



**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE



**Medical Detectives**  
**and**  
**Mass Fatality Incidents.**

Disaster Victim Identification  
INTERPOL, and You.

Sean G. Smith  
Flight Nurse-Paramedic  
MSc Forensics (cand.)



INTERPOL

DISASTER VICTIM IDENTIFICATION UNIT





# Faculty / Moderator: NO CONFLICTS



**Sean G. Smith, BSN  
Flight RN-Paramedic**

CNPT, FP-C, TP-C, CCRN-K, CCRN (CMC), CFRN, CEN, CPEN, etc  
(lab rat, bouncer, nuclear engineering student, super secret  
squirrel, lab rat...ICU/Flight/ED/ Ebola/ 50+ Medical Missions/  
NASA (PRN), etc...)



**The Emergency Medical Response  
Special Interest Group of WADEM  
AHLS PRE-CON**

**criticalcareprofessionals@gmail.com**



# Train With The Best

## Experienced Elite Expert

### Premier Hazmat Training for All Healthcare Professionals

The Advanced Hazmat Life Support (AHLS) Provider Course is the premier, international course that teaches a systematic response for the medical management of patients exposed to hazardous materials, including chemical, biological, radiological, and nuclear agents. The 16 hour, two-day AHLS Provider Course is the most comprehensive training program, teaching the critical skills needed to evaluate and treat victims exposed to chemical spills, toxic terrorism, and other threats.

AHLS is for Interdisciplinary  
Healthcare Professionals:

- Paramedics • Physicians • Nurses
- Nurse Practitioners • Physician Assistants
- Pharmacists • Toxicologists
- Respiratory Therapists • Military Personnel



### WADEM 2019 Pre-Congress AHLS PROVIDER & INSTRUCTOR COURSES May 4 – 6, 2019 Brisbane, Australia

Queensland University of Technology  
Gardens Point Campus  
2 George Street  
Brisbane, QLD 4000



**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

Last Month, the EMR SIG presented on Mass Casualty Incident Triage. Join us today as we move to Disaster Victim Identification (DVI).

From first response to family closure, we will explore the forensic science of identifying the fallen. DVI encompasses many disciplines, including anthropology, odontology, radiology, molecular biology, and more.

We will briefly cover the evolution and science of victim identification, psychosocial support for families and first responders, Interpol procedures, and your potential roles and responsibilities with respect to forensic science and mass fatalities.







**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

**When: Historical Disasters**

**Who: Identify and Discuss Agencies, Broad Roles and Responsibilities**

**What: Disaster Victim Identification: Phases**

**How: Methodologies**





**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

**When: Historical Disasters** (only the barest few)

Disaster: Deaths and/or Damage > Response Capability

1988 Lockerbie

2001 9-11

2004 Tsunami

2005 Hurricane Katrina





## **When: Historical Disasters** (only the barest few)

Disaster: Deaths and/or Damage > Response Capability

2008 Typhoon Frank: Princess of the Stars Ferry Disaster

2009 Australia Black Saturday bushfires

2010 Haiti Earthquake

2013 Typhoon Haiyan

2015 Nepal Earthquake





## **Historical Disasters: CHALLENGES** (only the barest few)

### **Disaster: Deaths and/or Damage > Response Capability**

1. **Disasters are Increasingly Multinational:** Global Society Without Borders. Multiple Governments, Jurisdictions, Socio-Cultural and Religious Norms, etc. Complex Coordination is necessary not only to ensure timely Disaster Victim Identification, but also due respect to each of the points above and closure for both the team members and Victim Family members.







**Historical Disasters: CHALLENGES** (only the barest few)  
**Disaster: Deaths and/or Damage > Response Capability**

**2. Lack of Clear Command, Communication, Coordination**

**Multidisciplinary: Local Government Agencies, Public Health, Academic Institutions, Military, Police, NGOs, Volunteers, etc.**





## **Historical Disasters: CHALLENGES** (only the barest few)

Disaster: Deaths and/or Damage > Response Capability

Failing to plan is Planning to Fail

3. Potential Logistical and Psycho-Social Issues Complicating DVI, Family Closure, Team Well Being, etc.

Scene Disturbed/ Not Mapped/Labelled, Victims Removed. etc.

Destruction of Remains: Disaster Itself

Decomposition of Remains: Not Recorded / Mortuary Deficits /

Failure to mobilize adequate personnel of specific training.





## **Historical Disasters: CHALLENGES** (only the barest few)

Disaster: Deaths and/or Damage > Response Capability

Failing to plan is Planning to Fail

Failure to provide adequate psycho-social services to  
Responders and Family Members.

Failure to systematically obtain Ante Mortem Data

Failure to systematically obtain and manage Post Mortem Data

Lack of Ante mortem Medical Records (often young vs. old)

Catastrophic Destruction of all known relatives





**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

**Who: Identify and Discuss Agencies, Broad Roles and Responsibilities: (How are the above challenges met?)**

**INTERPOL** (International Criminal Police Organization)

**ICMP** (International Commission on Missing Persons )

**EU Members / Multinational Consortiums**

**Individual Nations**







**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

## **Who: Identify and Discuss Agencies, Broad Roles and Responsibilities:**

**INTERPOL (International Criminal Police Organization)**  
**Universally Accepted Standard guides and reporting format. Common Language.**





## **INTERPOL (International Criminal Police Organization)**

“Assistance from the Command and Coordination Centre at the INTERPOL General Secretariat in Lyon, France, to send messages between National Central Bureaus 24 hours a day in Arabic, English, French or Spanish.”

Again, Global Society Without Borders. Multinational Disasters.



## **INTERPOL (International Criminal Police Organization)**

“An Incident Response Team to provide further assistance upon request, such as on-site investigative support or connection to INTERPOL’s databases.”

Emphasis Mine.



## **INTERPOL (International Criminal Police Organization)**

### **Multi-dimensional approach**

“INTERPOL's DVI activities are supported by a INTERPOL Disaster Victim Identification Conference and the INTERPOL Working Group on Disaster Victim Identification, both of which are made up of forensic and police experts.”





## INTERPOL Multi-dimensional approach

“The Working Group on DVI formulates INTERPOL DVI policy and strategic planning while the DVI Conference meets regularly to discuss improvements to procedures and standards in DVI matters.”





## **INTERPOL Multi-dimensional approach**

“Policies and guidelines have been produced in the following areas and are backed up by training programmes:

- Victim care and family support;
- Occupational care for DVI teams;
- Compliance with international standards and forensic quality assurance controls;
- Information-sharing and exchange;
- Operational assistance to countries which lack DVI capacity.”





**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

## **Who: Broad Roles and Responsibilities:**

**ICMP (International Commission on Missing Persons )**

**Standing Capacity for high throughput DNA testing.**

2004 Tsunami 2005 Hurricane Katrina 2008 Typhoon Frank:  
Princess of the Stars Ferry Disaster 2010 Haiti Earthquake  
2013 Typhoon Haiyan 2014 Malaysian Airlines (MH17) Ukraine





**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

## **Who: Identify and Discuss Agencies, Broad Roles and Responsibilities:**

**Multinational Consortia, e.g. The European Union  
CEPOL (European Police College): Standardized DVI  
Curriculum, based on INTERPOL.**







**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

## **Who: Identify and Discuss Agencies, Broad Roles and Responsibilities: Individual Nations**

**AU/NZ:** Australasian DVI Committee, ANZPAA Disaster Victim Identification Committee (ADVIC), etc. INTERPOL

**Canada:** RCMP/Provincial/etc.

**Kingdom of Thailand:** Governmental / Multinational Task Force (Tsunami is Common DVI QA/QC Case Study.)





## Who: Individual Nations

**The Republic of the Philippines:** National Bureau of Investigation Disaster Victim Identification Team (NBI-DVI)

**Israel:** “ZAKA” ( *Zihuy Korbanot Ason*, "Disaster Victim Identification" or *Chesed shel Emet* "Kindness of Truth").  
(Thailand, Japan, Nepal, Haiti, etc.)

**USA/NIST/States:** **NIST:** National Institute of Standards and Technology (Standards/Practice Guidelines)

NDMS Disaster Medical Assistance Teams (**DMATs**)

Disaster Mortuary Operational Response Team (**DMORT**)

**NYC:** Unified Victim Identification System (UVIS)





## What: Disaster Victim Identification: Phases

1. Scene
2. Post-mortem phase
3. Ante-mortem phase
4. Reconciliation





## What: Disaster Victim Identification: Phases

### 1. **Scene:**

Account for ALL victims with due respect and attention. No discrimination on any basis. (Appropriate records) Governed by laws/conventions of affected country. Observation of religious and socio-cultural norms when possible.

Ensure Scene Safety for DVI team. (possible hazards include physical environment, infection control, etc.)







## What: Disaster Victim Identification: Phases

2. **Post-mortem phase**: Victims have been removed from Scene.

Post Mortem Examination to Determine:

- Cause of Death
- Victim Identity: Physical Exam including Identifying Marks such as Scars and Tattoos, Belongings, Dental Exam, Fingerprints, DNA Sampling, Radiologic Studies, etc.

**NB: Personal Features are Support, NOT Conclusive.**





## What: Disaster Victim Identification: Phases

### 3. Ante-mortem phase:

Liaison with family members using standardized format to obtain information used in identifying the victim(s). This can include physical description, personal effects thought to be on the victim's person, Biological samples such as hairbrush, razor or toothbrush for DNA comparison, and familial DNA samples.(NB: Psycho-Social Best Practice: Exit Strategy)





## What: Disaster Victim Identification: Phases

### 4. **Reconciliation:**

Ante and Post Mortem Records are compared. If a probable match is determined for a given victim, local authorities, e.g., a Coroner, Board, etc., will then make the final legal determination of Victim Identification and if possible, (no criminal proceedings in play) release the victim to their family.





**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

## How: Methodologies

### Primary Identifiers

### Secondary Identifiers

### Combined Correlation





## Primary Identifiers

1. Dental Records
2. Fingerprints
3. DNA







## Primary Identifiers: Dental Records



Ideally, Comparison of Ante-Mortem Records and Post-Mortem Exam Findings. Approximately 50% of Victims in 2004 Tsunami were IDed on Dental Findings. Typically very rapid and very specific. Photographic superimposition of suspected decedents may be used in absence of ante-mortem records to narrow possible matches. (Photo generally requires upper anterior teeth.)

Cmdr. Kevin Torske, U.S. Navy, a senior forensic odontologist. Photo Credit: Cpl. James P. Johnson, U.S. Army





## Primary Identifiers

### Fingerprints

INTERPOL AFIS

Automatic Fingerprint Identification System  
(per NIST Standards)

1,700+ IDs in 2017 alone. Exclusion in Minutes. Inclusion approximately 1 hour, due to mandatory double verification.

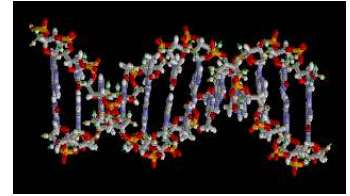




## Primary Identifiers

### DNA:

## Polymerase Chain Reaction (PCR) analysis



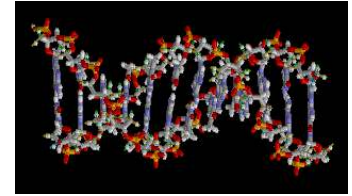
**STRs (Short Tandem Repeats) 3-5 Base repeats conserved amongst related individuals. (There are four bases found in DNA: adenine, thymine, cytosine, and guanine.) Based on statistical probability, as the number of STR matches increases, the % chance that it could NOT be the victim (i.e. someone else from a given population at large) decreases.**



## Primary Identifiers

### DNA:

- Somatic
- Paternal/ Y Chromosome
- “Maternal”/Mitochondrial (particularly useful for small sample size and/or missing female familial links: conserved) Paternal mtDNA is not routinely observed in Humans. However, depending on the procedures used, an IVF offspring may have mtDNA from donor female.





## How: Methodologies

### Secondary Identifiers: Supporting Evidence to Primary.

- Personal Description
- Personal Effects
- Medical Findings other than Dental, Fingerprints, or DNA.







## How: Methodologies Combined Correlation

Even if Primary Identifiers are obtained, as much supporting evidence as possible should recorded.





**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

# YOU

(a FEW examples)

INTERPOL (18y/o National of INTERPOL member, relevant training/ degree)

LOCAL AGENCY coordinating with INTERPOL C&C or IRT.

SARrescue/Recovery

NDMS Disaster Medical Assistance Teams (DMATs)

Disaster Mortuary Operational Response Team (DMORT) (9-11, Katrina)

US NAVY A Casualty Assistance Calls Officer (CACO): information/assistance to NOK.

Critical Incident Stress Management (CISM)\*

Rehab Crews (Firefighting example, but applicable)

Supervised Unskilled Forensic Anthropology Functions





**WADEM**  
WORLD ASSOCIATION FOR DISASTER AND EMERGENCY MEDICINE

## **References:**

<https://www.interpol.int/INTERPOL-expertise/Forensics/DVI>





## Forms and guides

- ☐ [DVI guide \(version 2018\)](#)
- ☐ [AM Data Collection](#)
- ☐ [Disaster victim recovery form](#)
- ☐ [DVI Forms \(new version 2018\)](#)
- ☐ [Training Packages from Australia and New Zealand](#)
- ☐ [Principles of Good DVI Governance](#)
- ☐ [White Paper DVI](#)
- ☐ [INTERPOL Tsunami Evaluation Working Group](#)
- ☐ [INTERPOL DVI Family Liaison Strategy](#)
- ☐ [DVI Quality management Guidelines](#)





## **References:**

The INTERPOL Guidelines and links listed on the previous two slides are more than adequate as an in-depth introduction.

However, should you wish recommendations with respect to references regarding a specific topic such as Forensic DNA Analysis, etc., Please do not hesitate to contact me via email.

Nota Bene: Unless otherwise stated, all imagery is either public domain or sourced from Wikipedia.





# Shameless Plug ALERT!



## EMERGENCY MEDICAL RESPONSE

### ^ VISION

The Emergency Medical Response Special Interest Group of WADEM exists to foster collaboration among scientists and practitioners with an interest in research, education, management and practice in prehospital, transport, emergency and / or disaster health care.

### ✓ OBJECTIVES

# Questions, Comments, Concerns?????



## AHLS PRE-CON

**Thank You.... Thank You Very Much....!**

**[criticalcareprofessionals@gmail.com](mailto:criticalcareprofessionals@gmail.com)**