The Role of the Anthropologist in the Application of NamUs

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ABSTRACT

The National Missing and Unidentified Person System (NamUs) provides a web-based platform where forensic scientists, law enforcement investigators, and the public can share information related to missing person and unidentified decedent cases across the United States. Through this secure online database, forensic anthropologists, along with medical examiners, coroners, law enforcement officers, family members of missing persons, and concerned citizens, can access varying levels of information on a common platform to assist in the resolution of these cases. Conventional wisdom and experience allows that an individual who is known within the community and has been dead a very short time is more likely to be identified than someone who is badly decomposed and/or skeletal. For others, even when there has been an extended postmortem interval, circumstances, associated evidence, and location of the remains are just some of the elements that direct the investigation and help establish the identity of the decedent. When the remains are degraded by factors such as extended postmortem interval, mechanical disruption, scattering, or burning, however, the identification becomes much more difficult. In the first week of May 2016, there were 10 767 open cases of unidentified remains in NamUs. Of these, 7257 were classified as unrecognizable by a variety of aforementioned factors. By the very nature of their work, anthropologists can develop key pieces of information from decomposed and/or skeletal elements and NamUs can provide the technology to consolidate and share their findings as well as those of all subject matter experts involved with the investigation. *Acad Forensic Pathol.* 2016 6(3): 424-431

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INFORMATION

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INTRODUCTION

As outlined on the National Missing and Unidentified Person System (NamUs) website, NamUs was created in response to an overwhelming need for a centralized reporting system and resource center for unidentified human remains cases, and to aid in the resolution of missing person cases (1). Over the years, numerous individuals as well as civilian and government organizations had teamed together and compared lessons learned while attempting to consolidate and search information on the unidentified and missing.

The pilot Unidentified Decedent Reporting System (UDRS) was launched in 2005. The unidentified person section of NamUs was an outgrowth of this public service project by the Data Committee of the National Association of Medical Examiners (NAME), in conjunction with Occupational Research and Assessment, Inc. (ORAINC) and the International Association of Coroners and Medical Examiners (IACME) (2). Openly sharing identifying information on the deceased was a huge step forward in resolving many difficult cases, but having a central repository filled with detailed information on missing persons was equally important. Building on the success of the DoeNetwork (<http://doenetwork.org>), Operation Passageway was populated by volunteers in 2007 and this functioned as the prototype and initial data source for the current missing person component of NamUs.

Together, these would establish case matching between unidentified decedents and missing persons, and in 2007, the National Institute of Justice (NIJ) began its work to coordinate, develop, and implement NamUs within a multidisciplinary community of criminal justice stakeholders whose work continues to evolve today. NamUs is wholly owned by the Department of Justice, and is the first nationally centralized online repository, technical assistance service provider, and resource center for missing persons and unidentified human remains cases that is available to both criminal justice providers and the public. NamUs harnesses technology and employs a talented team of professionals who provide support and resources for unidentified persons cases, missing persons cases, and

unclaimed persons cases. NamUs is both searchable and accessible by the general public, law enforcement community, medical examiners and coroners (ME/C), victim advocates, allied forensic professionals, and others. It is a powerful tool with which subject matter experts can assist the criminal justice community to cross-jurisdictional boundaries by simplifying the sharing of information between law enforcement agencies, medical examiners' and coroners' offices, as well as the general public. New cases can be added by law enforcement, medical examiners or coroners' offices, or the general public; be verified by case managers; and become visible and searchable across the country in a very short time. By breaking down barriers to communication among these key groups, the potential for solving missing persons' cases is enhanced and investigative workload is reduced. NamUs also provides data management and forensic resources for missing and unidentified cases at no cost to investigating agencies or searching family members.

Most decedents are identified quickly by conventional means. Following the identification, the next of kin is/are notified and the remains undergo customary funerary procedures. In some instances, however, the identity of the individual is not immediately established and medical investigators may turn to available missing person databases to try and find appropriate matches. This is not a simple task. That National Institute of Justice reports that on any given day the list of missing persons in the U.S. is approximately 100 000 (2). The odds of finding a match between a missing person on this list and an unidentified decedent during a random search is almost infinitesimal. The problem is further complicated by the fact that not everyone with knowledge about a missing person is using the same list, or even the same method of sharing their information.

Since some decedents remain unidentified for an extended period of time and for a variety of reasons, it will eventually become necessary for medical examiners/coroners/justices of the peace, and other medicolegal investigators to initiate action that reaches out to persons unknown. The objective at this point is to publicly circulate information on the deceased

in an attempt to reach someone who has information on a person who is considered unaccounted for or missing.

These attempts usually start with a local focus. Unidentified bodies are almost always newsworthy, and local professional media outlets (as well as social media resources) are eager to circulate any and all information that investigators are willing to share. Sometimes these efforts are immediately successful. Occasionally, they are not. When the case goes “cold” and the medicolegal authority feels it is necessary to circulate information to an even larger audience, NamUs is available as a free resource to aid in this effort. In the past, ME/C officials did not have a common platform or an integrated technology-based system by which they could openly and easily exchange information about the unidentified decedents in their care.

DISCUSSION

How it Works

NamUs is a powerful tool to help share information on missing persons and unidentified remains, but it must be emphasized that NamUs is not a substitute for an official investigative case file or an official report related to missing and unidentified persons. NamUs is only a repository for information entered by users from across the country, and a NamUs record may or may not contain complete information about any particular case. User provided information is crucial to resolving many cases entered into NamUs, as each piece of information has the potential to provide the crucial link between a missing person and an unidentified decedent (3).

From the perspective of a medical examiner or coroner entering a case into NamUs, this is not the same as sharing a complete autopsy report. NamUs is a tool whose primary goal is to circulate information that can be used for identification of that individual. ME/Cs and criminal justice agencies may choose what information they share with the public, but they can also choose to share law enforcement sensitive informa-

tion exclusively with other medical professionals and/or criminal justice agencies by entering that information into areas of the system that are restricted from public view. Full details of the policies and procedures for case management can be seen in the online policy manual (4).

Before a case can be entered into the database for unidentified remains, the entering party must register as a user. Users may register in several different categories and users can be granted different levels of access. By virtue of their medicolegal authority, medical examiners, coroners, and justices of the peace are allowed to enter cases as soon as they register in the system. The anthropologist, even though they are oftentimes the primary investigator, must first obtain permission from one of the aforementioned individuals. Full-time employees of a ME/C office, professional consultants, even third-party resources can use the system, but to have the ability to enter and edit cases, the jurisdictional authority simply grants written permission for them to act on their behalf. This is just one of the ways NamUs provides a common forum on which subject matter experts involved with all aspects of the investigation can share information on a common platform even before the case is published.

“Published” in the context of NamUs means that the case can be seen by anyone with access to the Internet and who accesses the database. Therefore it is important to understand that cases are not just directly published on the site as they are entered as might happen on a private website or on a social media page. When a case is entered, it falls into a queue that allows the case to only be visible to the case creator, the NamUs Regional System Administrator, and any other specific person who has been given access to that case though their professional role or through written permission by the jurisdictional medical examiner/coroner. This common confidential platform allows the involved parties to decide what information is to be shared only with other professional individuals who have full-view access and what information is to be shared with the public. After the case is entered, it remains invisible to other investigators and the general public until all involved parties are satisfied that the

entered information is complete and accurate. Once the involved parties are satisfied regarding the accuracy and integrity of the report, they may elect to publish the case for others to see or choose to keep the report unpublished. There are various reasons why they may choose to keep the report from public view, but the choice to do so remains strictly with the case administrators.

One possible reason for a case to remain unpublished is that investigators have already established a presumptive identification of the victim, but there is no way for them to confirm the identity without further forensic testing. It is necessary for a case to be entered into NamUs in order for associated analysis such as DNA to be conducted by the University of North Texas DNA Lab (1). The case does not need to be published, but it does need to be entered into NamUs and have a NamUs number assigned to it. If the investigating agency needs to take advantage of the various other services such as anthropology, odontology, or fingerprint analysis offered by NamUs, the case needs to be entered into the system, but again, it does not need to be published. This way, various direct comparisons can be made to establish positive identification where there was previously only a presumptive identification.

It is also important to note that when the status of a case changes, the case owners and/or managers have the ability to alter that case status online. If a previously published unidentified case becomes identified, it can be archived. This removes the case from all published components of the NamUs but the entering party retains the ability to access the information.

Role of the Anthropologist

Due to the scripted television dramas and information posted on the Internet, there is an unrealistic expectation that all the features associated with dead bodies can be immediately and easily analyzed and categorized. This may be true when the person has been dead for a short time and there has been no disruption or degradation of the remains by mechanical or thermal means. However, developing a precise biological pro-

file during any stage of the postmortem interval can be problematic. This becomes increasingly difficult when the rather subjective soft tissue criteria often used to produce a complete biological profile are obliterated or not recovered at all. This is where the specialized training and skills of a forensic anthropologist can prove invaluable.

During the first week of May 2016, there were 10 783 open cases of unidentified persons in NamUs. Of these, over 67% were considered unidentifiable because of the body conditions. (**Table 1**).

Networking

Many aspects of the dilemma regarding unidentifiable remains are discussed by other anthropologists contributing to this themed issue of *Academic Forensic Pathology*, and won't be covered in this article. Suffice it to say that anthropology-based materials and methods can become especially important when developing a thorough biological profile, and even more important when that profile is entered into a system such as NamUs. Understanding and interpreting the anthropological findings is also critical when searches between missing and unidentified persons are conducted.

When preparing a case for entry into NamUs, agencies are strongly encouraged to rely on established relationships and professional agreements already in

Table 1: Cases in Which the Body Conditions were Entered as "Not Recognizable"*

Partial remains, skeletal parts only	2820
Putrefaction	2292
Near complete or complete skeleton	1235
Charred/burned	326
Mummified	269
Trauma	267
Insect activity	48

*Readers should realize that there are constant changes in the number of unresolved cases entered into the system and there can be changes pertaining to individual cases.

place between ME/C and forensic anthropologists. The secure and tiered access levels inherent in NamUs allow for such collaborations.

For instance, in those jurisdictions where cases of unidentified remains are routinely handled by a forensic anthropologist, the medical examiners work through the NamUs Regional System Administrator to grant full-view, full-edit permission to the anthropologist. This access is in addition to, not in lieu of, the ME/C who is still legally responsible for the remains and the identification. This proactive addition of an anthropologist allows all involved parties to enter details of the case they are investigating and allow online consults during the “life” of the case. Because of the flexibility of the system and user-friendly options, these consultations can be conducted online even before the case is published. Individuals involved with the case can always go back and edit or enhance a case both during and after publication.

NamUs also provides the opportunity for agencies without anthropology resources to access the professional services of forensic anthropologists. In Denton, Texas, the Laboratory of Forensic Anthropology has provided anthropological analyses of skeletal remains to investigative agencies since 1988. The laboratory is under the direction of a board-certified forensic anthropologist and employs three full-time forensic anthropologists dedicated to active casework. As part of the University of North Texas Center for Human Identification, the laboratory provides services to investigative agencies, medical examiners, and other medicolegal entities at no cost (4).

During the postmortem examination, the pathologist is likely to have the majority of information regarding an unidentified deceased person. When consulted, anthropologists often find, interpret, and analyze key pieces of information, odontologists and fingerprint specialists may be able to assist with others, and crime scene investigators may even be able to produce more, such as maps, photos of the scene and associated evidence. The resources of NamUs are there for everyone to use, and it provides a common forum in which subject matter experts of many disciplines in-

involved with all aspects of the investigation can share information on a common platform even before the case is published.

Cold Case Review

Starting with UDRS, which was initiated by the National Association of Medical Examiners, volunteers began entering unidentified persons cases into the first iteration of the NamUs Unidentified Person Database in 2007. Since that time, the number of cases entered into the system has been steadily rising, with nearly 13 000 cases entered into the system at the time this article was submitted. Many of the entered cases have been resolved, but as of May 11, 2016 there are still 10 783 active, published cases in the system, with some cases dating back over a century.

Even as new active cases are being entered on a regular basis, agencies are going through the process of cold case review. Sometimes investigators discover a box of bones in a storage facility or the back of a closet, or perhaps an entire skeleton has been carefully curated in a medical examiner or coroner’s office for years. It is entirely possible that only the case file and a stack of photos are all that remain after the body was unceremoniously cremated before the collection of critical biological evidence according to protocols that likely wouldn’t be allowed today.

As experts review these old cold cases, it is possible that the investigation will uncover the existence of additional identifiers. Maybe a tattoo was mentioned or even described in the narrative, or perhaps even a photograph of it exists somewhere. This information can be entered directly into the NamUs case file. Once the remains are reexamined, there is a chance to enhance or even change the original assessment of the remains: age, race, sex, stature, etc. If the skull and mandible are available, perhaps a facial reconstruction can be undertaken in order to bring new visual attention to the case. With NamUs, the case manager (or anyone attached as a subject matter expert for that case) can log-in, edit, and add anything they feel would appropriately enhance the case.

There are also opportunities for additional subject matter experts to consult with the entering party. Cases can be vetted and shared between any number of medico-legal investigators. Through NamUs, several parties that may have been working independently in the past can now become a cohesive team that can then use this system to consolidate information from numerous sources and to put all available pieces together.

Exhumations

Sometimes, during the process of cold case review, there may be a need to conduct an exhumation. This is not uncommon. Over the years, some information may have been lost due to changes in case ownership and disasters such as fires and floods also occasionally destroy case files. Sometimes details of a case may be only anecdotal and the only hard evidence available for forensic analysis is in the grave. Being buried without identification was not rare, and in many cases the investigation was hampered by the limited technology available at the time the remains were discovered. In many places across the United States, it was common practice to place remains in pauper cemetery shortly after death if identification was not immediately elicited and more often than not, key biological identifiers were not collected before interment.

Exhumations for obtaining DNA are becoming more and more common. Sometimes, the prospect of an exhumation is considered primarily to obtain bone samples that can be processed to establish a DNA profile, but an exhumation should always be considered an opportunity to get a second look at the remains. Anthropologists should also be considered to be key participants when an exhumation is undertaken. There may be a temptation to only collect a limited number of skeletal elements for DNA processing, leaving the majority of remains in the ground. This should be discouraged if many or all of the bones and teeth are present. These can be removed in order to allow a complete anthropological or dental workup that may not have been conceivable at the time because of limited resources. Even if the original workup was considered adequate at the time, this is an excellent opportunity to obtain a second look and opinion from other pro-

fessionals including anthropologists, odontologists, and fingerprint experts, as well as those collecting evidence that may yield a complete DNA profile.

As the case is revisited, any newly gathered information can be added or original entries can even be revised to enhance the total information contained in a NamUs case. This might include an updated biological profile, the addition or reanalysis of a dental chart or radiographs, photos of clothing, or other personal affects that may have been buried with the remains. If soft tissue has been preserved, fingerprints or new photos of tattoos might be used to supplement the original written description or interpretation. As in any cold case, if the skull and mandible are available, a facial reconstruction should be considered to bring new visual attention to the case and perhaps create a lead that can be further investigated.

Sometimes, an exhumation produces a large amount of information that can be reanalyzed and shared, and it is possible that the result can be less than anticipated. Much depends on the postmortem interval, method of interment, and the amount of material collected during the initial investigation. Each and every exhumation should be approached as an opportunity to shed light on a cold case involving an unidentified deceased person.

Investigators may also want to include journalists in this process, and by being proactive in this respect they can help guide the media exposure and make certain that the information available to the community is accurate and timely. If the initial event focus is primarily on the process of exhumation, and not the remains themselves, there will be additional opportunity to bring attention to the case when it is updated and circulated through a universal medium such as NamUs.

Entering the Information

The biological profile and estimated postmortem interval must be as accurate as possible when a case is entered into NamUs, but NamUs was designed to take into account the fact that when dealing with an unidentified person, many of the biological profile

particulars need to be expressed as an *estimate* and not an *absolute*. In NamUs, the age of the individual can be entered as an estimate with categories as broad as “adult” or “adolescent.” There is a separate place to enter the age estimate as both minimum and maximum numbers. Height and weight can be entered as measured or estimated values, but there is also a consideration for when these features cannot be calculated at all. The year of death can be categorized into a “probable” range of years and the postmortem interval can also be entered as an estimate.

This is not a final process, as cases can be edited after initial entry. NamUs staff, as well as online resources, are always available to help with case entry and modification.

Searching for Matches

When a new missing person or unidentified decedent case is entered into NamUs, the system automatically performs cross-matching comparisons between the databases, searching for matches or similarities between cases (5). This list of suggested matches is available and viewable by all registered users of NamUs, and the parameters of the automatic searches can be changed to include additional states or altered information (e.g., larger or smaller range of age or height). Vetted professional users of the system can see and review many additional details that can allow them to assess these proposed matches, and compare entered information such as dental charts and radiographs, as well as fingerprints and medical identifiers that are not circulated to the public for privacy reasons. These users with enhanced access can also see case notes and investigative details that may help with identification or at least guide further investigation.

Since investigators routinely narrow their searches to try and find matches based on the biological profile of the unidentified deceased, anthropologists who are familiar with skeletal features are an excellent resource to help search through thousands of files where the missing person reports can contain ambiguities or even subtle hints of skeletal anomalies that can lead to an identification.

With skeletal findings, in particular, an anthropologist can help guide the query of data fields, as well as reassess prior searches for possible matches. Anthropology specialists may also be able to advise other users within and among different agencies. Words that are common and almost universal among the medical community may have a different level of use and meaning among the public. Searching for the key word “spine” in NamUs missing persons (MP) may prove to be less fruitful than searching for the word “back.” It is important to remember that the descriptors on the MP side are often entered by the family and it is incumbent on the forensic experts to interpret these entries. Searches can be conducted by anyone, but searches by an anthropologist can clarify that a missing person described as having “bone lumps near each eyebrow” or a “bone lump on center of rear of head”, may simply be describing the fact that this missing person demonstrates exaggerated but not atypical male characteristics associated with supraorbital ridges and/or an occipital protuberance. A missing person with “suffers from polio” listed as a descriptor may be a match to a skeleton that was found to have unique atrophy of skeletal elements whose description or analysis may not have been linked to this the specific disease of polio. A missing person’s described “goose egg” on the head could mean many different things to many different people.

It is especially important for investigators to be willing to search each parameter with words that are likely to be used by the general population and be willing to adapt and alter the search accordingly. For example, when conducting a search of the open-text field under “skeletal findings” the unidentified person (UP) section had 69 cases wherein the key word “mandible” was entered. In the missing person section, there were only five cases where the word “mandible” was entered but the word “jaw” was entered 27 times. Similarly in UP the word “femur” appeared 69 times, and MP the word “femur” appeared 13 times. The word vertebrae appeared 109 times in UP. The same word only appeared six times in NamUs MP.

Anthropologists are also aware of ambiguities developed in the process of assessing the biological profile,

and experienced NamUs users from any subject matter discipline know to avoid exclusions or a possible match because of a slight deviation from the height estimation or age estimation. They also know that exclusions should never be made on subjective criteria such as race, eye color, hair color, or even postmortem interval estimations. Some exclusions, however, can be based on skeletal criteria alone. The most obvious example would be the confirmed presence of an antemortem limb amputation. A scientifically sound exclusion can be considered if those same skeletal elements are present in the remains.

CONCLUSION

The role of the anthropologist in the application of NamUs is varied but crucial. By the very nature of their work, anthropologists can develop key pieces of information from decomposed and/or skeletal elements and NamUs can provide the technology to consolidate and share their findings along with those of all subject matter experts involved with the investigation.

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