

Caring for Our Ancestors: The Ethical Standards for Preventive Conservation for Mummified
Remains in Museum Settings

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Humans are designed to deteriorate yet remain resilient in the face of adversity, both in life and in death. The human body is built to break down over time, with unavoidable diseases and degenerative conditions that reflect the course of individual lives. This process continues after death, culminating in the complete decomposition of the remains, effectively returning the individual to the earth. However, human and environmental interventions have created anomalies of individuals whose remains endure: mummies. Mummified remains, both intentional and spontaneous, offer valuable insights into not only funerary and cultural practices surrounding death but also lifestyles, nutrition, physical activities, health and disease indicators, and medical practices (Lombardi, 2001). Unfortunately, like many other heritage artifacts, mummified and human remains were treated like prized treasures, viewed as objects rather than individuals, often sold to the highest bidder after being stolen from their resting places. While intentional and unintentional mummification are found worldwide, this paper will focus primarily on Egyptian mummies, as they are the most prevalent in museum collections. Museum curators and conservators are working not only to preserve these individuals but also to establish new ethical standards for handling remains.

Mummification is an ancient method of preserving the skin and other organs, which can occur naturally or be induced intentionally through exposure to extreme climates or through embalming. Many cultures used mummification in their funerary rituals, the most famous being the Chinchorros of South America (Chile/Peru) and the ancient Egyptians. The process of mummification varies across cultures and climates, as different temperatures and humidity levels affect the body differently after death. In Egypt, the process varied by social status and wealth but typically involved disembowelment, cleaning, and immersion in natron, a naturally occurring salt mixture (Byard, 2025). Bodies were then wrapped in layers of linen coated with resin,

typically cedar turpentine, pine, or mastic, which isolated the body from the environment and prevented rehydration (Abdel-Maksoud, 2019; Bryad, 2025). Since these remains lack moisture, they are often referred to as 'dry mummies'. This process was part of Egyptian religious practices that emphasized the preservation of the body for the afterlife. Throughout the different Dynasties, the technique improved as Egyptians learned how the body reacts to various environments and how the process of decomposition unfolds. Eventually, animals are mummified as well: cats, birds, bulls, and so on, and often buried with individuals. However, mummification is not specific to Egyptian culture; individuals from all over the world have been intentionally mummified. In Korea, several remains were found encapsulated in a mixture of lime, sand, and clay that formed an airtight seal around the bodies, and the Maori people often mummified the heads of Toi Moko, individuals with high-status facial tattoos (Bryad, 2025).

Unintentional mummification typically results from environmental factors, including dry climates with no moving air or oxygen-deprived environments such as bogs. Bog bodies have been found across Europe, as bogs are swamp-like bodies of water that are low in temperature, low in oxygen, and rich in moss, which helps reduce bacterial growth (Bryad, 2025). Remains such as those often found in bogs or in other bodies of water are referred to as 'wet mummies'. In Greenland, the Thule culture placed their dead in caves, which provided low temperatures and dry winds (Bryad, 2025). Humans have gone to great lengths to honor and preserve their dead, whether intentionally or not, and mummies offer anthropologists and archaeologists opportunities to study life throughout human history.

Like many ancient artifacts, mummies drew considerable interest in the late 18th and 19th centuries. This infatuation with all things Egypt has continued into modern times; however, many Victorian travelers used the opportunity to procure antiquities, including mummies (Baber

2016). During the 19th century, the ‘supply’ of mummies began to dwindle as demand increased, and antiquity dealers sold fakes to travelers and collectors, since the public seemed to care little whether the bodies under the wrappings were genuine. Mummy ‘unwrappings’ under the guise of popular public entertainment were used to rifle individuals for potential antiquities wrapped around them (Baber, 2016). Eventually, thousands of mummies were looted over the course of a century and a half and taken back to Europe. Some were displayed in cabinets of curiosity, while wealthy and affluent members of European society exhibited others. By the end of the 19th century, the illusion had worn off, and thousands of artifacts, including mummies, made their way to antiquities shops or were ‘generously’ donated to museums. During this time, however, many travelers and grave robbers competed with academics, also seeking mummies for scientific studies (Baber, 2016). Regardless of how they left Egypt, thousands of mummies are now housed in European and American museum collections, while many remain in private collections.

After being in a particular environment for extended periods, mummies and human remains acclimate, posing a significant risk when removed. Since decomposition is slowed by the lack of moisture and oxygen within and around the body, once reintroduced, the process resumes. In pop culture and films, this is typically shown when the individual turns to ‘dust’; however, in reality, the fragile, desiccated tissue begins to crumble. In simple terms, mummified remains require temperatures between 60 and 70 degrees Fahrenheit and humidity between 40 and 50 percent. These are common for most archival and museum collections. As with other collections, mummies remain susceptible to insect activity, mold, and fungal growth. Conservators must also consider how the individual was mummified (intentionally or unintentionally), the processes used, and any prior conservation efforts.

The humid climate of most Egyptian tombs, along with the presence of food and the lengthy mummification process, attracted insects. Many sets of remains were found with beetle and fly carcasses; however, many conservators are unsure whether these insects were present during mummification or afterward (Barnes et al., 2019). Mummies are susceptible to pest infestations, primarily by keratinophagous insects such as clothes moths and carpet beetles, which feed on keratin and bore into the skin (Carminati, Begerock, and Gill-Frerking 2014). Insect infestations have long been a concern for archaeologists and conservators; early preventive measures included applying a turpentine varnish to the body and repeating the application based on the number of insects observed (Carminati, Begerock, and Gill-Frerking 2014). Turpentine, derived from pine resin, is often used as a paint thinner and can be highly toxic if inhaled or absorbed through the skin. Other varnishes used were arsenic-based, intended to halt insect infestations altogether (Timbart et al. 2021). While resin was used in the mummification process, these varnishes were also used as insecticides for pest management, and to beautify the remains for display, giving them an antique-like appearance (Carminati, Begerock, and Gill-Frerking 2014). Several mummies in the National Museum of Natural History collection exhibit this varnish covering both the boreholes and the insects themselves (Carminati, Begerock, and Gill-Frerking 2014). There is little research on how the chemical composition of these varnishes, insecticides, and pesticides interacts with that of the remains (Meier 2001).

While insects pose a threat to mummified remains, they are relatively easy to monitor. Biodeteriorants, such as bacteria and fungi, pose a significant threat to remains and conservators as they can thrive in ideal museum settings. As with insects, bacteria, and fungi are rarely introduced into the collection space. Most adhered to the body or other organic material during

the mummification process or before the tomb was sealed. However, increasing fluctuations in humidity and temperature can promote bacterial growth, thereby increasing decomposition rates. Most bacterial growth begins when relative humidity is above 60 percent, and temperature is approximately 70 degrees, due to increased air moisture (Naji et al., 2014). Fungal spores, such as mold, also increase activity with higher temperatures and humidity. Similarly, mold spores remain viable on dry skin but do not germinate at humidity levels below 65 percent. Other fungal spores can grow in relatively low humidity and in dry climates found in collection areas. When active, these spores secrete enzymes that degrade organic matter, such as skin, thereby weakening the remains overall (Naji et al., 2014). Bacteria, mold, and other fungi pose serious threats not only to the remains but also to conservators and museum staff who work on them. While most individuals who encounter mold for a short period of time are not affected, prolonged exposure to mold spores can lead to infections, mold-induced pneumonitis, and lung inflammation (Antonie and Taylor 2014). A variety of chemicals, pathogens, and residues from both pre- and post-collection exposure on human remains pose health hazards, and there is no reliable way to determine what each set of remains has been exposed to without extensive testing, such as gas chromatography. PPE for conservators must be adapted to each situation and set of remains, with gloves and masks as a minimum, and proper ventilation (Neisskenwirth and Troxler 2023; Wills 2022).

While bio-organisms threaten the remains themselves, previous conservation attempts pose additional hurdles, as many of these techniques have caused more damage to the individuals or used chemicals that react with other materials. Often, there is little to no documentation of prior conservation efforts or the techniques used on these individuals, both in the present and in the past. To develop the most effective preventive care plan, conservators and collections staff

must first gather as much information as possible before handling the individual (Brown, Leveque, and Nau 2017). X-rays and CTs can provide insights into the condition of the remains beneath the wrappings, including dislocations, fractures, and joint separations. In the early 19th century, if bones were broken, they were glued back together. After years of continuous gluing without stabilizing the bone, a buildup of glue and vinyl formed, resulting in a loss of bone material adhered to the vinyl (Wills 2022). Another method early conservators used to set bones was to insert pins, but when the metal was exposed, it would oxidize, leaving green staining on and around the area (Nicola, Nicola, and Nicola 2008). Additionally, the wrappings that surround individuals have been removed, intentionally or accidentally. If wrapping were loose, conservators would use a similar adhesive to re-secure the linens; however, as with bones, the adhesive hardens and becomes brittle (Timbart et al., 2021). As the glue hardens, it penetrates the linen fibers, distorting them and making the fabric brittle.

Conservation and preventative care for mummified remains is not a one-size-fits-all practice. Each individual has a unique chemical makeup, structure, and story that is specific to their mummification process. Standard techniques for insect infestations, mold growth, and repairs do not apply to remains because they respond differently to these methods. Usually, in pest infestations, objects can be frozen for a period to kill any living insects and eggs. Bones and mummified remains can be frozen; however, many contain organic and inorganic materials that should not be separated.

Additionally, freezing can cause ice crystals to form within open cavities, reintroducing water to the remains when they melt, thereby promoting bacterial and mold growth and making them difficult to detect (Meier 2001). The most recommended form of preventative solutions when faced with pest, fungal, or bacterial infestations is a 'no oxygen' environment. These are

typically enclosed, vacuum-sealed storage containers that create a microclimate with no oxygen (Meier 2001). The lack of oxygen stops bacterial and fungal growth at the cellular level while also killing pests without potentially causing further damage to the remains.

Before treating or handling any mummified remains, thorough investigations and tests should be run on the individual if permitted. For routine maintenance, conservators should use HEPA-filtered vacuums to remove surface dust and archival-safe thread to stitch wrappings or cloth back together if needed (Smithsonian Institution 2011; Nicola, Nicola, and Nicola 2008).

Like any sacred objects, the mystery surrounding their death and funerary practices caused mummies to be romanticized by high society and overly desired by eager scientists. These people were stripped of their identity, forcibly removed from their resting places, and placed in unsafe conditions that caused permanent damage or, in some cases, destruction. “My specimens could not resist the excessive humidity... forced me to abandon nearly all the anatomical specimens, keeping only the skulls” (Carminati, Begerock, and Gill-Frerking 2014). These people were treated like prized specimens that were to be poked and prodded until they spilled their secrets. Little thought or care was given to conservation (Timbart et al., 2021). For those remains that ended up in cabinets of curiosities or in street performances, they were often discarded when the illusion ended (Baber 2016). These ideals and views of life ending at death have now led scientists and museum professionals to adopt an ethical approach to conservation and research.

Human remains and past societies have fascinated anthropologists and museum professionals alike for over a century. There is something unique about “recognizing ourselves in the people who have shared our experiences,” yet existed in entirely different contexts and communities (Wills 2022). When working with these collections, one might ask ‘Where does the

person end and the remains begin?’ ‘Is there anything that remains of the individual who once inhabited this body?’ (Wills 2022). It can be difficult to distinguish, or even to imagine, these remains as once-living entities. However, what collections staff, conservators, and anthropologists can no longer do is treat remains as objects while respecting the human behind the remains (Timbart et al., 2021). Other ethical frameworks include: returning dignity to the individual by cleaning non-original material, keeping all original material with the remains, reattaching pieces if needed, and reintegrating linens and wrappings, and all interventions or additions can be removed or reversed if needed, while also providing additional support to the remains to limit further damage (Brown, Leveque, and Nau 2017). Interventions should be as minimal as possible and must be distinguishable from organic material (Timbart et al. 2021). Lastly, everything must be intentionally and thoroughly documented, including the materials and techniques used, notably when treatments must be reversed or when safety protocols and standards have been violated (Timbart et al., 2021). Documentation should be provided to the public and members of descendant communities to ensure they understand why specific techniques were used or, in some cases, why they were not.

Mummified remains are an integral part of the historical record, offering insights into lives that are often misrepresented or overlooked by biased historical accounts. Their significance extends beyond academia, as they are the ancestors of many living communities. For some, these remains provide communities with the opportunity to learn about their past cultural practices and lifeways. Scientists and anthropologists use these remains for a variety of reasons, as discussed in this paper: diet, cultural practices, disease and population health, and ancient environments. It is important to remember that these are people, not objects. As museum

professionals and academics, it is our responsibility to the public and descendant communities to provide proper care for these individuals, even if that means allowing them to degrade naturally.

Anthropologists and other scholars regard mummies as vital sources of information, a glimpse into life in the ancient world, whereas for descendant communities, these individuals are living ancestors. While experts in their own right, many anthropologists and even some museum professionals often become seagulls who attempt to take over an entire project because, in their mind, their way is the correct 'standard' way (Cusak-McVeigh 2025). When it comes to the care and preservation of mummified remains, communities should be central to discussions of treatment and care, as there may be times when no treatment is required (Wills 2022). These conversations are tricky and are often muddied by various opinions, making it difficult to please everyone.

Currently, there is a considerable debate online over the display, treatment, and research of Egyptian mummies, with some arguing that these practices are acceptable as long as researchers and experts honor and respect the remains. In contrast, others strongly oppose the display of remains outside Egypt (el-Gawad and Stevenson 2023). As museum professionals who learn the 'best practices' for handling and caring for objects, compromise is difficult when it comes to discussing treatment and care plans with descendant communities. However, these communities know more about the funerary rituals and individual needs; in such instances, they become the experts. Discussions should focus on what needs to be done to ensure stability, which interventions can be deferred, and what should be avoided altogether. There will be times when we, as museum professionals and scientists, must relinquish control, allowing the body to decompose if the community so chooses (Timbart et al., 2021). Preservation limits must be decided on with community values in mind. There will be a compromise, and that is okay.

The concept of mummification dates back millennia, emerging independently across cultures rather than in a single culture, as popular culture would have it. The processes of intentional mummification varied depending on resources, climate, and funerary customs. While many techniques may have originated through accidental discoveries in the historical record, they have since been refined to detect signs of decomposition. As mummies and artifacts were discovered during colonization, an infatuation with Egyptian mummies and artifacts gripped European society. Scientists and wealthy socialites competed for mummy ownership, which led to mass looting of graves, tombs, and temples. Eventually, as the ‘egyptomania’ faded, human remains and other funerary objects entered museum and academic collections. Unfortunately, these remains were treated solely as research specimens, with little regard for their conservation or cultural integrity. As public perception of the treatment of human remains in museums and academic settings changed, many museum professionals and researchers began conducting ethical reviews of practices, policies, and standards. Conservation techniques now stem from a preventative action approach to damage and interventions. For most, this means taking a step back to ‘what is needed for stabilization’ and ‘what are the limits’. Museums are incorporating ethical guidelines and standards, communicating with descendant communities, and collaborating to develop appropriate treatment plans that prioritize human remains. Modern preventive treatments reflect these ethical changes, as many procedures are easily removable, aim to restore dignity rather than beautify, and preserve the individual as a whole rather than specific areas. This echoes the basic controls of preventive conservation: humidity, temperature, and light exposure. Mummified remains are highly sensitive to fluctuations in these categories, which promote the growth of fungi and bacteria that accelerate decomposition. These bio-organisms are not only detrimental to the remains themselves but can also pose serious

health risks to individuals working with them. The knowledge that can be gained from researching mummified remains can be valuable, but should never outweigh cultural values, the safety of those handling these remains, or the humans behind the bodies.

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Humans are biologically designed to deteriorate, yet remain remarkably resilient in the face of adversity, both in life and in death. The human body inevitably breaks down over time through the cumulative effects of aging, disease, environmental stressors, and injury. This deterioration continues after death through decomposition—an essential ecological process that returns organic material to the earth. However, under certain conditions, this natural process is disrupted. Cultural practices, environmental anomalies, and intentional interventions have led to the preservation of individuals long after death: mummified remains. These individuals, whether intentionally prepared or preserved through climate and chance, offer a rare window into past lives and cultural traditions. They also force modern scholars to confront the ethical responsibilities of handling ancestors whose bodies were never meant for scientific display. Mummified remains, both deliberate and accidental, provide extraordinary insight into funerary

rituals, cultural worldviews, ancient diets, disease burdens, medical knowledge, and daily life (Lombardi 2001). But their significance extends beyond academia—they are the ancestors of living communities.

Despite this, mummies have a troubled history within Western collecting practices. For centuries, they were removed from their burial contexts, sold as exotic curiosities, displayed for entertainment, and subjected to invasive scientific experimentation. As museums and archaeological institutions confront the legacy of colonial collecting practices, new ethical frameworks are emerging that center dignity, cultural sovereignty, and collaborative care. This paper explores the history, scientific study, conservation challenges, and ethical debates surrounding mummified remains, with particular attention to Egyptian mummies due to their prevalence in museum collections.

Intentional Mummification Across Cultures

Mummification refers broadly to the preservation of soft tissue after death, whether through intentional cultural techniques or through favorable environmental conditions. While popular media often associates mummification exclusively with ancient Egypt, the practice emerged independently across many societies, each developing distinct methods tied to cultural beliefs, climate, and available materials.

Egyptian Techniques and Beliefs

Egyptian mummification is the most extensively documented and best preserved. It evolved over millennia, becoming increasingly sophisticated as embalmers gained knowledge about the human body and decomposition. Techniques varied by period, region, and socioeconomic status. High-status individuals often underwent elaborate processes, including organ removal, cleansing, and dehydration using natron—a naturally occurring salt mixture (Byard 2025). Resin-coated linen wrappings helped protect the body from moisture, creating the “dry mummies” most commonly seen in museums (Abdel-Maksoud 2019; Bryad 2025).

The process was deeply tied to Egyptian religious beliefs, especially the concept of the ka and ba—spiritual components that required physical preservation for the soul to survive in the afterlife. The body was not merely a vessel but a necessary anchor for eternal existence. This belief structured funerary architecture, tomb offerings, and burial practices.

Other Intentional Traditions Worldwide

Egypt was far from alone in its belief that the dead required care:

- **The Chinchorro of Chile and Peru**, among the earliest known practitioners (as early as 5000 BCE), created some of the world's oldest artificial mummies. Their methods included removing soft tissues, strengthening the skeleton with sticks, modeling clay over the body, and painting the exterior. Unlike Egyptians, the Chinchorro mummified individuals regardless of status, including infants and children.
- **The Māori of Aotearoa (New Zealand)** preserved the tattooed heads (toi moko) of high-status individuals. This was a ritual act that honored social position and lineage.
- **The Taklamakan Desert mummies of China** were dried and preserved by extreme aridity; their textiles and bodies remain remarkably intact.
- **Inca “ice mummies”**—including the famous “Juanita” discovered on Mount Ampato—were preserved through extreme cold and low oxygen at high altitudes. These individuals were part of ritual offerings (capacocha).
- **Korean Joseon-period lime-sealed burials** created airtight chambers of clay, lime, and sand, producing well-preserved bodies unexpectedly (Bryad 2025).

Across these examples, cultural meaning, ritual care, and symbolic expression shaped the preparation of bodies. While methods differed, the underlying principle—that the dead required physical preservation for spiritual or social purposes—is widely shared.

Unintentional Mummification and Environmental Preservation

Accidental preservation occurs when natural conditions inhibit typical decay processes. These conditions include:

The Bog Bodies of Northern Europe

Found throughout Ireland, England, Germany, and Denmark, bog bodies formed in cold, oxygen-poor peat bogs. Their skin and soft tissue are exceptionally preserved, though bones often decalcify due to acidic conditions. Many show evidence of ritual death or execution—a phenomenon known as the “triple death” (strangulation, stabbing, and drowning). Their preservation provides insight into Iron Age diets, health, and social structures.

Desert and High-Altitude Preservation

The deserts of Chile, Peru, and Egypt, along with high-altitude regions in the Andes or Himalayas, promote natural mummification through extremely dry or cold climates. These individuals often retain clothing, hair, and stomach contents, allowing researchers to reconstruct seasonal diets, migration patterns, and cultural practices.

Frozen Environments: Ötzi the Iceman

Discovered in the Alps in 1991, Ötzi is one of the most extensively studied mummies in the world. His preservation has allowed researchers to identify his last meals, tattoos, genetic profile, health conditions, social status, tools, and even the cause of his death (an arrow wound). Ötzi exemplifies how accidental mummification can preserve information unavailable in traditional skeletal analyses.

Colonial Collecting, Egyptomania, and the Commodification of the Dead

Beginning in the 18th century, European fascination with Egypt intensified. Napoleon's campaigns and the publication of early archaeological studies spurred widespread Egyptomania. Mummies became prized commodities—objects of wonder, status, and scientific curiosity. Victorian travelers sought mummies as souvenirs, while antiquities dealers often sold fabricated or composite individuals (Baber 2016).

Entertainment and Mummy Unwrappings

Public unwrapping events—hosted in salons, theater halls, or private gatherings—transformed sacred bodies into spectacles. These performances frequently destroyed the remains through careless handling and the removal of wrappings for souvenirs. Unwrapping became so popular that the demand for mummies exceeded the supply, prompting further tomb looting and illicit excavations.

Scientific Exploitation

Mummies were also sought for early medical and scientific study. Physicians dissected them to learn about ancient diseases, while chemists analyzed embalming materials. Some remains were even ground into powder to create pigments or “mumia”—a medicinal substance believed to have healing properties.

Legacy in Museum Collections

By the late 19th century, public interest waned, and thousands of mummies ended up in museums. Many institutions accepted them as “generous gifts,” despite their often unethical origins. Today, the presence of these bodies in Western museums continues to raise ethical questions, especially regarding consent, cultural ownership, and display practices.

Environmental and Biological Threats to Mummified Remains

Mummified bodies acclimate to specific environmental conditions over centuries. Sudden changes can trigger deterioration.

Moisture and Temperature Fluctuations

Once moisture reenters the body, tissues rapidly weaken. In popular culture, this is often dramatized as mummies turning to “dust,” but in reality, desiccated skin, muscles, and wrappings begin to crumble. Ideal storage conditions typically include:

- **Temperature:** 60–70°F
- **Relative humidity:** 40–50 percent

Fluctuations can accelerate decay or promote microbial growth.

Insect Activity

Keratin-feeding insects like carpet beetles and clothes moths pose significant threats (Carminati, Begerock, and Gill-Frerking 2014). Historically, conservators used toxic varnishes, turpentine, or arsenic compounds to address infestations—treatments now known to damage bodies and pose health hazards.

Bacteria, Fungi, and Mold

Mold and bacteria often originate from ancient contexts but become active when humidity increases. Mold spores can remain dormant indefinitely, then germinate once conditions exceed 65 percent humidity (Naji et al. 2014). These organisms degrade skin and wrappings and can endanger conservators’ respiratory health (Antonie and Taylor 2014).

Scientific Analysis and Modern Technologies

Advances in imaging, biomolecular analysis, and chemical testing have revolutionized the study of mummies without requiring destructive methods.

CT Scanning and 3D Imaging

High-resolution CT scans allow researchers to:

- visualize organs and bones beneath wrappings
- identify trauma, disease, or congenital conditions
- detect artifacts placed inside wrappings
- reconstruct facial features
- evaluate internal damage before conservation (Brown, Leveque, and Nau 2017)

Stable Isotope Analysis

Isotopes of carbon, nitrogen, oxygen, and strontium reveal:

- diet (marine vs. terrestrial protein)
- geographic origins
- migration patterns
- seasonal food availability

Ancient DNA (aDNA)

While fragile, ancient DNA can illuminate:

- familial relationships
- population movement
- genetic disorders
- disease-causing pathogens

DNA research, however, raises ethical concerns, especially regarding consent and the treatment of ancestors as biomedical specimens.

Residue and Chemical Testing

Gas chromatography and mass spectrometry can identify:

- embalming materials
- pesticides applied by early conservators
- environmental contaminants
- plant resins, oils, and pigments

These methods help inform safer conservation strategies.

Challenges of Past Conservation Methods

Earlier conservators often applied substances intended to strengthen or preserve mummies but that ultimately caused irreversible damage. Examples include:

- **Animal glues** used to reattach broken bones that later hardened, cracked, and pulled bone fragments away (Wills 2022).
- **Metal pins** inserted into limbs, which corroded and stained surrounding tissue (Nicola, Nicola, and Nicola 2008).
- **Excessive rewinding** with inappropriate materials.
- **Varnishes and shellac** used to impart a “museum shine.”
- **Toxic pesticides** such as arsenic and mercuric chloride (Timbart et al. 2021).

Many of these interventions were undocumented, leaving modern conservators unsure which substances are present and how they will react to new treatments.

Modern Conservation Practices

Today, conservation of mummies prioritizes preventive care, reversibility, and cultural respect.

Preventive Measures

Conservators often use:

- **Oxygen-free storage environments** to inhibit bacterial and fungal growth (Meier 2001).
- **HEPA-filtered vacuums** to remove surface dust safely.

- **Archival-safe thread** for stabilizing wrappings (Smithsonian Institution 2011).
- **Microclimate display cases** that regulate humidity and temperature.

Minimal Intervention

Contemporary ethics emphasize:

- maintaining original materials
- avoiding beautification
- ensuring all treatments are reversible
- documenting all procedures (Timbart et al. 2021)

These guidelines reflect a shift away from treating mummies as artifacts and toward treating them as human beings deserving of dignity.

Ethical Considerations and Community Collaboration

As Wills (2022) notes, there is something deeply human about recognizing ourselves in people who lived thousands of years before us. Yet it is increasingly clear that museums must balance scientific interest with the rights and beliefs of descendant communities.

Questions Scholars Must Ask

- Where does the person end and the specimen begin?

- What obligations do we have to individuals who cannot consent?
- When is it appropriate to intervene—and when should decomposition be allowed to continue naturally?

Role of Descendant Communities

In many cases, communities hold knowledge about funerary practices, spiritual beliefs, and cultural values that must guide conservation decisions. As Cusak-McVeigh (2025) warns, museum professionals sometimes assume authority (“seagulls”), overshadowing community voices. True ethical practice requires power-sharing.

Current Global Debates

There is ongoing debate about whether Egyptian mummies should be displayed in Western museums. Some argue that respectful, educational display is acceptable; others maintain that these bodies should remain—or be returned to—Egypt (el-Gawad and Stevenson 2023). These discussions echo broader repatriation movements such as NAGPRA in the United States.

Conclusion

Mummified remains offer extraordinary opportunities to learn about past cultures, environments, and individuals. But this knowledge must be balanced with responsibility. These are not objects; they are people, ancestors, and members of communities whose voices have historically been silenced. As museum professionals and scholars, we must prioritize dignity, cultural respect, and minimal intervention. The preservation of mummified remains—whether physical, cultural, or ethical—must place humanity at the center of the conversation.