

# APIC STATE OF THE ART REPORT

## INTRODUCTION

This APIC State of the Art Report (SOAR) is the first document of its kind from the national APIC Guidelines Committee. A SOAR is similar to a guideline in that it addresses a practice issue of interest to the APIC membership. But whereas the development of an APIC guideline is based on an accumulated body of scientific knowledge, a SOAR is developed when there is little or no scientific knowledge on which to base recommendations.

Infection control professionals are frequently questioned on issues related to the use of scrubs. Who should wear them? When should they be worn? Who should launder them? A literature search conducted by the Guidelines Committee led to the selection of Nathan L. Belkin, PhD, as the author. He is published widely on this and related topics.

This SOAR is designed to assist infection control professionals in the development of policies and procedures related to the use of scrubs and similar apparel by health care personnel outside controlled environments, such as the surgical suite.

**Sandy Pirwitz, RN, MS, CIC**

## Use of scrubs and related apparel in health care facilities

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**Nathan L. Belkin, PhD**

**1995, 1996, and 1997 Guidelines Committee**

Association for Professionals in Infection Control and Epidemiology, Inc.

Since the turn of the century, clothing known as surgical scrub apparel (hereafter referred to as “scrubs”) has been worn by health care personnel in the operating room setting. Today, a wide variety of this type of apparel is being used for many applications in health care outside the operating room. But what are scrubs? Where did the concept and use originate? Are they necessary in some health care settings? And, from an infection control perspective, are they a useful means of preventing or controlling transmission of infection?

The purpose of this APIC State of the Art Report, or SOAR, is, first, to examine the scientific literature on the relationship between the use of scrubs and infection prevention. Second, this

report is designed to provide infection control professionals and others with a process for making decisions regarding the use of these garments in health care facilities.

This article will address the use of scrubs outside a controlled environment such as the operating room.

### HISTORICAL EVOLUTION

The use of scrubs began in the operating room setting around 1900 and was preceded by the surgical cap and gown.<sup>1</sup> The word “scrub” was derived from the practice of surgical personnel who scrubbed their hands before performing surgery or assisting in surgical procedures. What might be the first mention of scrubs was published in 1894 by one of the leading American advocates of asepsis, Hunter Robb, MD. Robb stated that “it is safer and better that all should put on a complete change of costume rather than simply don a sterilized coat and pair of trousers over the ordinary clothing as has been recommended by the

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German school.”<sup>2</sup> He also suggested that these “suits” be made of white material that could be easily washed.

In the late 1950s, concern for the level of airborne contamination emerged as a possible influence on the incidence of surgical wound infection. It had already been demonstrated that dissemination of skin bacteria occurred as a result of friction between areas of heavy skin colonization and that many more bacteria were liberated by movement involving the lower extremities.<sup>3,4</sup> Subsequent studies demonstrated that a reduction in airborne bacteria arising from the perineum, thighs, and feet could be achieved by wearing specially designed trouserlike clothing that was occluded at the feet and waist and made of tightly woven material that restricted the dissemination of skin squames.<sup>5,6</sup> So it was that pants were first introduced for women in the health care setting.

A scrub “revolution” later took place that included changes in the color, design, and the materials of which they were made. The fabrics selected possessed a number of desirable characteristics, that is, wrinkle-resistance, ease of maintenance, and extended durability. The scrub dress was still the preferred style for women as recently as 1976. Since then, a change to pantsuits and nondefinitive sizing has steadily evolved.<sup>7</sup> Use of two-piece scrubs also expanded beyond the operating room setting during this period.

## **DEFINING SCRUBS**

The definition of scrubs is quite varied. Recently, scrubs have been adopted as a replacement for the more traditional type of uniform worn by nursing and ancillary department personnel. Therefore, in attempting to define what scrubs are, it may be easier to begin by identifying the purpose for which the garments are used in an individual health care facility.

### **Scrubs in the operating room**

The Association of Operating Room Nurses’ (AORN) “Recommended Practices for Surgical Attire” suggests that scrubs in the operating room “promote high-level cleanliness and hygiene within the practice setting.”<sup>8</sup> Further, it recommends that all scrub attire should be placed in appropriately designated containers for washing or disposal and should not be hung or put in a locker for wearing at another time.<sup>8</sup> It is important to note that despite these AORN recommendations and the long-standing tradition of wearing scrubs in the operating room setting, no scientific data

support the practice as a means for preventing transmission of infection.

### **Scrubs and cover gowns**

A “cover gown” is a garment, that is, a laboratory coat or jacket, worn over scrubs to prevent their contamination. The need for cover gowns initially surfaced in the 1970s as the result of a study that reported reduced levels of contamination on scrub apparel when cover gowns were worn outside the operating room.<sup>9</sup> However, a more recent study has reported no significant difference in the infection rate between the use or nonuse of cover gowns in a neonatal intensive care unit.<sup>10</sup> AORN’s current position states that the use of cover gowns “depends on the culture of each perioperative setting, the perioperative manager’s assessment of priorities and state regulatory laws.”<sup>11</sup>

### **Scrubs as uniforms**

Webster defines a uniform as the official or distinctive clothes or outfit worn by members of a particular group when on duty.<sup>12</sup> That being the case, scrubs may be viewed as providing a practical and economical way of identifying and associating the health care worker with his or her area of responsibility or department. Other factors favoring scrub-type uniforms include availability from a number of competitive sources in a wide selection of sizes, colors, and prints; relative ease of laundering and maintenance; and cost, as they are less expensive than the conventional type of uniforms.

### **Scrubs as personal protective equipment**

If the use of scrubs occurs in situations in which the wearer may be exposed to blood-borne pathogens, consideration should be given to the Occupational Safety and Health Administration’s (OSHA) requirement that the “employer provide, at no cost to the employee, appropriate personal protective equipment” and “that the type and characteristics will depend upon the task and degree of exposure anticipated.”<sup>13</sup> Traditional scrubs are generally not made of a barrier-type, liquid-resistant material and, therefore, may not provide adequate protection. For these reasons, those responsible for selecting a protective type of apparel item must determine that it is of the “type and characteristics” commensurate with “the task and degree of exposure anticipated.” They must consider the quality of the material as well as its design, such as the areas of the garment in which the liquid-resistant material is used.

OSHA's accompanying *Instruction and Enforcement Procedures for Examiners* alerts its examiners that "scrubs are usually worn in a manner similar to street clothing, and normally should be covered by appropriate gowns, aprons or laboratory coats when splashes to skin or clothing are anticipated."<sup>14</sup> The instruction procedures further state that

if a pull-over scrub (as opposed to scrubs with snap closures) becomes minimally contaminated, the employee should be trained...to remove the pull-over scrub in such a way as to avoid contact with the outer surface, e.g., rolling up the garment as it is pulled toward the head for removal. However, if the amount of blood exposure is such that the blood penetrates the scrub and contaminates the inner surface,...it may be prudent to train employees to cut such a contaminated scrub to aid removal and prevent exposure to the face.<sup>14</sup>

#### **OWNERSHIP OF APPAREL**

There are no scientific data supporting or regulations requiring health care employers to provide scrubs for personnel for infection prevention reasons. However, if the garments are used as a uniform, certain management decisions need to be made. Who owns the uniform? If the employer does not supply the garment, will the employee be required to purchase his or her own at a designated source, possibly through payroll deduction? How many sets of scrubs is the employee required to have? If the employee is terminated before having paid for the garments, will the employer incur the loss? Does the employer provide an allowance to the employee for laundering?

Policies and procedures regarding identification of contamination and a process for laundering must be developed. If the employee owns the apparel and is responsible for its maintenance, reasonable conditions of cleanliness and the frequency of laundering may need to be established. To date, there have been no indications in the literature that scrub apparel worn home has been responsible for the transmission of infections of any kind.

If the employer owns and supplies the scrubs, will employees be permitted to wear the garments while traveling to and from work? If not, are dressing facilities and locker rooms available? Who is responsible for monitoring whether the scrubs are being properly changed? On the other hand, if health care staff members are allowed to

wear scrubs to and from work, how can the employer control the loss of items that are not returned?

In some facilities, the employee is responsible for a certain number of sets issued at the time of employment. Damaged or worn-out sets are exchanged for replacements. At resignation or termination, the employee must return the same number of sets as originally issued or pay the cost of replacement. When the employer owns the garments, policies and procedures to assure internal control for the issuance, collection, and maintenance are necessary for adequate inventory management. Designation of responsibility for enforcing appropriate use and preventing theft and loss is an issue that also needs to be considered.

#### **PROCESS FOR CONSIDERATION OF SCRUB USE**

The use of scrubs in health care settings has been debated with as many variations in opinion as any issue that lacks conclusive scientific evidence for direction. Additionally, the multitude of variables influencing the risk of nosocomial or occupational infection related to scrub use makes the gathering of epidemiologic evidence both laborious and cost prohibitive. Therefore, it seems reasonable to suggest that each health care facility, and perhaps different settings within a facility, customize its approach to the use of scrubs and related apparel.

The process for consideration of scrub use should include the use of the infection control professional as an expert consultant regarding pertinent infection control literature and regulations. In addition, a number of policy and operational details must be considered. Initially, administrative and economic decisions need to be made regarding the cost-effectiveness of scrubs. The benefits may include patients' perceptions and preferences of their health care providers as "professionals," or patients' abilities to distinguish among departments and disciplines in the health care setting.<sup>15</sup>

Cost considerations include purchase price, maintenance, loss, and management. The facility's personnel policy should be reviewed to determine whether the attire is a "uniform," a condition of employment, or provided as a fringe benefit. This personnel policy should be consistent with any state or local regulations concerning uniforms and scrubs and should consider the condition of the labor market in the area, such as the presence of an employee union. Finally, how can the employer assure that a scrubs policy is equitably ap-

plied for all health care personnel from physicians through support staff?

At a time when the entire health care community is being pressured to contain and reduce costs, continuing a practice for which there is no identifiable benefit may not be considered cost-effective or reflect a sense of fiscal responsibility. Therefore, if the costs associated with the use of scrubs are significant and outweigh any identified benefit, their use may need to be reevaluated. This evaluation might require formation of an appropriate multidisciplinary team to make consensus decisions based on usage information that may or may not be readily available, such as which personnel wear scrubs, what types are worn, and how frequently they are changed.

### LAUNDERING

There is no scientific evidence to suggest that home laundering versus institutional laundering poses any increased risk of infection transmission. OSHA holds employers responsible for laundering any clothing, including scrubs, worn by health care workers that becomes contaminated with blood or other potentially infectious body fluids, regardless of who owns the scrubs. This can be problematic. Institutional laundry operations may have difficulty processing certain types of materials, such as rayon, acrylics, knits, or non-colorfast fabrics, without damaging the fabrics. Some facilities have made special arrangements to launder and process employee-owned contaminated clothing in specially designated locations with appropriately trained staff. Some facilities have installed a washer and dryer in a designated area and developed a mechanism for a "uniform exchange" so that employees are provided with temporary uniforms while their own scrubs are being laundered.

### SUMMARY

There is no scientific evidence that the use of scrubs or other related apparel contributes to either the cause or the prevention of infections associated with health care facilities. However, because this type of apparel is now used so commonly as a replacement for the more traditional type of uniform, its original function as an

ensemble worn by surgical personnel no longer prevails. The variety of these applications actually raises a new series of issues and challenges that would be best resolved by a multidisciplinary health care group with representatives from administration, nursing, medicine, materials management, human resources, infection control, and other affected departments. The purpose of this report is to facilitate this process.

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