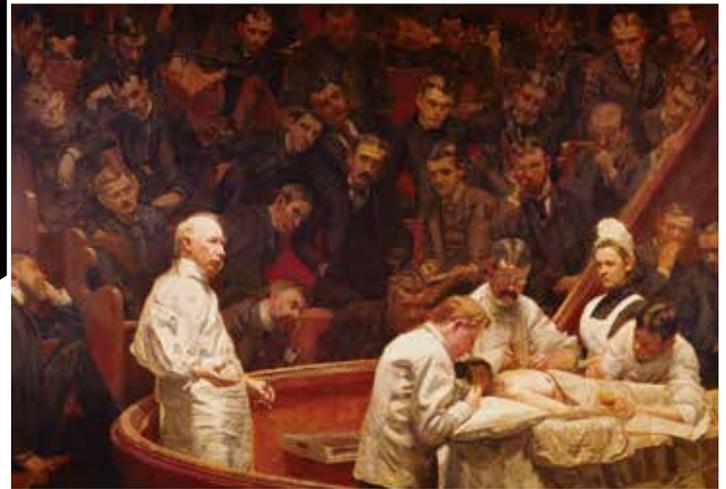




The Gross Clinic, by Thomas Eakins, 1875.
Photo by Geoffrey Clements/Corbis/VCG via Getty Images



The Agnew Clinic, an 1889 oil painting by American artist Thomas Eakins. Universal History Archive/UIG via Getty images)

The doctor's white coat:

A symbol of the U.S. medical profession

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The white coat has served as the symbol of doctoring in the United States from the late-19th century to the present. The evolution of physician attire, from black to white, demonstrates how the profession has been grounded in the trust gained from a commitment to science, has applied that science to the bedside, and to its dedicated pursuit of medical education reform. The white coat remains the most common symbol of the medical profession when compared to other symbols of attire and common bedside diagnostic instruments.

Mid- to late-19th century

Traditionally, black was the formal attire for physicians, nurses, and nuns in the mid- to late-19th century.¹ Black connoted seriousness, as well as the anticipation of death and mourning.¹⁻³

Photos from the Civil War document attending surgeons attired mostly in black. The painting by Thomas Eakins in 1875, featuring Dr. Samuel Gross and his Jefferson Medical College students performing surgery, is frequently cited as one of the most prominent examples of physicians of the era. It depicts all participants dressed in black.

However, 14 years later, Eakins painted Dr. D. Hayes Agnew, professor of surgery at the University of Pennsylvania and his students, in the surgical suite. They are dressed in all white.

The doctor's white coat



President James Garfield in his bed at the White House after an assassination attempt, July 2, 1881. Illustration from L'Illustration, Journal Universel, 2007, Volume LXXVIII, August 13, 1881



Re-enactment of the demonstration of ether anesthesia in an operating room at Massachusetts General Hospital, Boston, by W.T.G. Morton, October 16, 1846. Photo by: Universal History Archive/UIG via Getty Images



Union Army hospital tent on the battlefield at Gettysburg. An injured man lies on a table while the surgeon stands nearby with a knife. Photo by SSPL/Getty Images

Louis Pasteur and Joseph Lister laid the foundation for establishing the important connection between the scientific method and the practice of medicine. Despite the discovery of pasteurization in the 1860s, and of antiseptic surgical technique a few years later, U.S. physicians were slow to accept and adopt scientific breakthroughs, specifically the germ theory causation of disease.

The prolonged death of President James A. Garfield from sepsis in 1881 was likely the result of improper wound exploration, debridement, and treatment administered by his attending physicians, rather than from the bullet fired from the gun of Charles Guiteau. Garfield's public suffering was indicative of the poor quality of care of the era.⁴ It isn't surprising that the citizenry lacked confidence in medicine and in its doctors, felt much of the medical care provided was quackery, and believed medical education was grossly inadequate.⁵

Early- to mid-20th century

In the beginning of the 20th century, with Walter Reed's definitive research on yellow fever transmission, Sir William Osler's recognition as an esteemed clinician-educator, and Abraham Flexner's (AΩA, Raymond and Ruth Perelman School of Medicine at the University of Pennsylvania, 1946, Honorary) treatise on the necessary reforms to correct deficiencies in medical education,⁶ the public began to view physicians and the profession in a more favorable light. The successes of biomedical science and education, as well as the meticulous attention to detail in infection control and surgical outcomes, portrayed cleanliness, and by association whiteness.

The Latin term *candidus*, means white. The descendant word, candor, reflects a valuable asset for physicians as they foster and nurture trusting relationships with their patients.¹ Whether by association or chance, physicians discarded the black attire and donned white clothing, which became the new standard symbol representing the medical profession, its value, and authority.⁷

It would be remiss not to recognize two technological advances occurring almost simultaneously in the transition from black to white attire—the manufacture of cotton, and the development of commercial washing machines. Both allowed for large quantities of washable cotton apparel to be made available for repetitive use more quickly and efficiently.⁸ Prior to the mid-19th century, most clothing was made from leather, linen, and wool, all requiring shaking and brushing for removal of dirt and debris.

Wearing all white became required for medical trainees of the early 1900s,⁹ a tradition that continued until the late 1970s. As a result, doctors became members of the “uniform” society.



The installation *Unframed Ellis Island*, by French artist JR intended to bring this landmark building, its patients and staff members to life. Photo credit Timothy A. Clary/AFP/Getty Images

Mid- to late-20th century

In 1976, in one of the first studies of patient approval ratings, physicians were reported to have high or very high public approval ratings of 56 percent,¹⁰ a seemingly low figure.

At the time, there was ample reason for the credibility of doctors to be suspect in the public eye. One was the perception that hospitals and their practitioners prolonged agony more than restored quality to life.¹¹ Ethical breaches of major significance in research and the practice of medicine also did much to erode public trust. From 1936–1970, the U.S. Public Health Service conducted the Tuskegee observational study of African-American men with syphilis, who were not administered penicillin, despite its efficacy for treating the disease since the 1940s.¹²

Equally controversial was the use of the cervical cancer cells from Henrietta Lacks for research without her, or her family's, express permission.¹³

On the positive side, the credibility of physicians and the profession of medicine was enhanced by many noteworthy successes. Dr. Jonas Salk's (AQA, New York University, 1937) discovery of the polio vaccine spared many children the ravages of its neurological complications. Dr. Frances Kelsey, a physician at the Food and Drug Administration, was the guiding force in blocking the approval of the drug thalidomide from being prescribed in the U.S., thereby preventing disastrous musculoskeletal birth defects that had plagued European children and their families.¹⁴ The massive expansion of the National Institutes of Health budget from \$8 million in 1947 to more than \$1 billion in 1974,¹⁵ and the passage of the U.S. Medicare Act by President Lyndon B. Johnson in 1965, were also factors in improving the health of the country and the credibility of physicians and the medical profession.



William Osler (seated) giving a seminar, 1887. Bettman



Portrait of American Army Surgeon Major Walter Reed (1851-1902), early 1900s. Photo by Photoquest/Getty Images

Subsequently, health delivery systems became more advanced. There was the advent of intensive care and hemodialysis units. Medical evacuation innovations—air transport—accounted for saving many lives, especially in combat.

Television also brought popular and admired fictional doctors into the lives of everyday citizens. Between 1961 and 1966, Dr. Ben Casey (Vince Edwards), and Dr. Kildaire (Richard Chamberlin) inspired generations of aspiring physicians.

In the 1970s, Blumhagen¹¹ set out to address whether the white coat held its privileged position in the eyes of the public as the symbol best depicting and representing physicians, their presumed trustworthiness, and their healing

The doctor's white coat



TV show *Ben Casey*, November 1961.

Photo by ABC Photo Archives/ABC via Getty Images



Alan Alda as Captain Benjamin Franklin "Hawkeye" Pierce in the CBS Korean War comedy *MASH*, July 24, 1972.

Photo by CBS Photo Archive/Getty Images

role in society. He reviewed 11 comic strips and 45 publications from four medical journals. He recorded 70 observations of "doctoring" symbols including 36 white coats (51 percent of total), 18 stethoscopes (26 percent), 11 head mirrors (16 percent), and five black bags (seven percent). Blumhagen concluded that the white coat had retained its prominence as the symbol of physicians and doctors. He suggested that it contributed to, and reinforced, the perception that physicians, as figures of authority, used the best available scientific evidence to protect their patients.

The white coat was felt to be powerfully symbolic for placing patients at ease, and reassuring them that physicians would address their complaints with competence.¹⁶

Late-20th century to early-21st century

Over the last 35 years, clinicians, medical scientists, and those in allied-health industries have continued to identify breakthroughs for improving health, extending longevity, and enhancing quality of life. Society has benefited from the availability of advanced diagnostic and therapeutic technologies, along with biological and pharmaceutical agents for combating many chronic diseases, cancers, and disabilities. Collaboration among scientists globally improved to meet the challenges of deadly infectious disease epidemics. Public policy proved beneficial with federal legislation, including the Medicare Prescription Drug, Improvement, and Modernization Act, and the Patient Protection and Affordable Care Act.

Despite all of the clinical and policy breakthroughs,

patient approval ratings of physicians in 2016 only improved modestly over 1976, to 65 percent.¹⁰

In 2016, as a follow-up to Blumhagen's work,¹¹ a much larger study was undertaken by reviewing a total of 235 separate publications from the medical and lay press, identifying 360 symbols of the profession. The following were identified:

- 151 white coats (42% of total);
- 74 stethoscope/white coat combinations (21%);
- 48 individuals in scrubs (13%);
- 44 stethoscopes (12%);
- 27 surgical gowns (8%);
- 7 scrubs/stethoscope combinations (2%);
- 5 scrubs/white coat combinations (1.4%);
- 3 scrubs/stethoscopes/white coat combinations (<1%);
- and
- 1 scrubs/surgical gown combination (<1%).

The 2016 study confirmed Blumhagen's findings, demonstrating that the white coat had maintained its status as the symbol most commonly representing doctoring.

How does doctors' attire, portrayed by lay and medical publishers, correlate to what patients and health professionals prefer? Petrilli and colleagues found that 20 percent of patients preferred to have their physicians dress formally, with or without a white coat; 20 percent preferred to have their physicians wear scrubs; and 60 percent offered no preference.¹⁷ There were also differences in preferences based on the location of care. Fifty-five percent of outpatients preferred



Dr. Jonas E. Salk (ΑΩΑ, New York University, 1937) and a nurse administer a polio vaccine to Pauline Antloger at Sunnyside school in Pittsburgh, PA. Bettman

physicians to be formally attired, with or without a white coat; more than 25 percent preferred the white coat; and 18 percent had no preference. In the acute care setting, 20 percent of patients preferred formal attire, with or without a white coat; and 80 percent had no preference. Inpatients universally preferred physicians wear white coats.

There is ample discordance in how publishers depict physicians as opposed to what patients prefer, and this discordance extends to the profession. Most, if not all, U.S. medical schools conduct annual white coat ceremonies for beginning students. A rite of passage, the white coat ceremony signifies the unique contract between physicians and their patients, emphasizing humanism, professionalism, compassion, honesty, and empathy.¹⁸

To many physicians, the white coat signifies a unique bond that brings them together, as colleagues, out of mutual trust and respect. The bond allows them to collaborate in caring for each other's patients, conducting research, fostering public good as members of professional societies, and supporting each other in times of personal crisis.

However, some pediatricians and psychiatrists choose not to wear white coats as they believe that their patients may feel overwhelmed by the perceived excessive authority embodied by the white coat.^{2,11} Infectious disease specialists believe white coats represent a patient safety hazard.¹⁹ In addition, studies have suggested that the doctor's white coat may have an exaggerated effect on blood pressure, commonly known as "white coat hypertension."²⁰



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The white coat is the profession's symbol

It was not until the late-19th century that the white coat became the symbol most relevant and prominent for representing the medical profession. The change from black to white attire has been linked to scientific discoveries, the adoption of these discoveries into clinical practice, and the inferred associations of cleanliness to whiteness, whiteness to candor, and candor to trust and credibility.

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The doctor's white coat

From left, James B. Reuler, MD (ΑΩΑ, University of Chicago, 1973), David A. Nardone, MD, and Donald E. Girard, MD (ΑΩΑ, Oregon Health & Science University School of Medicine, 1969, Alumni), proudly wearing their white coats in 1977 (top), and 2002. Photo courtesy American College of Physicians



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