A PRE-DESIGN STUDY OF PATIENT AND MEDICAL PROFESSIONAL ATTITUDES AND REACTIONS TOWARDS THE COLORS OF MEDICAL SCRUBS

THESIS

Presented in Partial Fulfillment of the Requirements for
the Degree of Masters of Fine Arts in the Graduate
School of The Ohio State University

by

Erik A.Aagard, M.S.

****

The Ohio State University
2008

Thesis Committee:
Professor Noel Mayo
Dr. Peter Kwok Chan
James Arnold
Senior Lecturer, Dr. Elizabeth Sanders

Approved by

Advisor
Graduate Program in Industrial, Interior, Visual Communication Design
ABSTRACT

Surgical scrubs are worn by a variety of medical professionals in various capacities all over the world. Called by the shortened name “scrubs” the one-time surgical only attire is now worn by men and women in every conceivable medical capacity. Once only available in white, scrubs now come in a diverse array of color assortments, all of which carry implicit meaning both for the medical professional and patient.

To assess some of the possible interpretations of various scrub colors, and determine preferred colors, a three pronged approach was used. A Make-See-Do model (a hands-on, participatory experience) was employed to triangulate the data. First, nineteen medical professionals were given an in-person questionnaire asking about their color preferences, scrub color preferences, clothing preferences, and experiences wearing surgical scrubs. The professional then used a MakeTool (a toolkit to build a model) to pick their preferred color(s) and cut of scrubs by affixing small laminated colored scrub pieces to foamcore “dolls” with velcro patches. Sixteen different colors were available. Second, the identical questionnaire was also sent to 249 medical professionals who took the online survey and selected scrub configurations and preferred colors with toggle buttons. Thirdly, 341 potential patients were given an online survey asking them to guess the profession of a medical professional, based on the color of her scrubs. A list of ten possible professions was listed below her picture and the same picture was shown ten different times with the same woman wearing
different colored scrubs each time. To help understand and interpret the data, a literature review of color symbolism, marketing, psychology, physiology, and history was completed.

Patient and medical professional response was several times greater than initially anticipated. Both groups appeared to be quite emotionally invested in the choice of scrub colors and had strong preferences about what colors were associated with medical professionals.

The most preferred color for medical professionals was light blue, light green, and then darker blue. Professionals who wore these colors were likely to be identified first as a doctor, a nurse, and then a dentist. Nurses had wider latitude with colors and were recognized as nurses if they wore the aforementioned colors or pink, purple, gray, or red. Patient surveys demonstrated that the colors blue and green were clearly viewed as “medical” colors. If other colors were worn by professionals, patients became confused at their role.

Professionals were consistent in their views on scrubs and no difference was seen between online and in-person interviews. The colors overwhelmingly preferred by medical professionals were: light blue, light green, and a darker blue. These colors were seen as the most “professional.” Darker colors and bright and light colors were considered unacceptable. Most professionals didn’t think a trim color was necessary and only 15% of them preferred two colored scrubs. A majority of the participants believed the fit of scrubs needed improvement and had various suggestions for upgrades and betterment.
Dedicated to Julie and my parents who believe, “determine the thing that shall be done, and we shall find the way.” (Abraham Lincoln)
ACKNOWLEDGMENTS

I would like to thank my wife Julie for having faith in this whole life changing adventure. Without her support, confidence, and good cheer - this whole journey would have never taken place.

I am also grateful to my parents for their unflagging optimism and confidence in me and their focus on education and their belief of “whatever you are - be a good one.” (Abraham Lincoln)

I am grateful to Noel Mayo for his non-stop encouragement, Peter Chan and Liz Sanders for helping me to down focus on topic, and to James Arnold for urging me forward and being a good friend.
VITA

Nov 4, 1967 ........................................ Portland, Oregon

1991 ............................................. A.S. Mathematics,
                                        Utah Valley University

1995 ............................................. B.S. Mechanical Engineering,
                                        Brigham Young University

1995 ............................................. B.A. Near Eastern Studies,
                                        Brigham Young University

1999 ............................................. M.S. Mechanical Engineering
                                        Brigham Young University

1994-1997 ........................................ Teaching Assistant and Research Associate
                                        Brigham Young University

1998-2004 ........................................ Lecturer, CAD & Manufacturing Design
                                        University of California at Irvine

1997-2001 ........................................ Technical Application Support
                                        Unigraphics Solutions

2001 ............................................. Mechanical Engineer, Design
                                        AMI Machining

2003 ............................................. Mechanical Engineer
                                        Alsius Corporation

2003-2004 ........................................ Product Design Engineer
                                        Roger Cleveland Golf Company

2005 ............................................. Industrial Designer
                                        Arctic Cat Snowmobiles

2004 - present .................................... Graduate Teaching and Research Associate
                                        The Ohio State University
FIELDS OF STUDY

Major Field: Industrial, Interior, and Visual Communication Design

Major Field: Mechanical Engineering
# TABLE OF CONTENTS

**CHAPTERS:**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>ii</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>iv</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>v</td>
</tr>
<tr>
<td>VITA</td>
<td>vi</td>
</tr>
<tr>
<td>FIELDS OF STUDY</td>
<td>vii</td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>WHY COLOR?</td>
<td>1</td>
</tr>
<tr>
<td>INTEREST DEVELOPMENT</td>
<td>2</td>
</tr>
<tr>
<td>OPPORTUNITY</td>
<td>3</td>
</tr>
<tr>
<td>A SHORT HISTORY</td>
<td>4</td>
</tr>
<tr>
<td>GOALS</td>
<td>5</td>
</tr>
<tr>
<td>2. METHODOLOGY</td>
<td>6</td>
</tr>
<tr>
<td>LITERATURE REVIEW</td>
<td>6</td>
</tr>
<tr>
<td>PATIENT SURVEY</td>
<td>7</td>
</tr>
<tr>
<td>MEDICAL PROFESSIONAL SURVEY</td>
<td>10</td>
</tr>
<tr>
<td>MEDICAL PERSONEL INTERVIEWS</td>
<td>12</td>
</tr>
</tbody>
</table>
3. LITERATURE REVIEW

WHY COLOR IS IMPORTANT ..........................................................16
COLOR AND LANGUAGE ................................................................17
COLOR IN PRODUCTS .....................................................................18
COLOR AND MARKETING ...............................................................20
COLOR ASSOCIATION ....................................................................22
PSYCHOLOGY/PSYSIOSIOLOGY ......................................................25
COLOR TEMPERATURE ....................................................................30
INVolVEMENT IN DECISION MAKING ...........................................32
SCRUBS VS. FORMAL WEAR ..........................................................33
IS APPEARANCE IMPORTANT TO PATIENTS? ............................34
FORMAL VS INFORMAL MEDICAL WEAR ....................................36
DITCHING THE DIE, WHITE COAT .................................................39
COLOR MEANINGS ........................................................................40
  REDS ..........................................................................................41
  ORANGE ....................................................................................43
  BLUE ..........................................................................................44
  BROWN .....................................................................................45
  YELLOW .....................................................................................46
  GREEN .......................................................................................48
  PURPLE ......................................................................................49
  BLACK ........................................................................................50
  WHITE .......................................................................................51
# LIST OF TABLES

1. Patient Results Survey, Age ..............................................................................................55
2. Patient Results Survey, Background ...............................................................................55
3. Patient Survey, Seafoam Green Scrubs ............................................................................56
4. Patient Survey, Gray Scrubs ............................................................................................56
5. Patient Survey, Orange Scrubs .......................................................................................57
6. Patient Survey, Dark Blue Scrubs ...................................................................................57
7. Patient Survey, Pink Scrubs .............................................................................................58
8. Patient Survey, Tan Scrubs ..............................................................................................58
9. Patient Survey, Purple Scrubs ..........................................................................................59
10. Patient Survey, Yellow Scrubs .......................................................................................59
11. Patient Survey, Black Scrubs ..........................................................................................60
12. Patient Survey, Red Scrubs .............................................................................................60
13. Patient Survey, Light Blue Scrubs ...................................................................................61
14. Medical Professional Survey Online, Gender .................................................................62
15. Medical Professional Survey Online, Age .......................................................................62
16. Medical Professional Survey Online, Background .......................................................63
17. Medical Professional Survey Online, Color Blind .........................................................63
18. Medical Professional Survey Online Favorite Color .......................................................64
19. Medical Professional Survey Online, Favorite Color Why ............................................64
20. Medical Professional Survey Online, Least Favorite Why ............................................65
22. Medical Professional Survey Online, Time Worked ........................................... 68
23. Medical Professional Survey Online, Scrubs Experience .................................. 68
24. Medical Professional Survey Online, Secondary Color ..................................... 70
25. Medical Professional Survey Online, Secondary Color Placement ................. 71
26. Medical Professional Survey Online, Scrubs Difference .................................. 71
27. Medical Professional Survey Online, Scrubs Difference Peers ..................... 72
28. Medical Professional Survey Online, Avoidance Reasons ............................ 73
29. Medical Professional Survey Online, Scrubs Difference Peers/Patients ... 73
30. Medical Professional Survey Online, Scrub Stories ....................................... 74
31. Medical Professional Survey Online, Scrubs Options ................................... 75
32. Medical Professional Survey Online, Style Options ...................................... 76
33. Medical Professional Survey Online, Scrub Cut Preferences .......................... 77
34. Medical Professional Survey MakeTool, Gender ............................................ 81
35. Medical Professional Survey MakeTool, Age ................................................. 81
36. Medical Professional Survey MakeTool, Color Blind .................................... 82
37. Medical Professional Survey MakeTool, Favorite Color .................................. 83
38. Medical Professional Survey MakeTool, Favorite Color Why .......................... 83
40. Medical Professional Survey MakeTool, Least Favorite Why ......................... 84
41. Medical Professionals Survey MakeTool, Comfortable Clothing .................... 85
42. Medical Professionals Survey MakeTool, Ideal Clothing .................................. 85
43. Medical Professional Survey MakeTool, Time Working .................................. 86
44. Medical Professional Survey MakeTool, Scrub Usage ..................................... 86
45. Medical Professional Survey MakeTool, Secondary Color ............................. 88
46. Medical Professional Survey MakeTool, Secondary Color Placement ......88
47. Medical Professional Survey MakeTool, Scrub Difference.........................89
49. Medical Professional Survey MakeTool, Scrub Color Avoidance...............90
50. Medical Professional Survey MakeTool, Bad Scrub Colors.......................90
51. Medical Professional Survey MakeTool, Scrub Stories ..........................91
52. Medical Professional Survey MakeTool, Scrub Options ..........................92
53. Medical Professional Survey MakeTool, Options Suggestions ...................92
54. Medical Professional Survey MakeTool, Cut Preferences ..........................94
<table>
<thead>
<tr>
<th>Figure</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Patient Survey Questions</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Patient Survey, 11 Scrub Colors</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Medical Survey, Scrub Cut Styles</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>Medical Survey, Scrubs Color Selection Chart</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>Medical Personel Interviews MakeTools</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>Medical Personel Interviews, Scrubs Cutouts</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Medical Professional Survey Online, Color Preferences</td>
<td>78</td>
</tr>
<tr>
<td>8</td>
<td>Medical Professional Survey Online, Mixed Scrubs Percentages</td>
<td>79</td>
</tr>
<tr>
<td>9</td>
<td>Medical Professional Survey MakeTool Color Preferences</td>
<td>95</td>
</tr>
<tr>
<td>10</td>
<td>Medical Professional Survey MakeTool, Mixed Scrubs Percentages</td>
<td>96</td>
</tr>
<tr>
<td>11</td>
<td>Question 3, Green Scrubs</td>
<td>111</td>
</tr>
<tr>
<td>12</td>
<td>Question 4, Gray Scrubs</td>
<td>112</td>
</tr>
<tr>
<td>13</td>
<td>Question 5, Orange Scrubs</td>
<td>112</td>
</tr>
<tr>
<td>14</td>
<td>Question 6, Dark Blue Scrubs</td>
<td>113</td>
</tr>
<tr>
<td>15</td>
<td>Question 7, Pink Scrubs</td>
<td>113</td>
</tr>
<tr>
<td>16</td>
<td>Question 8, Tan Scrubs</td>
<td>114</td>
</tr>
<tr>
<td>17</td>
<td>Question 9, Purple Scrubs</td>
<td>114</td>
</tr>
<tr>
<td>18</td>
<td>Question 10, Yellow Scrubs</td>
<td>115</td>
</tr>
<tr>
<td>19</td>
<td>Question 11, Black Scrubs</td>
<td>115</td>
</tr>
<tr>
<td>20</td>
<td>Question 12, Red Scrubs</td>
<td>116</td>
</tr>
<tr>
<td>21</td>
<td>Question 13, Light Blue Scrubs</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>22.</td>
<td>Scrubs Mix and Match Color Chart</td>
<td>121</td>
</tr>
<tr>
<td>23.</td>
<td>Scrubs Cut MakeTool</td>
<td>124</td>
</tr>
<tr>
<td>24.</td>
<td>Scrubs Color MakeTool</td>
<td>125</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

WHY COLOR?

Color is a deceptively large subject area. It’s very much like an iceberg where up to 90% of the area lies beneath the surface of the water. However, a lot happens beneath the water: animals have their habitat, live and reproduce, hunt and fish, create homes, etc. The mass of ice is also manipulated by ocean currents, and other icebergs crash into the areas jutting out below the surface. Additional masses of ice are added on to the older masses, and some areas of ice are sheared away changing the balance and shape of what has accumulated previously. All this happens without those on the surface ever being aware of it.

Such is the same for color. Tremendous historical currents have influenced present conceptions of various hues. New movements collide with older thoughts, and influences from different streams of thought are always brought into contact with established belief, changing the balance and center of gravity of opinion. The landscape of color is so large that much of it must be ignored and the remainder still must be covered at a run. Color’s width and breadth made it an ideal subject for serious academic focus because it could be mined in a variety of areas without ever being forced into a narrow specialization. Further, color’s interrelation with other subjects made it the perfect subject as a launching point for multi-disciplinary studies. Also, color is interesting to a very wide audience.
This large interest group invites collaboration and further possibility for
discovery and insight. It touches so many areas simultaneously, with real
effect, that it cannot be ignored or bushed aside. Color can affect the feel, usage,
interface, and brand message of an object. It creates layers of cognition and
interplay. How many physical interactions do this? Very few.

INTEREST DEVELOPMENT
The author’s professional interest in color began ten years ago. Working on
CAD (computer aided design) workstations that created models primarily in
green, much effort was placed to change the color on the faces or bodies of those
models to look more realistic. Because of this a reputation for and interest in
photorealistic rendering was developed. As this expertise was increased, further
interest in color and lighting developed because it added a level of detail and
professionalism to finished presentations that helped clients solve problems and
buy into final solutions.

The next level of interest for the author in color was peaked while working in
the golf industry. A decision was made to make a line of clubs for women. The
marketing department informed the design department that a particular shade
of green had been chosen for the club because that particular color of green
was a “woman’s color.” No data on the color green was forthcoming and yet
the marketing department became ever more shrill while insisting “all women
love green.” However, despite marketing’s hubris and lack of data the author
was fairly certain that detailed quantatative research on various ethnographic
groups must have been conducted somewhere. Finding it would be the trick.
It was years later when the author became aware of The Color Marketing
Group, The Color Association of the United States, AIC (The International Color
Association), etc. Understanding what research has been done and how it has been done is one of the main motivations for the author’s study of color.

Several experiences converged to motivate the author to study color usage in medical settings. The first was overhearing conversations of medical, dental, and optometry students talk about how they felt about color. All of the dialogues overheard were impassioned, partisan, and fairly heated in their viewpoints. Watching medical professionals was also revealing, impressions could quickly be made by watching doctors and dentists work and travel around their work environments. Impressions could be formed quickly and the author wondered if others shared the same reactions to various colors of scrubs. In searching for a monotone clothing style, scrubs were identified as one of the few clothing styles in that are all one color and also unisex. Women’s dresses can be one color, but very few clothing items are worn by both men and women are one color. It may be argued that uniforms meet this criteria and that scrubs are a subset in uniforms. However, most uniforms have large areas of identifying marks that are often contrasting colors. Scrubs are most often one solid color with no regions of contrast.

Lastly, scrubs are a clothing item that have not been redesigned in almost 60 years. The cut has remained virtually unchanged and the fabric has been the same since the early 1970s. Very few color changes have been introduced, and alternatives to basic design are minimal. Most professionals who wear scrubs complain that they are hot in the summer, cold in the winter, and that the fabric could be much more comfortable. They have a high user dissatisfaction and although a staple of the medical community, it appears that very little serious research has been done on scrubs.
OPPORTUNITY

A study of scrub colors from both sides of the aisle would provide fundamental groundwork for scrub redesign, color psychology, and color theory. This would provide medical professionals the opportunity to understand how patients viewed them, and to coax suggestions for design from professionals who wore scrubs. The results would be scrubs that be a fuller understanding of color both in theoretical and pragmatic realms. This simple study would briefly cover color symbolism cross reference that symbolism with both doctor and patient. Questions could be resolved such as: Did doctors care which colors they wore? Did patients have a preference for scrub colors? Did medical professionals care which colors were worn by other doctors - or did they just ignore them? Are some colors of scrubs simply to be avoided? Do scrubs convey a certain status or position? Had the current scrub colors of sea foam green and ceil blue become so entrenched that they were iconic? Were certain professions associated with particular colors? And should some hues of color just be avoided altogether?

A Make-See-Do methodology (interactive hands-on toolkit) was decided upon as the tool that would allow the most straightforward participatory interaction and yield the richest research data. Simultaneously, an immersive study in the rich literature about color with focus on the symbolism and history was undertaken. Stress was placed on current literature with emphasis on marketing and perception as well as classical color theory. Focus for this study was limited to North American culture due to the wide variety of international color interpretation. It is also understood that color meanings have also changed significantly with time and even from generation to generation, so focus was placed on the present – meaning the last 20-30 years. It is understood that it is quite probable that color inferences and frames of reference for color will be
different a generation from now. The presence of the internet with its ability to disseminate both culture and information instantly from all corners of the globe will have a marked impact in the years to come.

A SHORT HISTORY

Scrubs are one of the most simple clothing designs ever created. Their design is purely utilitarian. They are a simple design that has not changed in years: unisex, reversible, rugged fabric, single color, with a drawstring waist. They are sold almost exclusively to medical professionals and used most often in critical care facilities. But it was not always so.

Early in the 20th century surgeons wore their street clothes to operate, sometimes donning a butcher’s white apron over the top. They operated bare handed with non-sterile equipment. With Lister’s antiseptic theory, doctors adopted cotton masks and rubber gloves to protect themselves from infection. It was not until the 1940s that antiseptic gowns in favor of a simple white surgical outfit that could be donned and cleaned easily afterwards. In the 1950s and 1960s hospitals abandoned the white in favor of various shades of green. The reasons for this were twofold: 1) to reduce eyestrain, and 2) to hide splashes of fluid on the garments themselves. By 1970 the scrub had evolved to the form of today: v-neck, short sleeve top, with a drawstring waist pant. (scrubs, 2007, wikipedia). Today scrubs are made in almost every color imagineable. Medical supply companies are becoming more adventurous with their fit and cut while hospitals are getting more free with when and where scrubs may be worn and the colors that can be worn. Thus, it becomes even more important to understand how both patient and practitioner interpret scrub color.
GOALS

The goals for this study will be to understand how both patient and practitioner view scrub colors. How do patients view various colors? What do they think the professional wearing a particular color does? Does color define role? What do medical professionals think of the colors they and their colleagues wear? Do they think it has any effect on their patients? Should any colors be avoided in a medical setting? If so—why?

Finding the answers to these questions will provide a great benefit for the medical professional. Because as has been demonstrated by countless historians “clothing is always the bearer of important meanings (Pastoureau, 2001, p3).” Correct color choices will allow professionals to quickly and clearly define their function. It will put the patient at ease. And a patient at ease will experience less pain, answer questions clearly, won’t be distracted as easily, give better information, have a positive experience, have a better perception of the doctor, and be willing to come in for follow up treatment. In short the use of correct color in a medical setting will eliminate one more distraction in a situation that is already confusing and complex.
CHAPTER 2

METHODOLOGY

To accurately collect data from both the perspective of the patient and the medical practitioner, several methods were used for collecting data. This triangulation gave a broader perspective of how color was perceived in scrubs than just relying on one methodology.

LITERATURE REVIEW

To understand and provide a framework for the interpretation of color meanings a literature review was done to place the colors in their proper contexts. Research was done on the historical meanings of color that would impinge on today’s interpretation of color. However, like paint on the side of your house, not many of the original meanings, customs, thoughts, and attitudes about color have survived intact to the present day. And like outside paint, their chroma has changed in the weather of time and some patina has developed. Moreover, the meanings gleaned from the literature review are focused narrowly on the meanings for today. Doctors today would gain no benefit knowing their ceil blue was in fact a color of ill repute in the 13th century (Pastereau, 2000, p. 120). Nor would it make any difference to today’s referee to know that in the 12th century their stripes labeled them as insane, criminal, or a prostitute. (Pastereau, 2001, p. 20). So modern interpretations will always be used. To put even a finer point on the color interpretation—only the current culture of English speaking
North America was used for the basis of color symbolism. All other international meanings were usually excluded unless they provided additional relevant insight.

The literature review was also used to understand physiology—how eye and the body react to light and color. Marketing strategies and concepts were also studied to see how color has been used in the past to titillate, tease, and teach. Color idioms were probed and the use of color in brand awareness, and branding itself was perused. Psychology and color perception were scrutinized to gain insight into cerebral color cognition and how the brain interprets color. Association both in its context to psychology and marketing and the complex interactions on the fuzzy boundaries between both disciplines was also surveyed. Classical color theory: warm colors, cool colors, and their implications were addressed. Developmental color differences and recognition in children was also touched upon, so that a continuum of color perception from birth to adulthood could be observed. Lastly a case for the use of scrubs over formal medical wear was developed to demonstrate the superior germ resistant nature of scrubs over formal wear. Likewise, patient benefit was illustrated—showing doctor recognition was greatly enhanced. From this body of knowledge, data from doctor and patient surveys could be interpreted, and richer and more meaningful conclusions could be drawn from the surveys.

PATIENT SURVEY

Three surveys were done to get color interpretation information: two online surveys - one for medical personnel and one for patients. Then an in-person interview/survey was conducted. Potential and current medical patients were given an online survey. Initially the survey respondents were students in the
college of design at The Ohio State University, former colleagues, friends, and family. Then many of the initial respondents forwarded the survey to their friends, who did the survey, forwarded it to their friends, and so forth. The surveys were designed in accordance with The Ohio State University’s Internal Review Board (IRB) regulations. The questions were also edited by thesis committee members and tightened up to improve clarity. The online surveys were then posted on SurveyMonkey.com to provide the widest possible access and ease of information gathering and to provide complete anonymity for all respondents.

The patient survey was a quick two minute online survey designed to get the patient’s instant impression of scrub colors. The person taking the survey could only select one response per picture. A picture of a woman in front of an office building wearing scrubs with the question, “what does this person do?” was shown. Ten professions that usually wear scrubs: doctor, nurse, office staff, etc., were listed under the picture (Figure 1). The same picture was then modified in Adobe Photoshop so the color of the scrubs and nothing else in the picture was changed. This allowed those taking the survey to focus exclusively on color and not have distracting changes introduced into the picture. Ten photos with the same question, “what does this person do?” with the ten different career options were shown in ten different questions, each with a different color scrubs (Figure 2). Responses to the question were kept constant but the colors shown were placed in a sequence to not predispose participants into selecting medical professions. The choice “other” was included to keep survey takers moving forward. This gave indecisive participants an alternative choice to the ten professions listed. Also, to keep participants engaged and moving forward they were told:
What does this person do?

○ Delivery
○ Receptionist
○ Dentist
○ Nurse
○ Hygienists
○ Staff
○ Doctor
○ Chiropractor
○ Vet
○ Dietician
○ Other

Figure 1
Patient Survey Questions
Please select your first impression about the role that the person in uniform might be playing. The same person will be wearing 10 different colors of uniform. Please pick a role for each color following your instincts. You can repeat the same choices.

Responses were then collected and tallied by SurveyMonkey’s online data collection service. Additionally, each online survey collected basic demographic data about respondents so that data could be properly analyzed (Appendix A). One small deviation from traditional questioning was observed. Respondents were asked their cultural background as opposed to their ethnicity. The reason for this is due to the transient nature today’s society. A second generation Mexican raised in Duluth, Minnesota will have markedly different cultural influences than his counterparts in Tijuana, Mexico.

MEDICAL PROFESSIONAL SURVEY

The online survey to medical professionals was a much longer survey taking about 15 minutes to complete. In addition to the basic ethnographic questions it asked professionals about their experience wearing scrubs, their professional experience, their color preferences, dislikes, and clothing peer approval. It also gave them a chance to design their ideal features for scrubs and a chance to pick their favorite color for scrubs. And professionals were asked for their suggestions for scrubs improvement. For a complete list of questions see the Appendix A.

On the other side of the scrubs equation are the medical professionals. They come from a variety of backgrounds: dentistry, orthodontics, veterinary medicine, doctors, dental hygienists, nurses, office staff personnel, chiropractors,
Figure 2
Patient Survey, 11 Scrub Colors
(black, dark blue, gray, green, orange, pink, purple, tan, light blue, yellow, red)
acupuncturists, hospital staff members, etc. All view color in scrubs differently based on their professions. A survey of colored scrubs would be incomplete without their opinions. The purpose of the medical professional survey was to find out what professionals who wear scrubs think of them. Do they like them? Do they like the colors? Do their patients like the colors? If they could make changes to scrub colors, or scrubs in general - what would they change? What was their ideal type of clothing? What would be their ideal cut of scrubs? (Figure 3) What was their favorite color of scrubs? (Figure 4)

In order to get rich data and candid information, open ended questions were used for most of the survey. This allowed for both detailed and personal information to be gathered. In total, nineteen questions were used. Seven were multiple choice, eleven were open ended. People were shown two questions with pictures, each asking them to select a combination of scrub top and bottoms. The survey was posted on The Ohio State Medical school student interest web site. It was also circulated at The Ohio State Dentistry program site and the Iowa State Dentistry program site, as well as the University of California at Los Angeles Dentistry program site, and a news group for nurses, dental hygienists, veterinarians, and physical therapeutists. Local medical personnel were also recruited for the survey.

MEDICAL PERSONAL INTERVIEWS
In order to clarify some of the viewpoints and opinions of the online survey, an in-person interview with the same questions as the online interview was conducted. The subject was photographed to document their typical clothing style. To protect identity, as per IRB regulations, the face in the photograph was blurred so that it was unrecognizable. Photographs were labeled, “participant 1,
Figure 3
Medical Survey, Scrub Cut Styles

Figure 4
Medical Survey, Scrubs Color Selection Chart
participant 2, etc.” so that later data would preserve anonymity. The interview was also recorded so that later transcriptions could be made accurately. Interviews ranged in length from 15-45 minutes. Participants were doctors, nurses, dentists, and dental hygienists from The Ohio State University’s medical and dental schools, as well as local medical personnel from various hospitals, clinics, and offices.

A MakeTool (Sanders & William, 2003, p. 4), an interactive hands on toolkit, was used to evoke creative solutions from the medical user when selecting both the style and the colors preferred for their ideal set of scrubs. This allowed for a tactile “hands on” experience where the user was allowed to mix and match pieces at will. The MakeTool (Sanders, 1992, p. 52) in this study was a foam core “doll” in the shape of a person with velcro strips attached. (Figure 5) MakeTool scrubs were laminated paper printouts with Velcro strips on the back. (Figure 6) Colors were the same scrub colors used in questions eighteen and nineteen from the online survey. Scrub top and bottoms were separate pieces which allowed the user to mix and match to their liking. The colors chosen were the printouts of the online surveys so that results would be consistent with the two groups. As with questions eighteen and nineteen of the online survey, users were asked to mix and match scrub tops and bottoms to find both their favorite style and color combinations. It should be noted that for both medical professional surveys the colors chosen for the scrubs color selection chart were taken from current medical clothing catalogs. All these scrubs colors have been and still are available from various vendors.

The tools were now in place to catch the thoughts, opinions, and feelings of those who wore scrubs and those around them. Furthermore, the mechanisms
of data collection were robust and allowed for large and accurate amounts of data collection, yet allowed enormous personal candor. The hope was then to get at least 75 respondents for the patient study, 75 participants for the online medical professional survey, and at least 20 people for the medical professional interviews/MakeTool study.
Figure 5
Medical Personnel Interviews MakeTools

Figure 6
Medical Personnel Interviews, Scrubs Cutouts
CHAPTER 3

LITERATURE REVIEW

WHY COLOR IS IMPORTANT

In this scrubs color preference study, a basic understanding of color and its relation to several disciplines will need to be taken into consideration. Seeing how color is used in marketing and branding will provide insight as to how color is marketed to health care professionals as well as others. Knowing color’s effect on physiology, psychology and it’s attendant effects will aid in predicting and interpreting health worker’s reactions to various colors of scrubs. In short, a basic review of why and how color is used in marketing will assist the analysis of both the health worker and patient’s reactions to scrub colors.

Why is color important? Does it have any effect on how we perceive or think about the world around us? Does it influence what we eat or wear, buy or build, design or destroy? Does color have inherent meaning, and do others interpret its meaning the same way? Is color personal? Does it convey rank, status, or position? Does color affect us physically? Does color change the way an object is viewed or used? Doesn’t the function, the form, and the fit of an object mean more to the end user than the color of an object? Can color affect how the object is perceived? Does color say something about how an object will be used? Does color add meaning or value to an object, or have any inherent meaning in and of
itself? In short - all the answers are yes.

Color is as much a part of the world around us as the very air we breathe. It is a ubiquitous and inseparable aspect of life. It’s inescapable -- no matter where life exists on this planet - color is a part of daily life. Color transcends culture and country, time and territory, politics and people - it is one of the few truly universal aspects of life on earth. Color prodded our progenitors, motivated modern masses, and will drive our descendants.

Color affects dramatic events as well as the seemingly mundane aspects of life—from the food we eat down to the way we dress. For example: the color of our clothes mirrors outdoor seasonal color—via the fashion industry (Gimba, 1998, p. 6). Almost everyone perceives color, makes judgements based on color, and has opinions, interpretations, and preferences about color.

In ancient times, as well as today, many cultures imbued color with meaning (Crone, 1999, p. 248). Moreover, associating particular hues with symbols is a practice originating in antiquity (Kim, 2006, p. 344). All cultures value particular shades, tints, and hues (Ou & Luo, 2004, p. 233). Indeed many cultures have chromatic characteristics that are a part of national identity. When Americans hear the phrase, “red, white, and blue,” they don’t think of France: England, Holland, Iceland, Luxemburg, Liberia, Australia, North Korea, New Zealand, Norway, Puerto Rico, Panama, Paraguay, Russia, Taiwan, or the Dominican Republic. They think of the United States of America (USA), even though most Americans know their usage of the red, white, and blue is not exclusive to the USA. Some cultures even share identical symbolism for the colors of anger, envy, fear, and jealousy (Hupka, Zaleski, Otto, Reidl & Tarabrina, 1997, p. 160).
COLOR AND LANGUAGE

Color is so ubiquitous it peppers our everyday language without our realizing it. Think of all the phrases with a color reference, the following is just a sampling of modern English color idioms:

blue blood, once in a blue moon, brownout, in the pink, greenhorn, red letter day, green with envy, blue streak, rosy future, black and blue, boys in blue, scarlet women, red light district, black mood, green person, golden opportunities, silver lining, red tape, white lie, yellow journalism, white elephant, blackball, true blue, blackmail, out of the blue, black sheep, blue ribbon, black day, brown bagging, blueprint, brownstone, feeling blue, gray market, blue law, gray mood, blue plate special, gray area, get the green light, red carpet treatment, green thumb, caught red-handed, greener pastures, red in the face, greenback, seeing red, green around the gills, red flag, going green, not worth a red cent, tickled pink, green-eyed monster, red letter day, pink slip, in the red, pinkie finger, pink collar, blue collar, purple heart, yellow-bellied, white Christmas, yellow fever, white sauce, white hot, white goods, etc. (Sensational Color, 2008)

Before going further it must be noted that the literature on color psychology, perception, cognition, effects on the body, marketing, use in art, etc., is immense. Therefore, this literature review will confine itself to color in the context of marketing, branding, psychology, and physiology associated with bringing a product to market. Color meanings will be examined and the case for wearing
scrubs as opposed to traditional business clothing will be argued.

COLOR IN PRODUCTS

Products in a variety of colors have not always been available for the consumer market. Much of this was due to the limitations of technology. This changed in the 1920s when American merchandisers increased their deployment of color (Eskilon, 2002, p. 20). What made this all possible was a breakthrough in 1923 by the DuPont company. DuPont created a nitrocellulose lacquer that was colorful, quick drying, and durable. “Duco” as it was called, took four weeks off the time it took to paint a car (“The New Age of Color,” 1928, p. 22). This innovation allowed Earl and the designers at General Motors (GM) to now use color as styling element (Garman, 1994, p. 5). Because the automotive industry was the highest profile industry in the 1920s, it was just a matter of time before other industries followed their directions with color. GM’s chairman, Alfred Sloan, recalled that “Duco” made possible “the modern age of color and styling (Sloan, 1964, p. 264).”

The interest in color for products and marketing ignited a chromatic revolution. Magazines that previously had run advertisements in black and white now ran ads in four colors. Consumer goods such as tile, ovens, mixers, etc., began offering a greater variety of color options (Harris, 1990, p. 320). Fortune magazine was introduced in 1930 and printed in color, one of the first magazines to do so, to capitalize on the focus on color. In one of its early issues it cited an executive for a major corporation who said, “color is becoming more and more of a selling urge (“Color in Industry,” 1930, p. 87).
The quest for color quickly engrossed many industries. Business of all sorts embraced color as a tool for greater sales, market share, and expression (Battersby, 1988, p. 137). Consequently color in packaging was adopted which “changed the buying habits of a nation (Franken & Larrabee, 1928, p. 1).” Marketing heavily borrowed color and lighting techniques used in film and theatre to dramatize their products, and thus began the start of color marketing (Boyd, Jr., 1928, p. 59).

COLOR AND MARKETING

Color is extremely important. It affects all consumers. According to a study done by Cheon Mi-ryung, the secretariat of the Seoul International Color Expo in 2004:

According to the survey, 92.6 percent, or 200 respondents, said that they put most importance on visual factors when purchasing products. Only 5.6 percent said that the physical feel via the sense of touch was most important. Hearing and smell each drew 0.9 percent. When asked to approximate the importance of color by percentage when buying products, 48 percent of the respondents said 50-70 percent while 36.7 percent said 70-100 percent. This means that as much as 84.7 percent of the total respondents think that color accounts for more than half among the various factors important for choosing products. For consumers these days, color is not simply one of many variables, but is in fact the most important factor in making purchase decisions (Park, 2006, p. 2).

Singh (2006, p. 783) found that people made a decision about a product within 90 seconds of seeing it, and that 62-90% of their assessment was made on color
alone. Color consistently rates as one of the top three factors in attraction for buyers (Cooper, 1994, p. 5). Another study noted that “color is one of the most significant factors in global marketing that has the power to affect the success of a particular product and/or business (Adidam & Reizgevičiute, 2007, p. 16). Companies who try and create memorable, interesting, and easily identifiable images now consider color a primary tool in their product production programs (Noor, 2002, p. 1). Why is color so powerful? It taps into raw emotion and provokes visceral gut-level reactions which enhance or diminish object status (Guest, 1966, p. 40).

Color also has the ability to create interest in markets that are already saturated or stagnant (Park, 2004, p. B2). “Color can shake up the established order of things, drawing fresh attention to an existing product by making it stand out in a crowd. (Piirto, 1997, p. 40).” Persuasive color palettes help products distinguish themselves from their peers (Cullen & Triedman, 2002, p. 75). Slightly unusual colors or color usage can help a product carve out a niche in crowded market spaces (Shaw, 2007, p. B16). Judd and Wyszecki (1975, p. 62) assert, “for every package or each type of merchandise we carry in our hands...a range of colors that is acceptable.”

This is vitally important with over 8,000 items on the average supermarket floor vying for customer attention. Consumers have responded to the dizzying array of options with increasing sophistication in their choices. As legendary marketing pioneer Oilvy (1971, p. 84) once noted, “the consumer isn’t a moron. She is your wife.”
Many corporations now use color as their main tool to establish brand recognition (Park, 2004, p. 2). “It appears in advertising, packaging, distribution, and even on the product itself to elicit positive feelings or communicate intended meaning (Klink, 2003, p. 143).” Color is one of the main elements in brand meaning and has inherent qualities of meaning that fuse with brand (Keller, 1998, p. 83). Consumers associate brands with certain color such as Coca-Cola and Marlboro with red, Cadbury with purple, and Guinness with black (Grimes & Doole, 1998, p. 799). Political “consent engineering” draws heavily on color to connect party association (red—republican, blue—democrat) and establish credibility and patriotism (Howard, 1984, p. 203).

Color has been shown to raise brand recognition by 80% and can often be 85% of the reason consumers choose to buy (Shaw, 2007, p. 16). Color is so influential that an audit of several grocery stores showed that 50% of the copycat brands imitated leading brand color (Morton & Zettelmeyer, 2004, p. 161). The association of color and brand is so strong that preschoolers, with little conditioning, can quickly pick out and identify major brands (Macklin, 1996, p. 251).

Why would branding have any bearing on scrubs colors? Because scrubs have traditional colors and health care professionals may brand those hues as “medical.” They may connect non-traditional scrub colors with other professions. Or their patients may not connect them to the medical profession. There may be a “brand preference” when it comes to scrubs. And it is important to bear in mind that a possible bias or prejudice might exist in the mind of either patients or medical professionals.
Clear product differentiation and brand recognition established by color is of immense value to corporations and public organizations. Once positioned in the market place — institutions will vigorously defend their intellectual real estate in court (Kahn, 2006, p. 7). Why? Color identification is instantaneous. The brain will register the color before reading text or a tag line (Jackson, 2006, p. 14). Scientists believe that some color forms of objects are encoded on the brain for future and immediate recall (Patel, Blades & Andrade, 2002, p. 965). Further, color imprints on the psyche to when connected with various hues.

COLOR ASSOCIATION

Jacobs (1991, p. 21) found that students in the United States infused the color black with the attributes expensive and powerful, blue with dependable, trustworthy and high quality, red with love, purple with progressive and inexpensive, gray with dependable and high quality, and yellow with happy. Further, Bottomley and Doyle (2006, p. 63) discovered that consumers had strong preferences for specific color combinations connected with products and occupations. When color is combined with the right preferences, product marketing is exponentially more influential (Lee & Barnes, 1990, p. 25). If used incorrectly, color will ruin an advertising campaign (Ricks, 1983, p. 60). When carefully researched and implemented correctly, color profoundly affects the success of the advertised product (Clarke & Honeycutt, 2000, p. 255). Hattwick, Needham, and Olsen (1950, p. 3) note:

Color...is a tool which can do greater harm than good if indiscriminately used. The advertiser who chooses colors on the basis of broad generalizations of personal bias is in danger of making gross mistakes.
“You never want to get on the wrong end of a color trend (‘If You Can’t Rebuild It, Repaint It’, 2005, p. 25).” The effect of understanding appropriate color has other application as well. Advertising copy claims are reinforced dramatically when married with appropriate color (Meyers-Levy & Peracchio, 1995, p. 121). Ping (2005, p. 5) comments:

Color is the marketing tool. People are always making buying decisions based on what color a projects. This is true of everything from office furniture to a bag of chips.

Trent (1993, p. 4) has observed that corporations who know target market color are able to maximize profits by trimming product lines to only sell high volume items. Color expert James Martin (2005, p. 5) explained “with a small investment, a new paint job can add thousands of dollars to the selling price of a house.” Marketers who understand consumers’ associations to various colors can take advantage of the associations by matching products to colors (Grossman & Wisenblit, 1999, p. 78). By changing the chips in their laundry detergent from red or yellow, colors perceived to damage or dirty clothes, blue (a “clean” color) chips in Cheers laundry detergent dramatically boosted their image of cleaning ability (Heath, 1997). This utilization of color association has become so ingrained that some markets or products have “typical” colors associated with them (Martindale & Moor, 1988, p. 661). This is true for the scrubs market where sea foam green and ceil blue have been the predominant colors since the 1970s.

Color is complex, it has both an arousal and an evaluative element (Crowley, 1993, p. 59). Color can have an effect when subtle and nuanced, or when loud and overstated. Because of this - it has a multi-dimensional effect on the psyche
This complex interplay leaves few hard and fast rules for manipulating emotion. Color selection is a distinctly human endeavor. Many researchers have attempted to carefully craft rules for universal color harmony (Lo, 1936, p. 617). However, attempts to empirically create color harmony have met with disaster (Burchett, 2002, p. 28).

Eynseck (1941, p. 385) found that broad color ranges could be correlated to men and women, but specific color targetization was problematic. Moreover it is unwise to assume that specific hues will always appeal to a specific population segment (Whitfield, Wiltshire & Genetic, 1990, p. 387). Harmonizing colors is even more questionable. A background in color theory combined with intuition and a keen sense of aesthetics are needed to create huge harmony. Almost all adults know the names of the eight basic colors: red, blue, yellow, orange, green, purple, pink, and brown, but are quite unclear about how to mix and match colors to affect others or themselves (Burton, 1984, p. 40).

**PSYCHOLOGY/PHYSIOLOGY**

Why is color so powerful? One reason is color takes advantage of human physiology and psychology. Human beings are built to react to color. Over 80% of the sensory experience is visual (Sharpe, 1974, p. 10). Our bodies absorb light and color through the skin and react to color in our environments while our brains constantly evaluate and react to the color taken in by the eyes (Mahnke, 1982, p. 11). Light comes in through the eyes and the sensation of light is received in two areas of the brain: the cerebral cortex and the hypothalamus (or midbrain).
The cerebral cortex is the center of cognitive activity. It receives information and processes it: recognizing, identifying, and structuring a response to each stimulus. The midbrain controls the internal environment of the human body...It also stimulates glands that control the production and release of hormones. When the brain is stimulated by a thought, mental image, or outside stimulus (like light), the midbrain triggers the release of hormones. This response means that a color stimulus has an effect on the strongest human needs and emotion--stress, hunger, thirst, and sex (Holtzschue, 2002, p. 37).

Color has been linked to a myriad of positive effects on the body. Perceived sweetness of a food or liquid can be modified by color (Alley & Alley, 1998, p. 561). Kiddo (2000, p. 254) asserts that,

red energizes the liver, scarlet increases blood pressure, purple lowers blood pressure, orange strengthens lungs and increases calcium metabolism, green activates sympathetic nervous system, and yellow energizes the alimentary tract.

Experimenters found that the color pink inhibits muscle strength while the color blue enhances it—even when suggesting the opposite to test subjects (Smith, Bell, and Fusco, 1986, p. 289). Painting testing center walls pastel colors, instead of traditional white, significantly increased student test scores and feelings of well being (Phillips, 2004). Furthermore, students uniformly performed worse on exams when writing on primary blue paper vs. pastel papers (Tal, Akers, Hodge, & Tal, 2008, p. 26). When questioned about three vignettes concerning the verdict about a murder or rape case, college students at the University of Utah answers
were substantially different depending on the color of questionnaire paper. (Weller & Livingston, 1998, p. 433).

LeMaire, Short, Ross-Stewart, and Short (2007, p. 180) tested athletes and found that they viewed competitors wearing black as “meaner” and competitors wearing red as “stronger.” Interestingly enough competitors who wear black are 6% more likely to be called for a penalty (Sporting Black, January 2007). In the case of a competitor wearing blue and a competitor wearing white—research suggests that the white garbed athlete may be intimidated by the blue, especially a bright blue (New York Times, 2008, March 10). In a study over the last 55 years of English football, Attrill and Gresty (2008, p. 577) discovered that teams wearing red won their matches more often than any other color, and that teams wearing white did better than teams wearing yellow. Color identifies your team or tribe, but for millennia it has also identified a person’s function—like a priest wearing black (Nibley, 1992, p. 103).

What is the color of productivity? Blue chip companies tend to use gray for much of their office decor and some observers correlate this to the high degree of company productivity (“Grey—the color of productivity?”, March 2000). This is in contrast to a study done by Xerox of 1,223 office employees -- 60% of the respondents said they would add color to their work area if allowed (Immen, 2006, p. 7). Babin, Hardesty and Suter (2003, p. 541) found as far as retail environments blue interiors were viewed the most favorably by consumers and orange was much less favorable.

Color is closely linked to iconic memory (Banks & Barber, 1977, p. 536) and is a major retrieval mechanism for adult memory (Tavassoli, 2001, p. 104). Objects,
words, and their associated color appear to be bound together in the memory to aid comprehension (Keele, 1972, p. 245). Color aids perception and the memory of that perception (Hendon, 1973, p. 28). Color can also have an audible connection -- Klink (2000, p. 143) found that products containing brand names with higher frequency sounds are perceived as lighter in terms of color.

Affiliation between color and emotion is so strong that Birren (1956, p. 60) has suggested that emotion and color are so closely liked that they could be considered hard wired in the brain. Indeed, studies on the neural basis of language have suggest that there may be separate neural structures for the perceptual, categorical, and semantic aspects of color (Moran & Desimone, 1985, p. 782). Other research has demonstrated synaesthesia of higher frequency sounds associated with lighter colors and lighter shades of the same color (Marks, 1997; Jacobson & Waugh, 1987). Payne (1958, p. 725) discovered that perceived weight is linked to color. Darker colors are considered to “weigh” heavier than their lighter counterparts.

The brain is not the only part of the body designed to perceive and understand color. Human eyes are particularly well adapted for viewing color. They pick up contrasting values and colors easily and provide the brain with instant information for evaluation (Schindler, 1986, p. 69). Eyes use color for anticipatory and attentive tasks, mental concentration, and searching (Derefeldt, Swartling, Berggrund & Bodrogi, 2003, p. 171). When processing complex visual information, color greatly speeds comprehension (Derefeldt, et al., 1999). It also reduces the amount of effort required to process information (Hughes & Creed, 1994, p. 1871) and increases mental cognition and awareness (Ressing, Soltz, Barry & Hartsock, 1994, p. 2).
Color also reduces reaction times to complex stimuli (Giselmann, et al., 1998). It also doubles the amount of images that can be recalled by a subject and significantly prolongs accurate recall of those images (Suzuki & Takahashi, 1997, p. 25). Color categorizes what is seen. This classification is immensely helpful, but it is not the whole story. Color also gives context to categories thus making them much more meaningful, memorable, and personal (Sholl, 1996, p. 14).

DEVELOPMENTAL COLOR

Color recognition begins early. Babies as young as six months old are able to show preferences between several shades of the same color (Meyers, 1908, p. 253). Moreover, small children display differences in color preferences between the sexes early in life (Hoyenga & Wallace, 1979, p. 93). Toddlers can begin to name colors at sixteen months of age with a majority of children beginning to start correct matching of colors and their names by their second birthday (Bateman, 1915, p. 467). By the age of two or three boys and girls will demonstrate knowledge of sex-role stereotypes with regard to color. (Kuhn, Nash & Bmcken, 1978, p. 450). And from around age six on, children’s sex-role color preferences will match fairly closely to adult sex-role stereotypes (Picariello, Greenberg & Pillemer, 1990, p. 1453). From the beginning of life girls show a greater capacity for color discrimination than boys -- a competency gap almost never overtaken by most boys (Baldwin & Stecher, 1925, p. 125). Between the ages of two and six children’s ability to name and match color correctly will go from 25% to 97%, however this learning curve for color will slow down after age six and thereafter proceed with sporadic jumps (Cook, 1931, p. 303).
Children will often prefer particular foods based on color, young children preferring yellow and orange (Lowenberg, 1934, p. 50). Further, of all the sensory attributes of food: texture, flavor, shape, temperature, appearance, aroma, and color — color plays a major role (Moskowitz, 1978, 157). Likewise, if all other factors are equal: taste, shape, etc. - color will be the deciding factor for food choice (Walsh, Toma, Tuveson & Sondhi, 1989, p. 645). Birren noted that the most appealing colors of food in general were red, orange, and clear green (Birren, 1956, p. 92).

Children have distinct emotional associations with color. Boyatzis and Varghese (1994, p. 77) found that when read a sad story, children would color with a brown crayon, and a yellow crayon when read a happy story. Even though there is wide interpretation in the symbolism of color from culture to culture, disparity in interpreting color does not seem to manifest itself prominently until the pre-teen years (Stewig, 1974, p. 1012). However, once the child matures, the prejudices of culture will outweigh individual aesthetic preferences for color selection (Fong, 1965, p. 110).

Color preferences for children change frequently. From the ages of three to eight their favorite color will move through the spectrum from red and settle to blue (Garth & Porter, 1934, p. 448). Then the favorite color will modulate around blue through adolescence and young adult years (Primavera, 1972, p. 128). Popular thinking used to believe that color preference was then fixed until the end of life. However, research demonstrates that partiality for a particular color will remain in flux throughout the remainder of life (Dittmar, 2001, p. 219).
COLOR TEMPERATURE

Color “temperature” dials directly into human physiology and emotion. Preferentially men prefer cool colors while women tend to prefer warm colors (Granger, 1955, p. 3). Cool colors: blues, greens, purples, etc., shut down the pituitary gland producing relaxation, and are considered calming (Krietler & Krietler, 1972, p. 75). A subdued blue was considered responsible for the sluggish sales of Nabisco’s Honeycomb Graham Snacks (Ramirez, 1990, p. 1). Subsequently the package was redesigned and relaunched with better sales.

Cool colors are very sedating. For example: adults in a research study were asked to pick colors that would help them relax at home. Most of the colors picked for large areas of the house were cool (Manav, 2007, p. 144). Cool colors have consistently demonstrated a pleasant and relaxing effect in home decor (Janssens, 2001, p. 17). One reason for this is color is connected with emotion (Bellizzi, Crowley & Hasty, 1983, p. 21). It evokes a palpable perception of atmosphere (Kotler 1978, p. 49). Moreover, Cimbalo (1978, p. 303) tested association between colors and emotions, and designated yellow, orange, and blue as happy colors, and red, black and brown as sad colors. Lightness and chroma of the color will also have a marked effect in evoking emotion also—sometimes being more important than the effect of the color itself (Xin, Cheng, Taylor, Sato & Hansuebsai, 2004, p. 451). Indeed Swedish researchers found that chroma was so important in emotional response that the question should not be “which color is more arousing?” but “which saturation of color is more arousing?” (Porter, 1990, p. 33).

Warm colors: reds, yellows, oranges, etc., activate the pituitary gland, stimulate all physical appetites, the psyche, etc., and are considered arousing (Birren,
Great art demonstrates this vividly. Edvard Munch’s most famous painting *The Scream* (a painting of a person overcome with existential angst) was inspired by “clouds stained red, as if with blood. I felt as though the whole of nature was screaming… I painted that picture, painting the clouds like real blood. The colours screamed (Stang, p. 90).”

Alzheimer’s patients with dangerously low appetites have been coaxed to increase their eating by serving food to them on plates with warm colors (Jager, 2004, p. 16). Bellizzi and Hite (1992, p. 347) discovered that red colored backgrounds in stores consistently created arousal whereas blue did not. Red appears to make time pass quickly, which is one reason casinos use it so prevalently (Argue, 1991, p. 7). Walters, Apter, and Svebak (1982, p. 193) found that red in print advertisements consistent produced excitement in the viewer. One caution should be noted—warm colors can be overdone, and over arousal leads to irritation. McDonald’s use of a highly saturated red in their restaurants is so provocative that many customers have complained of headaches. This caused McDonalds to desaturate the red to less arousing pastel shade of red (Von Bergen, 1995, p. 1). The warmer the color and the more saturated the color—the greater the physical and emotional arousal (Gorn, Chattopadhyay, Yi & Dahl, 1997, p. 1387).

The influence of warm colors are especially pronounced with food. The effect of color in food is enormous. It enlivens and enhances the sense of taste, appeals to beauty, and reinforces the gestalt of eating experiences (Kulman, 2001, p. 56). Strain (1968, p. 1030) found that color magnified the number of food choices to appear greater than the number that actually exist. Scanlon (1985, p. 314) demonstrated adults preferring different colors of cheese, even when taste
between the cheeses could not be distinguished

The emotional and physical effects of colors will need to be taken into consideration when dealing with scrubs colors. Health professionals will be reacting to the colors of their colleagues as well as the colors they wear. Patients will react to the colors doctors and their cohorts don. While it is beyond the context of this study to try to understand all the complex interplay color causes between patient and doctor, attitude bias caused by color should be able to be observed.

INVolvEMENT IN DECISION MAKING

The level of decision involvement for product purchase plays a major role as to how much sway color will hold on the final choice (Zaichkowsky, 1986, p. 4). Consumer behaviors are very different for low involvement (few variables involved) vs. high involvement (many or complex variables) decisions (Beatty & Kahle, 1988, p. 5). Some of the reasons for high involvement are: social risk, economic risk, reliability, comfort, and functional performance. Kardes (1988, p. 225) has noted that when simple factors are involved (low involvement), consumers make decisions based on very little information. Hence when a purchase decision is low involvement and there is little differentiation from product to product - color becomes a primary factor for choice (Grossman & Wisenblit, 1999, p. 78). This was validated in a study by Middlestadt (1990, p. 244) who found that consumers picked one product over another (the same product) because one product was lit with a blue light and the other with a red light. Because scrubs are a low involvement product, and there is very little differentiation between different brands of scrubs. The prediction for this scrubs color survey is that color will be a major factor in scrub choice for medical
professionals.

**SCRUBS VS. FORMAL WEAR**

A recent blog illustrates the friction between scrub wearers and those in favor of formal attire. A physician wearing scrubs, while working a 30 hour shift, was lambasted by another doctor for not wearing a dress shirt, tie, and white coat. Both doctors exchanged heated remarks and Medline journal articles supporting their point-of-view. The doctor in scrubs wrote about the experience on his blog and appealed to the larger medical community for their input and received some of the following comments:

Kathryn

Personally I really don’t care what doctors (fake or real) wear as long as they listen to me. I hate it when they don’t listen...it has nothing to do with attire.

FunkyBrownChick

My preference is a white coat or scrubs. Scrubs seem more personal. If my doctor showed up in a suit and tie, I’d get a little freaked out because, silly as it may sound, I’d think s/he was trying to add a little distance from the patients. *ME* doctor. *YOU* lowly patient.

Sneha wrote:

I’m a med student in Australia. The only time we EVER wear scrubs is if we are actually in the theatre. All staff and students are forbidden to wear scrubs outside the theatre section of the hospital.
So therefore I’d say, shirt and tie, although at night I’d say forget the tie, but still wear a shirt and slacks. The only time we can dress “comfortably” is in emergency on the weekends. Oh and we never wear a white coat - only the orthopedic surgeons insist on white coats, in my hospital anyway. What is it with you American’s and white coats? (Bob Jones, (2006). Clothes Make the Man, Retrieved January 31, 2008, from Ah Yes, Medical School, Web site: http://ahyesmedschool.blogspot.com/2006/03/Clothes That Make The Man).

Over 138 respondents weighed in with fairly partisan comments. Each comment was examined and rated: for wearing scrubs all the time, against wearing scrubs, or indifferent. Of the 138 respondents 62% preferred scrubs, 20% preferred formal medical wear, and 18% didn’t care about clothing choice. (see Appendix B)

IS APPEARANCE IMPORTANT TO PATIENTS?

For patients, the first impression of medical personnel is usually made by the clothing worn by the caregiver. This impression is critical, for in the brief moments of introduction, a patient will make several judgements. First, is my caregiver competent? Second, can I trust this stranger with sensitive personal information? And third, can I relax and let my guard down and allow this unknown person intimate contact with my vulnerable body?

Gaining patient trust is crucial to the healing process. If proper trust is not established an unhealthy cycle may follow. A patient may not make full disclosure to their doctor. This in turn will lead to an incorrect or incomplete diagnosis. Healing or remedy is only partially achieved, and this leads back to
decreased confidence in the healer, with the cycle repeating.

This begs the question, “How does one recognize a competent doctor, dentist, nurse, or other medical professional?” And once recognized, what in appearance signifies medical skill and authority? For the last fifty years, for men, the most professional medical wear has been a dress shirt with a tie and a white lab coat worn over the top. A set of scrubs with a white lab coat worn over the top of the scrubs is also seen as very professional. For women in the medical profession, a business suit with a white lab coat worn over the top is considered the most formal medical dress. This is followed by scrubs with a white lab coat worn over the top (Short, 1993, p. 270).

Formal medical attire would have been the norm in the 1940s and 1950s but as societal and social standards of formality have relaxed, so have medical clothing standards. Many doctors themselves have started pushing back on the standards previously imposed on them. Some physicians now argue that restrictive clothing standards increase physician discomfort and may hinder performance (Bell, Cardello & Schutz 2005, p. 308). Further, some doctors argue that formal medical wear is hot, unhygienic, and creates a barrier between them and their patients (Watson & Chapman, 2002, p. 1209).

FORMAL VS INFORMAL MEDICAL WEAR
The pressure for formal prescribed “doctor wear” has a long tradition and is first noted by Hippocrates. (Hippocrates, 1923). The white coat in medicine was first documented in 1889 and was used both by laboratory scientists and surgeons to prevent contamination. From both the operating theatre and laboratory it became
imbued with sense of power and scientific authority. (Blumhagen, 1979, p. 111).

Of the few studies carried out on the effect of clothing between medical practitioner and patient, several conflict in their findings. Not surprisingly, there is also a difference of opinion on medical dress between international cultures. And lastly, the age of the patient demonstrates a remarkable difference in how the patient wants the doctor to be attired.

In an Israeli study on physician appearance to patients 75% of the patients surveyed that “the attire of their physician had no influence in choosing their family doctor” (Menahem and Shvartzman, 1998, p. 391). However, half of the patients surveyed noted that they preferred their physician to wear a white coat, and older age patients had an increased preference for white coats. An American study done on medical attire found:

Respondents overwhelmingly favor physicians in professional attire with a white coat. Wearing professional dress (i.e. a white coat with more formal attire) while providing patient care by physicians may favorably influence trust and confidence building in the medical encounter. (Rehman, Nietert, Cope, Osborne Kilpatrick, 2005, p. 1279)

Indeed American medicine has a long held view that formal wear in a medical setting is much better than informal wear. (Blumhagen, 1979, p. 111). Doctors are repeatedly counseled:

the physician’s dress should convey even to his most anxious patient a sense of seriousness of purpose that helps to provide reassurance and
confidence that his or her complaints will be dealt with competently...
Casual or slovenly dress is likely to convey, rightly or wrongly, casual or inattentive professional handling of their problem. Such a patient may respond in an inhibited manner, fail to volunteer information, refuse to carry out recommended diagnostic or management programs, fail to keep appointments, and be uncomfortable enough to seek help elsewhere. (Kriss, 1975, p. 1024)

American tradition also holds that whether in a clinical or emergency setting, the doctor can always be recognized as the one wearing formal attire under a white coat. (McNaughton-Filion, Chen, and Norton, 1991, p. 208). But research testing this long held theory does not hold up under testing (Brewer, Key, and O’Rourke, 2004, p. 257) American formality in dress is in stark contrast to Australian doctors who prefer “business casual” wear in their clinics and reserve scrubs for the operating room (Watson and Chapman, 2002, p. 1209).

Residents of Great Britan were split on the issue of formal wear with a slight majority favoring it over scrubs (Dover, 1991, p. 293). At the same time there is a trend among British doctors in hospitals to abandon the white coat and move towards informality in dress (Tiwari, Abeysinghe, Hall, Perea, Ackroyd, 2001, p. 343). Scandinavia, with Denmark excepted, is in lockstep with the stance of Americans and Japanese that formality in medical attire is best (Anvik, 1990, p. 91).

While older patients clearly prefer formal wear with a white coat, medical professionals working with young patients face a different challenge. Namely, when children see a white coat or an adult in formal dress, their anxiety level
about imminent medical procedures skyrocket (Walker and Tolentino, 2007, p. 201). The obvious solution for this would be for the medical professional to “dress down” to ease children’s fears. However, some health care professionals believe that when they “dress down” they will not be taken seriously by the children’s parents (Manno, Rosenfeld, Narula, Karakurum, 1991, p. 98). The only age group that appeared indifferent to the medical specialist’s appearance were adolescents (Neinstien, Stewart, Gordon, 1985, 456).

The location for wearing formal (shirt and tie) vs. informal (scrubs) medical vestments was consistent with most patients surveyed by researchers. In emergency settings patients did not care about the accoutrements of their health caregiver (Pronchi, Sexton, Melanson, Patterson, Heller 1997, p. 451). Patients were primarily concerned with the speed and efficiency of treatment and were not focused on health care worker clothing (Taylor 1987, p. 426).

Not only are physicians and other medical personnel concerned about looking professional to patients and the public in general, but they are also concerned with insuring that their clothing choices do not transmit infection. Some regulations have been enacted by hospitals and other organizations who are troubled with the idea of cross-contamination between patients. But the rules and governance actually make a difference in sterility?

DITCHING THE DIE, WHITE COAT

Mandating health care professionals to wear a tie and shirt may actually hinder sterility efforts in the workplace. Loh, Ng, and Holten (2000, p. 65) found that the sleeves and pockets of formal medical wear (white coats) were very likely to be contaminated with the bacteria Staphylococcus Aureus.
Another surprise was the necktie a major carrier of infection (Dixon 2000, p. 250). The MSRA and clostridium difficile microorganisms are often carried from one patient to another, much like a bee pollinating flowers, as the tie comes in casual contact or brushes against someone. This happens almost imperceptibly as the medical practitioner moves through their rounds (Hayes, Lim, Glancy, & Prasad 2007, p. 442). A British investigation noted:

Wearing a tie may enhance patients’ satisfaction and confidence, say critics, but a dangling tie also substantially increases the risk of passing infection from one patient to another. “There is no point being very careful about gelling your hands between patients if your tie has just landed in something nasty and then landed on the next patient,” said specialist registrar Jim McCaul (Dobson, 2003, p. 1231).

A similar investigation into necktie wear in America found that:

almost half the neckties worn by doctors in a New York hospital carried pathogens, compared to only 1 of 10 ties worn by security guards in the same hospital....Twenty of the 42 clinicians’ neckties carried pathogens, including *Staphylococcus aureus*, *Klebsiella pneumoniae* and *Aspergillus* (Comeau 2004, p. 440).

This cross contamination is far from innocuous. In Great Britain alone the penicillin resistant *Staphylococcus aureus* (MSRA) and *Clostridium difficile* are responsible for the deaths of over 5000 patients per year. In addition, it costs the British government $1.7 billion dollars per year in health costs (Day 2006, p. 440).
COLOR MEANINGS

Colors have inherent meaning associated with them. Colors are a part of that unique group of symbols that are more than symbols. For example: white represents purity, freedom from stains, cleanliness. But white actually is free from impurity and pollution. It actually is clean. Some of this meaning transfers to various hues better than other, but the symbolism is always there. Symbolism may also be connected to a particular historical, practical, or psychological source. A color association may be derived from the physical environment: the blue of the sky or sea, the green of the forest, the yellow of the desert etc. Color meanings can also be taken from nature: the black and red of a wasp and black and orange markings of a South American Poison Arrow frog both warn of the dire consequences of interaction (Pentak & Roth, 2004, p. 138).

Kandinsky (1994) stated:

> generally speaking, color directly influences the soul. Color is the keyboard, the eyes are the hammers, the soul is the piano with many strings. The artist is the hand that plays, touching one key after another purposively, to cause vibrations in the soul. (p. 369)

One note of caution with color in regard to epistemology must be noted. In many cases we assume that our conceptions and definitions of colors are the same as today and have existed throughout history. This is not the case as color symbology has changed radically from generation to generation (Pastoreau, 2001, p. 9). Further, the ancient names of the colors were cause for confusion. “The Latin *flavus*, meaning “yellow” is the etymological root of the English *blue*, French *bleu*, and German *blau*. (Ball, 2001, p. 16).
Some color meanings are arbitrary and developed relatively late in the history of the world i.e. - Catholic liturgical colors beginning in the 9th century (Nibley, 1992, p. 93). Color symbolism may be cultural with symbolism crossing several cultures - i.e. yellow for the sun, red for fire, etc. Other symbolism may be developed by cultural iconography - the Virgin Mary in Medieval and Gothic art with her blue robe symbolizing her heavenly and celestial presence (Koenig, 2003, p. 240). It is critical for designers to select color appropriate and complimentary to the design at hand. Therefore, it is incumbent upon the designer to understand the ties between colors and their meanings. Otherwise, a designer might select symbolism wildly inappropriate to the design and harm an otherwise good design.

**REDS**

Red is a primary color. It is one of the oldest colors used by man. Researchers “found that in some 90 primitive languages with few color words, the third most common colour word (after black and white) was always red (Scholl, 1996, p. 14).” Walch and Hope (1990, p. 220) note that red is an attention getting color. Blood, life, love, and emotion are all red (Sweet, 1992, 16). “The most physical color in the spectrum, red suggests the very ebb and flow of life.” (Eiseman 2000, p. 7) It’s vivid hue grabs the attention of every eye.

Red is the color of blood and life and is associated with the appetites of life. Red has a marked physiological effect on the body (Costigan, 1984, p. 24). Red is arousing. When viewed it stimulates the adrenal glands, activates Galvanic Skin Response (sweat glands) and turns on bodily appetites (Davidoff, 1991, p. 120). It also kicks the body into fight or flight mode (Nakshian, 1964, p. 143).
Red may be perceived as lively and exciting or demanding and aggressive. Men generally see red as aggressive while women see it as sexy (Paul, 2002, 30). It can also signal danger (Buxton, 2001, p. 24). It connotes fire and bloodshed. It’s a warning signal that’s imprinted and reinforced generation after generation. Red is the color with the most energy (Boyle, 2000, p. 70).

Bright red is associated with men, dark red with women. It suggests victory, impulsivity, ardor, and freedom. (Chevalier & Gheerbrant, 1996, p. 794). It is the color worn by Catholic cardinals denoting their connection to royalty (Tucker and Malleson, 1900, p. 449). Red can also represent the blood of death and is the color often worn by the executioner. (Scott, 1967, p. 58). Until the 1800s red was the most frequent color of the bridal gown when white started coming into fashion. (Varichon, 2007, p. 27).

A recent study of college students linked red with evil and Satan as well as red hearts, love, Valentine’s day, and lingerie (Nas & Helen 2004, p. 396). Red is about speed and delivery (Sweet, 1996, p. 13). Red is also bonded to hate, vanity, excitement, dynamic, stimulating, powerful, courageous, impulsive, adventurous, demanding, stirring, spontaneous, motivating, violent, warlike, temperamental, and the antagonistic. Much more subtle than the pure reds, the maroons, burgundy and rich reds add a degree of sophistication and depth. Dark reds suggest earthy, warm, strong, sturdy, established, rich, elegance, refined, tasty, expensive, maturity, sumptuous, cultivated, luxurious, and robust. (Eisman, 2006, p. 7)

Pink is much softer than red and carries less emotional weight. It is associated with young girls, flirting, sweetness of character and taste, tenderness, babies,
romance, femininity, softness, delicacy, affection, and attention getting (Eiseman, 2006, p. 11) One reason for this is the preference of younger people preferring warm colors vs older people who prefer cool colors (Benson, Bruce, & Hogg, 2000, p. 118). Vivid and hot pinks connect to the same energy and spirit as red. They too are energetic, youthful, kinetic, and suggest abandon. (Eiseman, 2000, p. 23).

**ORANGE**

Orange was anciently associated with royalty in Europe but became a class modifier by its heavy use in the early 20th century. It denotes commonality, perhaps because “many of the names attached to various shades of orange are also the names of foods: tangerine, nectarine, melon, mandarin, carrot, pumpkin, persimmon, and the glowingly edible nasturtium flower.” (Eiseman, 2007, p. 14) It’s meanings lean to nuturing, soft fuzzy, tactile, delicious, fruity, sweet tasting and smelling, inviting, warm, comfort, intimacy, modesty, embracing, energizing, It is considered the point of balance between the spirit and the libido. (Chevalier & Gheerbrant, 1996, p. 723). Orange was the color of once white rags cast off, which were adopted by Buddhist monks to show their piety and humility (Baynes, 1888, p. 435).

Orange can signal commonality and accessibility (Lane, 1991, p. 144). Orange is lively, energetic, and extroverted (Mahnke, 1996, p. 123). It also suggests: desire, juicy, tangy, fun, whimsical, happy, glowing, sunset, hot, active, friendly, good-natured, expansive, spontaneous, optimistic, communicative, jovial, sociable, self assured, persuasive, animated, common, loud, frivolous, spicy,
flavorful, pungent, exotic, earthy, wholesome, welcoming, abundance, creativity, invigoration, uniqueness, and unbounded energy (Adams, Morioka, & Stone, 2004, p. 51).

BLUE

Like the hue red, blue is one of the cool colors which also provokes physiological response, albeit a calm response. It has a long association with religion and spirituality. Mary, the mother of Jesus, was typically depicted in blue. This was due to the early paint pigments of blue made from crushed Lapis Lazuli - a precious stone. Due to the scarcity of the stone, blue was the most expensive color and was reserved for the most important part of the painting - typically the Virgin Mary’s clothing (Ball, 2003, p. 216). Although not prominently featured in early Christian or Medieval art, blue gained tremendous prominence, popularity, and prestige when king Henry III and Saint Louis began wearing blue, a custom that previous kings almost certainly did not practice. (Pastoreau, 2001, p. 62). As the hue deepens in shade it gains authority and credibility. Blue represents:

calm, quiet, patience, peace, cool, water, cleanliness, calm, heavenly, constancy, faithfulness, true, dependable, restful, contentment, tranquility, reassurance, trust, serenity, expansiveness, openness, infinity, transcendence, distance, energy, brisk, vibrancy, flags, stirring, impressive, aquatic, high spirits, exhilaration, geniality, liveliness, sprightliness, conviviality, cordial, credible, authoritative, basic, conservative, classic, strong, reliable, traditional, uniforms, service, nautical, loyal, confident, professional, though-provoking, introspective, aids concentration, clarify thoughts, aloof, distant, sick, melancholy. Blue is connected with comfort and security (Wexner, 1982, p. 434).
One tradition about blue says:

It has long been said that where children are concerned it is always, ‘blue for a boy and pink for a girl.’ The origin of this distinction stems from the Middle East. Blue is the colour of heaven, the sacred colour of all that was wonderful, it was the colour that was assigned to the beloved male offspring (Sweet, 1997, p. 15).

Blue symbology spans the gamut. Two examples will suffice: with both earthy and aristocratic connotations. The term “blue movie,” “blue jokes,” and “blue web sites,” i.e. pornographic material derive from the abandoned practice of making convicted prostitutes wear blue gowns when in prison (Paterson, 2003, p. 57). On the other end of the spectrum the term “blue blood” is a translation of the term “sangre azul” claimed by certain families of the Castile who were “uncontaminated” by Moorish or Jewish admixture, probably from the notion of visible veins of people with fair complexion (The American Heritage Dictionary of the English Language, Fourth Edition. 2006, p. 221).

BROWN

The Hebrew word for brown (khoom) means “sun scorched. (Paterson, 2003, p. 70). In old English it simply meant “dark.” (Dictionary.com, brown) Brown is the subtractive mixture of the primary colors. Brown is one of the most common hues on the planet. It’s almost impossible to look outside and not see some shade or tint of brown. For that purpose it is associated with nature, earth, warmth, and home. It also symbolizes:
the rugged outdoors, rustic, woodsy, delicious, rich, robust, appetizing, grounded, steady, solid, rooted, wholesome, sheltering, warm, durable, secure, reliable, natural, traditional, supportive, and old (Eiseman, 2006, p. 25).

Brown was often a mainstay of early Christian art depicting mourning, the thus before adopting blue, the Virgin Mary was almost always depicted in dark colors, most often brown. (Pastoureau, 2001, p. 50) Brown is one of the most savory of colors to the palette. Many of the most appetizing foods are brown: chocolate, steak, potatoes, bread, donuts, coffee, nuts, fried chicken, etc. (Walker, 1990, p. 71). Winston Churchill, who started painting during World War II to relieve his stress, once said, “I cannot pretend to feel impartial about colors. I rejoice with the brilliant ones and am genuinely sorry for the poor browns. (Coombs, Churchill & Churchill, 2004, p. 71). Brown was adopted as the Nazi party color and their subsequent rise in Germany was called the “brown revolution.” (Toland, 1978, p. 42). Hitler even went so far as wearing a brown bathrobe with brown silk pajamas, and sleeping in a bed covered with a brown quilt (all with swastikas) (Infield, 1974, p. 142).

**YELLOW**

From the Latin flavus - the root word for blue and yellow. Yellow is one of the three primary colors, a color that cannot be made by mixture. It is the hottest, most expansive, and dazzling of all colors (Chevalier & Gheerbrant, 1996, p. 1137). Kandinsky notes that it is typically “earthy” and must be handled carefully because of its nature to encompass everything. (Kandinsky, Lindsay & Vergo, 1994, p. 181). Yellow has long been associated with the feminine and
neo-Romantic Expressionists cemented this relationship giving making it “soft, cheerful, and sensual.” (Gage, 1999, p. 36)

Yellow has been held closely to prosperity and plenty. The yellow pollen of plants and the yield of corn are both reminders of fertility and bounty. Hence yellow’s incorporation into Egyptian other pantheons. (Massey, 2002, p. 144) Yellow suggests optimism, enlightenment, good health, and happiness (Arntson, 2007, p. 143). Shades of golden yellow carry the promise of a positive future and yellow hints at creativity and enthusiasm (Sensational Color, yellow). Heat, vitality, and light as well as a philosophical ability to see clearly are all associated with yellow (Eiseman, 2006, p. 19). Its first use in the sense of cowardly or the untoward was in 1881 (Online Etymological Dictionary). The flammeum worn by Roman brides were often yellow. It was symbolic of the egg, life, fertility, and the energy of lightning (Sebesta & Bonfante, 1994, p. 56). Similar robes and colors were also worn by the Roman priestesses. Varichon (2007) comments:

to the medieval sensibility yellow was considered a sub-white. From the start of the Christian Era, the color began to embody several negative qualities. In the world of the theater, social climbers and traitors dressed in yellow....starting in the thirteenth century it became the color of madness, so much so that houses were “saffroned’ as a sign of dishonor after rebellions and bankruptcies. p. 70.

GREEN

From the Old English “gréne” and the Old Teutonic root “grô” from which we derive “grass” and “to grow” (Paterson, 2003, p. 186). There are more hues of green than any other color on earth, and our eyes are perfectly adapted to detect
it easily (Zollinger, 1999, p. 123). The Egyptian god of life and resurrection, Osiris, was often depicted in green. Throughout history, green has been associated with vigorous growth, with a tender unripe state, or with youth’s inexperience. (Hope and Walsh, 1990, p. 151). Green symbolizes:


In the Middle Ages physicians wore green robes, allegedly because they used herbs and simples (Chevalier & Gheerbrant, 1996, p. 452). While green became the color of Islam in the East, in Medieval Europe sumptuary laws required people of dubious, dishonest, or dangerous professions: doctors, surgeons, executioners, prostitutes, usurers, minstrels, musicians, beggars, vagabonds, and outcasts, to wear green articles of clothing. (Pastoureau, 2001, p. 91). Green is a color of healing. Muslims of many ages collected celadon green china bowls because they were considered to be alexipharmic (an antidote to poison). Green has been associated with Indian mysticism, Persian poems, Buddhist paintings, and the Romantic period (Finlay, 2004, p. 259). Green has also been used in painting as a sign of life and hope (Gage, 1999, p. 191). It is the color of the vegetable kingdom. Itten (2004) observed:

fruitfulness and contentment, tranquility and hope are expressive values of green, the fusion and interpenetration of knowledge and faith. When luminous green is dulled by gray, a sense of sad decay easily results. If the green inclines towards yellow, we feel the young, vernal force of nature. A
spring or early summer morning without yellow-green, without hope and joy for the fruits of summer is unthinkable. If the green inclines towards blue, its spiritual components are augmented. (p. 136)

PURPLE

The mixture of blue and red and complement of yellow. From the Latin purpura and the Greek porphyra. (Hope & Walsh, 1990, p. 256). Purple symbolizes:

the romantic, nostalgic, fanciful, lightweight, wistful, sentimental, thoughtful, curative, protective, peace of mind, contemplative, meditative, spiritual, soul-searching, intuitive, mysterious, enchanting, sensual, thrilling, intensely exciting, dramatic, creative, witty, expressive, visionary, rich, royal, prestigious, subduing, distant, and introspective. (Eiseman, 2006, p. 47).

Only worn by royalty, “those next in command would be allowed to wear colors such as gold, silver and red. The hio polloi would not be allowed to wear any color exuberance in the wearing apparel.” (Patterson, 2003, p. 316). In the Bible purple woven into the fabric of the tabernacle and the garments of the priests officiating in the temple to represent the royalty of God (Exodus 28:6; 36:8). Triumphant soldiers in the Roman army wore purple robes in their victory parades and purple became the “color oficialis” of Caesars and emperors with Nero condemning to death anyone who dared wear imperial purple (Varichon, 2007, p. 137). Purple maintained its status as the color of royalty from the Romans to the Middle Ages. Even the venerable Bede posited that purple was emblematic of the color of heaven. (Gage, 1999, p. 73).
Monet (Claretie, 1888) proclaimed, “I have finally discovered the color of the atmosphere. It’s violet. Fresh air is violet. Three years from now everyone will work in violet. (p. 266).

**BLACK**

From the Old English “blæk” which meant “to burn or scorch.” (Dictionary.com). Traditionally black was created by using charcoal. Vine twigs were burned and then splashed with water and ground into a slurry. Or linseed oil was burned in a lamp two or three fingers away from a good baking dish (Hope and Walsh, 1990, p. 41).

Medieval Europeans were terrified of black. Black was associated with affliction, penance, night, the color of sin, fallen angels, hell and the devil. (Varichon, 2007, p. 228). In Chinese culture color was associated with the five primary elements, the directions, and the four seasons. Black was associated with water, north, and winter. (Sensational color, black) Aztec priests wore black robes (often stained with blood) and their faces and bodies were died black to symbolize death, their victims were painted red (for life) and black (for sin). (Smith, 2002, p. 215) A slightly different twist of the red black combination was used in an early version of the abacus, the Chinese used red to symbolize positive numbers and black to symbolize negative numbers (Teresi, 2002, p. 67). Black was the de facto color of the bohemian beatnik wardrobe. Black jeans, jackets, wing tips, sneakers, berets, shirts, and trench coat all signaled a rejection of worldly values (Stover, Himmelein, Robertson & Robertson, 2005, p. 72). Priests and other clerics adopted black dress to symbolize the mystery of the initiation they had undergone and also to symbolize their death as to worldly desires (Bingham, 1856, p. 230). Legal courts were originally created as a branch of the church. The
black robes worn by the priests were adopted by the legal profession and the
tradition remains. (Vandor, 2001, p. 30) Sumptuary laws in Medieval Europe
dictated restraint in dress which promoted the wearing of black. (Pastoreau,
2001, p. 93). Black was not associated with mourning and funerals (in English
culture) until the 19th century. However, once the dyes for creating black
clothing were perfected - black became one of the most trendy colors from that
time forward. (Harvey, 1995, p. 23). Henry Ford, a deep thinker who ascribed to
austerity in dress, offered his model T in black to conform with this old idea of
probity in dress. Black has come to symbolize:

powerful, empowering, elegant, sophisticated, mysterious, heavy, bold,
aesthetic, classic, strong, expensive, invulnerable, magical, nighttime, sober,
prestigious, stylish, modern, depression, death, mourning, underworld,
evil, oppression, suppression, and menacing (Eiseman, 2006, p. 65).

WHITE
White symbolizes: the complete presence of light, ghostly, purity, clarity,
simplicity, innocence, delicacy, silence, peace, and cleanliness (Eiseman, 2006, p.
59). White was often associated with the rich since they were the only ones who
could afford to wear clothes made from white cloth since they needed frequent
washing. (Patterson, 2003, p. 411). Early Christian priests celebrated mass and
other rituals in their ordinary clothes which were made from white or undyed
wearing black for mourning white was the de facto color of mourning attire
(Varichon, 2007, p. 30). In the 18th and 19th century white as a symbol of purity
was reinvented and rejuvenated by upper class women’s adoption of white as a
symbol of icy virtue. (Harvey, 1995, p. 205).
It’s not hard to see how white is associated with cleanliness, purity, and innocence. A white paper, piece of clothing, etc., is pure precisely because it is not dirty. It’s dual symbolic nature is obvious to all who see. Hence the easy transference of white as a symbol of purity into other venues. Christian and other religions talk often cleansing the stained or “scarlet” garments of the sinner from red to white. Frequent mention is made in the Bible (and other liturgical works) of saints washing their garments, stained with sin, white “through the blood of the lamb” (Revelations 7:14). How is this to be? Nibley (1992) explains:

if you mix all the colors together, you have a garment that is perfectly white, meaning that it can take any color. If you combine all colors, all experience, all knowledge, you will get white...But it is the light, and the garment of white, in which all the colors the spectrum are contained (p. 123).
CHAPTER 4

RESULTS

The emotional, psychological, and symbolic draw of color proved irresistible for both patient and medical professional alike. Both groups were keenly interested in color and individuals from both camps asked for final results. The number of respondents was much higher than anticipated. Initially it was anticipated that 75 people would respond to the patient survey, 75 people would respond to the medical personnel survey, and that 25 people would consent to do interviews. The initial contacts about the surveys, both patient and medical, were very enthusiastic about the prospect of discovering how scrub colors were interpreted by others and passed the survey on to others. At final count the numbers were:

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Started Survey</th>
<th>Completed Survey</th>
<th>% Completed Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients (Online)</td>
<td>341</td>
<td>315</td>
<td>92.4</td>
</tr>
<tr>
<td>Medical Professionals (Online)</td>
<td>249</td>
<td>139</td>
<td>55.8</td>
</tr>
<tr>
<td>MakeTool Interviews (In Person)</td>
<td>27</td>
<td>25</td>
<td>92.6</td>
</tr>
</tbody>
</table>

MEDICAL PROFESSIONAL ONLINE SURVEY

Professional work contacts, school colleagues, students, and community contacts were the front line for survey takers. Because of their interest in the final results, many forwarded the surveys onward - somewhat in a underground guerrilla marketing fashion. Several of the Ohio State dental students put the link to the
survey on the OSU dental student e-mail server - as did several medical students. From there the results from the surveys snowballed. Many medical students and dental students took the survey and then forwarded it on to friends at other medical schools. Doctors who were contacted about the survey sent it on to colleagues. This was enormously helpful and eliminated a tremendous amount of potential legwork for seeking participants. The large response was probably due to two reasons. One, the author has a large social and professional network. These friends and associates were willing to help with with an interesting survey topic. And two, the nature of today’s email culture—forwarding email, funny pictures, inspirational thoughts, lists, etc., is a natural part of popular culture now.

One interesting metric between the two online surveys was the rate of response between the two surveys. The patient survey started out quickly - over 200 responses in one day, and then just a few responses every week or so. The medical professional survey started very slowly, and the response rate consistently stayed at about 20 responses a week until the survey period was over. Emails were probably forwarded early on and sat in mailboxes because they were not urgent. The live interviews were somewhat more challenging. There were several challenges with the MakeTool interviews. First, it was very difficult to pull professionals away from their work. Second, once interviewing it was difficult to confine interviews to 15 minutes—because of the impassioned responses. Third, often because of the work area, other interested parties would come to observe the testing, creating an audience. Sometimes this made interview subjects somewhat embarrassed.
SURVEY FINDINGS—PATIENT SURVEY

FINDINGS

In all online surveys both sets of participants selected their answers from sets of radio buttons under the questions. A radio button appears depressed when selected. This clearly let respondents know which answers were chosen. In both the patient and the medical professional surveys only one answer per question was allowed. Only one question was displayed per screen. And participants could move forward or backwards through the quiz with arrow keys at the top of the survey. They were free to move forwards or backwards as they pleased. Further, an answer didn’t need to be selected to move forwards or backwards in the survey. Moving forward didn’t depend on the previous question being answered. The question could just be skipped. Combined with unfettered forward and backward movement, this gave respondents complete freedom over response order for the survey.
1. What is your age?

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18—24</td>
<td>49.0%</td>
</tr>
<tr>
<td>25—34</td>
<td>28.5%</td>
</tr>
<tr>
<td>35—44</td>
<td>12.2%</td>
</tr>
<tr>
<td>45—54</td>
<td>5.9%</td>
</tr>
<tr>
<td>55—64</td>
<td>3.0%</td>
</tr>
<tr>
<td>65—74</td>
<td>1.5%</td>
</tr>
<tr>
<td>75—84</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 1
Patient Results Survey, Age

2. What is your cultural background?

<table>
<thead>
<tr>
<th>Cultural Background</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>European—Nordic</td>
<td>21%</td>
</tr>
<tr>
<td>European—Latin</td>
<td>3.9%</td>
</tr>
<tr>
<td>American—Anglo</td>
<td>63.1%</td>
</tr>
<tr>
<td>American—African</td>
<td>2.4%</td>
</tr>
<tr>
<td>Asian</td>
<td>5.1%</td>
</tr>
<tr>
<td>Latino</td>
<td>3.3%</td>
</tr>
<tr>
<td>Near Eastern</td>
<td>0%</td>
</tr>
<tr>
<td>African</td>
<td>0%</td>
</tr>
<tr>
<td>Pacific</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

Table 2
Patient Results Survey, Background
3. What does this person do?

Table 3
Patient Survey, Seafoam Green Scrubs

4. What does this person do?

Table 4
Patient Survey, Gray Scrubs
5. What does this person do?

Table 5
Patient Survey, Orange Scrubs

6. What does this person do?

Table 6
Patient Survey, Dark Blue Scrubs
7. What does this person do?

Table 7
Patient Survey, Pink Scrubs

8. What does this person do?

Table 8
Patient Survey, Tan Scrubs
9. What does this person do?

<table>
<thead>
<tr>
<th>Role</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery</td>
<td>2.5%</td>
</tr>
<tr>
<td>Receptionist</td>
<td>14.2%</td>
</tr>
<tr>
<td>Dentist</td>
<td>3.8%</td>
</tr>
<tr>
<td>Nurse</td>
<td>27.4%</td>
</tr>
<tr>
<td>Hygienist</td>
<td>17.7%</td>
</tr>
<tr>
<td>Staff</td>
<td>7.3%</td>
</tr>
<tr>
<td>Doctor</td>
<td>1.9%</td>
</tr>
<tr>
<td>Chiropractor</td>
<td>4.1%</td>
</tr>
<tr>
<td>Vet</td>
<td>7.9%</td>
</tr>
<tr>
<td>Dietician</td>
<td>8.2%</td>
</tr>
<tr>
<td>Other</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

Table 9
Patient Survey, Purple Scrubs

10. What does this person do?

<table>
<thead>
<tr>
<th>Role</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery</td>
<td>8.9%</td>
</tr>
<tr>
<td>Receptionist</td>
<td>5.7%</td>
</tr>
<tr>
<td>Dentist</td>
<td>0.6%</td>
</tr>
<tr>
<td>Nurse</td>
<td>6.6%</td>
</tr>
<tr>
<td>Hygienist</td>
<td>6.0%</td>
</tr>
<tr>
<td>Staff</td>
<td>11.7%</td>
</tr>
<tr>
<td>Doctor</td>
<td>2.2%</td>
</tr>
<tr>
<td>Chiropractor</td>
<td>5.4%</td>
</tr>
<tr>
<td>Vet</td>
<td>9.5%</td>
</tr>
<tr>
<td>Dietician</td>
<td>11.7%</td>
</tr>
<tr>
<td>Other</td>
<td>31.6%</td>
</tr>
</tbody>
</table>

Table 10
Patient Survey, Yellow Scrubs
11. What does this person do?

Table 11
Patient Survey, Black Scrubs

12. What does this person do?

Table 12
Patient Survey, Red Scrubs
13. What does this person do?

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery</td>
<td>2.9%</td>
</tr>
<tr>
<td>Receptionist</td>
<td>1.9%</td>
</tr>
<tr>
<td>Dentist</td>
<td>11.0%</td>
</tr>
<tr>
<td>Nurse</td>
<td>24.5%</td>
</tr>
<tr>
<td>Hygienist</td>
<td>7.1%</td>
</tr>
<tr>
<td>Staff</td>
<td>1.9%</td>
</tr>
<tr>
<td>Doctor</td>
<td>44.8%</td>
</tr>
<tr>
<td>Chiropractor</td>
<td>1.6%</td>
</tr>
<tr>
<td>Vet</td>
<td>1.3%</td>
</tr>
<tr>
<td>Dietician</td>
<td>1.6%</td>
</tr>
<tr>
<td>Other</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

Figure 13
Patient Survey, Light Blue Scrubs
1. What is your gender?

- Male: 51.4%
- Female: 48.6%

Table 15
Medical Professional Survey Online, Gender

2. What is your age?

- 18—24: 51.4%
- 25—34: 46.1%
- 35—44: 1.6%
- 45—54: 0.4%
- 55—64: 0.0%
- 65—74: 0.0%
- 75—84: 0.4%

Table 16
Medical Professional Survey Online, Age
3. What is your cultural background?

Table 17
Medical Professional Survey Online, Background

4. Are you color blind?

Table 18
Medical Professional Survey Online, Color Blind

67
5a. What is your favorite color?

Table 18
Medical Professional Survey Online Favorite Color

5b. What is your favorite color—why?

reason categories
1) The color makes the participant feel happy, calm, or secure.
2) The medical professional liked the way the color looked when they wore it.
3) The color reminded the participant of a positive memory.

Table 19
Medical Professional Survey Online, Favorite Color Why
6a. What is your least favorite color?

Table 20
Medical Professional Survey Online, Least Favorite Color

6b. What is your least favorite color—why?

<table>
<thead>
<tr>
<th>reason categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) The color makes the participant feel unhappy, upset, or unsecure.</td>
</tr>
<tr>
<td>2) The medical professional disliked the way the color looked when they wore it.</td>
</tr>
<tr>
<td>3) The color reminded the participant of a negative memory.</td>
</tr>
</tbody>
</table>

Table 21
Medical Professional Survey Online, Least Favorite Why
There was a wide variety of responses to the question: “What type of clothing is the most comfortable for you to wear in a work setting?” Answers could be grouped into two categories: functional wishes for improvements, and favorite clothing types. Many of the participants listed several types of preferred work clothing. Multiple clothing answers like: “business causal; cotton, easy to move in, whether it’s scrubs or more professional attire,” and “Sweats, jeans and hoodies” were not uncommon. Functional clothing requests ran something like this:

    Ideal clothing would be straight or boot cut pants that aren’t too long and that have a low rise thick waist band. Shirts would fit through the shoulders and be long enough to cover my back when bending down.

To give a clearer sense of the data, each individual clothing type was categorized and tabulated. Question seven’s table gives a snapshot of this overview. The most perplexing answer, and most often repeated was “respectable” clothing. Not one respondent gave any more information on what respectable clothing was or what it was about the clothing that made it respectable: cut, color, formality, etc.
One can only infer that the clothing worn was the most appropriate for the situation at hand, but nothing more. A more detailed line of questioning would need to be developed to pursue this further. The “respectable/appropriate” clothing answer was a unanticipated and surprising answer, especially from a population thought to be highly articulate with specialized and large vocabularies.

7. What type of clothing is the most comfortable for you to wear in a work setting?

<table>
<thead>
<tr>
<th>Clothing Style</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-shirt</td>
<td>16%</td>
</tr>
<tr>
<td>jeans</td>
<td>20.9%</td>
</tr>
<tr>
<td>t-shirt &amp; jeans</td>
<td>9.8%</td>
</tr>
<tr>
<td>sweats</td>
<td>8.6%</td>
</tr>
<tr>
<td>business casual</td>
<td>5.5%</td>
</tr>
<tr>
<td>business formal</td>
<td>1.2%</td>
</tr>
<tr>
<td>scrubs</td>
<td>7.9%</td>
</tr>
<tr>
<td>cargo pants</td>
<td>0.6%</td>
</tr>
<tr>
<td>loose clothing</td>
<td>8.6%</td>
</tr>
<tr>
<td>fitted clothing</td>
<td>1.8%</td>
</tr>
<tr>
<td>cotton</td>
<td>3.1%</td>
</tr>
<tr>
<td>soft clothing</td>
<td>1.8%</td>
</tr>
<tr>
<td>respectable</td>
<td>28.2%</td>
</tr>
<tr>
<td>pajamas</td>
<td>1.8%</td>
</tr>
<tr>
<td>athletic</td>
<td>2.5%</td>
</tr>
<tr>
<td>functional</td>
<td>22.1%</td>
</tr>
<tr>
<td>sweater</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

Table 22

Medical Professional Survey Online, Comfortable Clothing
8. How long have you worked around medical professionals?

<table>
<thead>
<tr>
<th>Time (years)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—5</td>
<td>76.2%</td>
</tr>
<tr>
<td>6—10</td>
<td>22.6%</td>
</tr>
<tr>
<td>11—15</td>
<td>0.0%</td>
</tr>
<tr>
<td>16—20</td>
<td>0.6%</td>
</tr>
<tr>
<td>21—25</td>
<td>0.0%</td>
</tr>
<tr>
<td>26—30</td>
<td>0.0%</td>
</tr>
<tr>
<td>31—35</td>
<td>0.0%</td>
</tr>
<tr>
<td>36—40</td>
<td>0.0%</td>
</tr>
<tr>
<td>41—45</td>
<td>0.0%</td>
</tr>
<tr>
<td>46—50</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 23
Medical Professional Survey Online, Time Worked

9. How long have you worn scrubs?

<table>
<thead>
<tr>
<th>Time (years)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—5</td>
<td>89.6%</td>
</tr>
<tr>
<td>6—10</td>
<td>9.1%</td>
</tr>
<tr>
<td>11—15</td>
<td>1.2%</td>
</tr>
<tr>
<td>16—20</td>
<td>0.0%</td>
</tr>
<tr>
<td>21—25</td>
<td>0.0%</td>
</tr>
<tr>
<td>26—30</td>
<td>0.0%</td>
</tr>
<tr>
<td>31—35</td>
<td>0.0%</td>
</tr>
<tr>
<td>36—40</td>
<td>0.0%</td>
</tr>
<tr>
<td>41—45</td>
<td>0.0%</td>
</tr>
<tr>
<td>46—50</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 24
Medical Professional Survey Online, Scrubs Experience
For the question: “what scrubs colors do you like best?” Multiple answers were the norm and not the exception. A typical answer was, “surgical blue, dark green, navy or royal blue, maybe maroon.” For an answer like this each preferred color was counted:

- 1 response ceil blue
- 1 response dark green
- 1 response dark blue
- 1 response maroon

### 10. What scrubs colors do you like best?

<table>
<thead>
<tr>
<th>Color</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>yellow</td>
<td>0.7%</td>
</tr>
<tr>
<td>orange</td>
<td>1.3%</td>
</tr>
<tr>
<td>red</td>
<td>1.3%</td>
</tr>
<tr>
<td>maroon</td>
<td>2.0%</td>
</tr>
<tr>
<td>pink</td>
<td>1.3%</td>
</tr>
<tr>
<td>purple</td>
<td>5.3%</td>
</tr>
<tr>
<td>light blue</td>
<td>59.3%</td>
</tr>
<tr>
<td>dark blue</td>
<td>20.0%</td>
</tr>
<tr>
<td>black</td>
<td>10.0%</td>
</tr>
<tr>
<td>tan</td>
<td>4.0%</td>
</tr>
<tr>
<td>light green</td>
<td>44.7%</td>
</tr>
<tr>
<td>white</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

Table 25
Medical Professional Survey Online, Best Scrubs Colors
The next question was, “should scrubs have a secondary color, if so where?” These answers can be clustered into two modes: yes vs. no, and if yes - where on the scrubs the secondary color should be placed. Those in favor of secondary color indicated the color location like “collar” or “pocket.” The professionals against secondary color had the concern that a secondary color would “complicate” the look of the scrubs. One survey taker summed up the concerns of many with this remark in response:

(should scrubs have a secondary color?) probably not. Maybe as trim on the neckline or hem of the sleeves, but not along the bottom of the shirt or the pants. I don’t tend to like secondary colors because: 1) people may not like the combination of colors that was chosen 2) certain colors being paired together goes (sic) out of style, so the combo can look outdated, or some may not want the combo if they are not up with current trends 3) again, the question/challenge of laundering arises. More colors equals opportunities for the dyes to bleed into each other, or that one color is retained by the fabric better than the other, causing parts of the garment to show aging faster than others.

11a. Should scrubs have a secondary color?

<table>
<thead>
<tr>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>38.7%</td>
</tr>
<tr>
<td>no</td>
<td>50.7%</td>
</tr>
<tr>
<td>don’t care</td>
<td>10.7%</td>
</tr>
</tbody>
</table>

Table 26
Medical Professional Survey Online, Secondary Color
11b. Where should the secondary color be placed?

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>piping</td>
<td>1.3%</td>
</tr>
<tr>
<td>collar</td>
<td>14%</td>
</tr>
<tr>
<td>sleeves</td>
<td>6.7%</td>
</tr>
<tr>
<td>pant seam</td>
<td>3.3%</td>
</tr>
<tr>
<td>borders</td>
<td>2.0%</td>
</tr>
<tr>
<td>pockets</td>
<td>8.7%</td>
</tr>
<tr>
<td>accent</td>
<td>1.3%</td>
</tr>
<tr>
<td>waistband</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

Table 27
Medical Professional Survey Online, Secondary Color Placement

Again the open ended question, “do the scrub colors you wear make a difference to your peers or patients?” had a bimodal response. In quantifying responses the data is broken down into a yes vs. no portion and then an open ended answers tally describing patient/medical professional perception to colored scrubs.

12a. Do the scrub colors you wear make a difference to your peers or patients?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>65.3%</td>
</tr>
<tr>
<td>no</td>
<td>26.7%</td>
</tr>
<tr>
<td>don’t care</td>
<td>8.0%</td>
</tr>
</tbody>
</table>

Table 28
Medical Professional Survey Online, Scrubs Difference
Survey participants who answered yes to “do scrub colors make a difference?” had answers in several categories. First assisting patients by either cheering them up or helping them differentiate staff, second, distinguishing medical staff positions, and third, cheering up or effecting themselves.

12b. Do the scrub colors you wear make a difference to your peers or patients? If so how?

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>helping patients</td>
<td>26.5%</td>
</tr>
<tr>
<td>distinguishing positions</td>
<td>44.9%</td>
</tr>
<tr>
<td>affecting self</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

Table 29
Medical Professional Survey Online, Scrubs Difference to Peers/Patients

Participants had shorter responses to the question, “what color of scrubs should be avoided and why?” Much of the feedback on bad scrubs color was able to be categorized into several areas: difficulty of cleaning, lack of professionalism, see through, and sending the wrong message to patients. Answers ranged from, “black - evil scrubs,” to:

Childish colors, like pink, light purple, yellow, or neon colors; these seem unprofessional to me, but may have a place in pediatrics or obstetrics. Also, white scrubs are just impractical.
13a. What scrubs colors should be avoided and why? Main reasons

- Difficulty cleaning scrubs: 8.6%
- See through: 5.8%
- Lack of professionalism: 5.8%
- Wrong message to patients: 50.4%
- No opinion: 13.7%

Table 30
Medical Professional Survey Online, Avoidance Reasons

13b. What scrubs colors should be avoided and why?

- Yellow: 23.0%
- Orange: 17.3%
- Red: 14.4%
- Maroon: 0.7%
- Pink: 13.7%
- Purple: 7.2%
- Bright blue: 1.4%
- Black: 10.8%
- Brown: 5.8%
- Light green: 2.2%
- White: 23.0%
- Bright colors: 18.7%
- Multiple: 2.2%
- Feminine: 0.7%
- Non-conservative: 5.8%
- None: 19.0%

Table 31
Medical Professional Survey Online, Scrubs to Avoid
The stories gathered from the scrub/story question were limited in scope and duration. Most dealt with getting ribbed by other medical staff and mistaken identity as in the following:

Housekeepers at my facility wear the dark navy blue colors. If any other employees wear the color, it is assumed they are housekeepers which can send the wrong message to patients.

14. Any stories about your scrubs in regards to particular colors?

Table 32

Medical Professional Survey Online, Scrub Stories

In contrast to question 14 there were a plethora of suggestions and responses as to how scrubs could be improved or changed. Answers ranged in length from short suggestions like: “better tailoring would be better. women look like potatos or marshmallows in scrubs because they are not tailored to fit a woman’s body.” Answers generally tended to be quite specific and detailed:
I would appreciate separate female scrubs that are not designed for nurses with cartoon characters, flowers, or multiple colors. I would like to wear solid blue or solid green scrub tops with smaller shoulders and no pockets lower than the breast line because I think they look more professional tucked in. Lower pockets create bulky excess fabric when tucked in. For scrub bottoms, I would appreciate drawstring solid blue or solid green bottoms with an inseam cut for a woman so it doesn’t hang down to the knee and a pocket on the side of one leg at the mid-thigh level that could fold an 8.5 x11 piece of paper folded horizontally. The best scrubs have one back pocket and one side pocket, sewn to be reversible so you have these 2 pockets whether you wear them right-side-out or inside-out. Also, I would never wear an elastic waist. (Scrubs Survey, question 14, response 109)

Like other open ended questions the answers in this section also had responses that multiple answers that could fit in multiple categories, ie. “better fit and warmer fabric.”

15a. What do you think of other options for scrubs: different fabrics, styles, etc?

<table>
<thead>
<tr>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>suggestions</td>
<td>87.8%</td>
</tr>
<tr>
<td>no suggestions</td>
<td>12.2%</td>
</tr>
</tbody>
</table>

Table 33
Medical Professional Survey Online, Scrubs Options
79
To further clarify results four categories for responses were created. These designations are based on somewhat arbitrary categorizations because some answers were so vague. Take for example the response “comfortable.” This could be construed several ways since in this situation comfort is defined by the dictionary as: “a condition or feeling of pleasurable ease, well-being, and contentment.” (Dictionary, p. 41) How is this achieved? It can be argued that a better fit of scrubs would be the key to comfort. But comfort could also be defined as a fabric that is soft on the skin, or keeps the wearer warm or cool. Or is it a blend of the two? In the few cases where just “comfortable” was defined as the best option for scrubs, this response was counted in the fabric category for simplicity in accounting. It could have just as easily be counted in the Fit category. Scrubs made of scratchy burlap bag in the right fit would be just as uncomfortable as silk scrubs two sizes too small. So it should be noted that the numbers in the Fit and Fabric categories are somewhat fluid but generally representative of the responses in those areas.

15b. What do you think of other options for scrubs: different fabrics, styles, etc?

<table>
<thead>
<tr>
<th>suggestion area</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>fit</td>
<td>29.5%</td>
</tr>
<tr>
<td>fabric</td>
<td>39.6%</td>
</tr>
<tr>
<td>function</td>
<td>24.5%</td>
</tr>
<tr>
<td>fashion</td>
<td>9.3%</td>
</tr>
</tbody>
</table>

Table 34
Medical Professional Survey Online, Style Options
16. Now I'm going to give you choices which let you design your ideal in scrubs. First look at the three sets of scrubs in white. What combination of top and bottom would you like to see as your ideal?

Table 35

Medical Professional Survey Online, Scrub Cut Preferences
17. Now look at the chart with 18 different colors of scrubs. To pick your ideal set of colored scrubs select the top and bottom numbers of the scrubs that you prefer. Feel free to mix and match different colored tops with bottoms. Then list your favorite set below. (For example: I might select top 17 & bottom 18 as my favorite color of scrubs, or if I liked two different colors – top 3 and bottom 2) If you have trouble deciding what your favorite colors are, just pick your first, second, and third favorites and list them below.
One note of interest with question 17 was that 10.5% of respondents selected tops and bottoms of different colors for their scrub color choice.

Figure 8
Medical Professional Survey Online, Mixed Scrubs Percentages
SURVEY FINDINGS—MAKE TOOL INTERVIEWS

The “do” of the Make-See-Do paradigm of testing was done by interviewing local medical professionals about their backgrounds, color preferences, and work experiences. It was essentially the same interview as the online interview, but with the addition of a MakeTool. The MakeTool in this case was foamcore dolls with velcro strips for adding laminated colored scrubs top and bottoms. This allowed for tactile interplay and kinesthetic processing when making color decisions.

The interviews typically took about ten minutes to complete, due to the time constraints of the medical professional. However, some of the interviews were considerably longer. Often after a participant had completed the study, they would get a colleague to do the study so they could compare results. All participants were keenly interested in the study and made the researcher swear “upon pain of death” to share the results of the study.

Lighting was always a concern as it was never consistent. Interviews were always in different locations, usually in a medical office. Some interviews were in the medical professional’s home, and some were completed outside while medical students were taking a break from clinic work.
1. What is your gender?

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>58.0%</td>
</tr>
<tr>
<td>Female</td>
<td>42.0%</td>
</tr>
</tbody>
</table>

Table 36
Medical Professional Survey MakeTool, Gender

2. What is your age?

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–24</td>
<td>21.0%</td>
</tr>
<tr>
<td>25–34</td>
<td>53.0%</td>
</tr>
<tr>
<td>35–44</td>
<td>16.0%</td>
</tr>
<tr>
<td>45–54</td>
<td>10.0%</td>
</tr>
<tr>
<td>55–64</td>
<td>0.0%</td>
</tr>
<tr>
<td>65–74</td>
<td>0.0%</td>
</tr>
<tr>
<td>75–84</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 37
Medical Professional Survey MakeTool, Age
3. What is your cultural background?

Table 38
Medical Professional Survey MakeTool, Background

4. Are you color blind?

Table 39
Medical Professional Survey MakeTool, Color Blind
5a. What is your favorite color?

Table 40
Medical Professional Survey MakeTool, Favorite Color

<table>
<thead>
<tr>
<th>Reason Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) I don't know, I just like it</td>
<td>52.6%</td>
</tr>
<tr>
<td>2) Old/Current school colors</td>
<td>5.1%</td>
</tr>
<tr>
<td>3) The color reminded the participant of a positive memory</td>
<td>26.3%</td>
</tr>
</tbody>
</table>

5b. What is your favorite color—why?

Table 41
Medical Professional Survey MakeTool, Favorite Color Why

87
6a. What is your least favorite color?

Table 42
Medical Professional Survey MakeTool, Least Favorite Color

6b. What is your least favorite color—why?

Reason categories

1) The color makes the participant feel unhappy, upset, or unsecure.
2) The medical professional disliked the way the color looked when they wore it.
3) The color reminded the participant of a negative memory.

Table 43
Medical Professional Survey MakeTool, Least Favorite Why
7. What type of clothing is the most comfortable for you to wear in a work setting?

<table>
<thead>
<tr>
<th>Clothing</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-shirt</td>
<td>10.5%</td>
</tr>
<tr>
<td>jeans</td>
<td>15.7%</td>
</tr>
<tr>
<td>polo shirt</td>
<td>5.1%</td>
</tr>
<tr>
<td>slacks</td>
<td>10.5%</td>
</tr>
<tr>
<td>scrubs</td>
<td>15.7%</td>
</tr>
<tr>
<td>nike shoes</td>
<td>15.7%</td>
</tr>
<tr>
<td>oxford</td>
<td>5.1%</td>
</tr>
<tr>
<td>capris</td>
<td>5.1%</td>
</tr>
<tr>
<td>formal wear</td>
<td>5.1%</td>
</tr>
</tbody>
</table>

Table 44
Medical Professionals Survey MakeTool, Comfortable Clothing

8. What is your ideal type of clothing?

<table>
<thead>
<tr>
<th>Ideal Clothing</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>low maintenance</td>
<td>21.0%</td>
</tr>
<tr>
<td>t-shirt</td>
<td>26.3%</td>
</tr>
<tr>
<td>shorts</td>
<td>15.7%</td>
</tr>
<tr>
<td>jeans</td>
<td>15.7%</td>
</tr>
<tr>
<td>sneakers</td>
<td>5.1%</td>
</tr>
<tr>
<td>cleans easily</td>
<td>5.1%</td>
</tr>
<tr>
<td>goes with anything</td>
<td>5.1%</td>
</tr>
<tr>
<td>formal wear</td>
<td>5.1%</td>
</tr>
</tbody>
</table>

Table 45
Medical Professionals Survey MakeTool, Ideal Clothing
9. How long have you worked around medical professionals?

<table>
<thead>
<tr>
<th>Time (years)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—5</td>
<td>42.1%</td>
</tr>
<tr>
<td>6—10</td>
<td>42.1%</td>
</tr>
<tr>
<td>11—15</td>
<td>10.1%</td>
</tr>
<tr>
<td>16—20</td>
<td>5.1%</td>
</tr>
<tr>
<td>21—25</td>
<td>0.0%</td>
</tr>
<tr>
<td>26—30</td>
<td>0.0%</td>
</tr>
<tr>
<td>31—35</td>
<td>0.0%</td>
</tr>
<tr>
<td>36—40</td>
<td>0.0%</td>
</tr>
<tr>
<td>41—45</td>
<td>0.0%</td>
</tr>
<tr>
<td>46—50</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 46
Medical Professional Survey MakeTool, Time Working

10. How long have you worn scrubs?

<table>
<thead>
<tr>
<th>Time (years)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—5</td>
<td>42.1%</td>
</tr>
<tr>
<td>6—10</td>
<td>42.1%</td>
</tr>
<tr>
<td>11—15</td>
<td>10.1%</td>
</tr>
<tr>
<td>16—20</td>
<td>0.0%</td>
</tr>
<tr>
<td>21—25</td>
<td>0.0%</td>
</tr>
<tr>
<td>26—30</td>
<td>0.0%</td>
</tr>
<tr>
<td>31—35</td>
<td>0.0%</td>
</tr>
<tr>
<td>36—40</td>
<td>0.0%</td>
</tr>
<tr>
<td>41—45</td>
<td>0.0%</td>
</tr>
<tr>
<td>46—50</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 47
Medical Professional Survey MakeTool, Scrub Usage
For the question: “what scrubs colors do you like best?” Multiple answers were the norm and not the exception. A typical answer was, “surgical blue, dark green, navy or royal blue, maybe maroon.” For an answer like this each preferred color was counted:

- 1 response ceil blue
- 1 response dark green
- 1 response dark blue
- 1 response maroon

### Table 48

<table>
<thead>
<tr>
<th>Color</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>yellow</td>
<td>0.0%</td>
</tr>
<tr>
<td>orange</td>
<td>5.1%</td>
</tr>
<tr>
<td>red</td>
<td>5.1%</td>
</tr>
<tr>
<td>maroon</td>
<td>5.1%</td>
</tr>
<tr>
<td>pink</td>
<td>5.1%</td>
</tr>
<tr>
<td>purple</td>
<td>5.1%</td>
</tr>
<tr>
<td>light blue</td>
<td>61.2%</td>
</tr>
<tr>
<td>dark blue</td>
<td>10.0%</td>
</tr>
<tr>
<td>black</td>
<td>0.0%</td>
</tr>
<tr>
<td>tan</td>
<td>0.0%</td>
</tr>
<tr>
<td>light green</td>
<td>31.6%</td>
</tr>
<tr>
<td>white</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

**Medical Professional Survey MakeTool, Best Scrub Colors**
12a. Should scrubs have a secondary color?

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>42.0%</td>
</tr>
<tr>
<td>no</td>
<td>58.0%</td>
</tr>
<tr>
<td>don’t care</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 49
Medical Professional Survey MakeTool, Secondary Color

12b. Where should the secondary color be placed?

<table>
<thead>
<tr>
<th>Placement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>piping</td>
<td>10.0%</td>
</tr>
<tr>
<td>collar</td>
<td>10.0%</td>
</tr>
<tr>
<td>sleeves</td>
<td>0.0%</td>
</tr>
<tr>
<td>pant seam</td>
<td>0.0%</td>
</tr>
<tr>
<td>borders</td>
<td>0.0%</td>
</tr>
<tr>
<td>pockets</td>
<td>0.0%</td>
</tr>
<tr>
<td>accent</td>
<td>5.7%</td>
</tr>
<tr>
<td>waistband</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 50
Medical Professional Survey MakeTool, Secondary Color Placement
13a. Do the scrub colors you wear make a difference to your peers or patients?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>57.0%</td>
<td></td>
</tr>
<tr>
<td>no</td>
<td>43.0%</td>
<td></td>
</tr>
<tr>
<td>don’t care</td>
<td>0.0%</td>
<td></td>
</tr>
</tbody>
</table>

Table 51
Medical Professional Survey MakeTool, Scrub Difference

13b. Do the scrub colors you wear make a difference to your peers or patients?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>helping patients</td>
<td>10.7%</td>
</tr>
<tr>
<td>distinguishing positions</td>
<td>15.7%</td>
</tr>
<tr>
<td>affecting self</td>
<td>5.1%</td>
</tr>
</tbody>
</table>

Table 52
Medical Professional Survey MakeTool, Scrub Difference Peers
14a. What scrubs colors should be avoided and why? Main reasons

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty cleaning scrubs</td>
<td>10.0%</td>
</tr>
<tr>
<td>See through</td>
<td>5.8%</td>
</tr>
<tr>
<td>Lack of professionalism</td>
<td>0.0%</td>
</tr>
<tr>
<td>Wrong message to patients</td>
<td>20.0%</td>
</tr>
</tbody>
</table>

Table 53
Medical Professional Survey MakeTool, Scrub Color Avoidance

14b. What scrubs colors should be avoided and why?

<table>
<thead>
<tr>
<th>Color</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>21.0%</td>
</tr>
<tr>
<td>Orange</td>
<td>5.7%</td>
</tr>
<tr>
<td>Red</td>
<td>5.7%</td>
</tr>
<tr>
<td>Pink</td>
<td>21.0%</td>
</tr>
<tr>
<td>Black</td>
<td>31.5%</td>
</tr>
<tr>
<td>Brown</td>
<td>21.0%</td>
</tr>
<tr>
<td>Light green</td>
<td>5.7%</td>
</tr>
<tr>
<td>White</td>
<td>26.0%</td>
</tr>
<tr>
<td>Neon colors</td>
<td>5.7%</td>
</tr>
<tr>
<td>Light blue</td>
<td>10.0%</td>
</tr>
<tr>
<td>Beige</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

Table 54
Medical Professional Survey MakeTool, Bad Scrub Colors
15. Any stories about your scrubs in regards to particular colors?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>story</td>
<td>57.0 %</td>
<td></td>
</tr>
<tr>
<td>no story</td>
<td>43.0 %</td>
<td></td>
</tr>
</tbody>
</table>

Table
Medical Professional Survey MakeTool, Scrub Stories

The stories for the live interviews were much richer and more interesting. The best story came from subject 11 who explained why scrubs in her hospital were kept under lock and key:

We lock our scrubs up, for several reasons. First, we had people walking out with scrubs and then putting them on and walking into different areas of the hospital to go and find drugs. And we had people wandering all over the place getting into areas they shouldn’t be, and they were causing problems. Since I work in a delivery ward we have scrubs under lock and key. We don’t want people wandering in or someone who looks official coming in and trying to take a baby. It’s happened before so we’re particularly on alert for it. So if a woman in our ward unexpectedly starts her period and bleeds through her clothes and needs some other clothes and wants some scrubs. She has to sign them out and then when she leaves, she has to turn the scrubs back in, because we don’t want anybody to have them. We guard them very carefully because we don’t want anybody to get them and just waltz around the place.
Several dentists explained that they had “unlucky scrubs.” When questioned further about it they said that whenever they wore that particular scrubs color, something unlucky happened. They would drill a patient’s tooth too deeply, get yelled at by an instructor or a patient, break equipment, or have some other mishap. Did this make them quit wearing the “unlucky” scrubs color? No - because they really were invested in the color - either it was one of their favorite colors or they really liked the way that particular color of scrubs looked on them.

16a. What do you think of other options for scrubs: different fabrics, styles, etc?

<table>
<thead>
<tr>
<th>Suggestions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>42.0 %</td>
</tr>
<tr>
<td>No</td>
<td>58.0 %</td>
</tr>
</tbody>
</table>

Table 56
Medical Professional Survey MakeTool, Scrub Options

16b. What do you think of other options for scrubs: different fabrics, styles, etc?

<table>
<thead>
<tr>
<th>Suggestion Area</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fit</td>
<td>58.0 %</td>
</tr>
<tr>
<td>Fabric</td>
<td>15.0 %</td>
</tr>
<tr>
<td>Function</td>
<td>5.7 %</td>
</tr>
<tr>
<td>Fashion</td>
<td>5.7 %</td>
</tr>
</tbody>
</table>

Table 57
Medical Professional Survey MakeTool, Options Suggestions
Doctors and nurses were the most vocal about possible changes for the scrubs. They had definite ideas or areas for improvement. Subject sixteen, a children’s doctor, offered a typical response:

I think they’re all too long. I think that I’m always walking on the heels. I’m always wearing them down, so they get worn out and I think that looks nasty. I think that, uh, the drawstring never seems to stay tight, so it’s always coming loose. So maybe the elastic would be kind of nice, I’ve never used any kind of those. And then um, pockets. The reason I like those pocket ones is that the scrub pants never have any pockets. And so I have one pocket back here (gestures to back pocket) and one pocket here (gestures to front of pants). And if I don’t wear my white coat, I don’t have enough things. Pockets on the side would be nice, because people can store stuff in there, not that I carry a lot of stuff, but it would be nice. I think it would be nice to have a little bit more. Some pockets are right on the knees, and pockets on the knees are annoying. Just cause whenever you bend. It would be nice to have pockets up here (gestures to thighs) where your hands fall. So you can get into them without affecting your gait. That way they won’t bump into your leg when you walk. Big pockets that you can fit your hand into would be best, so you could fit a scrip pad or a PDA in there. Small pockets are useless I think. You just need a little bit more.

Pockets were mentioned with everyone who voiced a concern about changes in scrub functionality or fit. And pockets were usually the first thing on the list of suggestions for improvements in scrubs.
17. Now I'm going to give you choices which let you design your ideal in scrubs. First look at the three sets of scrubs in white. What combination of top and bottom would you like to see as your ideal?

<table>
<thead>
<tr>
<th>Top</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Top Option 1" /></td>
<td><img src="image2.png" alt="Bottom Option 1" /></td>
</tr>
<tr>
<td><img src="image3.png" alt="Top Option 2" /></td>
<td><img src="image4.png" alt="Bottom Option 2" /></td>
</tr>
<tr>
<td><img src="image5.png" alt="Top Option 3" /></td>
<td><img src="image6.png" alt="Bottom Option 3" /></td>
</tr>
</tbody>
</table>

Table 58

Medical Professional Survey MakeTool, Cut Preferences
18. Now look at the chart with 18 different colors of scrubs. To pick your ideal set of colored scrubs select the top and bottom numbers of the scrubs that you prefer. Feel free to mix and match different colored tops with bottoms. Then list your favorite set below. (For example: I might select top 17 & bottom 18 as my favorite color of scrubs, or if I liked two different colors – top 3 and bottom 2) If you have trouble deciding what your favorite colors are, just pick your first, second, and third favorites and list them below.

Figure 9
Medical Professional Survey MakeTool Color Preferences
Interestingly enough 10% of the subjects responses to question 18 also wanted scrubs with mixed color top and bottoms - the same percentage as the online survey.

Figure 10
Medical Professional Survey MakeTool, Mixed Scrubs Percentages
The make-see-do model proved to be an effective methodology for triangulating results in this research study. Using online surveys from both the patient’s perspective and the medical professional’s perspective was very helpful. Further, watching doctors, dentists, and others put together models of their ideal clothing, while thinking aloud, gave great insight about their thought processes. The conclusion after all of this data gathering and analysis is that medical professionals are not satisfied with the current way scrubs are designed and constructed. Moreover, patients have very specific expectations for color for doctors and their staffs.

PATIENT ONLINE SURVEY
The online surveys with SurveyMonkey.com proved to be extremely cost effective and time effective method for getting patient feedback. The number of participants was almost four times the original goal of 75. About 50% of the participants were 18-24. Since the initial group recruited was originally from the author’s network in the College of the Arts this makes sense. Also, this age group is the “generation Y” and firmly entrenched in electronic media and social networking: Twitter, Facebook, My Space, Gmail, etc. Online communication is a natural for them, is a major portion of their social interaction, easy for them to use, and is considered a normal part of college social life. Each age group’s
bracket older from the 18-24 crowd had exponentially lower participation. This could be explained by each group’s lower contact with technology and other social commitments, or lack of connection to the 18-24 year olds. The 18-24 crowd is probably still in college, single, and not working with large amounts of discretionary time, whereas people in the older age brackets might have jobs, children, spouses, and a number of other commitments for their time - with very little free time. The makeup of the survey group was largely caucasian – well over 60%. This correlates with the ethnic makeup of Columbus, Ohio where this survey started. The other ethnic groups’ backgrounds were each usually about five percent. How well this reflects the general ethnic background of the United States as a whole is a topic for another study.

So how did patients interpret scrub colors?

**Green**
Most strongly associated with 1) Nurses (over 45%), and then 2) Doctors (25%). This was unexpected because only the doctors and nurses in the surgery department at the Ohio State University (OSU) Medical Center wear green. Since most students are not having major surgical procedures, they would be seeing doctors and nurses in other colors of scrubs. However the message is loud and clear by a 2:1 margin - nurses wear green.

**Gray**
No clear idea. Maybe office staff, maybe a vet might wear this color.

**Orange**
No idea whatsoever. Best second guesses—delivery or vets.

**Dark Blue**
A doctor (22%) or a nurse (19%) would wear this color. Secondary guesses would include dentists, hygienists, and vets.

**Pink**
Overwhelmingly a nurse (31%) would wear this color, followed by a receptionist or a hygienist (both about 20%).
Tan  A delivery person (32%) would wear this color, maybe staff members or a vet (both about 16%) might also opt for tan.

Purple  This is a nurse’s color (27%) then a hygienist (18%) or a receptionist (14%).

Yellow  No idea at all (32%) who might wear this color. Next best guesses include staff, vet, dieticians, and delivery.

Black  No idea at all (31%) who might wear this color. Next closest guess would be some sort of staff member (18%).

Red  No clear idea (23%) who would wear this color. Next alternative might be staff, nurses, or a receptionist (about 10% each).

Light Blue  The overwhelming opinion (45%) was that a doctor wears this color. Next would be a nurse (25%).

The colors most associated with a doctor are:

1. Light Blue—44.8%
2. Green—25.6%
3. Dark Blue—22.5%
4. Black—8.6%
5. Gray—8.4%
6. Red—5.7%
7. Tan—2.5%
8. Yellow—2.2%
9. Purple—1.9%
10. Orange—1.8%
11. Pink—1.5%
The higher ranking of black, gray, and red are probably due to a bias at the OSU health center where staff and doctors can wear OSU branded scrubs in gray, black, and red on OSU football game days. Students visiting the center on game days would likely attach positive associations to these scrubs—hence the higher ratings.

The colors most associated with nurses are:

1. Green — 46.7%
2. Pink — 30.7%
3. Purple — 27.4%
4. Light Blue — 24.5%
5. Dark Blue — 19.5%
6. Red — 14.3%
7. Gray — 13.6%
8. Orange — 6.6%
9. Tan — 4.4%
10. Black — 3.8%
11. Yellow — 2.2%

Two things spring to light with nursing colors. First, colors associated with nurses are traditionally “feminine.” These colors are also lighter in value than those associated with men. Second, nurses have a much wider color palate associated with them. They can wear double the amount of hues than a doctor can—and still be viewed as a nurse. The association of various hues to them is much much stronger than it is to the doctors. How do the other professions rate? After doctors and nurses the connection of color to other health care professions drop off by a standard deviation or two.
For example, the colors most associated with dentists are:

1. Light Blue — 11.0%
2. Dark Blue — 9.6%
3. Green — 8.0%
4. Gray — 6.3%
5. Red — 5.8%
6. Purple — 3.8%
7. Black — 3.8%
8. Tan — 2.8%
9. Pink — 1.2%
10. Orange — 0.6%
11. Yellow — 0.6%

The dentists share the same association with colors as the doctors, but at much lower levels. And like physicians at OSU, red, gray, and black get a popularity bump that would likely not be seen at other institutions. The conclusion that can be framed from the patient survey is that light blue, green, and dark blue are medical colors. Other colors can or may be associated with medicine, however, they are probably not the colors a doctor or nurse will be wearing. Those colors will be worn by support personnel or by someone else.

MEDICAL PERSONEL ONLINE SURVEY
As with the patient survey, the number of participants was very much higher than expected, yielding a richer harvest of data. The participant male to female ratio was about equal, which gives a balanced view of the results. The ages of the survey takers were about equally split between the 18—24 and the 25—34 age group. Very few other age groups participated. Why? The best guess for
this is the connectivity gap with age groups, and doctors in the second middle of their working careers are probably quite busy and have little or no time for extraneous online activity. Again, as with the patient survey, most participants were caucasian and almost none were color blind.

The most popular color by a 3:1 margin were the blues, followed by greens and reds. This mirrors national averages. Why did they like their favorite colors? Basically because of the way it made them feel. They felt they looked good in it, had positive associations with it, and thought others viewed them positively in it. The least favorite colors were the yellows, oranges, pinks, browns, and purples. All warmer colors, with the exception of purple, and all hovering at around the 15% level. The reasons for the least favorite colors were the exact inverse of the positive colors.

As to clothing types preferred in a work setting, casual clothing was by far the most preferred with t-shirts and jeans leading the way (20%). Two catagories that were high were respectable clothing (28%) and functional clothing (21%). What do these two groups infer? Probably that the clothing worn is appropriate for the situation. It does not make the wearer stand out and firmly identifies them in their appropriate role. Further questioning would be needed to sort out the nuanced details of respectable and functional.

The majority of respondants had only worked with medical professionals for five years or less, and had only worn scrubs for that amount of time. Their favorite colors were:
1. Light Blue—59%
2. Light Green—44%
3. Dark Blue—20%

with the other colors dropping off quickly after that. These were the same top colors as the patient survey of doctors with slightly higher percentages. Respondants noted that they liked these colors because these were “medical” or “professional” colors. Whether this is due to the blue/green scrubs having been unconsciously “branded” as medical colors, or simply having a 40 year association with medicine and green/blue cannot be determined from this survey. But there is a strong link between the two that bears further investigation. Next, what about scrubs with a secondary color? Most people responded no (50%). Those in favor of secondary color (38%) felt that the color should be on the collar (14%), pockets (8%), or sleeves (6%).

Did professionals think that scrubs color made a difference to their peers or patients? Yes (65%) was the overwhelming answer. Even those who didn’t think color made a difference to patients, noticed that their peers watched their scrubs colors closely. Peers noted when new scrubs, or scrub colors were worn or purchased, and a fair amount of ribbing occurred when someone, usually a male, deviated from the “norm.” How did colors make a difference in scrubs? Identification—they let patients know who the professional was, what their role was, and reinforced the role of the professional to themselves. For this reason, and the associated color symbolism, professionals strongly believed (over 50%) some scrub colors were to strenuously avoided because they sent the wrong message to patients. The top offenders for “bad” colors:
1. Yellow — 23%
2. White — 23%
3. Bright Colors — 18%
4. Orange — 17%
5. Red — 14%
6. Pink — 14%
7. Black — 10%

There was a caveat for white. The comments for white being such an awful color was not that white was as chromatically offensive as yellow, or that it looked unprofessional — but that it got dirty quickly. Professionals, often working a 12 hour or more shift, didn’t have the time or resources to change into alternate scrubs. So they didn’t want to look grimy or unkempt. This being said, it was quickly discovered that scrubs with blood on them were immediately thrown away. Not because of sanitary reasons, but because of the difficulty in removing blood stains. This practice was practiced both by the OSU medical center, which provided scrubs to every professional who worked there, but by all individuals as well.

Almost everyone had suggestions for changes in scrubs (88%). The number one area for change suggested was fabric (40%) followed by fit (30%) and then function (25%). Almost all females in the survey mentioned fit as a problem. The most popular style of scrub was the standard v-neck with an elastasticized waist and extra leg pockets, followed closely by a t-shirt top with the same pants, or the standard scrubs with v-neck top and draw string bottom.
When asked to pick their ideal color in scrubs with the online MakeTool there were no deviations from previous responses. The surgical greens and blues dominated the responses. This broad MakeTool question helped by serving as an interesting cross check of both patient perception and the professional’s earlier responses about scrub preferences. It provided a visual cue for professionals who might have trouble visualizing color ranges and how they might look. The one surprising factor was that only 10% of professionals responded with a “mixed” response: a top or bottom of different color. Given the range of colors and the number of color combination permutations a far greater mixed response was expected.

MEDICAL PROFESSIONAL MAKETOOL SURVEY
The working professionals interviewed were older than the online survey professionals. The bulk (over 50%) of the participants were in the 25-34 age range with only 20% of all participants in the 18-24 age range. Most professionals were male, and caucasian. Again blue was the runaway favorite color (over 50%) with red (over 25%) a distant second. One reason for red’s popularity was due to school color preference. A number of interview subjects had attended the University of Utah or were attending Ohio State, or had attended both, and had strong filial ties to both universities. The reason most often given for preferring a favorite color was “I don’t know, I just like it.” The least favorite colors picked were bright greens, yellows, and pinks (all about 15%), which was in line with the online study’s findings that warm, light colors were held in poor regard. The exact same rationale for obnoxious colors also manifested itself.

As to clothing, the most preferred work clothing was scubs, and jeans (15%) followed by slacks and t-shirts (10%). The most ideal clothing combination was
jeans and a t-shirt. Most professionals had worked and worn scrubs 5-10 years. The favorite scrub color was light blue (61%) and then light green (31%) with all other colors trailing behind. Most professionals thought that scrubs should not have a secondary color (58%), those that did thought that color should be on the collar or piping. Most everyone thought scrub color made a big difference with their peers and patients. It affected how the professional was perceived by the patient and how their felt about themselves. Pursuant to this, all professionals had strong opinions on what scrub colors should be avoided: dark colors and light or bright colors that were garish or difficult to clean. Cleanliness was a major issue to most professionals. Almost all professionals talked about wearing their scrubs for at least 12 hours at a time, and how they would start to feel sweaty and grimy towards the end of their shifts. Scrub cleanliness went a long way in belaying feeling messy and frumpy. Most professionals had a few stories about mistaken identity in unique scrubs, but most didn’t share stories.

People really opened up when asked about different options for scrubs. Most individuals (42%) didn’t have suggestions for changes, but the other survey takers more than made up for them with their vigor and enthusiasm. Fit (68%) by far and away was the biggest concern of everyone involved. Complaints were voiced about pants being too long or short, sleeves being too short, tops too large, v-necks too long, and fabric not stretching enough. Not one woman thought the scrubs fit her well. All felt that scrubs were elegantly designed for people who had shapes like sacks of flour. And pockets came up again and again as a major drawback of current scrub fabrics. When interview professionals actually got to use the MakeTool to pick scrubs colors—they really enjoyed the MakeTool. And in the end, chose the same colors as online survey takers.
OVERALL OBSERVATIONS

From the analysis of the data, interviews, and surveys it becomes quite obvious that to be viewed as a medical professional, or specifically a doctor, nurse, or dentist, light blue or green must be worn. If other colors are worn then both patients and physicians experience confusion as to the wearer’s role. Nurses have the widest latitude of any medical profession when it comes to scrubs. They can wear a much wider variety of scrub colors and still be perceived as a nurse—not so for anyone else. Warm colors and very dark colors are not well liked or received. Lastly, although there are a lot of new colors being introduced into the market today—they do not seem to be making much inroads in derailing blue and green as the colors “di rigueur” of medicine.

SUGGESTIONS FOR FUTURE STUDY

In light of this study several areas for further investigation could now be examined. First is the relationship between warm colors and dislike in a professional medical setting. What was it about warm colors that consistently turned people off? This could be a detailed study in and of itself. Closely connected with this is the idea of value. A study of value in scrubs would also be a good add-on to this study. The questions of “how light is too light” to be recognized as a doctor and “how dark is too dark” are both questions that would be interesting to answer. It would be very interesting to see a scale from light to dark and develop a range of “acceptable” values for medical recognition. Moreover it would be good to see if other hues that were “unacceptable” had the same degree of lightness or if it was the hue itself that was problematic. The same principle, of course, also applies to the dark colors. Another opportunity for research would be to see if word or image associations could be done on the colors at hand. If professionals could be coaxed to verbalize their feelings about
various colors, associations of feelings to various colors might be categorized and summarized.

Where else to go from here? A major study on fit and fabric is the logical next step. Fit is one of the major sticking points for most professional—both men and women. So finding the discrete areas of discomfort and areas for improvements would be the first step. Then looking for new ways of improving fit and adding functionality would be the logical follow up. Keying in on pockets: placement, number, and size, would also be a big fix for many professionals. Developing new fabric choices would go hand-in-hand with discovering a new fit and enable the designer to create a garmet that is functional, fits well, and helps put the patient at ease, and helps the medical professional feel good about themselves.
EPILOGUE

What was learned from this whole study, literature review, and analysis? In one short phrase—color is huge. Color affects us in powerful ways, both when we notice it on a billboard driving by, or with the background colors of our kitchens. It affects us in ways that scientists and researchers are still trying to understand. But whether we notice it or not, color is always present, and always making an impact on us. We are just hardwired for the experience of color.

What is so challenging about color is it’s imprecision. Almost everyone sees color, knows what it is, has opinions and feelings about it, but at the same time has difficulty describing it. Language cannot describe it well, try explaining the color yellow to a sightless person. It cannot be done. Compound this with the fact that everyone’s eye anatomy is different and actually views the hues slightly differently. Then add the interpretation of wavelength by the brain and toss in cultural and personal bias and it becomes amazing that we can even talk about color in any sort of cogent terms.

Color is dynamic. It’s dynamic in the sense that it changes constantly on several different fronts. Color trends or preferences are constantly in motion with all sorts of cultures constantly affixing meaning to hues. Fashion chugs along and cycles color through myriads of associations. In the 1960s black was a Beatnick color, in the 2000s it’s connected with power and prestige. Products get associated with colors like yellow taxis and red fire engines. And these
associations do not stay constant through history, they are in constant flux. General transportation carriages in 15th century France were not colored yellow, or blue for that matter.

Technology is also influencing the way we can view and use color. New advances in plastic injection molded technology make it possible to use any color in a product. And the vast bulk of products today are made out of plastic, not steel or aluminum, but colored plastic. New printing technology allows huge color ads to be placed on the sides of buildings and on floors. New paints allow almost every surface to be painted any desired color. Anodizing aluminum and steel lets manufacturers color metal to almost any color. Printing technology has evolved to put brilliant hues on almost any package conceivable. Color displays for computers and TV are more brilliant, higher definition, and cheaper than ever. Textile and clothing creation now dye and create clothing that is only limited by our imagination. All this technology combines to put us in the most colorful age of history the world has ever known.

The literature of color is immense. One could do a Phd. in forty or more color subjects: color perception, color interpretation, color in advertising, color in product design, color symbolism, color history, color technology, etc. This researcher found over 40,000 articles on the internet relating to color. Any arrogance or “expertise” gained by this research must be quickly replaced by humility for the vast amount of material still yet to be covered.

Where from here? The great color theorists of the past also were good painters. So the logical next step would be to start painting, both in oil and watercolor to get a better feel for the mixture of colors and how they work.
Serious research into the historical use of color and symbolic uses will also be undertaken to shore up foundations that were laid in this study. This will be combined with passionate interest in current marketing of color today and current color trends. It’s hoped that professional work will bring new opportunities to explore color further and to develop additional expertise. In short — this is only the beginning.
APPENDIX A
SURVEYS
PATIENT SURVEY

INTRODUCTION
Please select your first impression about the role that the person in uniform might be playing. The same person will be wearing 11 different colors of uniform. Please pick a role for each color following your instincts. You can repeat the same choices.

LEGAL NOTES
The survey will take approximately 2 minutes to complete. Your answers will be anonymous. Your IP address and email account will not be recorded. You can refuse to answer any questions you do not wish to answer, and you can withdraw at any time from the study for any reason without any consequence.

1) What is your age?
   ○ 18 - 24
   ○ 25 - 34
   ○ 35 - 44
   ○ 45 - 54
   ○ 55 - 64
   ○ 65 - 74
   ○ 75 - 84
2) What is your cultural background?
   ○ European - Nordic
   ○ European - Latin
   ○ American - Anglo
   ○ American - African
   ○ Asian
   ○ Latino
   ○ Near Eastern
   ○ African
   ○ Pacific

   ○ Delivery ○ Receptionist ○ Dentist ○ Nurse ○ Hygienist
   ○ Staff ○ Doctor ○ Chiropractor ○ Vet ○ Other

Figure 11
Question 3, Green Scrubs
○ Delivery ○ Receptionist ○ Dentist ○ Nurse ○ Hygienist
○ Staff ○ Doctor ○ Chiropractor ○ Vet ○ Other

Figure 12
Question 4, Gray Scrubs

○ Delivery ○ Receptionist ○ Dentist ○ Nurse ○ Hygienist
○ Staff ○ Doctor ○ Chiropractor ○ Vet ○ Other

Figure 13
Question 5, Orange Scrubs
Figure 14

Question 6, Dark Blue Scrubs

Figure 15

Question 7, Pink Scrubs
Figure 16
Question 8, Tan Scrubs

Figure 17
Question 9, Purple Scrubs
Figure 18
Question 10, Yellow Scrubs

Figure 19
Question 11, Black Scrubs
○ Delivery ○ Receptionist ○ Dentist ○ Nurse ○ Hygienist
○ Staff ○ Doctor ○ Chiropractor ○ Vet ○ Other

Figure 20
Question 12, Red Scrubs

○ Delivery ○ Receptionist ○ Dentist ○ Nurse ○ Hygienist
○ Staff ○ Doctor ○ Chiropractor ○ Vet ○ Other

Figure 21
Question 13, Light Blue Scrubs
Introduction

Hello, I’m Erik Aagard, a MFA candidate in Industrial Design at The Ohio State University. I’m asking medical professionals who wear scrubs a little bit about their scrubs and color preferences in order to design better scrubs. This should take about 10-15 minutes.

No information will be taken that will be linked back to you. Your personal information will not be sold or used for commercial reasons. This is in accordance with Internal Review Board (IRB) standards for IRB exemption. You can refuse to answer any questions you do not wish to answer, and you can withdraw at any time from the study for any reason without any consequence.

1. What is your gender?
   ○ male
   ○ female

2. What is your age?
   ○ 18 - 24
   ○ 25 - 34
   ○ 35 - 44
   ○ 45 - 54
   ○ 55 - 64
   ○ 65 - 74
   ○ 75 - 84
3. What is your cultural background?
   ○ European - Nordic
   ○ European - Latin
   ○ American - Anglo
   ○ American - African
   ○ Asian
   ○ Latino
   ○ Near Eastern
   ○ African
   ○ Pacific

4. Are you color blind?
   ○ Yes
   ○ No

5. What is your favorite color and why?

6. What is your least favorite color and why?

7. What type of clothing is the most comfortable for you to wear in a work setting?

8. How long have you worked around medical professionals?

9. What is your ideal type of clothing?

10. How long have you worked around medical professionals?
11. How long have you worn scrubs?

12. What scrub colors do you like best?

13. Should scrubs have a secondary color? If so where?

14. Do the scrub colors you wear make a difference to your peers or patients? If yes how?

15. What colors of scrubs should be avoided? Why?

16. What do you think of other options for scrubs: different fabrics, styles, etc?

17. Any stories about your scrubs in regard to particular colors?
18. Now I’m going to give you choices which lets you design your ideal in scrubs. First look at these three sets of scrubs in white. What combination of top and bottom would you like to see as your ideal? (see Figure 22)

- 1 & 2
- 1 & 4
- 5 & 2
- 3 & 2
- 3 & 4
- 5 & 4
- 5 & 6
- 3 & 6
- 5 & 6

**Scrub Styles**

![Scrub Styles Selection Chart](image)

**Figure 22**

Scrub Styles Selection Chart
19. Now look at the chart with 18 different colors of scrubs. To pick your ideal set of colored scrubs select the top and bottom numbers of the scrubs that you prefer. Feel free to mix and match different colored tops with bottoms. Then list your favorite set below.

*For example: I might select top 17 & bottom 18 as my favorite color of scrubs, or if I liked two different colors – top 3 and bottom 2) If you have trouble deciding what your favorite colors are, just pick your first, second, and third favorites and list them below.*
Hello, I’m Erik Aagard, a MFA candidate in Industrial Design at The Ohio State University. I’m asking medical professionals who wear scrubs a little bit about their scrub and color preferences in order to design better scrubs. Could I have a few minutes of your time? This survey takes approximately 15 minutes. You are free to terminate the interview at any point.

No information will be taken that will be able to be linked back to you. Your personal information will not sold or used for commercial reasons. Pictures taken of you and your selection will be altered in Photoshop so that you will not be recognized and information can’t be traced to you. This is in accordance with Internal Review Board (IRB) standards for IRB exemption.

I’d like first to take a picture of you, so I can note your clothing preference today. This photo will later be altered so that nobody will recognize you. This will preserve your anonymity for the color study.

1. What is your gender? [M/F]

2. What is your ethnicity? [Caucasian/Asian/Black/Hispanic, Native American/Arab American]?

3. What is your age?

4. Are you color blind? [Y/N]
5. What is your favorite color, and why?

6. What is your least favorite color, and why?

7. What type of clothing is the most comfortable for you to wear in a work setting?

8. What is your ideal type of clothing?

9. How long have you worked around medical professionals?

10. How long have you worn scrubs?

11. What scrub colors do you like best?

12. Should scrubs have a secondary color? Where?

13. Does the scrub color you wear make a difference to your peers or patients? If yes how?

14. What color of scrubs should be avoided? Why?

15. Any stories about your scrubs in regard to particular colors?

16. What do you think of other options for scrubs: different fabrics, styles, etc.?
17. Now I’m going to give you choices which lets you design your ideal in scrubs. There are several cuts of scrubs here. The traditional set with the V-neck and the tie pants you know and love. A t-shirt top, and an extended V-top. As for the pants the first set has pockets like regular pant pockets with an elastic waist. The second variation of that is with pockets on the outside of the legs with an elastic waist. I’d like you to select your ideal of top and bottom. Use the “doll” to model your choices so you can visualize them easier.

Figure 24

Scrubs Cut MakeTool
18. Now I’m going to give you a bag with 15 different colors of scrubs. I’d like you to use the toolkit to build your favorite set of colored scrubs. Simply stick the top or bottom on the doll with Velcro to find the pair of scrubs you prefer. You can have the tops and bottoms match or mix the colors of the tops and bottoms. Put the colors you don’t want here in a pile and I’ll put them in a bag for you. If you have trouble deciding what your favorite colors are, just pick your first, second, and third favorites, and I’ll take note of them.

Figure 25
Scrubs Color MakeTool
APPENDIX B, BLOG RESPONSES
AH YES, MEDICAL SCHOOL BLOG RESPONSES

Anonymous Blogger said...

Scrubs... If you showed up in my room in the middle of the night in a shirt and tie, I would think you were from hospital admin looking for a check...

Blogger MedStudentGod said...

Scrubs are fine. In fact...I think it is more “doctorly” looking than nice shirt and tie. That ensemble always reminds me of a quick fix doc (like family medicine) who really doesn’t get involved in the nitty-gritty of your care.

Blogger Rachel said...

Ok, the general rule of thumb is dress for the role to which you aspire. I think scrubs will do overnight, but if you are in the clinic, the above rule can guide you. It could play out very differently if you aspire to, say, pathology vs. plastics. Undastand?

Anonymous Anonymous said...

You didn’t really leave the scrubs article on his desk. He would have your nuts crushed. I prefer scrubs with a shirt underneath (no chest hair flowing out) during the night. If you wear a shirt and tie, a white coat must go over it.

Blogger Greg said...

Scrubs, definitely. People who wear suits at night are definitely weird.
Blogger eaf said...

Scrubs in the hospital, white coat in the office (what you wear under it is none of my business). The last thing I need while in the hospital is to see you in your Armani reminding me of what the bill will be when I leave. :-) Besides, you’ve been through three years of med school... I think by now you’ve earned the right to wear comfortable clothes!

Anonymous Graham said...

I’m going to site external validity here and say that I really think culture plays a big part here. I’m out in California, and while I often wear a shirt and tie for my inpatient and outpatient rotations, it’s more often than not that my male attendings drop the tie entirely.

My attending on surgery (who did his residency and fellowship at Hopkins) said his chief of surgery during residency was so serious about this (back in the 60s) that he would require residents and fellows after closing the surgery case to go back to the locker room and re-dress into a shirt and tie before talking to patients’ families about how the procedure went.

Anonymous Anonymous said...

Scrubs are hot! Doctors in suits look like prissy little rich boys who don’t want to get their hands dirty.

Blogger Daphnewood said...

I am fond of scrubs myself. This is on medscape: Doctors are told to ditch “disease spreading” neckties from BMJ BMJ. 2006; 332(7539):442
Blogger lucidkim said...

I work for a group of 19 doctors, only the ob/gyns wear scrubs AND, I MIGHT ADD, THEY LOOK TOTALLY HOT IN THEM. The family practice doctors vary in their attire, I think only the oldest, ... doctor wears a tie - the rest in polo/khaki combos with a white lab coat. Except for one who refuses to wear the lab coat because he says it sets the doctors apart from the patients and he wants to be seen as on the same level as his patient, not talking down to them or seeming to think he is a superior human being. I like that perspective.

My perception is that the doctors in scrubs are better doctors, have more experience and therefore I trust them more with my care. And they really are hot - all I can think is one pull of a string and tada, I could see the family jewels. And no t-shirt underneath, that’s as nerdy as wearing socks with sandals.

Anonymous yenta said...

honestly, i would trust the guy in scrubs more than the guy in the suit... why be all dolled up?

Blogger Motherkitty said...

As a patient, I would prefer to see my physician in clean clothes with a lab coat in the office. At the hospital, where strict adherence to cleanliness and sanitation are of utmost importance, lose the dress wear and wear the scrubs. I would rather see a doctor who looks like they are ready to get
down and dirty rather than a prissy ass standing there not willing and able to get their hands dirty and take care of the patient.

Blogger Heather said...

As a nurse, I don’t care if you are wearing scrubs or a Big Bird suit. Patients really don’t care either. Do you think that someone who is laying in bed, crapping out their weight in lactulose is going to care if your tie matches your shirt?

Actually, it is better if the ressies are wearing scrubs because we like to get you in there for some hands-on stuff. I don’t think you would want bloody pus, C-diff stool, or any other disgusting body fluid on your nice silk tie. Scrubs are definitely the way to go. Everyone looks hot in them because they mask body flaws well, and if you get something on them, just go down to surgery and grab another pair.

Blogger Ada said...

Scrubs for the hospital, shirt & tie (or at least a crisp dress shirt) for the clinic. ...Anyway, I can’t remember what the doctors were wearing last time I was in a hospital anyway, so your patients probably won’t either.

Blogger David said...

I don’t think you should live in scrubs as a doctor, different clothes for different settings/activities. There is something to be said for a nice button-up shirt, slacks, and a white lab coat.

Blogger HotPink said...

I recently spent eight hours in the ER with my boyfriend. I was tired.
A very handsome doctor walked by in scrubs, looking like he’s stepped out of the ER set and was ready to save me from the next six mini cups of coffee and my boyfriend from another three hours of moaning. Three hours later, we got a middle aged doctor wearing a damned tie. HIS SHIRT WAS PRESSED.

Who the hell wears a tie and a pressed shirt in an ER where you’re supposed to save somebody’s life? It looked like, if the Love of My Life had needed immediate surgery, the doctor would have said, “Eeww, are you kidding me? This is an Armani tie, I don’t want to get blood all over it.” No ties, Fake Doctor. Wear your scrubs. And if anyone has an issue with it, tell ‘em they can talk to me.

Blogger Audi said...

Well after seeing a piece done on doctors and ties and how they carry a LOT of germs because they come in contact with the patients. Also because they don’t look “dirty” they don’t get washed as often as the should. I would choose the scrubs. At least they get washed on a regular basis and unless you are a fat slob everyone looks good in scrubs.

Blogger GoodSheila said...

During my dad’s final fight with cancer, we were bombarded with several versions of scrubs making their way in and out of his room. It was very hard to tell who was an orderly, nurse, doctor or who was the cleaning lady.

That being said, surgical scrubs are viewed differently and a patient can tell that ‘this is the doctor’. I believe it shows authority and confidence. For morning rounds, though, I’d like to see the doctor in
‘normal clothes’. Please NO BOW TIES - they’re very distracting to me. I can’t help but suppress a giggle each time I see them, and miss all the important information given. ;)

No matter what, please never assume that we know you’re the doctor. Always introduce yourself to the room (for the new visitors that haven’t seen you before). And, keep your ID visible, so your patients that have seen 30 doctors that day will be able to look at your name without having the embarrassment of having to ask AGAIN. Okay - enough of my babble. I suppose my final thought would be to wear what YOU feel most confident in. Your confidence level is felt by your patients and their family.

Blogger missbhavens said...

Hospital? Scrubs. Clinic? Shirt, slacks, white coat, no tie(germy). NEVER scrubs AND a white coat. You’d be amazed how many people try this. If there was a red carpet leading to the hospital, Joan Rivers would rip them a new one as they passed by. And rightly so.

Anonymous denney said...

Scrubs! When a physician walks into a patient room in a suit at 3 am, the pt generally wants to know if he was running late after a physician’s banquet/mixer and asks me if I thought he’d been drinking while there.

There is a physician that wears a long lab coat with OR scrubs on my floor. It matches the shaving cream that he forgot to rinse off the top of his head quite well. Pts are generally “wowed” by a doc in a tailored suit with a stethoscope around the neck during the 7am-noon time frame.
But I’m guessing our geographic locations mandate all kinds of stupid dressing rules:

Blogger Sneha said...

I’m a med student in Australia. The only time we EVER wear scrubs is if we are actually in the theatre. All staff and students are forbidden to wear scrubs outside the theatre section of the hospital. So therefore I’d say, shirt and tie, although at night I’d say forget the tie, but still wear a shirt and slacks.

The only time we can dress “comfortably” is in emerg on the weekends. Oh and we never wear a white coat - only the orthopaedic surgeons insist on white coats, in my hospital anyway. What is it with you american’s and white coats? :)

Blogger redhead83402 said...

personally, I think that scrubs look good. They can be cleaned, changed, and don’t look too rumpled if you have to fall asleep on a bench during on call.

ALSO, sort of important, but presentation is everything! If you are having a meeting with the doc, say before a surgery, and he needs to explain things, you might wear slacks, button down shirt and the white coat, but if you are to look as though you actually ARE a doctor, say one who PRACTICES, you should wear scrubs. Besides the fact that as many folks have mentioned, scrubs look good on a variety of body shapes, they also give the patient the impression that ~ this doctor actually knows something~.
Blogger ER Nurse said...

Scrubs make docs look like they work and are real people like the patient- whereas the suit conveys book knowledge but not practical knowledge.

Blogger 4D said...

To be honest I don’t really care what a doctor is wearing. If I’ve gone to hospital with a problem, I’d prefer it if she/he is concentrating on my problem, not on the fact that their clothes are uncomfortable. I say you should wear what you’re most comfortable in.

Anonymous PrenurseEmma said...

Well, I’m a student nurse, and I usually get about in a fetching nurses’ uniform. I turned up for a psych placement in my own clothes, which included a velvet blazer, black pants, neat hair and my glasses, and was asked if I was the new doctor.

As pleased as I was with the promotion, and the potential for mischief, I had to inform them that no, I was a nurse. A student nurse at that. Obviously clothes do make the (wo)man, because when I turned up at another psych placement in jeans, I was not asked if I was a doctor. Professional wins for the public.

Blogger A. said...

Scrubs mean that you are working in a hospital. I mean, really, who wears scrubs on a subway or while directing traffic or in a classroom or while preparing a gourmet meal? So it stands to reason that you’d wear them when you are, in fact, working in a hospital. And I believe our
society has come far enough that comfortable clothes are as important as “looking professional.”

Also, I’m with the pp who says it is always in good form to introduce yourself. I’ve only been a hospital patient twice (for the birth of both my children), but it is amazing how many folks come and go in and out of a patient’s room. It is always helpful to have someone introduce themselves and tell you why they are there.

Blogger Cathie said...

One of the best Dr’s I ever saw in the hospital was wearing scrubs at 10:00am and he was great because
a) he actually looked me in the eye
b) answered the questions I asked
c) smiled at me
d) didn’t act like I was taking up his valuable Dr time.

These things are infinitely more important than what you are wearing and the guy that gave you the article is a complete fool. Stick to looking hot in scrubs.

Anonymous Anonymous said...

My vote is for scrubs in the hospital - which is the whole point here, 30 hours straight. Still, I have to agree that it’s hard to tell who’s the doctor when everyone is in scrubs.

So I also agree with the suggestion of keeping the ID visible and introducing yourself as the doctor.

I also agree with the comment about a doctor’s fine clothing reminding me of high bills in my future. I like the polo/khaki/white coat
look, myself, in the office. In fact, for something like pediatrics, I think a polo/jeans look is way cool.

Blogger Carina said...

My hubby wore scrubs whenever he was on-call (I know because I washed them). It was what all the residents did, but that was because the medical residents ran the codes in their hospitals. They had a dress code for the days, though.

Since becoming an attending, he’s ditched the ties entirely, and he never wears scrubs anymore. He doesn’t have hospital call, though, so it makes sense. Thank goodness I don’t have to clean his white coats, though. I say, unless there’s a written code you have to follow, wear the scrubs when you’re on call. That attending’s a jerk.

Blogger An Enlightened Fellow said...

Scrubs with a white lab coat over them. Best of both worlds, formal and informal.

Blogger Frozen Skeeter said...

Scrubs for sure. Anything else seems anal if your working 30 hours straight.

Anonymous Anonymous said...

If I’m on call, I will never, EVER not wear scrubs. Let them think I’m crazy but if you are going to bother me at 4am while I’m napping on the couch, don’t think I’m dressing up for a code blue.
Blogger GP said...

Frankly I think SCRUBS ROCKS for the long duty hours but even here in Malaysia it’s been implemented on how DR’s are suppose to be always formally attired. It’s SO inconvenient at times, especially when you are dumped with all the reports and the mid-night rounds. Somedays I feel like I may just collapse wearing formals especially when the heat from the environment and the work gets to you!!

Blogger Joy said...

As the mother who lived at the hospital for 6 weeks when her child was born with severe heart defects, and has been in and out with that child ever since, I prefer doctors who introduce themselves as doctors and wear their IDs where I can see them.

We had a cardiology fellow who followed us for that entire 6 week stay who always wore scrubs and never introduced herself. I was brand-new to the whole hospital thing and never could figure out if she was a really knowledgeable nurse with more authority than the other ones or a lower-ranking doctor or what. The staff physicians only wore dress clothes the days they had outpatient clinics.

I prefer a doctor to wear what matches me. If I’m coming in to a clinic, I’m wearing “normal” clothes and the doctor wearing business casual is fine (white coat is optional). If I or a family member is admitted into the hospital, scrubs make me feel less of a scrounge since I have probably worn the same clothes for two days, have barely slept a wink, and may or may not have showered when you come in for those awful 7am rounds! I want to feel like part of the team, and having gussied-up doc come waltzing in is very off-putting. Especially in the ED, I would
go scrubs all the way - you never know what mess you might brush up against (or worse) and the patients/families there had to drop everything to come anyway. Who knows what they’ll be wearing!

Anonymous Greg said...

Personally I don’t care what my doctor wears. My family medicine doctor wears jeans and a tee-shirt (I live in the the NY Tri-State area) and I don’t think any less of him cause he always gets the job done well. How a doctor speaks to me plays a much bigger role.

Blogger Nuclear Mom said...

Scrubs in the hospital, shirt and tie in the office. But I never balked either when my ob showed up in scrubs in the office. (But then again he’s hot.)

Blogger T. said...

Scrubs win my vote. At least in the hospital. Perhaps in the clinic, a pair of slacks and a dress shirt. I spent months in the hospital with a sick child and as long as the doc had a visible name tag, I couldn’t give a flying fig what they had on.

Anonymous Celeste said...

Scrubs in the hospital for the overnighter. I’ve seen one E/R staff add a white coat on top of that and I think it’s lame. I do find it annoying if somebody wears scrubs for a day in the office, though. I feel like THAT is the time to show some respect with the clothing choices.
Blogger Bird said...

If you are working at a hospital, i would like the scrubs...if you are at a doctors office, i like business casual. No ties, everyone looks like an jerk in a tie.

Blogger MattHeatherEmma said...

My hubby’s rule is always: Clinic-Shirt and tie. Wards: Scrubs... unless he is seeing patients for consult during the day. It really does vary from one attending to another. Some are absolute jerks when it comes to attire and some look like slobs all of the time.

Anonymous ilyka said...

Okay, I can honestly say I don’t care what the doctor’s wearing. I’m not sure I’ve ever even noticed. But now I think about it, I think I’d prefer scrubs.

Scrub say, “I’m an in-demand guy who could be called into the OR at any minute, because only my expertise can save you.” Scrubs say you’re too busy to put on a tie. I think I prefer that.

Blogger design42 said...

Scrub.

Anonymous Anonymous said...

Nothing BUT SCRUBS, formal attire for hospital ? Is someone going crazy ...?
Blogger wendela said...

Scrubs in the hospital, whatever you want that’s comfortable elsewhere. I agree that w/o visible i.d. it’s sometimes hard to tell who’s who and does what in the hospital. Over all, clean shoes, no matter what kind. :)

Blogger Matt said...

As long as you sort out whatever’s wrong with me you can wear a wonderwoman costume for all I care...

Blogger FUNKYBROWNCHICK said...

My preference is a white coat or scrubs. Scrubs seem more personal. If my doctor showed up in a suit and tie, I’d get a little freaked out because, silly as it may sound, I’d think s/he was trying to add a little distance from the patients. *ME* doctor. *YOU* lowly patient.

Blogger Tara said...

When you’re in a hospital setting, scrubs. In a more family clinic setting, “formal” attire. Plus, if you’re in the hospital, who wants to get cooze on their nice clothes? Anything can happen. Oh, and I agree that scrubs are quite comfy.

Blogger Brookezlinne said...

As a patient:: Wear scrubs in the hospital. It looks like you’re not afraid to *gasp* touch your patients.

In a clinical setting: Nice shirt, tie, etc. When I see a doc in a clinic donning scrubs I can’t help but think “You taking traumas in this office
today?”

As a co-worker: Scrubs are our right. We graduated college, we’re smart, we work stupid hours, dammit we get to wear pajama-like clothing to work. Neener neener!

Blogger nurse pica said...

wear wat u want...as long as u smell good and do ur job well.

Blogger elizabby said...

Hey, did you see the recent BMJ article about how ties carry nosocomial infections?! Forget the tie (unless you want wear a bow tie, in which case I’m never reading you again!) Scrubs are fine at night, shirt and nice pants during the day. No jeans, no sneakers, no jewellery. This is a professional setting. It’s not only the patients you have to impress (they want to know you take their illness seriously) but the families will be paying even more attention.

Anonymous Anonymous said...

I’d always prefer to see a doctor in scrubs. It’s just suppost to be that way. When somone sees scrubs they automaticly think doctor, but when someone sees a shirt and tie they think ... business school? Anyway, with as much work as doctors do, why not let them wear pajamas to work? As a doctor you’ve earned the right.

Blogger Tidy Bowl said...

Totally depends on the situation... if you’re in your office, in a practice, I expect a shirt and tie, or at least something dress-casual. If
you’re in an ER or admitting somewhere in a hospital, I would expect scrubs.

If you’re doing rounds in a hospital it could probably go either way. If you’re wearing scrubs, wear a t-shirt underneath them... if you really do look hot, I would appreciate the distraction from my pain, but I really don’t want to see your chest hair. If you’re wearing a shirt and tie, please don’t wear a suitcoat. That’s just a bit too much for me!

Anonymous Anonymous said...

I agree with the general consensus. Scrubs for hospital, get gussied up for office.

Blogger Sarabeth said...

Start in formal and change to scrubs, but personally, I don’t care what the doc is wearing. It’s all about the confidence and the way I’m treated as a person.

Anonymous Anonymous said...

I love scrubs. Shirt and tie is standard for the office but definitely not for when I’m on call. If I ever have an excuse to dress casually, I do it. Next year when I’m an intern and no longer a lowly med student I plan on dressing as casually as possible at all times.

Blogger the bored one said...

scrubs every time...i dont want my doc in a starchy shirt and strangling tie when i might be fighting for my life or some such thing...
Anonymous misha said...

I used to work in education but now work in a hospital. I have been amazed at how in this corporate, button-down setting people are so caught up in how things look rather than how things are. The suits are too formal.

When I am in the hospital with my kid....I have bed head and am in pseudo PJs sleeping in the fetal position on the window seat. No need to wake up to Doctor McDreamy in red carpet attire (or was that just a dream?).

Anyway---I am not mainstream----but would appreciate a kind, compassionate medical professional in a hawaiian shirt & flip flops over a cold fish in a 3 piece suit! On a related note---a lot of hospital nurses wear t-shirts and scrub pants---esp in pediatrics-- Why not?

Blogger Reg said...

Scrubs are fine. Be comfortable. I do like the white lab coat though. Can you wear that over them?

Blogger Margie the Pickle Princess said...

I think that when a doctor wears a tie; a) he’s a stuck up prick who’s going to charge me too damn much and thinks he knows everything, and b) he’s not really going to listen to my needs and is just going to rush me through and out with a quick fix to get rid of me.

Blogger Stepho said...

I vote scrubs in the hospital or any sort of clinic setting. If you are working in an office outside of the hospital, scrubs seem a little weird.
However, you should always have some sort of shirt under your scrubs (patients really don’t want to see your chest hair), and a white coat over the scrubs works too.

Anonymous Anonymous said...

Appearance matters. People are visual. People wear uniforms, everybody. Yea, they may not necessarily be mandated, but our appearance communicates what we choose it to. Scrubs have their place, as do more formal clothes.

Blogger Febrifuge said...

When I was a tech in the ER, people thought I was a doctor. When I shadow in clinic and I’m wearing a shirt and tie, people think I’m a doctor. Ergo (and yeah, I’m assuming my anecdotal evidence matters, but thas’ how I roll, yo), where you’re at and what you’re doin’ are clearly the more important factors.

So if I’m the patient, here’s what I’m thinking. Dude in scrubs in the clinic, when everyone else is wearing ties and jackets: tech. Dude in tie and jacket when everyone else is wearing scrubs: possibly a local investigative journalist looking for dangerous practices. What kind of place is this, anyhow?

Anonymous Vinay said...

I’m a med student in Australia... basically all the doctors here (interns, residents, registrars and consultants) wear shirts and ties... scrubs are pretty much reserved for people who just got out of surgery and are going to pop back in...there are a few old school docs who wear white
coats.. but they are few and far between... i think that goes against the "non-paternalistic" type o medicine we’re sposed to be working towards... its hard enoug to tell who everyone is.. with every nurse wearing a different damned uniform... so its good the docs look the same.. (and lets us med students pass as docs every now and again =P )

Anonymous Anonymous said...

First point: maybe the patients’ preferences regarding your attire doesn’t matter. I mean, they’d probably not prefer to be in the hospital (and I do mean the HOSPITAL, not the country club golf and family medicine clinic), but there they are...

Second point: you ever been to a party where you were significantly over- or under-dressed? It’s not pleasant. That disparity pales in comparison to that between a Dr. in a tie and a patient with a flimsy gown with the ass open in the back.

Anonymous Anonymous said...

Oh please wear a suit and tie and come in to my hospital room as I sit in some assine open-backed garmet that totally demoralizes me. Please widen the whole doctor-patient gap a little more, couldja?

Anonymous Anonymous said...

I say if you’re working 30 hours straight, you wear whatever you damn well please.

If you’re mostly in ER or in the OR, definitely the scrubs - lord knows what you’d get on your clothes.

If you’re in the office/clinic, I say comfortable casual is the way to
go. A tie is for researchers and specialists who worry more about what they look like than what they are doing.

Blogger Kathryn said...

Personally I really don’t care what doctors (fake or real) wear as long as they listen to me. I hate it when they don’t listen...it has nothing to do with attire.

Blogger The MSILF said...

Well, I gotta ring in on this one. In Israel, the world capital of unprofessionalism, the only time I have EVER seen a doctor wear a suit or tie is if he is going to appear on international tv.

I also don’t think I’ve ever, *ever* called a doctor by anything other than a first name. Scrubs are much loved everywhere. Somehow, they decided to color code them - at my hospital, nurses are one shade of blue, surgeons are green, and weirdly enough, internal medicine is in white scrubs, often with a white coat on top.

Ah, at some other hospital in ob/gyn, they asked us to put white coats or surgical gowns over scrubs when we left the operating theater and roamed other areas of the hospital, or to change scrubs when we came back in.

When older docs are in a clinic or whatever, they usually wear sandals (technically against the rules, I guess), clogs, jeans, and a t-shirt, or a short consultation jacket. In internal med when we weren’t in scrubs, I wore jeans and t-shirts under an open white coat (including the Vote for Pedro shirt, etc) and no one ever said anything. I must say though, this report is making me reconsider residency in the states.
Blogger unsinkablemb said...

IMO, if you’re in the hospital, scrubs are appropriate. If you’re in clinic, then go with the nice shirt, tie, white coat. I’m in the OR all the time, so all I see are Docs in scrubs. I must say, it’s a nice look.

As for docs of the baby boomer generation, my mom is in that category. From working with her while I was in nursing school, I observed that she is usually dressed in “business casual” with a white coat in the hospital and whatever-the-heck-color coat she wants in her office. She doesn’t seem to sweat about the clothing issue since she is able to develop a good rapport with patients rather quickly. It must be that in addition to her clothes, she wears a friendly smile.

Anonymous Anonymous said...

Scrubs all the way! If someone came into my room at a hospital with a tie on I would think I had died and the funeral director had come to collect. There is nothing worse than an uptight idiot in a business suit. I would be much more comfortable if you walked in with scrubs on or jeans/slacks and a nice shirt. Stay away from the formal wear, you are much to cool for that crap!

Blogger Peg said...

I think scrubs while in hospital on call, casual attire if visiting patient in the morning and in the office or clinic, suit or white coat casual.. tie optional. I have the most adorable orthopod and I have seen him in all of the above. The bottom line is that it really doesnt matter as long as you give good care.
Blogger Random “Frequent Flyer” Dent said...

In an ER, especially at night, go with scrubs. I’ve learned to associate scrubs with healthcare professionals, and overnight rotations, you need something you can move in.

Beside’s if they expect guys to wear ties, does that mean they expect women to wear skirts and heels? however, if you are in a clinic, and seeing patients with appointments, looking somewhat professional is a good idea.

Blogger Patty said...

Always wear a lab coat, whether you are in scrubs or street clothes. The lab coat should have your name, title, and institution embroidered over the left breast pocket. The hospital should provide this for you.

Originally scrubs were intended to be worn only in the operating room or newborn nursery, and each person who left the suite for a break was to cover the scrubs with a lab coat so “outside germs” didn’t get on the scrubs.

If you are staying on-call at the hospital, wear scrubs. If you are on-call while away from the hospital, wear street clothes. When a surgeon comes into the ER at midnight to do an emergency appendectomy, wearing street clothes says to the patient “I was not lounging around the hospital waiting for something to do, I interrupted my private life to come in and help you.”

When a patient’s family demands to know what’s taking so long for the doctor to get here, the nurse can explain “he has to drive to the hospital” but it doesn’t sink in until they see the physician arrive fully dressed.
If you are doing a medical rotation a dress shirt and tie with a lab coat is the way to go, it implies that you are interested in a broader approach to medicine. If you need to examine a patient who is “draining” ask the nurse to get you a gown to wear over your lab coat, so you don’t contaminate yourself and the next patient. If you are in a specialty that is mostly medical but sometimes interventional, scrubs = had to/might have to scrub in. If you do a procedure at the hospital that makes you late for clinic, wearing scrubs with a lab coat sends the message “sorry I’m behind schedule, but I had to save someone’s life before I could come over to the office, and I didn’t take time to change because I wanted to honor YOUR appointment.”

I have some bad news for you: the younger the physician, the more conservatively he must dress to have credibility. When you are old enough to have such a huge client base that you are turning patients away, then you can wear what ever you want.

Blogger MustangSally said...

In clinic/offices, wear something nice-looking. It doesn’t have to include a tie, but a nice shirt and neatly pressed pants are good for men. Women get away with a bit more because we have a wide range of choices (but then again you have more opportunities to get in trouble too!).

In the hospital, I think it depends on your role. If you’re an ER physician, something nice and a white coat over it is good. I remember when my mom had emergency surgery late one night, and the surgeon came in wearing nice dress clothes (tie included) and a white coat to examine her after she’d been admitted and before surgery. After the surgery when he came to let me know how it had gone he was wearing
green scrubs and a green cap, and I think that was great because it does kind of put you on an equal footing with patients. If a family member has just had surgery and you’re waiting to find out if they lived or died, it’s nice to have someone in comfy clothes come and talk to you. The dress clothes help reassure you beforehand that this person is a professional, and then afterwards the more casual clothing makes you more relaxed in their presence.

Blogger Sarah said...

The white coat makes doctors look like pompous asses - if you want to make people comfortable, then you have to be comfortable, so whatever works for you works for me.

Anonymous Anonymous said...

Scrubs no question. I’ve had a job where they expected me to dress up too, and why? To get all dirty and ruin my clothes. No thanks. Plus, quite frankly I’d be uncomfortable with a doctor who was all dressed up. When I am in the hospital it’s because I am sick. I don’t really care what anyone looks like, the most important thing is that hospital professionals are sincere, genuine, respectful, appropriately humourous and caring. That should shine through at all times, regardless of a person’s attire.

Blogger Summer said...

If you are on call but have to be in the clinic during the day of call, wear: Dress pants, nice shirt & white coat. Tie, if you want. Bring scrubs to change into after clinic. On call, in hospital only: scrubs & crocs all day/night.
Anonymous umichm3 said...

I think everyone with an MD/DO or <2 years away from an MD/DO should wear a white coat AT ALL TIMES, unless they’re wearing a surgical gown (or unless they’re in psychiatry). I don’t buy any of the crap about not wearing the white coat so that you are at the same level as your patients.

If you’re someone who’s not “book-smart” or hasn’t had a lot of “book learnin’”, you probably sure as hell don’t want to receive medical care from someone on your own level. And let’s be honest, most of the population fits this category. (Obviously, I emphatically agree with all the other SUBCONSCIOUS “same level - don’t be a jerk” stuff like trying to sit at or below the level of your patients, letting them talk without interruption for the first several minutes of the interaction, asking them if they have any questions, etc.)

Scrubs are appropriate only for people in surgical fields, emergency medicine, or when on call (during which scrubs are fair game for the full 30 hours - no changing for rounds bull). In my institution, attendings wear scrubs almost EXCLUSIVELY in the OR, and change to shirt/tie if they need to see a patient on the floor.

Otherwise, if criteria for scrubs are not met, it’s shirt/tie all the way (again, with the exception of psychiatry). The tie spreading disease literature is fascinating and may one day provoke widespread change, but for now, male doctors and doctors-to-be’s are resigned to wear ties with their shirts.

There is absolutely no reason, ever, to wear a suit for patient care. I know some places are weird about this (i.e. Mayo), but seriously, I look very askance at people in the hospital wearing suits, because they’re
either the administration, lawyers, or drug reps. Docs just don’t wear suits, at least around here.

Anonymous said...

I vote for anything that looks and acts like a doctor. When my dad was dying, the palliative care resident came in looking like she was going to a party...at 10 a.m. on Tuesday morning. Sparkly open-toe sandals, sleeveless shirt, tight pants, loose flowing hair, jewelry. Yeah, she was pretty, but that was the last thing on anyone’s mind - we just wanted her to be a good doctor, and she wasn’t. I would have cut her more slack if she had been professionally dressed and at least looked the part.

Blogger Nicole said...

Where I used to work in dot com land we would dress up for Halloween like big two-year olds. One year, I went as an ER doctor and wore scrubs. It was the most comfortable workday of my entire life. As a patient it would make sense to me that the doc would be wearing scrubs in the hospital. If I were going to their office for my yearly check under the hood, then that would be odd. . .

Blogger Thora said...

Scrubs. A doctor in scrubs looks likes he or she is DOING something... whereas a doctor in a tie looks like he’s just staying too clean... you know, like if I thought I had TSS, I don’t want the doctor with a tie on going in there for a swab... bring on the scrubs.
Anonymous Anonymous said...

Shirt and tie - I think there is a lot of confidence to be had in someone who takes (or at least looks like) they take their job seriously. Unfortunately people judge someone by what they look like and how they carry themselves and on first blush someone who dresses up looks more serious.

Anonymous oh shet said...

Well you’re right - scrubs are damn comfortable to wear anywhere, any time, day or night. I even wear them at home, having brought a few pairs home after late nights or overnight shifts.

But unless there’s a good reason for wearing them, like just having come out of OT or something (or just about to go in), shirt and tie please!

Blogger milkberry said...

I vote scrubs! A doctor in ties and pressed shirts are just like a football (soccer) coach in Armani suit during a game. They just don’t look the part. But that’s just my opinion :D

Anonymous Anonymous said...

Lots of good advice here and I’m torn over the scrubs or not. Chest hair is so icky (scrubs) but I wouldn’t want a frat boy, either. Ew. So, are you going to talk shoes? Please! A lot of docs wear CROCS. OMG! That’s so weird. If I got a male doc and he was wearing clogs, I’d pine for the male doc wearing NewBalances. Just know, people notice your kicks, too.
Anonymous Rachel said...

I can’t believe you got so many comments. my two cents is that i think a lab coat is best. that way it doesn’t matter what you wear underneath and it is still comfortable and yet you are still oozing the doctorness.

Blogger susan said...

ID where I can see it, an introduction, and a face I can see is what I like. I prefer people to be wearing what looks natural to them, rather than looking patronisingly like they’re trying to dress up as their job title for my benefit. I do like doctors to look clean and washable is much more reassuring than dry-clean only. Scrubs tick all the boxes.

Importantly for t-shirt wearing doctors in informal countries: if any part of the outfit has words on it let them not be rude ones.

Anonymous Anonymous said...

Scrubs it is at least it gives the impression you can be found in the hospital in case of need. Shirt and tie gives the impression you are just passing through!

Anonymous Nicole said...

in our second year of med school we had to do an “ethics research project”. our group did it on physician attire ’cuz we thought it would be fun to play dress-up. we surveyed a few hundred people in doctor’s offices and found that, for males, a suit and tie was actually perceived the worst, by very far, and scrubs or business casual (nice shirt no tie) did best.
Anonymous Anonymous said...

my most preferred doctor outfit is jeans, pink uggs, my pink fleece and my hello kitty adorned stethoscope. and with this outfit i won over the little girl who put “no dr. so-and-so allowed” signs all over her door. peds rules.

if you’re nice to your patients, you can wear whatever you want and they won’t care. if you’re not, you can still wear whatever you want because they still won’t care.

Anonymous Anonymous said...

I would say it is not your appearance but your demeanor that counts... But since we are talking about appearance I’d say...

1- In patients aren’t really going to give 2 hoots...they have bigger and better problems.

2- If there is any hands on patient care involved, wear scrubs for sanitarty purposes for you and for your patients.

3- If there is no “hands on” “down and dirty” patient care going on, say office hours...then professional attire with or without your labcoat. Looks nice either way but it is all in how you present yourself.

Presenting yourself: You could walk out from surgery and talk to a family just in scrubs or you could put a labcoat over your scrubs or you could take the time to change completely but I don’t really think the family will care either way...they want to know the status of their loved one. Can I say it again? It’s all in how you present yourself.

Be professional, be focused on them or their family member, be short and sweet, answer their questions to the point, act like you care for a moment or 2...oh yes, this is a good one, approach with passive postures...
like if you are walking up to a family, hold your hands behind your back, when you get to them, greet them, hold your elbows at 90 degrees and lock your hands together...it will keep you from standing there like an idiot and it will do 2 thinks...you have a passive stance on approach, a concerned to the point stance upon speaking and then you can get the hell out and you looked golden through it all. Works like a charm.

Good luck to you fake doctor. Be sure to let us know the results of your survey.

Anonymous Anonymous said...

You won’t get “fired” from the hospital for wearing scrubs. And even if some people prefer dress shirts and shoes, they wouldn’t be surprised by any means if you showed up in scrubs. I wear scrubs. I’m aware of this article, too. People are just wishy washy sometimes. If you told them some reason you were wearing them, they would then think dress shirts aren’t right anymore. Show that doc what’s up.

Anonymous Anonymous said...

1 more vote for scrubs. All sorts of professionals (and fake professionals) wear shirt and tie. Only doctors get to wear the scrubs.

Also, as someone who puts comfort above almost any other factor when it comes to dress, I like to see others comfortable as well, especially if they’re there to help me (the patient).

I know I work more efficiently when comfortable... wonder if that’s been studied? Doctor’s ability to do their job well should be at least as important as patient preferences when it comes to dress. Plus aren’t ties considered expensive germ collectors anyway???
Anonymous Anonymous said...

By all means, wear scrubs. When a doctor comes and speaks with me I want hard at work. A suit and tie doesn’t show a patient that the doctor is currently working and dealing with patients. It says that they have spare time to spend on fashion and less to spend dealing with their patients.

Blogger Jill’s world of research, reaction, and millinery said...

What ever in the hospital/clinic, but for heaven sake, DON’T wear scrubs with the surgical cap all wet and sweaty to the public library to check Wall Street after morning surgery, like one doctor used to do. Seriously. Gag! Keep the stuff you wear with sick folk in the hospital, not next to me in line at the grocery store, or at the next table at a restaurant. I only care if you are a doctor if you are actually treating me.

Anonymous Anonymous said...

I think it all depends on where you are. Scrubs are comfortable. I’m a lab jockie..and I have to wear scrubs. Usually a long sleeve t-shirt underneath. It’s easy and clean, the only drawback is you’re mistaken for a nurse a lot. Of course no patients see me and I basically sit around on second shift (5pm-130am) waiting for some ER doc to send something nasty our way.
REFERENCES


Banks, W., Barber, G. (1977) Color information in iconic memory, Psychological Review, 84(6), (536-546).


168


Grafixpress Ltd.


If you can’t rebuild it, repaint it. (2005, September 2005). *Chain Store Age, 27*.


Kandinsky, W., Lindsay, W., Vergo, P. (1994). *Kandinsky, complete writings on art*. Cambridge: Da Capo Press


Loh, W., Ng, V., Holton, J., Bacterial Flora on the white coats of medical students. *Journal of Hospital Infections (45)*, (65-68).


McNaughton-Filion, L., Chen., J., Norton, P., The physician’s appearance., *Family*


