when forensic DNA analysis can be done in-country.
Title:
From Dream to Emerging Reality: Uplifting the Scenes of Crime Unit at the Belize NFSS

Ashanti Guzman, MSc.
Assistant Director, Scenes of Crime Unit, Belize NFSS

Learning Objectives:
By the end of the presentation, participants will be able to:

1. Describe the role and functions of the Scenes of Crime Unit and its staff distribution countrywide.
2. Summarize the trainings received by Crime Scene Technicians locally and internationally.
3. Describe the improvements in infrastructure and processes that will impact the welfare and work of the staff of the Scenes of Crime Unit.

Abstract:
The Scenes of Crime Unit was established in 2004 under the command of the Belize Police Department. Its purpose was to assist the judicial process by providing impartial evidence to the Courts in Belize through crime scene processing and evidence recovery. However, in previous years its functionality was minimal due to limited staffing and the relative progress of forensic science in the country. In the earlier years following its establishment, the Unit’s best asset was fingerprinting and the production of black and white photographs which sufficed the demand at that time. Nevertheless, the Crime Scene Technicians received continuous training throughout the years, and in 2013 the Unit was amalgamated with the National Forensic Science Service where emphasis was then placed on the need to uplift the standards of crime scene processing.

Assessments of the Unit gave rise to participation in specialized training for Crime Scene Technicians and conducting competency testing. The office space in Belize City, which is the only Scenes of Crime Office countrywide that is staffed on a 24 hour basis, has recently seen a drastic improvement that has resulted in that office now meeting requirements for health and safety and for preserving the security and integrity of evidence, both of which have positively impacted the extent and quality of work performed by Crime Scene Technicians on a daily basis. Efforts are also underway to update the Unit’s internal training program and standard operating procedures, as well as to upgrade other Scenes of Crime office spaces across the country.
Title:
From Death Scene to the Morgue: NFSS Approach in Preserving Forensic Evidence and Preventing Decedent Revictimization

Roque I. Blanco, MD, M.F.A.
BMEO, NFSS

Learning Objectives:

By the end of the presentation, participants will be able to:

1. Describe the importance of death scene preservation
2. Identify where potential forensic evidence is lost due to improper body transportation
3. State the steps taken by the NFSS in preventing decedent re-victimization

Abstract:

The Belize Medical Examiner’s Office under the directorate of the NFSS has made great strides despite its fairly recent inception. Investigations of medicolegal deaths have been given a boost by the scientific approach the NFSS has undertaken in recent years.

In the past, death scenes were processed and all evidence, including expended shells and other items, were packaged and labelled and placed along with the body in the back of a pick-up truck to be ferried to the nearest hospital morgue. Furthermore, autopsies of decomposed bodies were performed on-site followed by immediate burial.

The NFSS has made great efforts to transition away from undesirable practices of the past with a view to minimize the occurrence of incidents that may lead to loss of potential evidence or revictimization of decedents. Significant investments of time and resources have been made in order to upgrade the procedures employed to maximize preservation of evidence and provide dignified handling and transportation of decedents.

This presentation will look at past practices, lessons learnt from past experiences, and the measures the NFSS as a whole is now taking to improve the medicolegal death investigation system.
Title:

Bullet trajectory/range of fire analysis – Aiming for Quality

Mark Mastaglio B.Sc.(Hons) FCSFS. Forensic Firearms Consultancy (FFC)/Principal
Forensic Services(PFS) UK.

Abstract:

Bullet trajectory reconstruction analysis and the determination of range of fire are
can be well established techniques. The presentation will give a brief introduction to these and will
focus on recent research giving insight into the quantification of accuracy/precision/uncertainty
of measurement with reference to ISO17025 accreditation requirements.

Learning Objectives:

By the end of the presentation, participants will be able to:

1. List accreditation requirements for Bullet Trajectory Reconstruction (BTR)
2. Describe a budget for Uncertainty of Measurement
3. Summarize recent published work concerned with robust BTR analysis
Title:
Change Management and Fiscal Space in a Time of Global Crisis: The Belize NFSS Experience

Gian Cho, MRes.
Executive Director, Belize National Forensic Science Service

Learning Objectives:
By the end of the presentation, participants will be able to:

1. State the major challenge areas which are impacting the NFSS in light of the pandemic and shifting national priorities
2. Describe examples of solutions being implemented by the NFSS to mitigate the impacts of the pandemic on the department’s daily operations
3. Explain how the NFSS is leveraging local and international partnerships to identify opportunities for bridging gaps in current resources

Abstract:
The Belize National Forensic Science Service (NFSS) was established as an independent government department in 2013 with the responsibility for providing services for the state in crime scene processing, medicolegal autopsies and laboratory analyses all under one roof. There has been sustained growth in the department over the past few years, however the recent global crisis of the COVID-19 pandemic presents several threats to furthering the growth and development of the various sections and units of the department. To navigate through these turbulent times while keeping the focus on providing quality forensic science services, several initiatives are underway in the areas of human and physical resources, training, management system implementation, local and international partnerships and legislative reform, to name a few.

This presentation will review the recent developments, major challenges and strategic priorities of the NFSS along its roadmap to improving and enhancing the forensic science services provided to Belizean law enforcement agencies and criminal justice system.
Title:

Strategies for Postmortem Toxicology in Cases Involving Decomposed Human Remains

Dr Stephen Morley

Abstract:

Post mortem toxicology has plenty of caveats in interpretation even before decomposition of the body is considered. Significant decomposition is common in post mortem cases in Belize due to climate and less rapid refrigeration of bodies. This causes several issues including difficulty in obtaining post mortem blood and fluids, redistribution of drugs at a more rapid rate than in milder climates, as well as the loss of tissue definition for the pathologist, making anatomical findings less obvious for the pathologists.

This talk will discuss some of the changes encountered with decomposition. Then, following observations by the Belize pathologists, will discuss original potential solutions using the more resilient tissues and organs. This may allow Belize to take a lead in the toxicological investigation of decomposed remains.

Learning Objectives:

By the end of the session the participants will be able to:

1. Discuss some of the changes encountered with decomposition of human remains and how these changes may impact post-mortem toxicology
2. Discuss how the Belize climate may affect decomposition in a different manner to most of the published literature
3. Discuss how tissue samples may be of more relevance in very decomposed bodies
Title:
Applying a Quality Approach to Developing Toxicological Analyses in the Forensic Laboratory
Dr Stephen Morley

Abstract:
Although drug seizure analysis is well established in Belize, the investigation of drugs in biological fluids is still in its infancy. This talk will discuss an approach to creating the foundations of a solid forensic toxicology service including sample processing, staff training, quality documentation, assay validation, and how these quality assured results feed into the production of reliable reports for the criminal justice system. It will then discuss what is necessary for the Belize team to continue developing the next stages of the quality framework as they improve processes and increase the analytical portfolio.

Learning objectives:
By the end of the session the participants will be able to:
1. Discuss the different aspects of quality in a toxicology laboratory
2. Understand the present quality processes in place within the Belize toxicology laboratory
3. Understand the processes that will need to be applied to close gaps in the present system
Title:

Natural Justice: the role of soil in the provision of intelligence and evidence

Professor Lorna Dawson, CBE, BSc, PhD, FRSE, FRSA, F.I.Soil.Sci., ChSci

Head of Forensic Soil Science, The James Hutton Institute, Aberdeen, United Kingdom.

Abstract:

Forensic soil science is an increasingly important discipline, involving soils, minerals, dusts, plants and rock fragments to determine provenance i.e. to provide a chronology of their ownership, custody or geographic location. Soil materials (and pollen and plant fragments within the soil) have been used as forensic trace evidence for a long time, with a history of use in Roman times, and are often highly distinctive from one region to another. Such traces are extremely useful in a forensic context, because of their environmental specificity; their high levels of transferability; their ability to persist on items such as clothing, footwear, tools and vehicles; and their high levels of preservation after long periods of time. This resilience makes soil trace materials, frequently present at crime scenes and forensic exhibits, highly valuable forms of intelligence and evidence that can aid crime investigations and crime reconstructions and help deliver justice.

Sediments/soil and vegetation on footwear and vehicles can indicate where a crime may have taken place, and may provide evidence of a person being at a particular place of interest. Improved analytical capabilities, coupled with the development and availability of relevant databases, and Geographical Information Systems, allow forensic geoscientists to help police to search for unknown objects or missing people, prioritise areas for investigation or search, and ultimately provide robust and reliable evidence in court. Forensic geoscience has mainly been used in the past in the context of high-impact crimes such as murder, rape, aggravated burglary and terrorism investigations, where resources allow it. However, with developments in analytical technology, and an increasing understanding of how soils and sediments are distributed within natural and anthropogenic environments, forensic soil science has more power to answer questions such as: “Where did the soil material come from?”, or “Where has this item been?” Understanding the context of a specific case is crucial to help answer such questions. In addition, being able to explain the significance of the evidence that has been analysed, and demonstrating logically how a conclusion has been reached, remains important for forensic soil science specifically and trace evidence generally.

The talk will discuss examples from case work, were evidence from the earth has been of importance in helping to investigate and to help bring about natural justice.

Learning objectives:

By the end of the presentation, participants will be able to:

1. Understand the use and importance of soil in intelligence and search operations
2. Explain the role of forensic soil science trace evidence analysis in evaluation and evidence provision in serious crimes
3. Understand the principles of how the science of biomarkers is assisting in finding buried human remains
Title:

International Partnerships for Strengthening Medicolegal Death Investigations Systems

Roger A. Mitchell Jr. MD

Abstract:

This lecture will discuss the importance of international partnerships for strengthening medicolegal death investigations systems. Over the past 2 years we have been supporting the Community of Practice meetings developed by the Centers for Disease Control (CDC) Foundation – Data for Health Project. As a part of the project, we host conference calls twice per month on a range of topics including COVID Deaths, Interesting Cases, Standard Operating Procedures, Legal Frameworks, and Local Medicolegal Death Investigations. We also provide technical assistance to the individual countries seeking to improve their system.

Learning objectives:

By the end of the presentation, participants will be able to:

1. Discuss the importance of international partnerships
2. Engage the international community of practice for relationships and support
3. Discuss opportunities for expansion and stability of the international community of practice
Title:

A Model for Establishing Board Certification for Forensic Medical Examiners

Roger A. Mitchell Jr. MD

Abstract:

This lecture will offer a model for establishing board certification for forensic medical examiners. In many countries there is limited opportunity to receive the necessary training, education, and certification in forensic medicine. Much of the requirements are ad-hoc or self-taught and may not meet the rigor required for board certification. There is a great opportunity to develop the basic parameters to ensure durable certification in forensic medicine in countries that are in need. Requirements may include: medical education, anatomic pathology training, histology training, forensic pathology training, death/crime scene training, forensic photography, and court testimony training. Written and practical examination by a board of internationally certified experts in forensic pathology/medicine would be required.

Learning objectives:

By the end of the presentation, participants will be able to:

1. Discuss the importance of board certification for forensic medical examiners
2. Establish the need for board certification
3. Identify the parameters to develop a board certification program in your country.